

BRENT SPENCE BRIDGE CORRIDOR PROJECT

# INTERCHANGE MODIFICATION STUDY (IMS) ADDENDUM

**DECEMBER 8, 2023** 





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# 1. INTRODUCTION

The purpose of this *Interchange Modification Study (IMS) Addendum* is to update the original *Access Point Request (August 2011)*<sup>1</sup> for the Brent Spence Bridge (BSB) Corridor project. The original document presented various design and performance criteria for Alternative I to substantiate that the proposed changes in access to the interstate system would not degrade the operation or safety compared to the existing conditions and was approved by the Federal Highway Administration (FHWA) on November 3, 2011. This approved design is Selected Alternative I (from the 2012 EA/FONSI). This IMS Addendum provides information relative to design and traffic analysis performed since 2012, referencing project documents leading to the identification of several value engineering refinements to Selected Alternative I. Throughout this IMS Addendum, these collective refinements incorporated into Selected Alternative I are referred to as Refined Alternative I (Concept I-W). The addendum will assist the Kentucky Transportation Cabinet (KYTC), the Ohio Department of Transportation (ODOT), and FHWA in assessing the differences in impacts to safety and mobility between the Selected Alternative I and the refinements incorporated into Refined Alternative I (Concept I-W) and provide the justification and documentation necessary to substantiate that the refinements incorporated into Refined Alternative I (Concept I-W) will not result in adverse impacts to operations or safety.

# 2. PROJECT AREA AND STUDY AREA

**Figure 1** illustrates the BSB project area and interstate I-71 and I-75 corridor, including geospatial data for the bridge crossing. The southern limit of the project is approximately 5,000 feet south of the US 25/Dixie Highway interchange on I-71/I-75 in Fort Mitchell at Kentucky milepost 188.0. The northern boundary of the project is about 1,500 feet north of the Western Hills Viaduct (WHV) interchange on I-75 in Cincinnati at Ohio milepost 2.5. The eastern and western limits of the project corridor generally follow the existing alignment of I-75, a major throughway for local and regional mobility within the Greater Cincinnati/Northern Kentucky region. Locally, I-75 connects to I-71, I-74, I-275, and US Route 50. The BSB provides an interstate connection carrying I-71 and I-75 over the Ohio River, providing a critical link along the national I-75 corridor stretching from Florida to Michigan.

<sup>&</sup>lt;sup>1</sup> AccessPointRequest-Aug.2011.pdf (brentspencebridgecorridor.com)



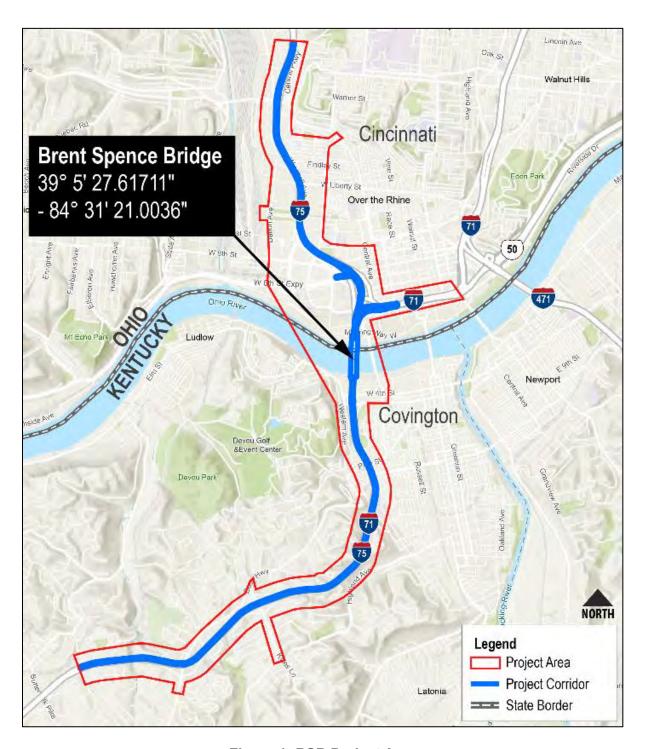


Figure 1: BSB Project Area



The BSB Study Area for this IMS Addendum extends to the first adjacent interchange beyond the project area, including Buttermilk Pike south of the US 25/Dixie Highway Interchange and Hopple Street north of the WHV Interchange. **Figure 2** shows the TransModeler operations limits, which extend along the I-71/75 corridor to include the I-275 Interchange on the south and the I-74/I-75 Interchange on the north. The model consists of mainline, ramps, and ramp terminal intersections.

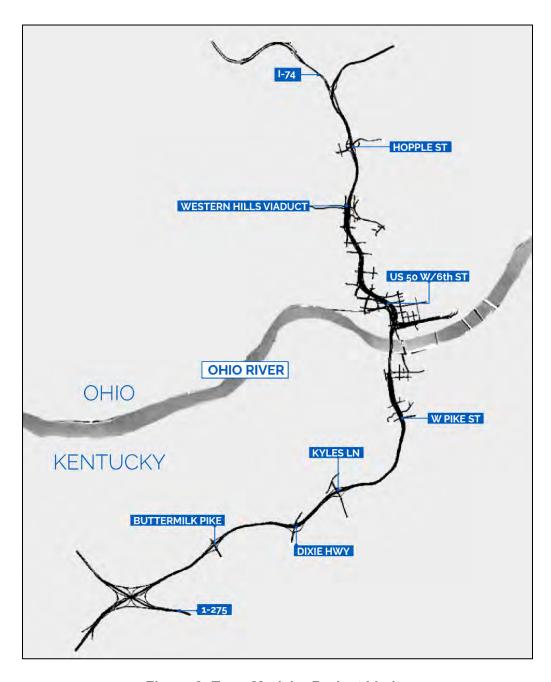


Figure 2: TransModeler Project Limits



# 3. PROJECT HISTORY

# 3.1 Project Background

On October 14, 2004, KYTC and ODOT recognized the need to improve the Brent Spence Bridge (BSB) corridor. They formally agreed to jointly develop and deliver a project to replace the existing BSB over the Ohio River. Key characteristics of the BSB corridor include:

- The corridor comprises 7.8 miles of I-71 and I-75, located within portions of Ohio and Kentucky.
- The BSB carries both I-71 and I-75 over the Ohio River.
- The BSB opened in 1963 and was designed to carry 80,000 vehicles per day (VPD). The current traffic volumes are 160,000 VPD.

# 3.2 Existing Conditions

The I-71 and I-75 facilities do not meet current design standards for numerous features, including lane widths, shoulder widths, horizontal and vertical clearances, left-hand entrances and exits, and horizontal and vertical geometry. The BSB, with its reduced travel lane and shoulder widths, is the most frequently noted substandard feature. The BSB was opened in 1963 as a double-deck truss structure designed to carry three 12-foot travel lanes in both directions over the Ohio River. In 1985, increased traffic volumes warranted an additional travel lane in each direction to add capacity. To accomplish this, the original safety curb on the bridge was retrofitted to the New Jersey Barrier style barrier, and the existing travel lanes were reduced in width to accommodate four 11-foot lanes with one-foot shoulders.

In addition to the design deficiencies on the bridge, the approaches on either side are also characterized by design deficiencies, such as narrow travel lanes and reduced shoulder widths. The substandard lane widths and lack of shoulders result in unacceptable operational deficiencies and create safety hazards for motorists.

# 3.3 Purpose and Need

The purpose of the BSB Corridor Project is unchanged from what was presented in the approved 2012 EA/FONSI:

- Improve traffic flow and level of service;
- Improve safety;
- Correct geometric deficiencies; and
- Maintain connections to critical regional and national transportation corridors.

# 3.4 Project Development Before 2012

To satisfy the requirements of the National Environmental Policy Act (NEPA), KYTC and ODOT completed numerous resource-specific technical studies to determine potential impacts on the human and natural environment. These efforts were documented in resource-specific technical reports. The results of the



resource-specific studies were incorporated into the evaluation of alternatives throughout the project's development. A summary of the decision-making documents that culminated in identifying the preferred alternative is provided in the *Project Summary Report*<sup>2</sup>. Several documents are summarized below that documented the selection of Alternative I:

- Environmental Assessment (EA) (March 2012) Compared the two feasible Build Alternatives E and I, and the No Build Alternative. Alternative I was recommended as the preferred alternative based on design, local access, traffic operations, estimated costs, environmental impacts, and stakeholder coordination.
- Access Point Request (August 2011, approved on November 3, 2011) Documented various design
  and performance criteria for Alternative I to substantiate that the proposed changes in access to the
  interstate system would not degrade the operation or safety compared to the existing conditions.
- Finding of No Significant Impact (FONSI) (August 9, 2012) FHWA determined that Alternative I would not significantly impact the human or natural environment.

# 4. DEVELOPMENT OF REFINEMENT CONCEPTS

Since the approval of the FONSI, the Selected Alternative I was further evaluated by KYTC and ODOT to apply practical design principles, which included an update to design standards, traffic counts, and traffic operations to determine potential cost savings. As a result of this effort, two value engineering concepts were developed with different lane configurations at the Ohio River crossing. These concepts did not change the access points provided in the preferred alternative, nor did they change the concept of creating a collector-distributor system that separates the interstate through traffic from the local connections. Evaluation of both concepts showed that they remained within the footprint of the original NEPA document. These efforts included:

- In October 2012, a Value Engineering Workshop was held to generate technical ideas to improve the design and constructability of Selected Alternative I.
- In 2015, as part of the continuing value engineering process, KYTC and ODOT developed the Whiz Bang Concept to evaluate further one of the high-value ideas generated during the Practical Design//Value Engineering Workshop: separating through (interstate) traffic from local ramp connections.
- In 2019, a Performance-Based Design Workshop was held to review the project using practical design principles, updated design standards, updated traffic counts, and traffic analysis to determine potential cost savings. Value engineering concepts were developed to reduce the cost of Alternative I. Each concept utilized different lane configurations for the existing and companion bridges – Concept W (Whiz Bang), Concept S, and Concept M.

<sup>&</sup>lt;sup>2</sup> 2021-11-4-Brent Spence Summary-Report.pdf (brentspencebridgecorridor.com)



The development of these concepts was documented in the *Analysis of Design Concepts (May 2020)* report<sup>3</sup>, with recommendations for moving forward based on operation, design, and cost. Concept W and Concept M were both considered viable options for the BSB corridor and recommended for further study. After completing the *Analysis of Design Concepts* report, the concept names were updated to Concept I-W and Concept I-M to convey more clearly that the concepts are value engineering refinements to Selected Alternative I.

Selected Alternative I and value engineering Concepts I-W and I-M were further evaluated as described in the following reports.

- In August 2022, a *Traffic Operations Report*<sup>4</sup> was prepared to review available traffic counts, OKI travel demand modeling, existing (2019) TransModeler calibration, development of refined alternative traffic forecasts, and TransModeler scenario analysis of 2050 build concepts. The primary focus of the traffic modeling was freeway operational analysis of the value engineering Concepts I-W and I-M.
  - Traffic operations analysis using TransModeler and refined traffic forecasts developed from the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) travel demand model were completed for the BSB corridor. The existing TransModeler files were calibrated to 2019 AM and PM peak periods, and the forecast origin-destination (O-D) matrices represented a 2050 condition. The two value engineering concepts were evaluated and compared to Selected Alternative I. The operations analysis indicated that Concept I-W has acceptable traffic operations while Concept I-M experiences excessive traffic queues for NB I-71/I-75 in the AM peak period.
- In August 2022, a *Design Summary Report*<sup>5</sup> was prepared to compare Selected Alternative I, Concept I-W, and Concept I-M regarding operations, local connectivity, design exceptions, work limits, and cost estimates. The operations analysis indicated Concept I-W has acceptable traffic operations with similar deficiencies to Selected Alternative I. At the same time, Concept I-M experiences excessive traffic queues for NB I-71/I-75 in the AM peak period. Based on a comparison of the design factors and traffic operations, it was recommended that Concept I-W be carried forward as a value engineering refinement to Selected Alternative I and that Concept I-M be excluded from further consideration. For the remainder of this IMS Addendum, the collective refinements incorporated into the Selected Alternative I since the 2012 EA/FONSI are referred to as Refined Alternative I (Concept I-W).

# 4.1 Refined Alternative I (Concept I-W) Conceptual Signing Plan

The 2012 Selected Alternative I conceptual signing plan was reviewed for compatibility with Refined Alternative I (Concept I-W). No fatal flaws were found for the signing of Refined Alternative I (Concept I-W) from the southern project limits in Kentucky to Linn Street in Ohio. However, while considering the signing, it was recognized that potential revisions could be made to the original Selected Alternative I signing plan to improve

<sup>&</sup>lt;sup>5</sup> 2022-8-23-Final-Design-Summary-Report-wAppendix-note.pdf (brentspencebridgecorridor.com)



<sup>&</sup>lt;sup>3</sup> Analysis-of-Design-Concepts.pdf (brentspencebridgecorridor.com)

<sup>&</sup>lt;sup>4</sup> BSB Traffic Operations Report Final.pdf (brentspencebridgecorridor.com),

driver understanding and operations for southbound I-75 drivers north of Linn Street in Ohio. Comments received from both states are addressed on the plan sheets included in **Appendix A**.

Coordination with the two BSB Corridor ODOT design projects north of Linn Street (Linn Street to Findlay Street and Findlay Street to north of the WHV) will be necessary to verify lane assignments for the interstate and determine appropriate pavement marking and signing needs for Refined Alternative I (Concept I-W). This will also include coordination with the freeway management/ITS design and destination signing in the BSB corridor.

# 5. LOCAL COORDINATION AND PROJECT PHASING

# 5.1 Local Coordination and Refined Alternative I (Concept I-W)

Since the 2012 FONSI, KYTC and ODOT have coordinated with local cities and counties to develop the refinements in Refined Alternative I (Concept I-W) and identify mitigation activities and additional measures that integrate the BSB Corridor Project into the surrounding communities. As part of these efforts, KYTC and ODOT coordinated with the City of Cincinnati and Covington to refine the project design in their communities. These refinements include:

- The local connections at the I-75 and WHV Interchange were changed based on the final bridge alignment of the WHV Replacement Project (a City of Cincinnati and Hamilton County joint project).
- The northbound entrance ramp to I-75 from Freeman Avenue from south of Ezzard Charles Drive was relocated to the north of Ezzard Charles Drive.
- The northbound entrance ramp in Ohio to I-75 from 4<sup>th</sup> Street was relocated to 3<sup>rd</sup> Street.
- The Ohio southbound I-75 to 5<sup>th</sup> Street exit ramp was removed to provide improved geometrics and open land for potential redevelopment.
- A new intersection with the northbound C-D ramp was created at 5<sup>th</sup> Street in Ohio; the number of lanes was reduced on the 5<sup>th</sup> Street approach to Central Avenue; the connection from 6<sup>th</sup> Street was changed from Winchell to the northbound C-D directly to I-75; and the exit ramp from SB I-75 to 7<sup>th</sup> Street was widened to two lanes.
- The number of lanes on Simon Kenton Way and Bullock Street between 12<sup>th</sup> Street and 9<sup>th</sup> Street in Kentucky was reduced to minimize right-of-way impacts.
- Simon Kenton Way was extended to the 5<sup>th</sup> Street ramp.

KYTC and ODOT will continue coordinating with appropriate local agencies throughout the procurement, final design, and construction phases of the BSB Corridor Project.



# 5.2 Design Criteria

The Refined Alternative I (Concept I-W) design follows the most current versions of the KYTC *Highway Design Guidance Manual* and the ODOT *Location and Design Manual*. Notable changes to the project design criteria since the 2012 EA/FONSI include:

- The original design followed the preferred criteria for design speed at that time. Per accepted practice
  for KYTC and ODOT, Refined Alternative I (Concept I-W) utilizes performance-based design guidelines
  that allow the design speed to match the posted speed for the I-71/I-75 mainline. As such, the design
  speed for the I-71/I-75 mainline is reduced from 60 mph to 55 mph. The design speed for the C-D roads
  matches the mainline design speed of 55 mph. Selected Alternative I used a design speed of 50 mph
  for the C-D roads.
- The original design utilized shoulder widths to accommodate pier foundations, light towers, and sign foundations. Current KYTC and ODOT design standards do not require the extra widening of shoulders in these situations. In addition, the requirement for 12-foot shoulders on roadways in Ohio with three or more lanes and high truck traffic was removed. As such, the design standard for inside and outside shoulder widths for I-71/I-75 and the C-D roads for Refined Alternative I (Concept I-W) is revised to 10 feet.

During the development of final plans, all design standards will be the current approved KYTC Highway Design Guidance Manual and the ODOT Location and Design Manual and will be verified to meet current AASHTO Standards at a minimum.

# **5.3 Description of Alternatives**

ODOT and KYTC identified Selected Alternative I as the preferred Alternative in the BSB 2012 EA/FONSI. Refined Alternative I (Concept I-W) was developed as a value engineering refinement to Selected Alternative I through a series of design and operational studies completed since 2012. The two alternative designs are described in the following sections as a general overview of the alignment and configuration of bridges. Specific differences related to the change in design speed for Refined Alternative I (Concept I-W) are not included.

#### 5.3.1 Selected Alternative I

Selected Alternative I utilizes the existing I-71/I-75 alignment from the southern project limits at the Dixie Highway Interchange north to the Kyles Lane Interchange. The Dixie Highway and Kyles Lane Interchanges are modified to accommodate a C-D roadway, designed along both sides of I-71/I-75 between the two interchanges. The alignment shifts to the west to accommodate additional I-71/I-75 travel lanes north of the Kyles Lane Interchange. Six lanes are provided in each direction between Kyles Lane and KY 12th Street. Near KY 12th Street, the alignment separates into three routes for I-71, I-75, and a C-D roadway in the NB direction.

A companion bridge (with a width of 172 feet) is designed just west of the existing BSB to carry NB and SB I-75 traffic with three lanes in each direction. Two additional lanes for SB I-71 traffic and three other lanes will



carry SB local traffic as part of the C-D roadway system. The existing BSB, which currently has four lanes on each deck, is rehabilitated to maintain two lanes for NB I-71 traffic and three for NB local traffic as part of the C-D roadway system.

Selected Alternative I reconfigures I-75 through the I-71/I-75/US 50 Interchange and eliminates access to and from NB I-75 between KY 12th Street and the US 50/OH 6th Street overpass in the NB direction. Selected Alternative I also eliminates access to and from SB I-75 between the Freeman Avenue and KY 12th Street exits. A new C-D system accommodates these movements. See **Appendix B** for the Selected Alternative I plan.

#### 5.3.2 Refined Alternative I (Concept I-W)

Refined Alternative I (Concept I-W) uses the Selected Alternative I alignment and design from the Dixie Highway Interchange to KY 12th Street and includes a C-D on both sides of I-75 north of US 50 in Ohio with access restrictions similar to those in Selected Alternative I.

In Refined Alternative I (Concept I-W), a companion bridge (with a width of 107 feet) is proposed just west of the existing BSB with all I-71 and I-75 traffic on the new bridge and all C-D traffic on the existing BSB. The new bridge will carry five lanes of SB I-71 and I-75 traffic on the lower deck and five lanes of NB I-71 and I-75 traffic on the upper deck. The existing BSB will be rehabilitated and restriped from four lanes to three lanes on each deck for NB C-D traffic on the lower deck and SB C-D traffic on the upper deck as part of the C-D roadway system. See **Appendix C** for the Refined Alternative I (Concept I-W) Plan. Also, **Appendix D** provides the number of lanes on the freeway segments and proposed turn movements at the intersections.

# 5.4 BSB Project Phasing

The BSB Corridor Project is divided into three phases, as shown in **Figure 3**.

#### 5.4.1 Phase I (ODOT PID 114161)

ODOT has a contract for the design of the interstate and interchanges in this corridor segment from Findlay Street to the north of the WHV, which includes coordination with the design of the WHV. In 2012, it had yet to be determined that the WHV needed a complete replacement, so Selected Alternative I included an interchange designed to connect to the existing structure. The WHV will be replaced, and a new interchange will be designed to ensure local and interstate connections. The City of Cincinnati and Hamilton County lead the WHV project. This Phase I work will follow a Design-Bid-Build process with construction coordinated with the WHV.

#### 5.4.2 Phase II (ODOT PID 113361)

ODOT has a contract to design the interstate and interchanges from Linn Street to Findlay Street in this corridor segment. Based on discussions with the City of Cincinnati, changes have been made to the Alternative I design of the Ezzard Charles Drive bridge over I-75 and the location of the northbound entrance ramp to I-75 from Freeman Avenue. This Phase II work will follow a Design-Bid-Build process.



### 5.4.3 Phase III (ODOT PID 116649/KYTC Project Item No. 6-17)

Phase III includes all work from Dixie Highway in Kentucky to Linn Street in Ohio, including constructing the new companion bridge and rehabilitating the existing BSB bridge. This phase will follow a Progressive Design-Build Process.

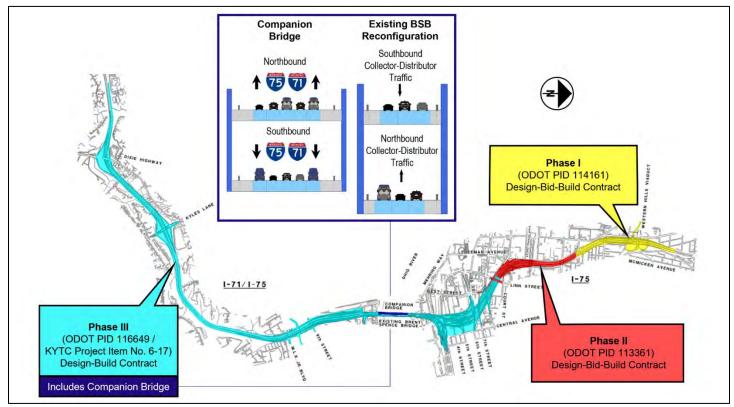


Figure 3: BSB Corridor Phasing

# 5.5 Adjacent Projects

Improvements to I-75 between Turfway Road and the southern limits of the BSB Corridor project, including the I-275 and Buttermilk Parkway Interchanges, are identified in the Metropolitan Transportation Plan and are currently in the NEPA development phase. These safety and capacity improvements are anticipated to be phased between 2027 and 2035, pending funding authorization by the KY General Assembly. The current layout and the potential construction phases are shown in **Figure 4**. The roadway improvements shown in Segment 3 are included in the 2049 operations analysis summarized in the BSB IMS addendum. A traffic operational sensitivity analysis was completed for BSB opening year 2029 and design year 2049 to evaluate I-71/I-75 operations for Refined Alternative I (Concept I-W) without the inclusion of this project. The sensitivity analysis indicated that the completion of this project is critical for efficient operations of I-71/I-75 between the BSB and I-275 Interchange.



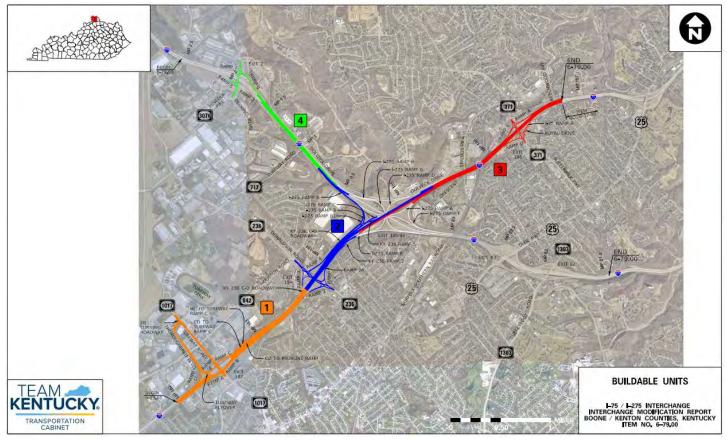


Figure 4: I-275 Project Layout and Project Phasing

# 6. LOCATIONS OF NOTABLE CHANGE

# 6.1 New Interchange Configuration at I-75 & WHV

During the development of Selected Alternative I, it was assumed that the WHV would remain in its existing location. Therefore, the design of the I-75 and WHV Interchange was shown with connections to the existing structure. The City of Cincinnati and Hamilton County have studied the bridge and determined that a total replacement is needed. The WHV Replacement Project has established the final bridge alignment and connectivity to local streets. As part of the BSB Corridor project, the interchange with I-75 was modified for Refined Alternative I (Concept I-W) to coordinate with the design and constructability of the WHV project. A comparison of the Existing 2012 EA/FONSI Selected Alternative I and the Refined Alternative I (Concept I-W) interchange designs for the WHV is shown in **Figure 5**.



# 6.2 Change in Location of Northbound Entrance Ramp from Freeman Avenue

In coordination with the City of Cincinnati, the northbound entrance ramp to I-75 from Freeman Avenue was relocated from south of Ezzard Charles Drive to north of Ezzard Charles Drive via Winchell Avenue. This configuration change is shown in **Figure 6**.

# 6.3 Cincinnati Ramp Modifications

In coordination with the City of Cincinnati, changes were made to various I-75 ramps between the Ohio River and Linn Street. These include relocating the northbound entrance ramp in Ohio to I-75 from 4<sup>th</sup> Street to 3<sup>rd</sup> Street and removing the southbound exit ramp in Ohio from I-75 to 5<sup>th</sup> Street to provide improved geometrics and create additional land for potential redevelopment. As part of these ramp changes, a new intersection with the northbound C-D ramp was created at 5<sup>th</sup> Street; the number of lanes were reduced on the 5<sup>th</sup> Street approach to Central Avenue; the connection from 6<sup>th</sup> Street was changed from Winchell Avenue to the northbound C-D directly to I-75; and the exit ramp from SB I-75 to 7<sup>th</sup> Street was widened to two lanes. A comparison of the ramp changes is shown in **Figure 7**.

# 6.4 Kentucky Collector-Distributor Modifications in Covington

The SB Exit from the collector-distributor (existing BSB) to 5<sup>th</sup> Street in Covington is a left-hand exit in Refined Alternative I (Concept I-W). This changes from the Selected Alternative I design that serves this movement with a right-hand exit from the companion bridge. The two configurations for this ramp are depicted in **Figure 8**. Revisions to the C-D roads are also shown, including the modification to the frontage roads between 12<sup>th</sup> Street and 9<sup>th</sup> Street to minimize right-of-way impacts and an extension of Simon Kenton Way (northbound frontage road) parallel to the I-71/I-75 northbound ramp to 5<sup>th</sup> Street in Covington.



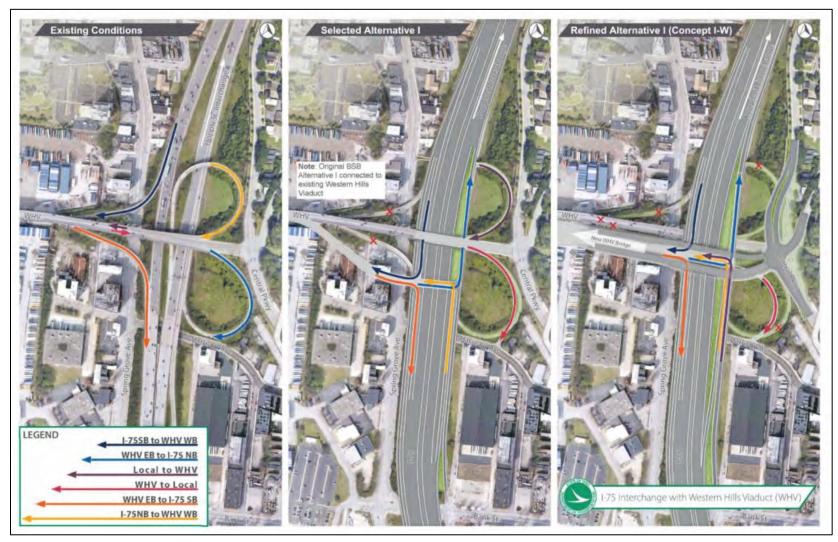


Figure 5: I-75 Interchange with WHV



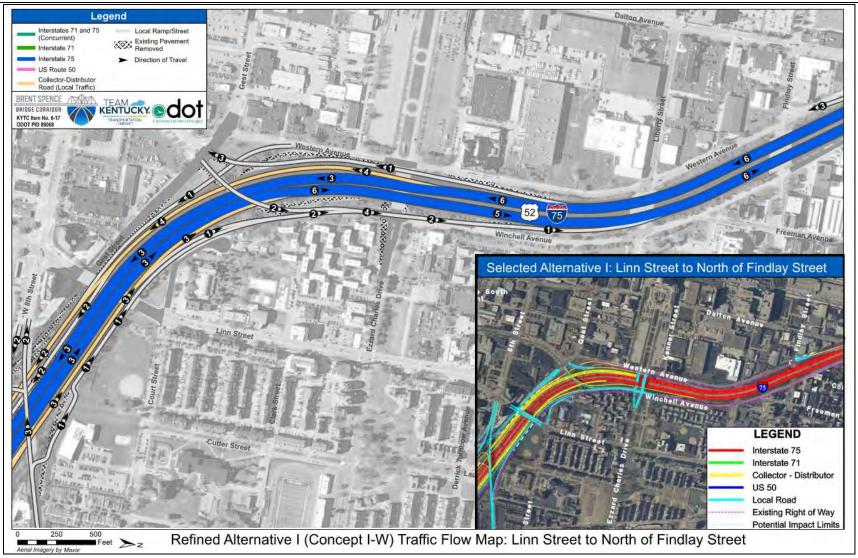
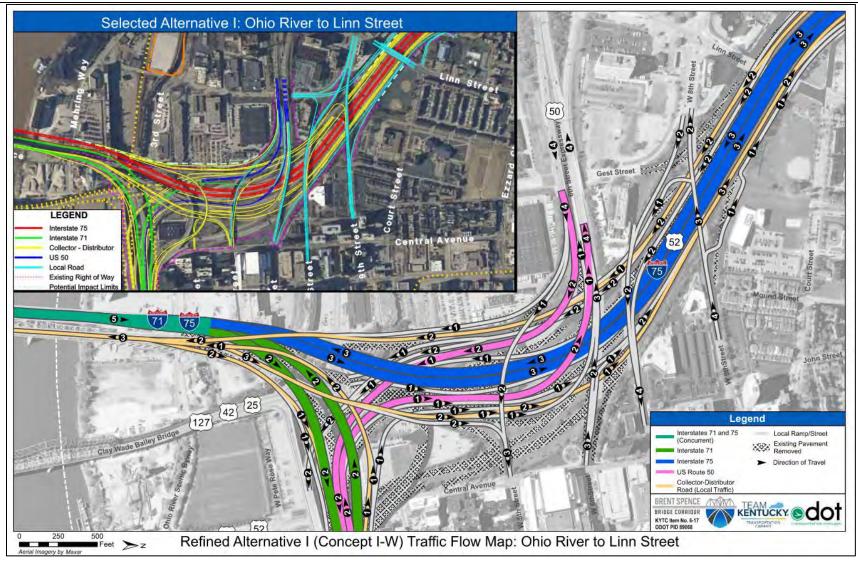


Figure 6: I-75 NB Entrance Ramp Modification at Freeman Avenue





**Figure 7: Cincinnati Ramp Modifications** 



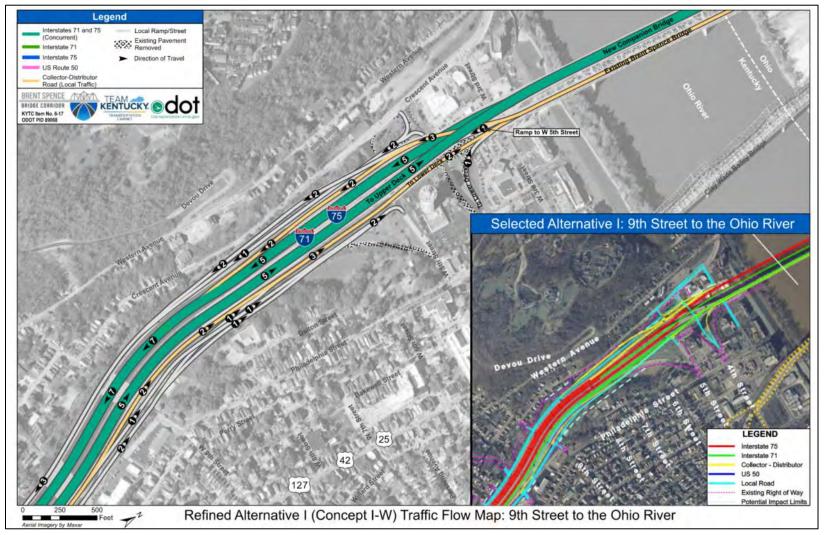


Figure 8: Kentucky Collector-Distributor Modifications in Covington



# 6.5 Brent Spence Bridge: Existing and Companion Bridge

The BSB, including the existing span and the companion bridge, has 16 travel lanes for both Selected Alternative I and Refined Alternative I (Concept I-W). This includes six lanes for local traffic, six for limited access I-75, and four for I-71. The companion bridge and lane widths are 12 feet for both alternatives. The shoulder width is 14 feet for Selected Alternative I and 10 feet for Refined Alternative I (Concept I-W). On the existing span, the NB local traffic is served on the lower deck for both alternatives with the same cross sections; the upper deck serves the northbound I-71 direct traffic for Selected Alternative I and the SB local traffic for Refined Alternative I (Concept I-W) (see **Figure 9** and **Figure 10**). There are cross-section differences for the upper deck of the existing span due to differences in the functionality of the road. Still, both alternatives meet design standards for the Companion Bridge. The existing BSB is improved from the existing conditions but requires design exceptions for both alternatives, including lane and shoulder widths.

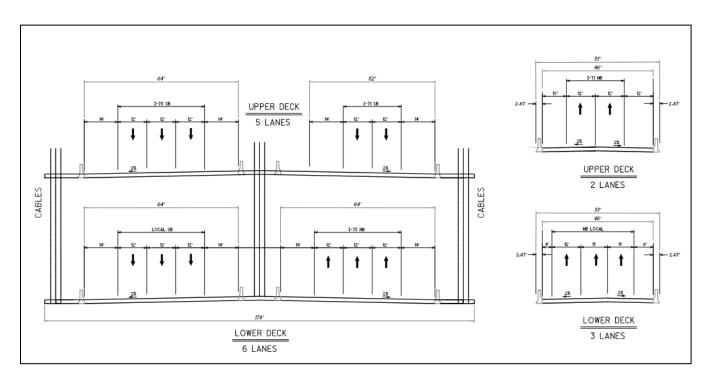


Figure 9: Selected Alternative I BSB Cross Sections

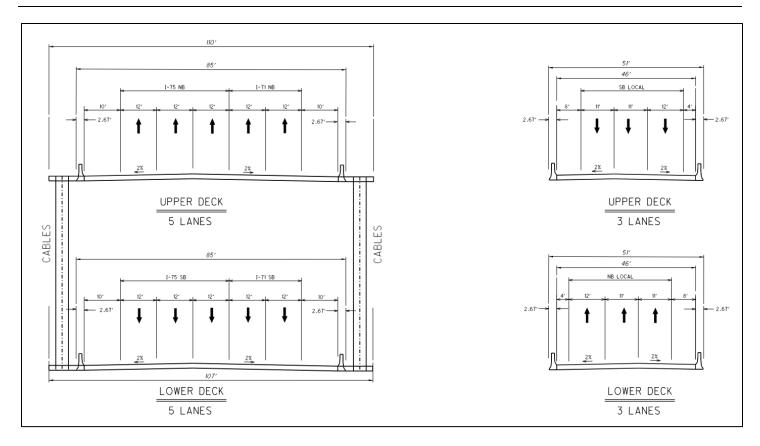


Figure 10: Refined Alternative I (Concept I-W) BSB Cross Sections

# 7. CERTIFIED TRAFFIC

Certified traffic forecasts, including design hours and Annual Average Daily Traffic (AADT), were developed for years 2029 and 2049 for the BSB project study limits. The forecasts include the No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). The study limits include the I-71 and I-75 interstate between the Buttermilk Pike Interchange in the south and the Hopple Street Interchange in the north and I-71 between the BSB and the US 50/I-471 Interchange. The ramp terminal and adjacent arterial intersections are included in the forecast area. The 2011 Access Revision Request traffic forecasts were forecasted for the design year 2035. The forecasting parameters, methodology, and certified traffic forecasts are in **Appendix E**: *BSB Certified Traffic Report*.

The design year 2035 traffic forecast developed as part of the 2012 BSB IMS for No Build and Selected Alternative I is compared to the 2049 traffic forecast for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). A screenline comparison of the BSB and CWB Bridge is shown in **Table 1** (Daily),



**Table 2** (AM DHV), and **Table 3** (PM DHV). In summary, the 2049 No Build forecasts are similar to the 2035 No Build forecasts, with some differences between the BSB and CWB distributions due to geometric changes at the NB I-75 entrance ramp from 4<sup>th</sup> Street in Covington. The 2049 Selected Alternative I forecasts are about 15% lower than the 2035 Selected Alternative I forecasts developed for the 2012 IMS. The forecasts are developed with base year traffic counts, base year model assignments, and future year model assignments. Therefore, the differences in the traffic forecasts indicate that the current OKI model of record (MOR) is forecasting fewer new trips to the corridor with the implementation of the BSB project compared to the model results from the 2010 OKI MOR.

Table 1: Daily Traffic Forecast Comparison – Ohio River Screenline

Facility			Daily					
Route	Bridge	Direction	2035 No Build ('12 IMS)	2035 Alt I ('12 IMS)	2049 No Build	2049 Selected Alt I	2049 Refined Alt I (I-W)	
		NB I-71		38,490		26,650	F7 FF0	
		NB I-75	98,530	40,900	86,900	34,700	57,550	
I-75/	Brent	NB I-71/75 CD		40,420		38,850	38,750	
I-71	Spence	SB I-71		35,500		27,600	- 60,250	
		SB I-75	98,530	38,600	96,050	34,100		
		SB I-71/75 CD		39,000		38,900	40,500	
LIC 42	Clay Wada	NB	6,420	11,100	17,900	8,200	10,700	
US-42	Clay Wade	SB	9,140	10,420	8,650	7,550	7,600	
Screenline		NB	104,950	130,910	104,800	108,400	107,000	
		SB	107,670	123,520	104,700	108,150	108,350	
		Total	212,620	254,430	209,500	216,550	215,350	

Table 2: AM Peak Hour Traffic Forecast Comparison – Ohio River Screenline

Facility			AM Peak Hour					
Route	Bridge	Direction	2035 No Build ('12 IMS)	2035 Alt I ('12 IMS)	2049 No Build	2049 Selected Alt I	2049 Refined Alt I (I-W)	
		NB I-71		3,690		2,390	E 120	
		NB I-75	8,650	2,450	8,000	2,950	5,120	
I-75/	Brent	NB I-71/75 CD		4,220		3,980	3,840	
I-71	Spence	SB I-71	6,520	2,310		1,840	4.220	
		SB I-75		3,920	6,460	2,570	4,230	
		SB I-71/75 CD		1,410		2,340	2,530	
115 42	Clay Wada	NB	800	1,140	2,320	1,160	1,300	
US-42	Clay Wade	SB	390	420	410	350	350	
	Screenline		9,450	11,500	10,320	10,480	10,260	
Scree			6,910	8,060	6,870	7,100	7,110	
		Total	16,360	19,560	17,190	17,580	17,370	

Table 3: PM Peak Hour Traffic Forecast Comparison – Ohio River Screenline

Facility			PM Peak Hour					
Route	Bridge	Direction	2035 No Build ('12 IMS)	2035 Alt I ('12 IMS)	2049 No Build	2049 Selected Alt I	2049 Refined Alt I (I-W)	
		NB I-71		2,380		2,190	4.520	
		NB I-75	6,690	4,000	6,630	2,580	4,530	
I-75/	Brent	NB I-71/75 CD		2,290		2,970	2,910	
I-71	Spence	SB I-71		3,170		2,300	4,710	
		SB I-75	8,870	2,730	8,450	2,340		
		SB I-71/75 CD		4,660		4,180	4,130	
LIC 42	Clay Wada	NB	470	770	1,320	660	910	
US-42	Clay Wade	SB	1,410	1,320	1,350	1,100	1,080	
Screenline		NB	7,160	9,440	7,950	8,400	8,350	
		SB	10,280	11,880	9,800	9,920	9,920	
		Total	17,440	21,320	17,750	18,320	18,270	

# 8. TRAFFIC OPERATIONS ANALYSIS

The traffic operational comparison for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) is based on traffic simulation analyses performed using Caliper's TransModeler platform. Travel time and level of service (LOS) metrics are reported for intersections and the freeway mainline segments. The analysis focuses on AM and PM period operations for the 2049 design year. **Appendix F**: IMS Addendum Traffic Operations Analysis describes the complete modeling methodology and results. The corridor-wide operational summary is covered in this section, with detailed segment-by-segment results reserved for review in **Appendix F**. The operations analysis described in this section assumes the completion of the I-275 project, which borders the southern project limits. Without the I-275 project, there is anticipated to be an operations concern associated with the existing roadway lanes between Dixie Hwy and I-275; the operations analysis report describes this condition in greater detail. The LOS summaries in the report are based on the peak hours of 7:00-8:00 AM and 4:30-5:30 PM.

# 8.1 Freeway Operations

The existing I-71/I-75 corridor has reoccurring travel delays for NB I-71/I-75 in the AM peak, with traffic queues stemming from the BSB and often reaching the I-275 Interchange. The PM peak has reoccurring traffic delays for SB I-71/I-75 upstream of the BSB, with queues forming on I-75 in Ohio, often reaching the WHV Interchange. The traffic analysis for the 2049 No Build indicates these traffic delays are compounded and impact the local arterials, with queues forming at the ramp terminal intersections. Selected Alternative I and Refined Alternative I (Concept I-W) address these operational deficiencies with the increase in freeway travel lanes and the addition of the C-D system. The I-71/I-75 travel time comparison from the I-275 Interchange to the I-74 Interchange (10.4 miles) is summarized in **Table 4**. Selected Alternative I and Refined Alternative I (Concept I-W) operate through the freeway system at free-flow speeds.

2049 Refined 2049 Selected **Facility Peak Period** 2019 Existing 2049 No Build Alternative I Alternative I (Concept I-W) 25 12 43 12 AM NB I-71/I-75 12 PM 12 29 12 AM 12 38 12 12 SB I-71/I-75 PM 12 26 65 12

Table 4: Maximum Peak Travel Time (minutes) for I-71/I-75

The freeway segments were also measured in terms of LOS. **Table 5** summarizes the number of freeway segments defined by HCS as diverge, merge, weave, or basic within each LOS grade.



**Table 5: Freeway Segments by LOS Grade** 

Peak Period	LOS	2049 No Build	2049 Selected Alternative I	2049 Refined Alternative I (Concept I-W)
	C or better	35	61	62
AM	D	11	22	27
Alvi	E	2	4	1
•	F	31	3	1
	C or better	19	62	57
PM ·	D	10	18	25
FIVI	E	4	7	6
	F	46	3	3

The LOS results are similar to the travel time comparison with many segments in the No Build registering a LOS F, while Selected Alternative I and Refined Alternative I (Concept I-W) have only a few segments in the LOS F and LOS E categories. The one AM and three PM LOS F segments for Refined Alternative I (Concept I-W) occur at external points of the project area, including US 50 to the west of I-71/I-75, and I-71 on the eastern project limits. All Refined Alternative I (Concept I-W) segments within the project area have LOS E or better.

# 8.2 Intersection Operations

The operations analysis for the IMS addendum includes 62 intersections. The operational goal is to have the intersections operate at LOS D or better. The results for each intersection are summarized in **Table 6** (Kentucky) and **Table 7** (Ohio). As shown in the tables, Refined Alternative I (Concept I-W) achieves the intersection LOS target for all intersections, except Philadelphia Street & 9<sup>th</sup> Street (LOS F), Bullock Street & 12<sup>th</sup> Street (LOS E), and Bullock Street & 12<sup>th</sup> Street (LOS E). These intersections are constrained to existing geometry due to right-of-way constraints. Philadelphia Street and 9<sup>th</sup> Street is a stop-controlled intersection adjacent to the ramp terminal intersection at 9<sup>th</sup> Street and Simon Kenton Street. This intersection is currently an all-way stop controlled. The TransModeler analysis assumed a one-way stop controlled on Philadelphia Street to prevent queueing between Philadelphia Street and Simon Kenton Street. The 12<sup>th</sup> and Bullock Street intersection is an all-way stop-controlled intersection in the existing conditions and is analyzed as a signalized intersection for the build alternatives. The 12<sup>th</sup> Street and Bullock Street intersection has a traffic signal for the existing and future year conditions.

The No Build intersections experience poor operations, primarily due to the impact of freeway mainline congestion, which backs up into the ramp terminal intersections. However, some intersections in the No Build have better operations than the Build, resulting from traffic metering. Selected Alternative I has three intersections with LOS F, including the 4<sup>th</sup> Street intersections in Kentucky and the Freeman Avenue & Gest Street intersection.



**Table 6: Kentucky Intersection Level of Service** 

Intersection	No Build	Selected Alt I	Refined Alt I (I-W)	No Build	Selected Alt I	Refined Alt I (I-W)
		AM Period			PM Period	
NB I-71/I-75 & Dixie Hwy	Α	В	С	Α	В	Α
NB I-71/I-75 & Kyles Lane	С	С	С	В	В	В
SB I-71/I-75 & Dixie Hwy	Α	Α	С	В	В	С
SB I-71/I-75 & Kyles Lane	С	В	В	С	С	С
Dixie Hwy & Kyles Lane	С	В	С	С	С	С
Main St & Pike St	Α	В	С	Α	В	В
5th St & Main St	D	С	С	С	С	В
4th St & Main St	С	F	В	С	F	В
Simon Kenton & 12th St	F	D	С	Α	С	С
Philadelphia St & 9th St	Α	Α	F	Α	Α	Α
Simon Kenton & 12th St	Е	D	D	С	С	С
Simon Kenton & 9th St	N/A	Α	D	N/A	В	В
Philadelphia & 5th St	В	С	D	В	F	С
Philadelphia & 4th St	С	F	С	С	E	С
Bullock & 12th St	F	С	D	Α	В	E
Bullock & Pike St	F	С	E	С	С	В
Bullock & 9th St	N/A	А	Α	N/A	Α	Α
Crescent & 5th St	Α	Α	Α	Α	В	Α
Crescent & 4th St	Α	Α	Α	В	Α	Α

**Table 7: Ohio Intersection Level of Service** 

14510 11 01110 1115100011011 20101101							
Intersection	No Build	Selected Alt I	Refined Alt I (I-W)	No Build	Selected Alt I	Refined Alt I (I-W)	
		AM Period			PM Period		
Central Ave & 3rd St	D	С	D	F	Е	D	
Central Ave & 4th St	В	С	В	D	D	В	
Central Ave & 5th St	В	C	С	D	E	В	
Central Ave & 6th St	В	C	A	D	D	С	
Central Ave & 7th St	В	В	В	F	В	B	
Central Ave & 9th St	В	В	В	F	В	C	
Mound St & 9th St	A	A	A	A	A	A	
US-42 & 3rd St	В	C	C	C	D	C	
Gest St & 6th St	C	A	A	В	A	A	
Elm St & 2nd St	В	В	В	A	A	В	
Race St & 3rd St	A	A	В	D	В	С	
Elm St & 3rd St	В	A	В	C	В	В	
Elm St & 4th St	В	В	В	C	C	В	
Plum St & 3rd St	F	A	A	F	D	В	
Plum St & 4th St	В	A	A	E	C	A	
Linn St & 6th St	С	В	В	D	В	В	
Linn St & 8th St	В	В	В	В	В	В	
Linn St & Court St	A	A	A	A	D	A	
Linn St & Ezzard Charles Dr	D	C	C	C	C	C	
Winchell Ave & Ezzard Charles	В	A	B	A	A	В	
Freeman Ave & Gest St	C	D	С	В	F	В	
Western Ave & Gest St	D	D	A	В	D	A	
Western Ave & Ezzard Charles	A	A	A	A	A	A	
Winchell Ave & Liberty St	В	A	A	В	В	В	
Winchell Ave & Findlay St	В	В	В	В	В	В	
Western Ave & Liberty St	В	В	В	В	В	В	
Western Ave & Findlay St	В	В	В	В	В	В	
Dalton Ave & Findlay St	В	C	В	C	C	C	
Linn St & Bank St	A	A	A	A	A	A	
Linn St & Central Pkwy	В	В	C	В	В	С	
Brighton PI & Central Ave	А	А	A	А	А	A	
Brighton PI & Central Pkwy	D	В	D	D	В	С	
McMillian Ave & Central Pkwy	В	В	D	В	В	С	
Colerain Ave & Harrison St	С	А	А	В	Α	A	
Patterson St & Harrison St	E	A	A	A	A	A	
Winchell Ave & Bank St	С	С	С	С	С	С	
Winchell Ave & Harrison St	Е	Α	Α	С	Α	Α	
NB I-75 & WHV	N/A	В	В	N/A	В	В	
Spring Grove Ave & Bank St	В	Α	Α	В	В	А	
Spring Grove Ave & Harrison	В	Α	В	В	Α	В	
SB I-75 & WHV	N/A	А	В	N/A	А	В	
WHV Ramp & Harrison Street	N/A	Α	Α	N/A	Α	Α	
NB I-75 & 5 <sup>th</sup> Street	N/A	N/A	В	N/A	N/A	В	



# 8.3 Turn Lane Storage Lengths

Turn lane length was calculated following ODOT and KYTC guidelines for all signalized intersections in the study area. The turn length accounts for deceleration, turning vehicles storage, and bay taper at the intersection. The calculation's design speed is 30 to 35 MPH, and the turn lane taper is 50 ft. The minimum turn lane length was 125 ft to meet the design guidelines for deceleration at this design speed. Vehicle storage lengths were calculated for each turning movement according to the 2049 certified traffic turning volume, number of turn lanes, and signal cycle length used in the TransModeler analysis.

The turn storage lanes were designed to accommodate through queue blockage. Thru blockage length is the storage length of through vehicles plus a 50 ft taper. The through storage length is calculated from through volume, number of through lanes, and cycle length. The turn length is the maximum between turn storage length plus taper, deceleration length, and thru blockage length. The turn lane storage calculations are conducted for the AM and PM peak hours, and the higher value is considered the recommended turn lane length. The calculation of the turn storage lengths is provided in the project files. A summary of the recommended storage lengths and provided storage lengths are outlined in **Table 8** and **Table 9**. If the turn lane is part of a shared through movements, "shared" is identified for storage lane length. In most cases, the storage lengths are constrained to available right-of-way. The design-build team will review the recommended storage lengths and incorporate design improvements where feasible.

Table 8: Recommended Turn Lane Storage – Kentucky

Intersection	Approach	Turn	Critical	Recommended Turn	Provided
11 11111		Movement	period	Lane Lengths (ft)	Length (ft)
NB I-75 & Dixie	WB	Right	AM	925	515
	EB	Left	PM	850	350
SB I-75 & Dixie	WB	Left	AM	875	330
0B170 Q BIXIO	EB	Right	PM	600	220
NB I-75 & Kyle	WB	Right	AM	1235	290
NB I-73 & Ryle	EB	Left	PM	825	440
SD 1.75.9 Kylo	WB	Left	PM	450	650
SB I-75 & Kyle	EB	Right	PM	450	280
	NB	Right	AM	425	160
Divis 9 Kula	SB	Left	PM	550	285
Dixie & Kyle	WB	Right	PM	300	Shared
	WB	Left	PM	225	Shared
	NB	Right	PM	425	470
Simon Kenton & 12th	NB	Left	PM	225	Shared
Simon Kenton & 12th	WB	Right	Both	550	575
	EB	Left	AM	525	Shared
	WB	Left	PM	525	Shared
Dullant 9 40th	EB	Right	AM	325	Shared
Bullock & 12th	SB	Right	PM	375	Shared
	SB	Left	Both	400	460
Main O Dila	WB	Right	PM	300	Shared
Main & Pike	EB	Left	AM	425	165
	WB	Right	PM	400	Shared
Simon Kenton & Pike	EB	Left	AM	800	245
	NB	Right	Both	325	Shared

Intersection	Approach	Turn Movement	Critical period	Recommended Turn Lane Lengths (ft)	Provided Length (ft)
	NB	Left	PM	325	430
	WB	Left	PM	575	215
Dullant & Dita	EB	Right	AM	675	Shared
Bullock & Pike	SB	Right	PM	575	Shared
	SB	Left	PM	300	Shared
	WB	Right	AM	550	Shared
Simon Kenton & 9th	EB	Left	PM	300	Shared
Simon Kenton & 9th	NB	Right	AM	600	Shared
	NB	Left	AM	600	Shared
	WB	Left	PM	150	Shared
Bullock & 9th	EB	Right	Both	125	Shared
Bullock & 9th	SB	Left	PM	450	Shared
	SB	Right	PM	450	Shared
	NB	Right	AM	425	Shared
Main 9 Eth	SB	Left	PM	575	110
Main & 5th	EB	Right	AM	600	Shared
	EB	Left	AM	600	Shared
	NB	Right	Both	225	Shared
Dhiladalphia 8 Eth	SB	Left	AM	225	170
Philadelphia & 5th	EB	Right	AM	600	Shared
	EB	Left	AM	600	Shared
	NB	Left	AM	575	340
Main & 4th	SB	Right	PM	725	695
IVIAIII & 4III	WB	Right	AM	1000	300
	WB	Left	PM	575	380
	NB	Left	AM	400	150
Dhiladalphia 9 4th	SB	Right	AM	725	310
Philadelphia & 4th	WB	Right	PM	550	Shared
	WB	Left	PM	550	Shared

Table 9: Recommended Turn Lane Storage – Ohio

Intersection	Approach	Turn Movement	Critical period	Recommended Turn Lane Storage	Provided Length
CW Bailey & 3rd	NB	Right	AM	325	150
	NB	Left	AM	325	240
	SB	Right	Both	150	Shared
	SB	Left	AM	225	Shared
	EB	Right	PM	825	150
	EB	Left	PM	150	Shared
	WB	Right	PM	250	Shared
	WB	Left	PM	450	150
	NB	Left	AM	225	160
	SB	Right	PM	300	Shared
Central Ave & 3rd	EB	Right	AM	300	165
	WB	Right	PM	425	Shared
	WB	Left	AM	450	350
	EB	Left	Both	225	210
Central Ave & 5th	NB	Right	PM	300	Shared
	SB	Left	Both	200	230
	EB	Right	AM	450	Shared
	EB	Left	AM	450	Shared
Central Ave & 6th	NB	Left	Both	250	240
	SB	Right	Both	150	Shared



Intersection	Approach	Turn Movement	Critical period	Recommended Turn Lane Storage	Provided Length
	WB	Right	PM	575	Shared
	WB	Left	PM	575	Shared
Central Ave & 7th	NB	Right	Both	250	75
	EB	Right	AM	500	175
	EB	Left	AM	500	Shared
	NB	Left	AM	225	180
Central Ave & 9th	WB	Right	PM	425	Shared
	NB	Right	PM	300	Shared
Elm & 2nd	EB	Right	AM	450	Shared
	EB	Left	AM	450	400
	SB	Right	PM	575	235
Race & 3rd	WB	Left	PM	650	410
	NB	Left	Both	300	150
Elm & 3rd	WB	Right	PM	800	130
	NB	Left	AM	425	160
Elm & 4th	WB	Right	PM	150	340
Plum & 4th	SB	Right	PM	150	Shared
	WB	Left	Both	150	50
	NB	Left	PM	200	125
	SB	Right	PM	225	530
Linn & Dalton	WB	Left	Both	150	400
	WB	Right	AM	250	Shared
	NB	Left	AM	225	300
	NB	Right	Both	150	150
Linn & 8th	SB	Left	Both	150	210
	SB	Right	PM	325	Shared
	EB	Left	PM	250	270
	EB	Right	Both	225	120
	WB	Left	PM	200	470
	WB	Right	PM	200	Shared
	NB	Left	AM	300	300
	NB	Right	AM	300	180
	SB	Left	AM	300	170
	SB	Right	AM	300	Shared
Freeman & Gest	EB	Left	AM	200	60
	EB	Right	Both	200	160
	WB	Left	AM	200	240
	WB	Right	Both	225	110
	NB	Left	PM	225	200
	NB	Right	Both	200	50
	SB	Left	PM	300	200
	SB	Right	PM	300	50
Linn & Ezzard Charles	EB	Left	AM	250	180
	EB	Right	Both	250	Shared
	WB	Left	PM	225	175
	WB	Right	PM	225	Shared
	NB	Left	Both	150	Shared
	NB		PM	225	
Winchell & Liberty		Right			Shared
<u>_</u>	EB	Left	PM DM	225	Shared
	WB	Right	PM DM	300	Shared
	SB	Left	PM	250	155
Western & Liberty	SB	Right	PM	250	Shared
	EB	Right	AM	200	Shared
	WB	Left	PM	250	170



Intersection	Approach	Turn	Critical	Recommended Turn	Provided
		Movement	period	Lane Storage	Length
Winchell & Findlay	NB	Left	PM	250	Shared
	NB	Right	PM	250	Shared
	EB	Left	PM	200	Shared
	WB	Right	PM	150	Shared
	SB	Left	PM	300	300
Western & Findlay	SB	Right	PM	250	Shared
	EB	Right	PM	200	130
	WB	Left	PM	150	Shared
	NB	Left	PM	200	135
	NB	Right	PM	200	Shared
	SB	Left	PM	250	260
Dalton 9 Findley	SB	Right	Both	225	Shared
Dalton & Findlay	EB	Left	PM	150	50
	EB	Right	PM	150	Shared
	WB	Left	Both	150	145
	WB	Right	Both	150	Shared
	NB	Left	PM	200	310
	NB	Right	PM	200	Shared
	SB	Left	PM	300	250
	SB	Right	PM	300	Shared
Spring Grove & Bank	EB	Left	PM	200	70
	EB	Right	PM	200	130
	WB	Left	PM	150	190
	WB	Right	PM	250	Shared
	NB	Left	PM	225	125
	NB	Right	PM	225	Shared
Winchell & Bank	EB	Left	PM	250	250
	WB		PM	300	180
	NB	Right Left	PM	225	Shared
			PM	225	Shared
	NB CB	Right			
	SB	Left	PM	250	175
Spring Grove & Harrison	SB	Right	PM	250	Shared
Spring Croto a Harricon	EB	Left	Both	125	Shared
	EB	Right	Both	125	Shared
	WB	Left	AM	150	Shared
	WB	Right	PM	250	Shared
Brighton PI & Central Pkwy	EB	Right	AM	375	Shared
Engineer i a ocimali kwy	WB	Left	PM	325	110
Winchell ramp & WHV	NB	Left	PM	525	300
	EB	Left	AM	375	200
	NB	Left	PM	250	200
	NB	Right	PM	250	Shared
Central Pkwy & McMillian	SB	Right	Both	225	Shared
	EB	Left	AM	250	250
	EB	Right	AM	250	120
	WB	Right	PM	225	Shared
	EB	Left	AM	200	200
Winghall 9 F	WB	Right	PM	250	150
Winchell & Ezzard	NB	Right	AM	450	Shared
	NB	Left	PM	375	Shared
	WB	Left	Both	150	100
	EB	Right	Both	125	Shared
Western & Ezzard	SB	Right	PM	375	Shared
	SB	Left	PM	375	180
	1 30	LOIL	ı ivi	010	100



Intersection	Approach	Turn Movement	Critical period	Recommended Turn Lane Storage	Provided Length
Central Pkwy & Linn (Mohawk)	SB	Right	PM	250	75
	SB	Left	PM	250	Shared
	NWB	Right	PM	300	Shared
	NWB	Left	PM	300	Shared
	NEB	Right	Both	150	180
	NEB	Left	PM	250	190
	SEB	Left	AM	300	Shared
	SEB	Right	AM	300	Shared

# 9. SAFETY ANALYSIS

Safety analysis of the BSB corridor is documented in **Appendix G**: *IMS Addendum Safety Analysis*. The purpose of the safety analysis is to highlight existing crash trends; identify safety priority locations in Kentucky and Ohio; provide a comparison of predictive safety for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W); and identify crash countermeasures that should be considered as the BSB project moves into detailed design. A summary of the findings is provided in this section.

# 9.1 Existing Crash Trends

ODOT and KYTC identify safety-priority roadway segments using existing crash data. Most of the I-71 and I-75 freeway segments are identified as priority locations for the project corridor. This means there is an elevated frequency of crashes compared to similar facilities. The project team reviewed crash data from 2017-2021 and found a significant pattern of rear-end and sideswipe crashes, typical in congested urban freeway systems with high ramp density. The specific crash distribution by state is listed below:

- Kentucky
  - 1,788 Rear-End crashes (53%)
  - 1,020 Side-Swipe crashes (30.2%)
  - o 434 Single Vehicle Crashes (12.9%)
- Ohio
  - 886 Side-Swipe crashes (39.2%)
  - 734 Rear-End Crashes (32.4%)
  - Single Vehicle Crashes (17.8%)

A crash density map showing the locations in the corridor with the highest crash frequencies is shown in **Figure 11.** The higher crash density locations include the Brent Spence Bridge, I-71/I-75 in Kentucky at Kyles Lane and near 12<sup>th</sup> Street, I-71 segments near the I-75 Interchange, and I-75 between 9<sup>th</sup> Street and the WHV.



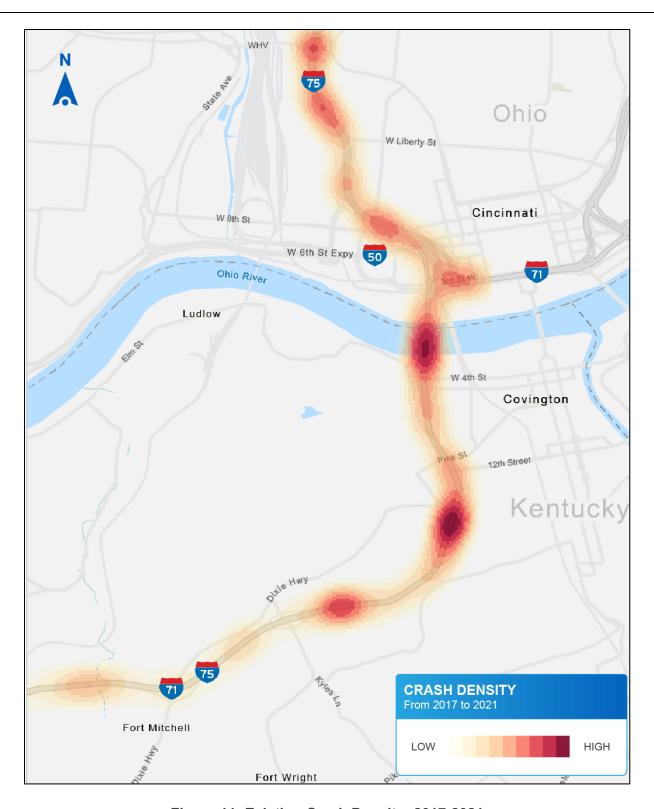


Figure 11: Existing Crash Density: 2017-2021



# 9.2 Alternative Safety Comparison

The existing I-71 and I-75 facilities do not meet current design standards for numerous features, including lane widths, shoulder widths, horizontal and vertical clearances, left-hand entrances and exits, and horizontal and vertical geometry. Selected Alternative I and Refined Alternative I (Concept I-W) provide freeway modernization that meets the operational needs of the corridor and improves upon all of the current design deficiencies. Refined Alternative I (Concept I-W) provides a 10 ft inside and outside shoulder width consistent with ODOT and KYTC freeway design standards. This implementation offers significant cross-sectional improvements compared to the existing configuration, especially on the Brent Spence Bridge. The predictive safety analysis for the project was split into three focus areas identified as safety priority segments for ODOT and KYTC. The segments include I-71/I-75 in Kentucky, the BSB, and I-75 in Ohio. A safety comparison of these sections is provided below.

#### 9.2.1 Brent Spence Bridge

During the five years between 2017 and 2021, Brent Spence Bridge experienced 662 crashes. Most were sideswipes (47.6%), rear-end crashes (40.2%), and smaller proportions of single-vehicle and other crash types. As for crash injury severity, the bridge experienced no fatal crashes and nine serious injury crashes, representing less than 2% of total crash records. Minor injury crashes represented a considerable proportion (7.3%), while possible injury and PDO crashes represented the majority of crash counts (91.4%) on the bridge.

The AM peak period (6:00 to 10:00 AM) experienced 117 crashes in that 5-year duration. Sixty-seven of them were sideswipes, and 38 were rear-end crashes. Eight crashes were identified as minor or severe injury crashes. Two hundred forty crashes were recorded during the PM period (2:00 to 7:00 PM) in the same 5-year duration. One hundred twenty-five of which were rear-end, and 100 were sideswipe crashes. Fourteen minor and severe injury crashes were recorded during that period. It is noted that the PM peak duration experienced more crashes than the AM peak due to higher vehicle miles traveled, represented by higher traffic volumes and longer peak duration. The more congested traffic is the primary cause of a significant proportion of rear-end crashes during the PM peak.

Most crashes on the BSB bridge are rear-end, and sideswipe crashes due to traffic congestion and substandard lane and shoulder widths. The existing cross-section of the Brent Spence Bridge has four 11-foot lanes with 1-foot shoulders in each direction. Both the Selected Alternative I and Refined Alternative I (Concept I-W) expand the total number of lanes across the Ohio River from 8 to 16, providing improved lane and shoulder width on the existing bridge.

The predicted crash rate for the BSB spans is summarized in **Figure 12**. This figure shows that the Refined Alternative I (Concept I-W) has a lower crash rate on the companion bridge and existing bridge span than the No Build. The Companion bridge is designed to ODOT and KYTC design standards, and the existing span is retrofitted with wider shoulder widths compared to the No Build condition. Selected Alternative I has the lowest crash rate with 14 ft shoulder widths on the companion bridge. Since the design of Selected Alternative I, the current design standard of KYTC and ODOT for inside and outside shoulders is 10 ft and is applicable on the Brent Spence Bridge. The design decision for the shoulder widths balances the many project needs, including safety, right-of-way constraints, and project costs.



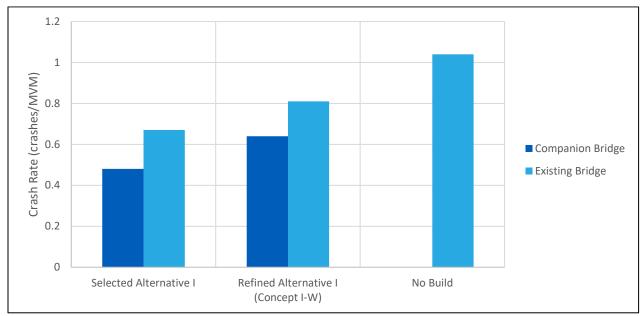


Figure 12: Predictive Crash Rate – Brent Spence Bridge and Companion Bridge

#### 9.2.2 Kentucky I-71/I-75 Mainline

From 2017 to 2021, the Kentucky I-71/I-75 mainline experienced 2,828 crashes. Rear-end was the most recorded crash type, representing 55.1% of crashes, followed by sideswipe crashes (27.2%). As for crash injury severity, the mainline experienced five fatal crashes, while injury and PDO crashes represented 12.8% and 87% of total crash records, respectively.

Five hundred sixty-nine crashes occurred during the AM peak period (6:00 to 10:00 AM) in the 5-year duration. Three hundred forty-eight of which were rear-end, and 137 were sideswipe crashes. The AM peak experienced one fatal crash and 59 injury crashes. One thousand-seven crashes were recorded during the PM period (2:00 to 7:00 PM) in the 5-year duration. Six hundred seventy-one records were rear-end, and 251 were sideswipe crashes. The PM peak experienced two fatal and 111 injury crashes. Higher crash counts during the PM peak can be related to higher traffic volumes and the extended peak period.

KYTC has identified most of the I-71/I-75 mainline in the project limits to have a LOSS 3 or 4 ranking, indicating significant potential for safety mitigation. The I-71/I-75 corridor has reoccurring traffic congestion and tightly spaced ramps, influencing the high existing crash rates. The proposed improvements for Refined Alternative I (Concept I-W) address the current conditions by implementing a C-D road system between Dixie Hwy and Kyles Lane and between 12<sup>th</sup> Street and the BSB and companion bridge. These system improvements and basic cross-section enhancements are expected to reduce the crash rate for the Kentucky I-71/I-75 mainline.

The predicted crash rates for comparable segments on I-71/I-75 are summarized in **Figure 13**. Overall, a crash rate reduction for I-71/I-75 mainline segments in Kentucky for Refined Alternative I (Concept I-W) compared to



No Build and similar crash predictions to Selected Alternative I. Refined Alternative I (Concept I-W) uses a consistent 10 ft inside and outside shoulder width from the southern project terminus to the Companion Bridge. The No Build has a section of 12 ft inside shoulder in the roadway sections between Dixie Hwy and 12<sup>th</sup> Street. This cross-sectional element is decreased to 10 ft with Refined Alternative I (Concept I-W) to allow for other roadway improvements, including the C-D road system between Dixie Hwy and Kyles Lane. Widening the shoulders beyond the design standards would expand the roadway footprint and negatively impact adjacent properties. Refined Alternative I (Concept I-W) for the one comparative segment (Dixie Hwy to Kyles Ln) shows a slight increase in crashes compared to the No Build. However, this minor increase becomes insignificant when viewed next to the safety improvements at the other segment of I-71/I-75 at 5<sup>th</sup> Street. Furthermore, the safety improvements associated with the C-D road system are anticipated to alleviate the existing safety concerns caused by peak period traffic congestion that is not captured as part of the predictive safety analysis.

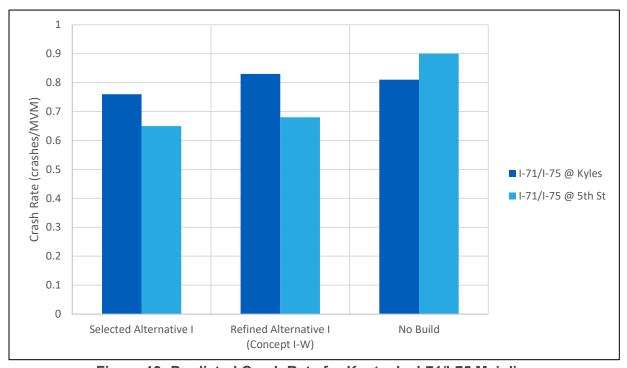


Figure 13: Predicted Crash Rate for Kentucky I-71/I-75 Mainline

#### 9.2.3 Ohio I-75 Mainline

Ohio I-75 mainline (North of Linn Street) experienced 1,031 crashes between 2017 and 2021. Most recorded crashes were sideswipe (43.3%) and rear-end (33.3%). Three fatal crashes were recorded on the mainline, while injury crashes represented 11.6% of total crash counts. Property damage-only crashes accounted for 88% of crash records on the I-75 mainline.

One hundred seventy-five crashes were recorded during the AM peak period (6:00 to 10:00 AM) from 2017 to 2021. Seventy-two of these crashes were sideswipes, and 44 were rear-end crashes. Seventeen minor and severe injury crashes were recorded during that peak period. As for the PM period (2:00 to 7:00 PM), 406



crashes were recorded in the 5-year study duration. One hundred sixty-eight crashes were sideswipe, and 186 were rear-end collisions. Thirty-eight crashes during that peak period were minor or severe injury crashes. Increasing crashes were recorded in the PM peak duration compared to the AM peak due to higher traffic volumes and a more extended PM peak period. The more congested traffic during the PM peak is the primary cause of a more significant proportion of rear-end crashes.

ODOT identifies the I-75 mainline between WHV and I-71/I-75 Interchange as safety priority segments. This area experiences many crashes due to reoccurring congestion and interactions between the freeway mainline, service ramps, and system interchange ramps. This area is improved with Refined Alternative I (Concept I-W) with the consolidation of ramps and introduction of the C-D road through the I-71/I-75 interchange. These improvements are expected to improve traffic safety on the Ohio I-75 mainline.

As discussed in the previous sections, the Selected Alternative I proposed 12 ft inside and outside shoulders for I-75. The Refined Alternative I (Concept I-W) reduces the shoulder widths to 10 ft to match current KYTC and ODOT freeway design standards. The proposed 10 ft shoulder widths achieves design standards and balances the corridor's operational, safety, right-of-way, and project cost considerations. A comparison of the predicted analysis for comparable segments of I-75 in Ohio is summarized in Figure 14. The figure shows that Refined Alternative I (Concept I-W) has a lower predicted crash rate than the No Build condition.

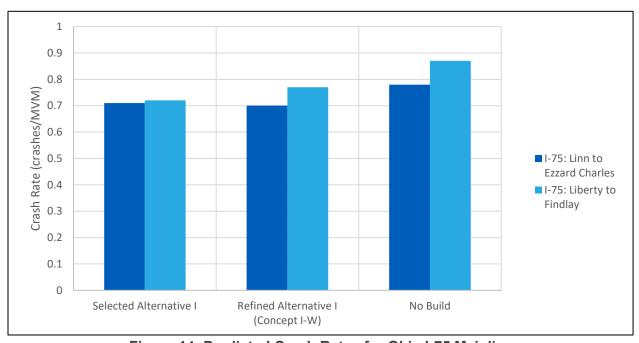


Figure 14: Predicted Crash Rates for Ohio I-75 Mainline

# 9.3 Safety Comparison for Locations with Notable Changes

Refined Alternative I (Concept I-W) incorporated design changes based on stakeholder feedback. These changes were not the result of a data-driven safety evaluation. However, the design updates meet design



standards and are not anticipated to result in unfavorable safety conditions. A brief qualitative safety review of these changes is provided in this section.

#### 9.3.1 New Interchange Configuration at I-71 & WHV

The City of Cincinnati and Hamilton County have collaborated with ODOT to design the WHV replacement and integrate the new facility with the I-75 improvement project. This resulted in a new design for the I-75/WHV Interchange in the Refined Alternative I (Concept I-W) in 2023. The Selected Alternative I from 2012 provided a plan for a new interchange, including a connection to the existing WHV, since its design had yet to progress.

The I-75/WHV interchange experiences crashes related to its current design, mainly due to the northbound I-75 left exit and loop ramp to the upper deck of the WHV. Existing crash types in this area of I-75 include 36% sideswipe, 30% rear-end, and 11% fixed object. The new interchange will remove the left exit (with slow vehicles in the left lane of I-75) and associated weaving, reducing sideswipe and rear-end crashes. Removal of loop ramps will mitigate wet weather, fixed object crashes, and rear-end collisions due to poor sight distance. The Selected Alternative I and Refined Alternative I (Concept I-W) designs are similar to a tight diamond and share these crash-reduction features. The Refined Alternative I (Concept I-W) improves upon the Selected Alternative I design by better incorporating the local connectivity to Spring Grove Avenue (running parallel to I-75 on the west) by eliminating the local street loop connections, which required tunneling under I-75 and a steep grade to access the upper deck of the WHV.

In summary, the latest design of the interchange will significantly improve the safety for interstate and local drivers using current design standards and more intuitive right-side ramp placement.

#### 9.3.2 Change in Location of Northbound Entrance Ramp from Freeman Avenue

The existing section of I-75 between Linn Street and Liberty Street includes partial interchanges with ramps to and from Freeman Avenue and ramps to and from Ezzard Charles to/from the north on I-75 within a relatively short distance. In the existing condition, northbound ramps from downtown streets and I-71 S converge with mainline I-75 just south of Ezzard Charles. Southbound in this area of I-75, drivers must select the appropriate lane to continue onto I-75 S or I-71 N/US 50E, use the right exit to Seventh Street, or use the left exit to Fifth Street or Second Street downtown. Given the left and right exit ramps and the associated need for driver decisions for lane selection, the highest crash types are sideswipe and rear-end due to weaving and stopped traffic.

The Selected Alternative I and Refined Alternative I (Concept I-W) are similar in using a C-D system for northbound and southbound I-75 to separate mainline traffic from traffic using the downtown and the design of right-side I-71/US-50 connections. These C-Ds diverge and merge with the mainline south of Ezzard Charles. In the Selected Alternative I, the ramps to and from Freeman remain similar to existing conditions, but the Ezzard Charles ramps are removed. In Refined Alternative I (Concept I-W), the southbound conditions are the same as in Selected Alternative I, with only the exit ramp to Freeman Avenue. However, in coordination with the City of Cincinnati, a change was made to the northbound entrance ramp to I-75 from Freeman Avenue from south of Ezzard Charles Drive to north of Ezzard Charles Drive at Winchell Avenue, similar to the existing condition. This change requires drivers from Freeman Avenue to use the arterial street to travel north through



the signalized intersection with Ezzard Charles before using the entrance ramp. This allows for better connectivity of the local roads to I-75 N while also adding more distance between the merge of the NB C-D and mainline I-75 N with this Ezzard Charles entrance ramp. However, this relocation moves the entrance ramp closer to the WHV exit ramp. It adds an auxiliary lane in Refined Alternative I (Concept I-W) between the Freeman Avenue entrance ramp and the exit ramp to WHV.

In summary, the relocation of the Freeman ramp is within design standards for ramp spacing. Creating NB and SB C-Ds will separate local access from mainline traffic, removing many closely spaced entrance and exit ramps and eliminating left exits from the No Build condition. This change will reduce weaving and associated sideswipe and rear-end crashes.

#### 9.3.3 Cincinnati Ramp Modification

The existing ramps and local street connections for I-75, I-71, and US 50 just west of the downtown provide reasonable access today for all users and destinations. Existing crashes are generally sideswipe and rear-end due to the curves, weaving, and stopped traffic during peak hours. The Selected Alternative I separated mainline and local traffic with C-D roads while maintaining various access points for local connectivity. This design met current standards of roadway design while still reducing the facility footprint.

The notable difference between the Selected Alternative I and Refined Alternative I (Concept I-W) in this area comes from the separation of C-D and mainline uses on the BSB and companion bridge, respectively. This plan required modification to the travel location for ramps and local connections from Selected Alternative I. In addition, the City of Cincinnati requested additional changes for various I-75 ramps between the Ohio River and Linn Street, which are incorporated into Refined Alternative I (Concept I-W). These include relocating the northbound entrance ramp in Ohio to I-75 from Fourth Street to Third Street and removing the southbound exit ramp in Ohio from I-75 to Fifth Street to provide improved geometrics and free additional land for potential redevelopment. As part of these ramp changes, a new intersection with the northbound C-D ramp was created at Fifth Street; lanes were reduced on the Fifth Street approach to Central Avenue; and the connection from Sixth Street was changed from Winchell Avenue to the northbound C-D directly to I-75. These changes also impact traffic to adjacent ramps, resulting in design modifications to two-lane exit ramps from SB I-75 to Seventh Street and Second Street.

In summary, the design of the Cincinnati ramps will be significantly different from a No Build condition due to the reconfiguration of lane use on the BSB and integration with a companion bridge. Refined Alternative I (Concept I-W) will separate mainline traffic from the C-D and local connections and meet new standards for curves and shoulders, reducing weaving and potential for rear-end, sideswipe, and fixed object crashes.

#### 9.3.4 Kentucky Collector-Distributor Modification in Covington

The existing local street connections from the BSB to the local street grid in Kentucky include ramps that do not meet current design standards, leading to a short southbound exit ramp to a T intersection at 5th Street. The parallel local arterials are designed as high-speed roadways near the BSB, meeting signalized arterials to the south towards 12th Street. Various crash types relative to interstate, local roads, signalized intersections,



and stop-control intersections occur due to the need for more consistency in the design along the routes, which are also not friendly to bikes and pedestrians.

Selected Alternative I separates mainline and local traffic with C-D roads while maintaining various access points for local connectivity. This design met current standards for the ramps. It provided a consistent design for the C-D system for southbound and northbound access and included a new connection under the interstate for 9th Street.

The notable difference between Selected Alternative I and Refined Alternative I (Concept I-W) in this area comes from the separation of C-D and mainline uses on the BSB and companion bridge, respectively. This plan required modification to the travel location for ramps and local connections from Selected Alternative I. Most notable is the southbound exit ramp from the C-D (existing BSB) to 5th Street in Covington, designed as a left-hand exit to meet vertical clearance and curve standards. This is a change from Selected Alternative I, which uses a right-side exit from the companion bridge. Revisions to the frontage road system south of 9th Street include the modification of Bullock Street (southbound frontage road) between 9th Street and 12th Street to minimize right-of-way impacts and an extension of Simon Kenton Way (northbound frontage road) parallel to the I-71/I-75 northbound ramp to 5th Street in Covington. There are also fewer lanes on both frontage roads from the Selected Alternative I design based on traffic modeling.

The new NB and SB C-D/frontage roads in Kentucky will provide an added connection to 9th Street, offering better connectivity for the Covington local street network. New intersection design with turn lanes and traffic signal timing will improve vehicular safety. Sidewalks, multiuse paths, crosswalks, and new signing will improve route options and safety for pedestrians and cyclists.

Reduced traffic on the existing BSB will allow the NB on-ramp from 4th Street in Kentucky to enter the bridge as an add-lane and not require a merge. This will reduce rear-end and sideswipe crashes.

In summary, the design of the Kentucky C-D/frontage road system will provide improved access to local destinations throughout Covington while addressing needed pedestrian and bicycle connectivity and safety. The left exit from SB C-D to 5th Street is less desirable than the right exit in Selected Alternative I. Still, it allows for a highly desired connection to 5th Street into the C-D and local street network and meets design standards.



# 9.4 Safety Countermeasures

The existing I-71 and I-75 facilities at many locations within the study area do not meet current design standards for numerous features, including lane widths, shoulder widths, horizontal and vertical clearances, left-hand entrances and exits, and horizontal and vertical geometry. The most frequently noted substandard feature of the corridor is the design of the BSB, with its narrow travel lanes and shoulder widths on the bridge and approaches. The existing BSB was also not designed to accommodate the current or future daily traffic volume. For these reasons, the BSB corridor experiences design deficiency and congestion-related crashes.

Selected Alternative I from the 2012 FONSI provides an improved corridor meeting current design standards. The new companion bridge will allow traffic distribution onto two bridges, and the proposed reconfiguration of the existing BSB will reestablish adequate shoulders and lane widths, reducing crash potential. Added capacity at the Ohio and Kentucky approaches and the bridges will further improve safety by lowering congestion-related crashes. In addition, separating interstate traffic from local traffic on the bridges and C-D system will enhance safety by reducing weaving and merging for all travelers.

Refined Alternative I (Concept I-W) shares many of the same design features for improved safety in the I-71/I-75 corridor as Selected Alternative I but provides additional design benefits by providing all interstate traffic on the companion bridge and all local or C-D traffic on the existing bridge. This eliminates the need for center barriers as on the Selected Alternative I companion bridge, which was used to separate opposing directions of traffic on the lower deck and the southbound I-71 and I-75 traffic on the upper deck. Other modifications in Refined Alternative I (Concept I-W) allow for better spacing of C-D connections to local streets and improved bike and pedestrian connectivity in the local arterial network.

The BSB project supports the <u>National Roadway Safety Strategy</u> (NRSS) <u>Safe System Approach</u> (SSA), a comprehensive approach to reducing serious injuries and deaths on the nation's roadways. Kentucky and Ohio will collaborate to design and operate a system that provides safe mobility for all users. The Project will incorporate the five SSA Safety System Elements:

- Safer People through real-time user information and messaging and improved driver expectation and decision-making features.
- Safer Roads through countermeasures on bridges, highway approaches, and adjacent frontage and C-D roadways, including pedestrian and bicycle improvements.
- Safer Vehicles and Safer Speeds through design speeds, speed limits, and intelligent transportation system (ITS) facilities that support connected/automated vehicle systems and speed management.
- Post-Crash Care through emergency vehicle access to the scene (using shoulders if needed), routing, and incident messaging.

The entire corridor will be rebuilt, and proven safety countermeasures identified by the FHWA will be proactively incorporated into the highway, C-D, and local street network. Examples of these countermeasures include:

Roadway/Highway



- Wider edge lines
- Enhanced delineation for horizontal curves
- Longitudinal rumble strips
- Median barriers
- Roadway lighting
- Appropriate speed limits or variable speed limits

#### **Local Streets**

- Corridor access management for frontage roads
- Dedicated left and right turn lanes at intersections
- Appropriate yellow change and all-red intervals
- Backplates with reflective borders for traffic signals
- Walkways and pedestrian refuge areas
- Bike lanes and side paths

There are locations where design exceptions are proposed if current standards cannot be met, generally for shoulder and lane width, horizontal and vertical curve issues, and grades. The Refined Alternative I (Concept I-W) plan will improve upon existing conditions overall, and the areas of design exceptions could be made safer with enhanced warning signing, speed advisory plaques, and enhanced delineation. Redundancy in design elements, such as roadway lighting and guardrails, will also create layers of protection to reduce the likelihood of driver error, prevent crashes, and mitigate harm when they occur. As the design-build project progresses, the currently identified locations of design exceptions can be reviewed to determine any design changes or specific countermeasures to improve safety in those areas.

A new guide and destination signing will be installed, and ITS technology will be designed for the corridor, including changeable message signs, sensors, and cameras with fiber connectivity. This will allow real-time driver information, incident management, and event traffic management to reduce confusion and provide clear guidance. Future uses can be considered for connected and automated vehicle technologies.

During final design median access points will be identified to ensure emergency responder access. KYTC will coordinate with the Northern Kentucky cities along the corridor, including Fort Mitchell, Fort Wright, Park Hills, and Covington, and Kentucky first responders, including police, fire, and emergency services, to ensure the completed project accommodates emergency response access to the collector-distributor and mainline roadways.

In summary of the crash mitigation strategies, **Figure 15** identifies high crash locations within the project corridor and highlights safety-related improvements to be implemented to improve future safety conditions.



## **Safety Countermeasures**

- New interchange with Western Hills Viaduct (WHV) will remove NB left lane, reducing sideswipe and rear-end crashes. Removal of the loop ramps will reduce wet weather and fixed object crashes as well as rear-end crashes due to poor sight distance.
- The construction of a NB and SB C-D system from Ezzard Charles in OH to 12th in KY will separate local access from mainline interstate traffic, removing closely spaced entrance and exit ramps and eliminating left exits. This change will reduce weaving and the presence of exiting vehicles in the left lane, reducing sideswipe and rear-end crashes.
- Newly constructed ramps at I-71/I-75 interchange will meet updated seismic criteria and provide edge and median barriers meeting the current standards. This will reduce the severity of fixed object crashes.
- The companion bridge will be built to add capacity to the Ohio River crossing with standard lane widths, shoulder widths, edge and median barrier designs to reduce sideswipe, rear-end and fixed object crashes. The shoulders will provide emergency vehicles access and storage for stalled vehicles, reducing secondary crashes.
- Existing BSB decks will be reconfigured from four lanes with no shoulder to three lanes with inside and outside shoulders. This provides more space for stalled vehicles and maneuvering at emergencies, reducing rear-end, sideswipe and single vehicle crashes.
- Reduced traffic on the existing BSB will allow for the NB I-71/75 4th St on-ramp to enter the bridge as an add-lane without merging. This will reduce rear-end and sideswipe crashes.
- The new NB and SB C-D/frontage roads in KY will provide an added connection to 9th St, offering better connectivity for the Covington street network. New intersection design with turn lanes and traffic signal timing will improve vehicular safety. Sidewalks, multi use paths, crosswalks and new signing will improve mobility and safety for pedestrians and cyclists.
- The new C-D road and increasing the number of lanes will provide safer maneuvering and reduce rear-end and sideswipe crash frequency. Maintaining sufficient friction levels will mitigate the effect of downhill grade (NB) and frequent wet road conditions.
- Reconfiguration of the lanes will reduce the frequency of sideswipe and rear-end crashes due to merging and diverging on this section.
- New C-D lanes in both directions between Dixie Highway and Kyles Lane will reduce rear-end and sideswipe crashes.

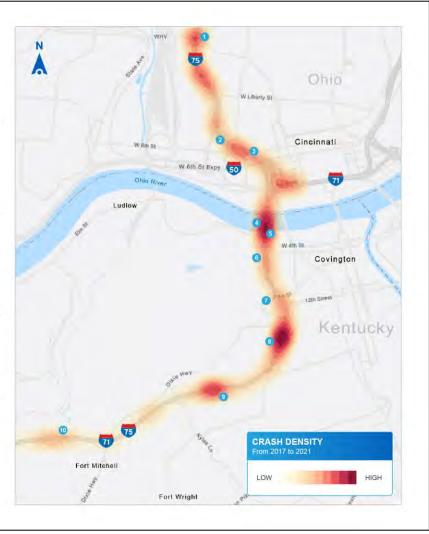


Figure 15: BSB Project Safety Improvements



# 10. COST ESTIMATES

The 2012 EA/FONSI cost estimates were updated to reflect current design contingencies, unit prices, inflation rates, and construction years for each project phase. The cost estimates were revised to include actual right-of-way, estimated costs for unacquired right-of-way, and utility relocation costs. Other updated costs included public relations, procurement, stipend, state labor, bridge painting, and design. Finally, previously expended preliminary development dollars were added to the estimated contract costs to estimate the total cost to implement the BSB Corridor Project.

A Cost, Schedule, and Risk Assessment workshop held by FHWA and the project team in October 2022 confirmed that the total project cost estimate is \$3.6 billion, which includes all costs required to deliver the project, including but not limited to planning, design, right-of-way acquisition, construction, construction management services, and agency labor.

The costs to deliver Selected Alternative I, defined in the 2012 EA/FONSI, were not updated to reflect current prices. However, based on the information presented in the *Design Summary Report* and the *2022 Project Summary with Associated Costs (June 2022)*, the total costs for Refined Alternative I (Concept I-W) are substantially less than the costs to construct Selected Alternative I.

# 11. ENVIRONMENTAL OVERVIEW

In accordance with the National Environmental Policy Act (NEPA), an <u>Environmental Assessment</u> (EA) was prepared for the Brent Spence Bridge (BSB) Corridor Project in the Commonwealth of Kentucky and the State of Ohio in March 2012. A <u>Finding of No Significant Impact</u> (FONSI) was approved by the Federal Highway Administration (FHWA) on August 9, 2012 (see Appendix B).

More than three years have passed since the 2012 FONSI and subsequent reevaluations of its validity. Project refinements have also occurred in response to public comments and further study, though they remain within the project footprint and impacts evaluated in the 2012 EA/FONSI. KYTC and ODOT are preparing a supplemental EA consistent with 23 CFR 771.129 and 771.130 to assess revised regulatory requirements, changed site conditions, design refinements, impact changes, further environmental commitments (enhancements and mitigation), and additional NEPA reevaluation and coordination efforts that have occurred since the 2012 EA/FONSI. The supplemental EA is anticipated to be available for public review, and public hearings are expected to occur in late 2023. FHWA's NEPA decision is expected in early 2024.



# 12. DESIGN EXCEPTIONS

Refined Alternative I (Concept I-W) currently has 19 design exceptions in Kentucky and 35 in Ohio. Most of the design exceptions are related to horizontal and vertical sight distances. There are also design exceptions for the existing Brent Spence Bridge, where the lane widths are 11 ft (12 ft is the design requirement), and the shoulder widths are 4 ft on the left shoulder and 8 ft on the right shoulder (10 ft is the design requirement). These design exceptions are similar or improved in all cases compared to No Build and Selected Alternative I. The design-build team will consider design enhancements and will not provide a design solution worse than currently proposed. Where removing the design exception is not possible, the states will retain decision-making authority and approvals, with an adequate justification provided in a design exception report. Mitigation strategies will be implemented for the remaining design exception to alert motorists and improve roadway safety. The current design exceptions for Refined Alternative I (Concept I-W) are listed in **Table 10** and **Table 11**.

Table 10: Refined Alternative I (Concept I-W) Design Exceptions – Kentucky

Route	Station	Design Met (Required)	Horizontal Dc (Maximum)	Horizontal SSD (Minimum)	Vertical SSD (Minimum)	Maximum Grade (Required)	Other	Design Speed Existing	Design Criteria
SB I-75 to Kyles Lane	445+00					8.1% (6%/8%)			KYTC - 904.4 / AASHTO 10.9.6.2.12
KY-SB-CD-75	566+50.00	51 mph (55)			439' (495')			N/A	
KY-SB-CD-75	572+05.41	46 mph (55)			373' (495')			N/A	
KY-SB-CD-75	575+27.31	45 mph (55)		360' (495')				N/A	
KY-SB-CD-75	577+47.53	45 mph (55)			360' (495')			N/A	
KY-SB-CD-75	580+45.54	45 mph (55)			360' (495')			N/A	
KY-SB-CD-75	583+15.88	47 mph (55)		385' (495')				N/A	
KY-SB-CD-75	Existing Bridge (Upper Deck)	4' left/8' right (10' both)					Shoulder Width		
KY-SB-CD-75	Existing Bridge (Upper Deck)	11' (12')					Lane Width		
KY-NB-CD-75	22+09.41	54 mph (55)			481' (495')			N/A	
KY-NB-CD-75	26+50.00	54 mph (55)			481' (495')			N/A	
KY-NB-CD-75	28+91.34	48 mph (55)		400' (495')				N/A	
KY-NB-CD-75	48+00.00	54 mph (55)			481' (495')			N/A	
KY-NB-CD-75	52+87.17	52 mph (55)		455' (495')				N/A	
KY-NB-CD-75	58+34.71	46 mph (55)			373' (495')			N/A	
KY-NB-CD-75	71+50.00	51 mph (55)			439' (495')			N/A	
KY-NB-CD-75	74+73.43	52 mph (55)		455' (495')				N/A	
KY-NB-CD-75	Existing Bridge (Lower Deck)	4' left/8' right (10' both)					Shoulder Width		
KY-NB-CD-75	Existing Bridge (Lower Deck)	11' (12')					Lane Width		



Table 11: Refined Alternative I (Concept I-W) Design Exceptions – Ohio

Route	Station	Design Met (Required)	Horizontal Dc (Maximum)	Horizontal SSD (Minimum)	Vertical SSD (Minimum)	Maximum Grade (Required)	Other	Design Speed Existing	Design Criteria
OH - I-71 NB	14+21.58	50 mph (55)	6°30'00" (5°30'00")					45 mph	Horizontal Curve Radius = 5°30'00" - ODOT 202.3
OH - I-71 NB	14+21.58	43 mph (55)		340' (495')				41 mph	HSSD = 495' - ODOT 201.2
OH - I-71 NB	28+10.00					6.51% (5.00%)			Max Grade = 5% - ODOT 203.2
OH - I-71 NB	28+97.11						Shoulder Width		Shoulder Width >= 10' - ODOT 301.2. & 303.1
I-75 CL	33+88.15	51 mph (55)		443' (495')				50 mph	HSSD = 495' - ODOT 201.2
OH - I-71 SB	17+41.26	50 mph (55)	5°37'00" (5°30'00")					35 mph	Horizontal Curve Radius = 5°30'00" - ODOT 202.3
OH - I-71 SB	17+42.26	45 mph (55)		360' (495')				35 mph	HSSD = 495' - ODOT 201.2
OH - I-71 SB	26+15.00					6.50% (5.00%)			Max Grade = 5% - ODOT 203.2
OH - I-71 SB	31+66.44						Shoulder Width		Shoulder Width >= 10' - ODOT 301.2. & 303.1
US 50 EB - OH	108+90.31	40 mph (50)	11°00'00" (6°45'00")					30 mph	Horizontal Curve Radius = 6°45'00" - ODOT 202.3
US 50 EB - OH	108+90.31	36 mph (50)		261' (425')				30 mph	HSSD = 425' - ODOT 201.2
US 50 EB - OH	109+50.00	45 mph (50)			360' (425')			30 mph	VSSD = 425' - ODOT 201.2
US 50 EB - OH	114+75.00	45 mph (50)			360' (425')			30 mph	VSSD = 425' - ODOT 201.2
US 50 WB - OH	112+25.00	45 mph (50)			360' (425')			35 mph	VSSD = 425' - ODOT 201.2
US 50 WB - OH	114+02.58	40 mph (50)	10°30'00" (6°45'00")					35 mph	Horizontal Curve Radius = 6°45'00" - ODOT 202.3
US 50 WB - OH	114+02.58	34 mph (50)		242' (425')				30 mph	HSSD = 425' - ODOT 201.2
US 50 WB - OH	128+38.49	34 mph (50)	10°30'00" (6°45'00")					30 mph	HSSD = 425' - ODOT 201.2
OH - I-75 SB to I- 71 NB	125+75.61	34 mph (45)		240' (360')					HSSD = 360' - ODOT 201.2
OH - NB CD to Local/I-75	4+80.00	40 mph (55)			305' (495')				VSSD = 495' - ODOT 201.2
OH - NB CD to Local/I-75	7+70.00					6.97% (5.00%)			Max Grade = 5% - ODOT 203.2



Route	Station	Design Met (Required)	Horizontal Dc (Maximum)	Horizontal SSD (Minimum)	Vertical SSD (Minimum)	Maximum Grade (Required)	Other	Design Speed Existing	Design Criteria
OH - NB CD to Local/I-75	8+88.92	45 mph(55)		360' (495')					HSSD = 495' - ODOT 201.2
OH - NB CD to Local/I-75	16+02.94	40 mph (55)			305' (495')				VSSD = 495' - ODOT 201.2
OH - NB CD to Local/I-75	17+24.96	42 mph (55)		325' (495')					HSSD = 495' - ODOT 201.2
OH - SB CD from I-75	3+20.00	46 mph (55)			360' (495')				VSSD = 495' - ODOT 201.2
OH - SB CD from I-75	6+40.00					6.02% (5.0%)			Max Grade = 5% - ODOT 203.2
OH - SB CD from I-75	16+00.00	50 mph (55)			425' (495')				VSSD = 495' - ODOT 201.2
OH - SB CD from I-75	20+31.37	52 mph (55)		455' (495')					HSSD = 495' - ODOT 201.2
OH - SB CD from I-75	21+30.00					6.5% (5.0%)			Max Grade = 5% - ODOT 203.2
OH - SB CD from I-75	28+40.37	52 mph (55)		455' (495')					HSSD = 495' - ODOT 201.2
OH - NB CD to I-75	36+51.70	48 mph (55)			400' (495')				VSSD = 495' - ODOT 201.2
OH - NB CD to I-75	40+36.53	48 mph (55)		400' (495')					HSSD = 495' - ODOT 201.2
OH - NB CD to I-75	42+41.09	45 mph (55)			360' (495')				VSSD = 495' - ODOT 201.2
OH - 3rd to NB CD to I-75	19+58.10	45 mph (55)			360' (495')				VSSD = 495' - ODOT 201.2
OH - 3rd to NB CD to I-75	20+90.14	47 mph (55)		385' (495')					HSSD = 495' - ODOT 201.2
OH - 3rd to NB CD to I-75	24+20.98	46 mph (55)			375' (495')				VSSD = 495' - ODOT 201.2



# 13. COMPLIANCE WITH FHWA POLICY REQUIREMENTS

FHWA provides guidance in the *Policy on Access to the Interstate System* dated May 22, 2017, which details two policy requirements the states must follow when seeking FHWA approval for a change in access to the interstate system. This section discusses each policy requirement as it relates to the BSB Corridor.

# 13.1 Policy Requirement #1

"An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, and ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis should, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (Title 23, Code of Federal Regulations (CFR), paragraph 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, should be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access should include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute, and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroads, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request should also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d))."

**Policy Requirement #1 -** Traffic operational and safety analysis was completed to compare the No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). The operational results indicate that Refined Alternative I (Concept I-W) will provide acceptable traffic operations. Section 8 demonstrates that operations are not degraded compared to No Build and Selected Alternative I. Likewise, the safety analysis confirms that the Refined Alternative I (Concept I-W) will improve the corridor's safety compared to the No Build condition through design modernizations, increased cross-section widths, improved freeway capacity, and increased ramp spacing. The Safety analysis is summarized in **Section 9**.

The conceptual signing plan, as described in Section 4.1 and shown in **Appendix A**, illustrates that signing can be designed in accordance with Manual of Uniform Traffic Control Devices (MUTCD) guidelines without adverse impacts on other signing or drivers' expectations.

# 13.2 Policy Requirement #2

"The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access, such as managed lanes (e.g., transit or high occupancy vehicle and high occupancy toll lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)). In rare instances where all basic movements are not provided by the proposed design, the report should include a full-interchange option with a comparison of the operational and safety analyses to the partial interchange option. The report should also include the mitigation proposed to compensate for the missing movements, including wayfinding signage, impacts on local intersections, mitigation of driver expectations leading to wrong-way movements on ramps, etc. The report should describe whether the future provision of a full interchange is precluded by the proposed design."



**Policy Requirement #2 -.** The proposed C-Ds and frontage roads allow for multiple points of access and connectivity in Ohio and Kentucky through local arterials. The ramp modifications in Cincinnati provide acceptable access in and out of the central business district. The operations analysis indicates these ramp modifications result in acceptable LOS for Refined Alternative I (Concept I-W).

The project will be developed to meet current design standards. Where current standards cannot be met, a design exception will be fully developed and vetted for that location and approved using state procedures.

#### 14. CONCLUSION

The BSB IMS Addendum aims to confirm that the value engineering refinements incorporated into Refined Alternative I (Concept I-W) result in acceptable operations and safety compared to the previously approved IMS design, Selected Alternative I (from the 2012 EA/FONSI). The operations and safety analysis compares the No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) and provides documentation to substantiate that Refined Alternative I (Concept I-W) does not adversely impact operations or safety.

The operations of the BSB corridor are improved significantly in both Selected Alternative I and Refined Alternative I (Concept I-W) due to the removal of the bridge capacity constraint over the Ohio River. This allows free flow traffic conditions on the freeway mainline throughout the project area, a significant operational improvement compared to the No Build. Additionally, the design modification for Refined Alternative I (Concept I-W) results in acceptable traffic operations for the C-D roadway, ramp terminal intersections, and adjacent arterial streets. Some traffic delays occur at external network points, including US 50, I-71, and I-71/I-75; however, these delays are similar to those in the Selected Alternative I and No Build conditions. Overall, the Refined Alternative I (Concept I-W) achieves the operational goals of the project's purpose and need.

The safety of the BSB Corridor is improved in both Selected Alternative I and Refined Alternative I (Concept I-W) from the No Build due to designs that alleviate capacity constraints and correct geometric deficiencies that contribute to existing crash conditions. These designs meet current standards for curves and shoulders, reduce weaving by separating mainline and local traffic, and eliminate left exits. The analysis shows that the improvements to safety over the No Build are similar between Selected Alternative I and Refined Alternative I (Concept I-W). Some isolated areas of Refined Alternative I (Concept I-W) show increased predicted crashes compared to Selected Alternative I, primarily from using 10 ft shoulders. The proposed 10 ft shoulder widths achieve the design standards and balance the corridor's operational, safety, right-of-way, and project cost considerations. Furthermore, the safety improvements associated with the C-D road system are anticipated to alleviate the existing safety concerns caused by peak-period traffic congestion.

The BSB Corridor Project is currently planned to be delivered in three phases. The two northern projects (PID 113361 and PID 114161) are being developed as Design-Bid-Build, and the remainder of the corridor (PID 116649/KYTC Project Item No. 6-17) is being developed according to a Progressive Design-Build process. The results of these recommendations do not preclude or eliminate consideration of additional concepts and ideas if developed by a design-build team as part of the Phase III project. Refined Alternative I (Concept I-W) is the base concept in the design-build Phase III of the BSB Corridor Project.



# Appendix A: Refined Alternative I (Concept I-W) Conceptual Signing Plan











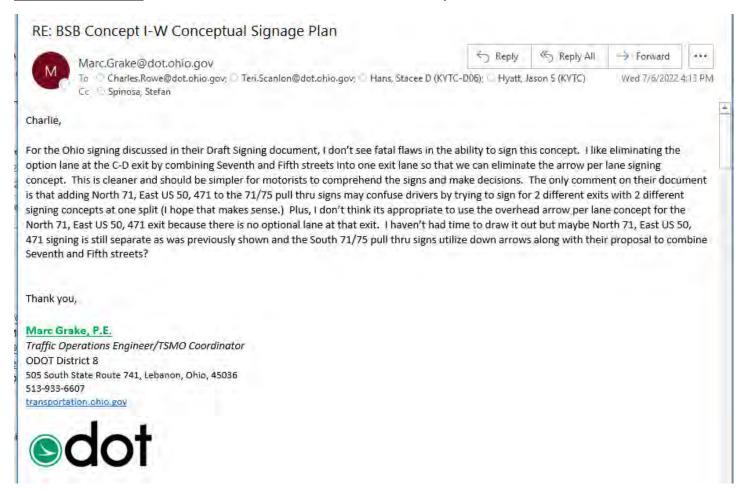
#### BRENT SPENCE BRIDGE HIGHWAY SIGNING REVIEW FOR CONCEPT I-W

<u>PURPOSE</u>: The purpose of this document is to address comments from ODOT and KYTC dated July 6, 2022 in response to the latest review of the potential highway signing plan for Concept I-W. The goal of the signing review is to determine, at a conceptual level, if there are any fatal flaws in the conceptual signing plan in transitioning from Alternative I to Concept I-W and to reflect the changes (if any) required on the Alternative I signage plan to accommodate Concept I-W.

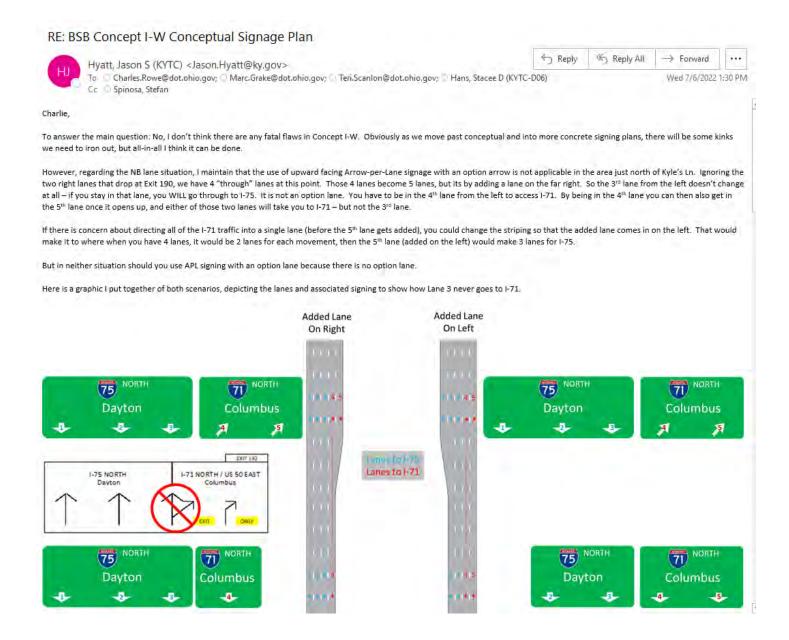
<u>TIMELINE:</u> An initial review by HNTB of the 2012 Alternative I signing plan was sent to ODOT and KYTC on March 25, 2022 with a memo and marked plans indicating potential changes to the signing to accommodate Concept I-W interstate and local traffic patterns that are different from Alternative I. The review also addressed two specific areas of concern for lane splits and traffic assignments, one on SB I-75 in Ohio approaching the mainline/CD split near Ezzard Charles and one on NB I-71/I-75 in Kentucky approaching the mainline widening from four lanes to five lanes near Pike.

Comments from both states were received on May 9, 2022 in an email and with comments and recommendations marked on the plan sheets, particularly for the two specific areas of concern. These items were addressed by HNTB in a memo dated June 16, 2022 and with notes on the plan sets. The memo presented potential signing to simplify and clarify the signing layout in Kentucky and Ohio in the two areas of concern based on the comments from each state. It was also noted that no fatal flaws were found for signing of Concept I-W.

**RECENT COMMENTS:** Comments from both states were received on July 6, 2022 in an email, which are included below:







**SUMMARY:** The review of the Alternative I signing plans relative to Concept I-W has been an iterative process with recommendations by ODOT, KYTC and HNTB for the need for simplified signing and clarity for drivers. All parties recognize that there are no fatal flaws in the signing of Concept I-W and that specific signing can be designed as part of ongoing project development. This also allows for coordination with the design and placement of freeway management/ITS and destination signing in the corridor.

The ODOT comments recognize that additional thought should be given to the location of and specific sign for the SB exit to NB I-71/US 50E and concur that keeping 5th and 7th together will simplify the signing at the split to the CD. This combination of movements may need further verification in traffic analysis and modeling and specific sign placement will require coordination with the freeway management/ITS and destination signing design.

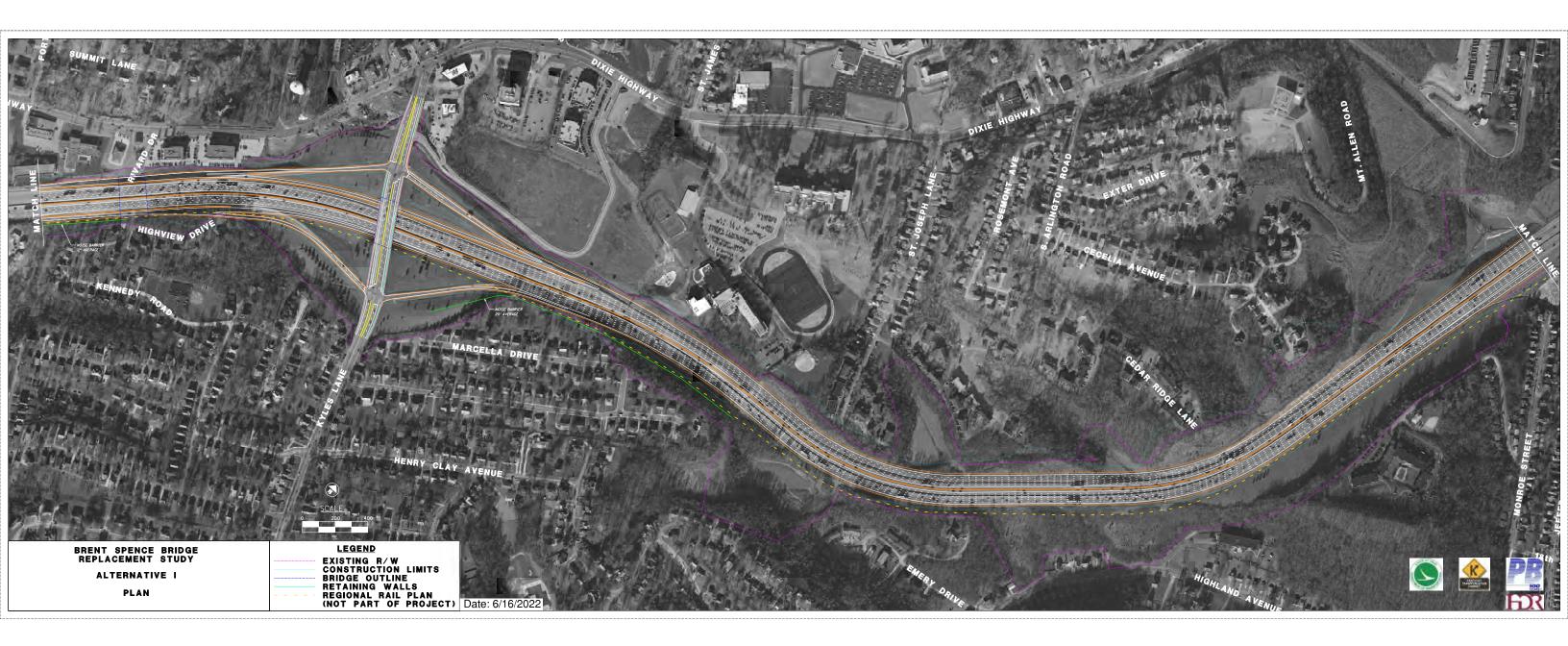


The KYTC comments point out that the creation of the fifth lane northbound in Kentucky could be an add-lane on either side of the highway. This will require further design to determine the best fit. There may also be a need for verification of lane use/signing with traffic analysis and modeling to determine how best to position the NB I-75 and I-71 traffic in the four lane section (as a 3 and 1 or 2 and 2 configuration) and how far in advance of the add-lane that the mainline movements should be signed separately. These issues can be addressed as part of the next phase of design.

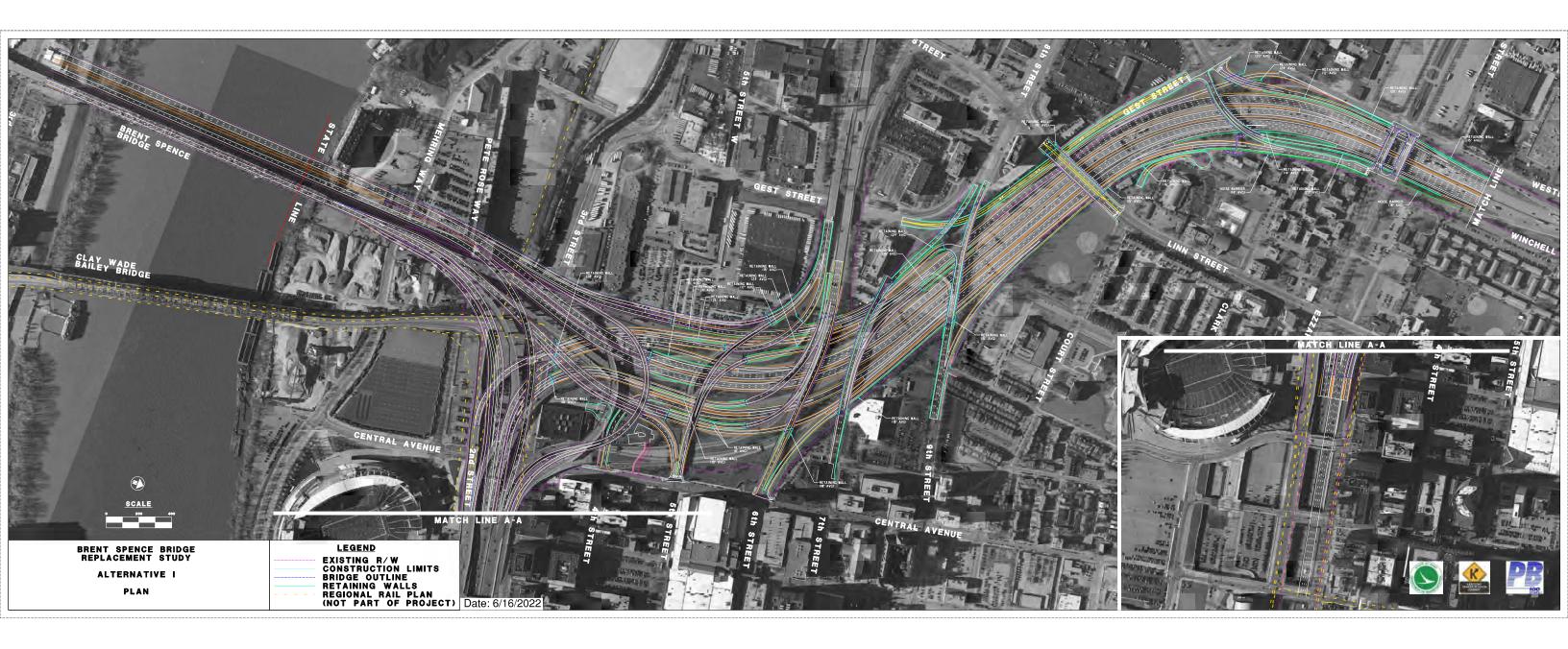
The next phase of design will likely include additional traffic analysis to verify any new design ideas but will also evaluate the C-D and associated signalized intersection operation. The verification of lane assignments for the highway lane use seems reasonable to include so that the remaining pavement marking and signing needs for Concept I-W can be determined. This will also coordinate well with the design of the freeway management/ITS and destination signing.

# **Appendix B: Selected Alternative I Design**



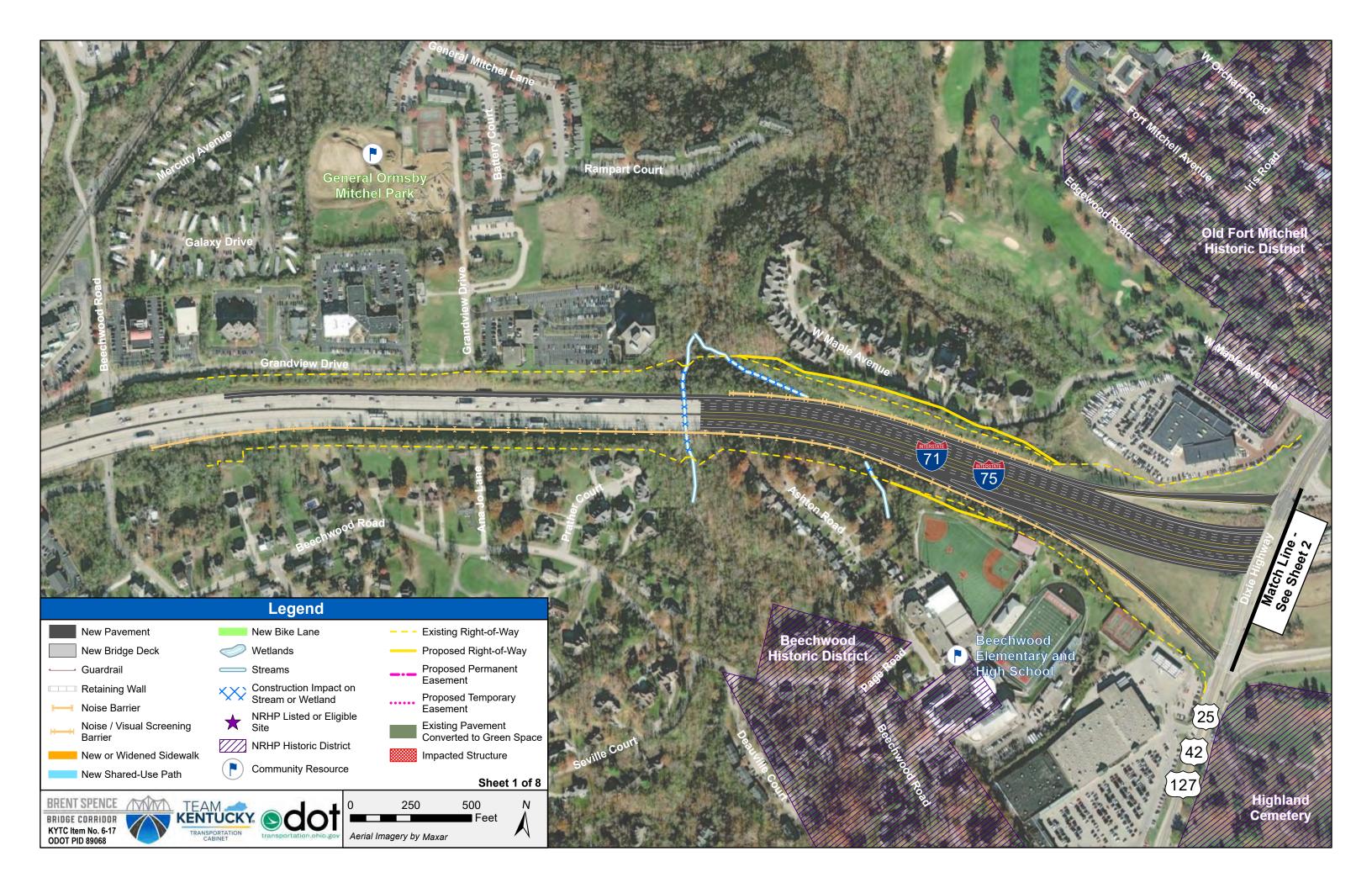


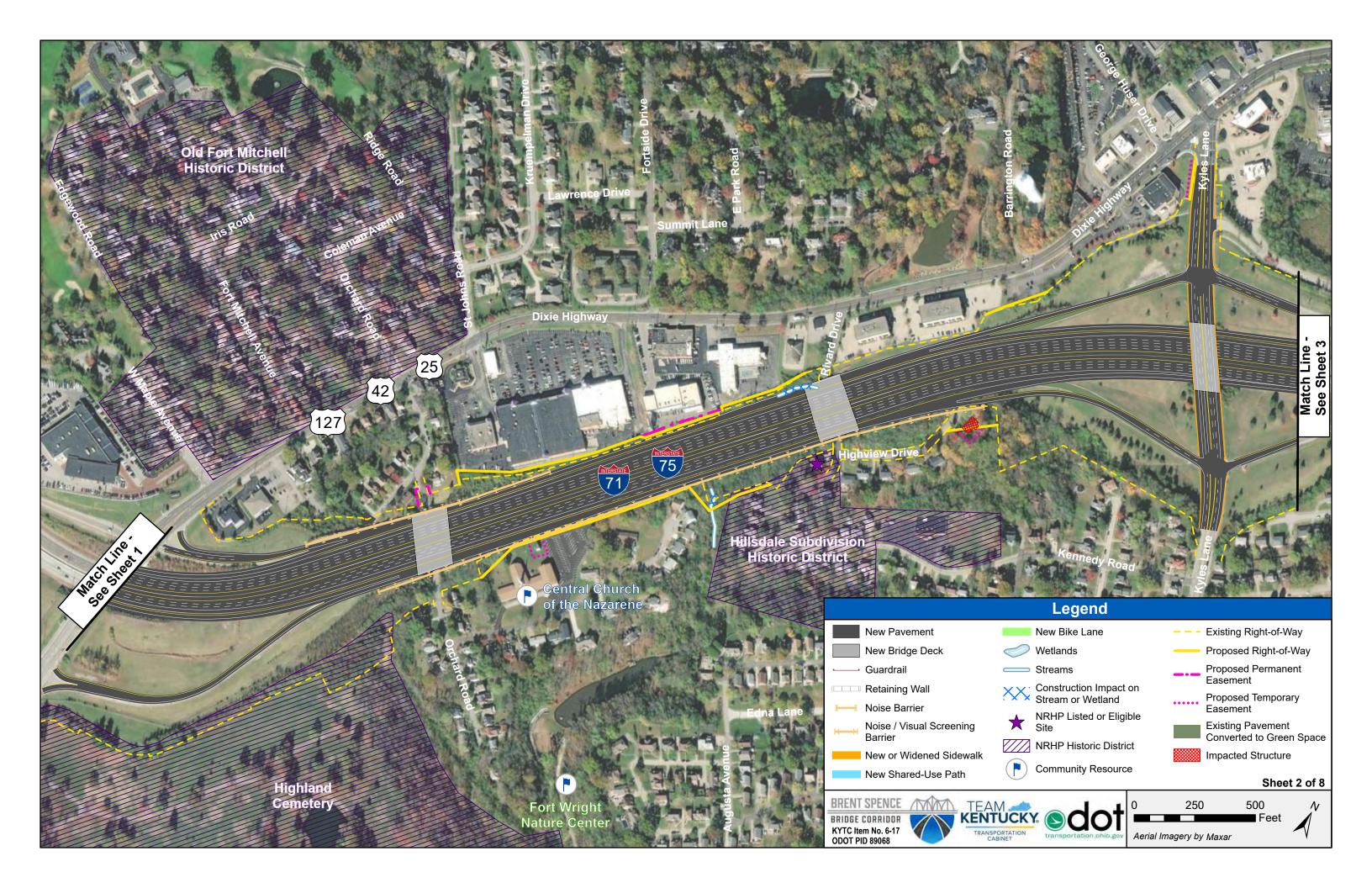


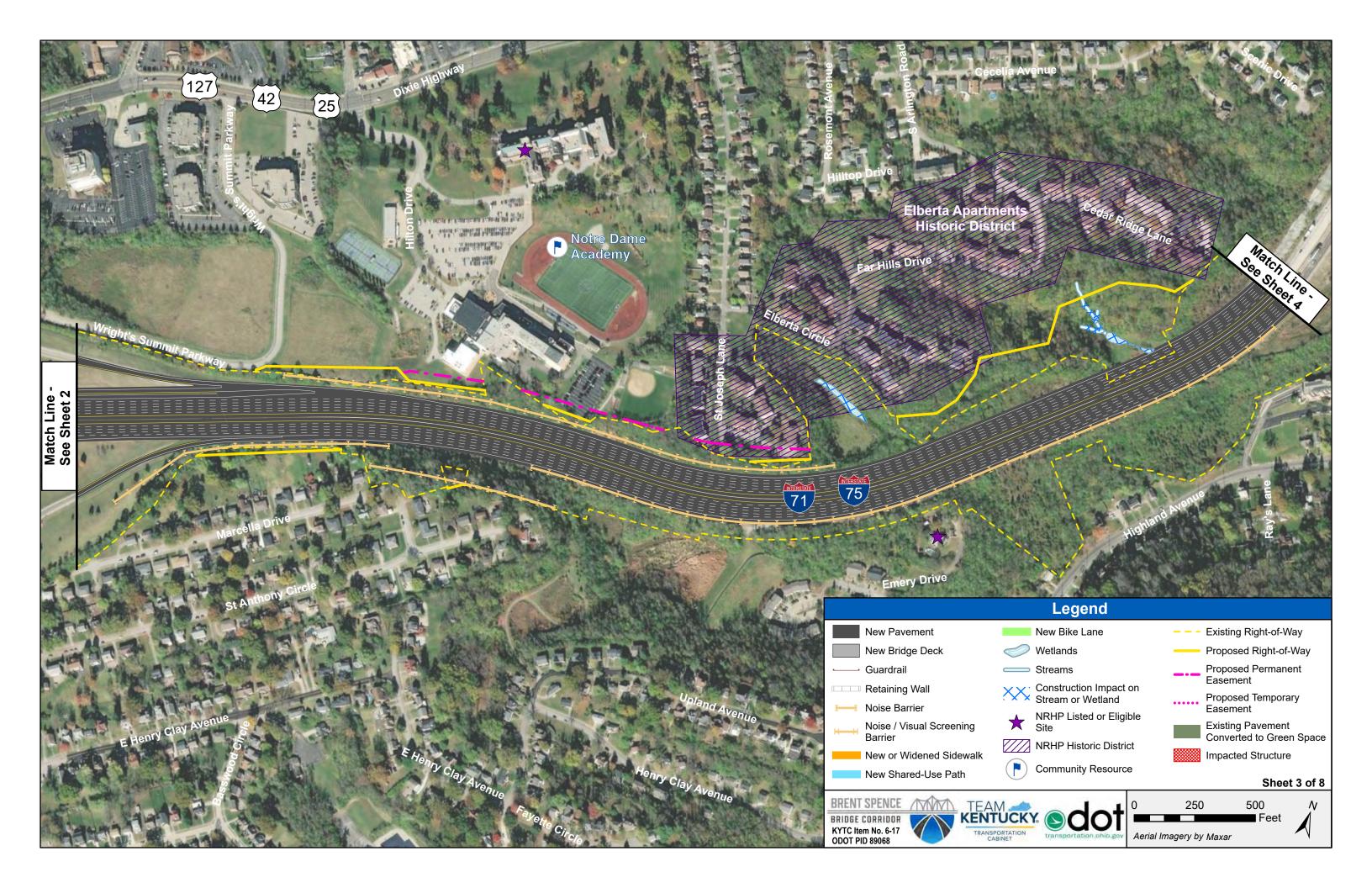


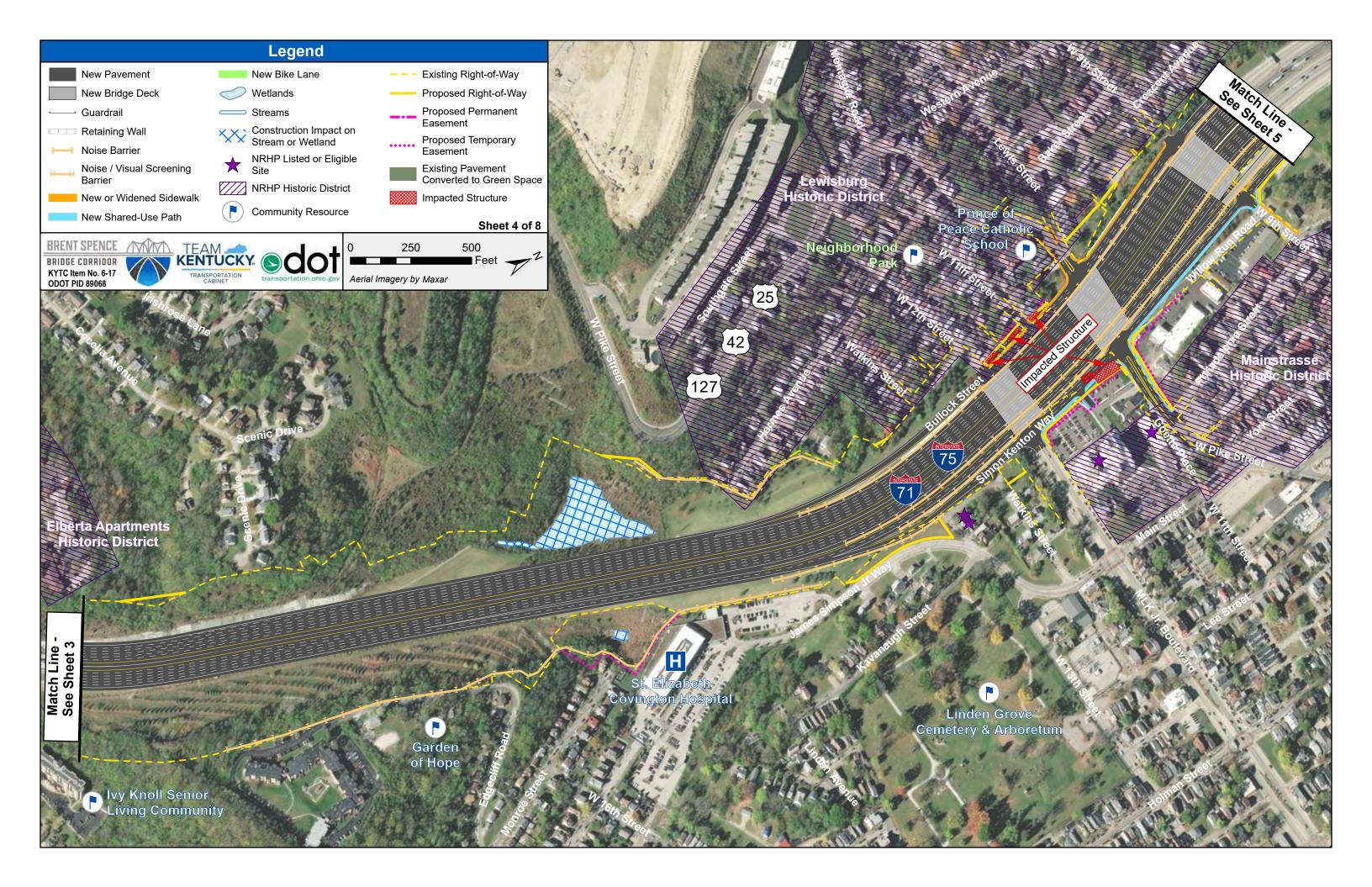


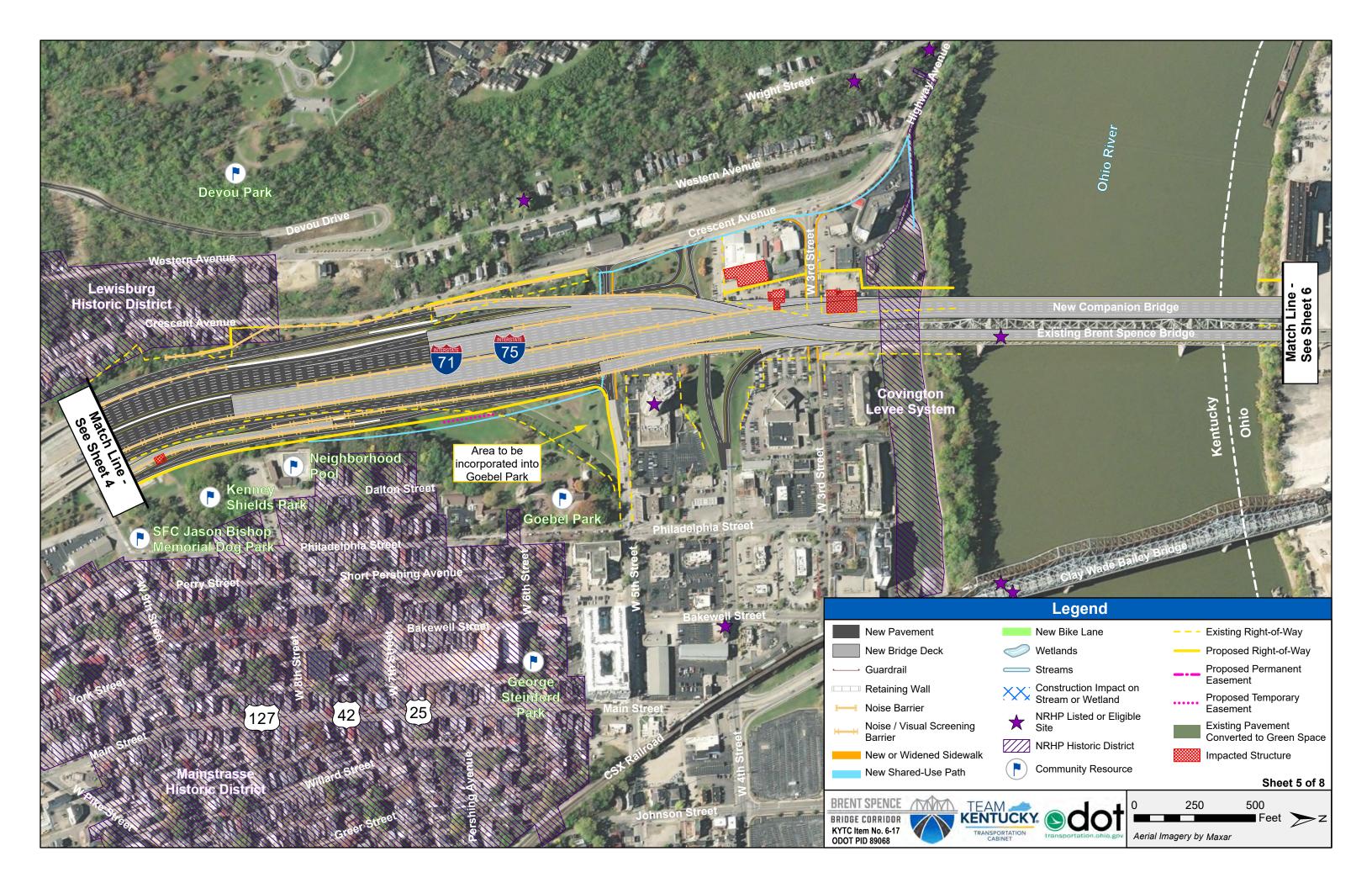
# Appendix C: Refined Alternative I (Concept I-W) Design

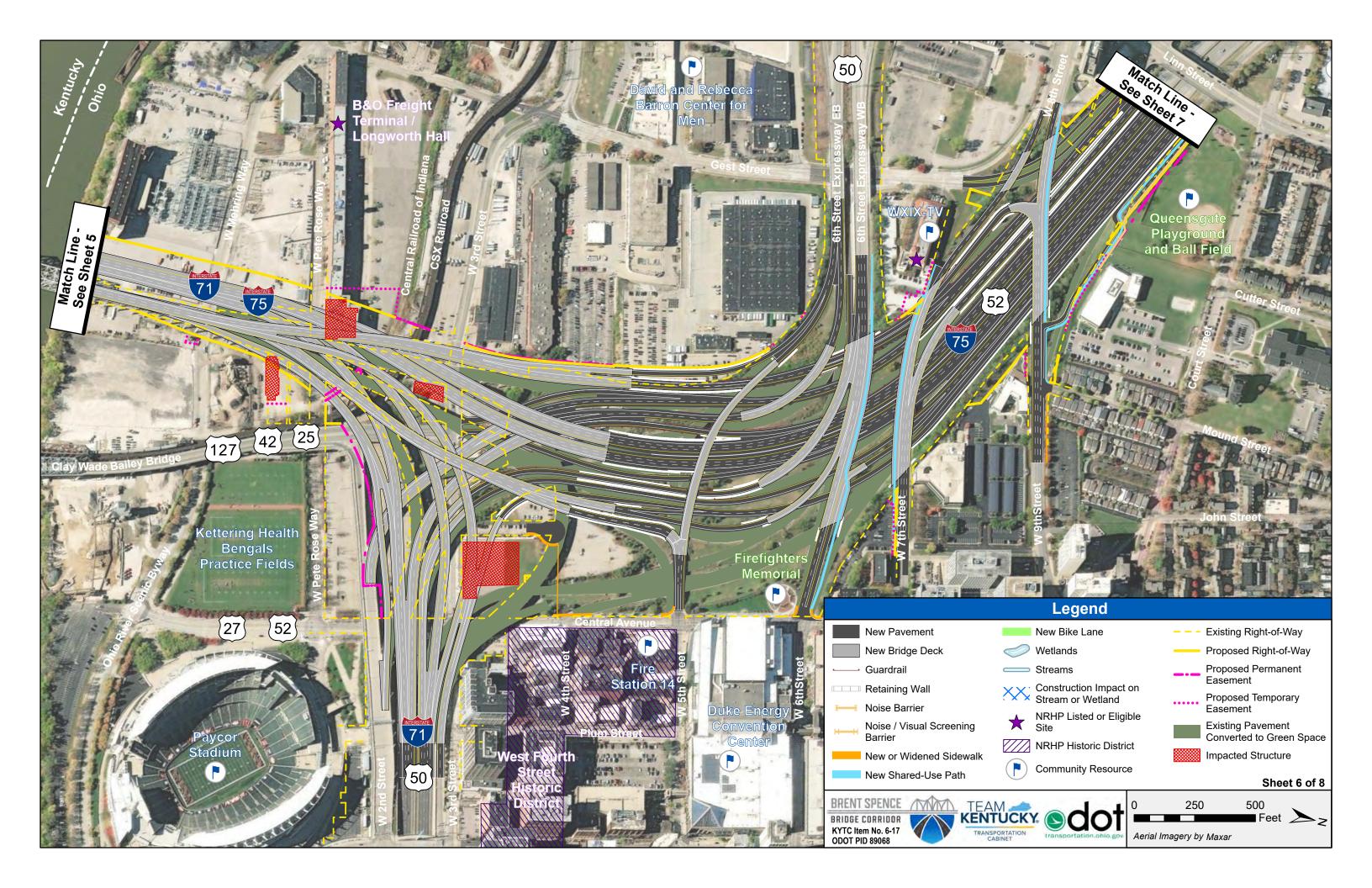


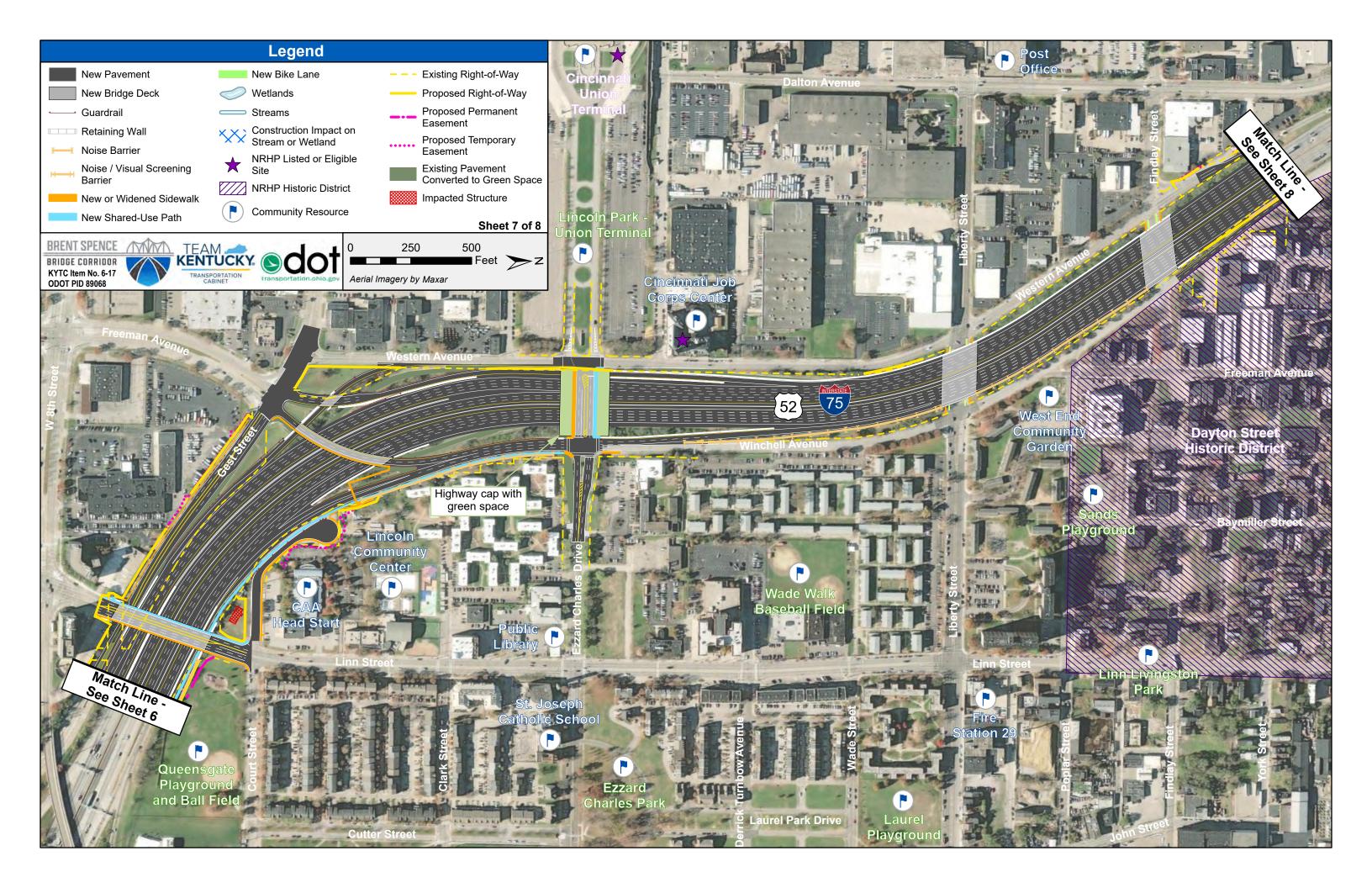


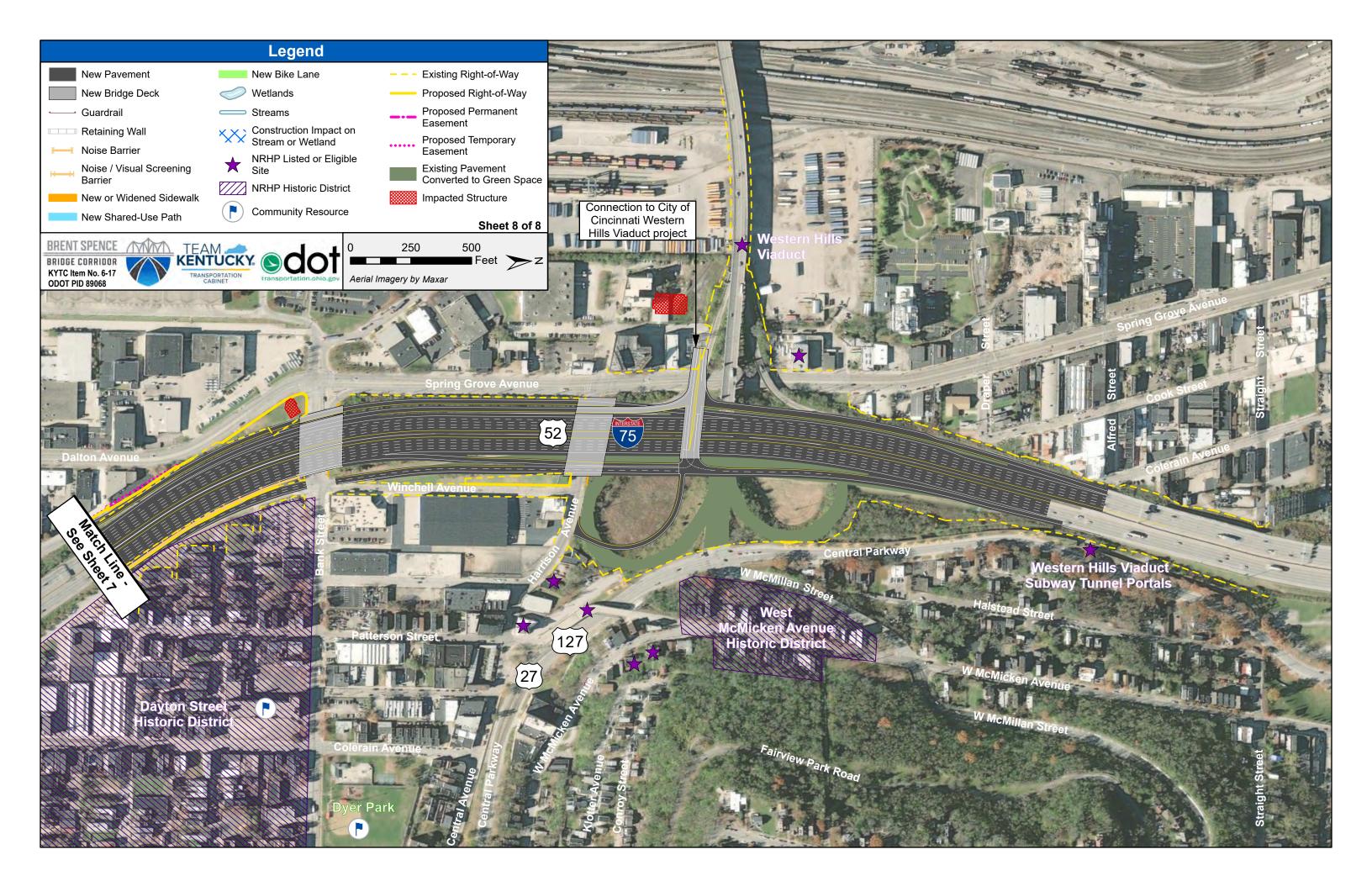




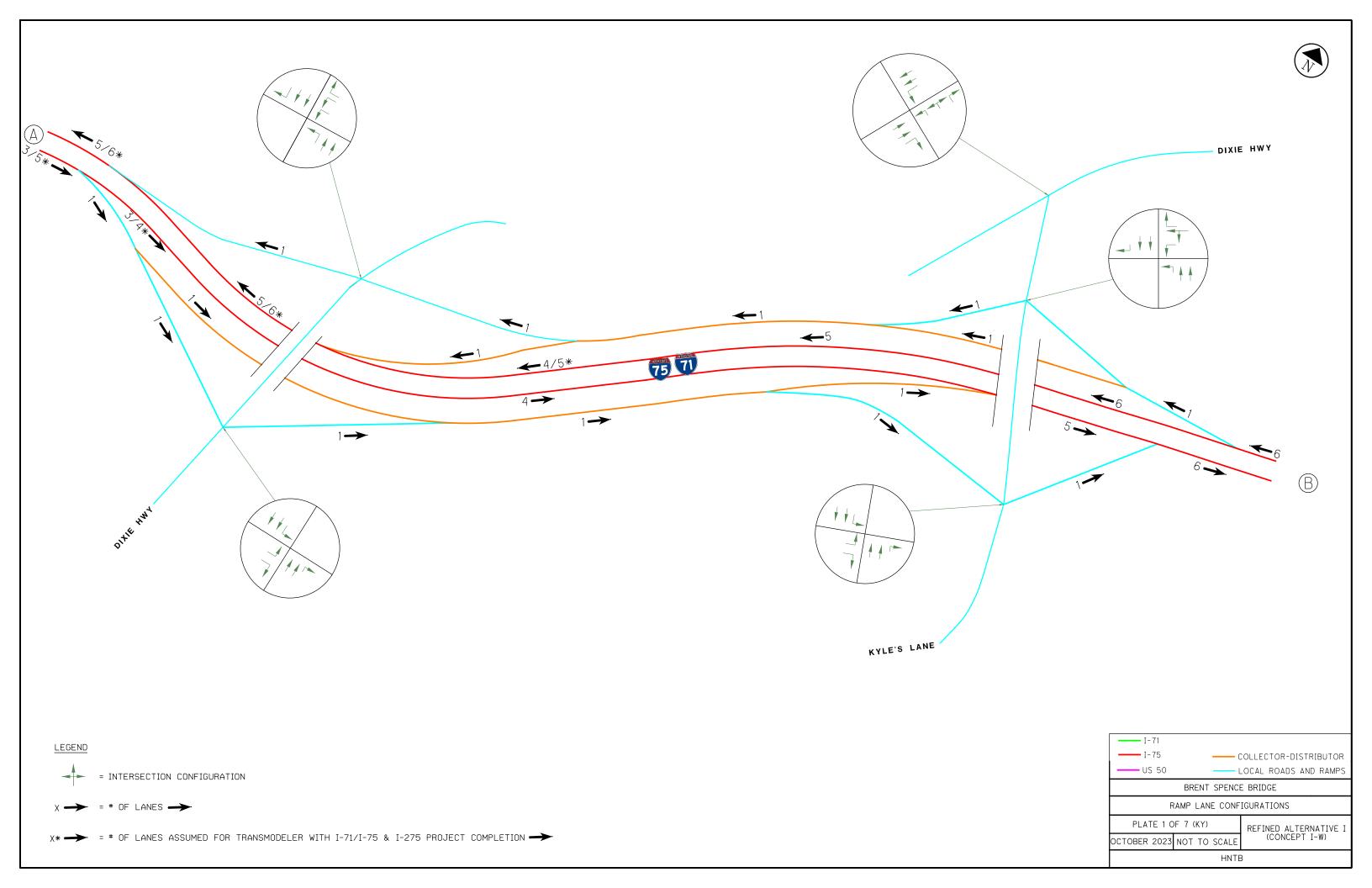


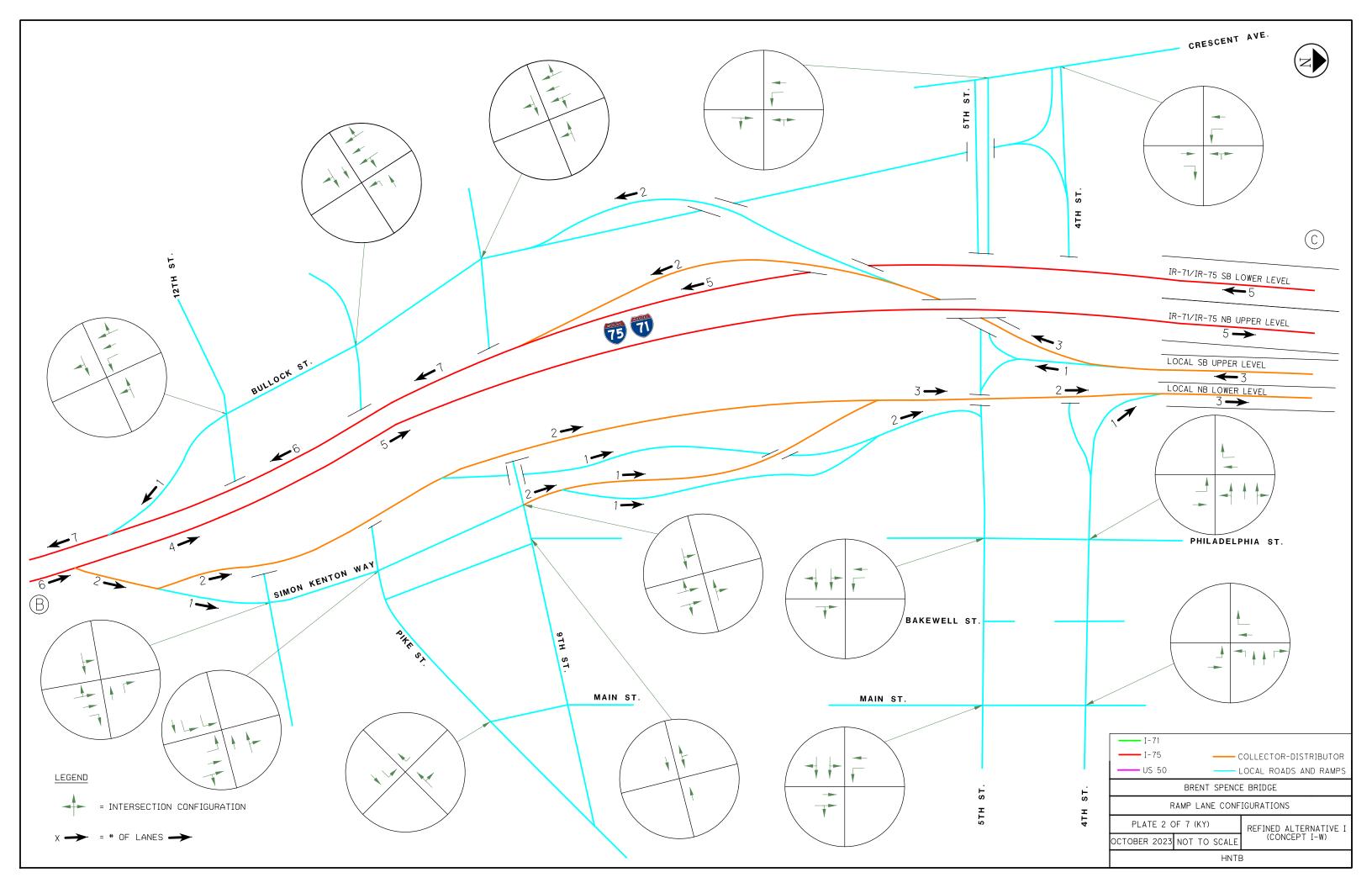


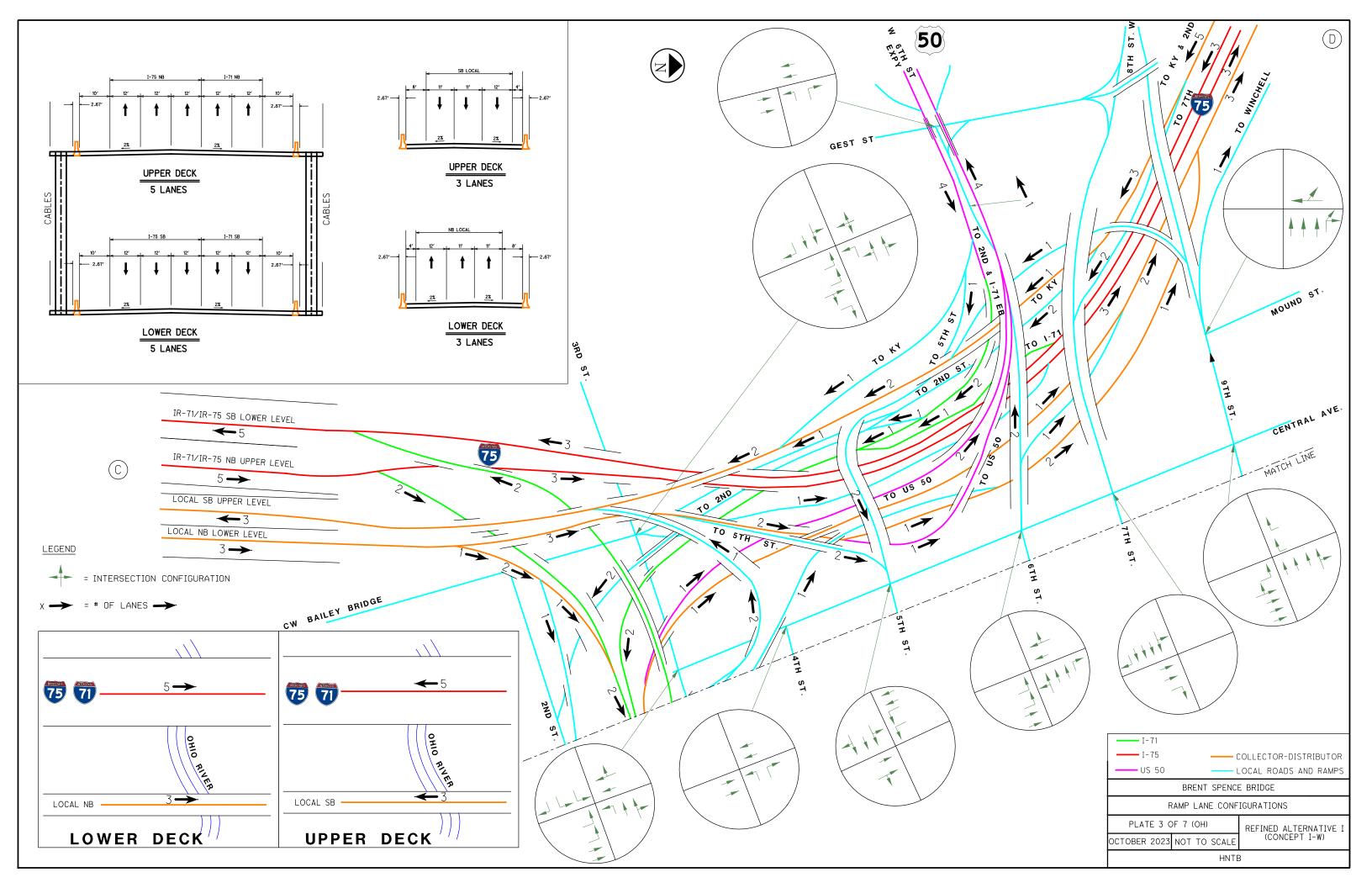


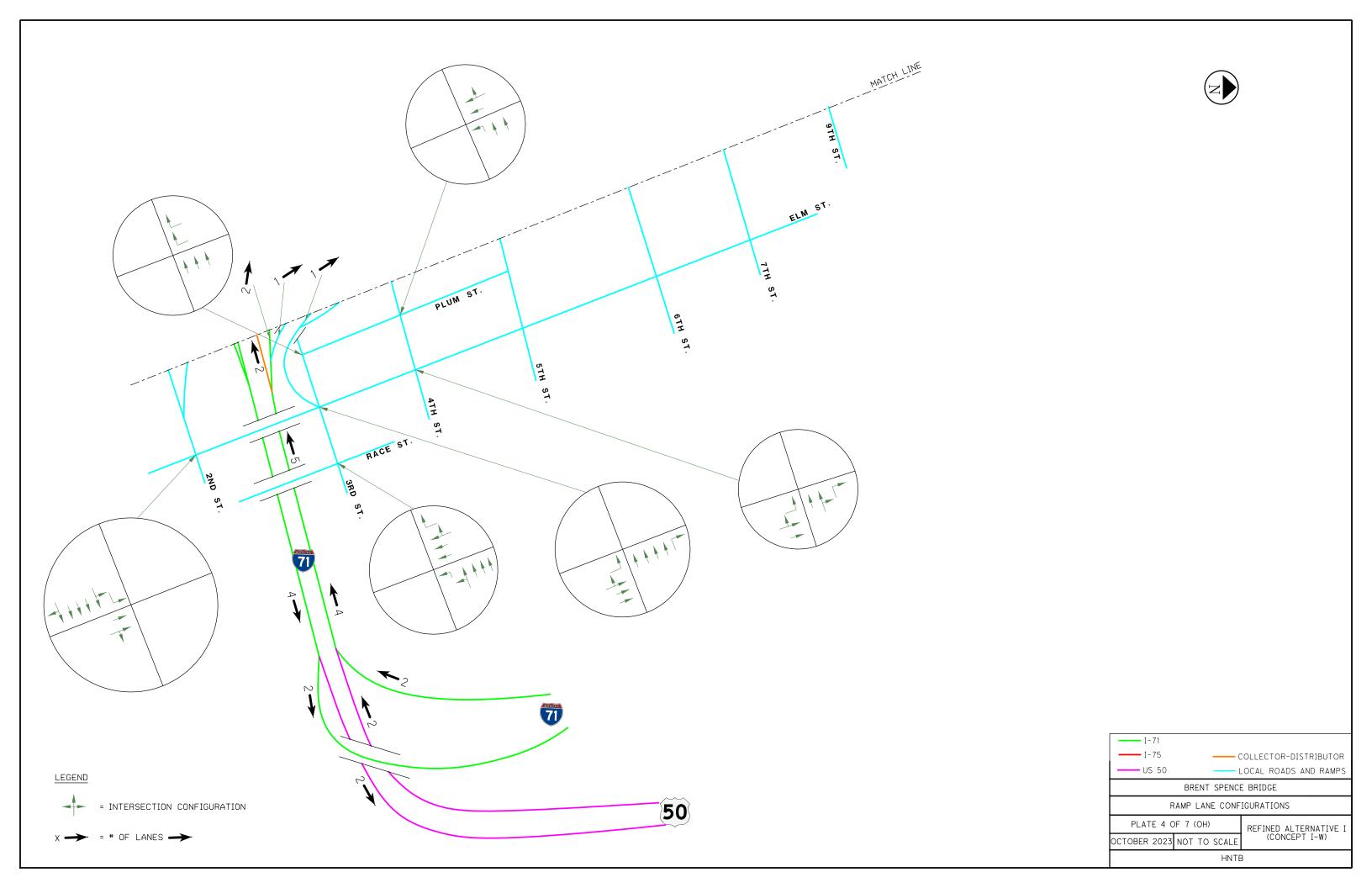


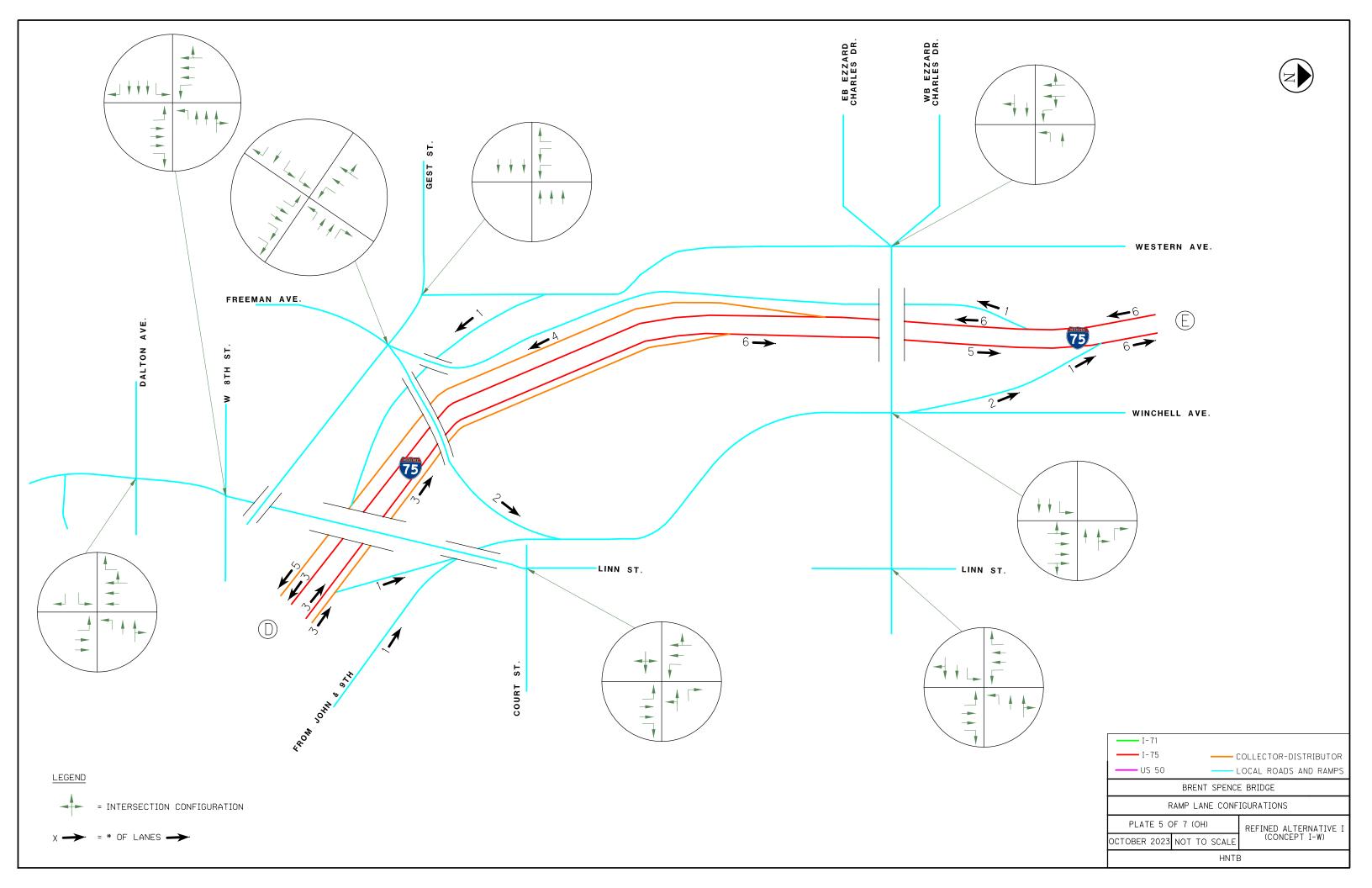
### Appendix D: Refined Alternative I (Concept I-W) Lanes

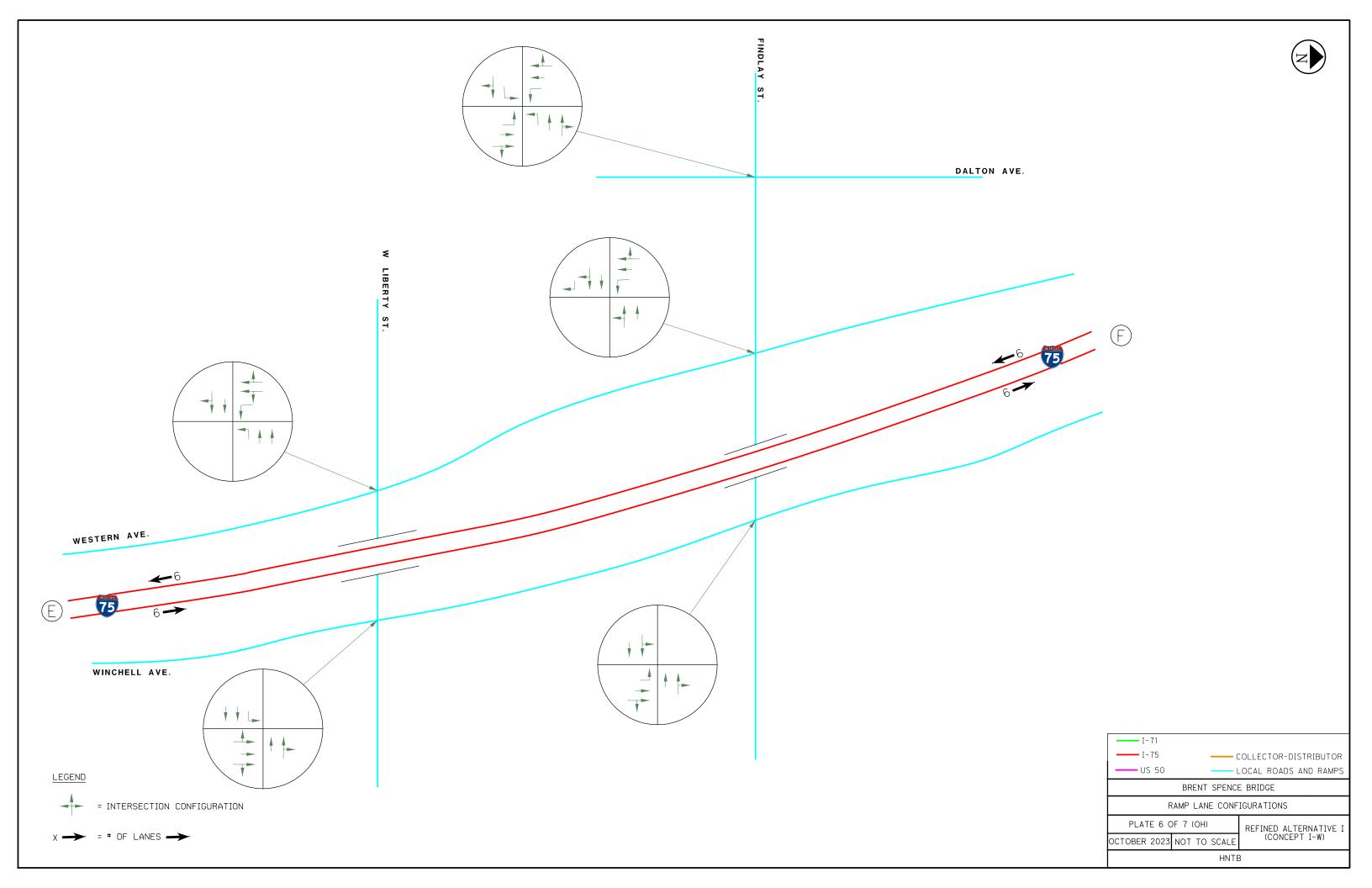


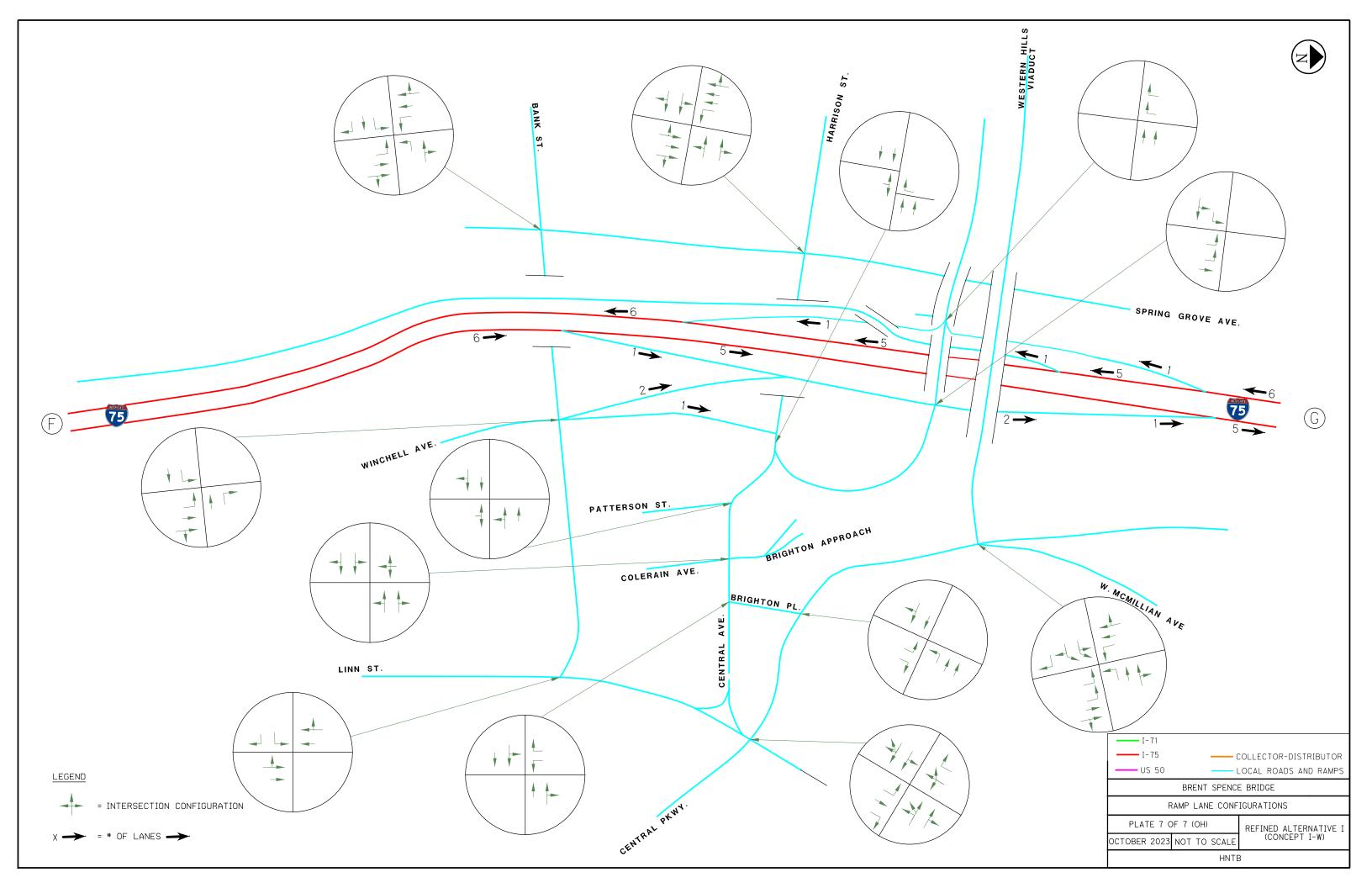












# **Appendix E: Certified Traffic Report**





**BRENT SPENCE BRIDGE CORRIDOR PROJECT** 

## **CERTIFIED TRAFFIC REPORT**

ODOT PID 89068 | KYTC PROJECT ITEM NO. 6-17 MAY 23, 2023







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#### Appendix B - Reports

- Appendix B-1: Count Evaluation Memo and Attachments
  - Details on Traffic Counts
  - Proposed factors including seasonal, COVID-19, expansion, and DHV factors
  - Traffic Count Plates
    - Existing Daily Counts / 2019 AADT Targets



Certified Traffic Report

- 2019 AADT Targets and Balanced
- Existing AM and PM Traffic Counts
- Appendix B-2: Project Travel Demand Model Overview

#### Appendix C - Exhibits

- Appendix C-1: Design Alternatives
- Appendix C-2: Existing Turning Movement Count Data Electronic Files Available Upon Request
- Appendix C-3: Short-Term Count Data Electronic Files Available Upon Request
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- Appendix C-5: Daily 2030/2050 No Build Travel Demand Model Assignments
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- Appendix C-8: Forecast Targets versus Balanced Table
- Appendix C-9: Traffic Weave Information Electronic Files Available Upon Request



#### 1. INTRODUCTION

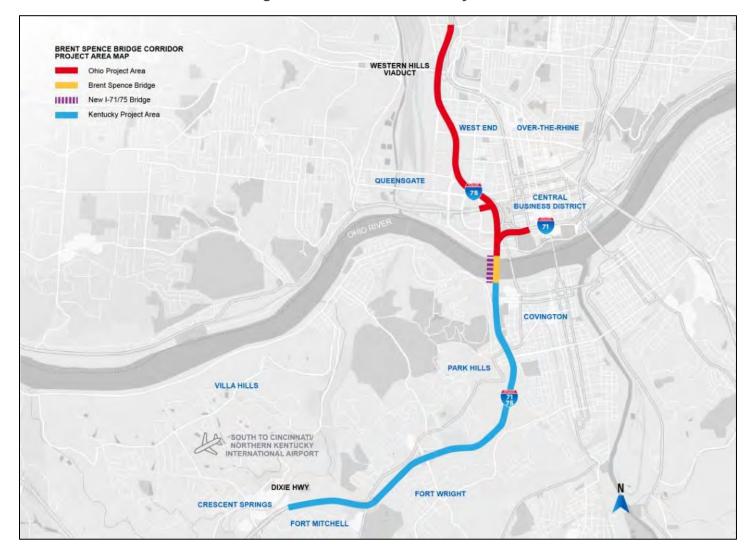
As part of the Brent Spence Bridge (BSB) Interchange Modification Study (IMS) addendum, certified traffic forecasts including design hours and Annual Average Daily Traffic (AADT) are developed for years 2029 and 2049 for the project study limits. The forecasts include a No Build and two build alternatives: the 2012 Selected Alternative I and the Refined Alternative I (Concept I-W) developed during the value engineering study. The study limit includes the I-71 and I-75 interstate between the Buttermilk Pike Interchange on the south and the Hopple Street Interchange on the north, and I-71 between the BSB and the US 50/I-471 Interchange (see **Figure 1**). Ramp terminal and adjacent arterial intersections are included in the forecast area. The traffic forecasts for the BSB IMS approved in 2012 was forecasted for a horizon year of 2035. This report includes a comparison of the 2049 forecasts to the 2035 forecasts presented in the 2012 IMS.

The certified traffic forecasts follow the Ohio Department of Transportation (ODOT) forecasting procedures. Prior to developing the certified traffic forecasts, the project team completed a count evaluation memo that established a base year 2019 count set and presented design hour factors (**Appendix B-1**) for the forecast limits. The ODOT forecasting and modeling group summarized the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) travel demand model validation for the project area (**Appendix B-2**). The travel demand model traffic assignments and base 2019 count data are used with the NCHRP 765 forecasting procedures outlined in ODOT's forecasting manual<sup>1</sup> to develop the project certified traffic.

This report summarizes the forecasting inputs, procedures, and the traffic forecasts for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W).

<sup>&</sup>lt;sup>1</sup> https://transportation.ohio.gov/static/Programs/StatewidePlanning/Modeling-Forecasting/Vol-1-TrafficForecastingBackground.pdf





**Figure 1: Traffic Forecast Study Area** 



#### 2. PROJECT DESCRIPTION

The purpose of the traffic forecasts is to support the Brent Spence Bridge IMS addendum. The IMS addendum is required by FHWA policy as the previous IMS was approved more than 8 years ago. The No Build and Selected Alternative I were forecasted as part of the previous IMS and need to be updated for the IMS addendum along with the Refined Alternative I (Concept I-W). The forecasts use updated travel demand models and the most recent traffic counts to forecast an opening year 2029 and horizon year 2049.

#### 3. FORECAST PARAMETERS

The forecast limits include the I-71/75 mainline and ramps between Buttermilk Pike and Hopple Street. The weave forecast is provided for I-75 NB between the Western Hills Viaduct (WHV) Interchange and Hopple Street Interchange. There are 66 intersections forecasted, which include intersections in Kentucky (**Table 1**) and intersections in Ohio (**Table 2**).

**Table 1: Kentucky Intersections** 

Dixie Hwy @ I-71/I-75 NB	12th St @ I-71/ I-75 SB	Main St @ W. 5th St
Dixie Hwy @ I-71/I-75 SB	Pike St @ I-71/I-75 NB	Main St @ W 4th St
Kyles Ln @ I-71/I-75 NB	Pike St @ I-71/I-75 SB	Philadelphia St @ W. 4th St
Kyles Ln @ I-71/I-75 SB	Philadelphia St @ 9th St	Crescent Ave @ W. 4th St
Kyles Ln @ US-25	Philadelphia St @ W. 5th St	Crescent Ave @ W. 5th St
12th St @ I-71/I-75 NB	Pike St @ Main St	9th St @ Bullock St
9th St @ Simon Kenton Way		

**Table 2: Ohio Intersections** 

W. 9th St @ Central Ave	9th St @ Mound St	Bank St. @ Winchell Ave
W. 7th St @ Central Ave	W. 8th St @ Linn St	Bank St. @ Linn St
W. 6th St @ Central Ave	Court St @ Linn St	Central Ave/Central Pkwy @ Linn St
W. 5th St @ Central Ave	Gest St @ Freeman Ave	Harrison Ave @ Spring Grove Ave
W. 4th St @ Central Ave	Gest St @ Western Ave	Harrison Ave @ Winchell Ave
W. 3rd St @ Central Ave	Gest St @ Linn St	Harrison Ave @ Patterson St
W. 2nd St @ Elm St	Ezzard Charles EB @ Winchell Ave	Colerain Ave/Brighton Approach @ Harrison Ave/Central Ave
W. 3rd St @ Elm St	Ezzard Charles WB @ Winchell Ave	Central Ave @ Brighton Pl
W. 4th St @ Elm St	Ezzard Charles EB @ Western Ave	Brighton Pl @ Central Pkwy
W. 3rd St @ Plum St	Ezzard Charles WB @ Western Ave	Central Pkwy @ WHV
W. 4th St @ Plum St	Ezzard Charles @ Linn St	Spring Grove @ WHV
W. 3rd St @ Race St	W. Liberty St @ Winchell Ave	WHV @ I-75 SB ramp
W. 6th St WB @ Linn St	W. Liberty St @ Western Ave	WHV @ I-75 NB ramp
W. 6th St EB @ Linn St	Findlay St @ Winchell Ave	Findlay St @ Dalton Ave
W. 3rd St @ US-42/US-127	Findlay St @ Western Ave	Bank St. @ Dalton Ave/Spring Grove Ave
2nd St @ CW Bailey Bridge	W. 6th St @ Gest St	

The forecast years include an opening year 2029 and design year 2049. The forecasts are developed for Selected Alternative I and Refined Alternative I (Concept I-W). The certified traffic plates include AADT, AM DHV, PM DHV for opening year and design year of the two build alternatives. The design hour truck % (TD) and 24-hour truck (T24) are also compiled in the traffic plates for each alternative. The truck factors reflect the truck percentages obtained with the base year traffic counts and correlated to the build alternatives.



#### 4. OTHER STUDIES

The forecasts for the Brent Spence Bridge corridor were developed using data and methodologies specific for the IMS addendum. Previous certified traffic forecasts in the study limits include the 2012 IMS and the ODOT study of I-75 between Linn Street and Hopple Street Interchange, which includes the WHV Interchange (PID 114161 and PID 113361). These certified traffic forecasts were reviewed in the development of the IMS addendum traffic forecasts. However, the modeling and traffic counts are unique to the current study and the project team did not constrain the traffic forecasts to match any of the previous studies.

#### 5. DATA SOURCES

#### 5.1 Summary of Data Sources

The traffic counts were collected between 2017 and 2022. The traffic counts were adjusted and balanced to a 2019 (pre COVID-19) condition. The turning movement traffic counts are listed in **Appendix C-2** and short-term link counts are listed in **Appendix C-3**. Existing AADT's were obtained from KYTC, ODOT, and OKI.

The study area land use assumptions rely on the OKI travel demand model. The project is using the OKI Model of Record (MOR), which has a calibration year of 2015 and has been updated by OKI to approximate a year 2020. OKI noted that they had made numerous updates from the 2015 model validation to year 2020 for existing and future year networks. OKI is using 2020 as the base year for traffic analysis in the region. More details on the OKI model and the project level validation prepared by ODOT are included in **Appendix B-2**. The daily traffic assignments from the OKI travel demand model are summarized in schematics like the traffic plates and provided in **Appendix C-4** (2020 Existing), **Appendix C-5** (2030/2050 No Build), **Appendix C-6** (2030/2050 Selected Alternative I), and **Appendix C-7** (2030/2050 Refined Alternative I (Concept I-W)). A comparison of the current OKI MOR and the model used for the 2012 IMS forecasts is discussed in Section 5.2.

#### 5.2 OKI Travel Demand Model History

The 2012 BSB IMS Study used a traditional 4-Step travel demand model, while the current OKI MOR is using an activity-based model which is consistent with current best modeling practices. Both models cover the OKI and MVRPC regions; including: eight counties for OKI (Butler, Clermont, Hamilton, and Warren in OH; Boone, Campbell, and Kenton in KY; Dearborn in IN), and three counties for MVRPC (Greene, Miami, and Montgomery in OH).

A comparison of the socio-economic (SE) input data differences in the two models are presented in this section. Though both models cover the same region, the MOR has a more detailed Traffic Analysis Zone (TAZ) structure as shown in **Figure 2**. Because of this difference, the SE data was aggregated into county level for comparison purposes.



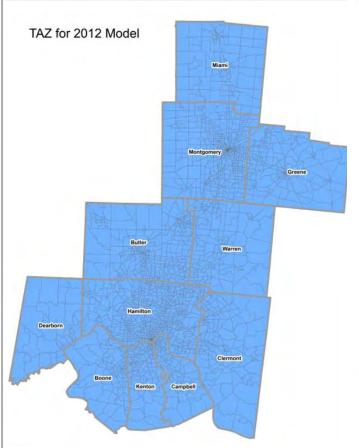
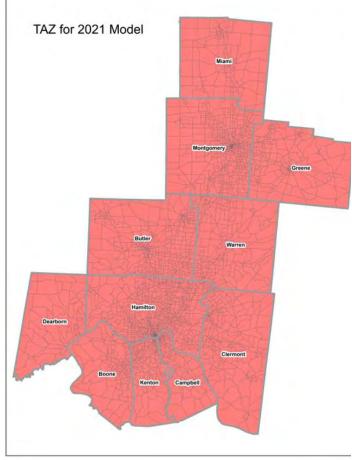


Figure 2: TAZs for the 2012 and 2021 Models

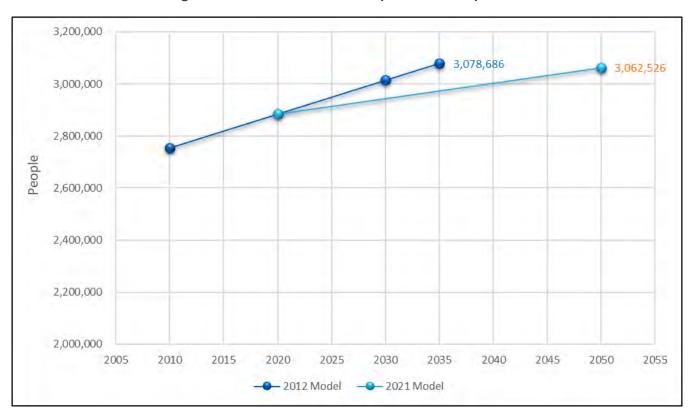


The 2012 OKI TDM has a base year of 2010 and a horizon year of 2030. Since the design year is used in the 2012 IMS is 2035, the 2035 SE data was extrapolated based on the 2010 and 2030 data. The current OKI MOR has a base year of 2020 and a horizon year of 2050. A comparison of the population data by county is shown in **Table 3**, total population graph in **Figure 3**, employment by county in **Table 4**, and total employment graph in **Figure 4**. These summaries show a decrease in population and employment in the current MOR for year 2050 compared to the previous model year 2035.

**Table 3. OKI Model Population by County** 

			Population			
	2	012 OKI TDM		Current OKI MC		
County	2010 2030		2035	2020	2050	
DEA	50,400	53,900	54,800	50,200	51,000	
воо	115,600	204,000	226,100	139,700	223,000	
CAM	90,600	94,100	95,000	92,500	90,900	
KEN	157,000	164,200	166,000	168,700	184,900	
BUT	357,100	429,300	447,300	386,900	426,000	
CLE	201,700	243,800	254,300	205,400	213,700	
НАМ	794,500	714,500	695,200	814,000	836,700	
WAR	208,800	332,200	363,000	228,200	238,400	
GRE	144,500	151,800	153,700	168,700	189,900	
MIA	106,600	106,700	108,200	106,200	117,300	
MOT	536,700	519,400	515,100	524,100	490,800	

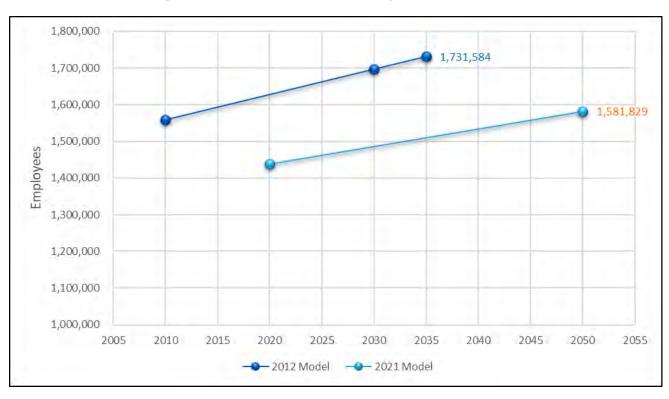
Figure 3: OKI Model – Total Population Comparison



**Table 4: OKI Model Employment by County** 

	Employment						
		2012 OKI TDM		Current	OKI MOR		
County	2010	2030	2035	2020	2050		
DEA	16,500	19,900	20,700	15,200	16,900		
воо	86,100	108,000	113,500	82,600	84,200		
CAM	30,900	36,000	37,300	30,500	33,900		
KEN	69,500	84,500	88,200	63,000	68,000		
BUT	156,700	191,200	199,900	144,100	154,200		
CLE	62,900	82,000	86,700	57,900	63,200		
НАМ	603,600	624,700	630,000	502,000	547,800		
WAR	77,200	95,600	100,200	86,700	90,300		
GRE	87,800	91,900	92,900	104,700	131,000		
MIA	53,500	55,800	56,400	51,800	64,000		
МОТ	314,500	307,500	305,700	299,600	328,300		

Figure 4: OKI Model – Total Employment Comparison



#### 6. EXISTING TRAFFIC VOLUME

The existing traffic volumes represent the year 2019. The balanced AADT and unbalanced peak hour traffic counts are in the Appendix of the Count Evaluation memorandum (**Appendix B-1**). The count evaluation memorandum details the methodology for adjusting the traffic counts to 2019 AADT. This includes a discussion on seasonal adjustment factors, expansion factors for turning movement counts, procedures for identifying count outliers, and an overview of the project design hour volume development factors.

#### 7. DESIGN TRAFFIC VOLUMES

The design traffic volumes are developed using the NCHRP 255/765 forecasting approach with 2019 traffic counts, 2020 existing travel demand model assignments, and assignments from the 2030/2050 travel demand models for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). ODOT's adjuster spreadsheets are used to calculate forecast targets for each of the build alternatives. The smoothing and balancing of the traffic volumes is completed outside the adjuster spreadsheet using a network-based analysis to minimize the difference between the balanced volumes and the target volumes. This balancing process also accounts for a target minimum that ensures a non-negative target growth rate from 2019 to 2029, and 2029 to 2049. The non-negative growth rate check does not apply for growth between 2019 and 2029 for locations directly impacted by roadway access changes. A short list of the locations where the non-negative growth rate does not apply, includes:

- 4th Street (Ohio) east of Central Avenue that is impacted by the ramp relocation (Alt I-W only)
- 6<sup>th</sup> Street and 9<sup>th</sup> Street ramps in Ohio access frontage road instead of direct access to the freeway
- Western Hills Viaduct and surrounding intersections impacted by the interchange modifications
- 4<sup>th</sup> Street Entrance in Kentucky some traffic is rerouting to the Clay Wade Bailey (CWB) in Alt I-W.
- 4<sup>th</sup> Street Corridor in Kentucky removal of NB I-71/I-75 Entrance ramp in No Build

The key factors and constraints applied in the adjuster spreadsheets include the design hour factor for AM and PM counts (1.10 for freeway ramps and 1.15 for arterials). This factor is applied globally for all ramp and arterial count locations and is standardized for this project based on the review of the 2019 ODOT peak hour to design hour factors for urban interstates and urban arterials and additional details are provided in the Count Evaluation Memorandum. The freeway mainline peak hour counts are adjusted using a proxy K-factor method. The proxy K-Factor method seeks to have mainline volumes that are consistent with observed 30<sup>th</sup> highest hour K and D factors. The proxy K-method is applied at the BSB, and I-71/I-75 external study limits, which includes I-71/I-75 south of Dixie Hwy, I-71/I-75 north of WHV, and I-71 east of I-75/I-75 system interchange. The resultant design hour factors for these mainline locations vary by site and are between 1.11 and 1.19.



#### 7.1 Intersection Forecasting Process and Assumptions

The adjuster spreadsheet is setup for every intersection in the project corridor for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). Within the spreadsheet, the *NCHRP255\_link*, *PM\_turns*, *AM\_Turns*, and *24\_turns* sheets are populated. Methodology and assumptions for each of the 4 sheets are listed in the section below.

#### NCHRP255\_link

This sheet holds the daily link forecasting data, which includes: 2019 balanced AADT traffic counts, 2020 existing daily model assignment, 2030 daily model assignment, and 2050 daily model assignment. The growth rates are calculated using the NCHRP 255/765 process as prescribed by ODOT's forecasting manual.

#### 24 turns

The growth rates calculated from NCHRP255\_link sheets are carried to the 24\_turns sheet. Existing 2019 AADT by turn movements are entered into the sheets. The total vehicle volumes are entered in the "pc" field. The truck factors are calculated outside the adjuster spreadsheets. Turn model volumes were entered to calculate turn specific growth rates. The resultant 2029 and 2049 daily volumes are used as forecast targets in the balancing and smoothing methodology outside the adjuster spreadsheet. Volumes are not carried back into the spreadsheet after balancing; instead, a summary table is provided to compare the target volumes for each turn movement and the resultant balanced volumes as a reasonableness check (**Appendix C-8**).

#### PM\_turns

The growth rates calculated from NCHRP255\_link sheets are carried to the PM\_turns sheet. The balanced peak hour turn counts are entered into the sheets for total vehicles. The intersection adjuster spreadsheet uses a peak hour to design hour factor of 1.10 for freeway ramps and 1.15 for arterials as identified from ODOT's 2019 tables and presented in the count evaluation memo. The DHV factor is entered directly into column N of the spreadsheet. The rest of the forecasting process follows the procedure outlined for the daily turn forecasts.

#### **AM turns**

AM\_turns sheet follows the same procedure as the PM, except the DHV factors are carried over from the PM turns sheet.



#### 7.2 Ramp and Mainline Forecasts

The ramp and mainline forecasts are also calculated using the adjuster spreadsheet, with the same DHV methodology as described for the intersections. The ramp and mainline forecast targets are combined with the intersection forecast targets in the balancing and smoothing process. The balanced volume is not reported in the adjuster spreadsheet. The total BSB span was forecasted by direction using the model assignments for all the bridge spans. The target volume for each span was calculated using proportions from the OKI travel demand model for AM, PM, and Daily.

The weave volume for NB I-75 between WHV and Hopple Street Interchange is computed using ODOT's weave analysis spreadsheets. The input and output data from this analysis are summarized in **Appendix C-9**. Streetlight O-D patterns were used for computing the weave distributions.

#### 7.3 Forecast Balancing and Smoothing

All the forecast targets developed with the adjuster spreadsheets are compiled in one database to complete a network wide balancing procedure. The target forecasts were balanced to have a closed system of traffic volumes where the network "ins" equal the network "outs". The traffic balancing used a combination of automated optimization routines and manual inspection. The balancing optimization routine is similar to ODOT's balancing principle of "split the difference" method, where the forecast targets are balanced to have values that are the best fit between all of the data points. The algorithm for the balancing optimization is built with the R scripting language and employs the principles of entropy maximization where the best solution is derived through random and iterative factoring of the forecast targets. Each factoring step optimizes the solution for a given forecast target location. The final solution is derived using a method of successive averages, where each location receives the same number of factoring iterations, which means an equal priority in the balancing process. The one exception to the equal weight rule is for the BSB, where the bridge balanced volume was forced to equal the target volume.

The result from the balancing process is then manually reviewed and adjusted to best conform with forecast targets, non-negative growth rates, desired K-factors, as well as to conform with high level trends observed from the travel demand modeling.

A comparison of the forecast target (as found in the adjuster spreadsheet) and the final balanced volumes are summarized in table form in **Appendix C-8**. The unsmoothed traffic forecasts can be viewed in diagram form in the adjuster spreadsheets found within the project files.



#### 7.4 Design Truck Factors

Design truck factors are developed for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). The truck factors are based on existing turn movement counts and short-term link counts. The traffic counts are correlated to compatible intersections, ramps, and mainline segments in the build alternatives. A unique truck factor is derived for all project road segments by using a similar process to balance the traffic forecasts, where a balanced truck volume is derived that best matches the truck percentage targets. The BSB truck percentages are based on a 2017 classification count collected by KYTC, which indicates the following truck percentages for the bridge:

NB I-71/75

o AM Peak: 10%

o PM Peak 12%

o Daily: 17%

SB I-71/75

AM Peak: 11%PM Peak: 9%Daily: 18%

The percentages across each bridge span are derived using the truck percentages at service ramps, intersections, and other mainline traffic counts. For instance, the BSB CD bridge span's truck percentages are influenced by observed truck volume on the ramps that will utilize the bridge in the build alternatives based on the OKI TDM. This leads to a lower truck percentage on the C-D bridge compared to the limited access I-71 and I-75 bridges.

#### 7.5 Certified Traffic Plates

Certified traffic plates are developed for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). The traffic plates are in **Appendix A**, and are organized in the following sub appendices:

- Appendix A-1: Daily No Build (2029 & 2049)
- Appendix A-2: AM DHV No Build (2029 & 2049)
- Appendix A-3: PM DHV No Build (2029 & 2049)
- Appendix A-4: Truck Factors No Build (AM TD/PM TD/T24)
- Appendix A-5: Daily Selected Alternative I (2029 & 2049)
- Appendix A-6: AM DHV Selected Alternative I (2029 & 2049)
- Appendix A-7: PM DHV Selected Alternative I (2029 & 2049)
- Appendix A-8: Truck Factors Selected Alternative I (AM TD/PM TD/T24)
- Appendix A-9: Daily Refined Alternative I (Concept I-W) (2029 & 2049)
- Appendix A-10: AM DHV Refined Alternative I (Concept I-W) (2029 & 2049)
- Appendix A-11: PM DHV Refined Alternative I (Concept I-W) (2029 & 2049)
- Appendix A-12: Truck Factors Refined Alternative I (Concept I-W) (AM TD/PM TD/T24)

#### 8. IMS FORECAST COMPARISON

The design year 2035 traffic forecast developed as part of the 2012 BSB IMS for No Build and Selected Alternative I are compared to the 2049 traffic forecast developed for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) as part of the BSB IMS addendum. A screenline comparison of the BSB and CWB Bridge is shown in **Table 5** (Daily), **Table 6** (AM DHV), **Table 7** (PM DHV). In summary, the 2049 No Build forecasts are similar to the 2035 No Build forecasts with some differences between the BSB and CWB distributions due to geometric changes at the NB I-75 entrance ramp from 4<sup>th</sup> Street in Covington. The 2049 Selected Alternative I forecasts are about 15% lower than the 2035 Selected Alternative I forecasts developed for the 2012 IMS. The forecasts are developed with base year traffic counts, base year model assignments, and future year model assignments. Therefore, the differences in the traffic forecasts indicate that the current OKI MOR is forecasting fewer new trips to the corridor with the implementation of the build design compared to the model results from the 2010 OKI MOR.



Table 5: Daily Traffic Forecast Comparison – Ohio River Screenline

Facility					Daily		
Route	Bridge	Direction	2035 No Build ('12 IMS)	2035 Alt I ('12 IMS)	2049 No Build	2049 Selected Alt I	2049 Refined Alt I (I-W)
		NB I-71		38,490		26,650	E7 EE0
		NB I-75	98,530	40,900	86,900	34,700	37,330
I-75/	Brent	NB I-71/75 CD		40,420		38,850	38,750
I-71	Spence	SB I-71		35,500	96,050	27,600	60,250
		SB I-75	98,530	38,600		34,100	
		SB I-71/75 CD		39,000		38,900	40,500
LIC 42	ClavaNada	NB	6,420	11,100	17,900	8,200	10,700
US-42	2 Clay Wade	SB	9,140	10,420	8,650	7,550	7,600
		NB	104,950	130,910	104,800	108,400	- 60,250 40,500 10,700 7,600 107,000 108,350
Scree	enline	SB	107,670	123,520	104,700	108,150	108,350
		Total	212,620	254,430	209,500	216,550	215,350

Table 6: AM Peak Hour Traffic Forecast Comparison – Ohio River Screenline

	Facility			ı	AM Peak Hour			
Route	Bridge	Direction	2035 No Build ('12 IMS)	2035 Alt I ('12 IMS)	2049 No Build	2049 Selected Alt I	2049 Refined Alt I (I-W)	
		NB I-71		3,690		2,390	г 130	
		NB I-75	8,650	2,450	8,000	2,950	5,120	
I-75/	Brent	NB I-71/75 CD		4,220		3,980	3,840	
I-71	71 Spence	SB I-71	6,520	2,310	6,460	1,840	4,230	
		SB I-75		3,920		2,570		
		SB I-71/75 CD		1,410		2,340	2,530	
110 42	Clay Wada	NB	800	1,140	2,320	1,160	1,300	
US-42	Clay Wade	SB	390	420	410	350	350	
		NB	9,450	11,500	10,320	10,480	10,260	
Scree	Screenline		6,910	8,060	6,870	7,100	7,110	
		Total	16,360	19,560	17,190	17,580	17,370	

Table 7: PM Peak Hour Traffic Forecast Comparison – Ohio River Screenline

	Facility				PM Peak Hour		
Route	Bridge	Direction	2035 No Build ('12 IMS)	2035 Alt I ('12 IMS)	2049 No Build	2049 Selected Alt I	2049 Refined Alt I (I-W)
		NB I-71		2,380		2,190	4.520
		NB I-75	6,690	4,000	6,630	2,580	4,530
I-75/	Brent	NB I-71/75 CD		2,290		2,970	2,910
I-71	Spence	SB I-71		3,170		2,300	2,910 
		SB I-75	8,870	2,730	8,450	2,340	
		SB I-71/75 CD		4,660		4,180	4,130
US-42	Clay Wada	NB	470	770	1,320	660	910
03-42	Clay Wade	SB	1,410	1,320	1,350	1,100	1,080
	Screenline		7,160	9,440	7,950	8,400	8,350
Scree			10,280	11,880	9,800	9,920	9,920
		Total	17,440	21,320	17,750	18,320	18,270

Additional daily comparison for mainline and ramp locations are in the **Table 8** (southbound I-71/75) and **Table 9** (northbound I-71/75) below.

Table 8: Traffic Forecast Comparison – SB I-71/75 Mainline and Ramps

	No Build Daily 2035	Alt I Daily 2035	No Build	Selected Alt I	Refined Alt I (I-W)
Facility Name	(2012 IMS)	(2012 IMS)	2049 Daily	Daily 2049	Daily 2049
SB North of Western Hills Viaduct	90600	92000	97050	94350	96500
SB Exit Ramp at Western Hills Viaduct	6270	6780	7850	13250	14250
SB Entrance Ramp at Western Hills Viaduct	5090	10000	6650	6700	7200
SB Mainline between Western Hills and Gest	89420	90210	95850	87800	89450
SB Diverge to Gest	5590	7310	6750	7300	6850
SB Entrance Ramp from Western Avenue	4730	3470	2900	2550	2350
SB Exit to 7th Street	6000	6170	9100	8000	15450
SB Exit to 5th Street/Central Avenue	5100	4820	4150	7300	_
SB Exit to 2nd	8440	8340	7450	5000	11400
SB Exit to 3rd Street/CW Bailey Bridge	_	920	_	500	1700
SB Entrance from 9th Street	4700	2500	6700	5500	6400
SB Entrance from 6th Street	7690	7600	7850	-	_
SB Entrance from 3rd Street	5180	5470	8550	10350	11550
SB Exit to 5th St	13390	12580	8800	7950	7850
SB Exit to Frontage	_	5680	_	6650	6400
SB Mainline after Merge of BSB	98530	94840	96050	86000	86500
SB Entrance from 12 St	5840	14660	8100	12100	12250
SB Mainline north of Kyle	96510	109500	96300	98100	98750
SB Exit to Kyle Ln	9820	10460	7900	8800	8550
SB entrance from Kyle Ln	6450	5970	5500	4950	5150
SB exit to Dixie Hwy	4980	10460	6400	5450	5450
SB Entrance from Dixie Hwy	5580	5890	4700	4900	5000
SB I-75 south of Dixie Hwy	93740	106090	92200	93700	94900

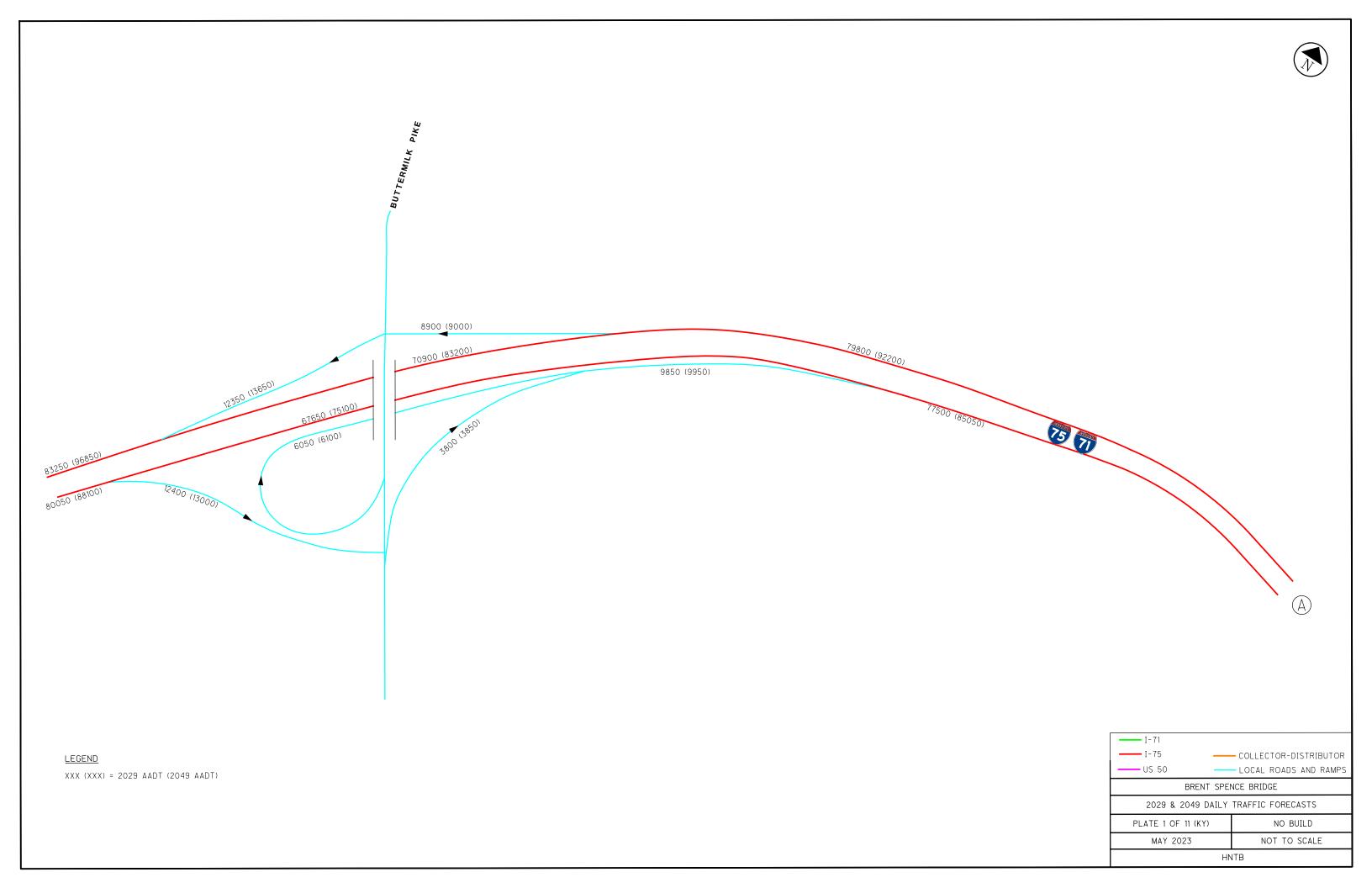


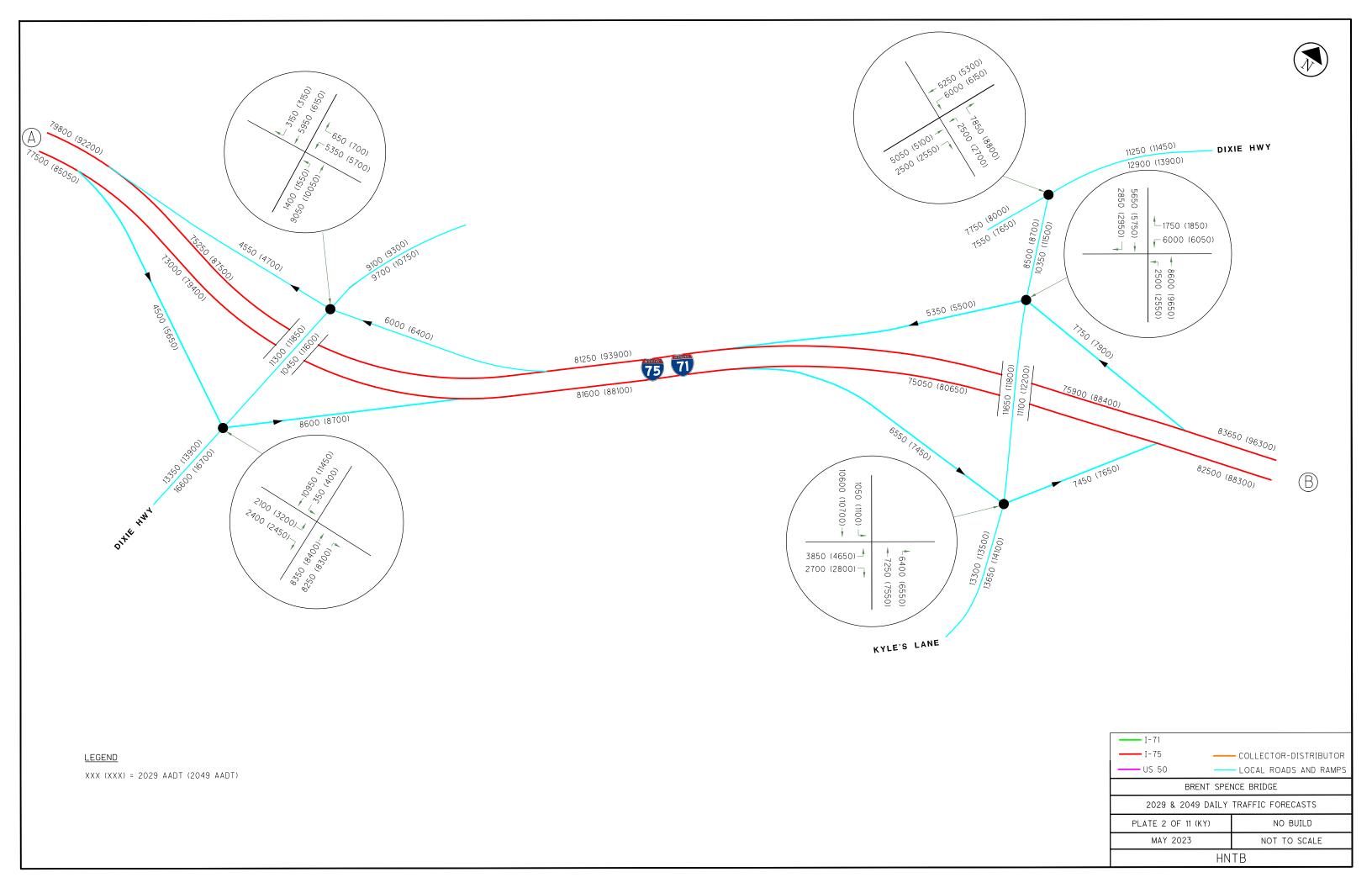
Table 9: Traffic Forecast Comparison – NB I-71/75 Mainline and Ramps

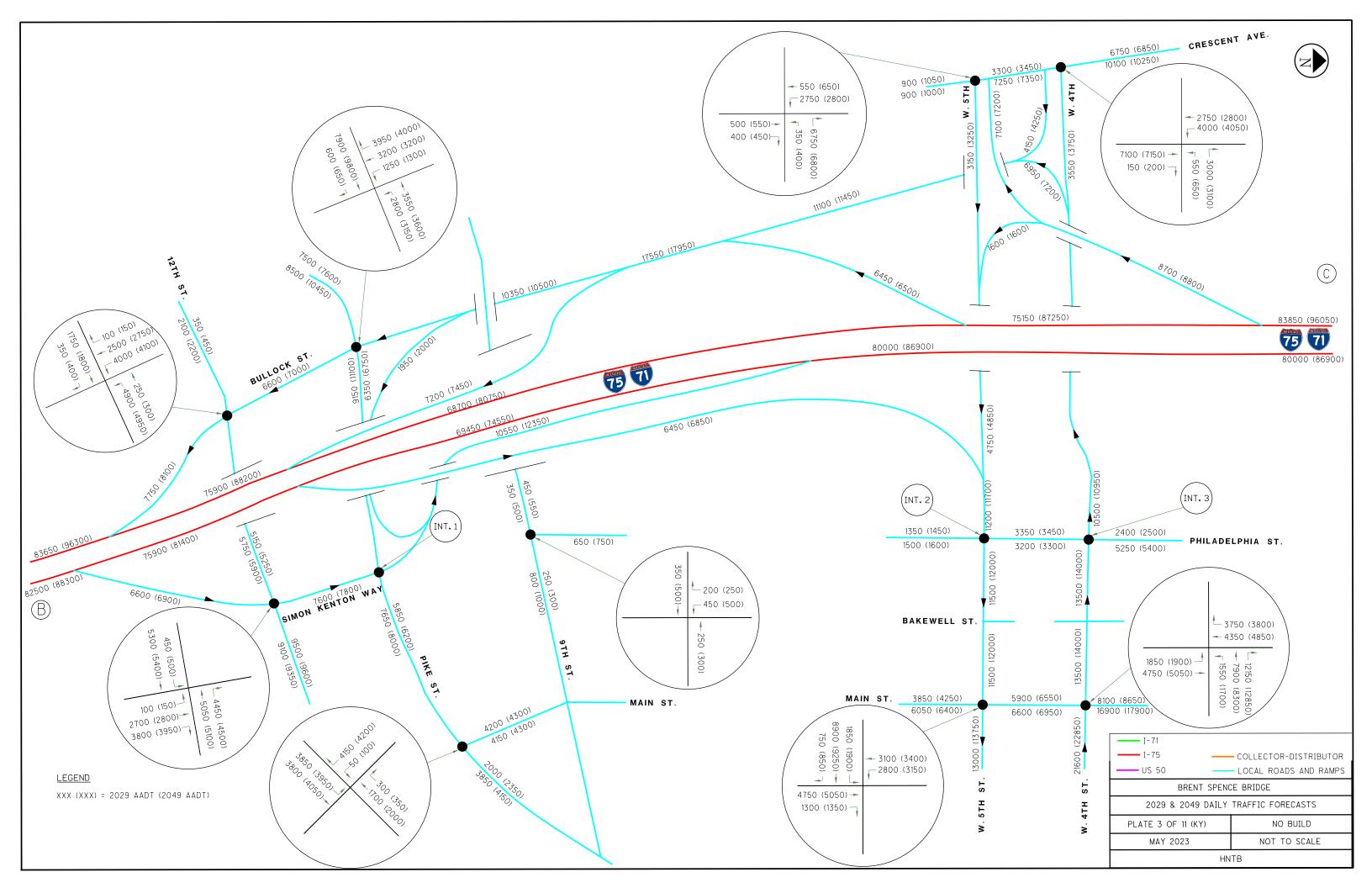
	No Build			Colocted	Refined
	Daily 2035	Daily 202E	No Build	Selected Alt I	Alt I (I-W)
Facility Namo	(2012 IMS)	Daily 2035 (2012 IMS)	2049 Daily		· · ·
Facility Name	(2012 11/13)		2049 Dally	Daily 2049	Daily 2049
Ramp from 3rd St/Bailey Bridge to I-75 NB	_	3900	_	700	3050
NB I-75 After Diverge from I-71	56480	40900	50500	34700	33200
NB I-71 Direct at Brent Spence (Center)	42050	38490	36400	26650	24350
NB I-71 after Diverge from NB I-75	7910	36140	6850	19550	6100
NB North of Western Hills Viaduct	90870	100140	99500	100450	98850
NB Entrance Ramp at Western Hills	12780	12000	17650	20350	16600
NB Exit ramp at Western Hills	4840	10570	8750	7150	11050
NB Mainline btwn Ezzard Charles and WHV	82930	91250	90600	87250	93300
NB Entrance from Gest	6630	9010	7750	12900	10200
NB Exit at Winchell/Ezzard Charles	4260	3660	2050	3850	3500
NB Entrance from 4th St {3 <sup>rd</sup> St Alt I-W}	11850	11230	13150	14900	6300
NB Exit to 6th Street	8350	9670	8650	9100	8550
NB Exit to 5th St/Central	5400	4140	4000	8000	5650
NB Exit to 2nd Street	6040	6040	5400	4700	5600
NB Entrance from 4th St (Kentucky)	14860	15220	_	12200	6600
NB Entrance from Pike St/9 <sup>th</sup> St to I-75/71	6400	8400	12350	7600	10750
NB Exit to 12th St	5170	16090	6900	12500	7050
NB I-75 North of Kyle Ln	90350	112280	88300	92900	92100
NB Entrance from Kyle	10470	11180	7650	8050	8300
NB Exit to Kyle	7430	6970	7400	5200	5100
NB Entrance from Dixie Hwy	6150	5910	8700	7600	7800
NB Exit to Dixie Hwy	4150	4390	5650	4600	4500
NB I-75 south of Dixie Hwy	85310	106550	85050	87050	85600

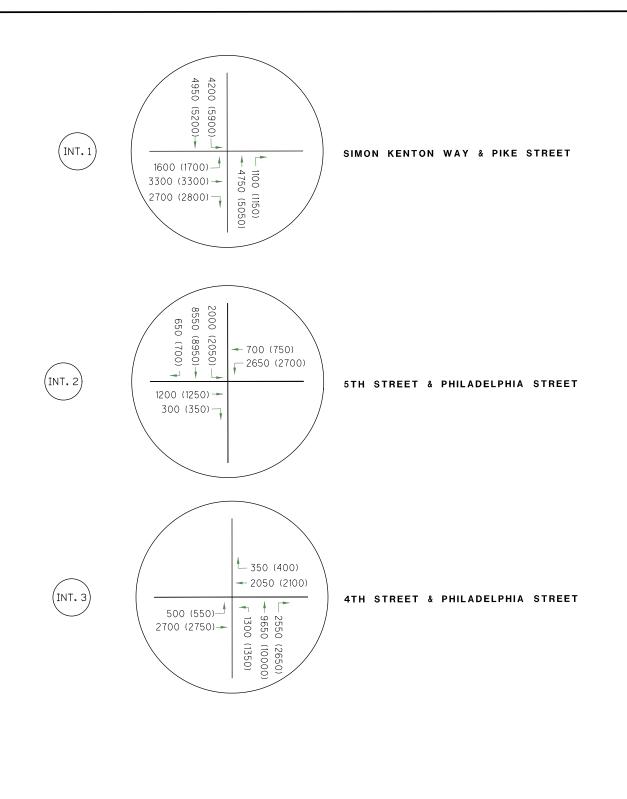


## **Appendix A: Certified Traffic Plates**









I-71
I-75 — COLLECTOR-DISTRIBUTOR
US 50 — LOCAL ROADS AND RAMPS

BRENT SPENCE BRIDGE

2029 & 2049 DAILY TRAFFIC FORECASTS

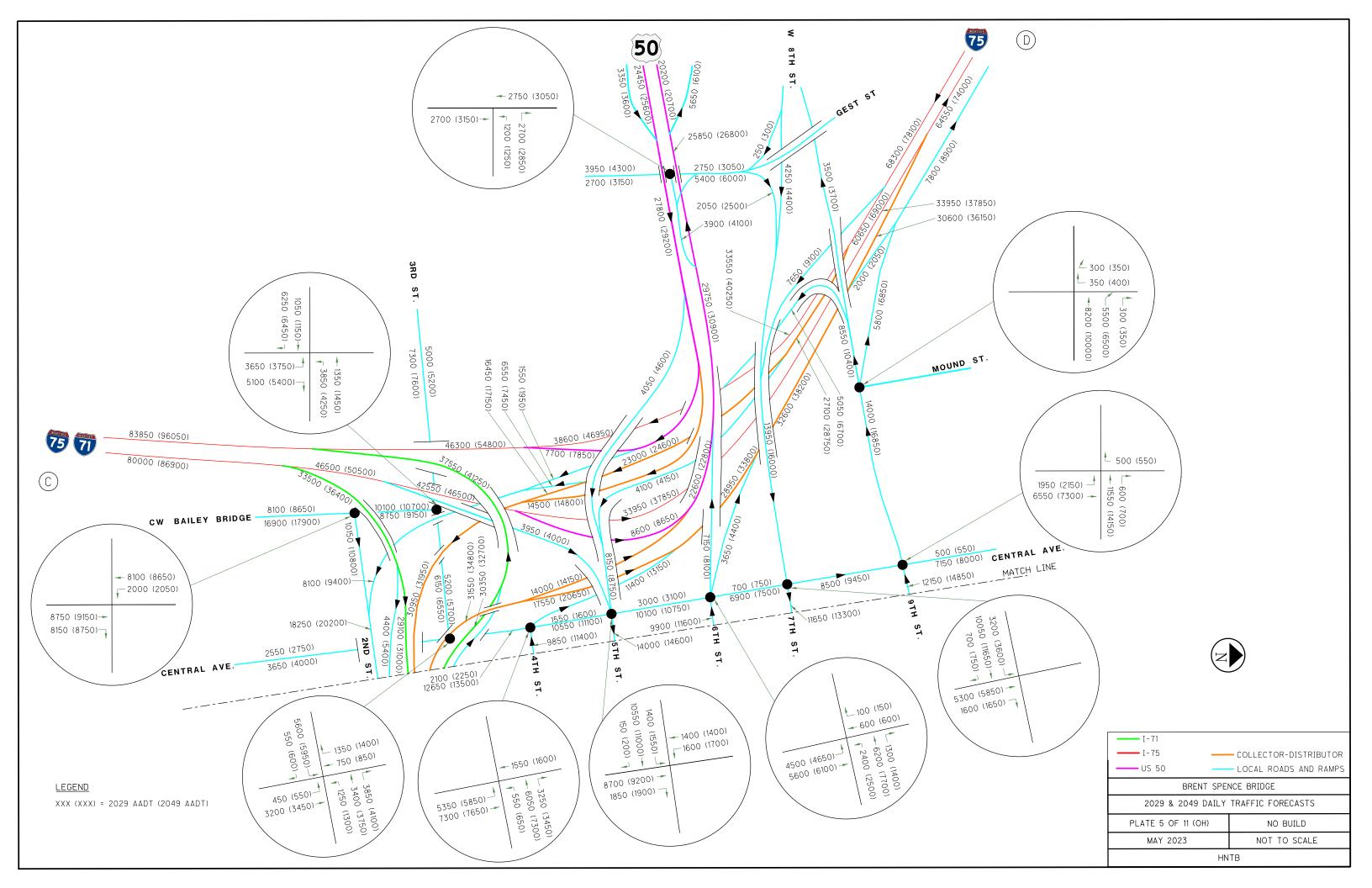
PLATE 4 OF 11 (KY) NO BUILD

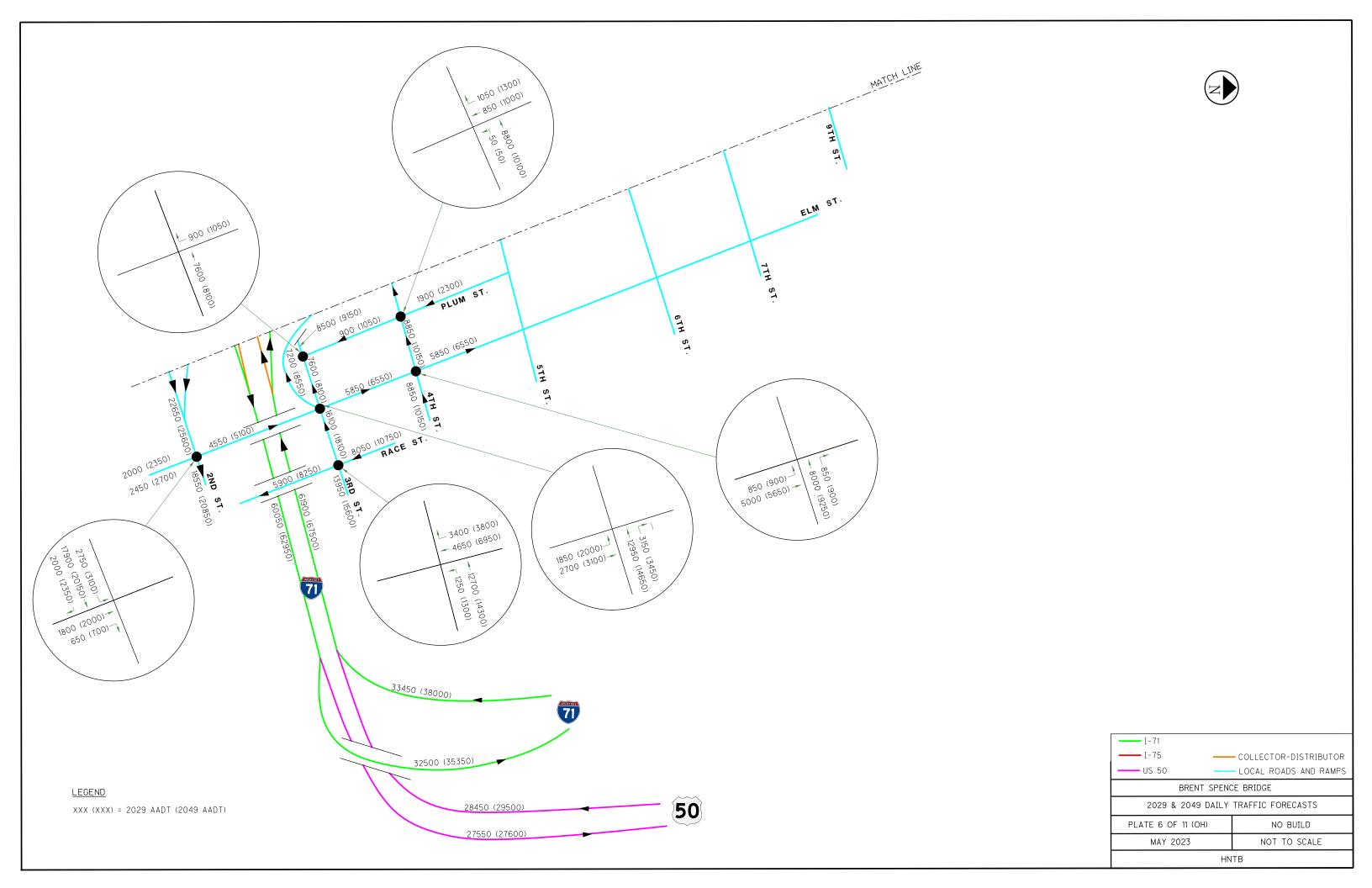
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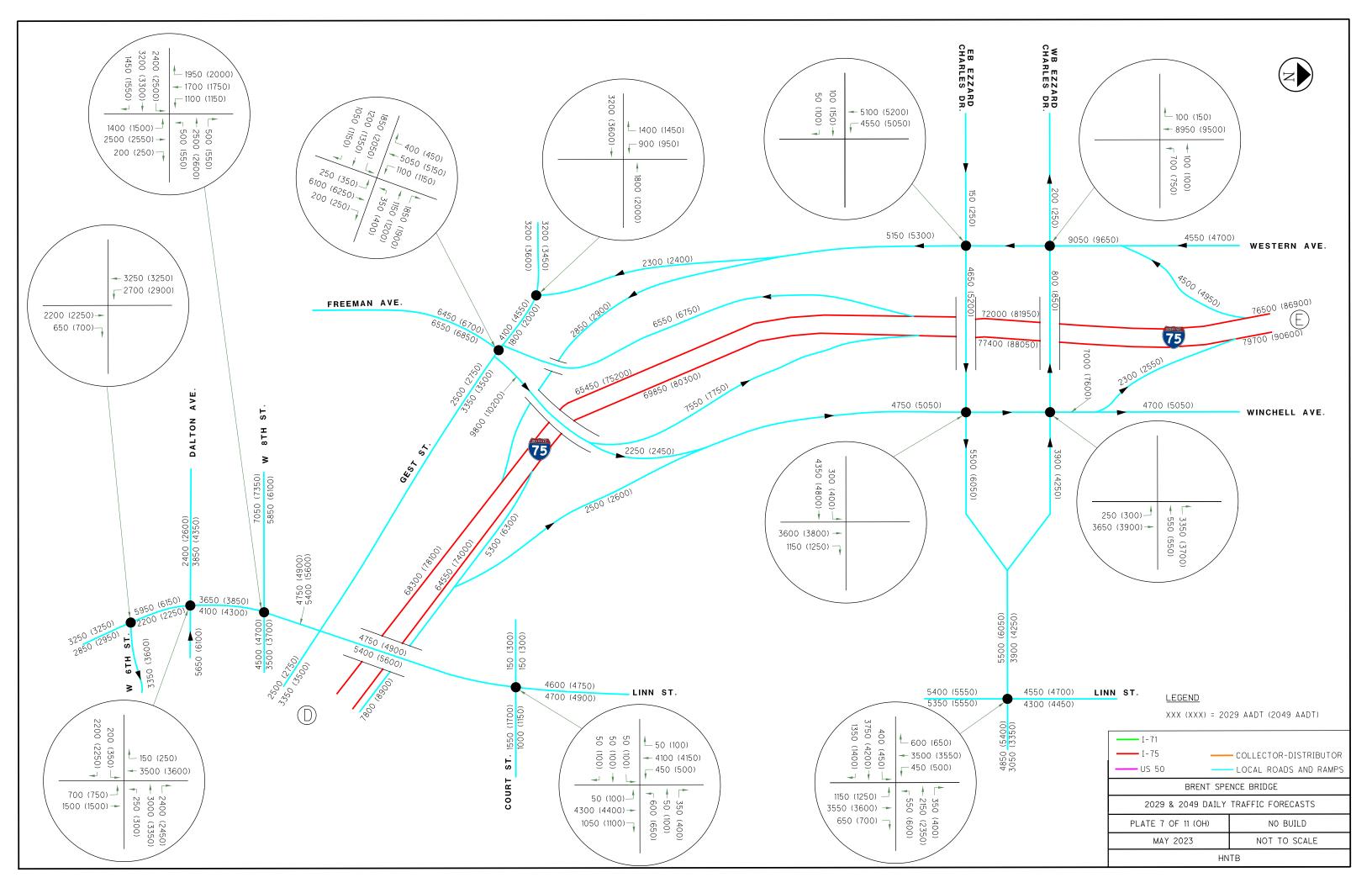
HNTB

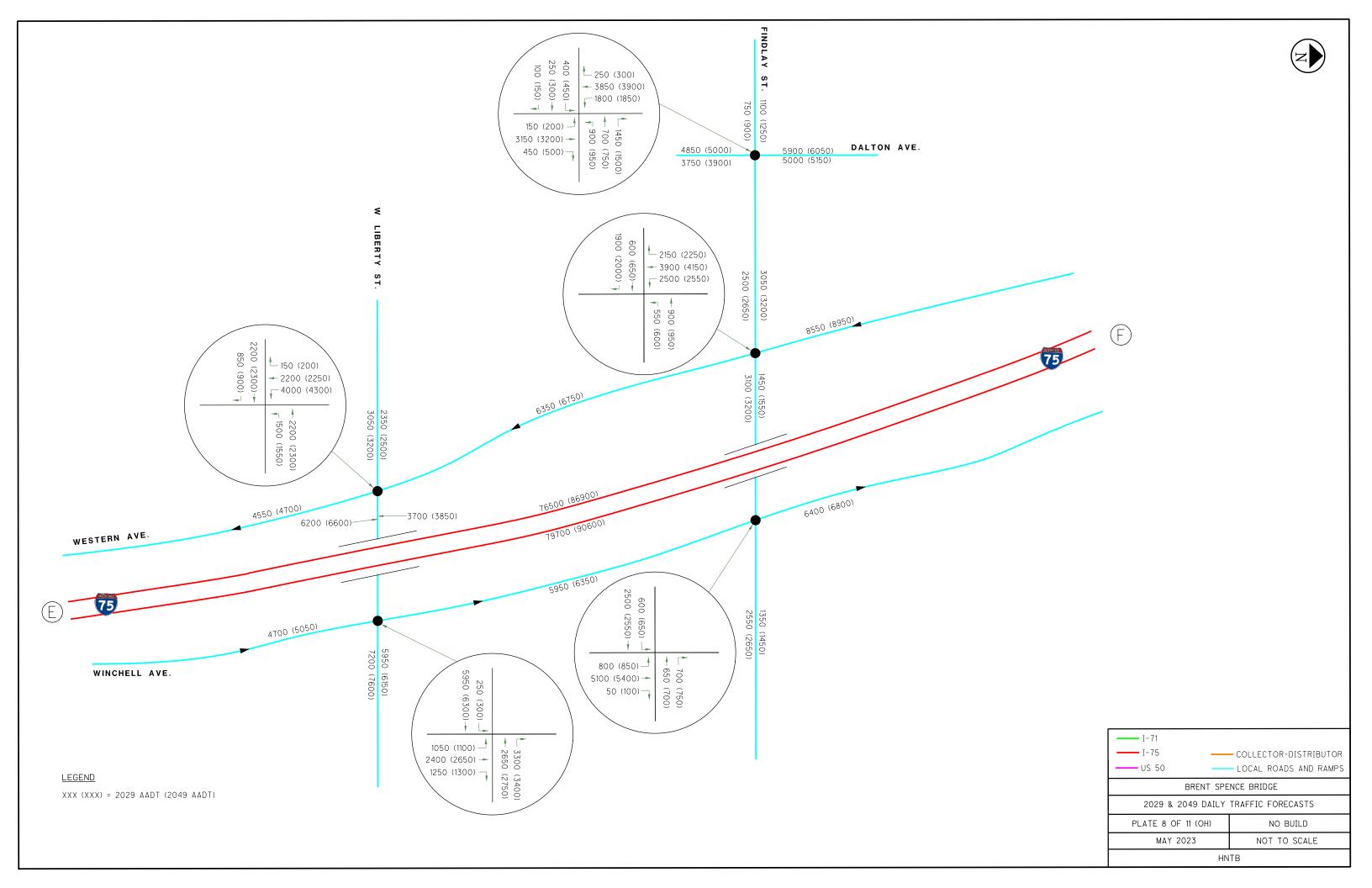
**LEGEND** 

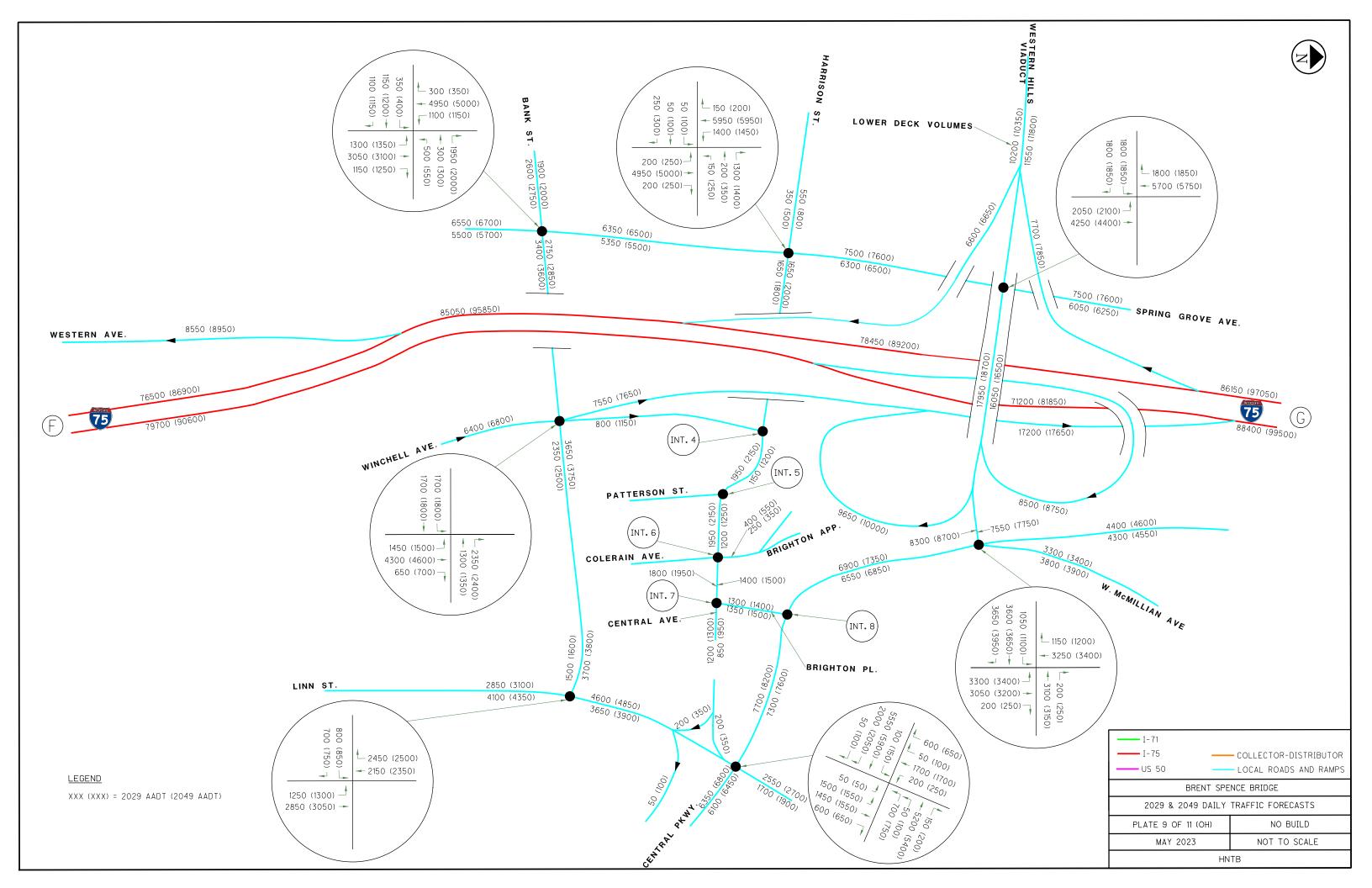
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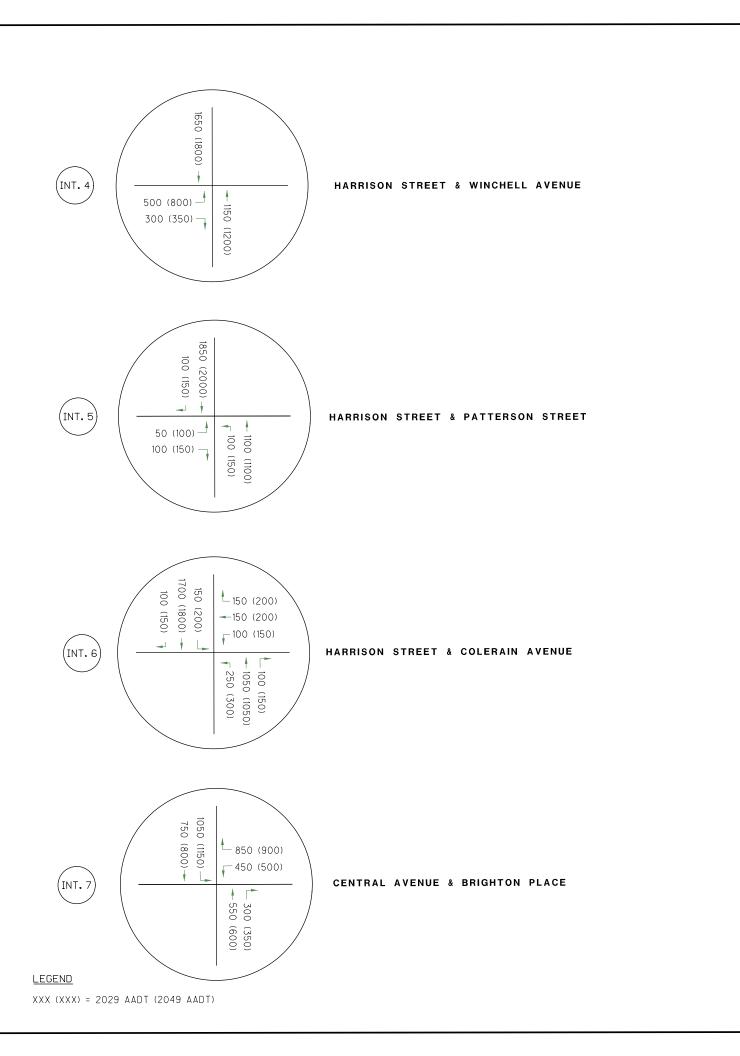


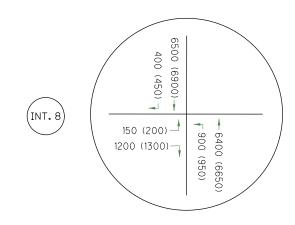




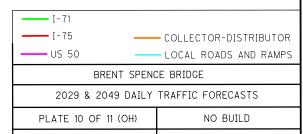






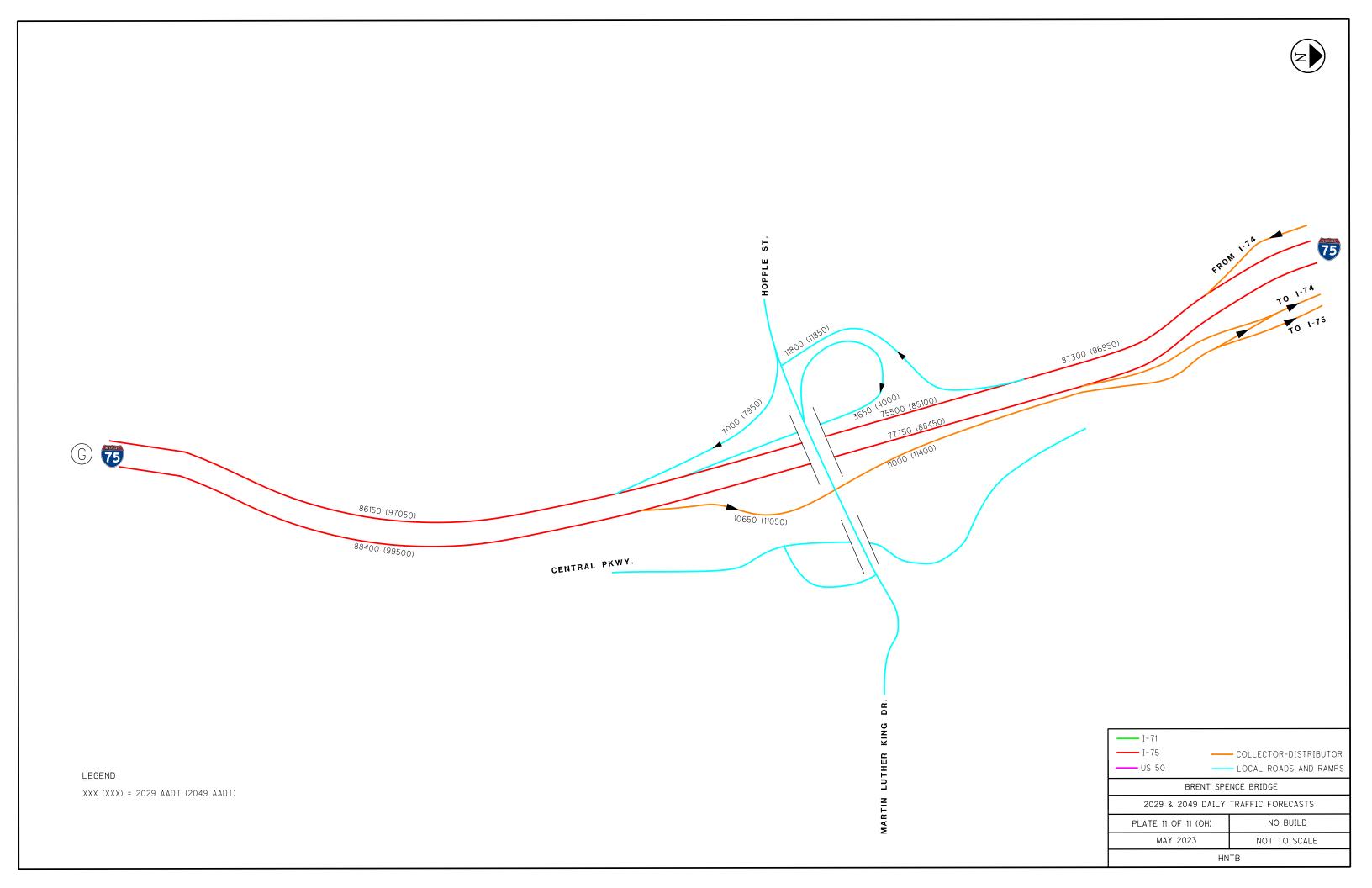


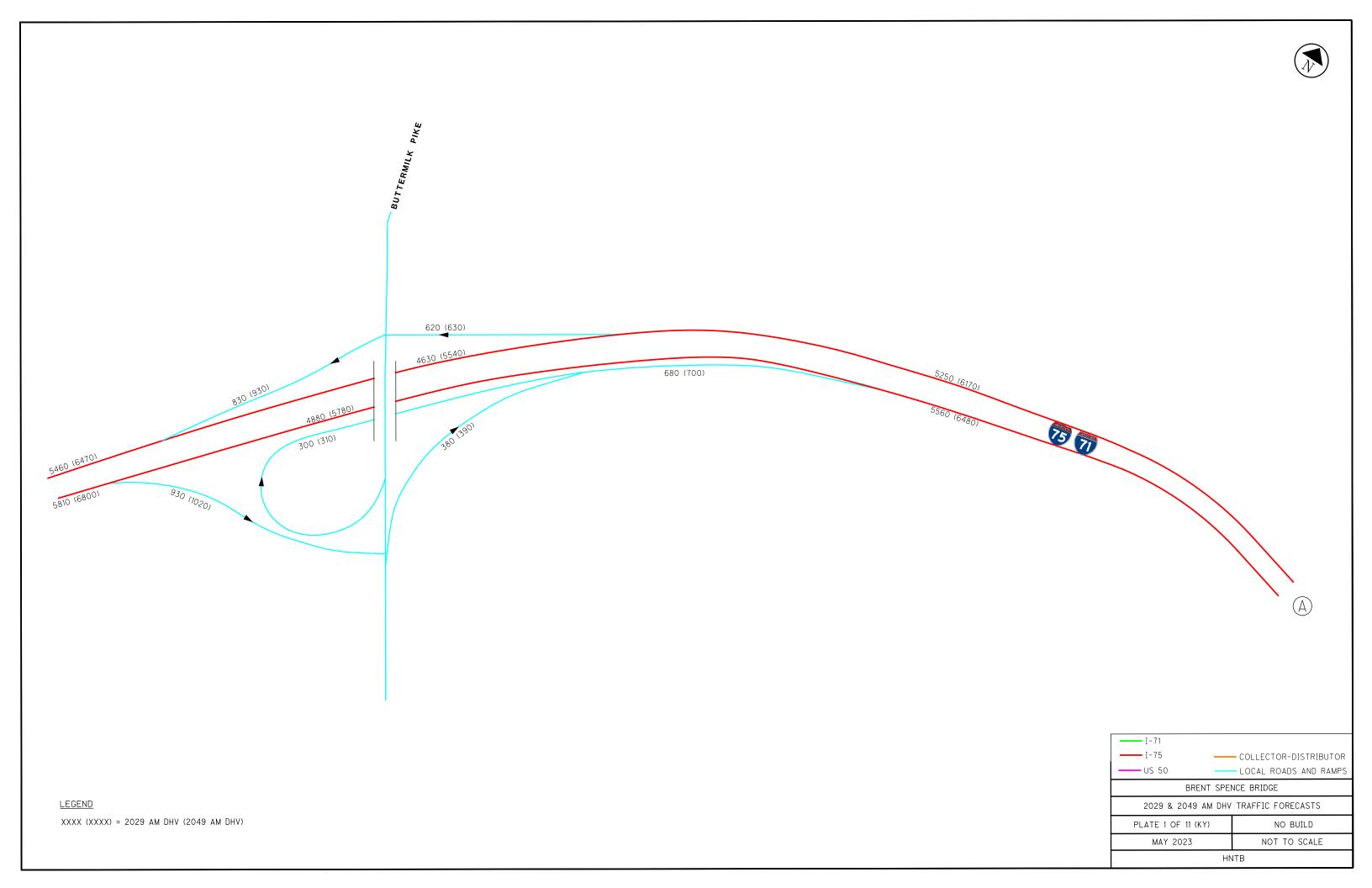
BRIGHTON PLACE & CENTRAL PARKWAY

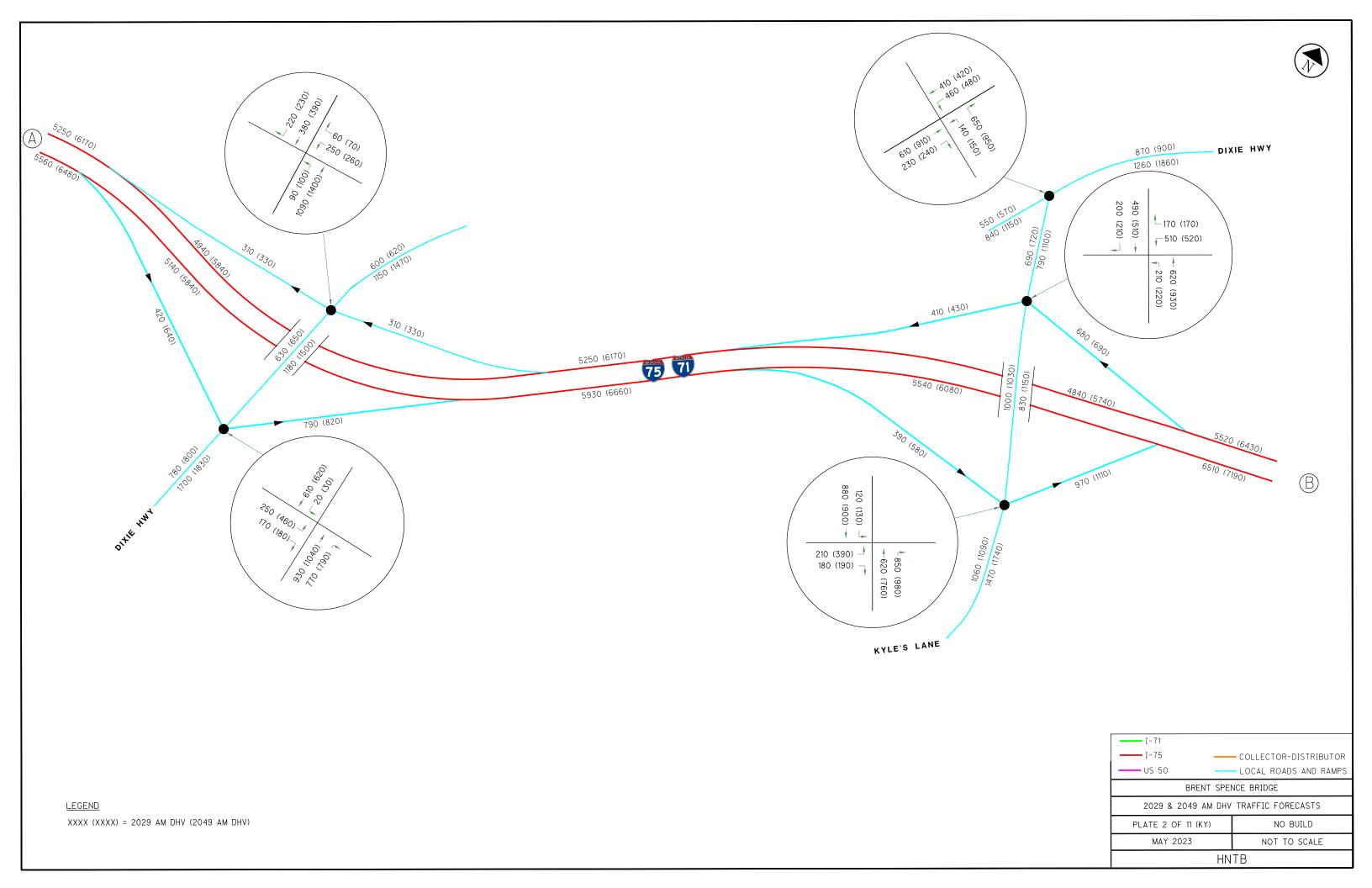


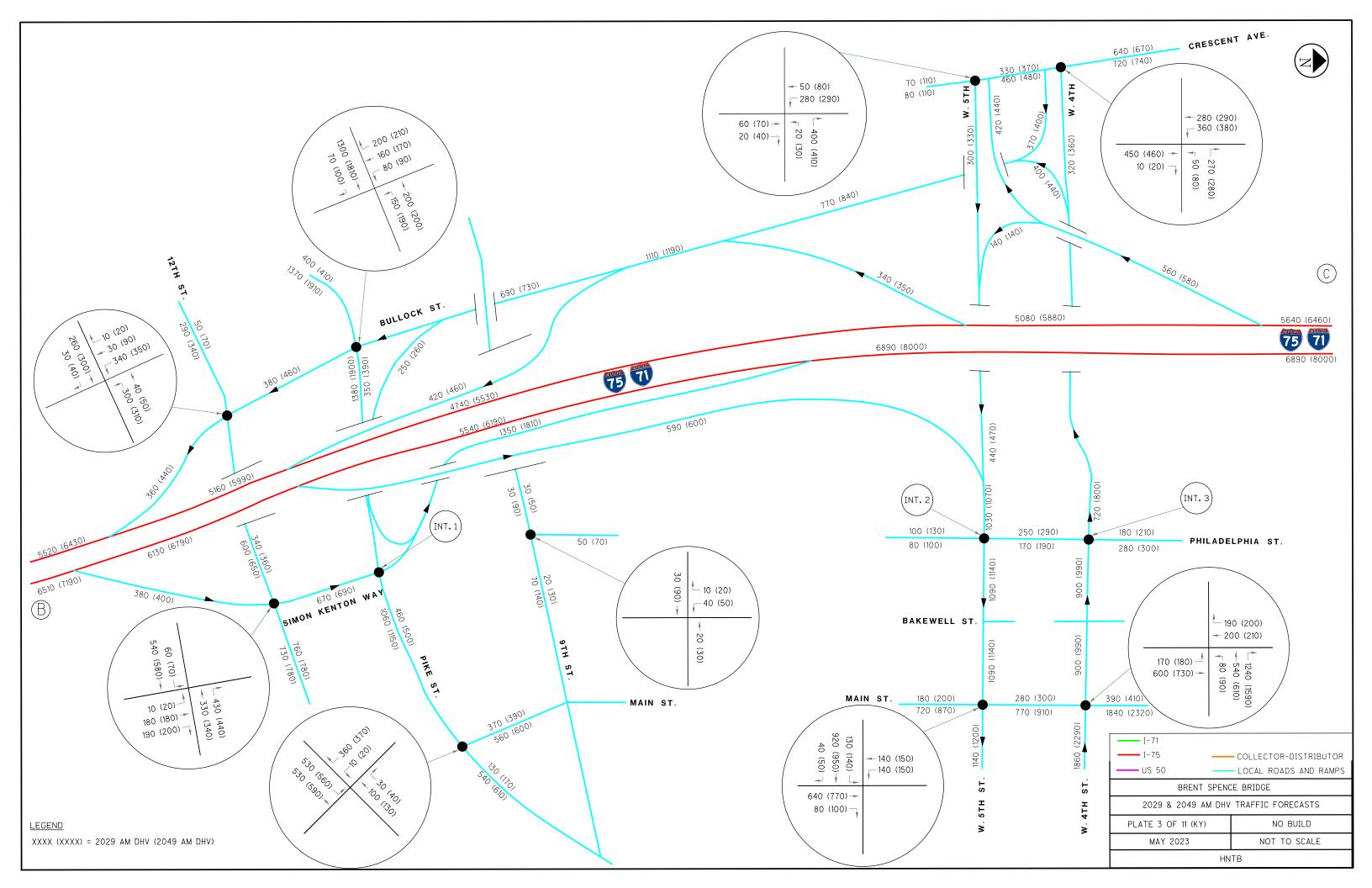
MAY 2023 NOT TO SCALE

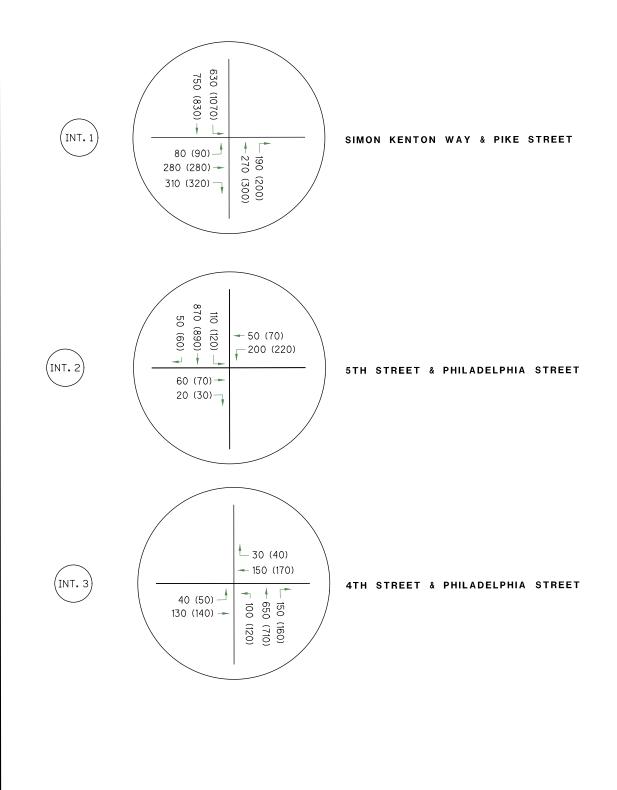
HNTB











I-71
US 50 COLLECTOR-DISTRIBUTOR
US 50 LOCAL ROADS AND RAMPS

BRENT SPENCE BRIDGE

2029 & 2049 AM DHY TRAFFIC FORECASTS

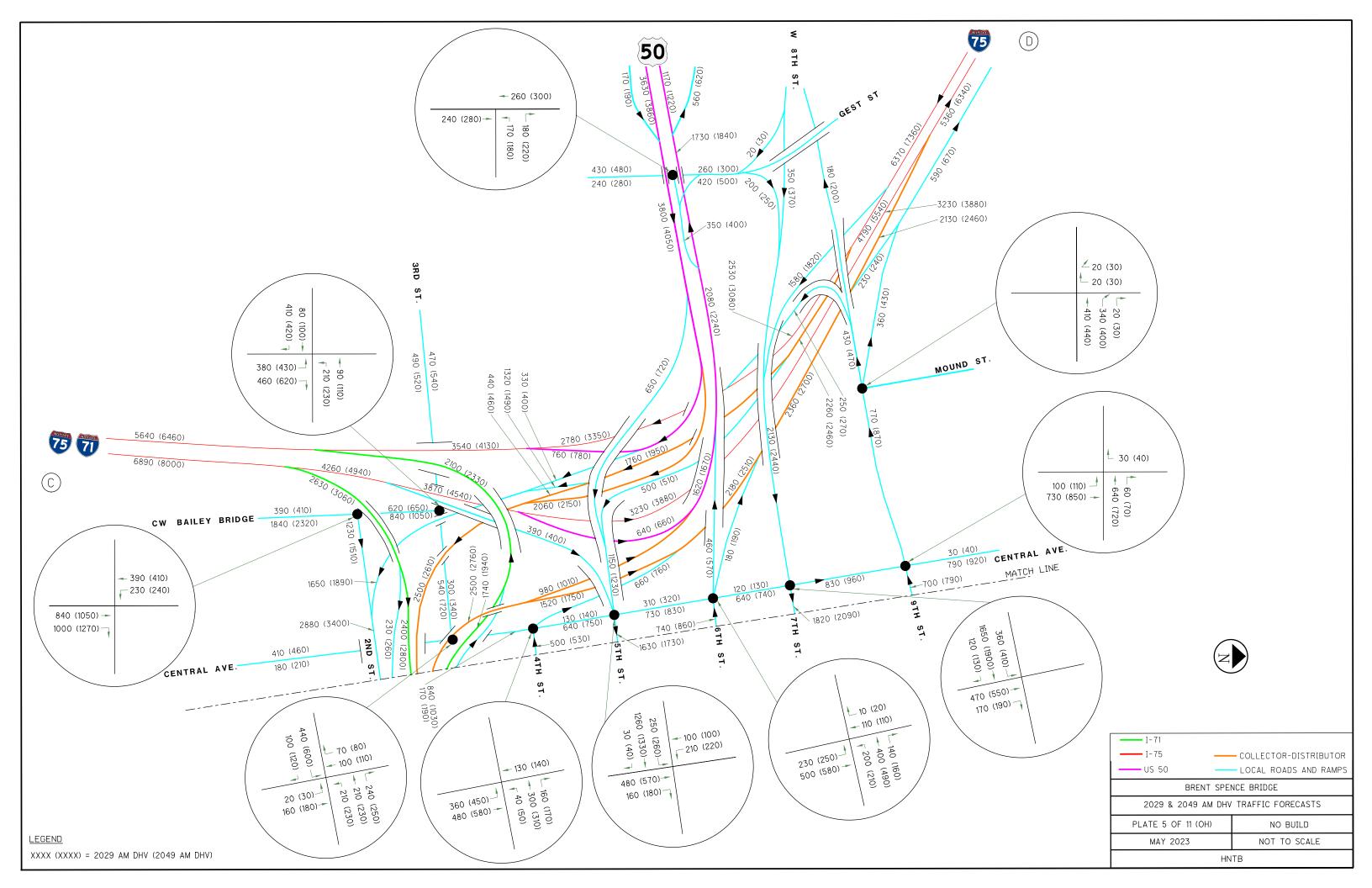
PLATE 4 OF 11 (KY) NO BUILD

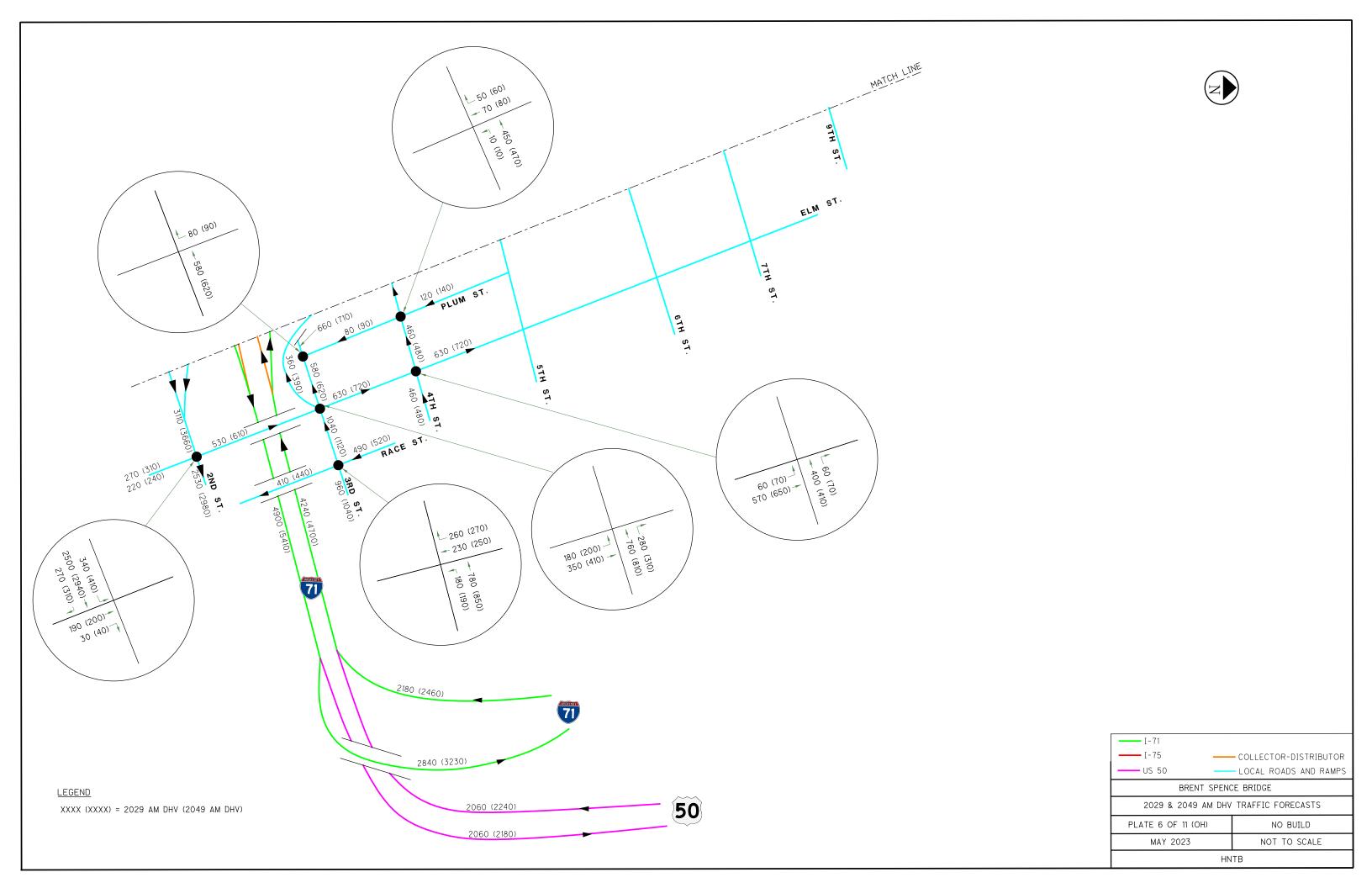
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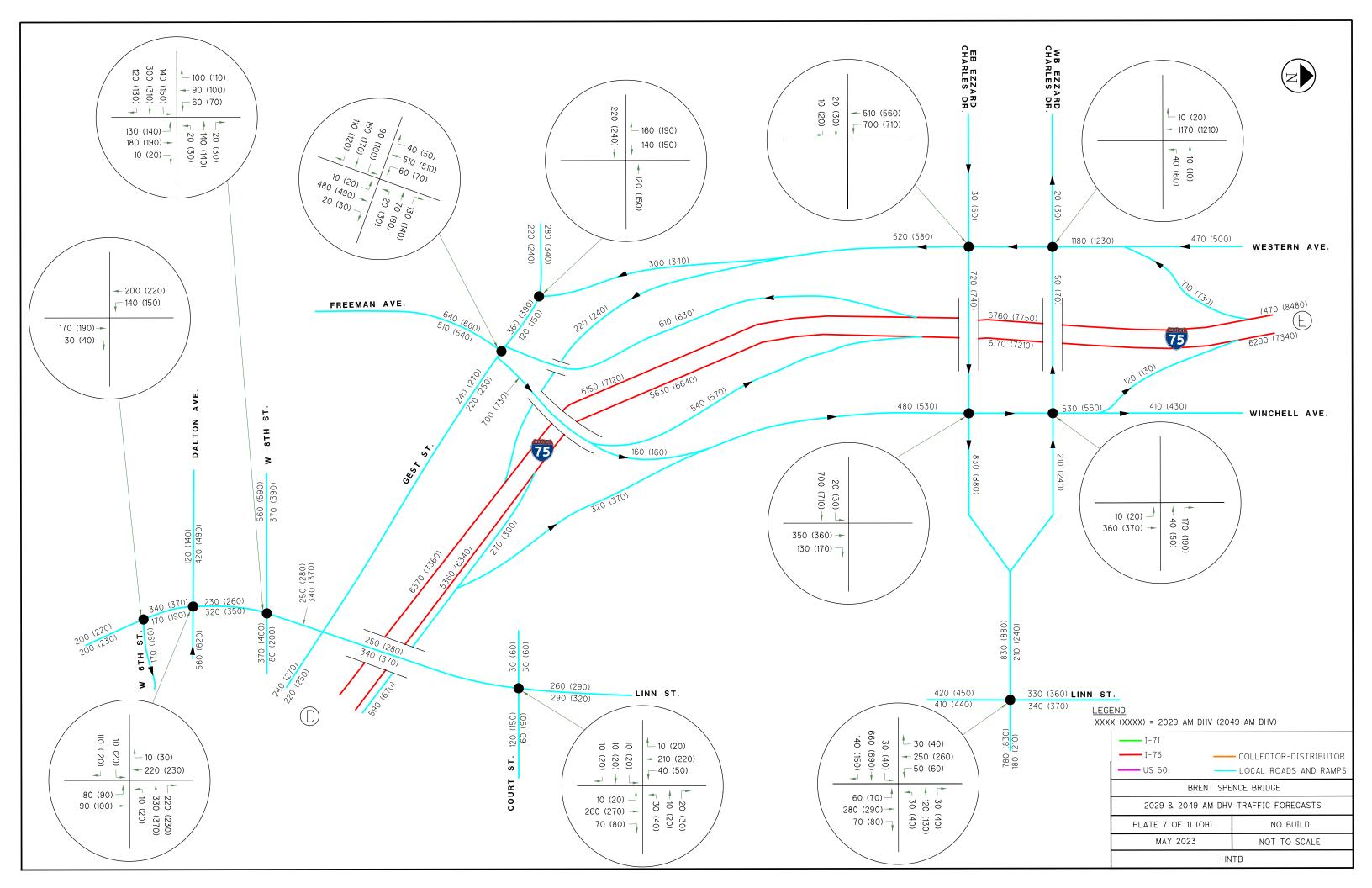
HNTB

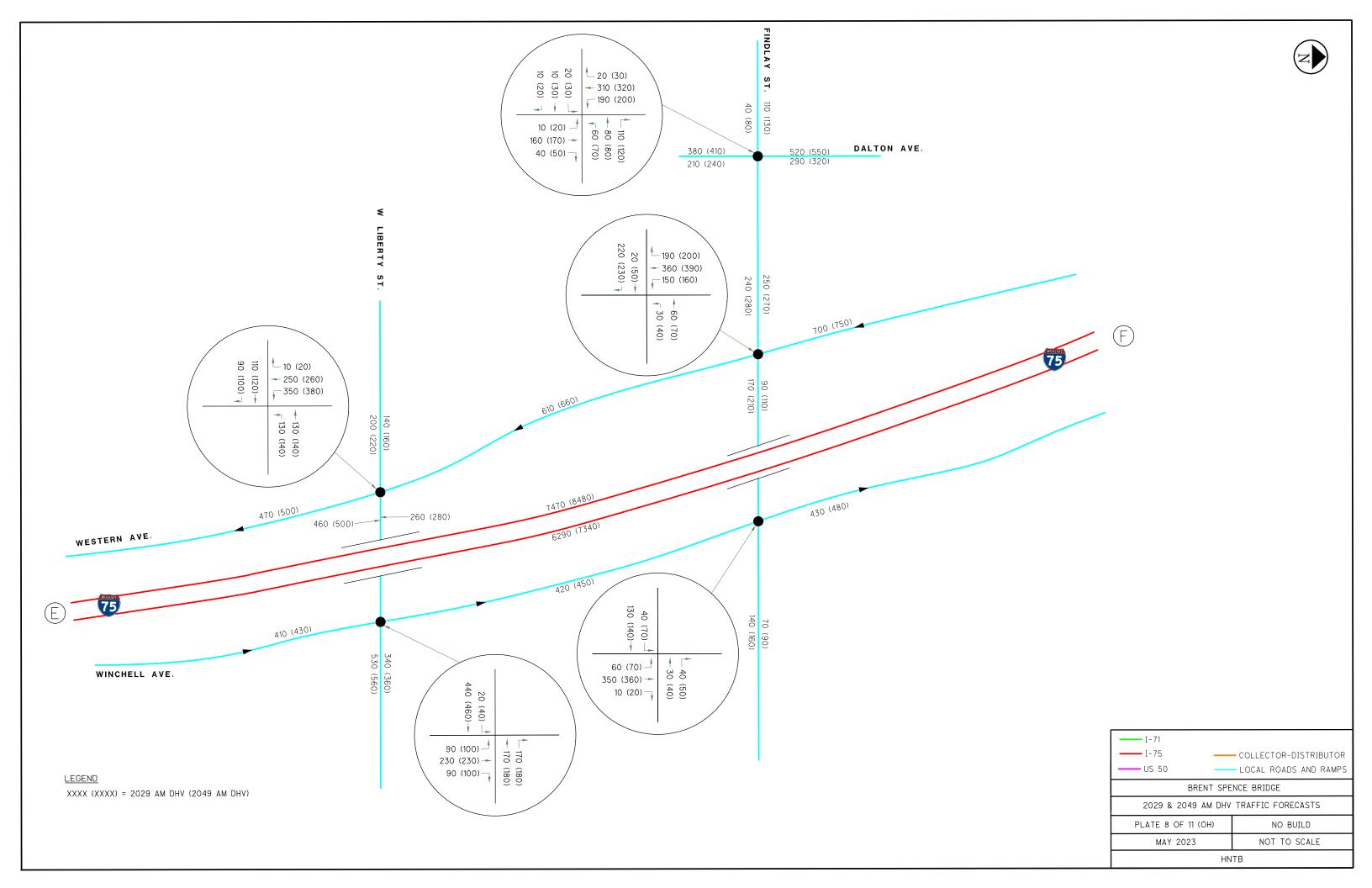
<u>LEGEND</u>

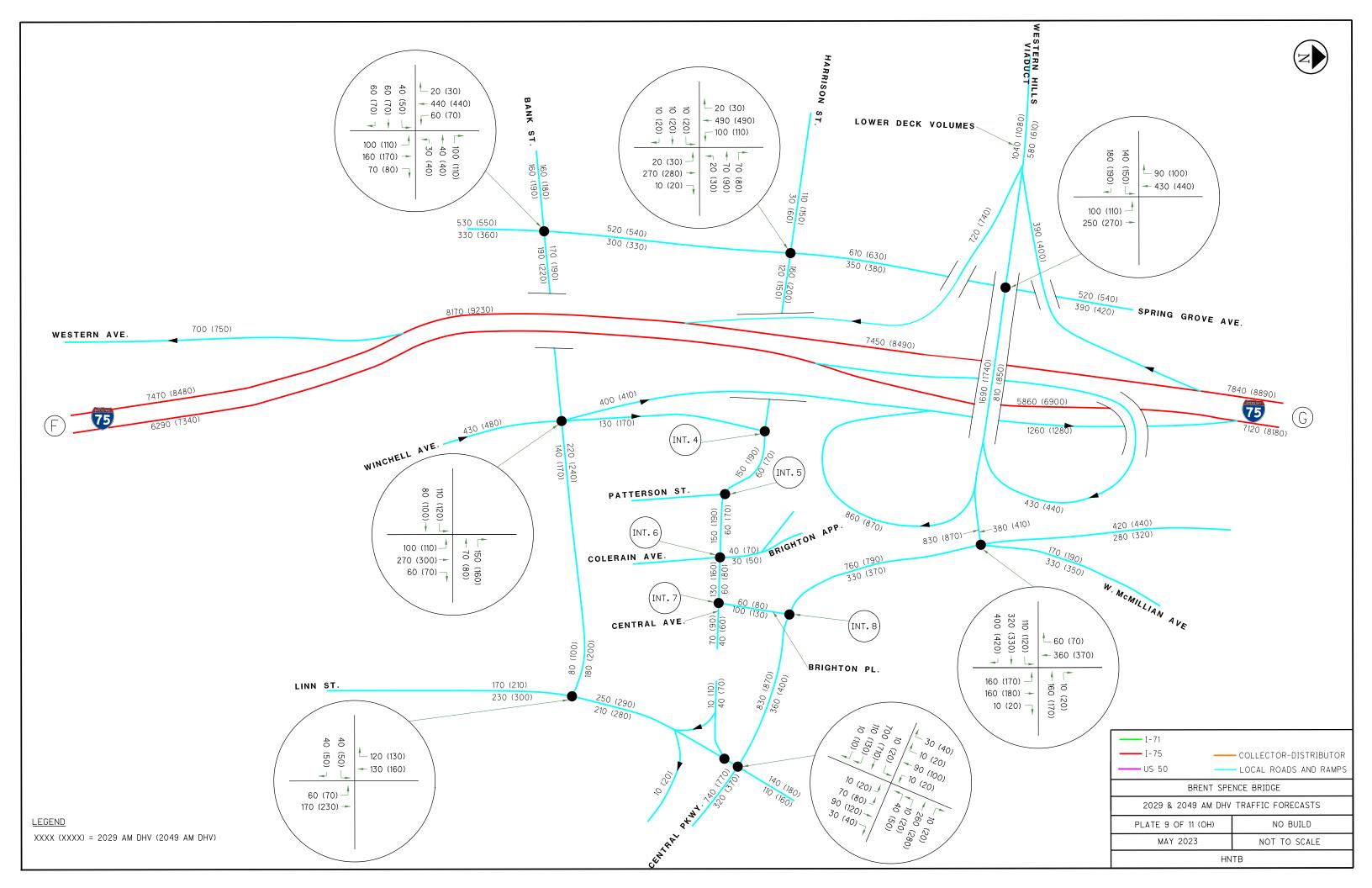
XXXX (XXXX) = 2029 AM DHV (2049 AM DHV)

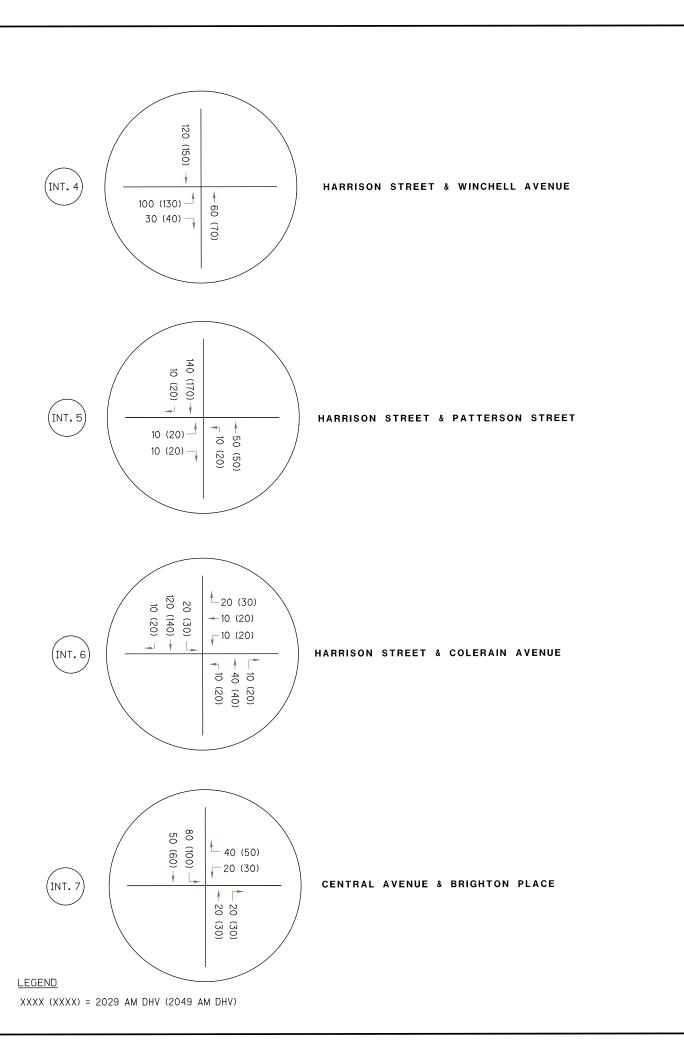


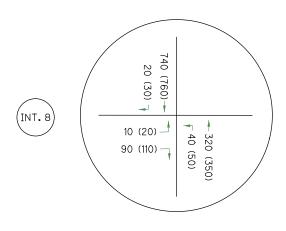












BRIGHTON PLACE & CENTRAL PARKWAY

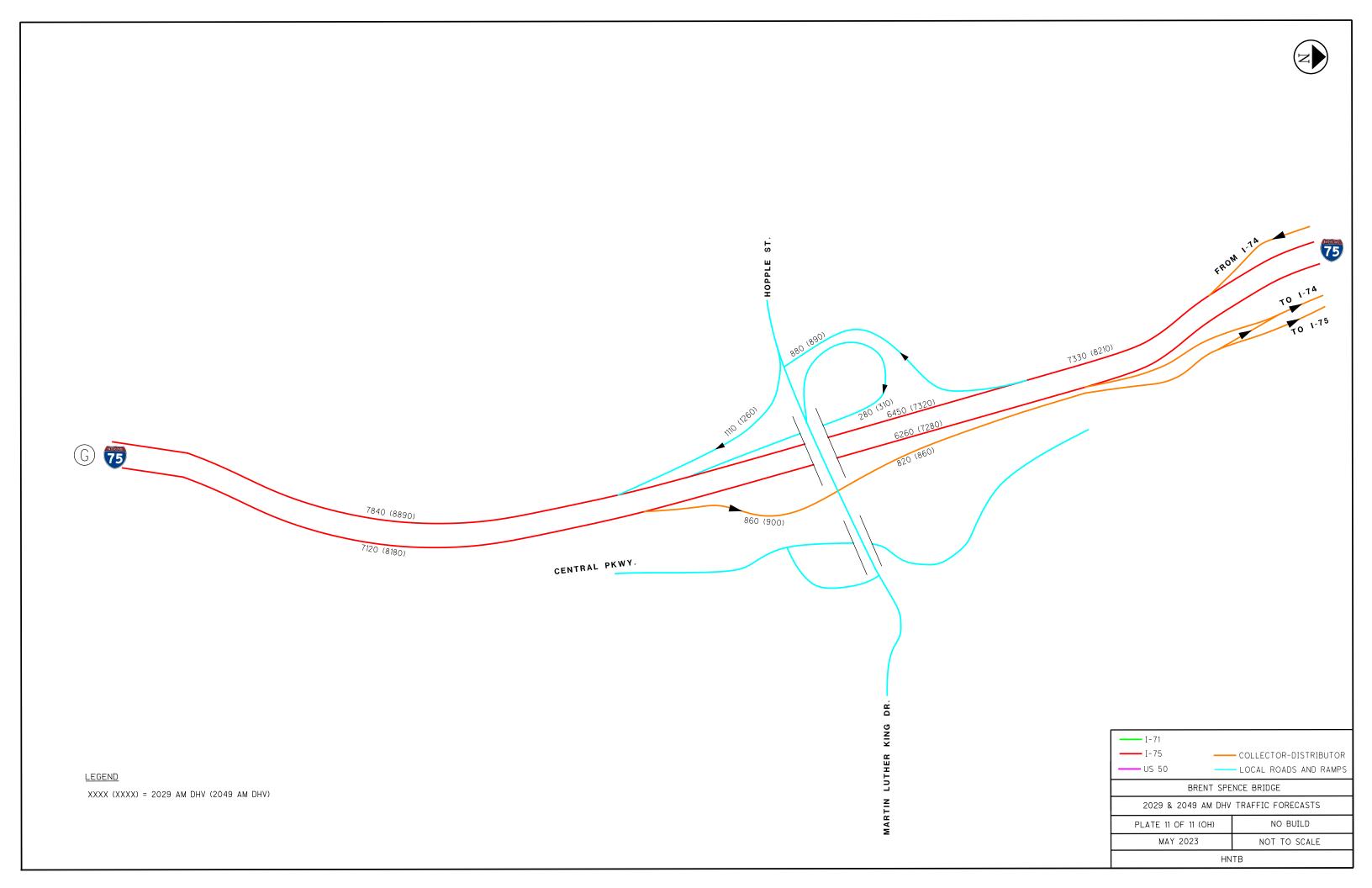


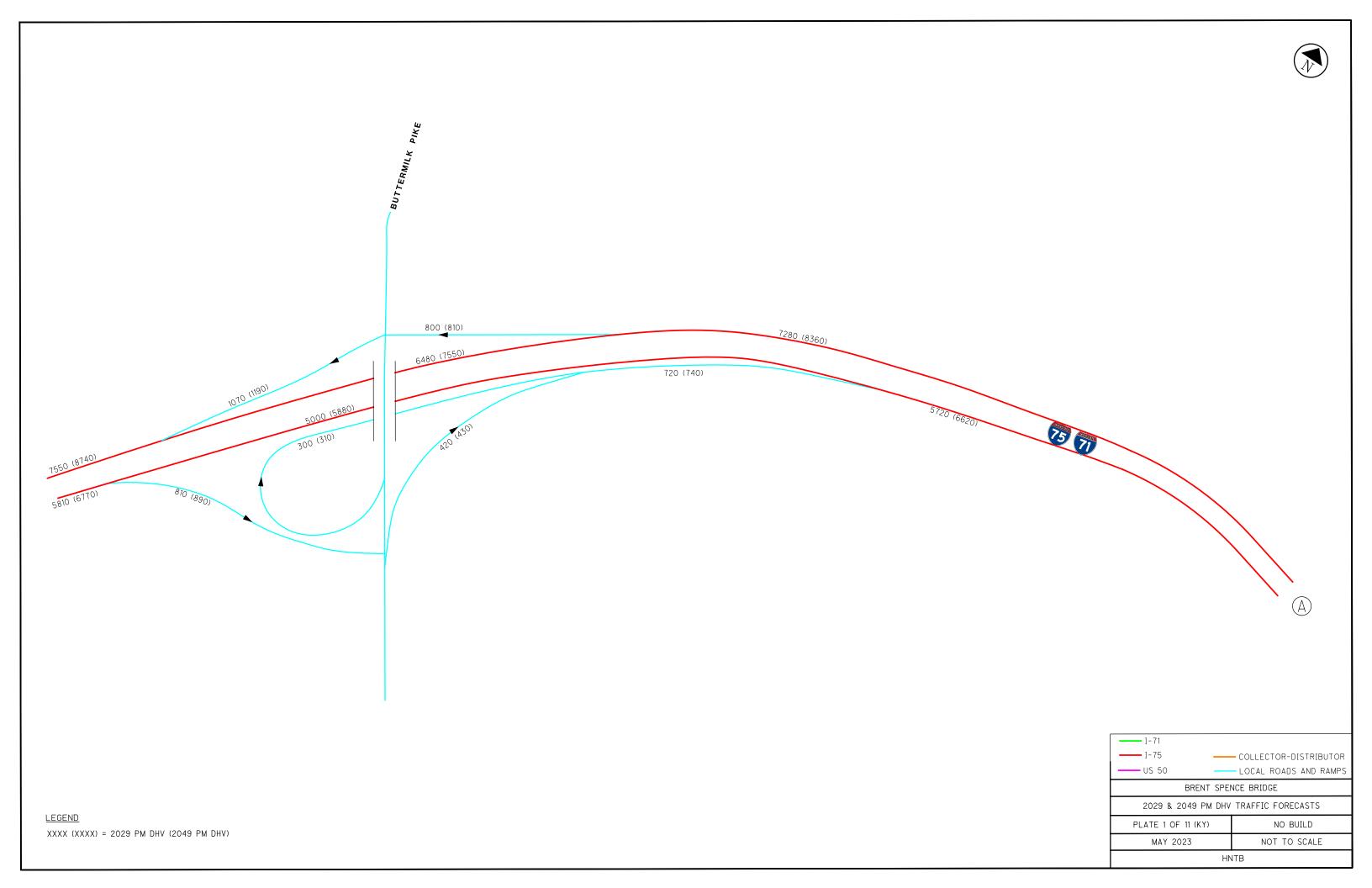
2029 & 2049 AM DHV TRAFFIC FORECASTS

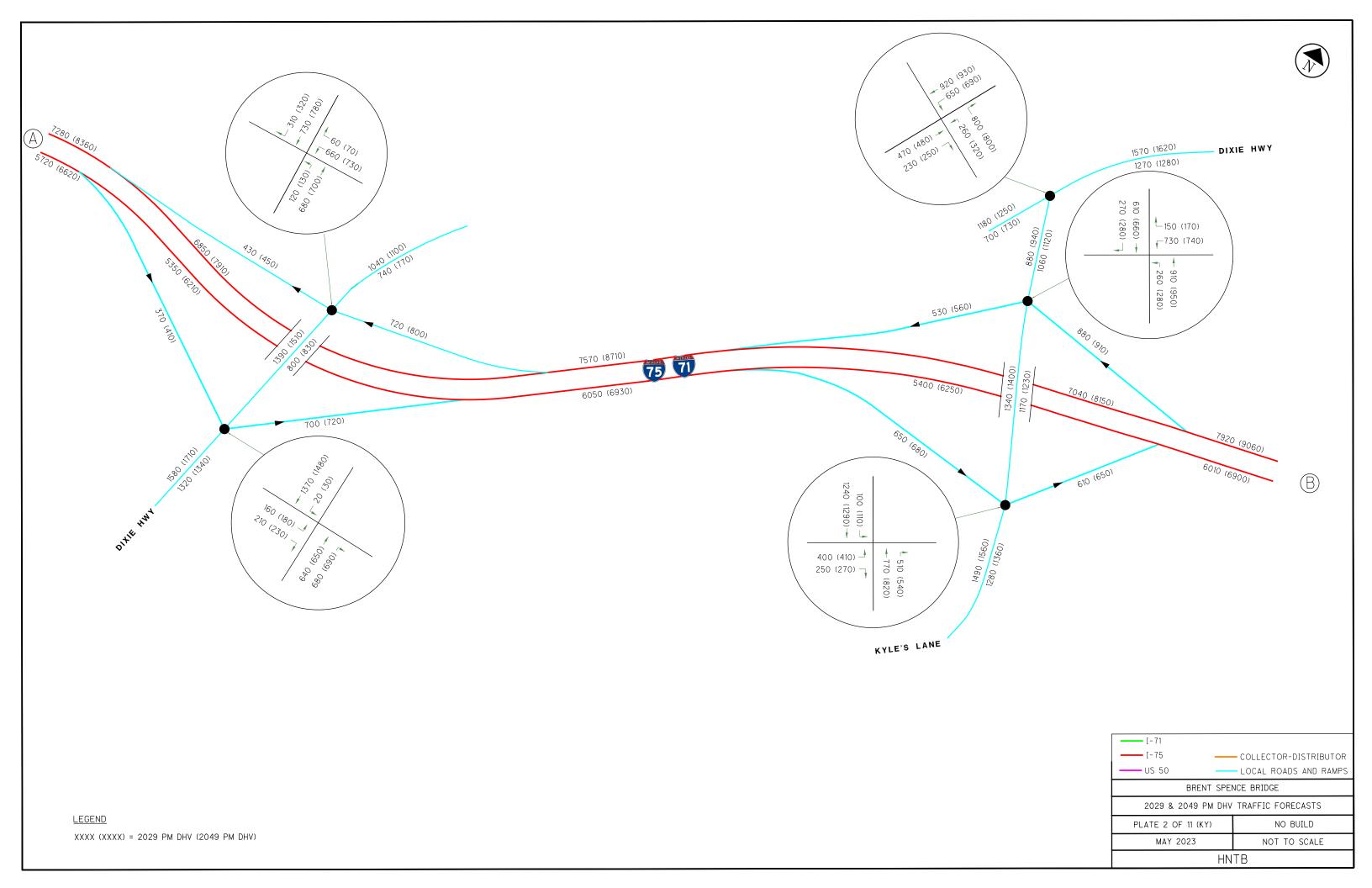
PLATE 10 OF 11 (OH) NO BUILD

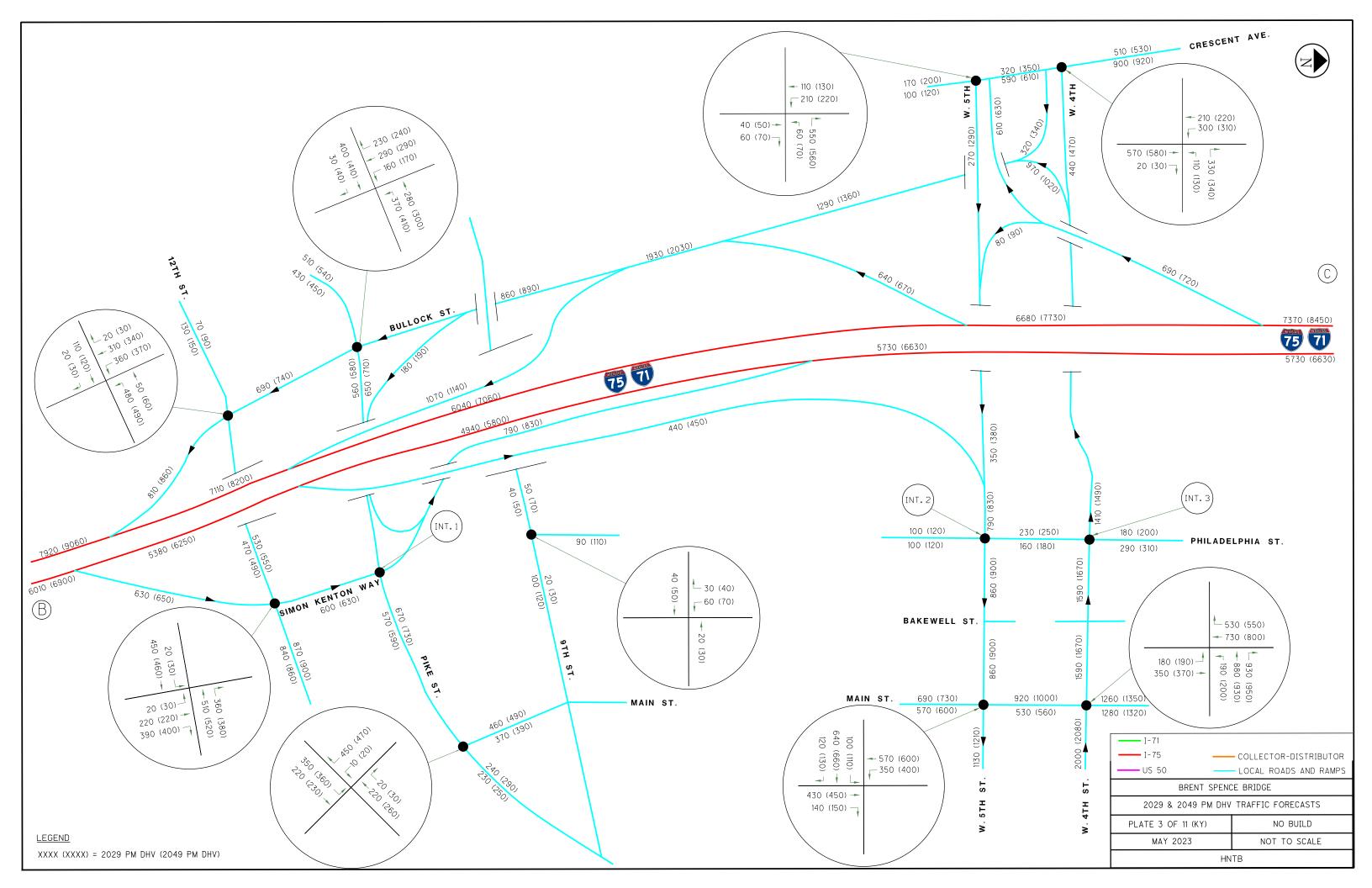
MAY 2023 NOT TO SCALE

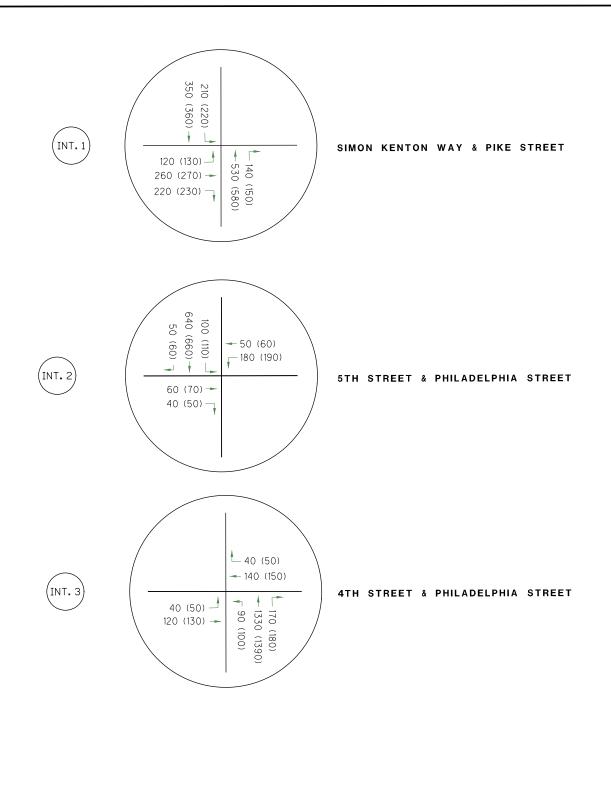
HNTB











I-71
I-75 — COLLECTOR-DISTRIBUTOR
US 50 — LOCAL ROADS AND RAMPS

BRENT SPENCE BRIDGE

2029 & 2049 PM DHV TRAFFIC FORECASTS

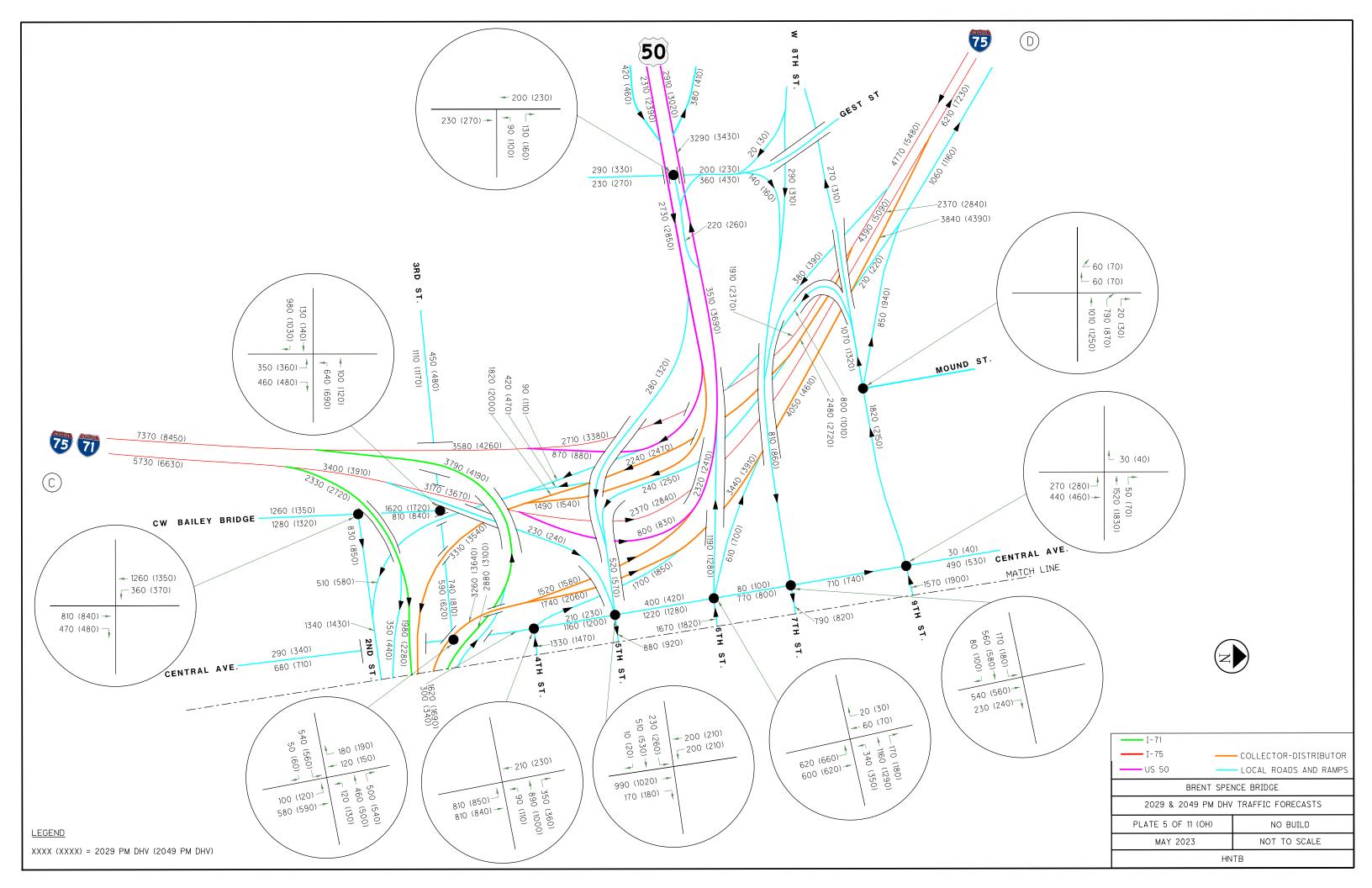
PLATE 4 OF 11 (KY) NO BUILD

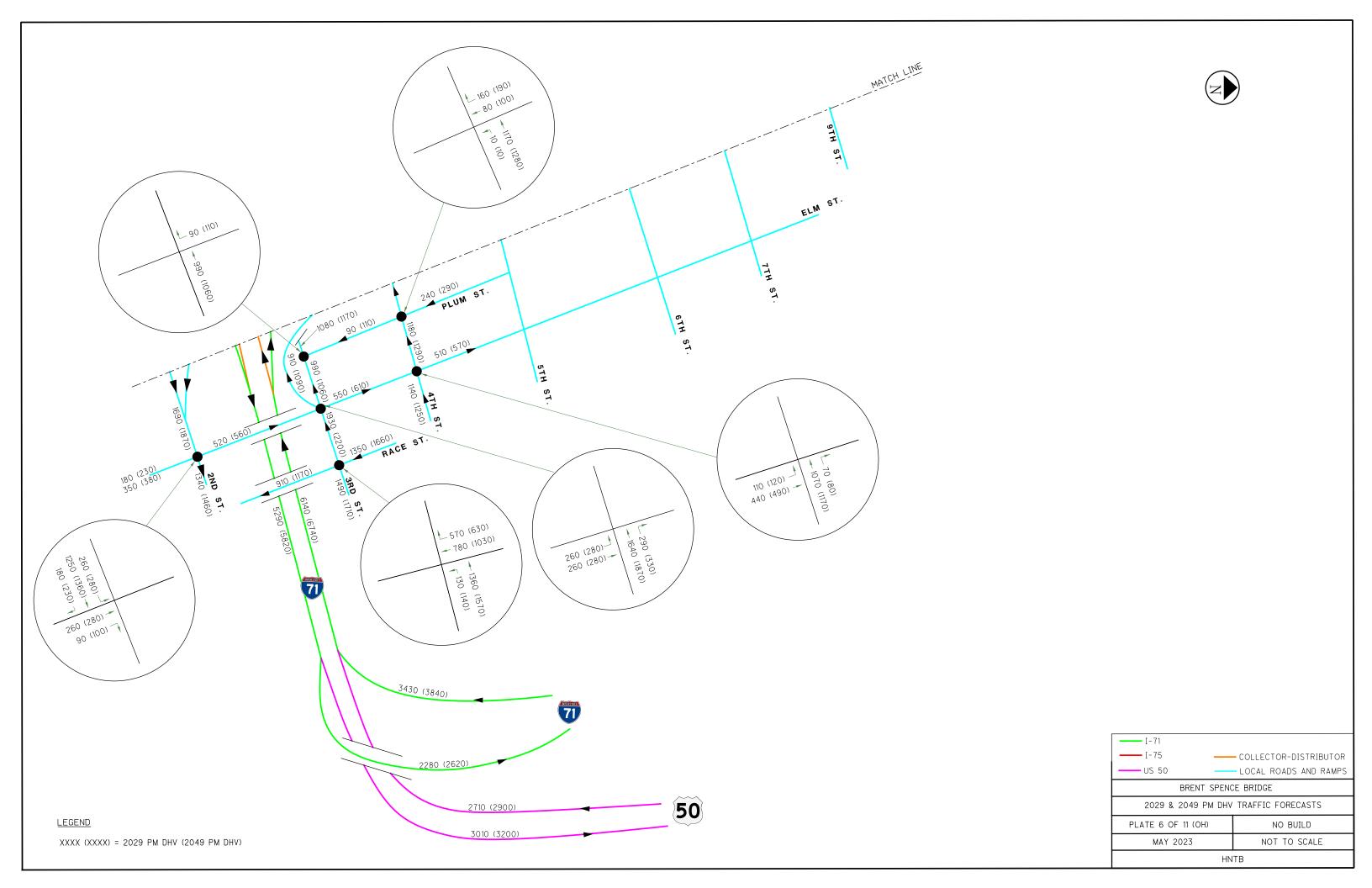
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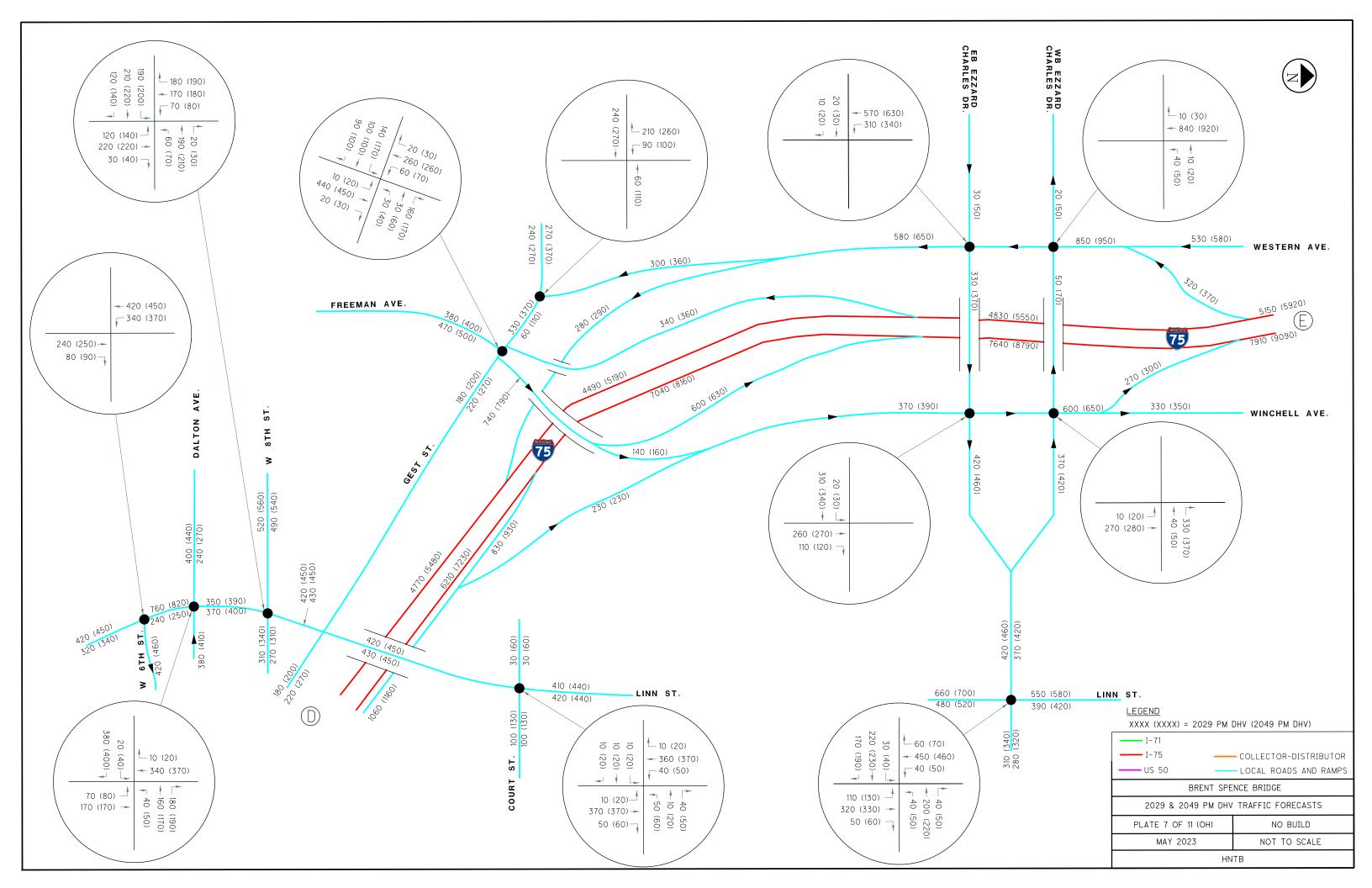
HNTB

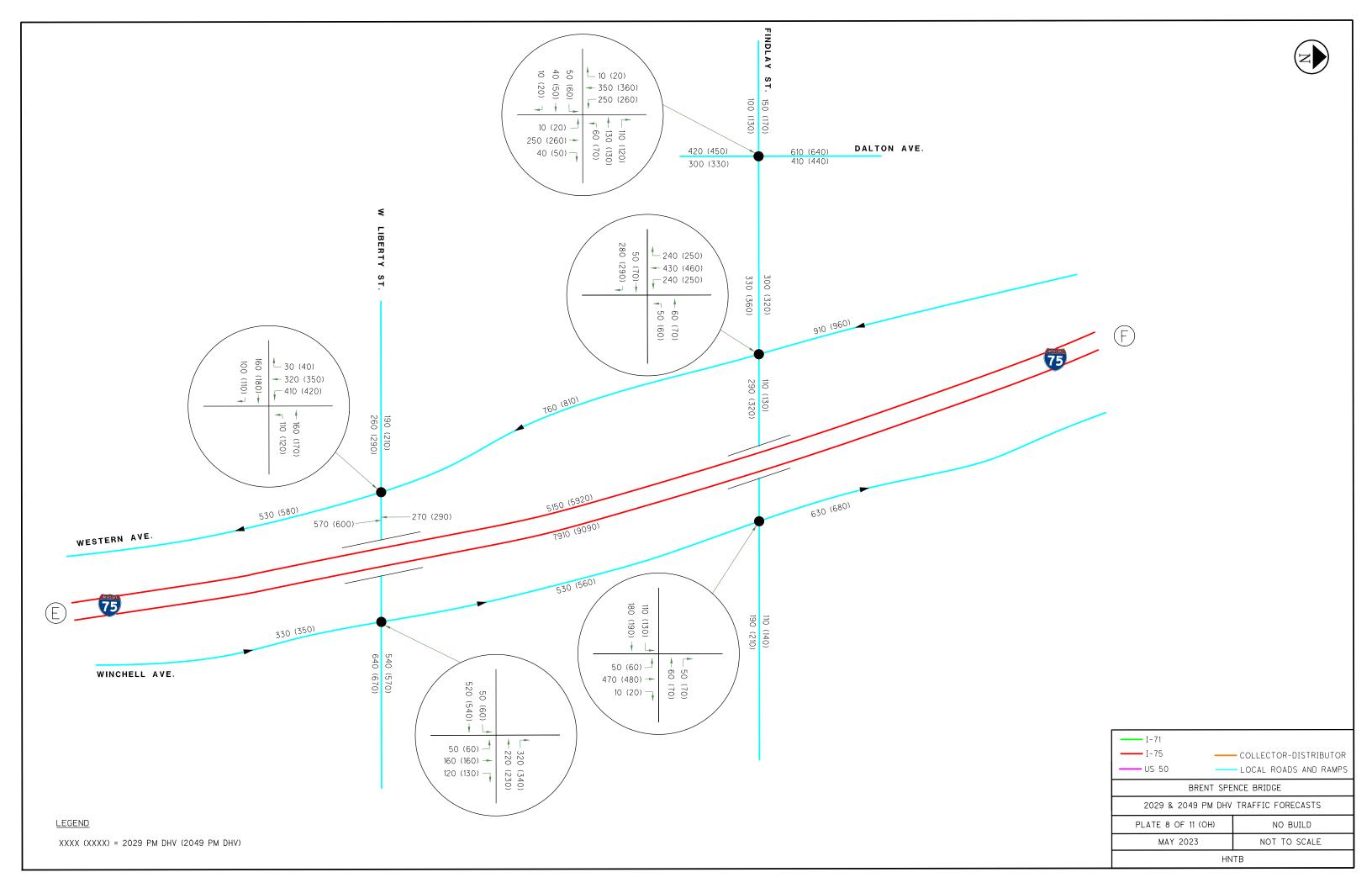
<u>LEGEND</u>

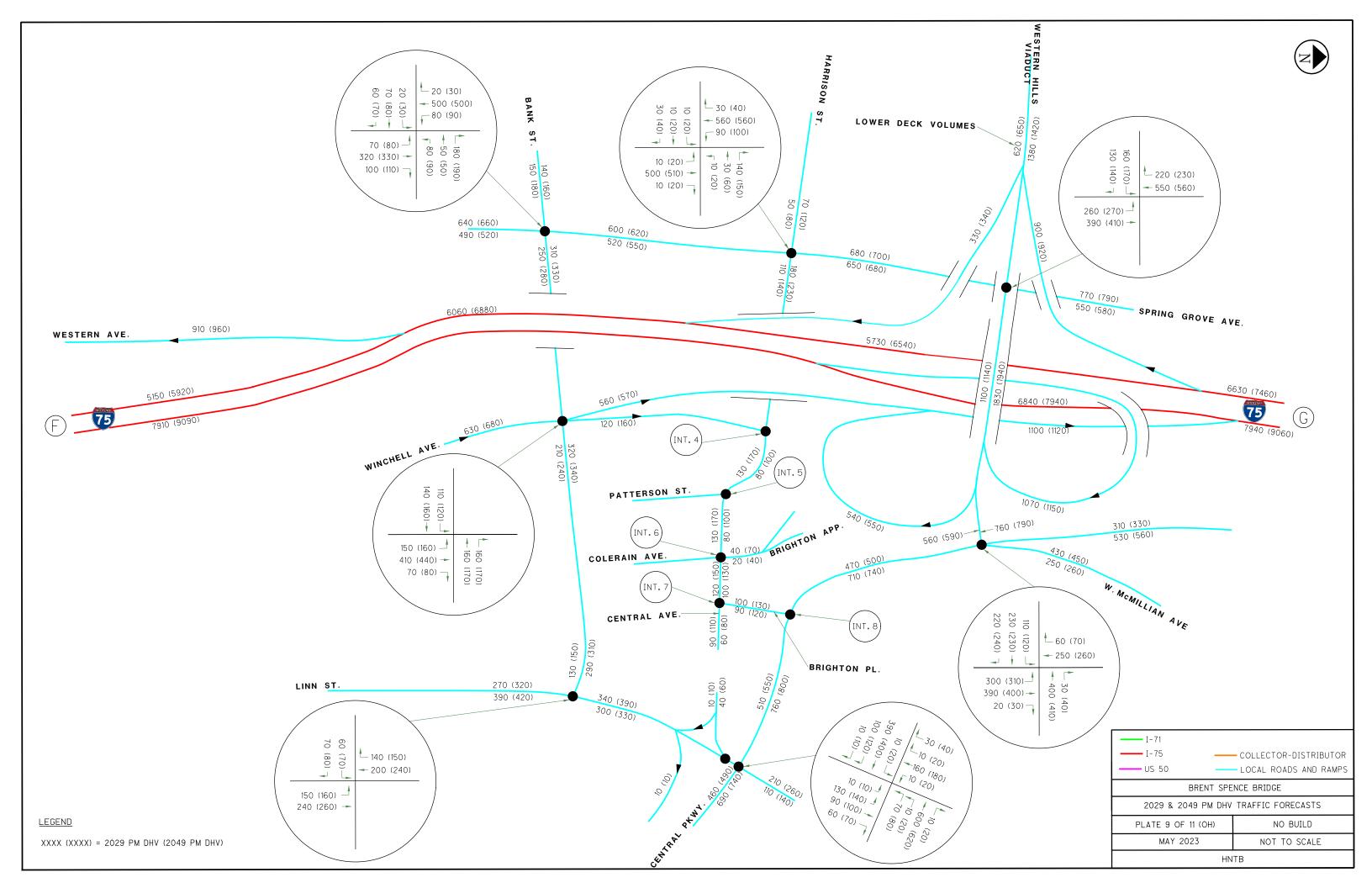
XXXX (XXXX) = 2029 PM DHV (2049 PM DHV)

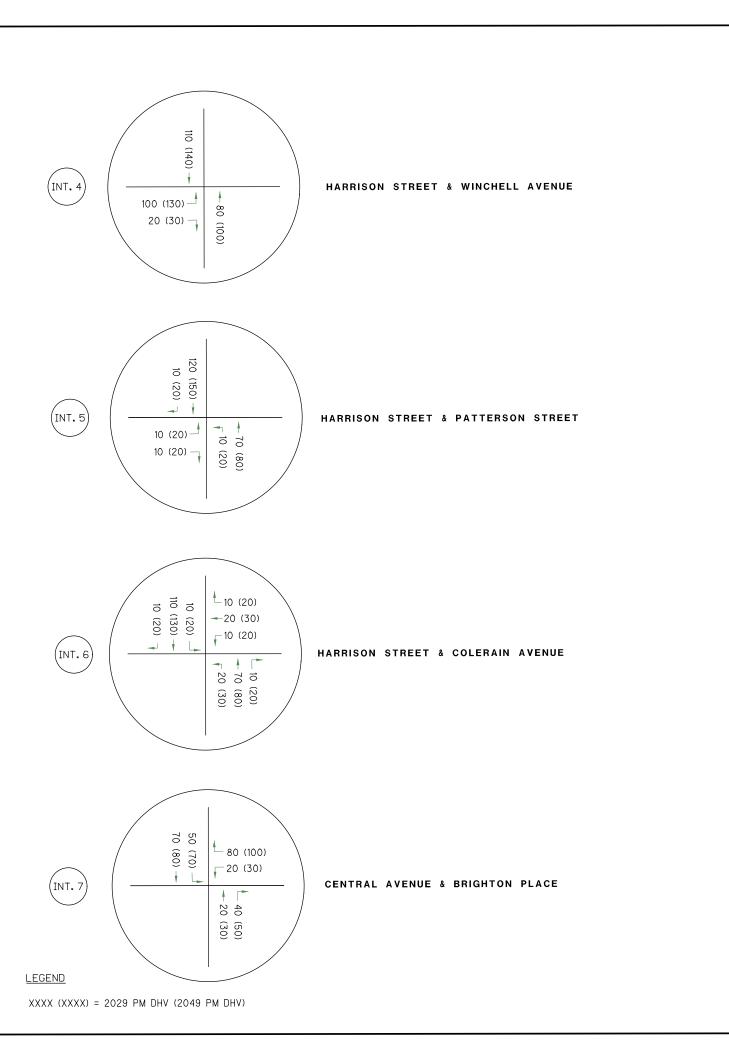


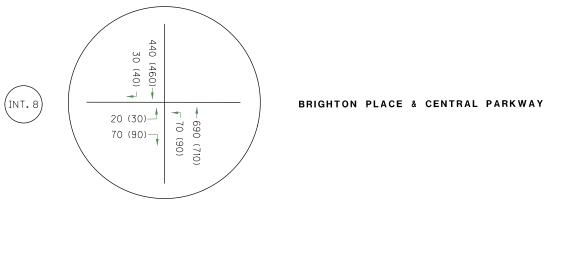


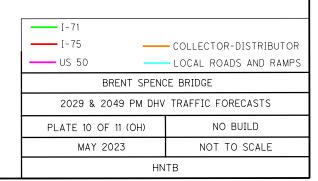


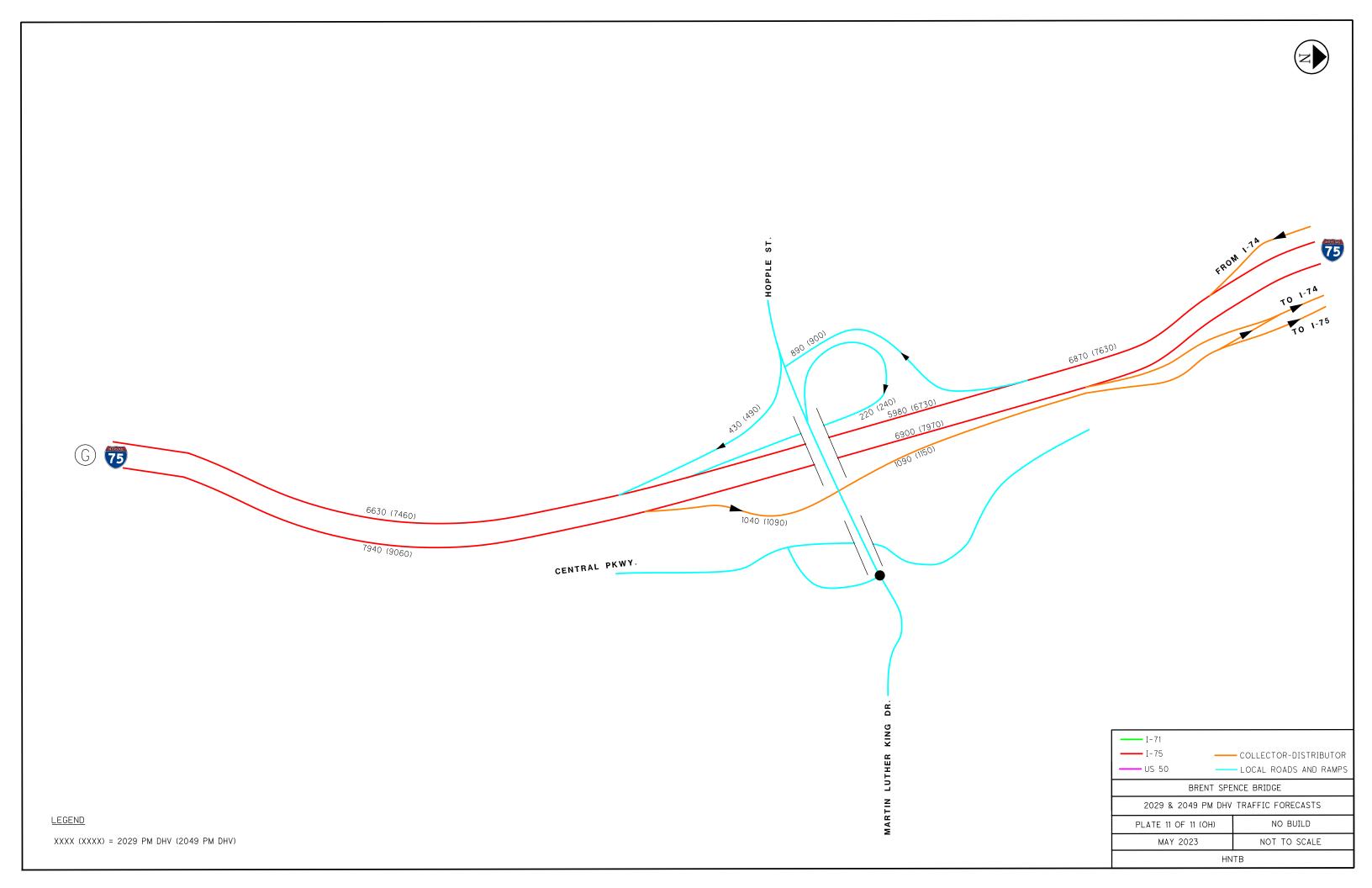


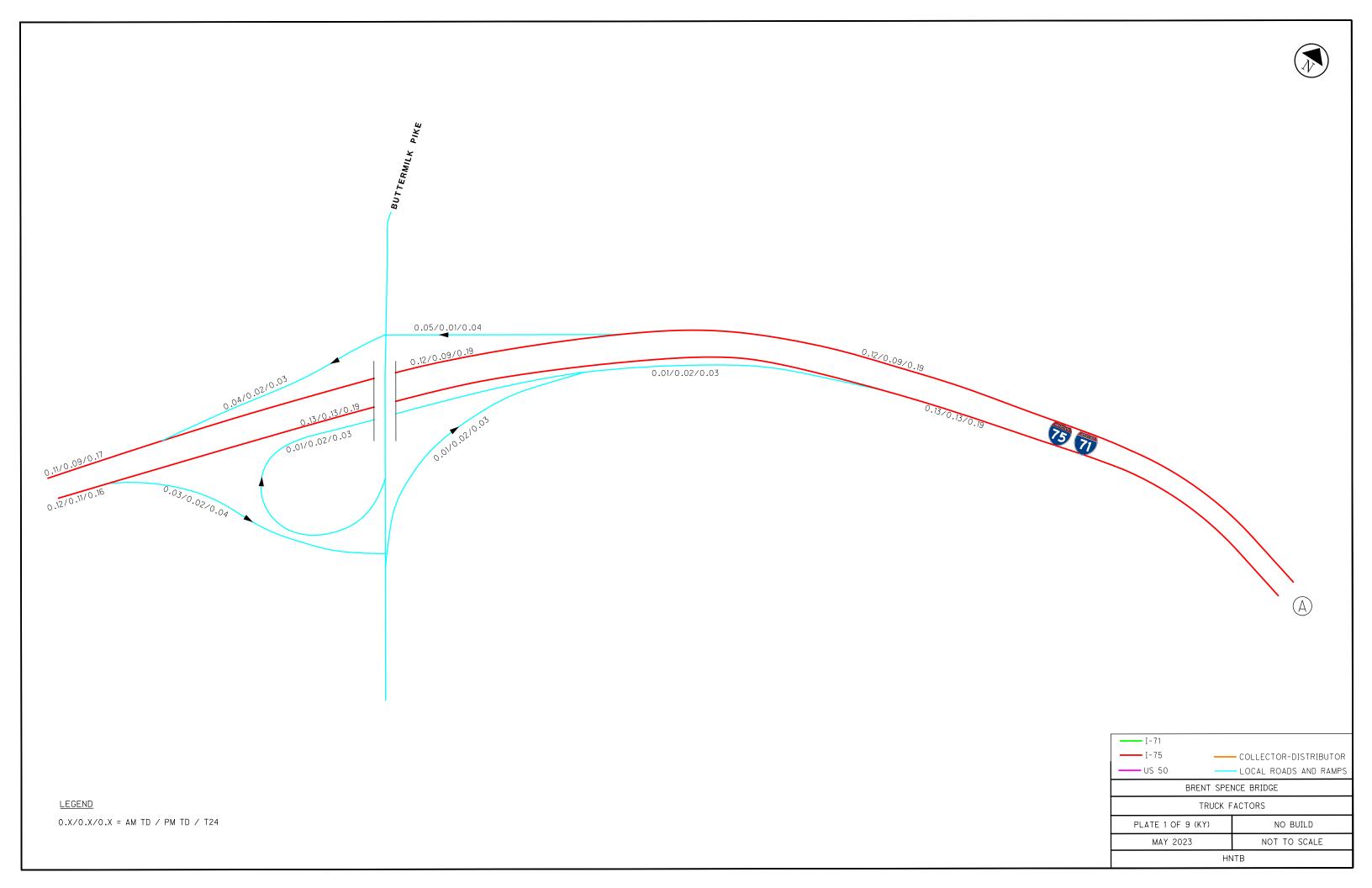


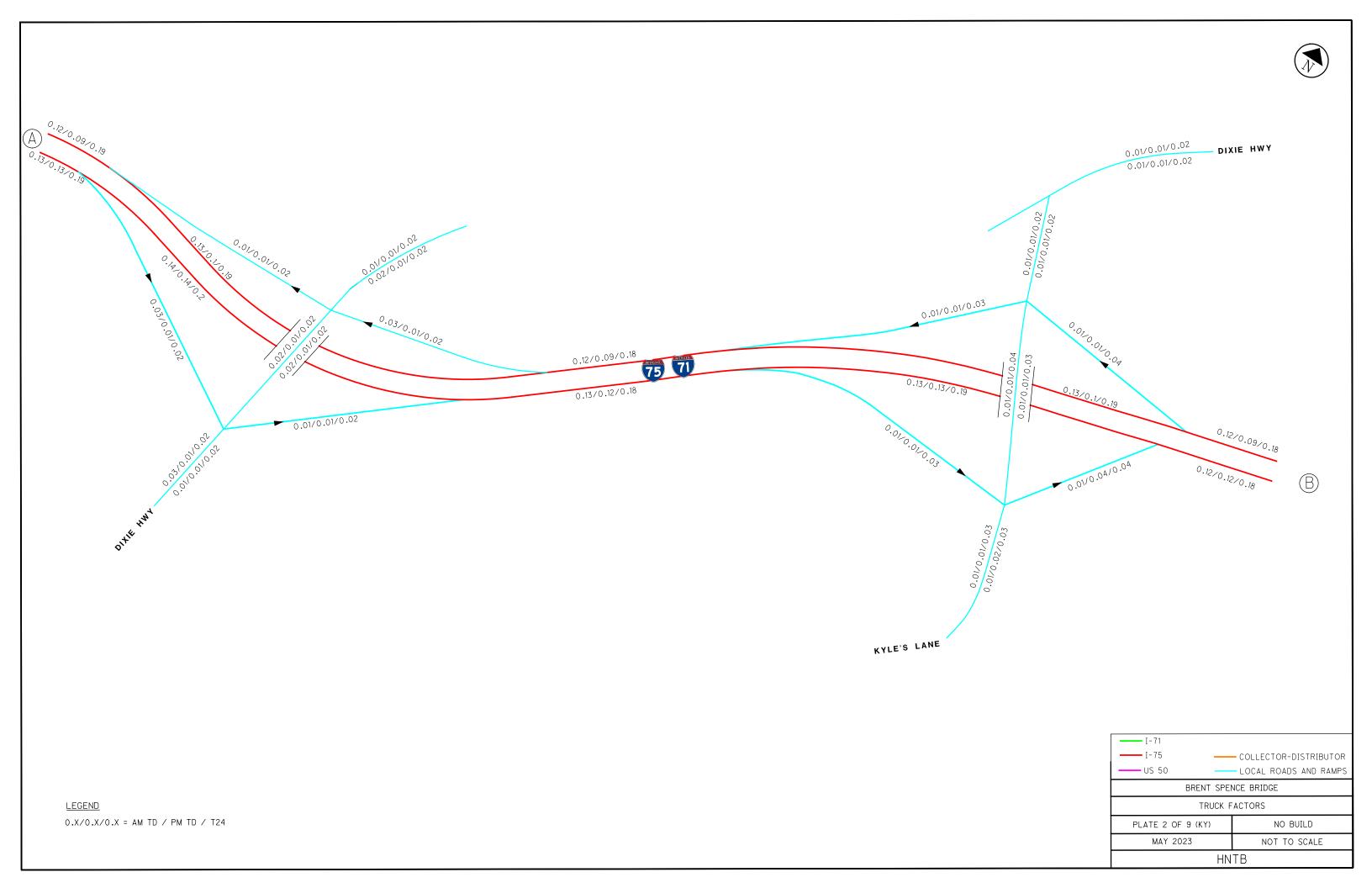


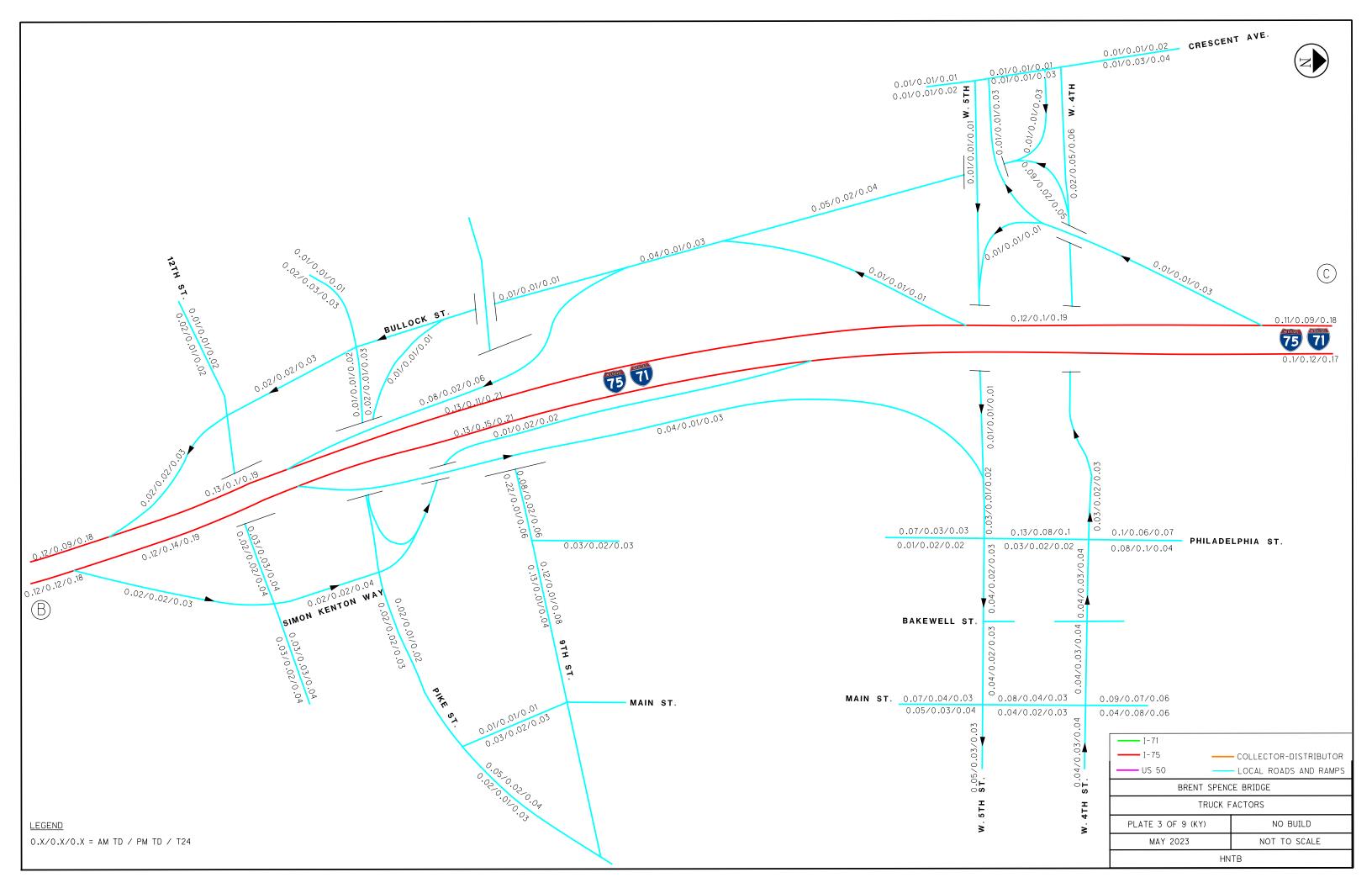


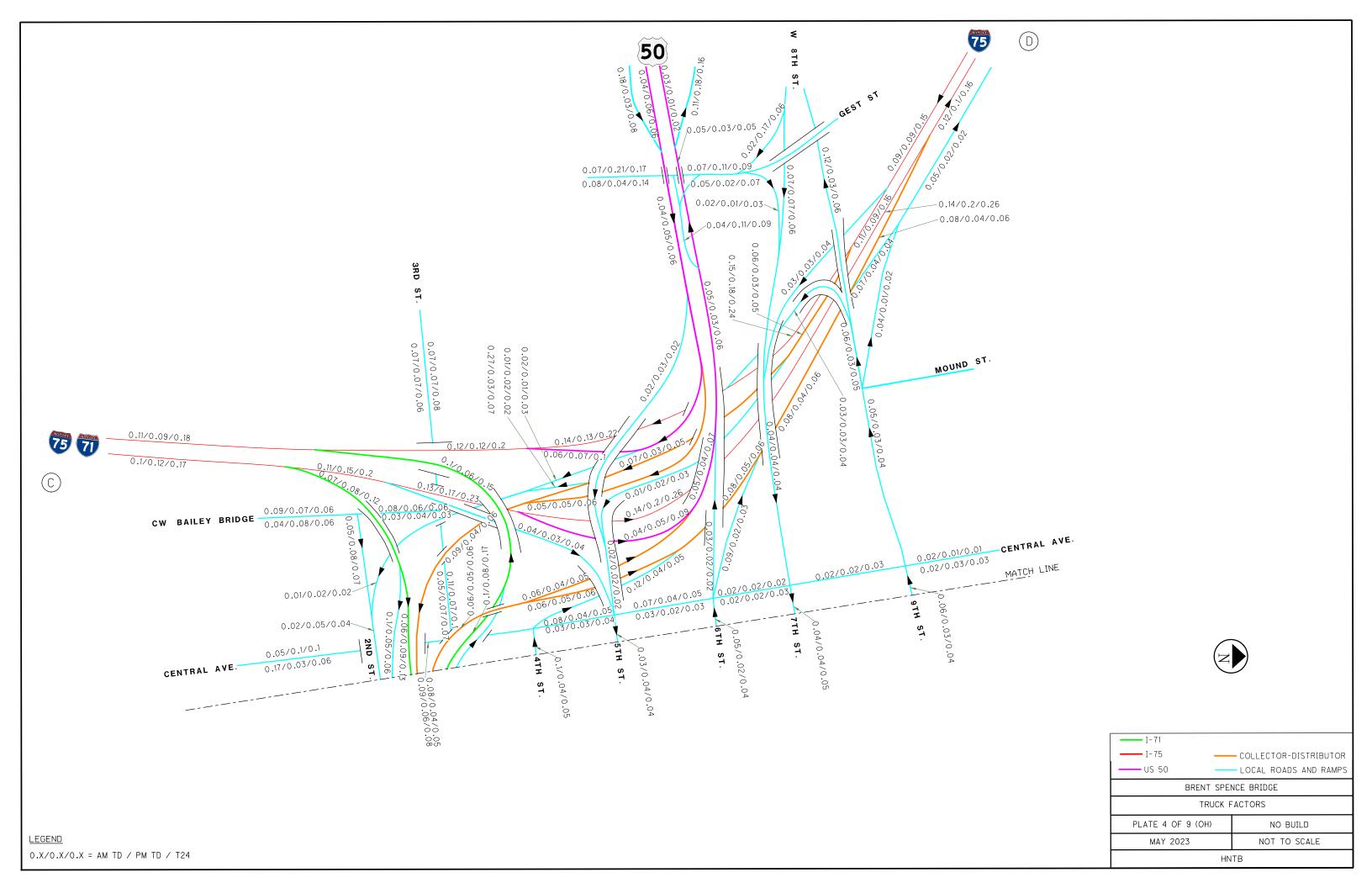


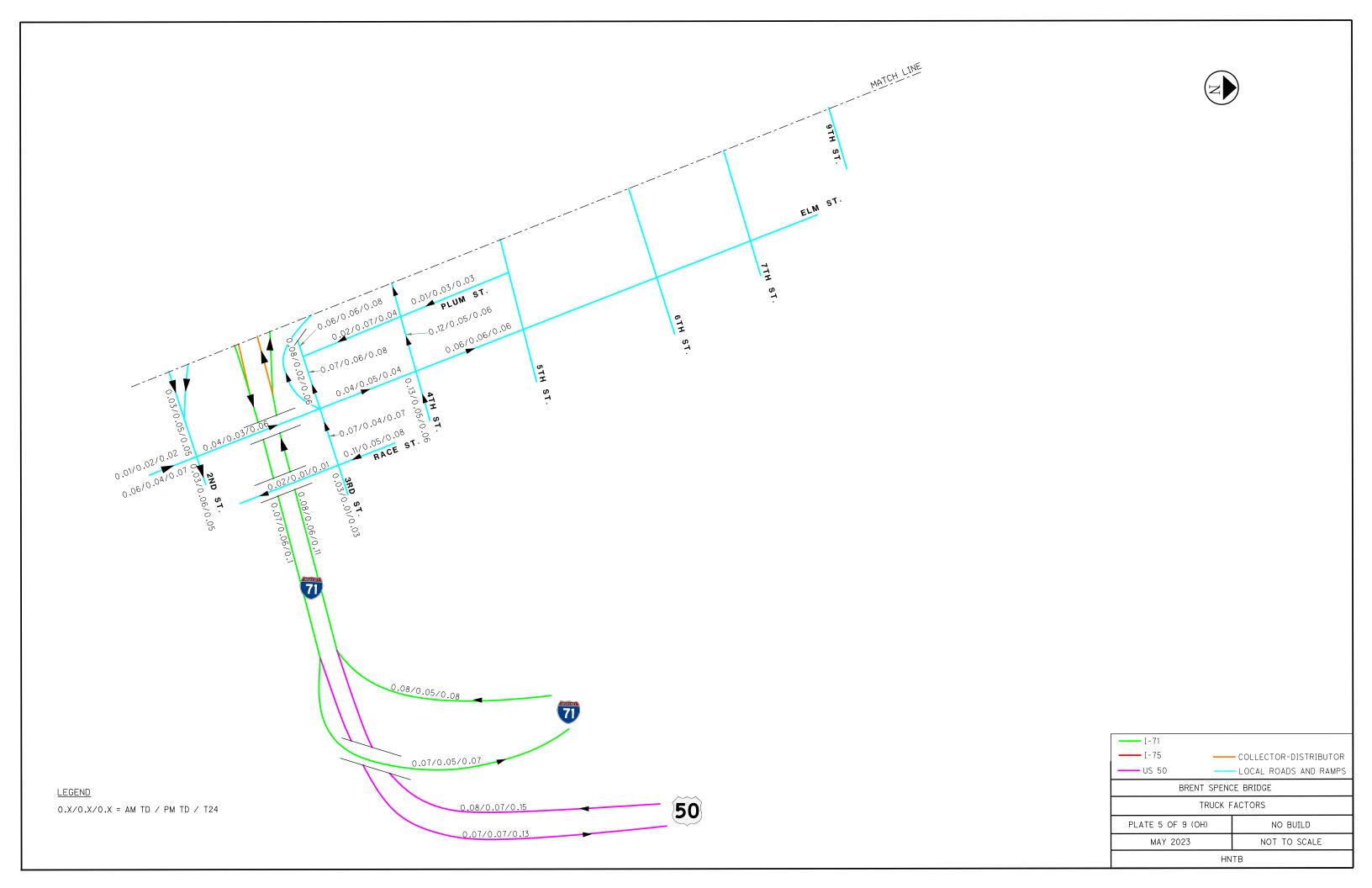


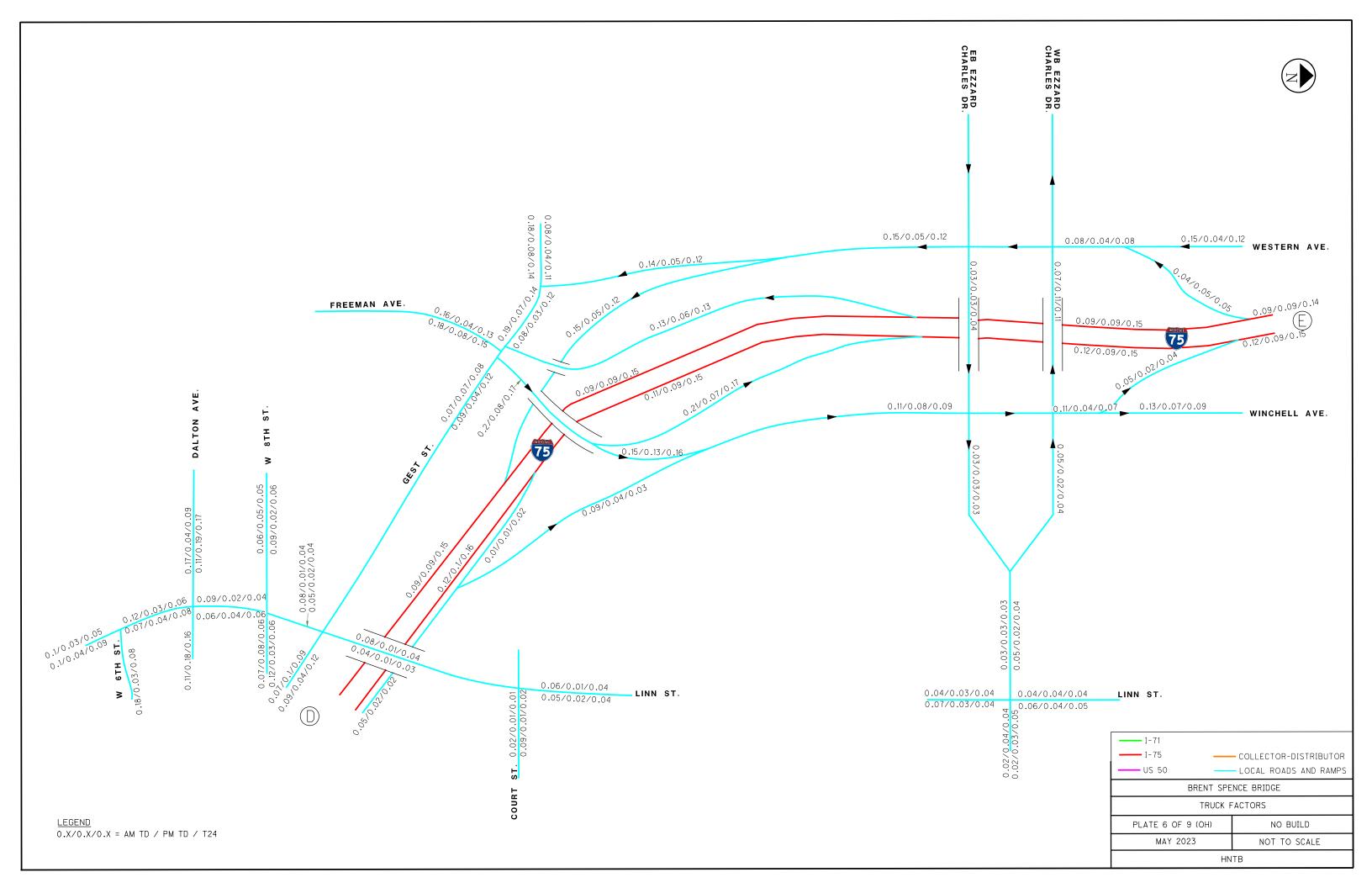


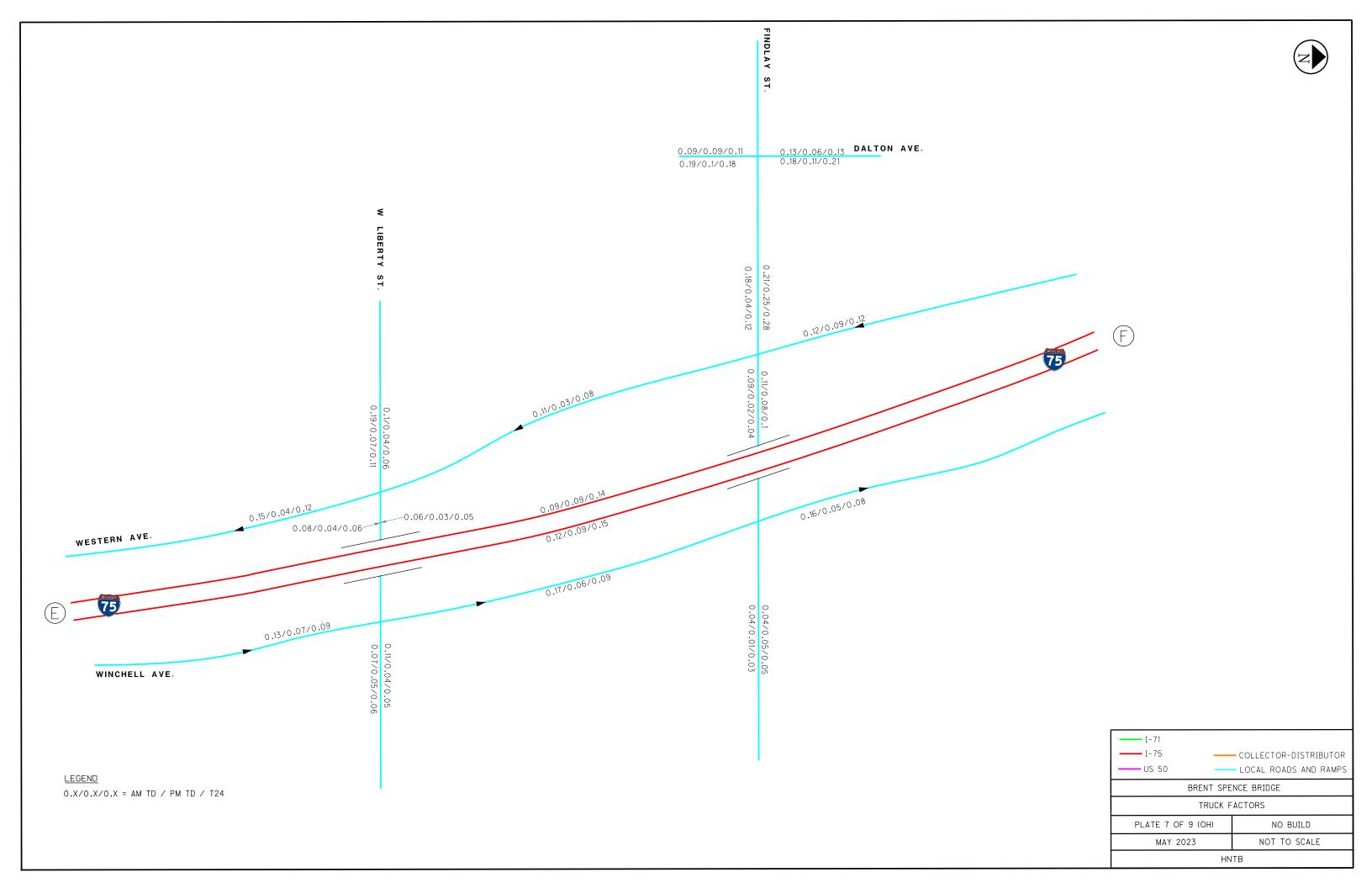


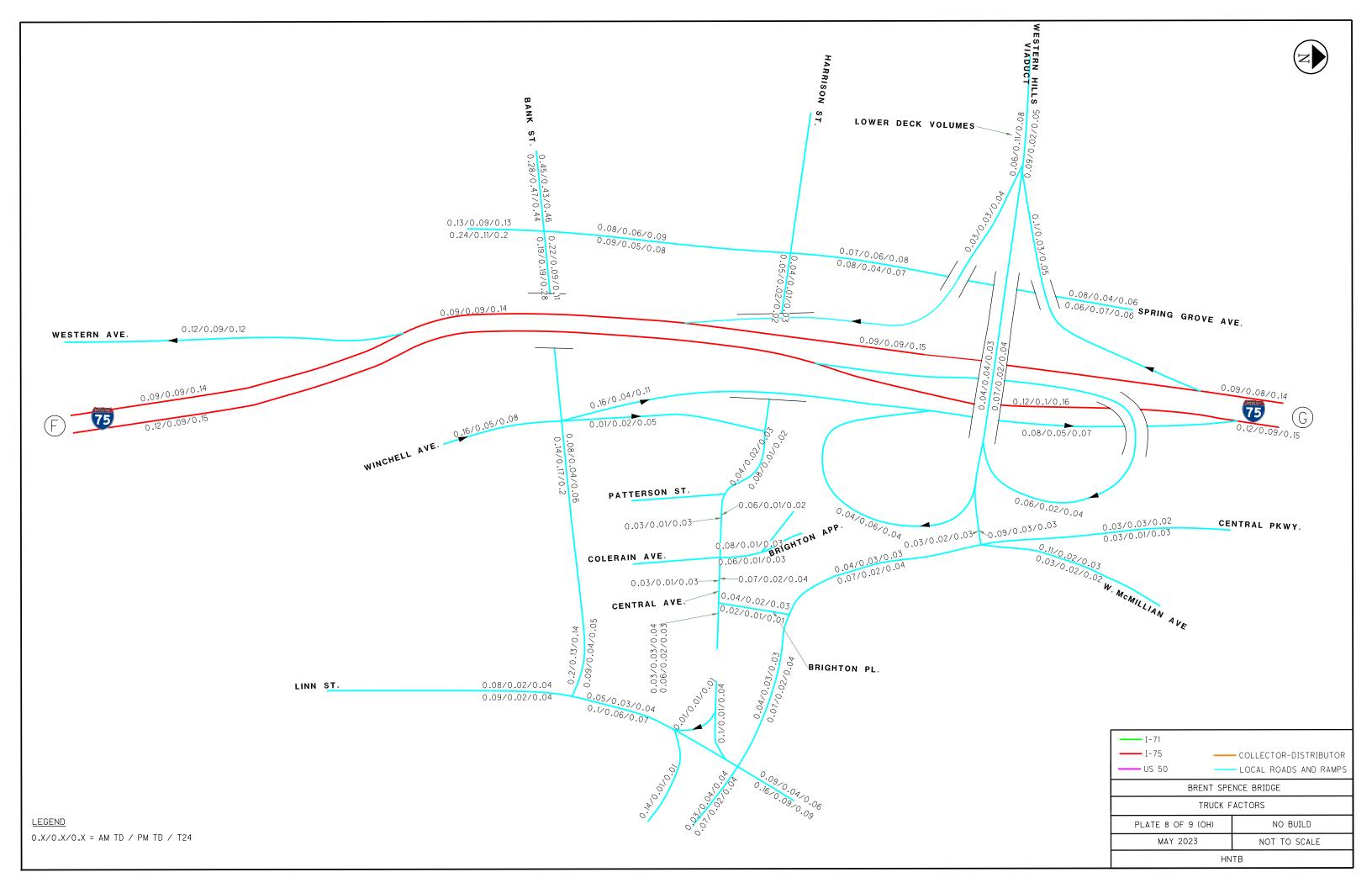


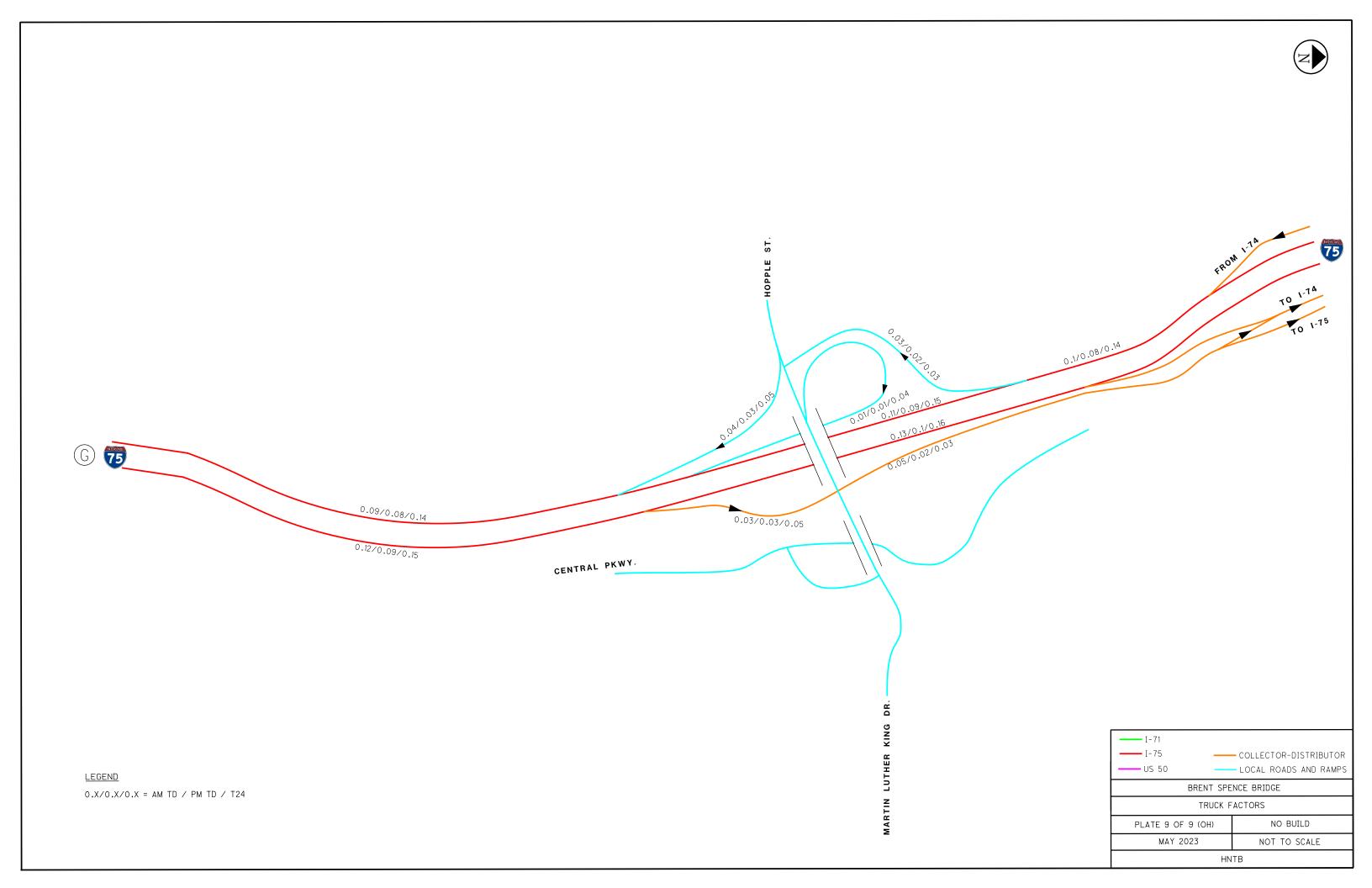


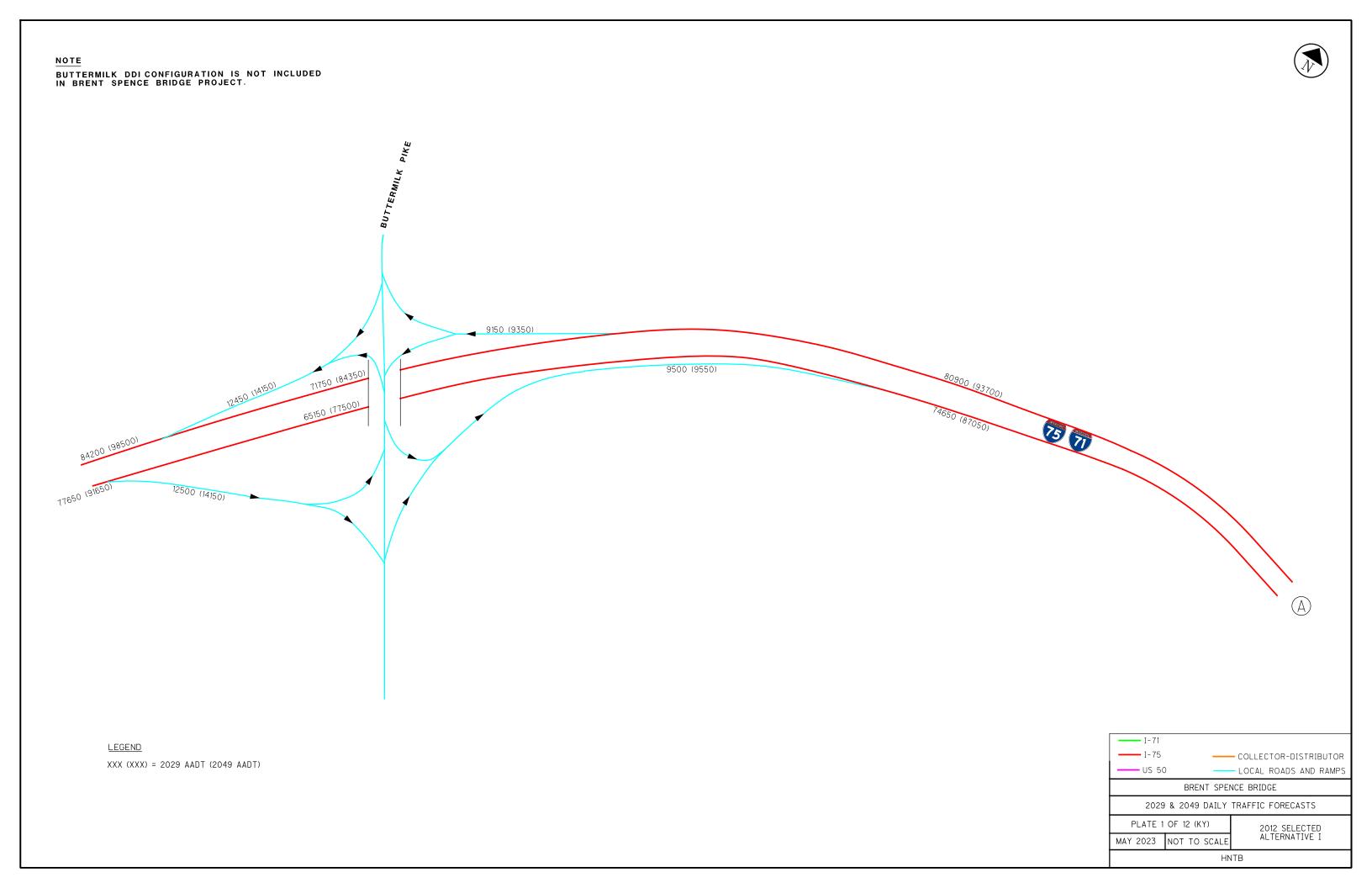


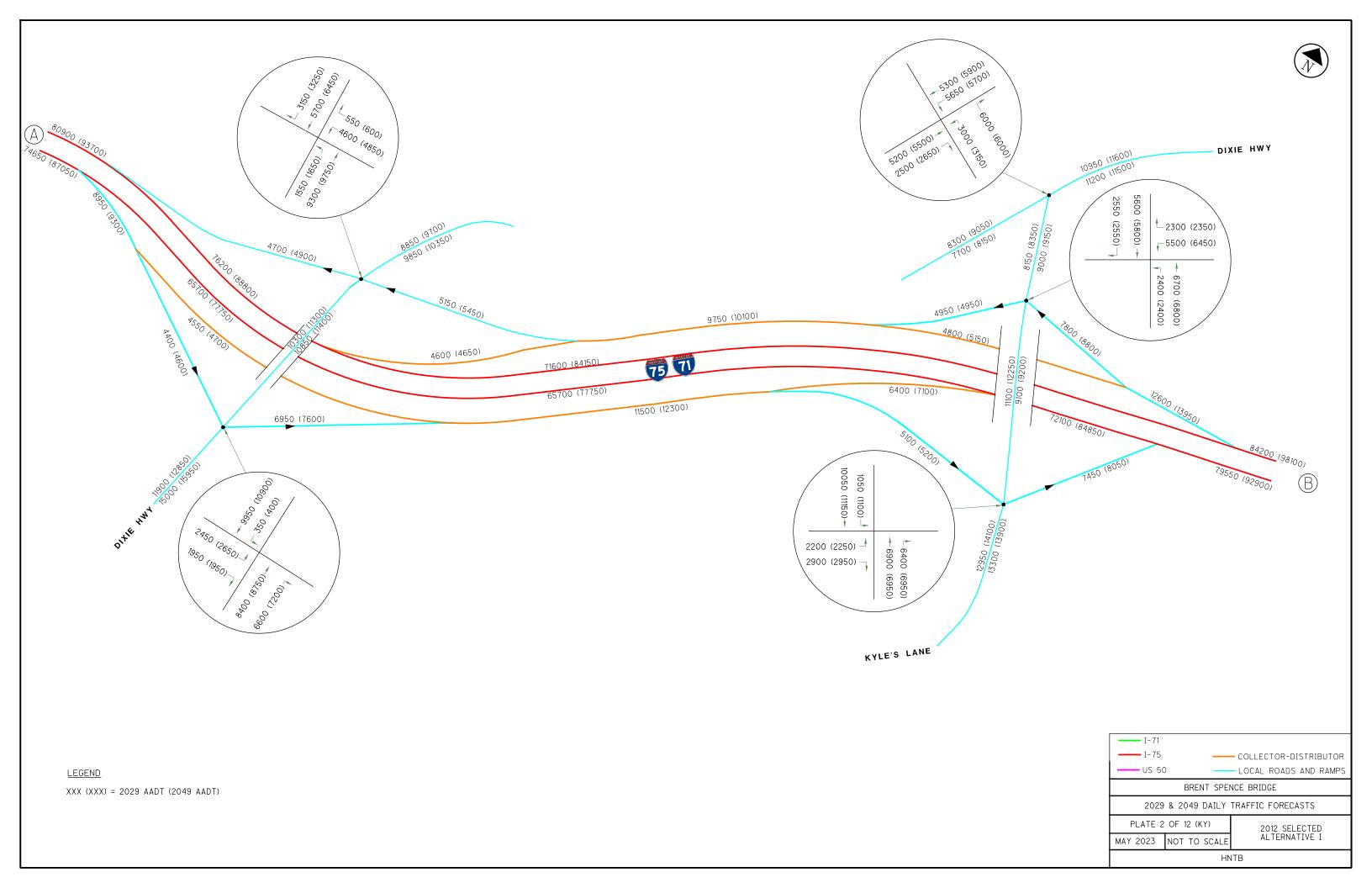


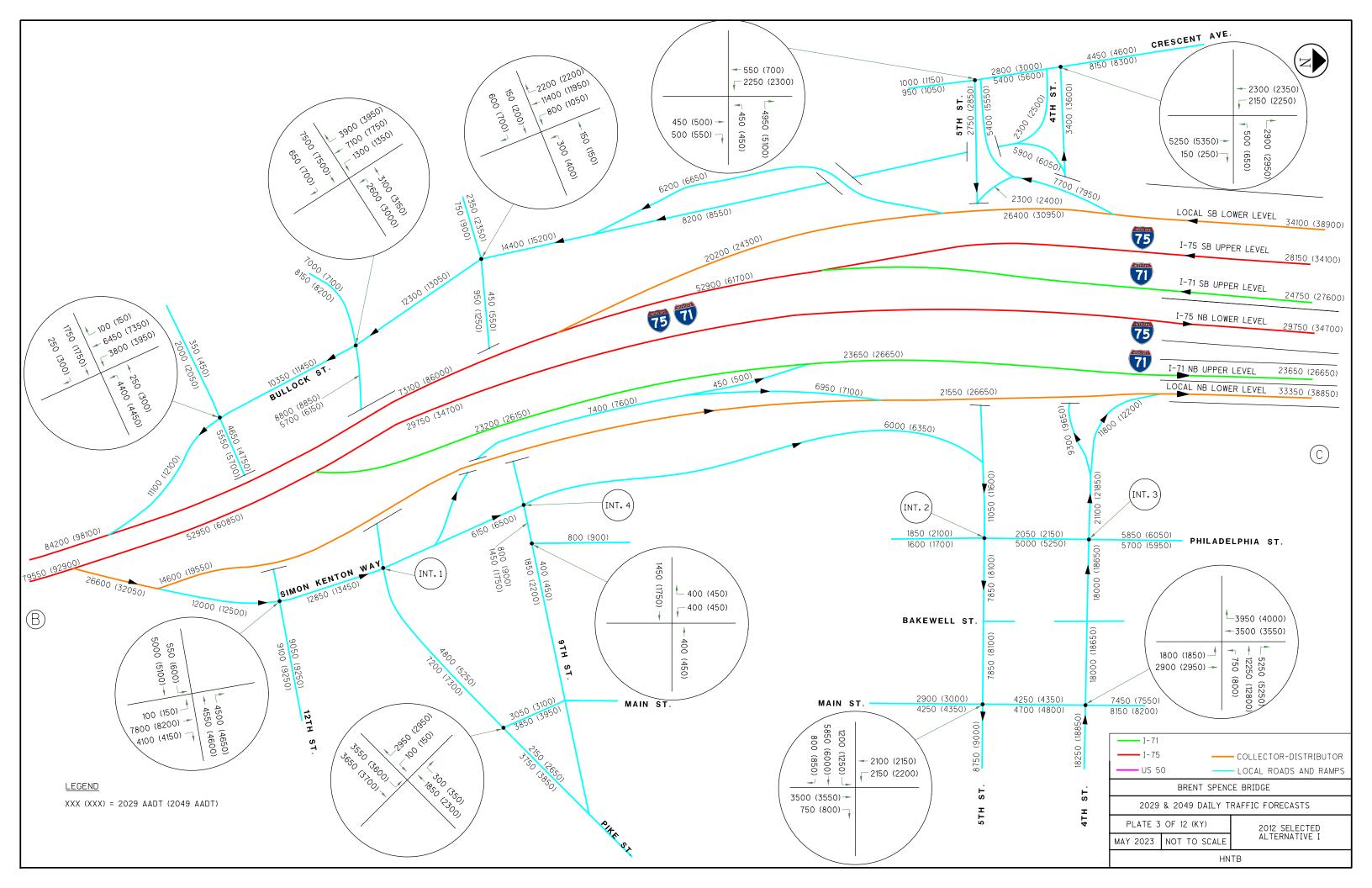


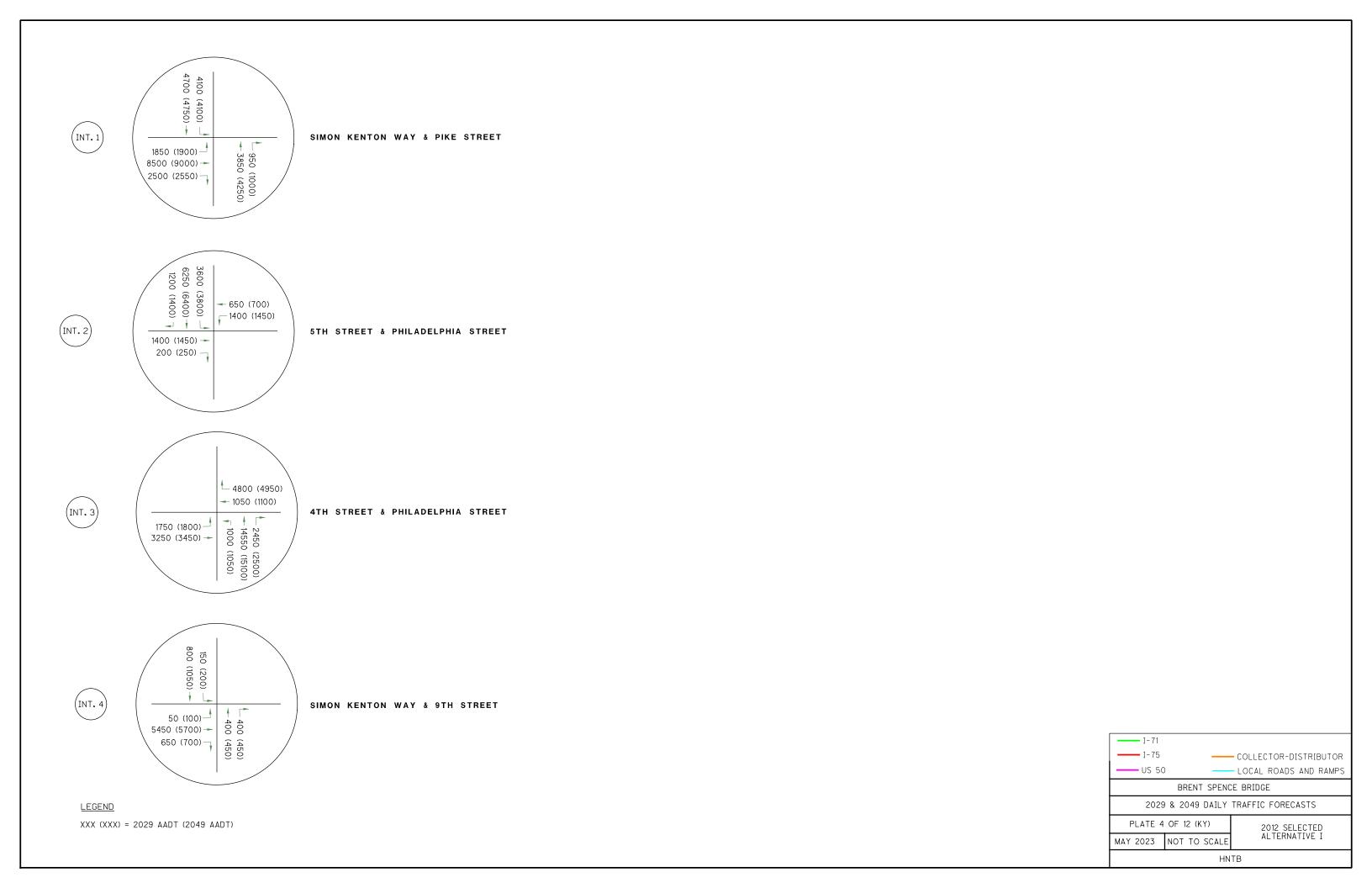


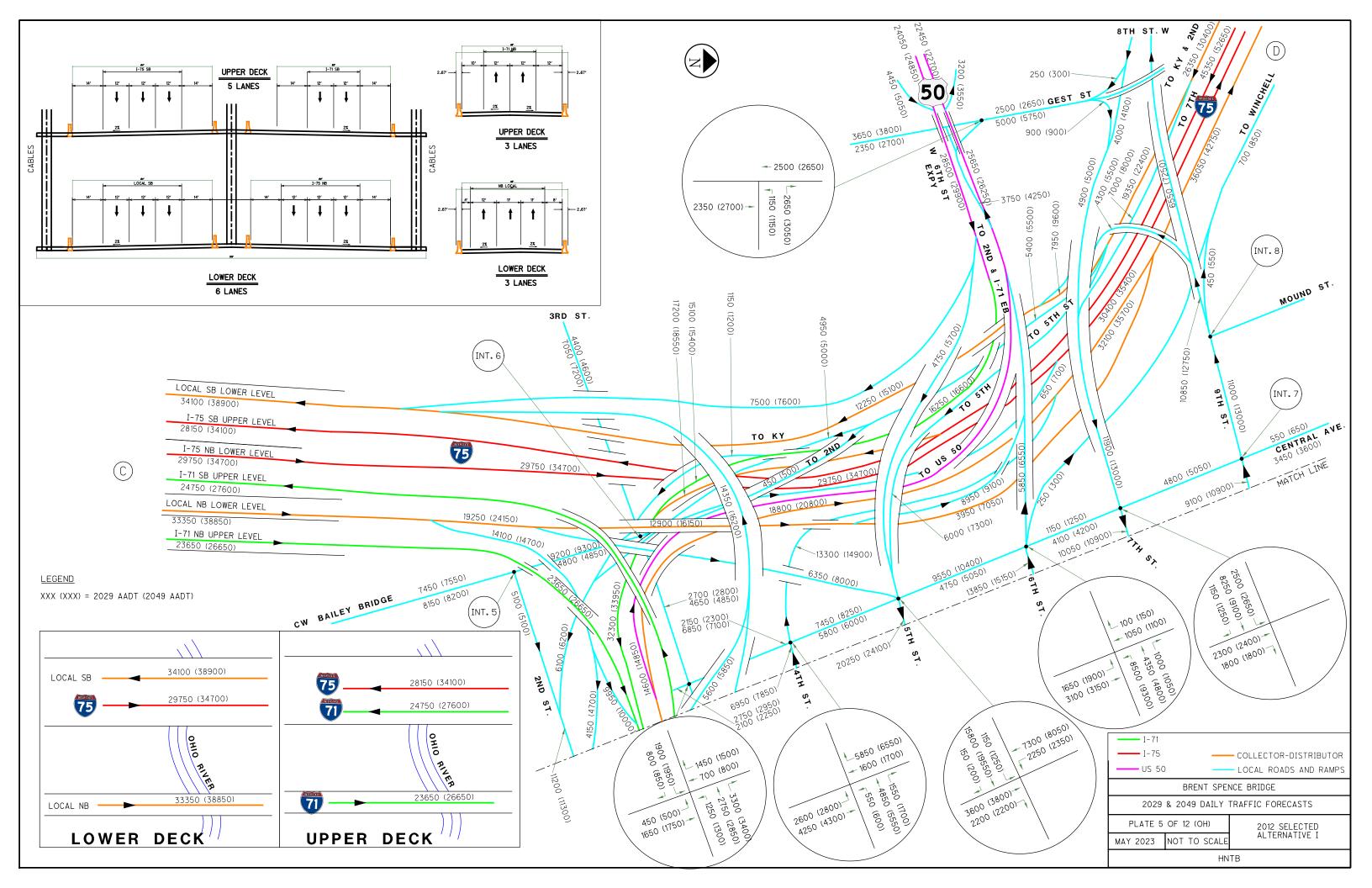


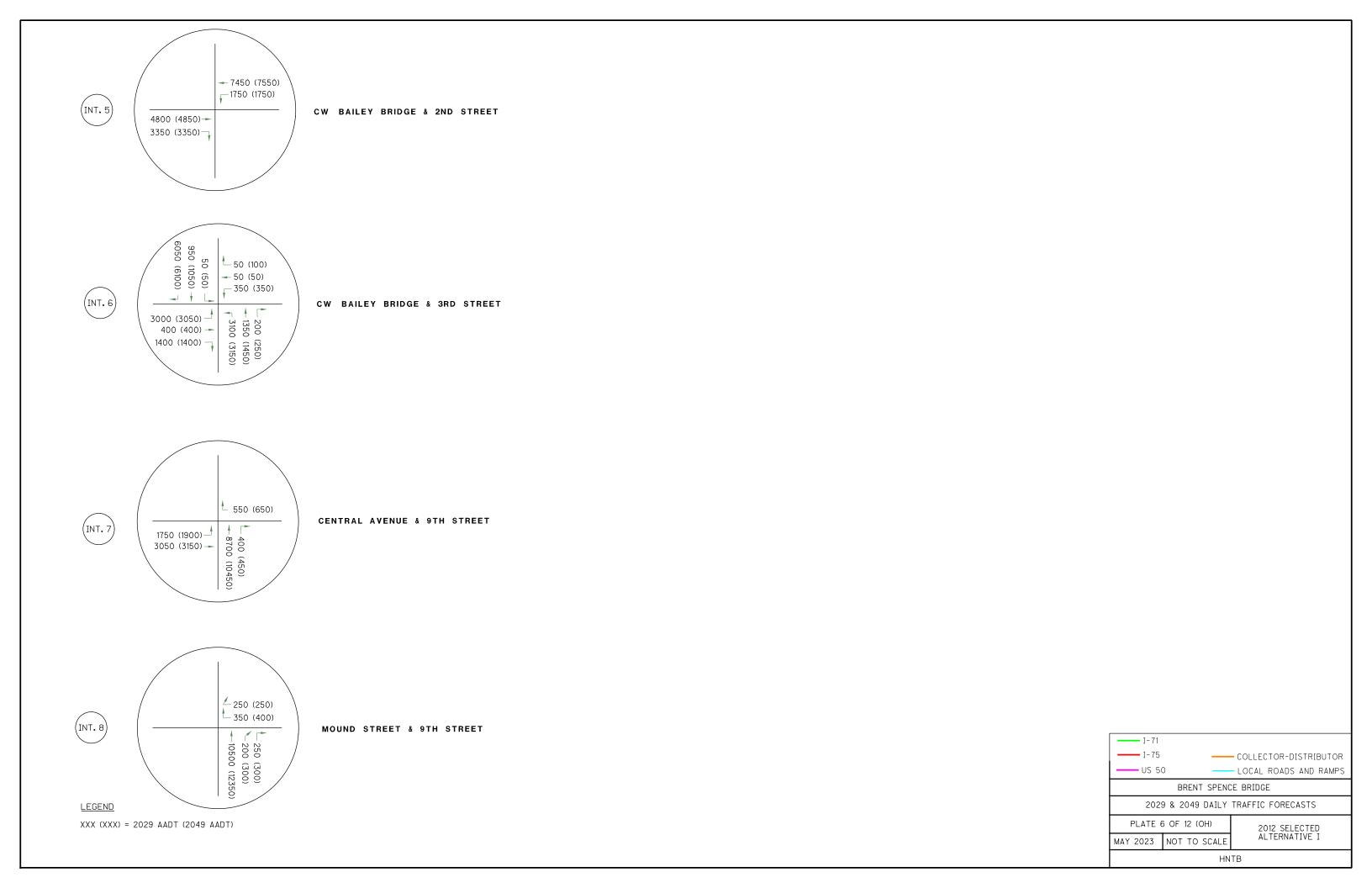


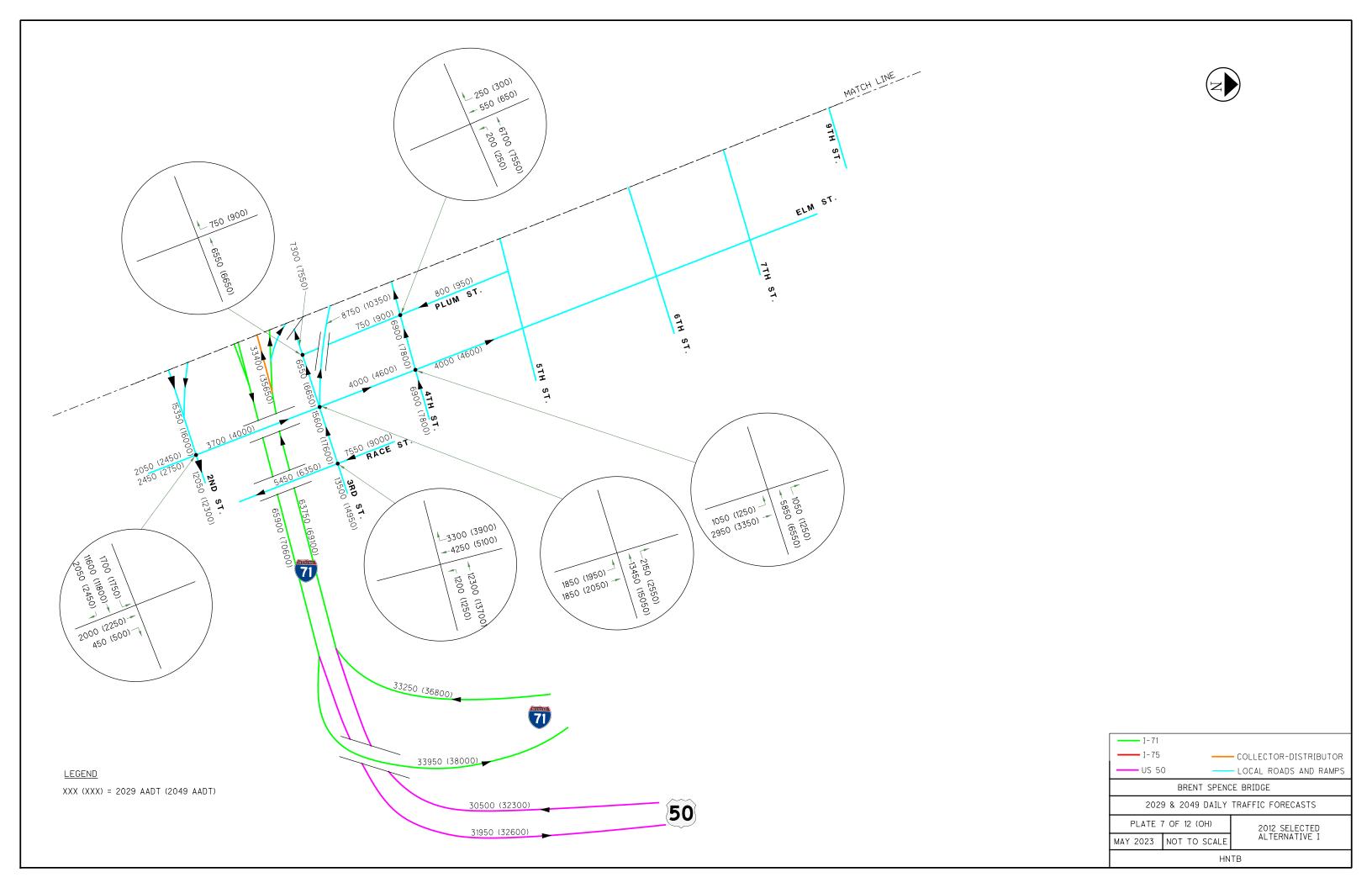


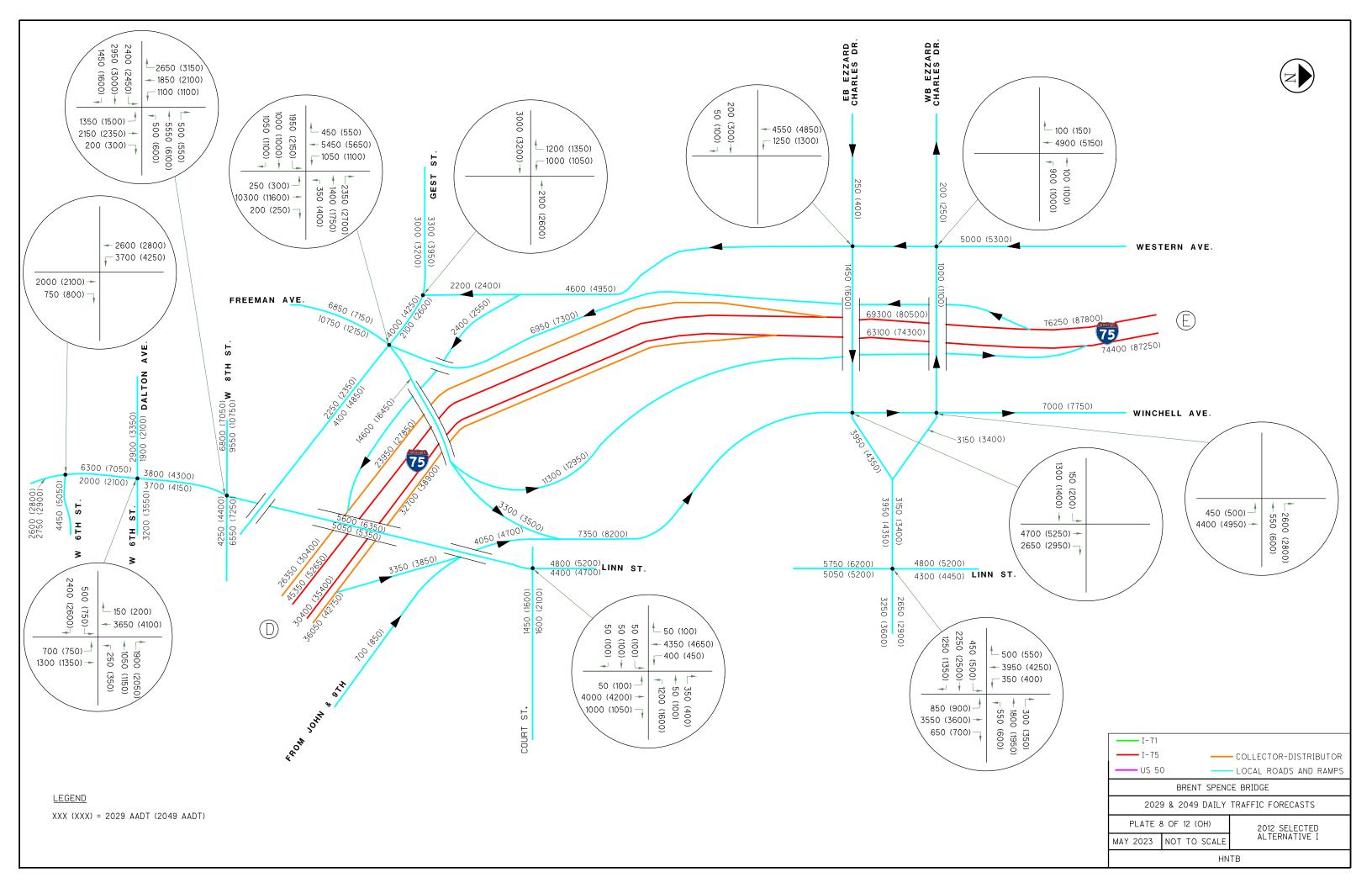


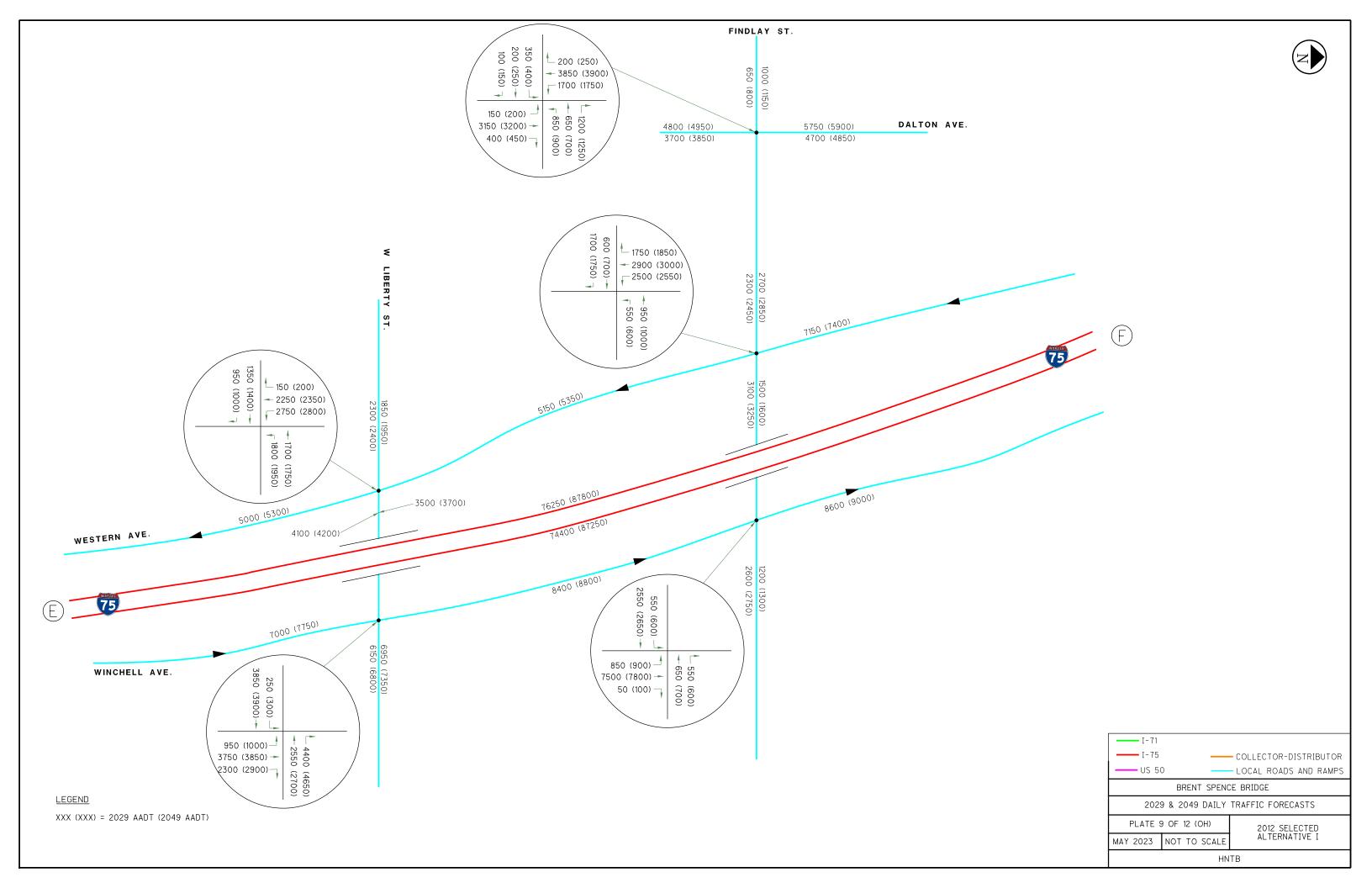


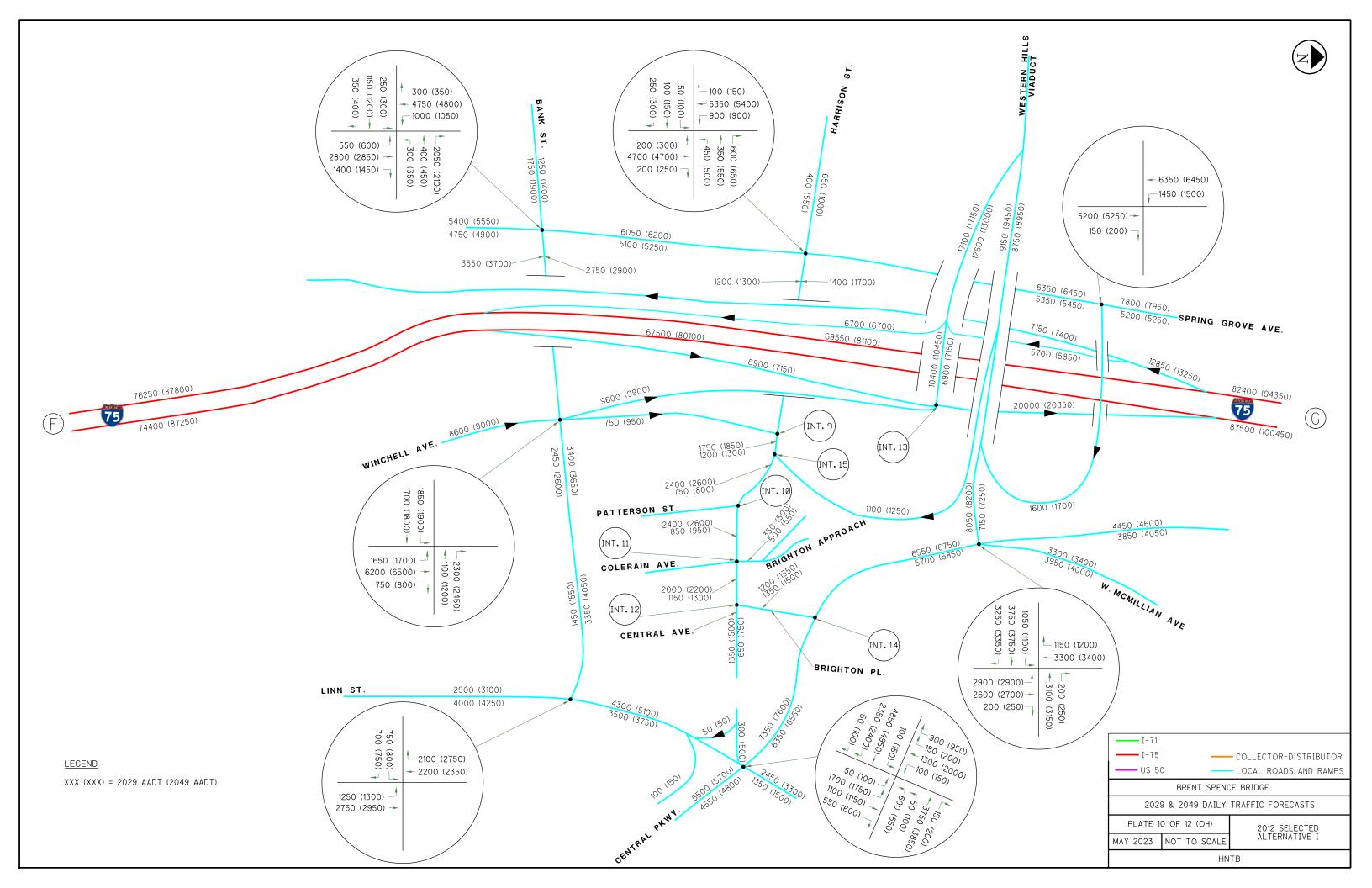


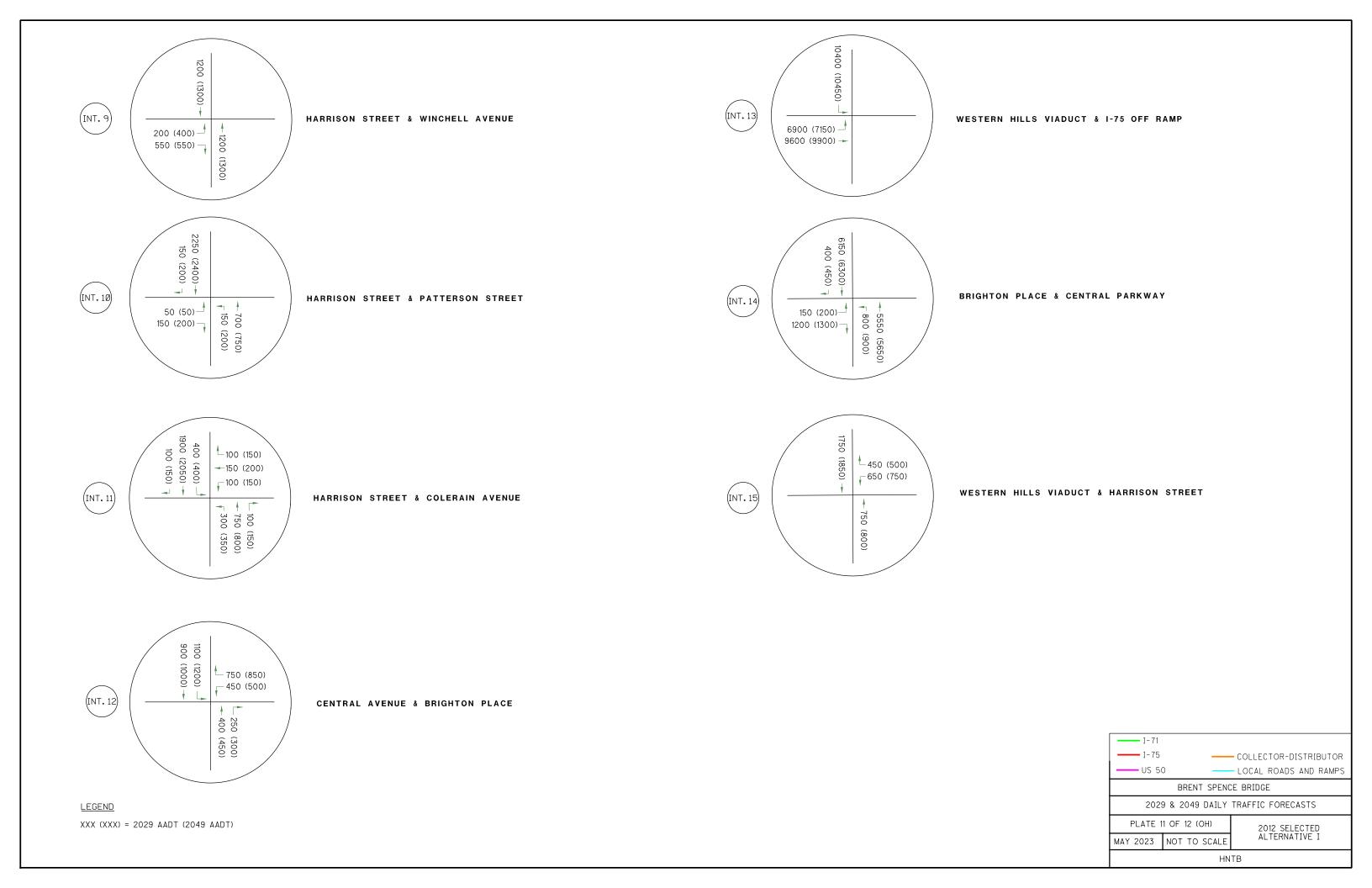


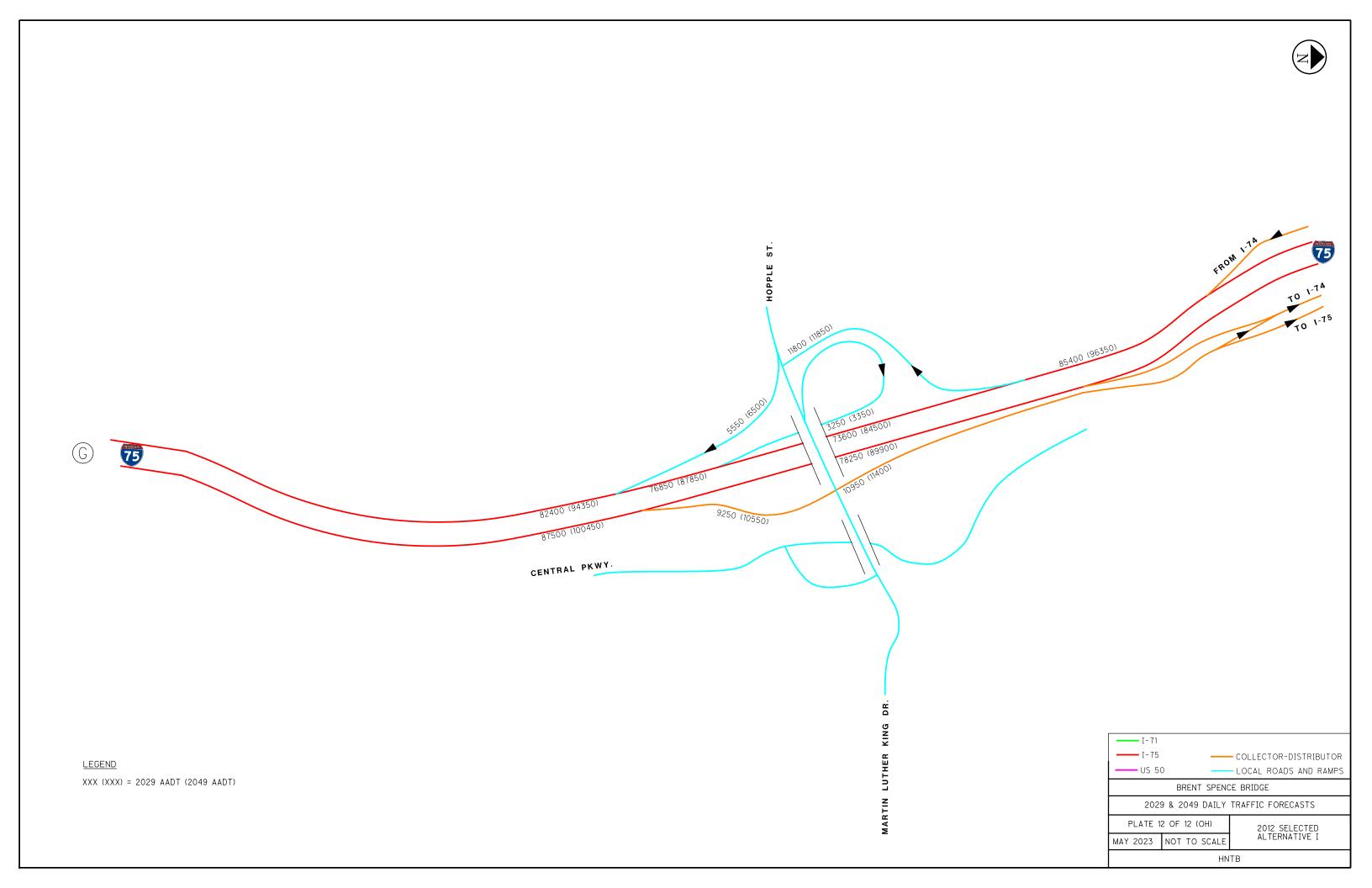


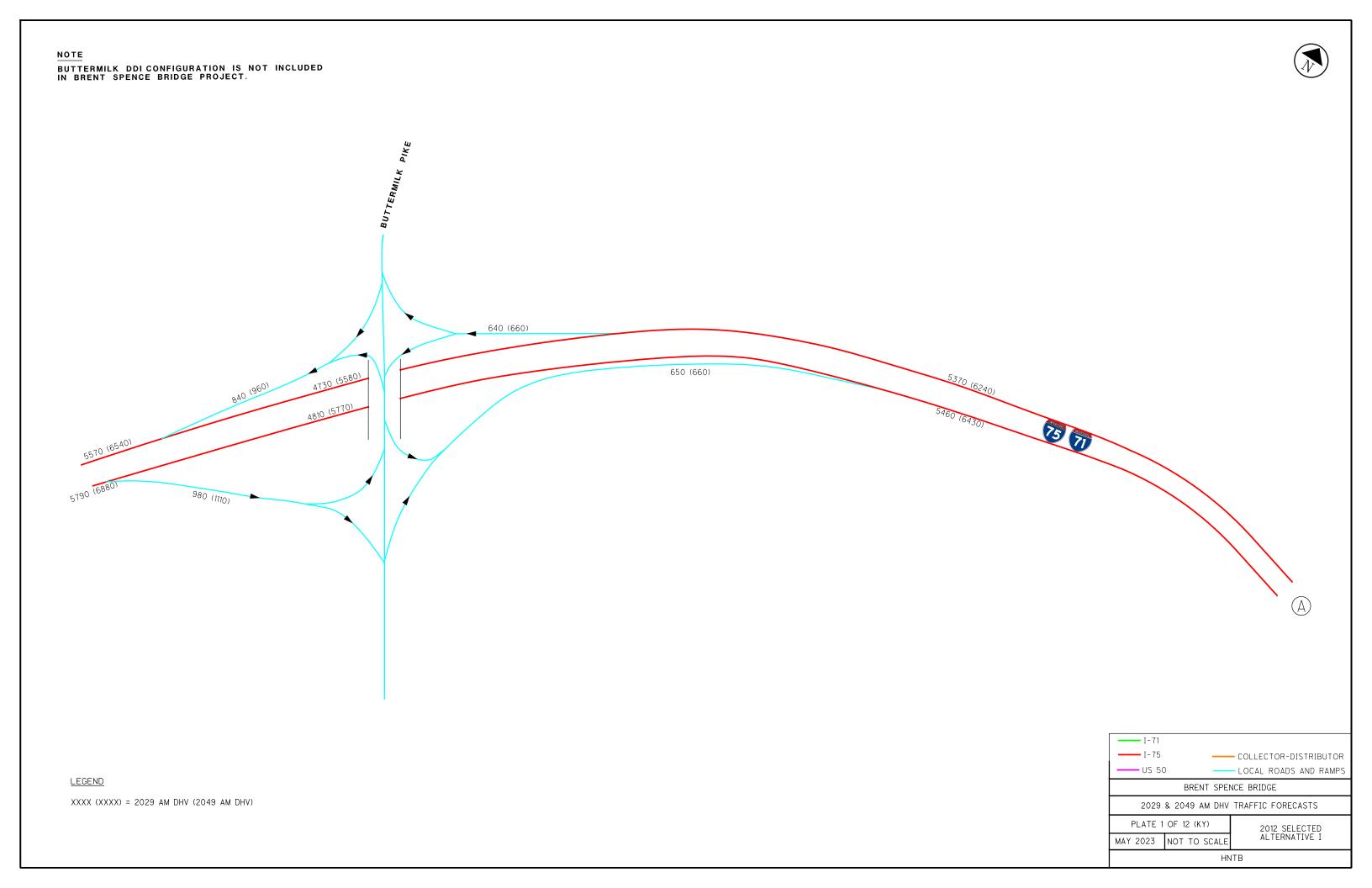


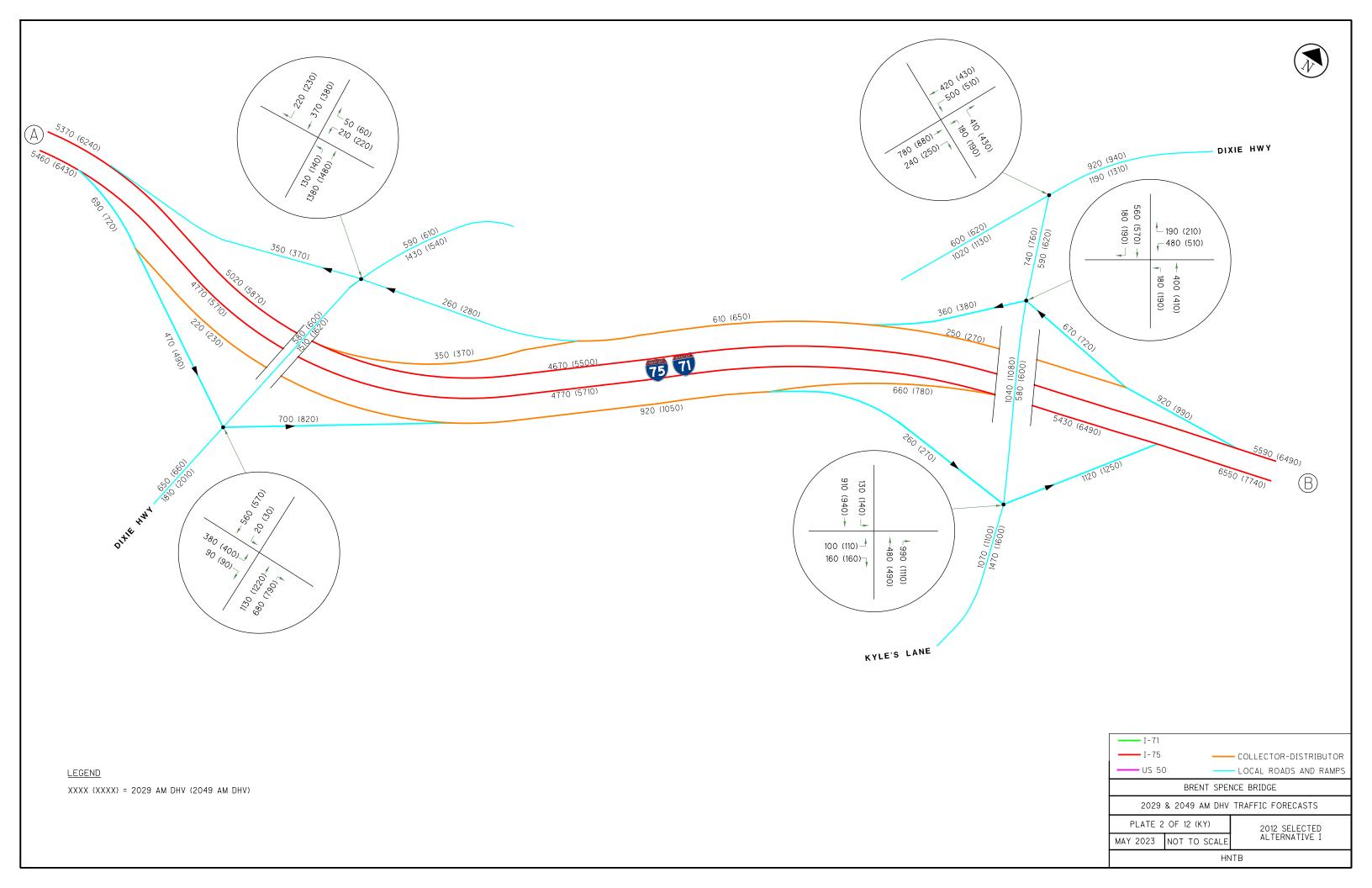


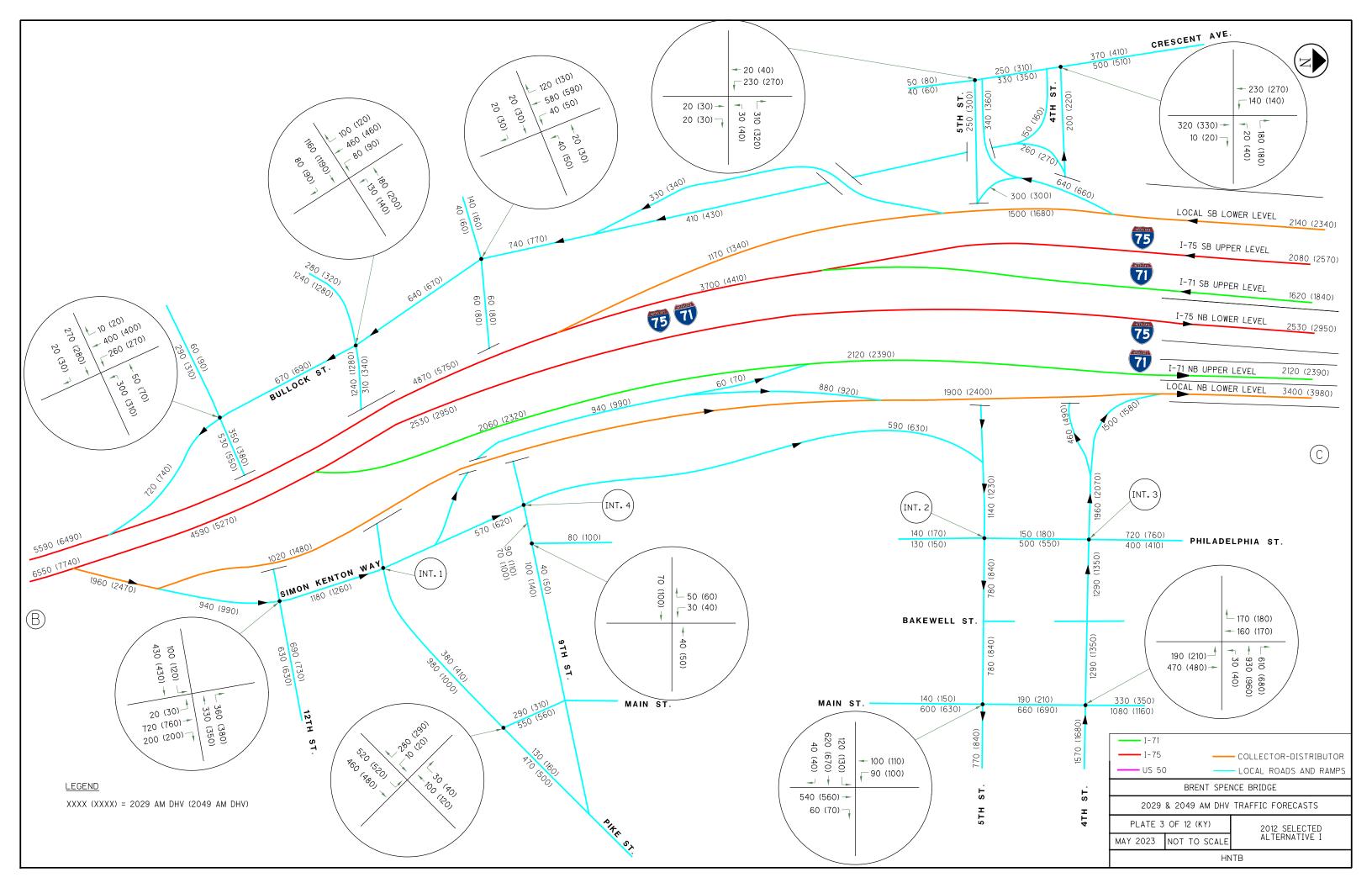


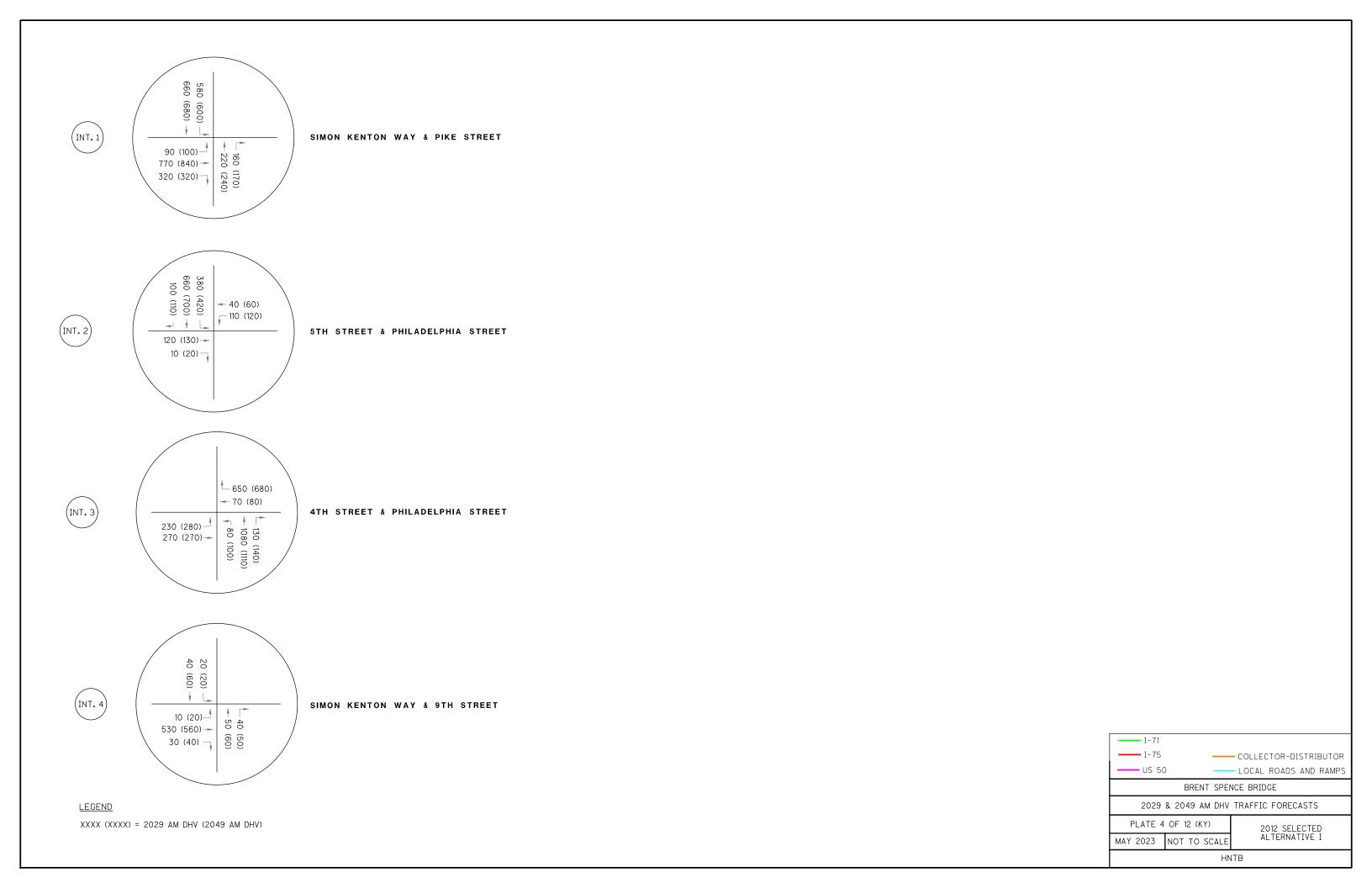


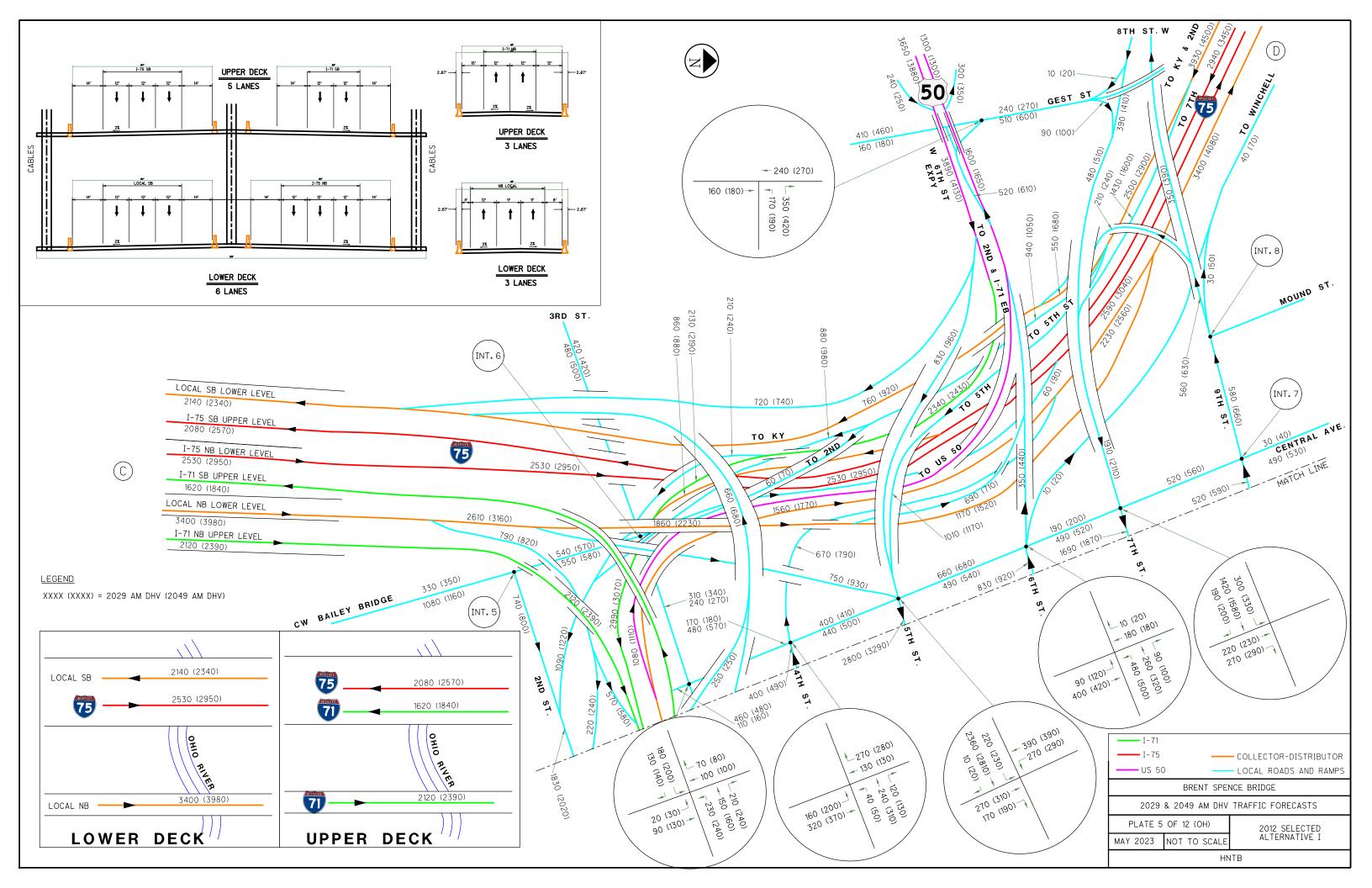


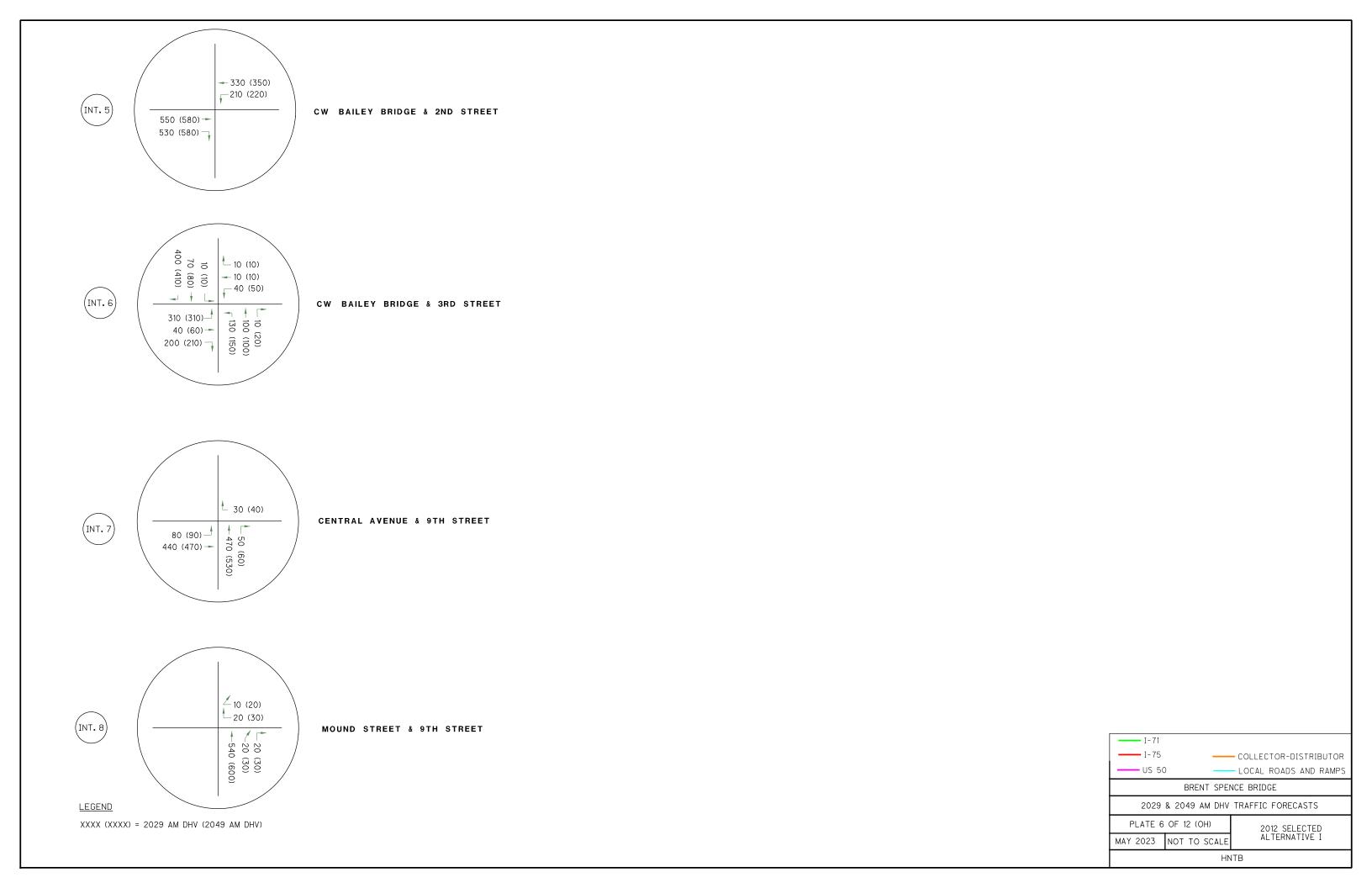


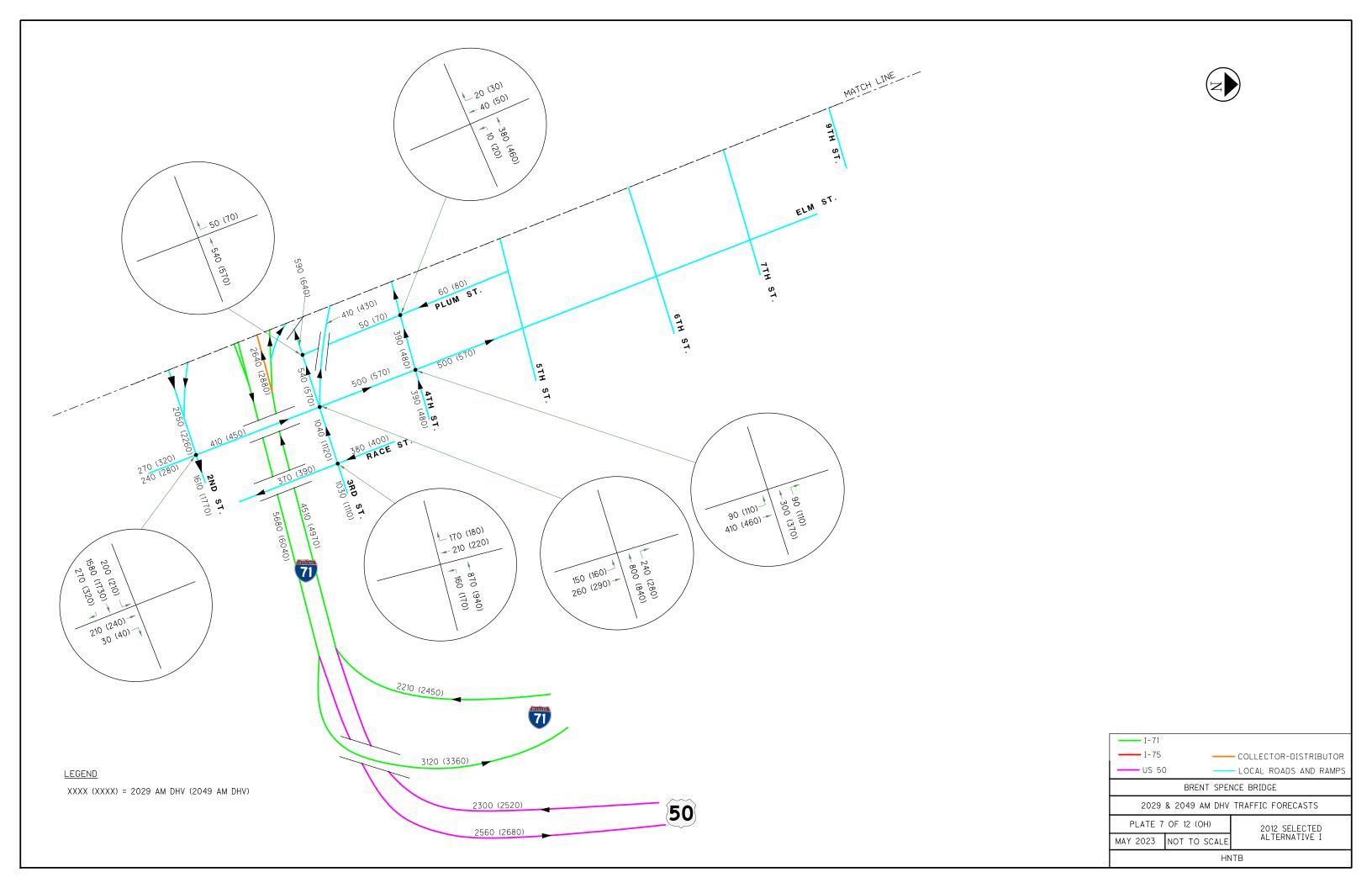


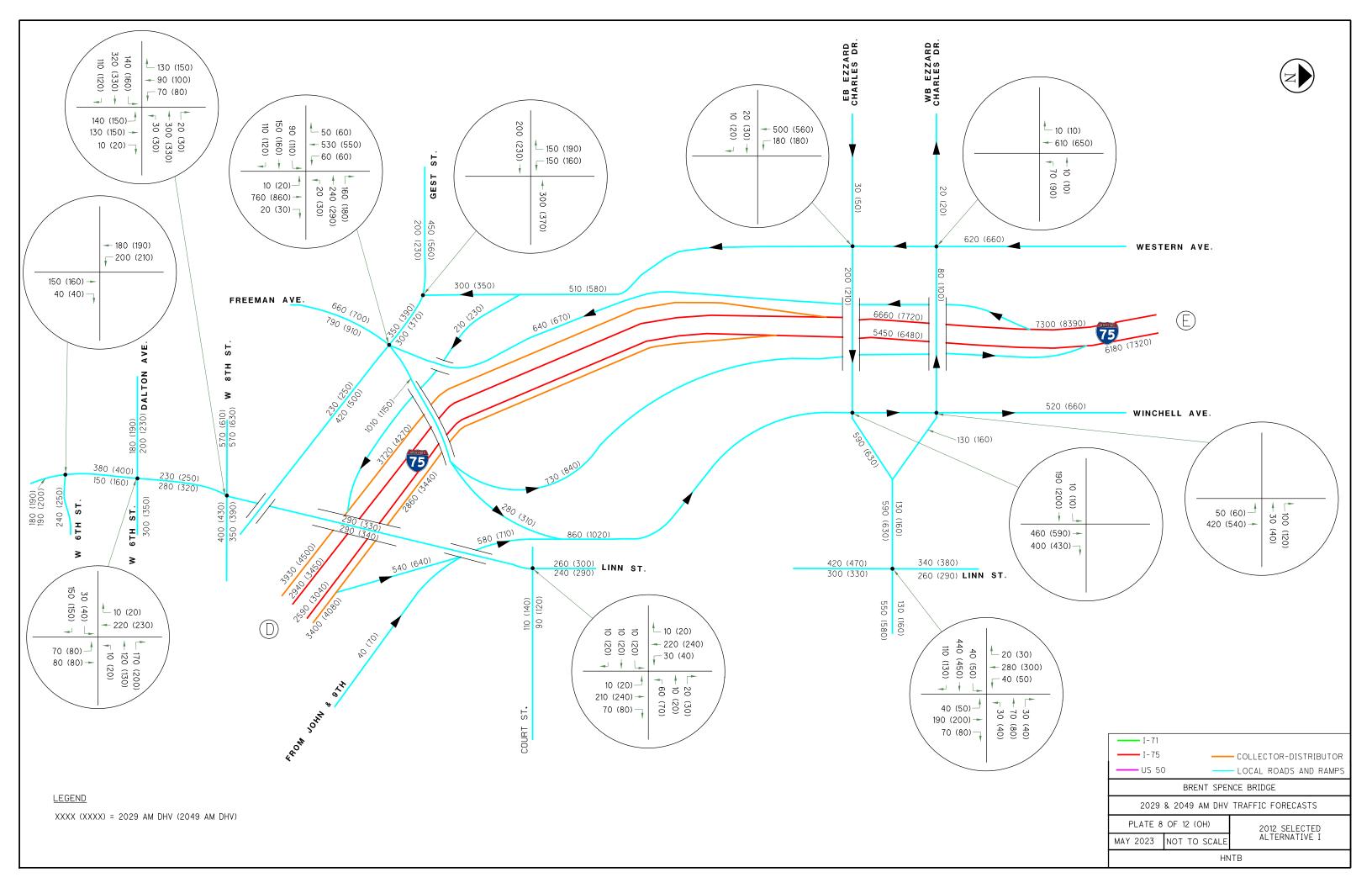


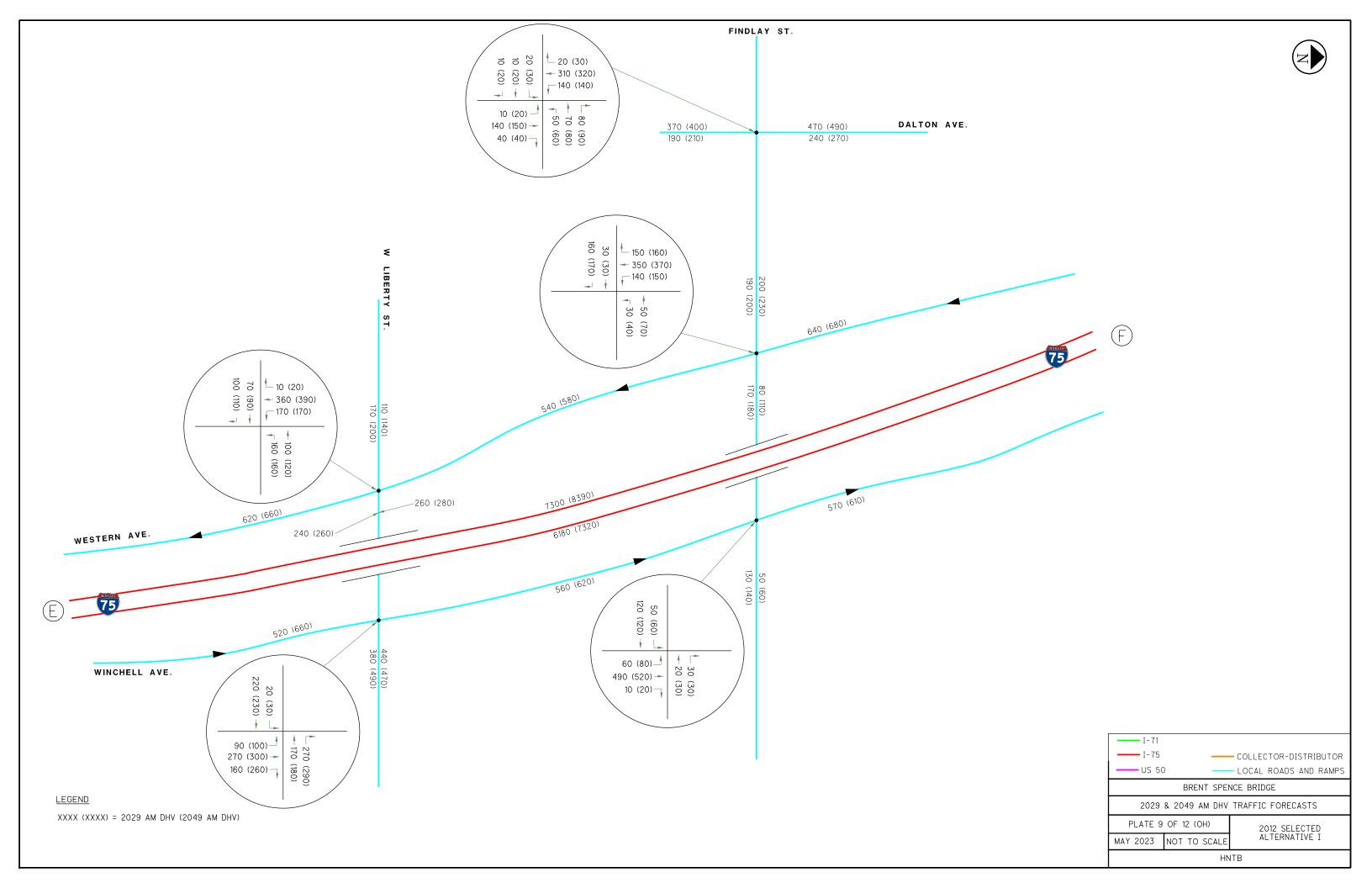


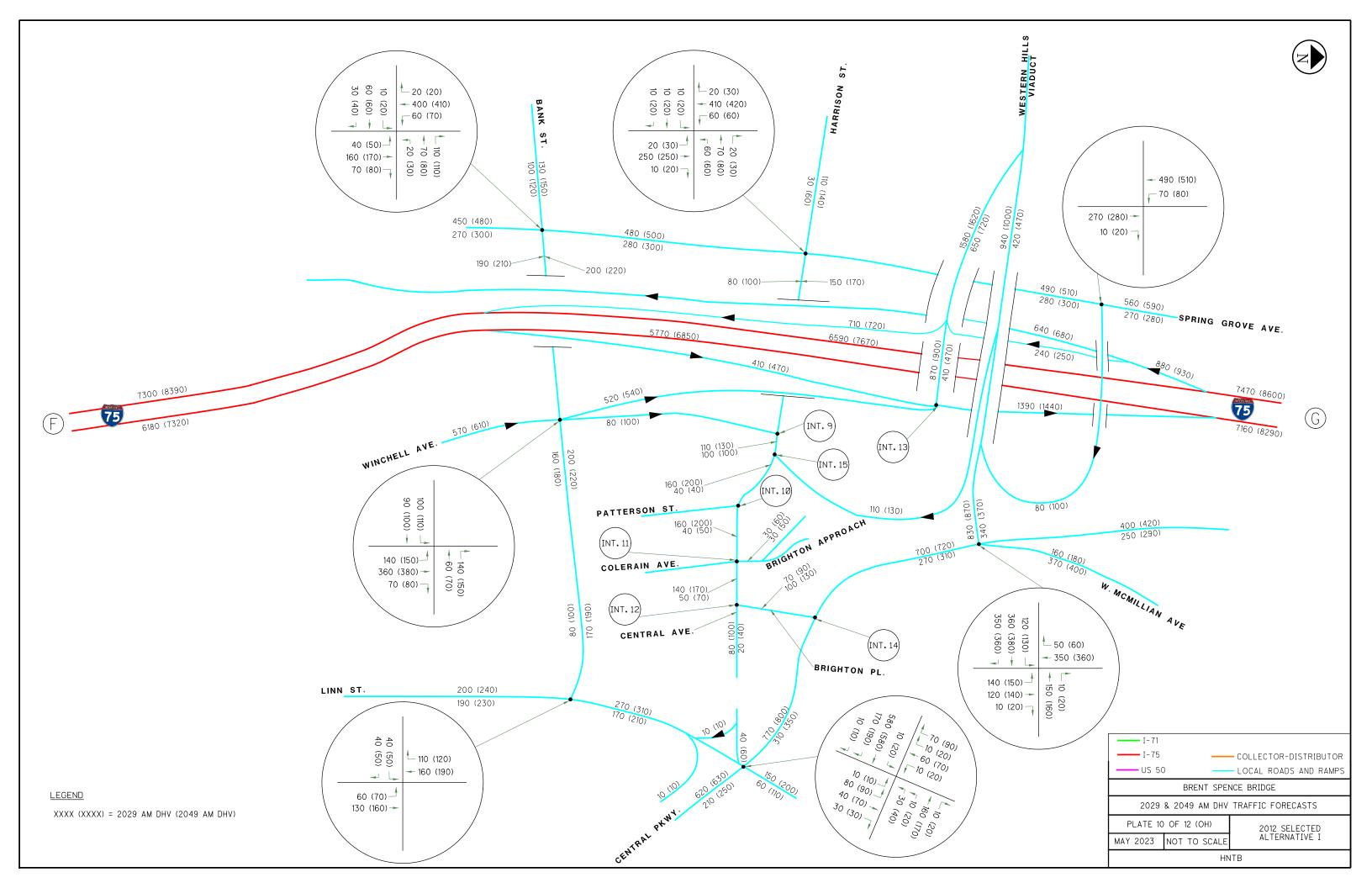


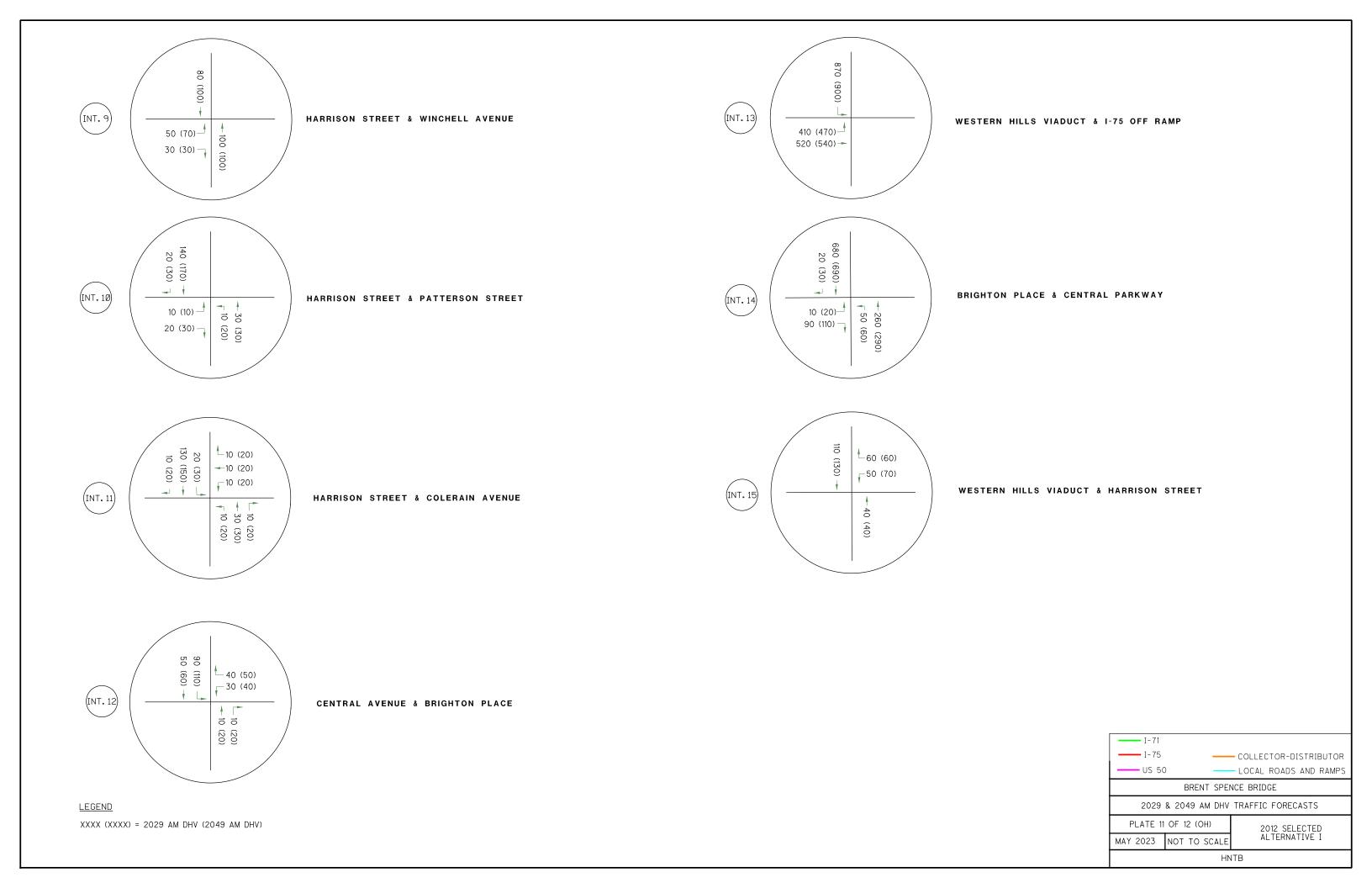


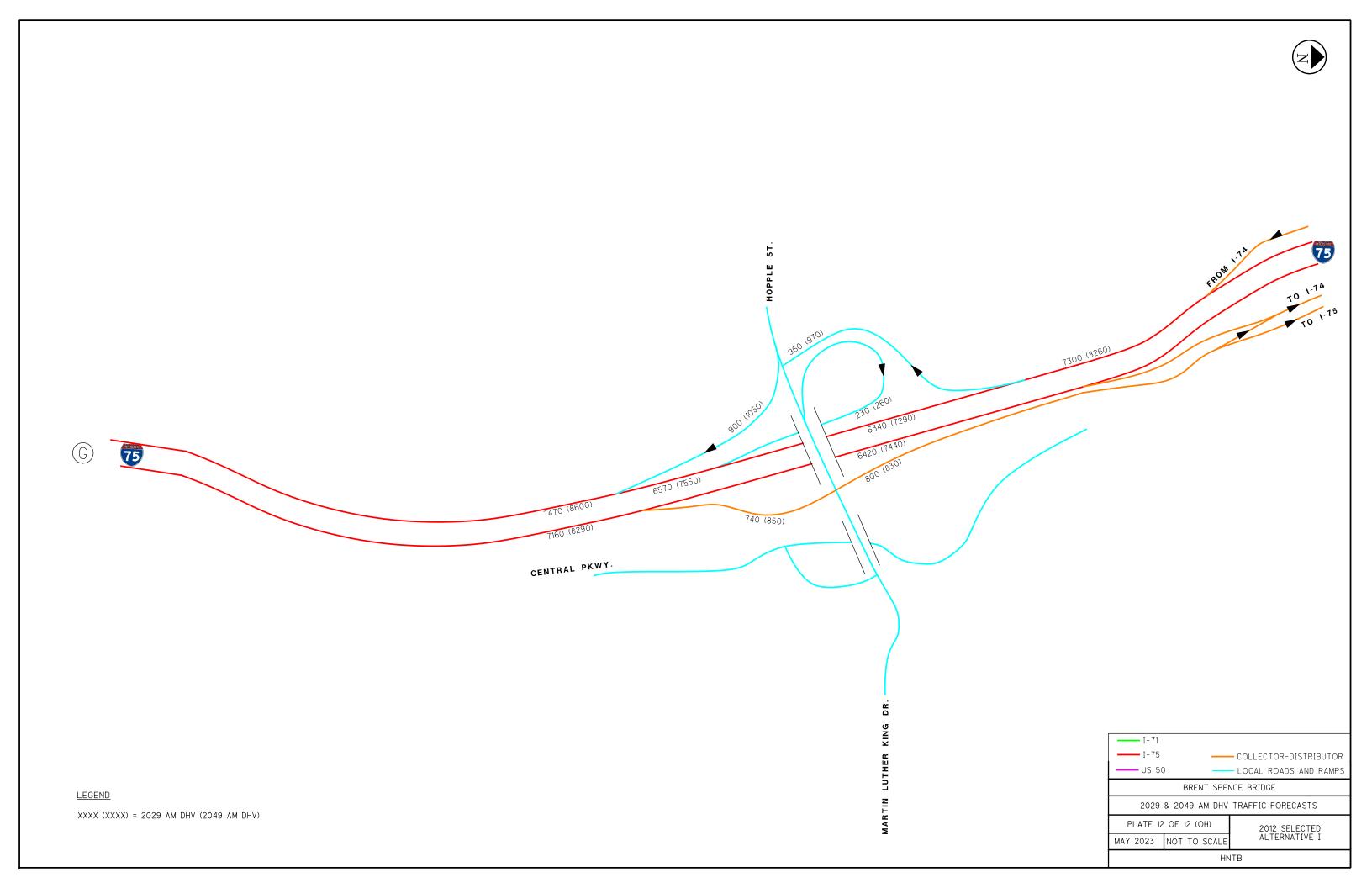


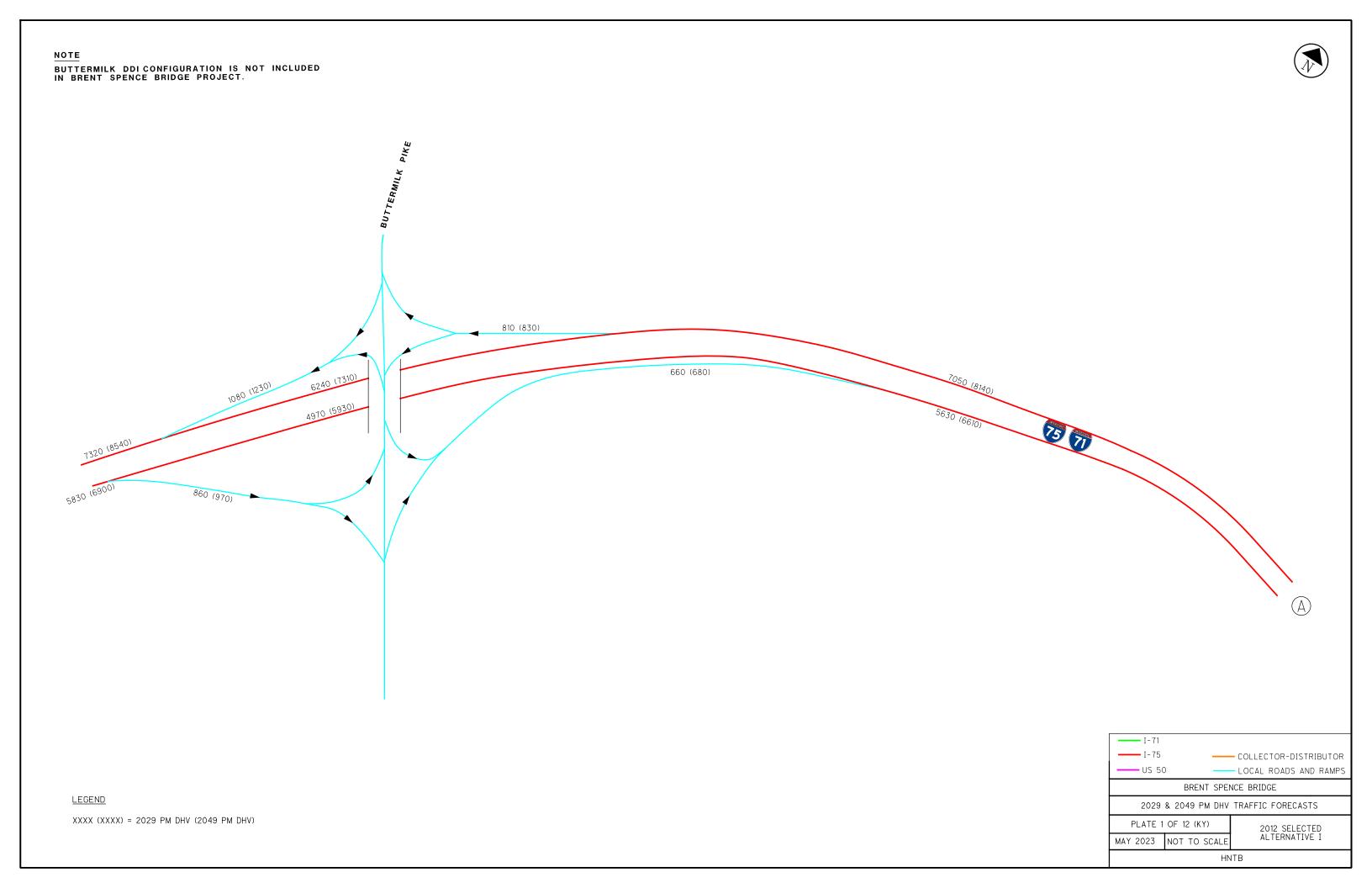


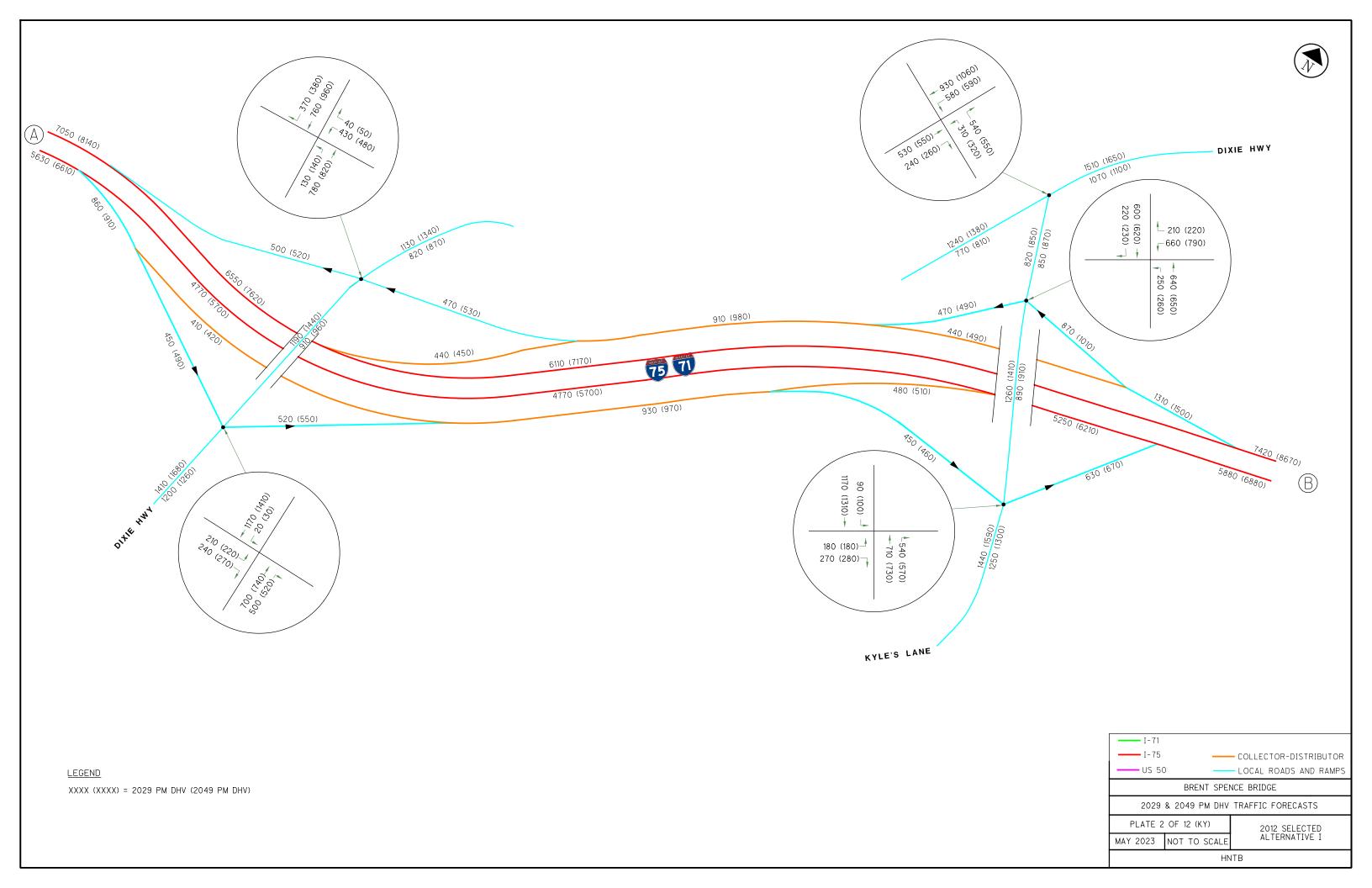


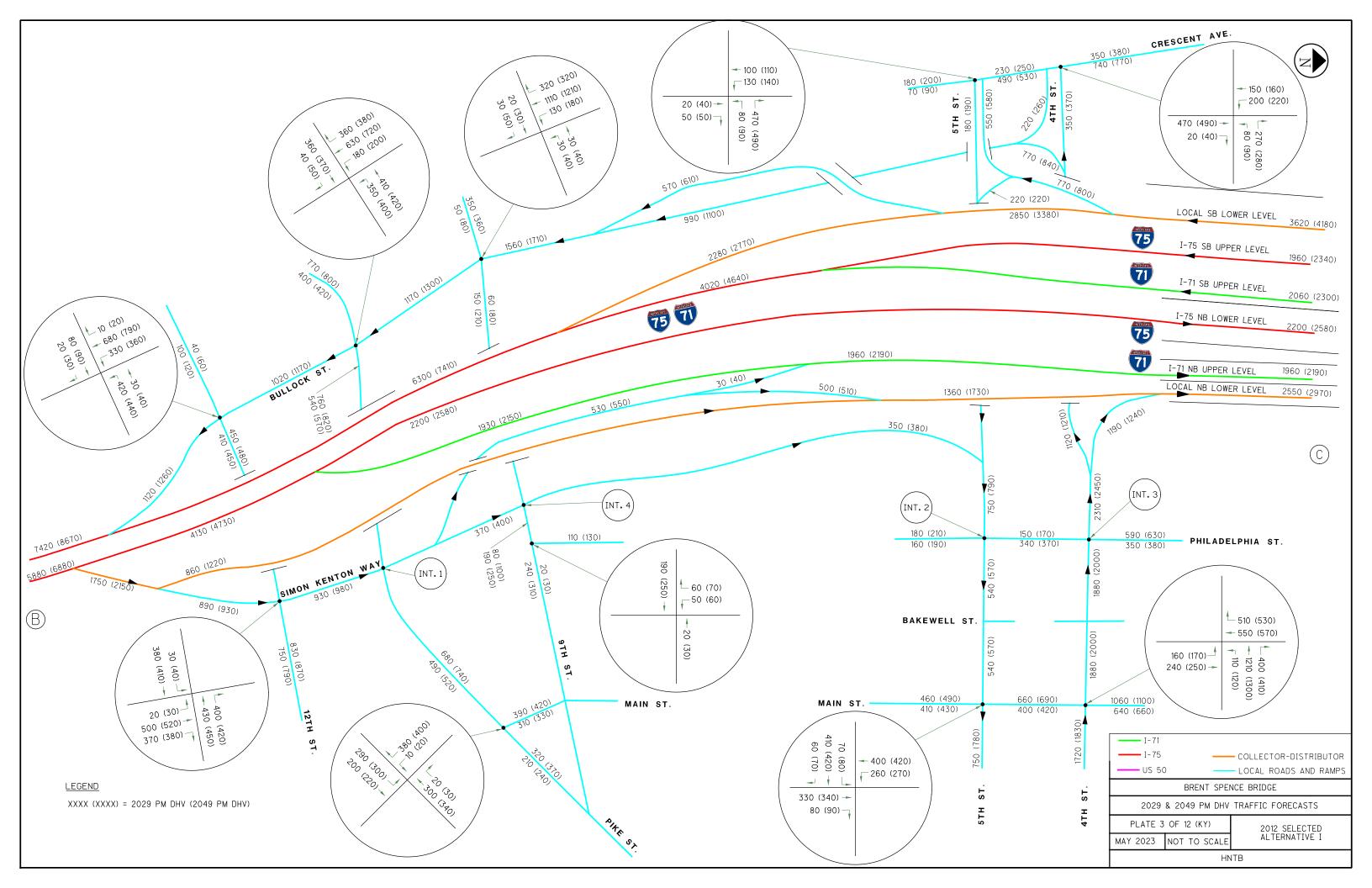


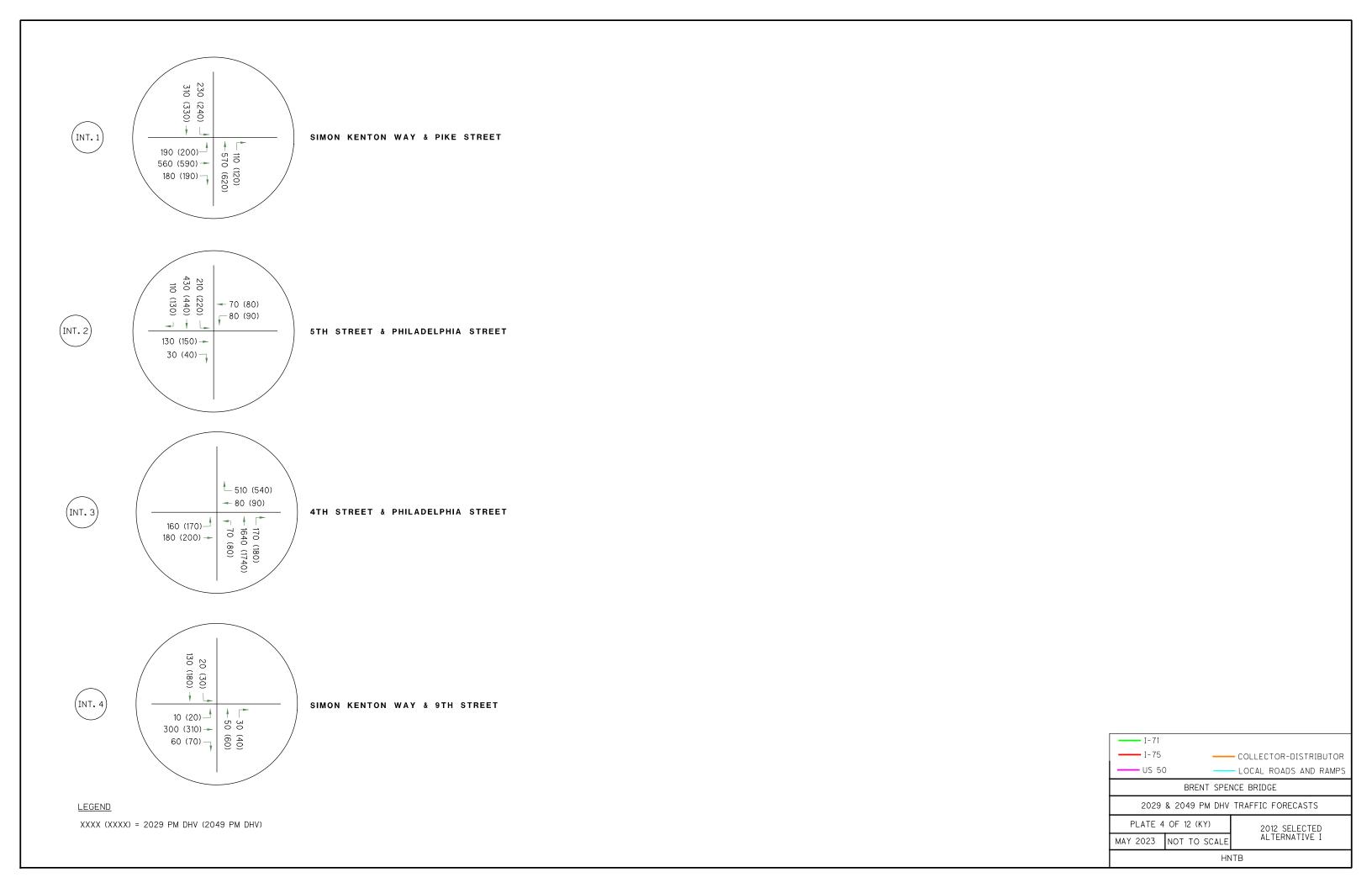


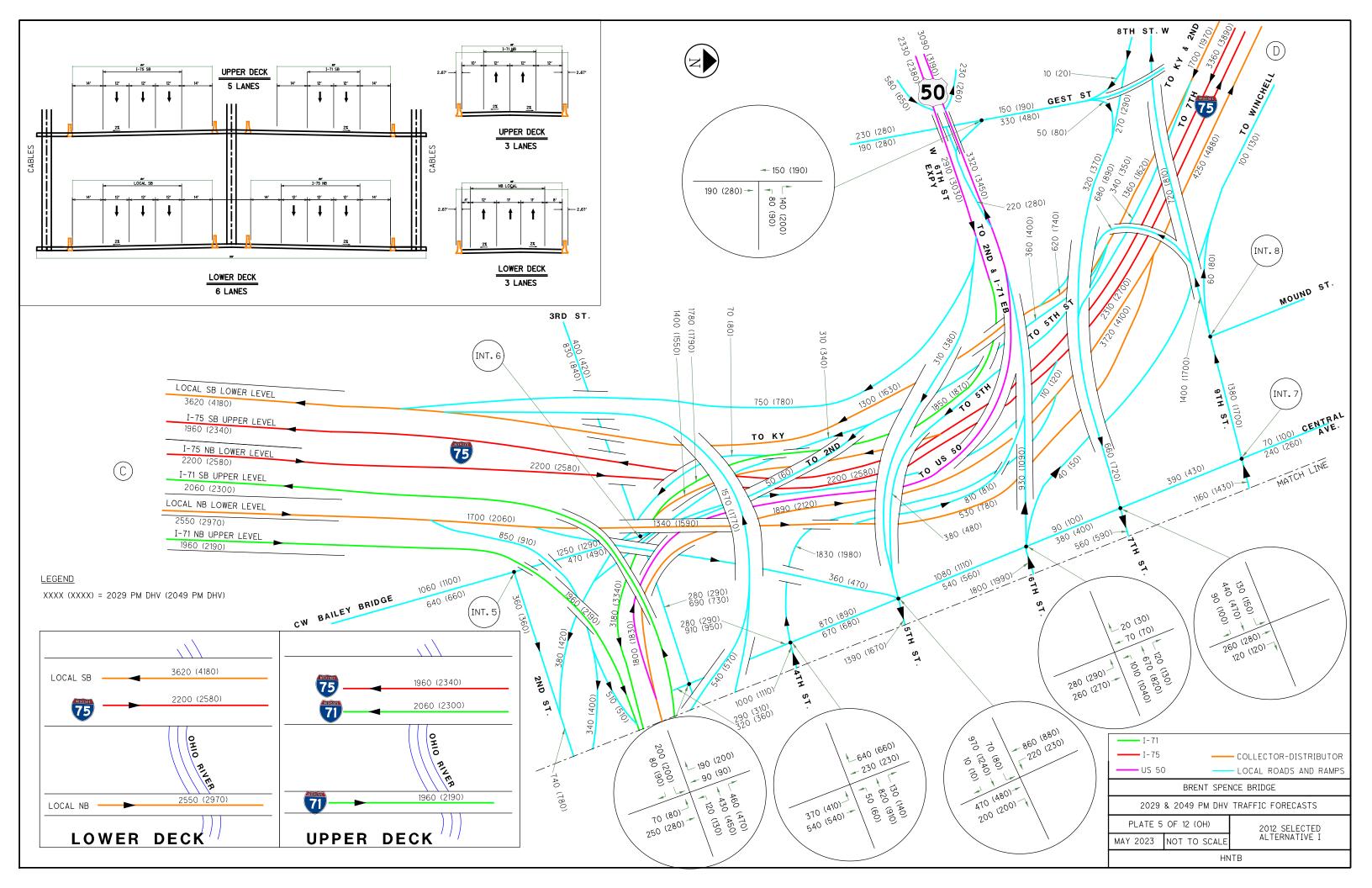


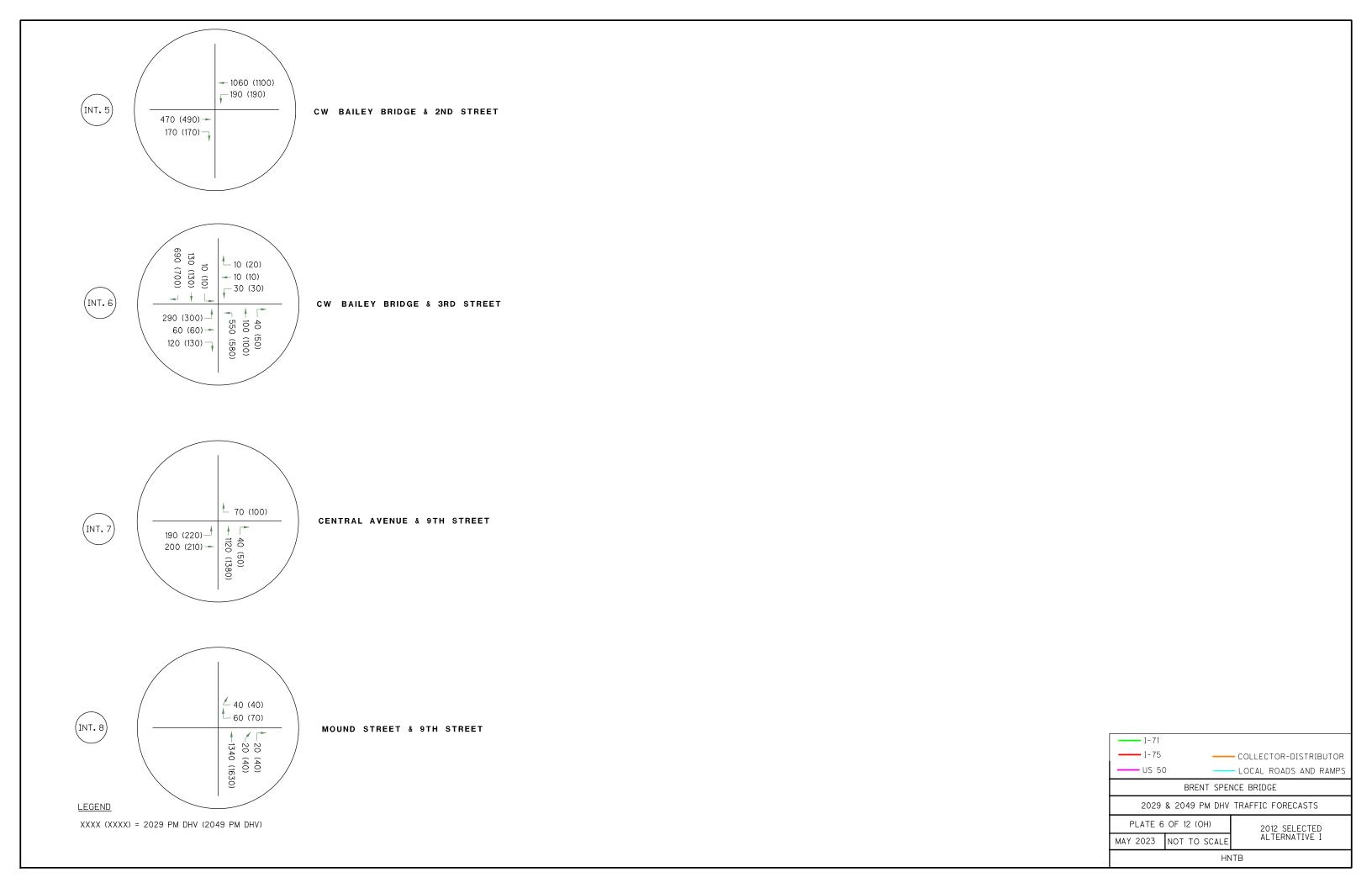


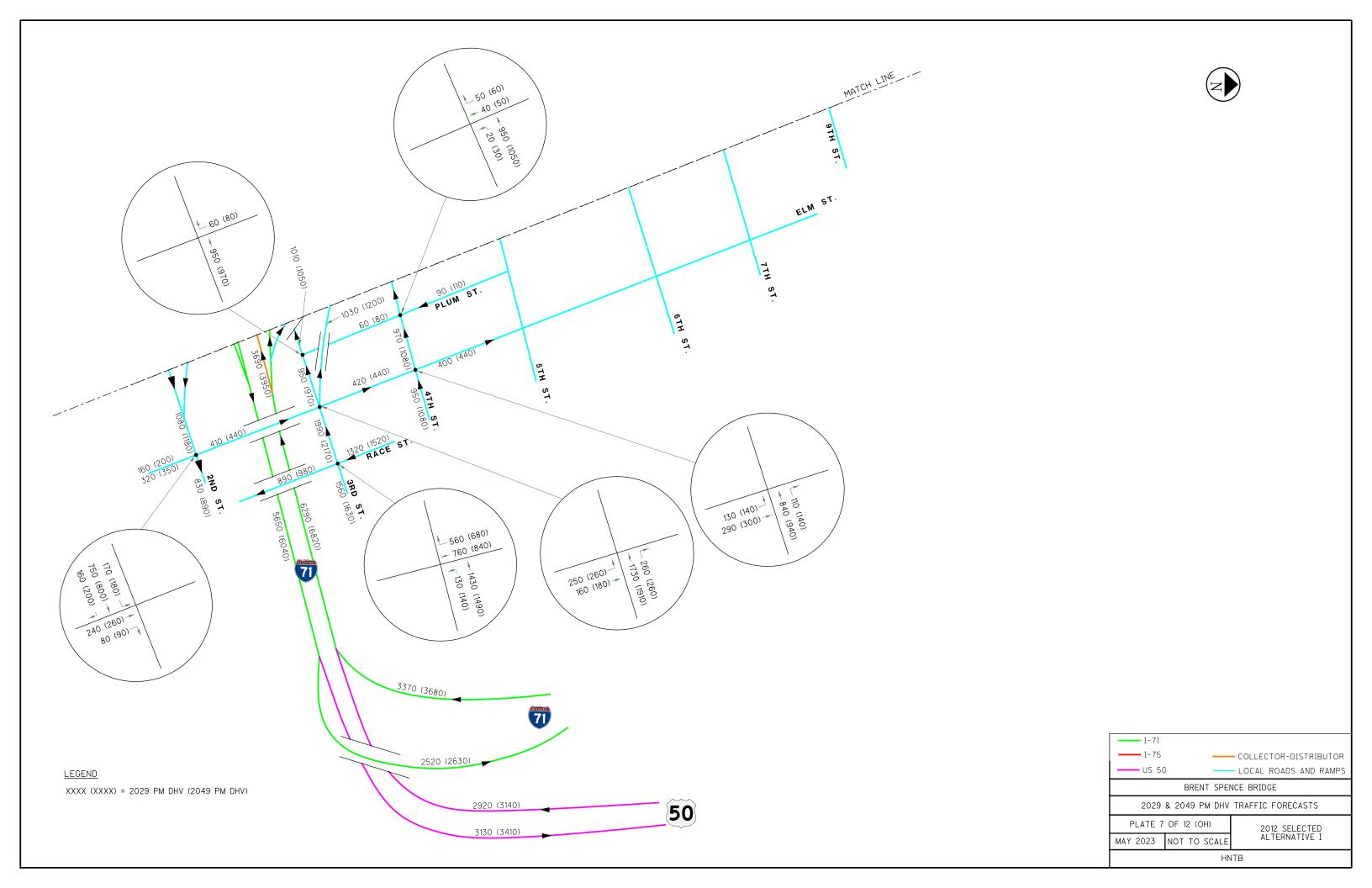


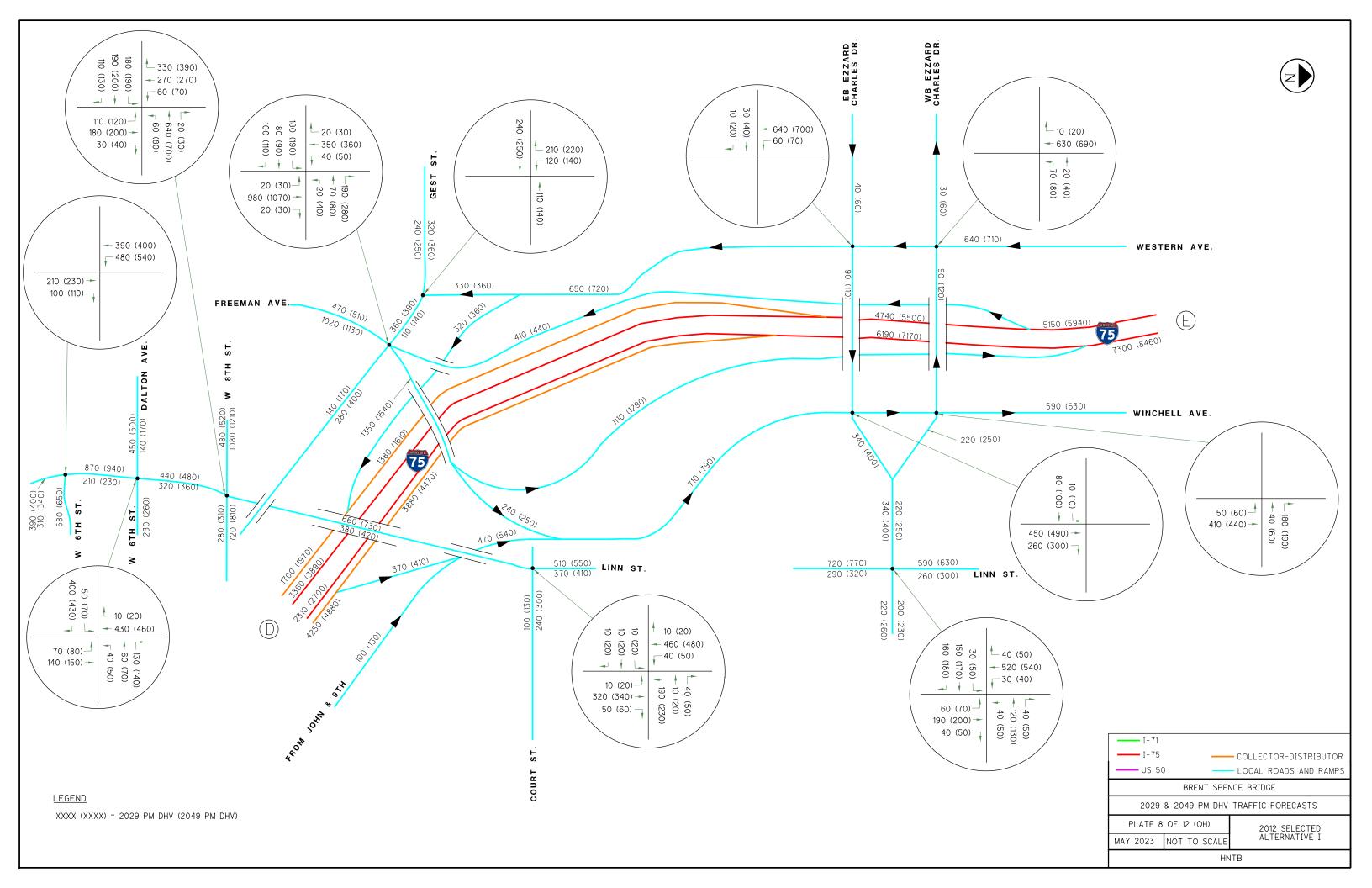


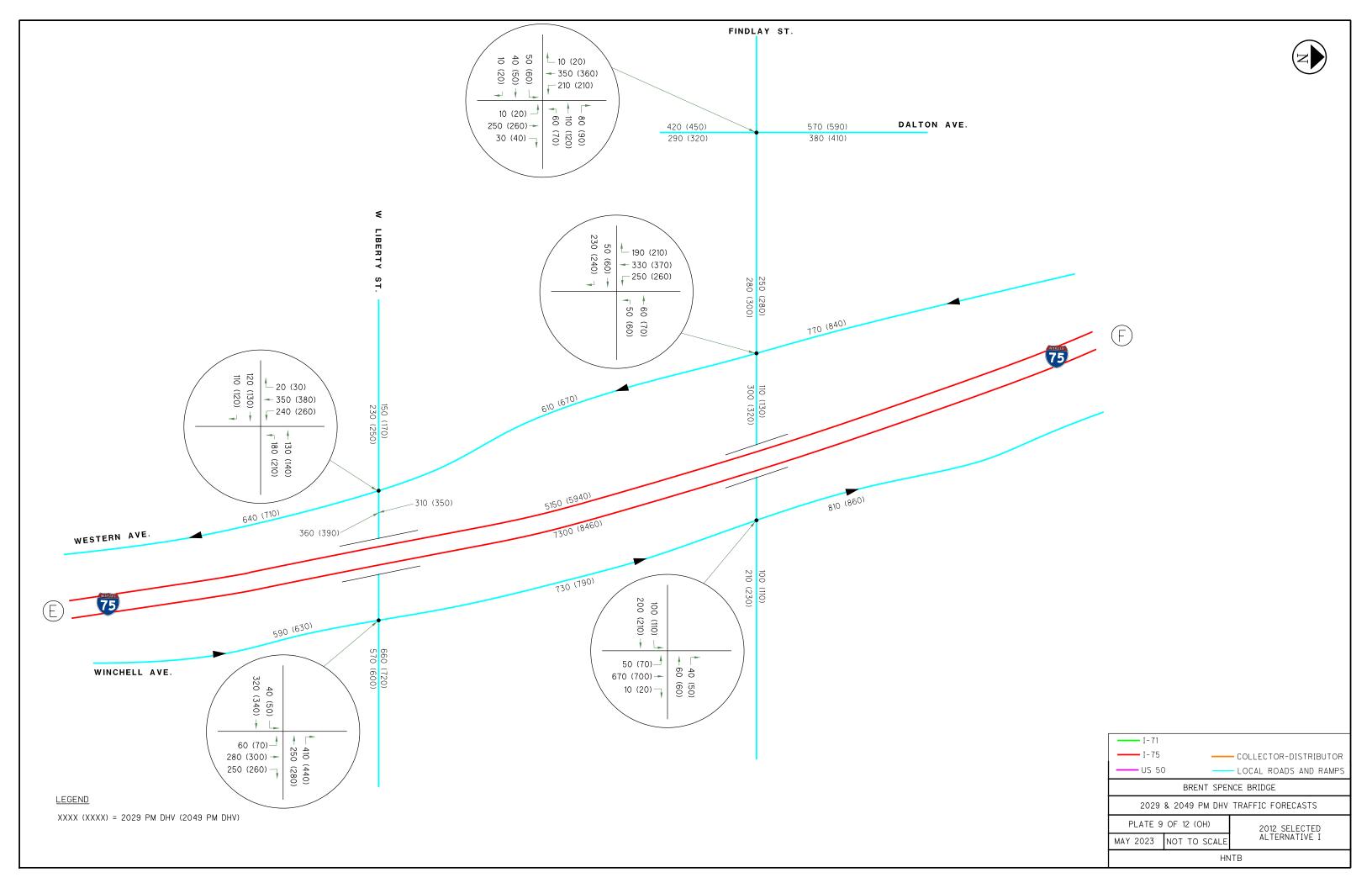


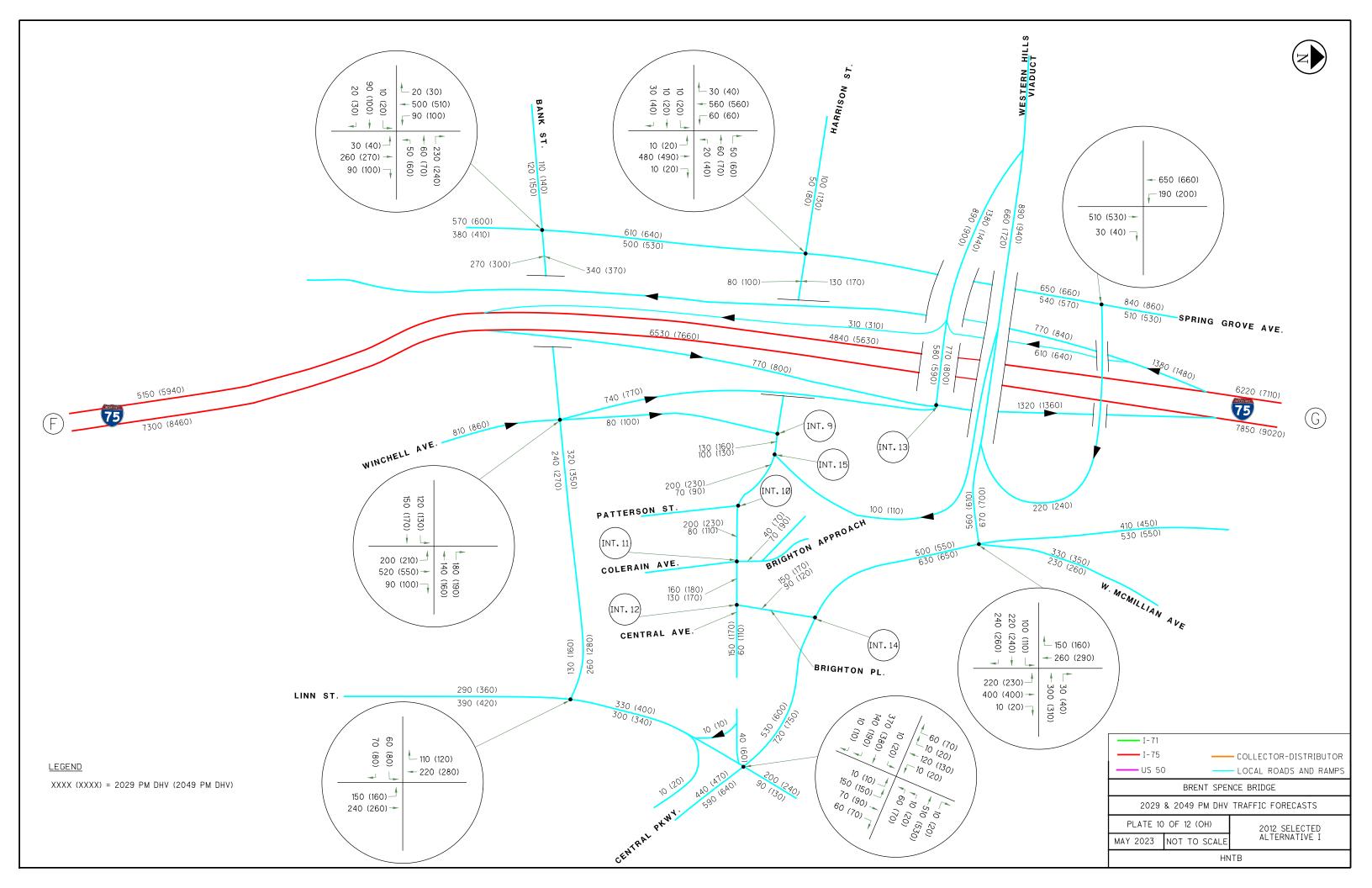


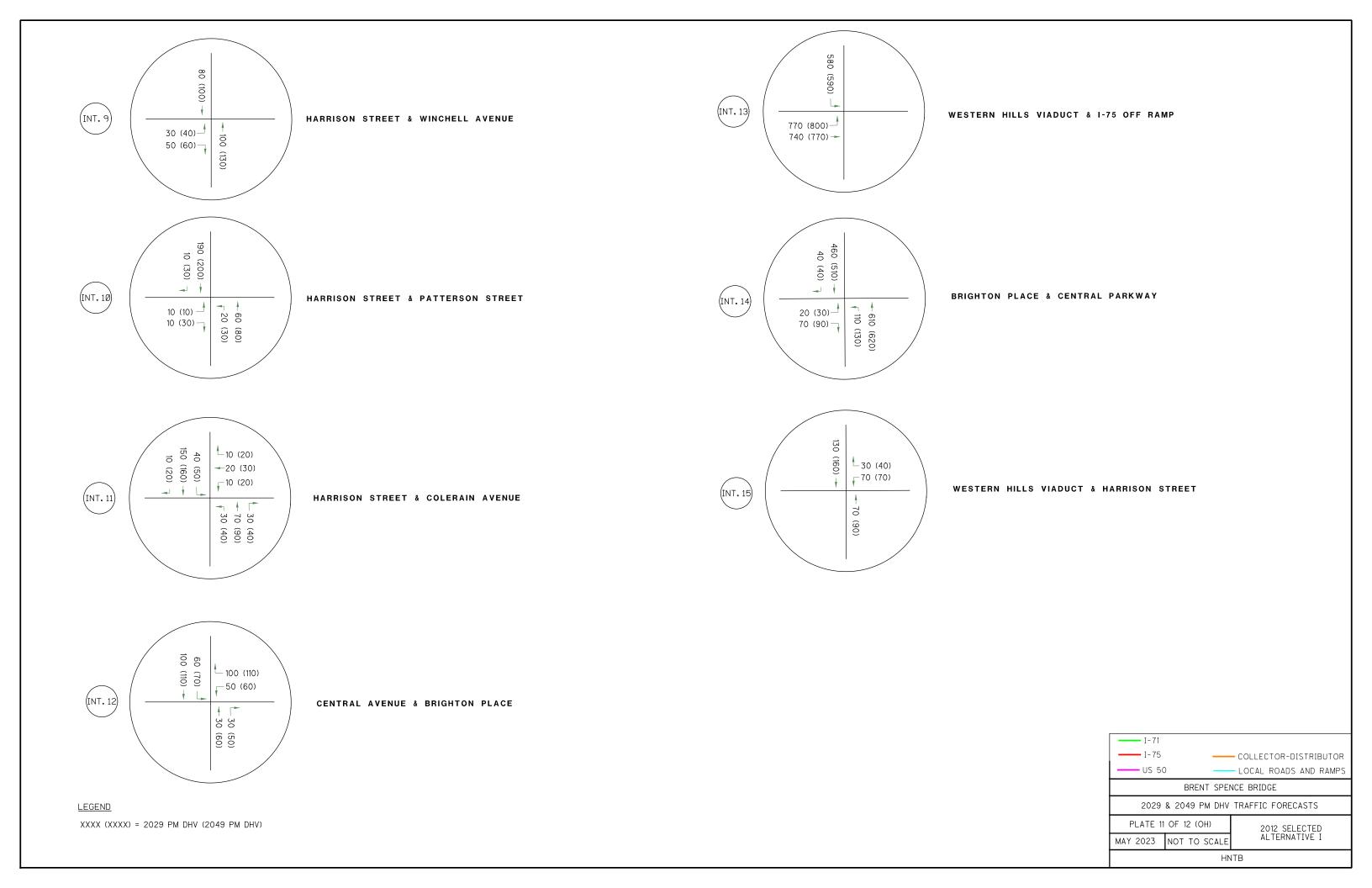


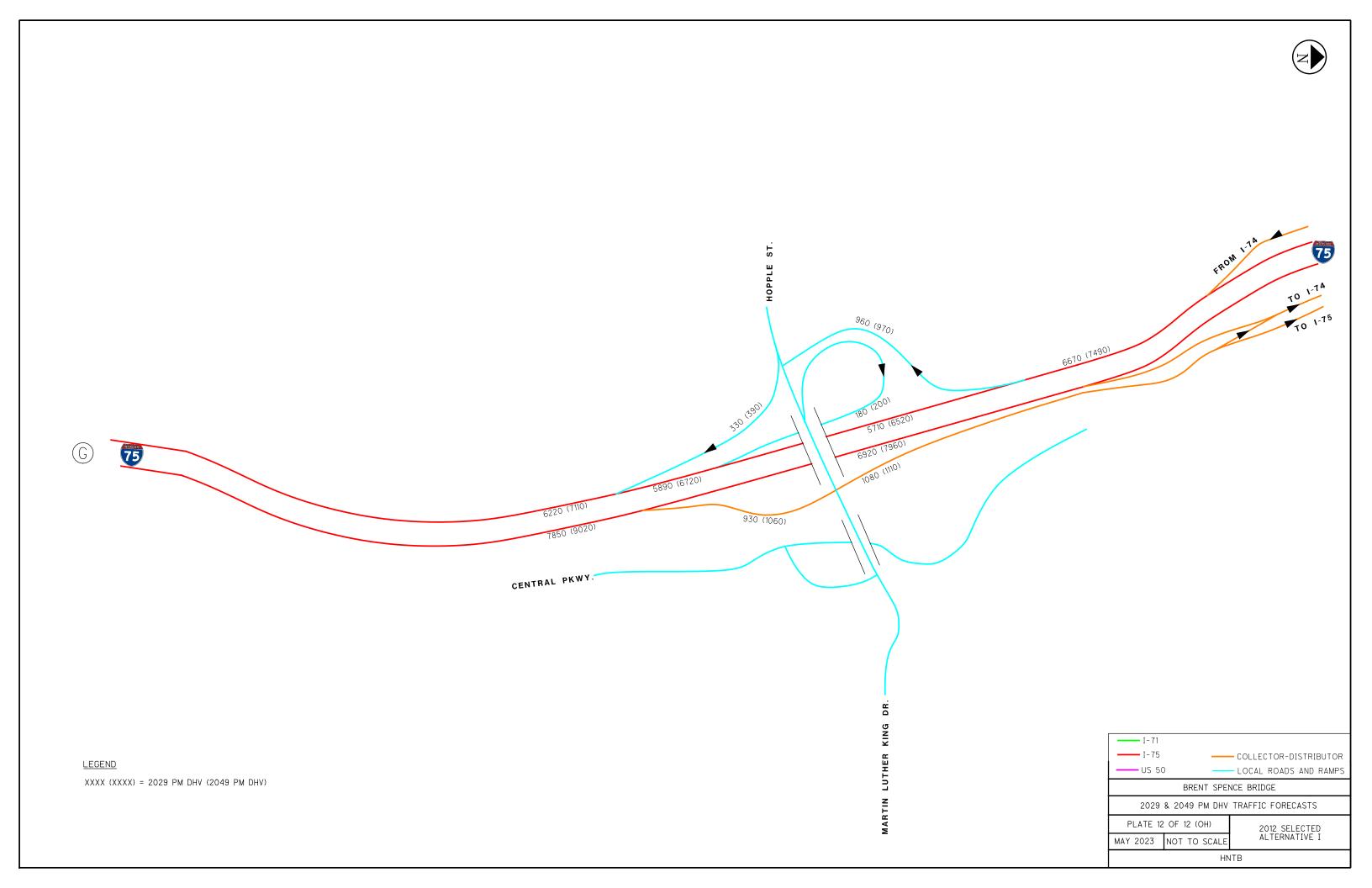


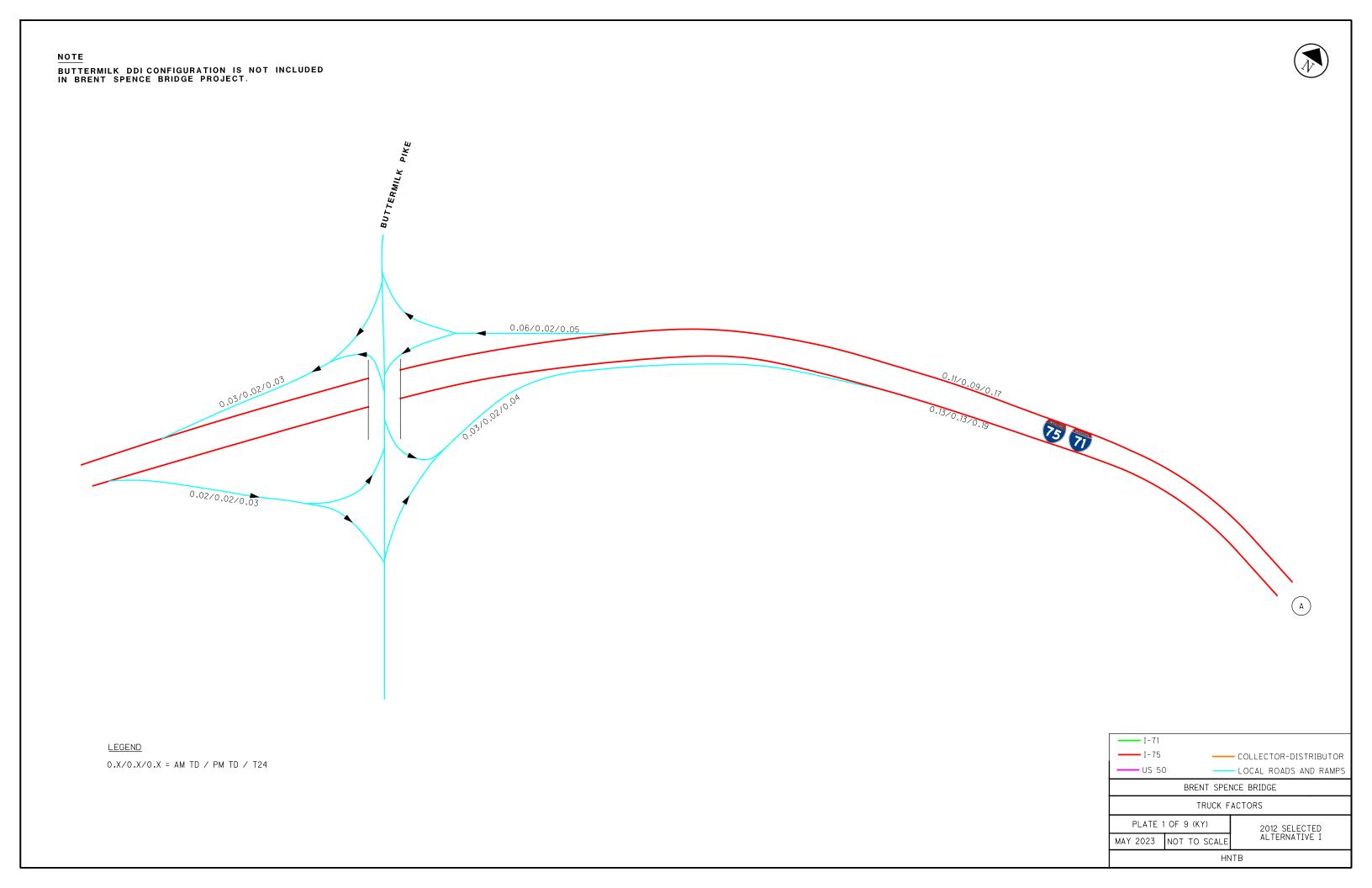


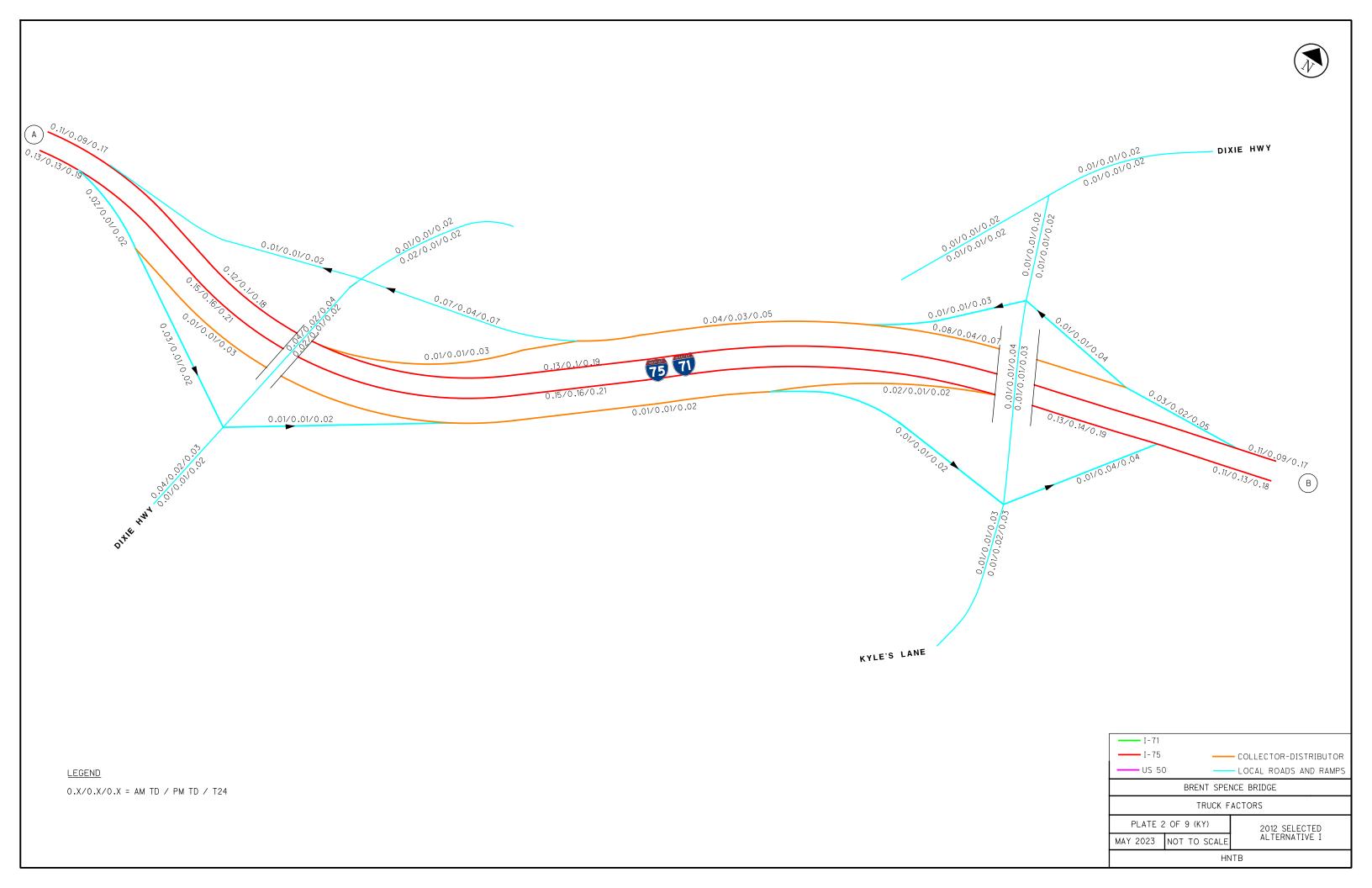


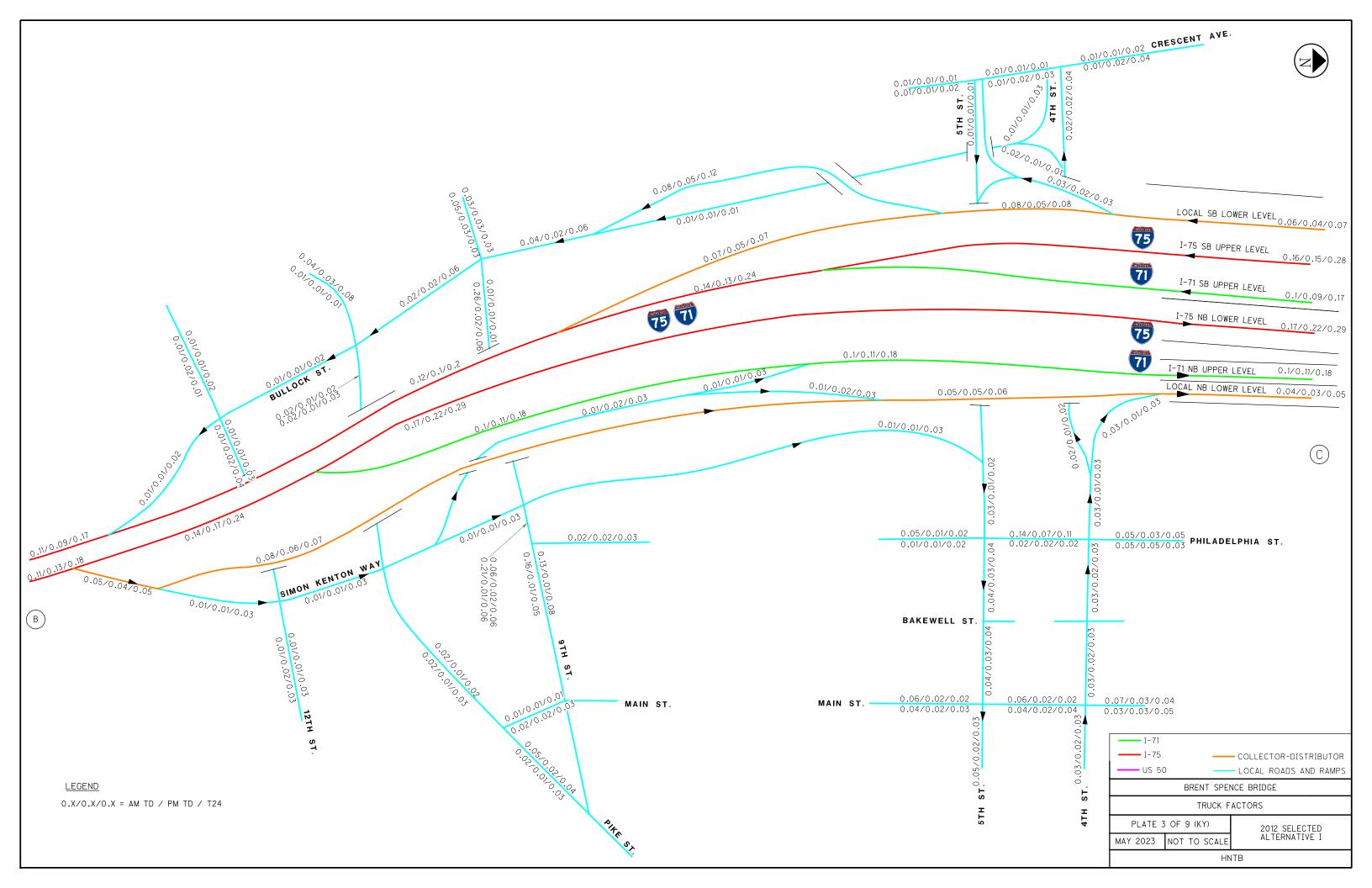


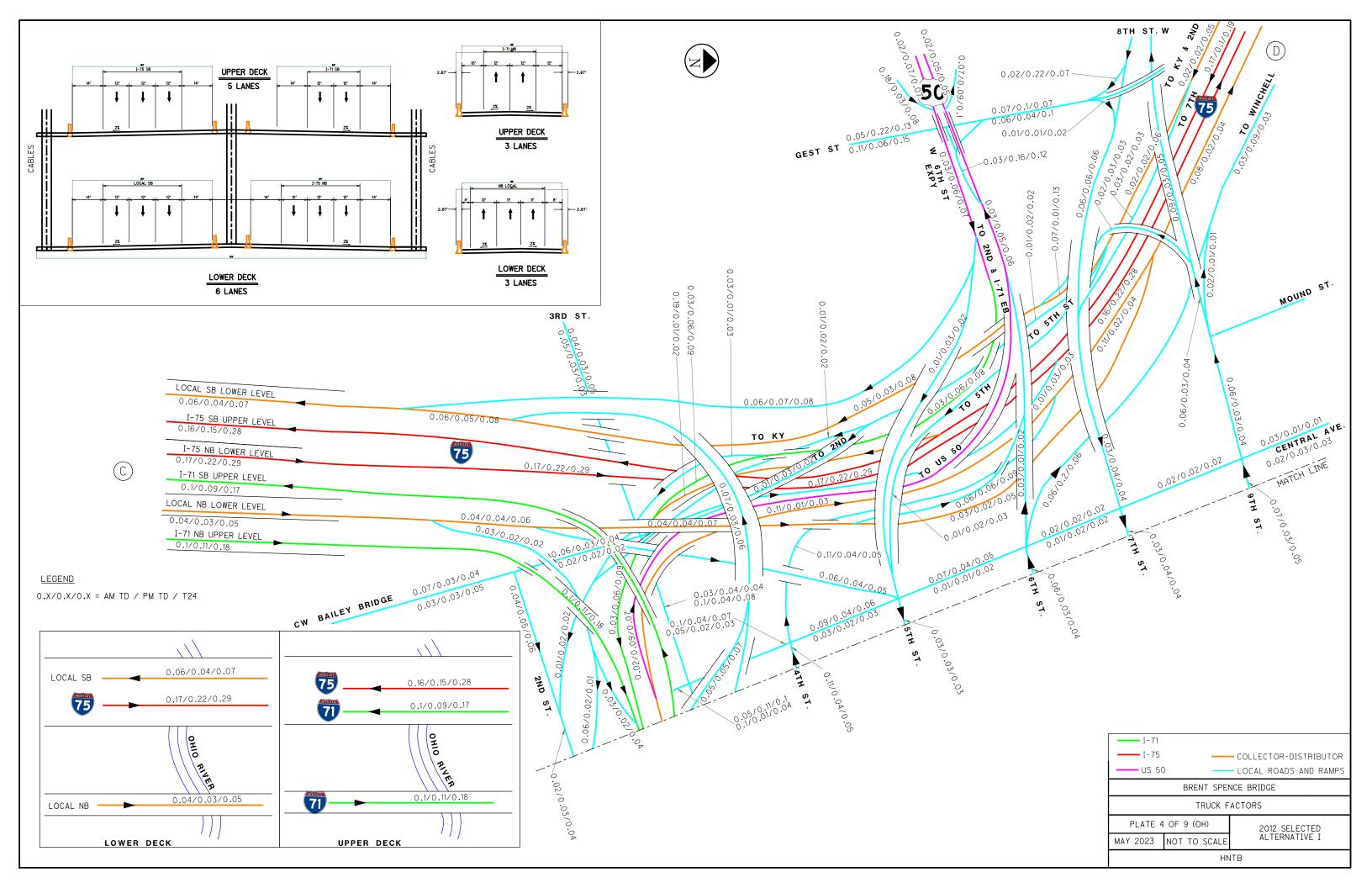


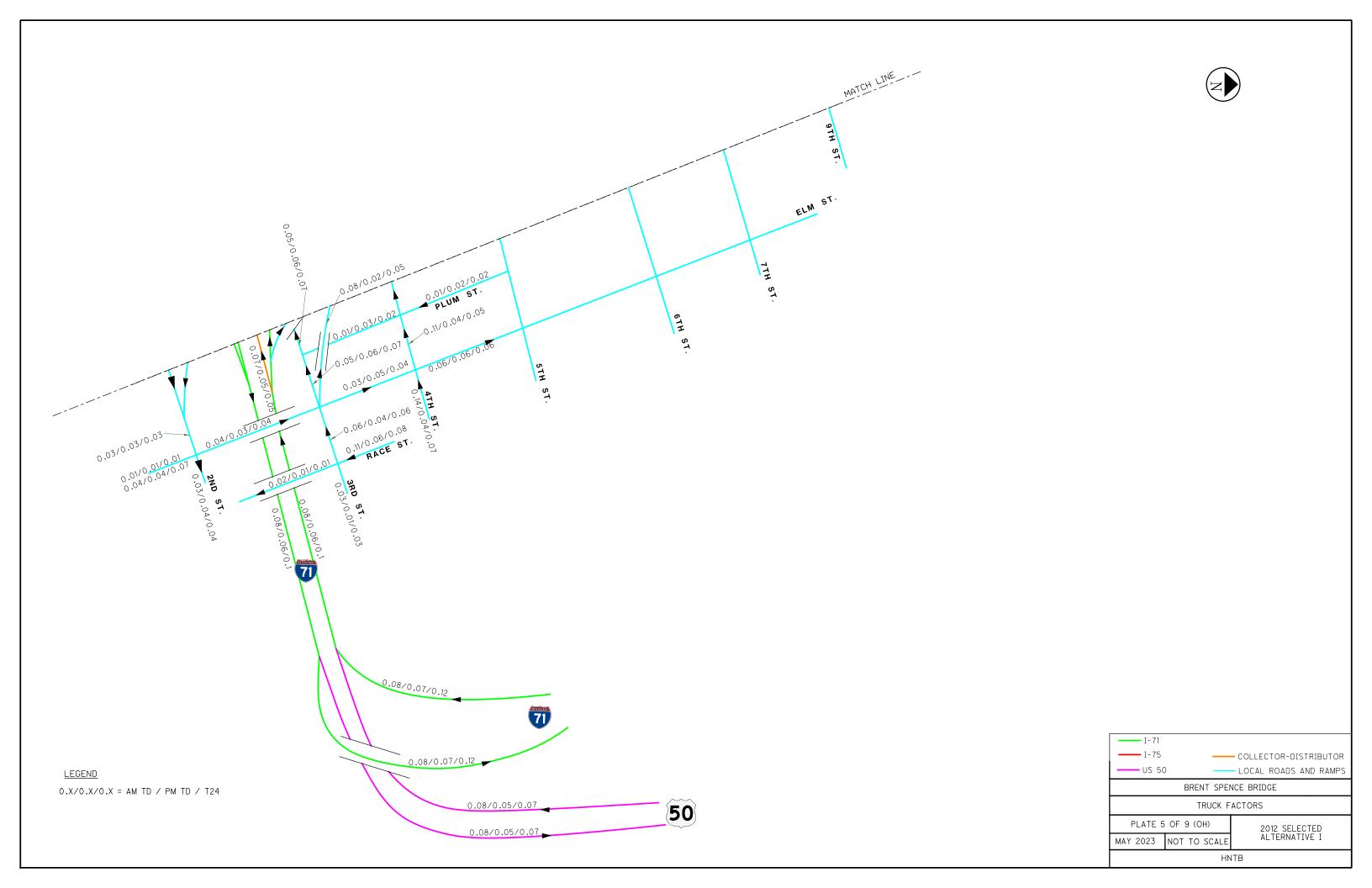


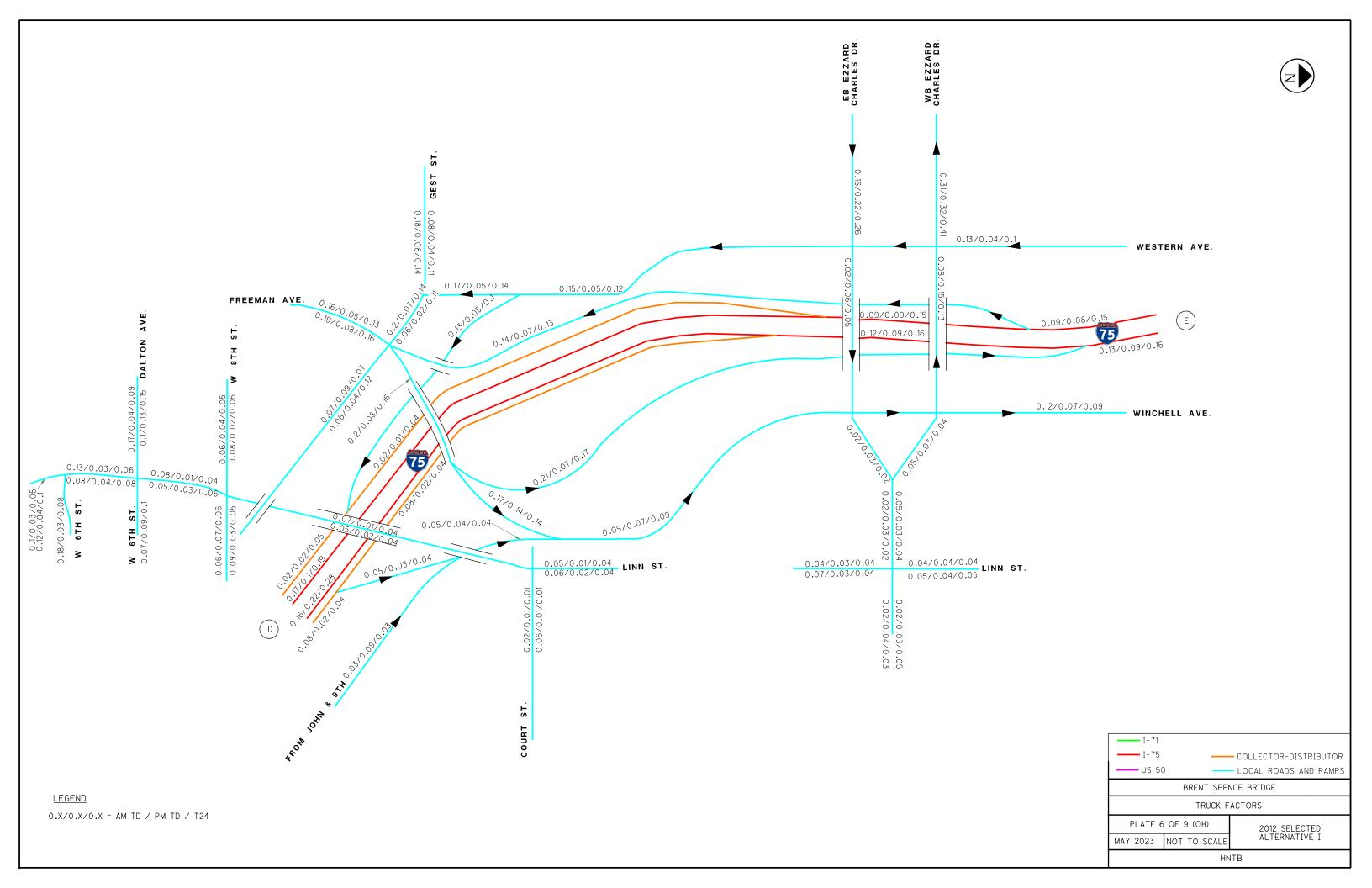


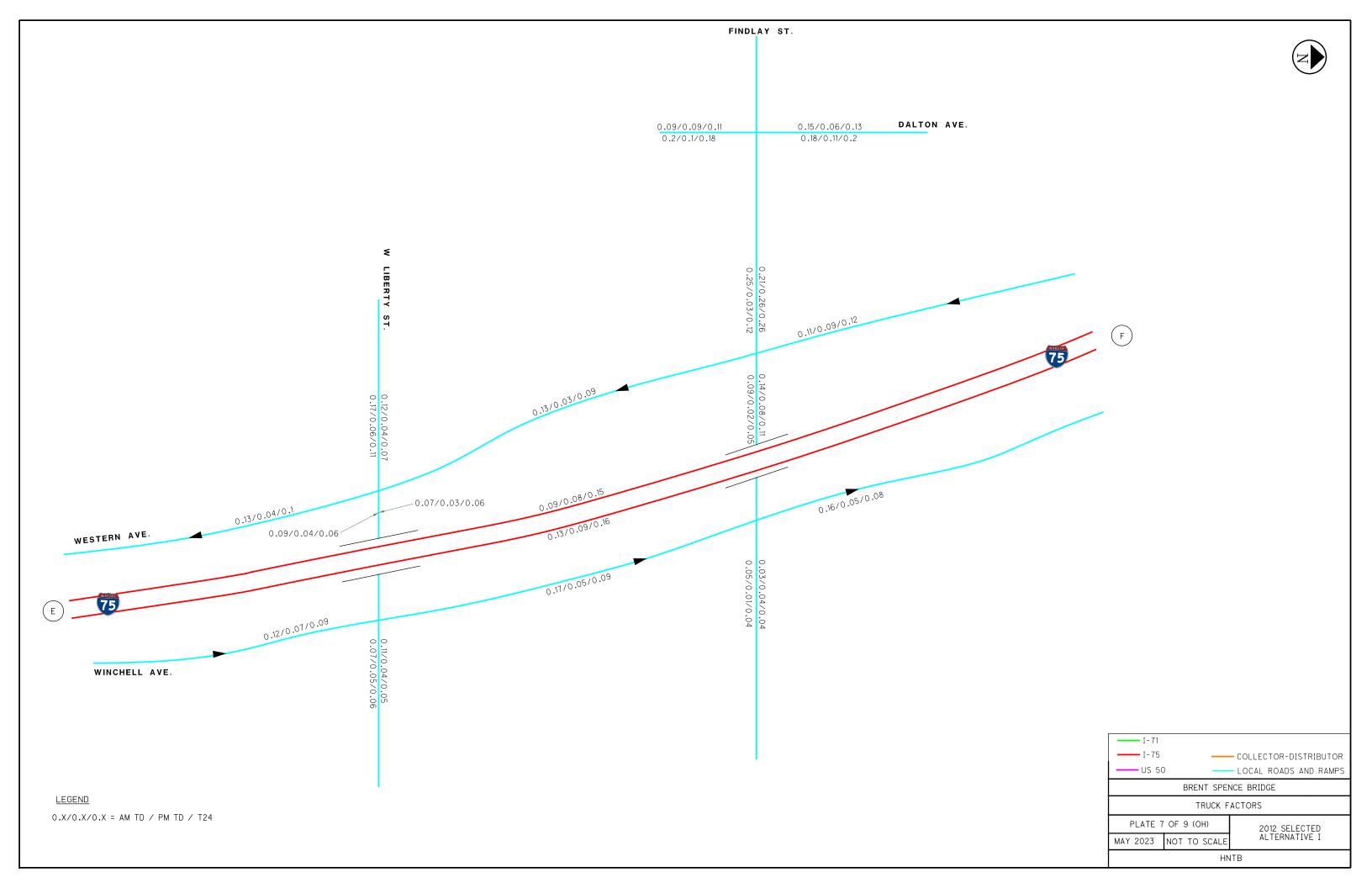


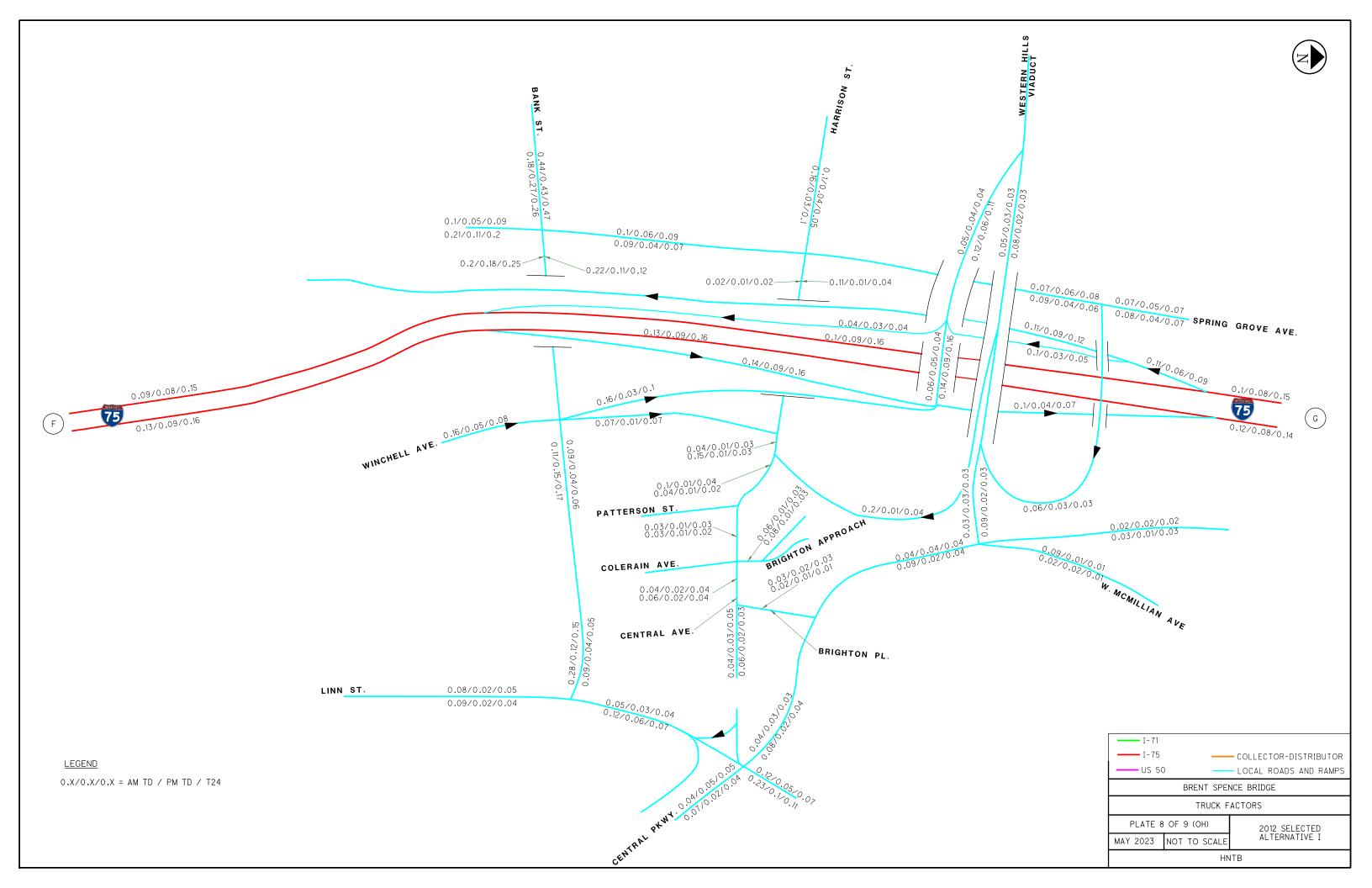


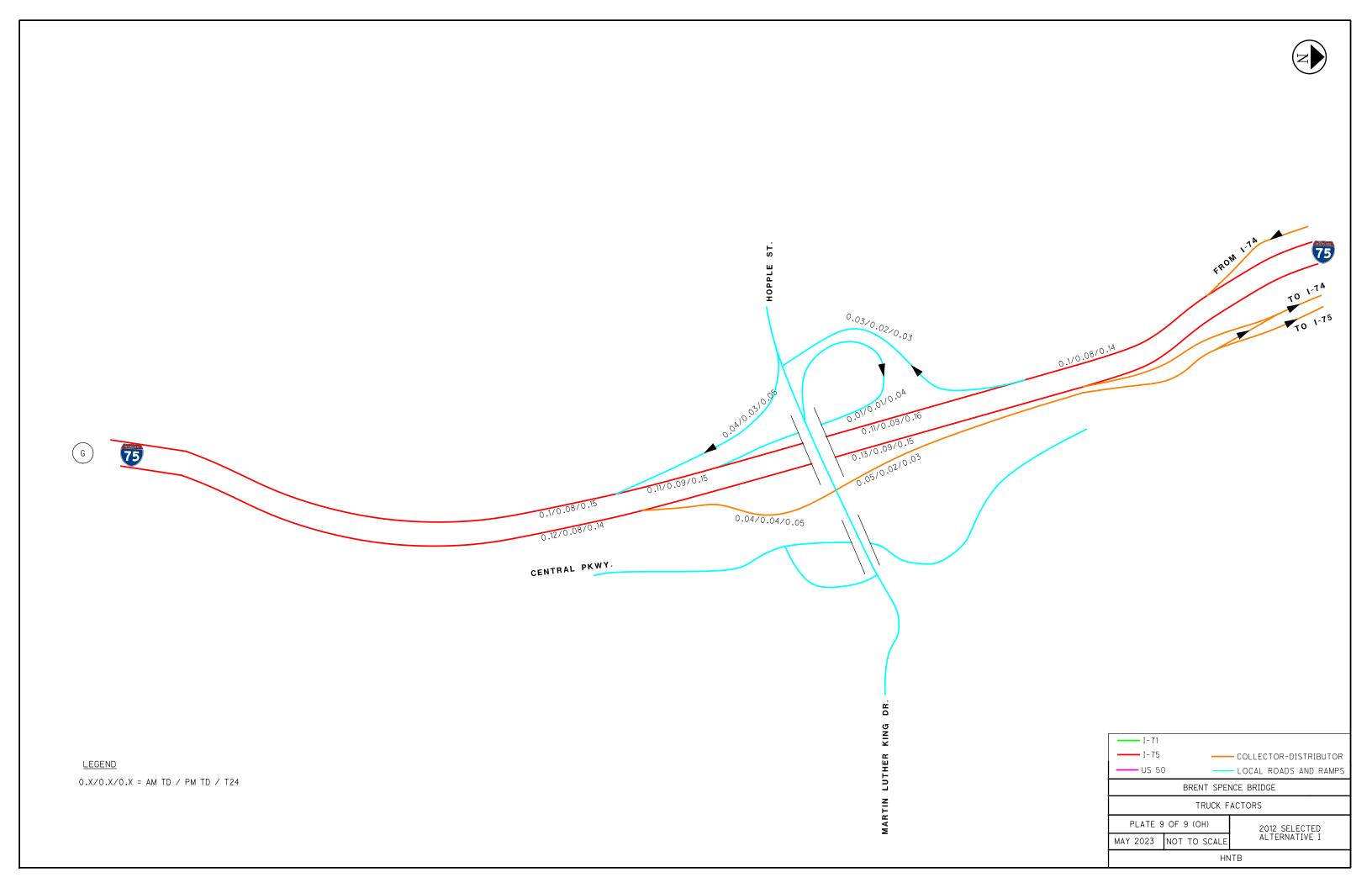


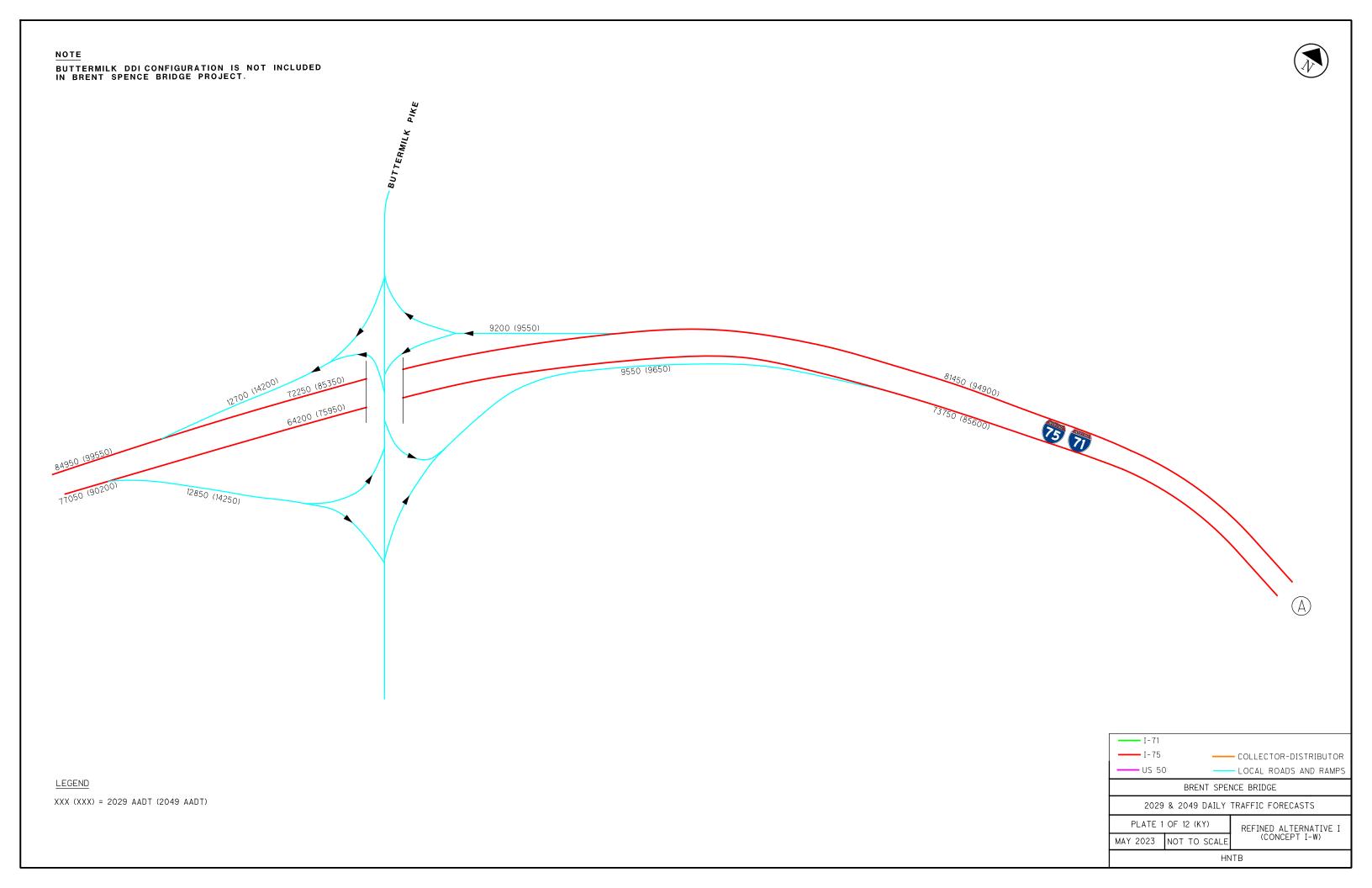


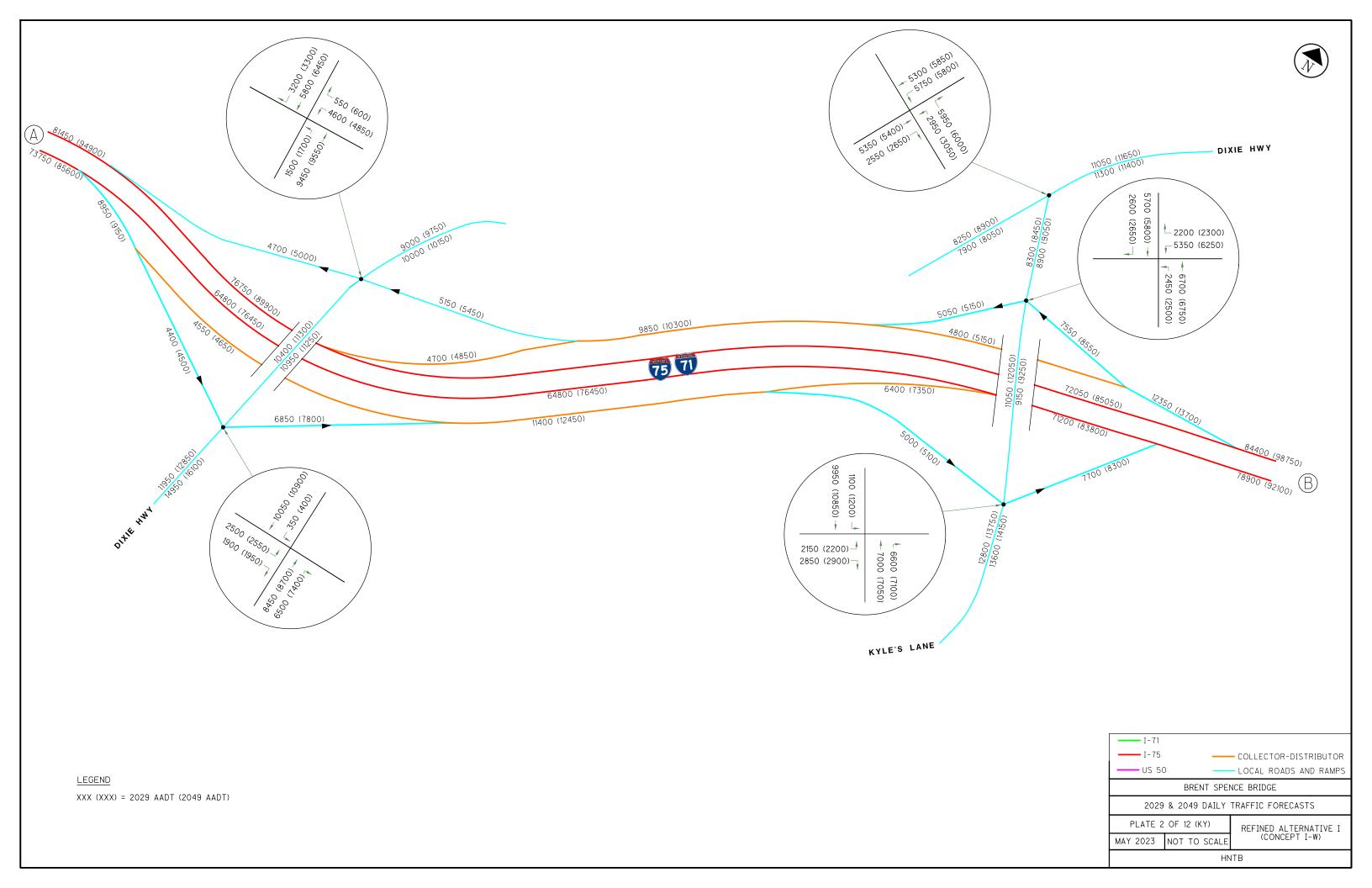


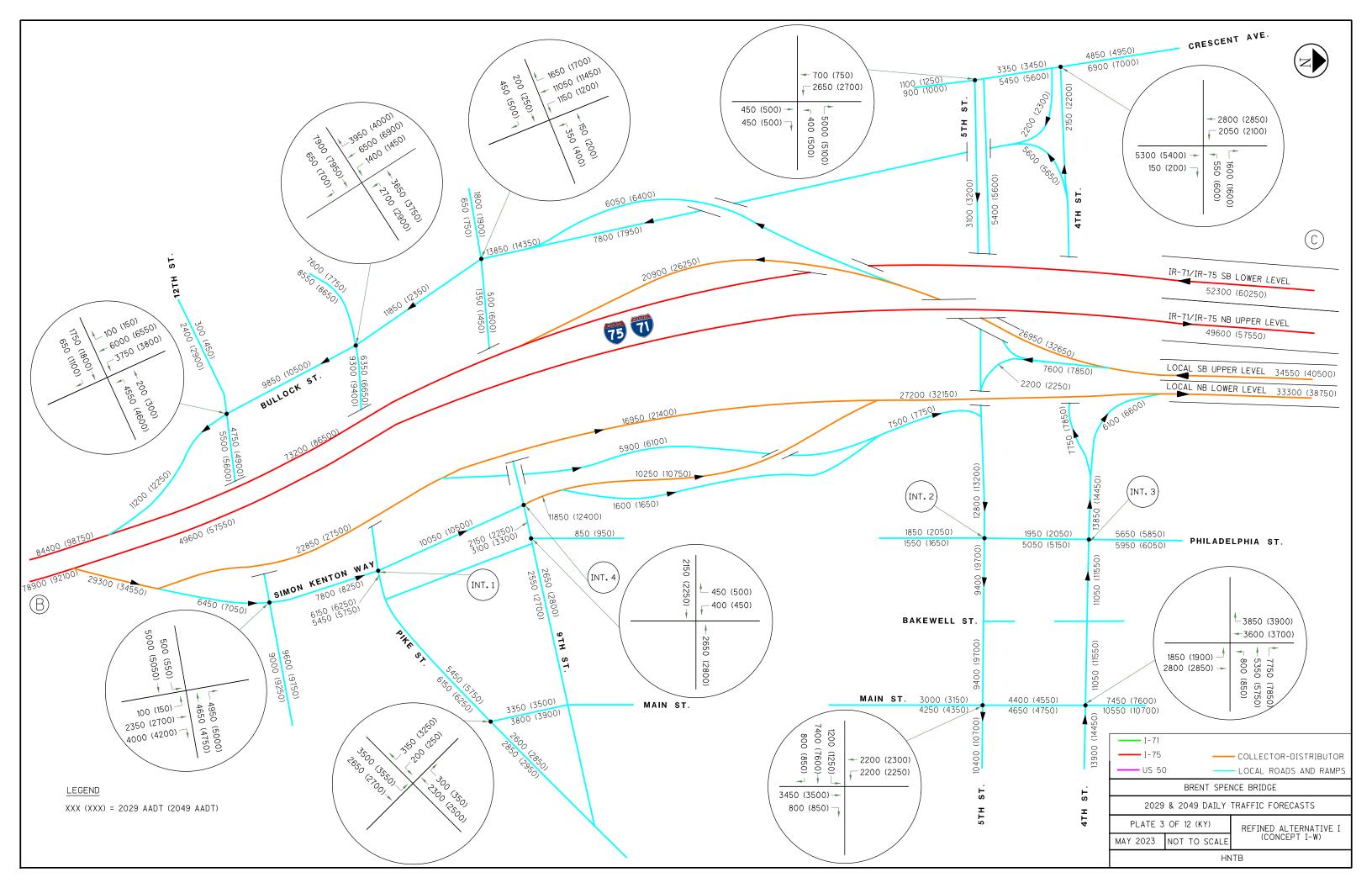


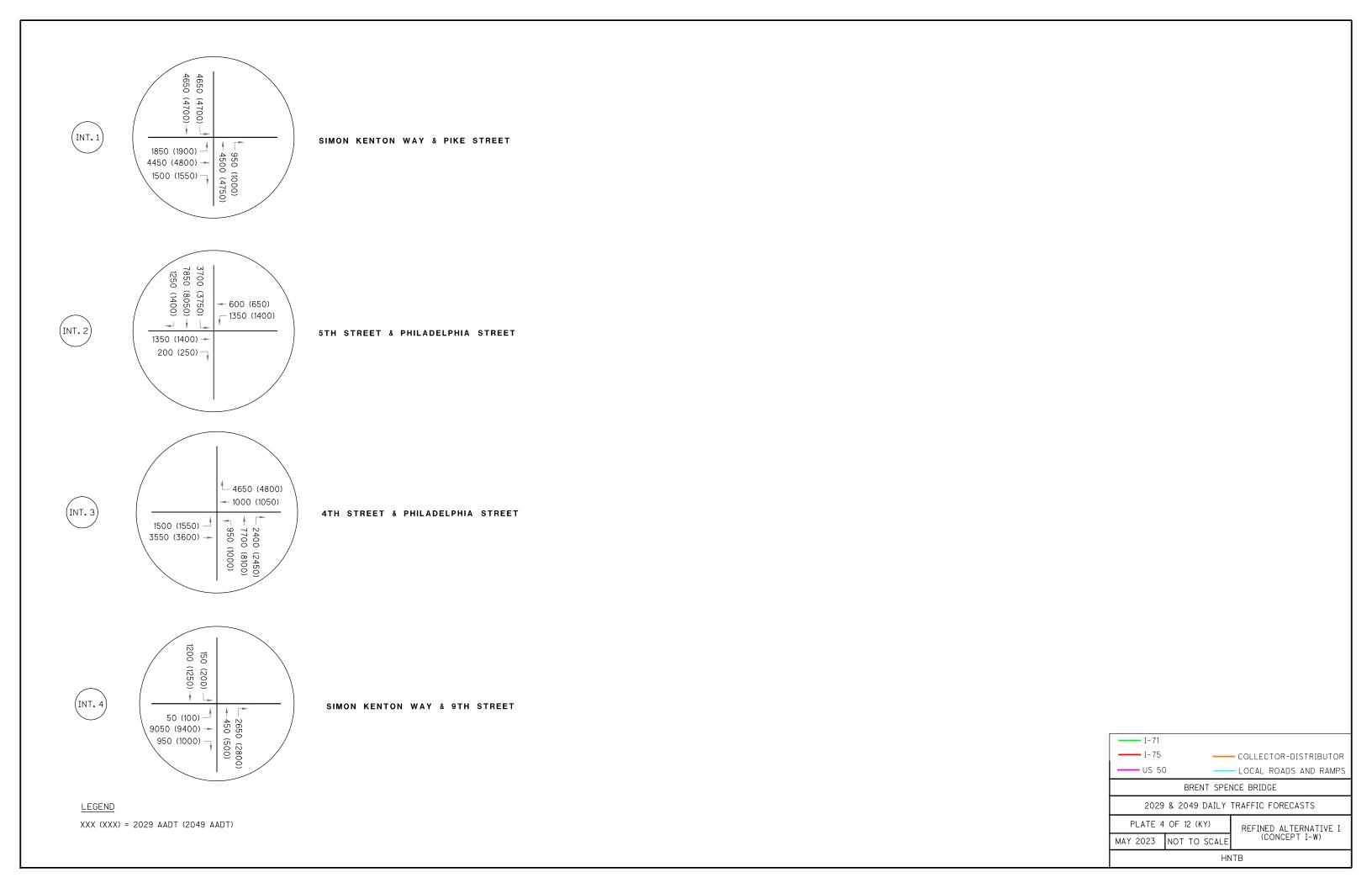


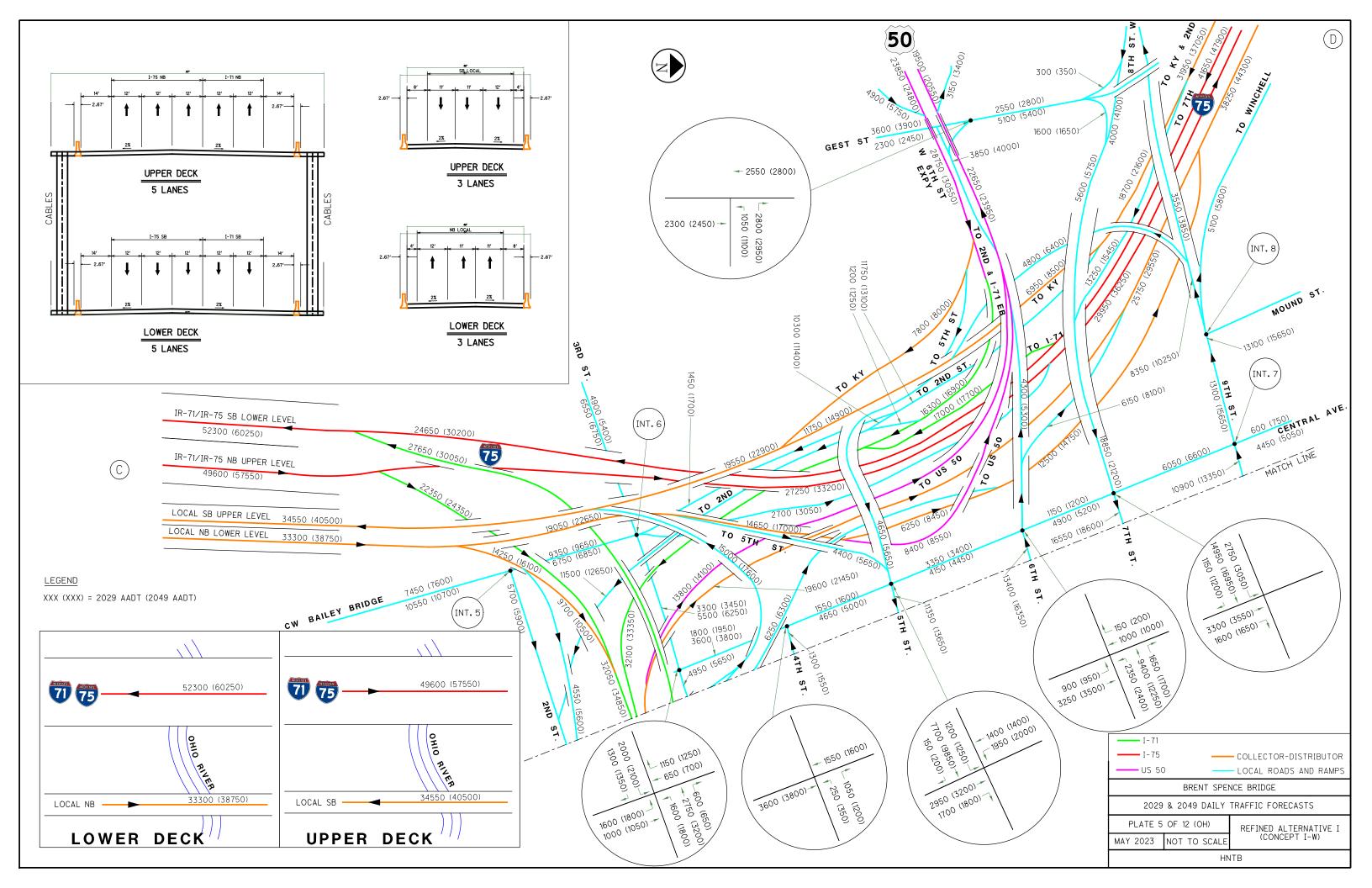


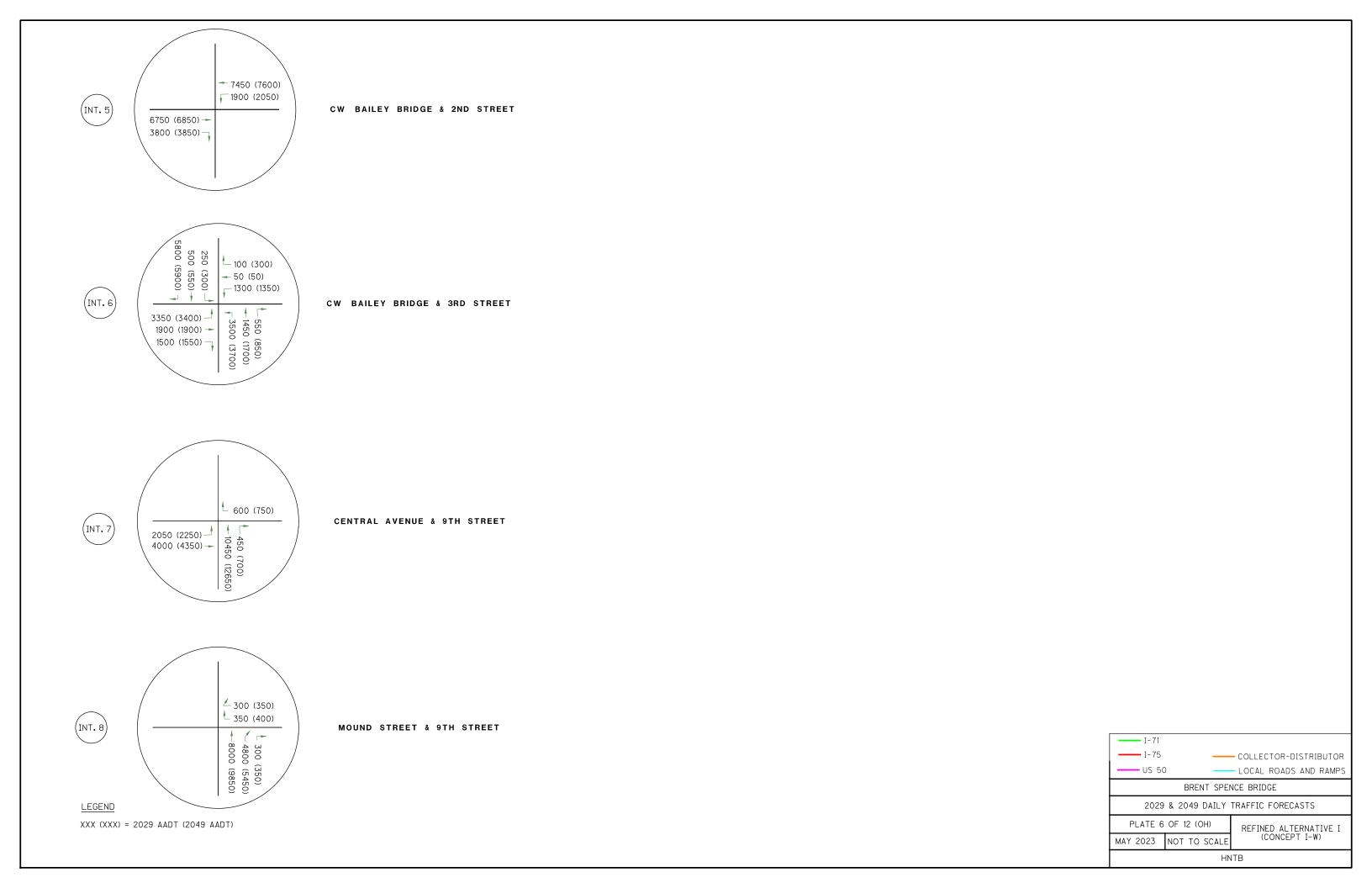


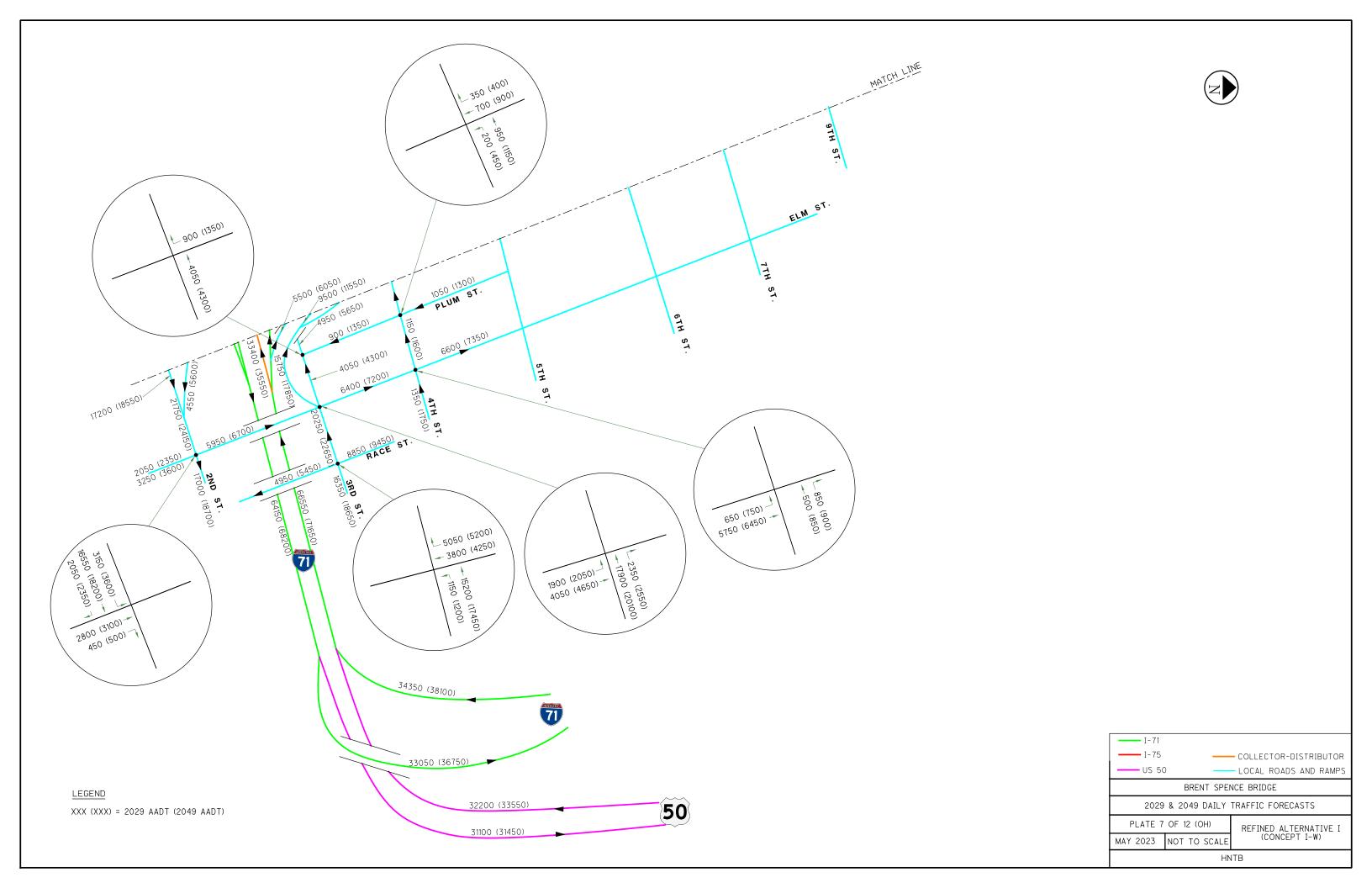


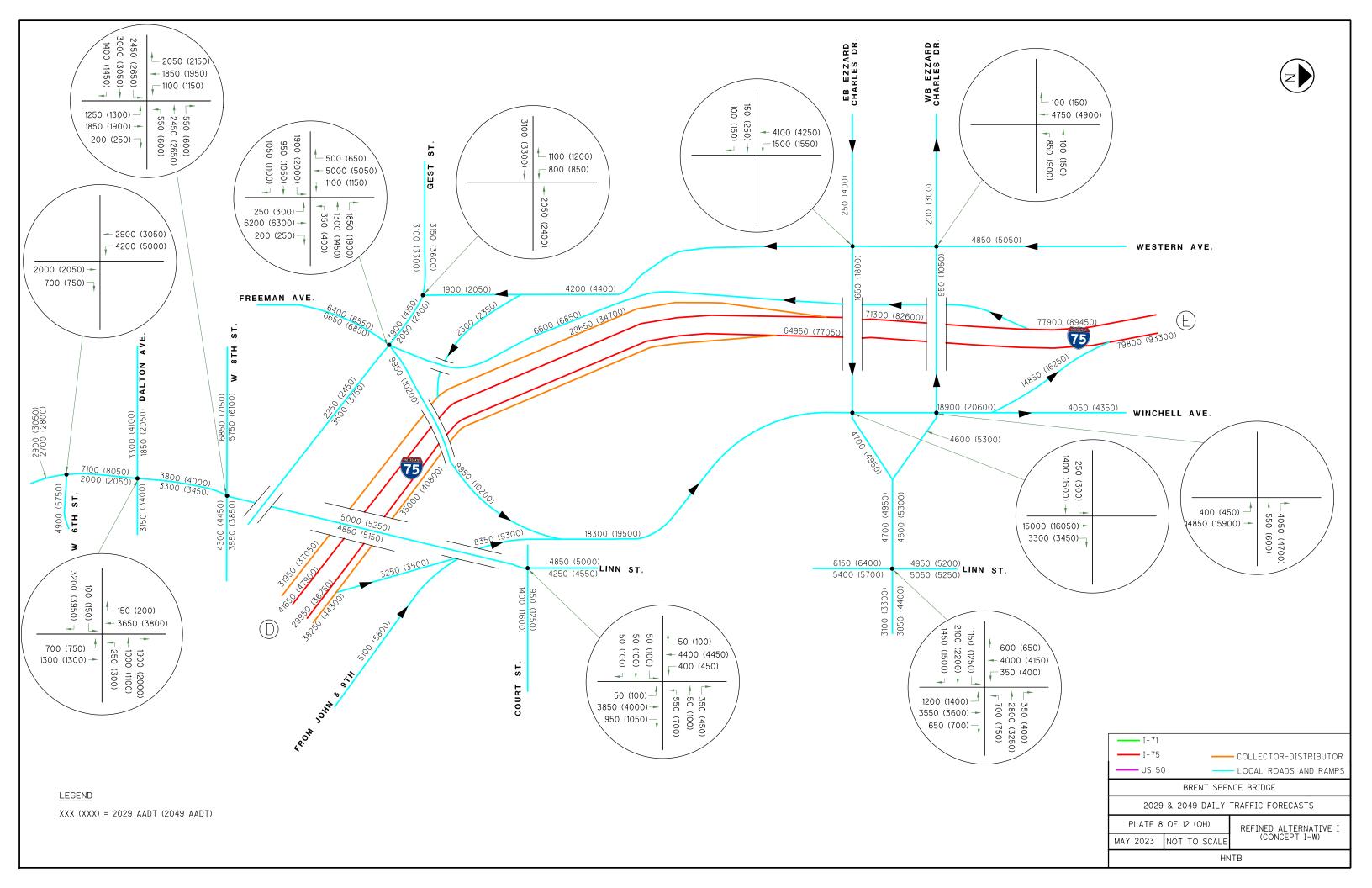


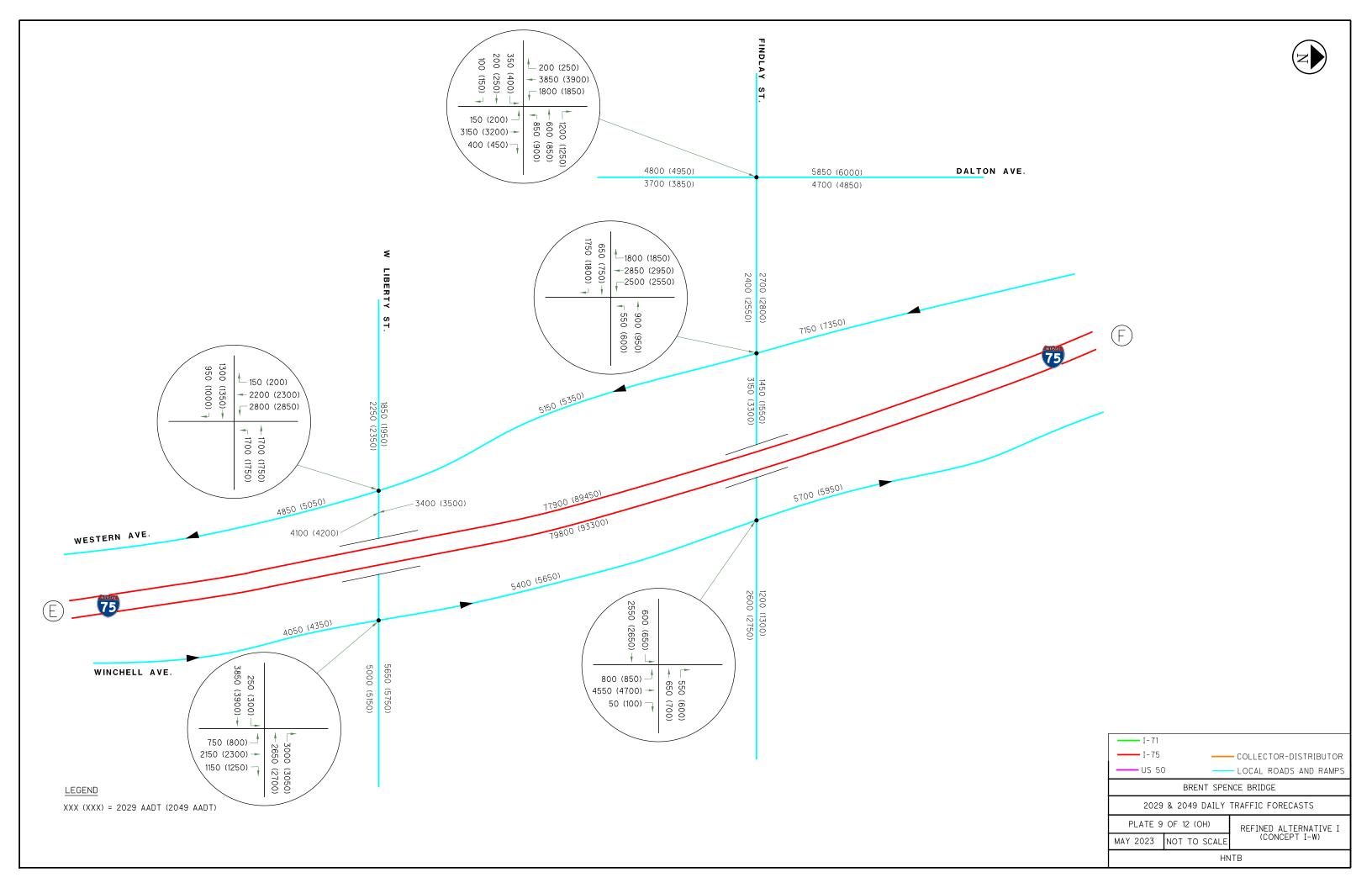


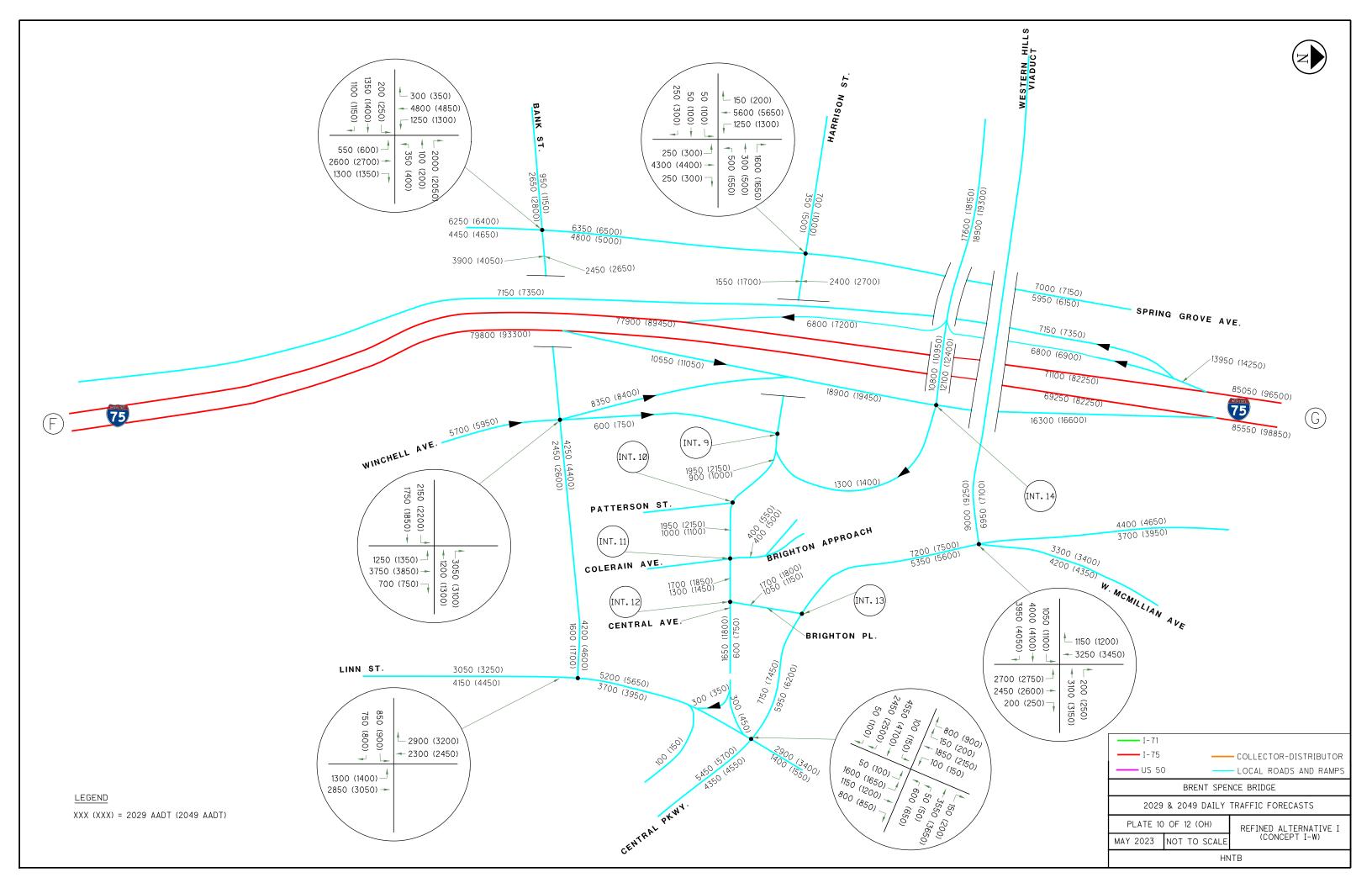


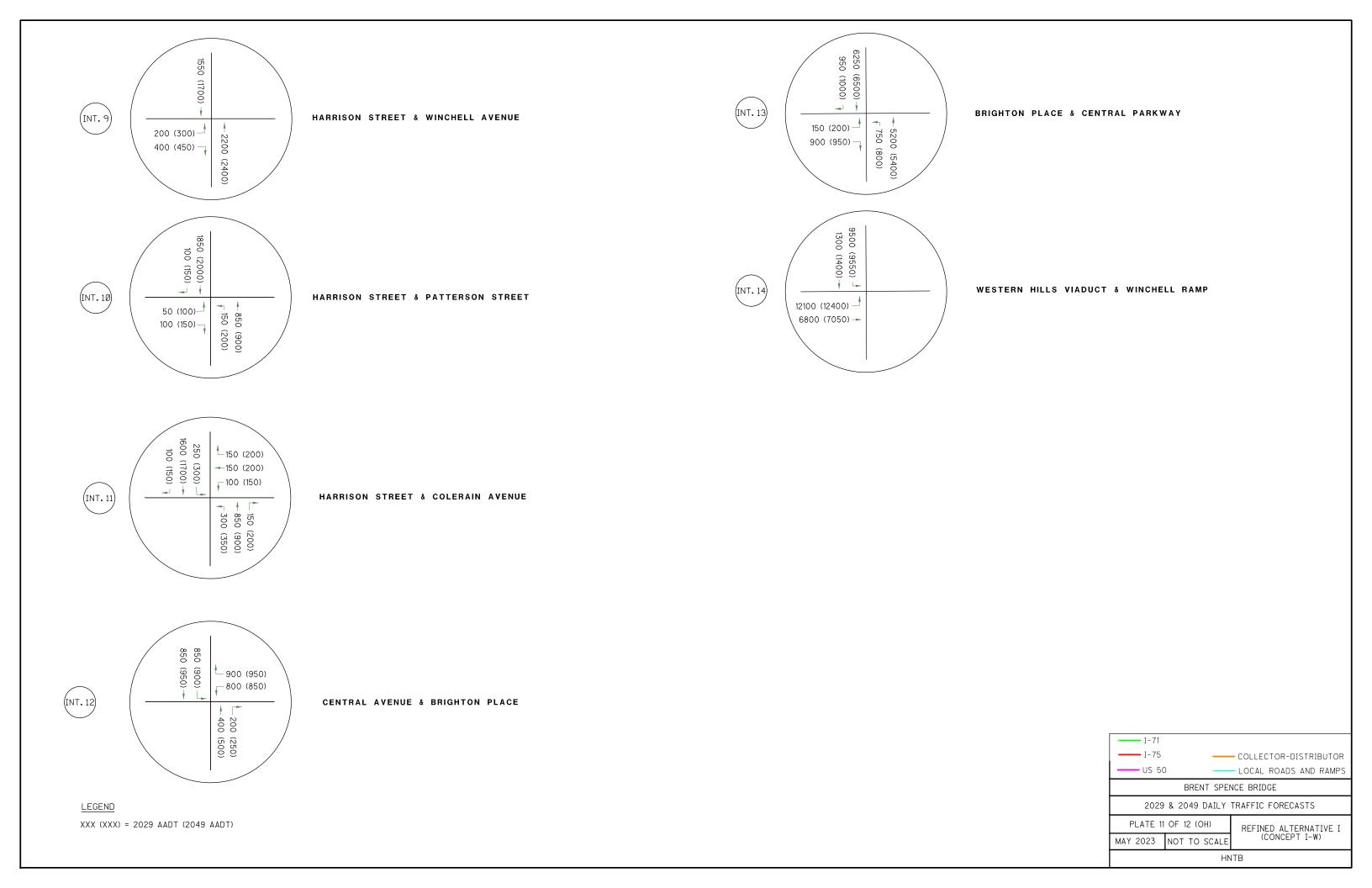


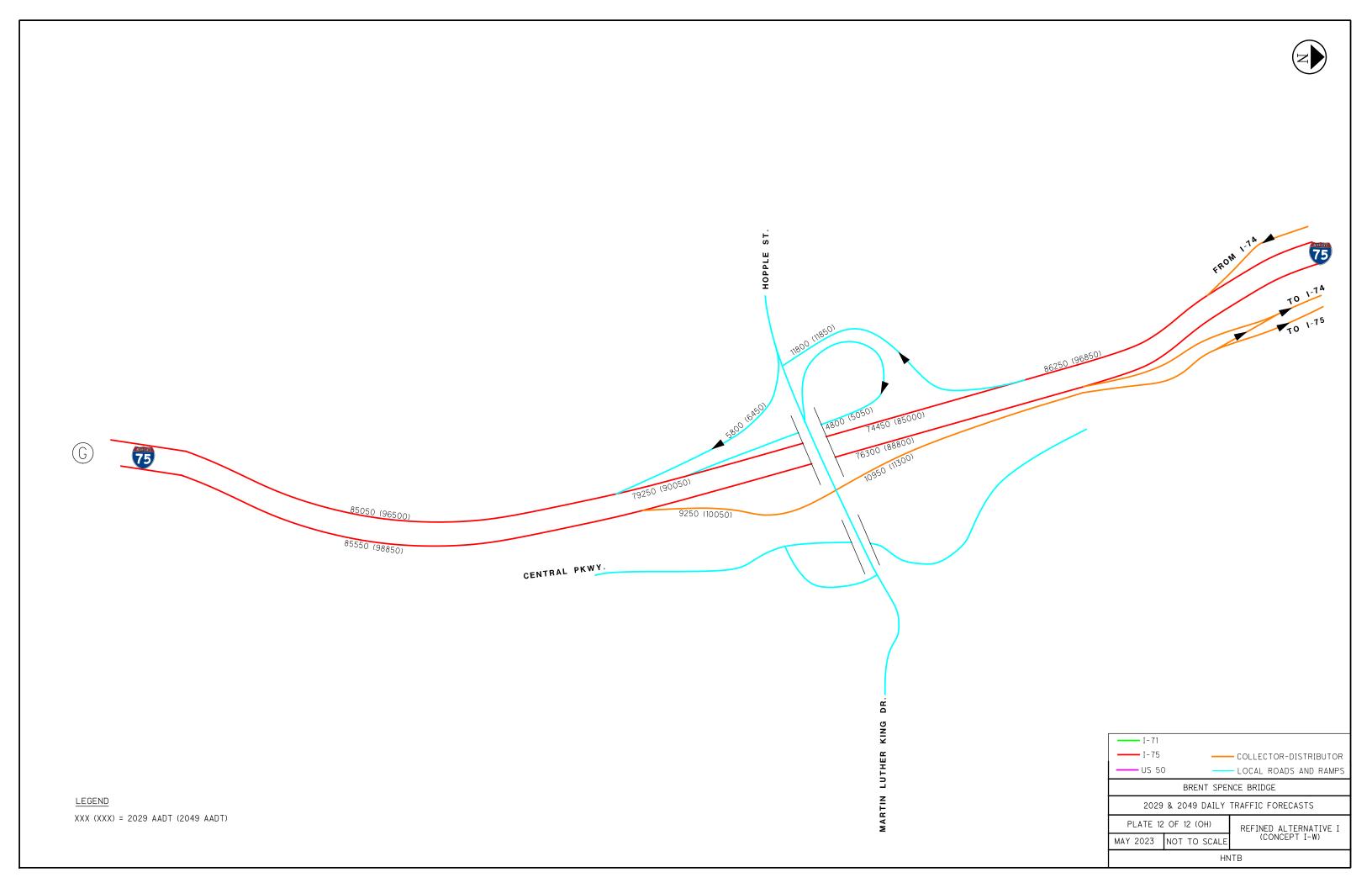


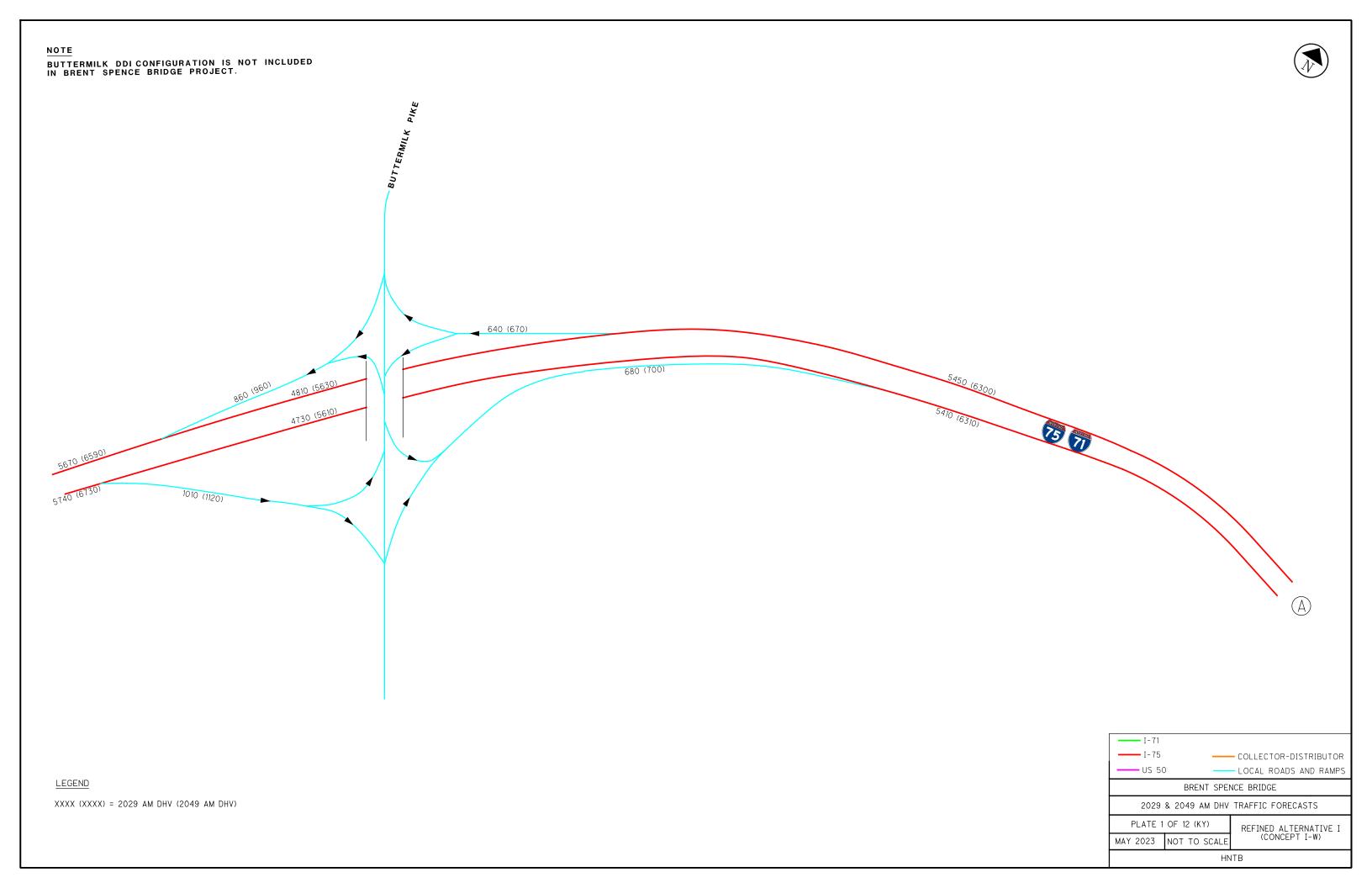


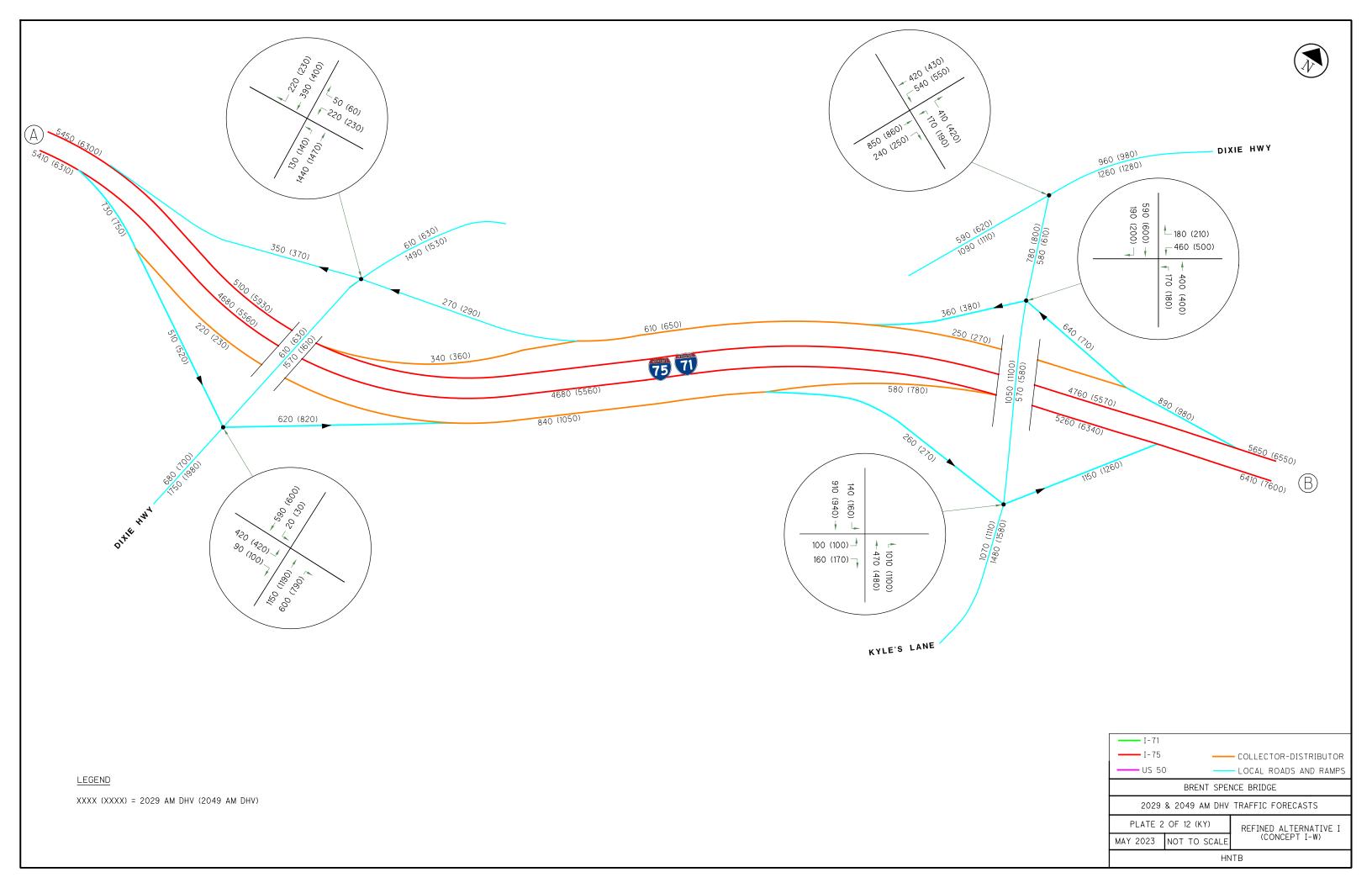


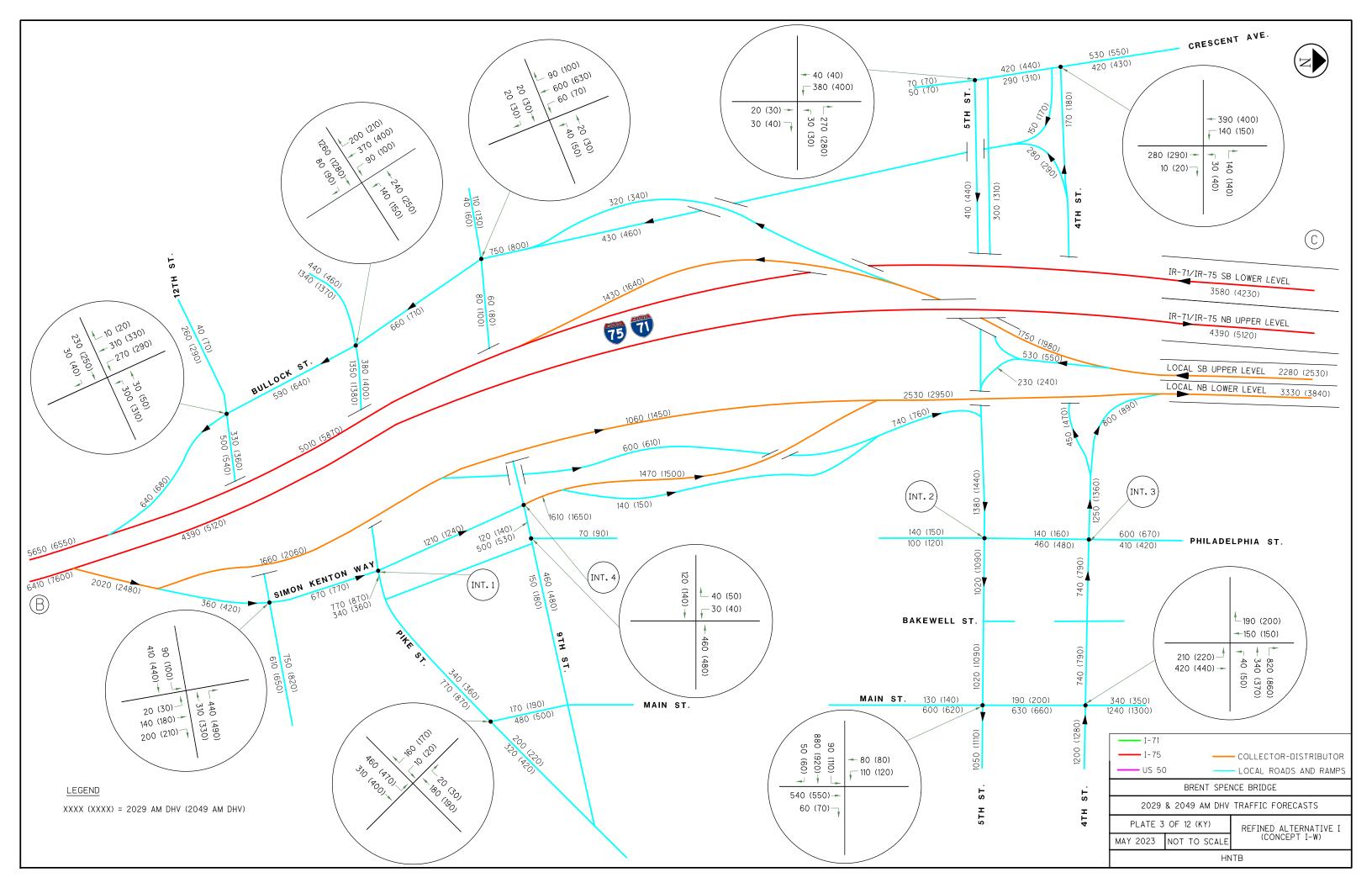


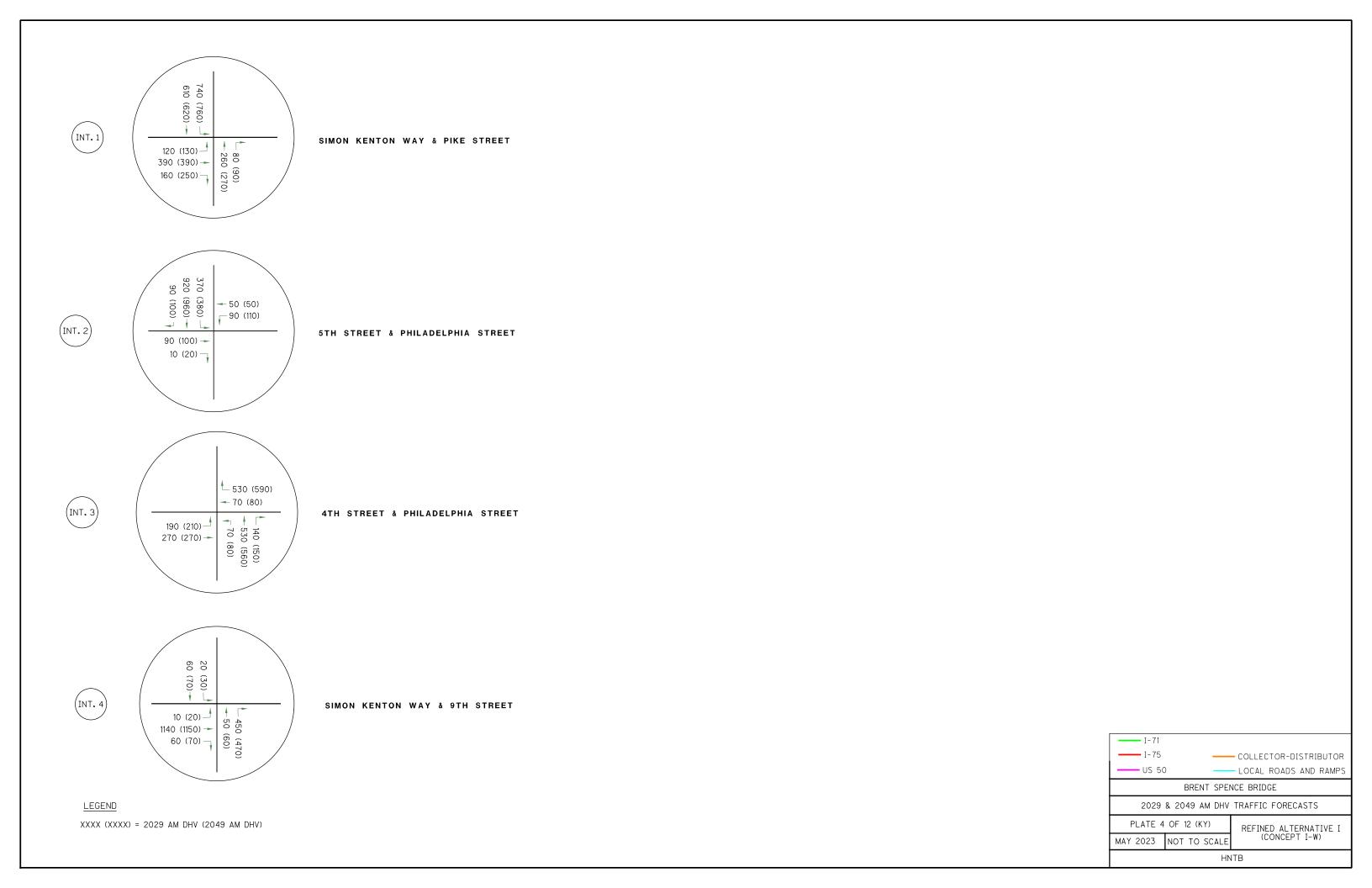


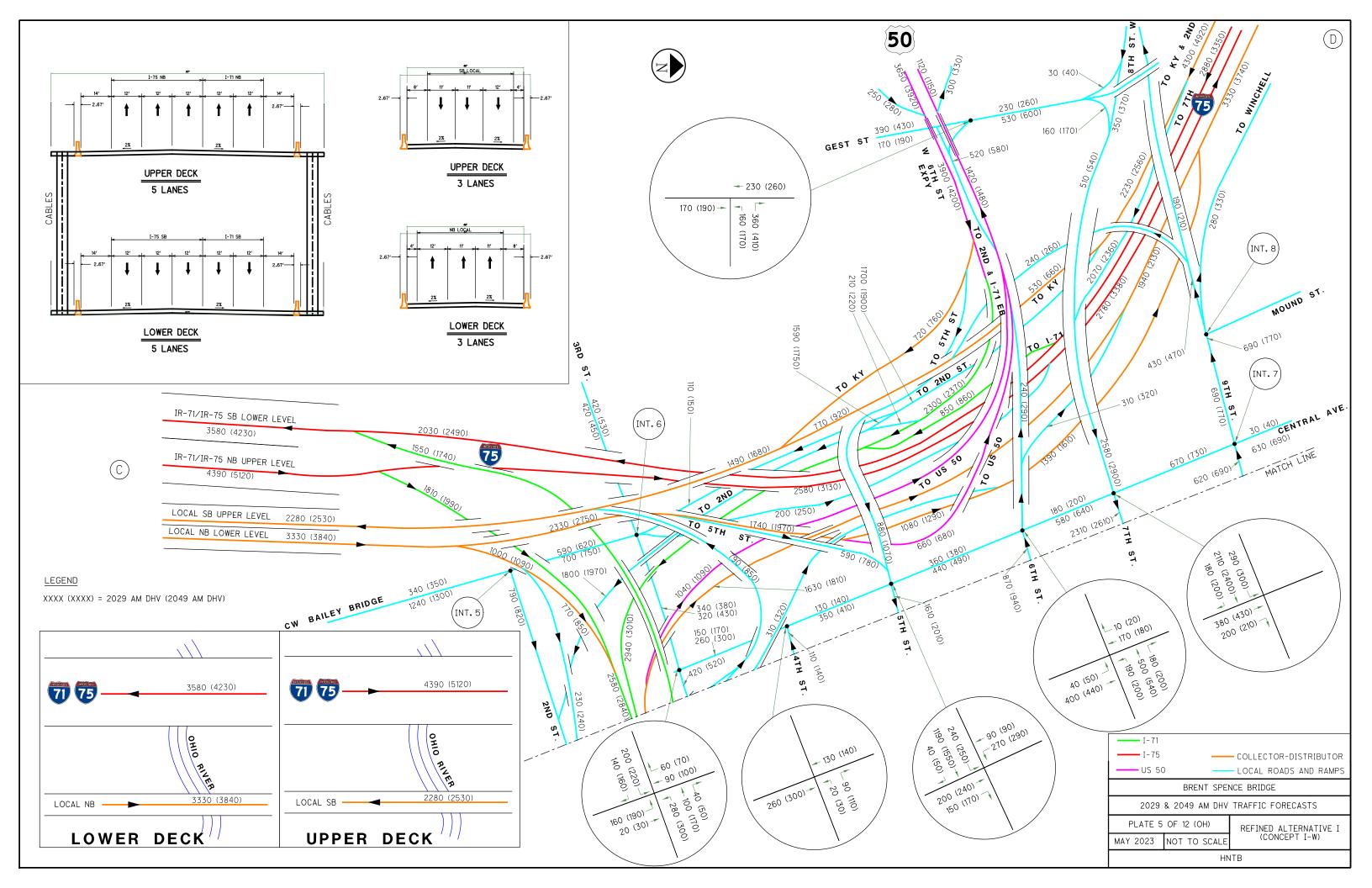


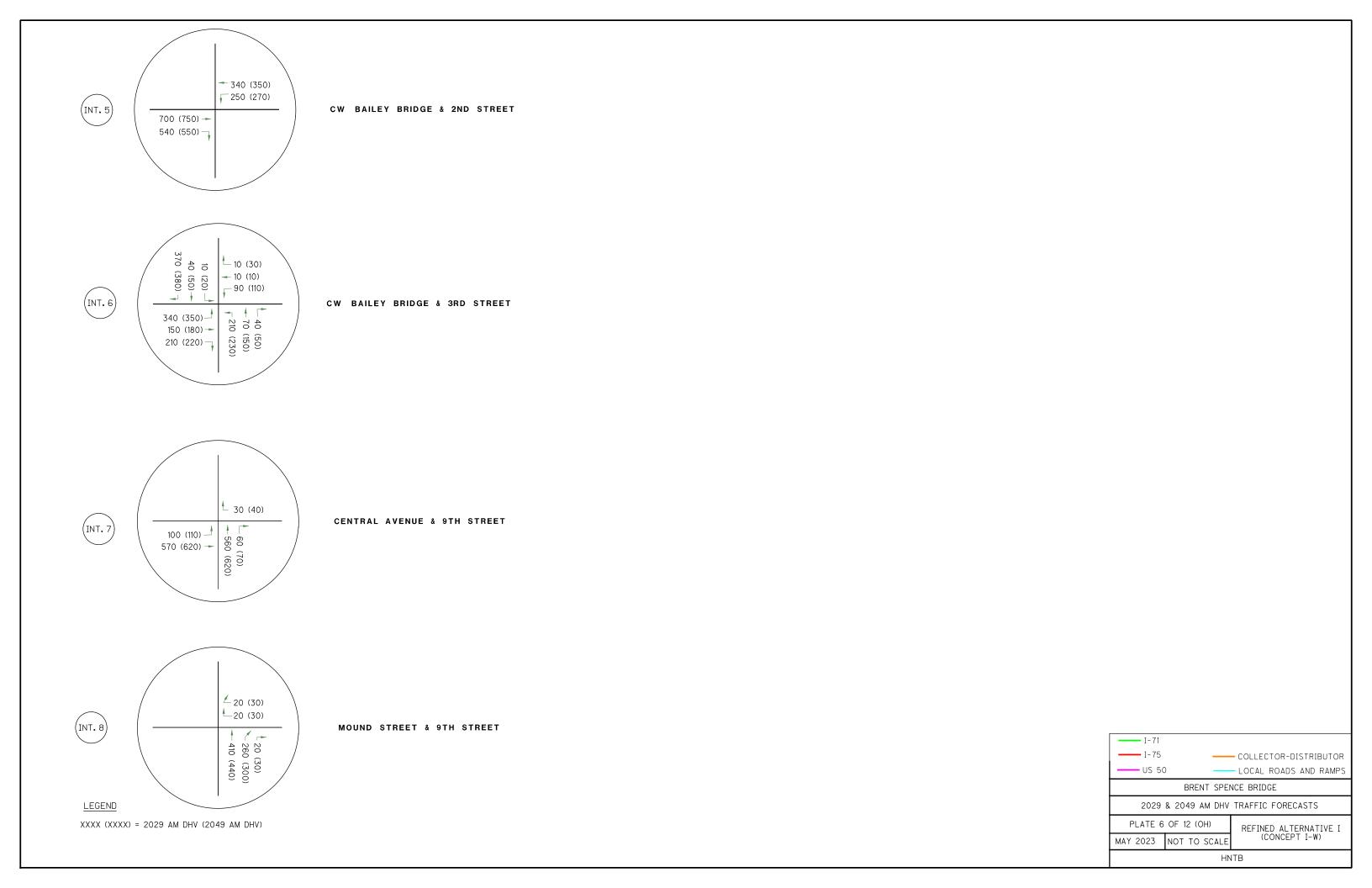


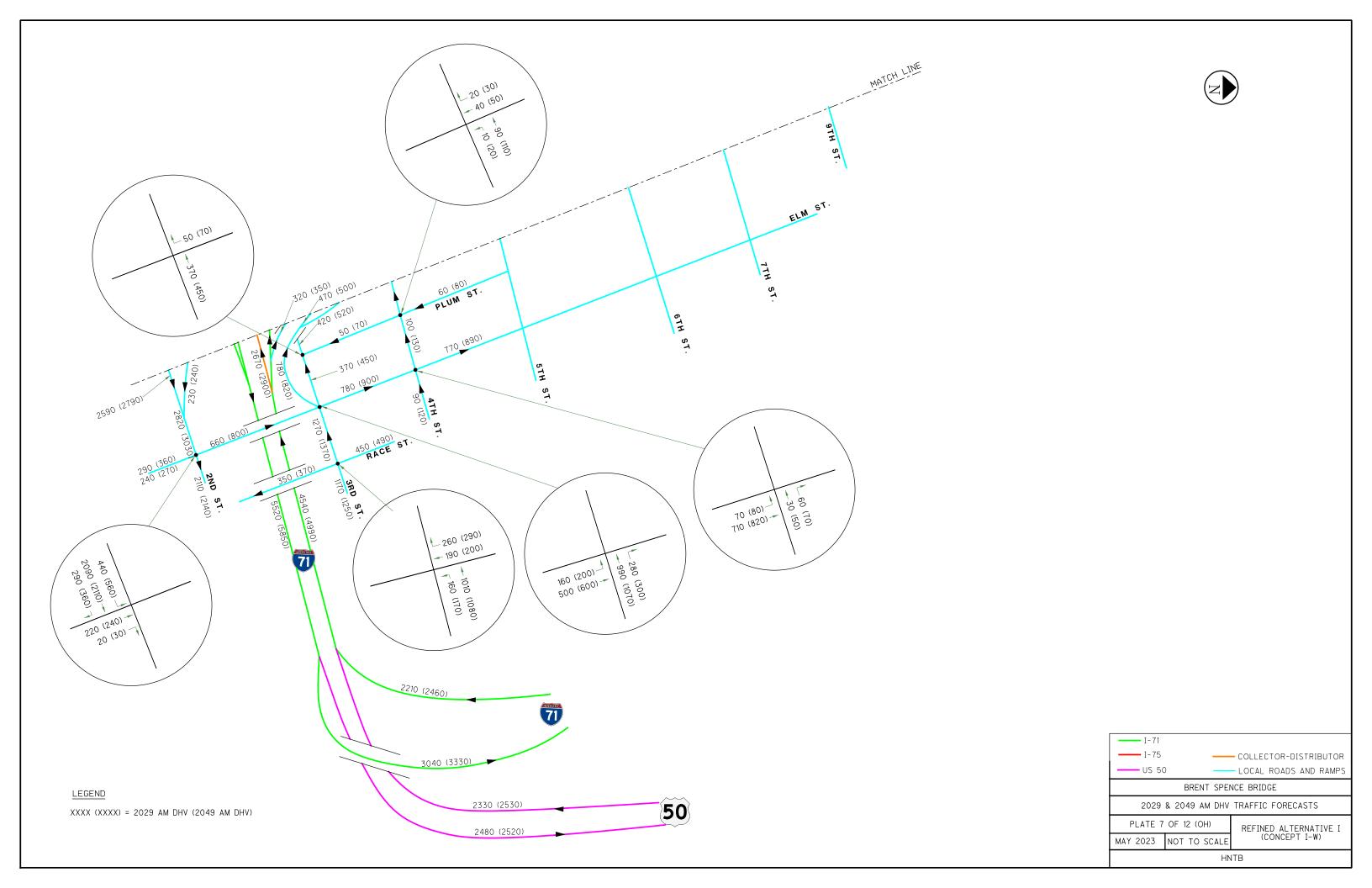


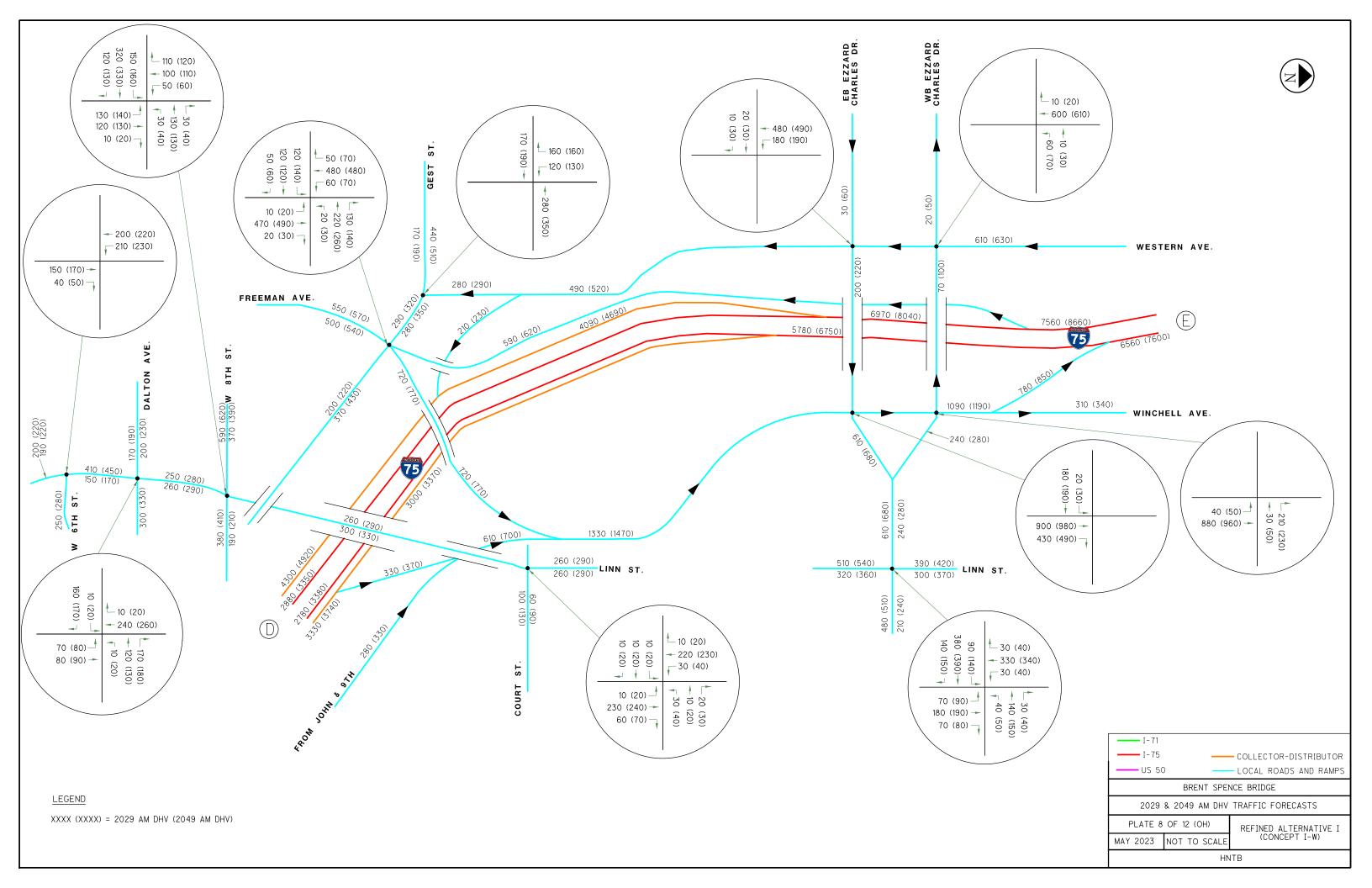


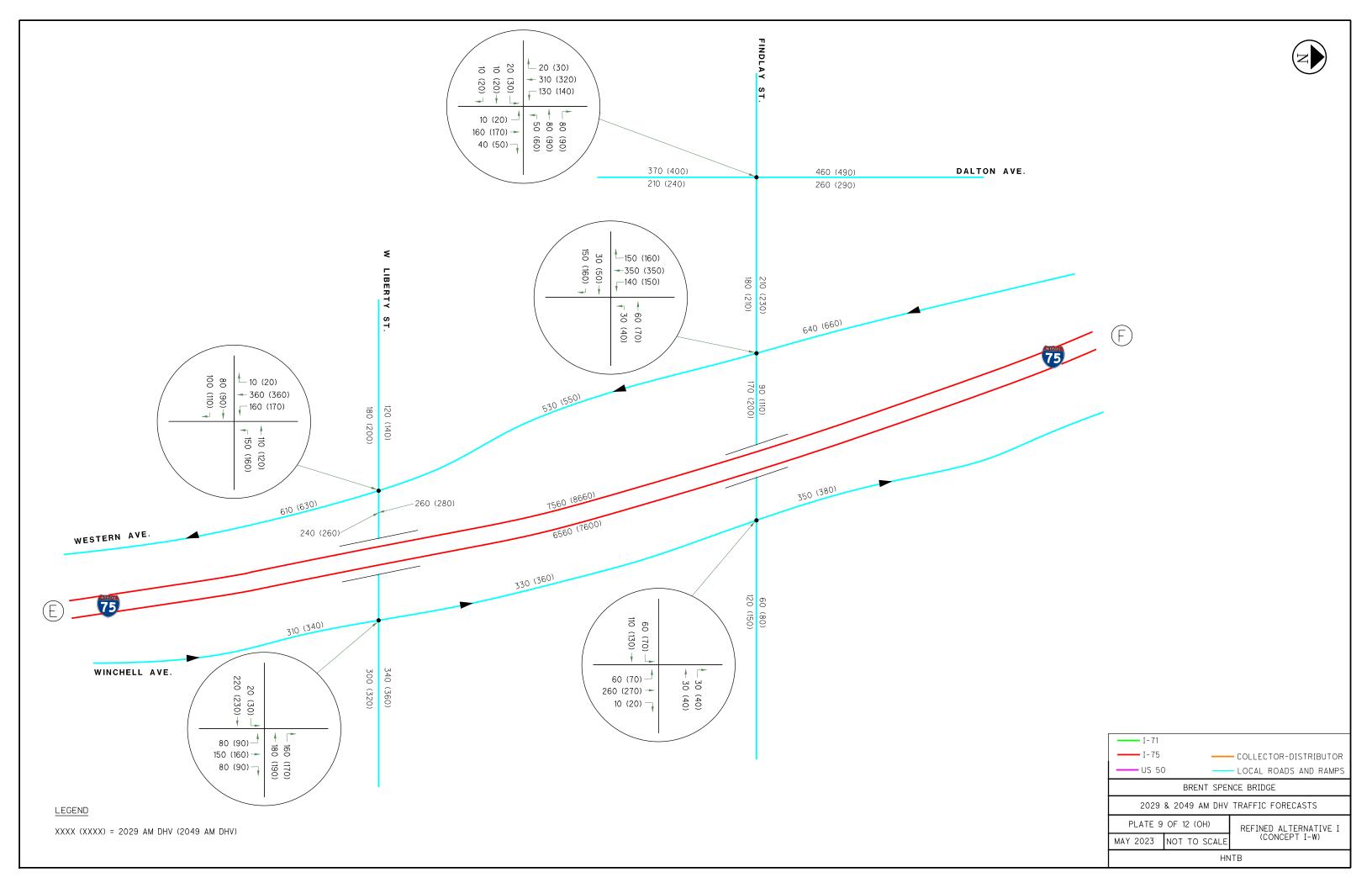


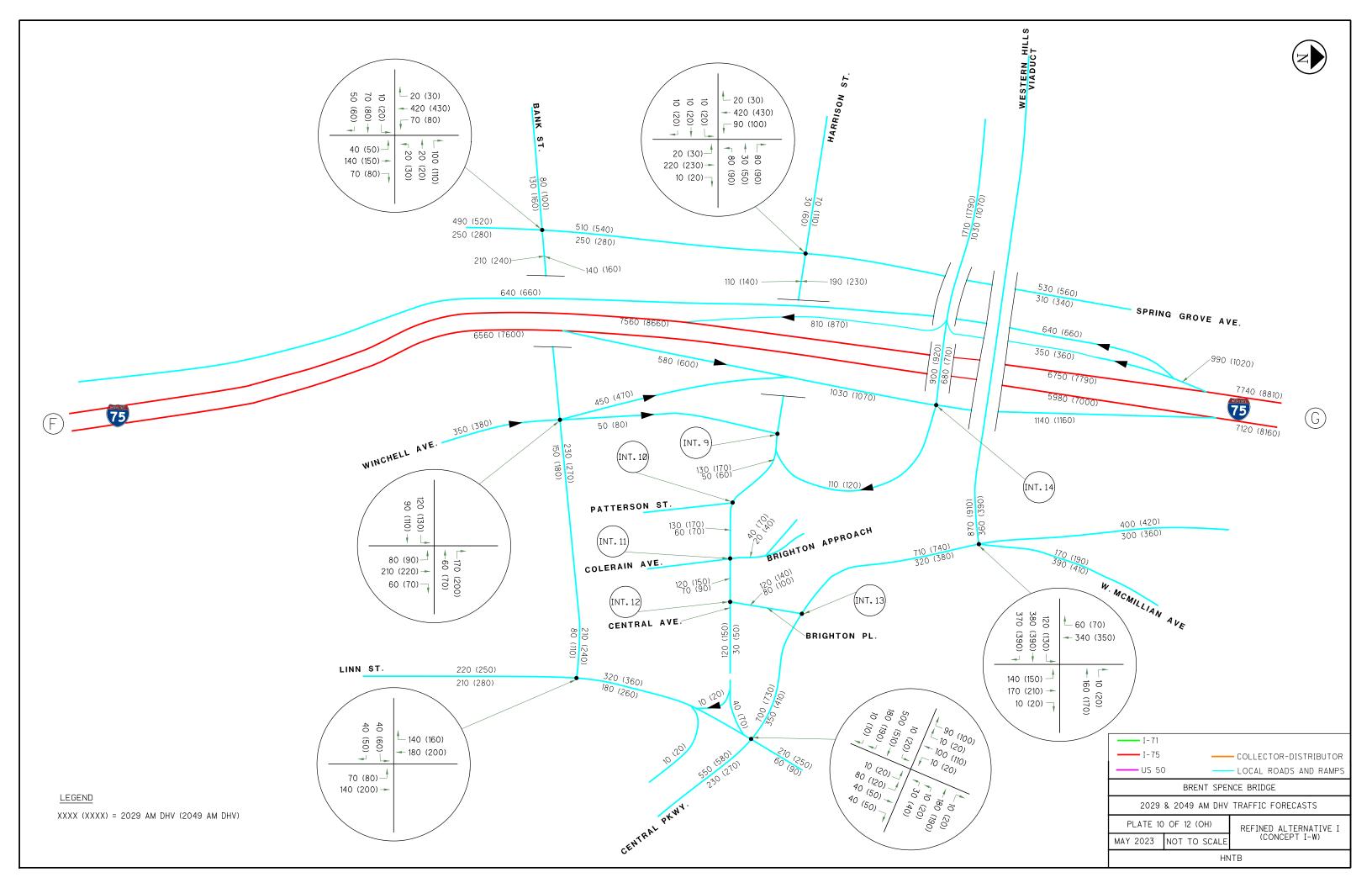


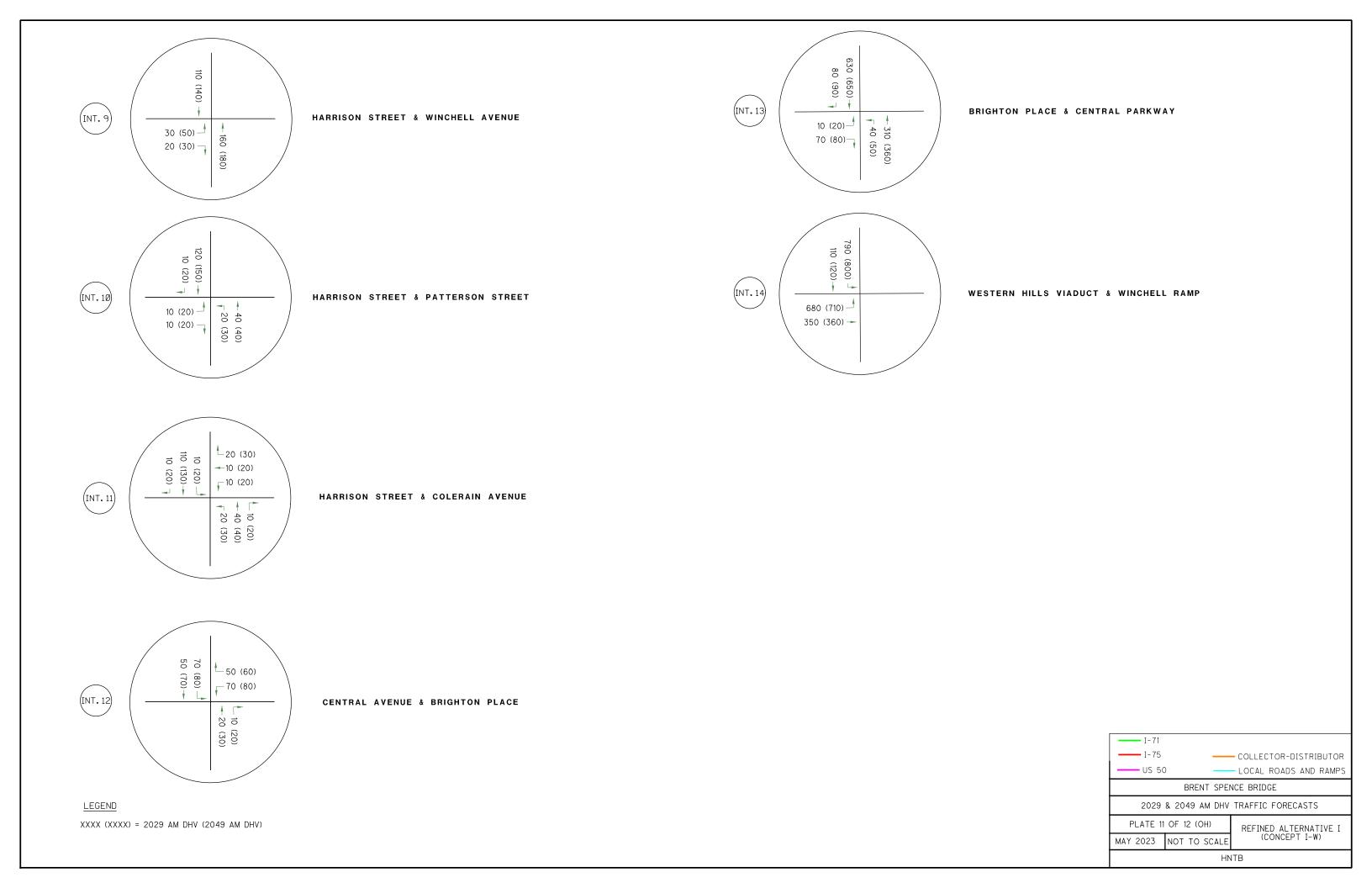


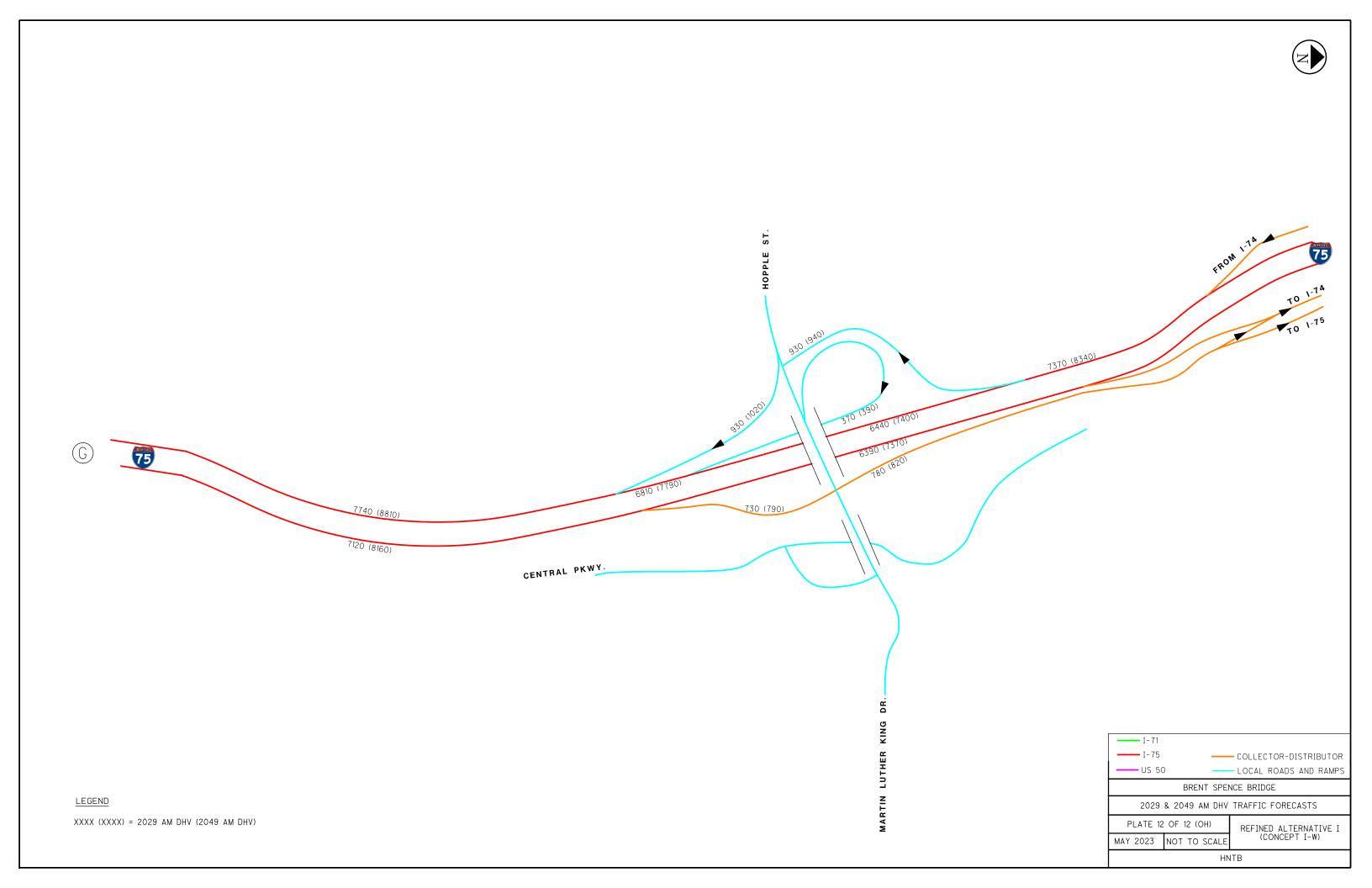


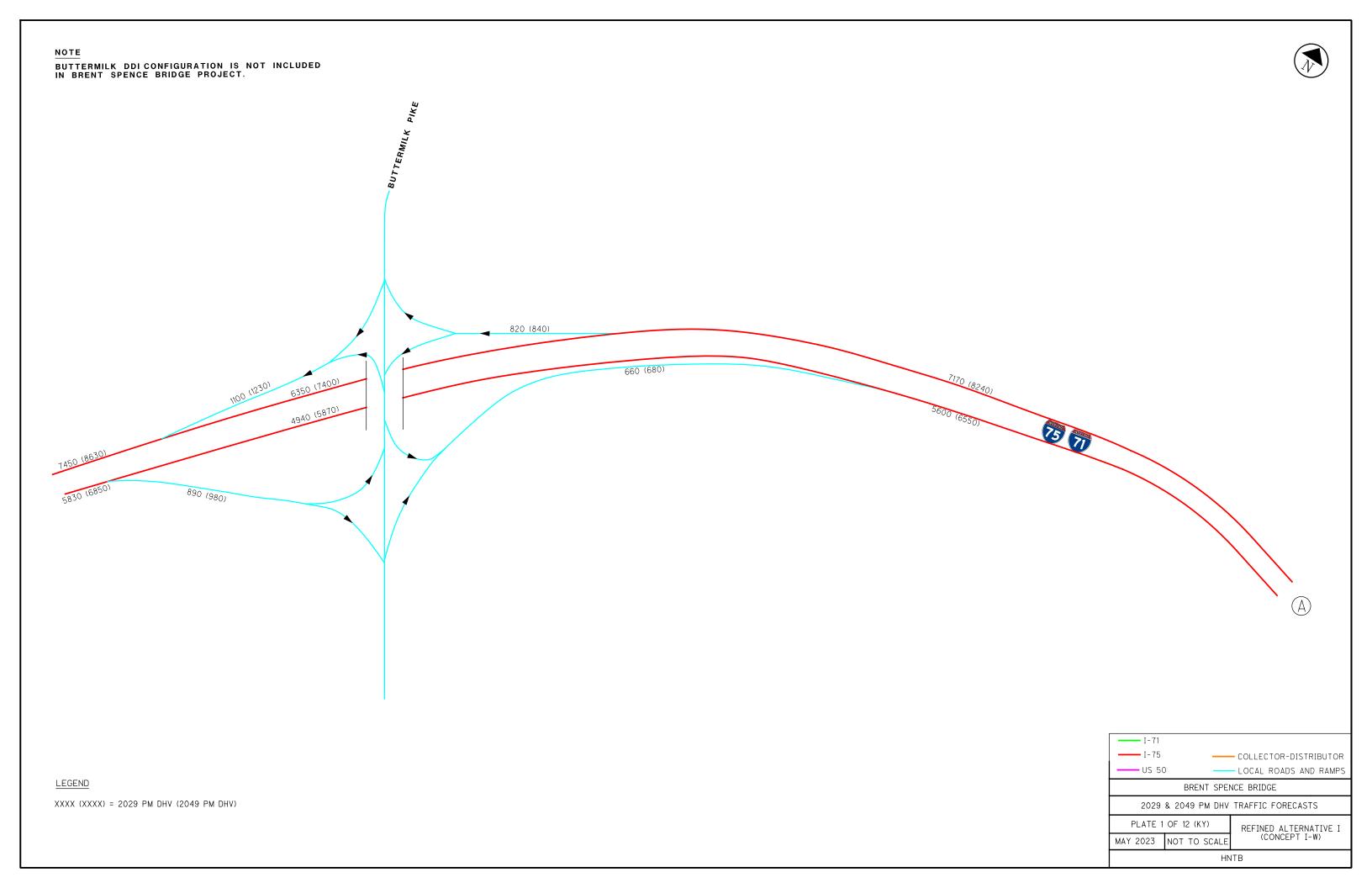


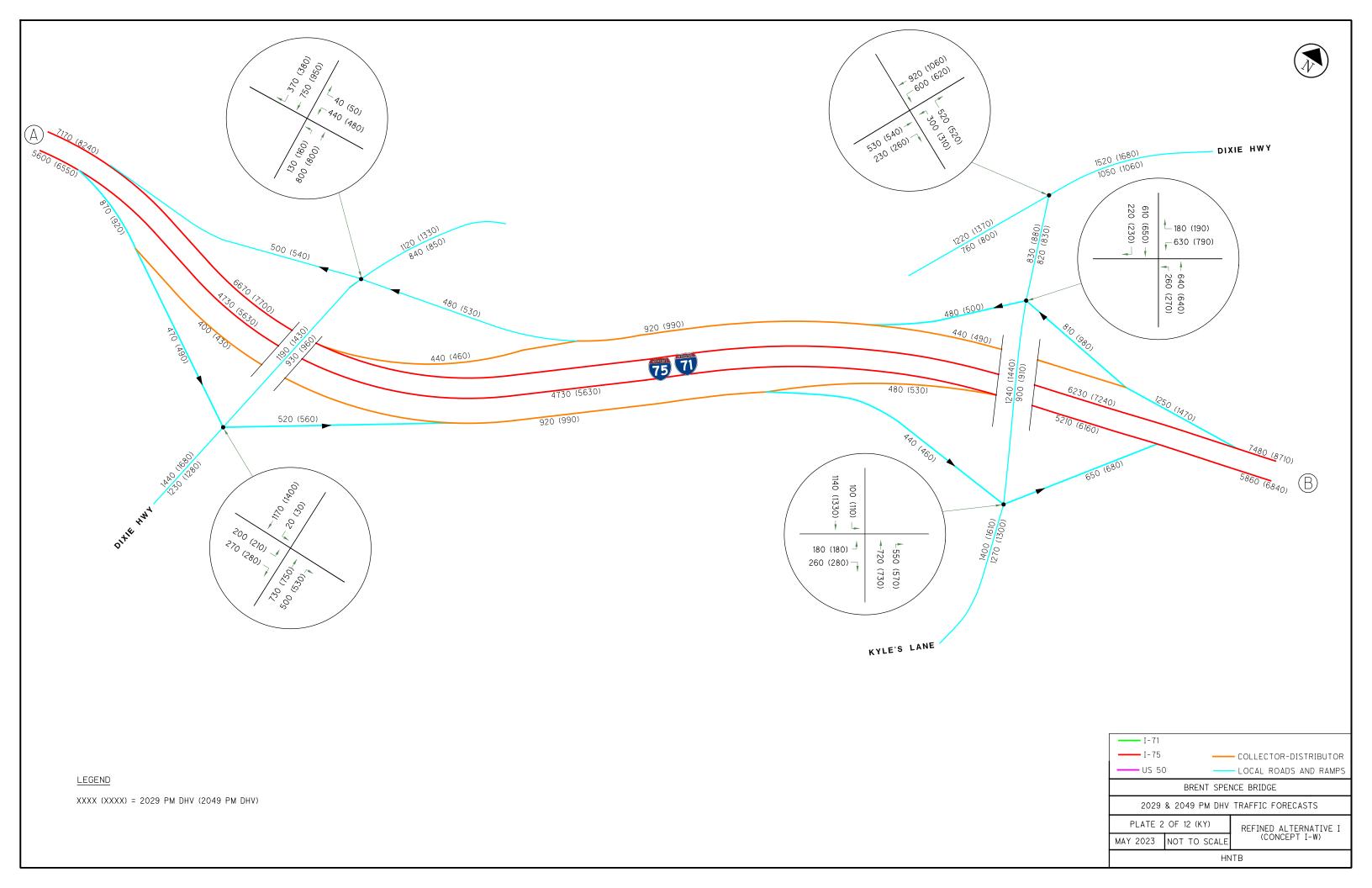


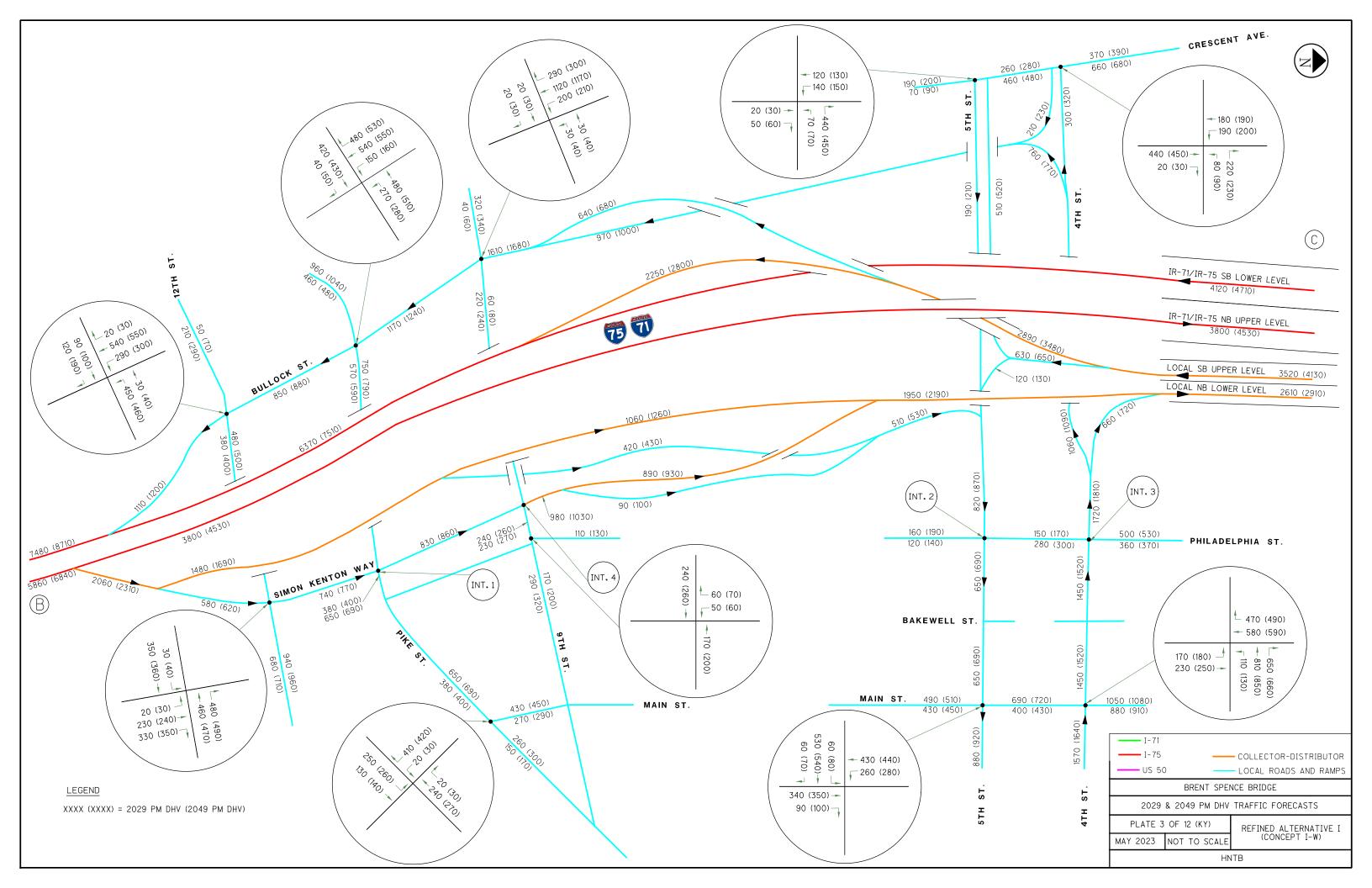


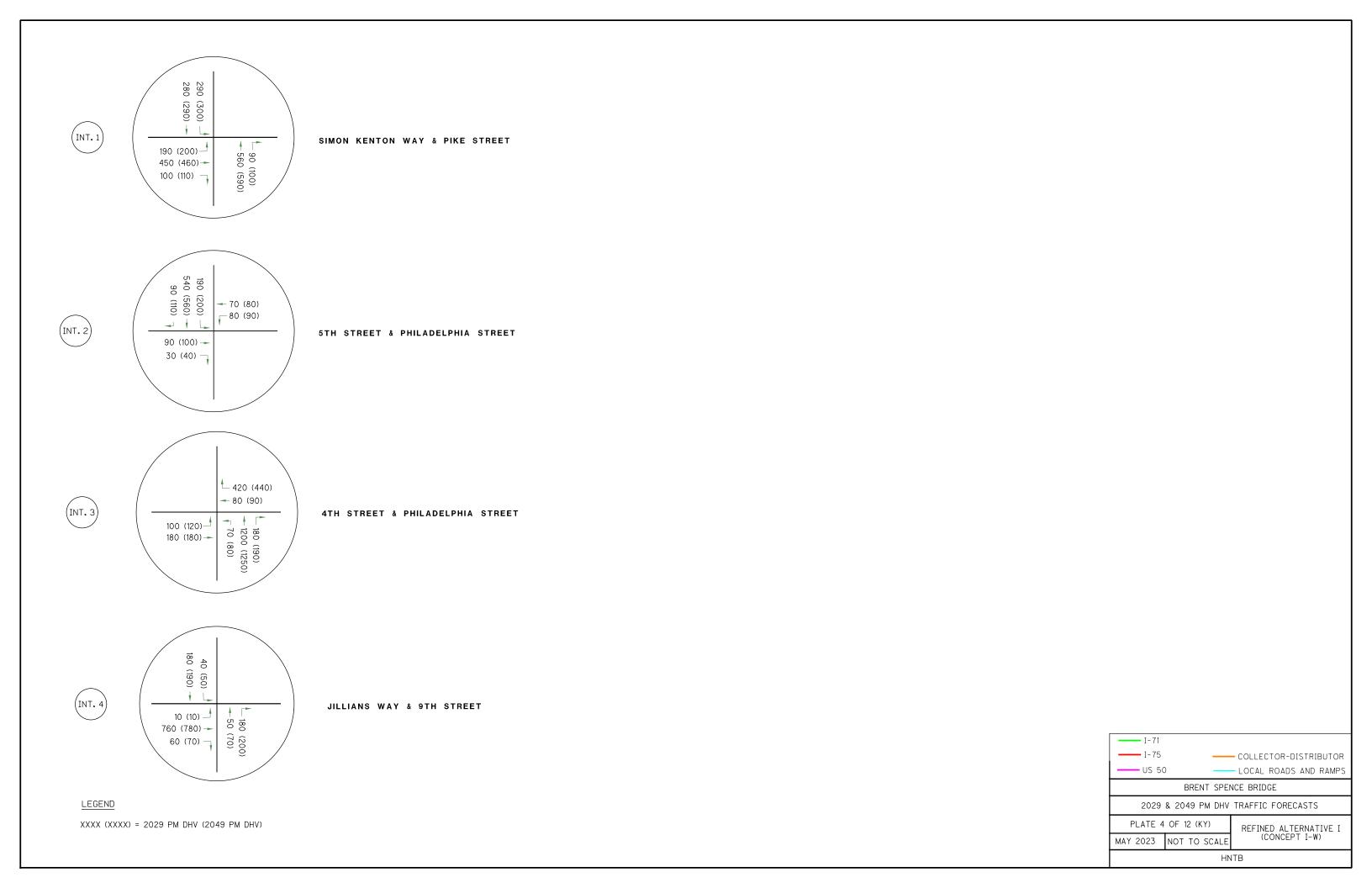


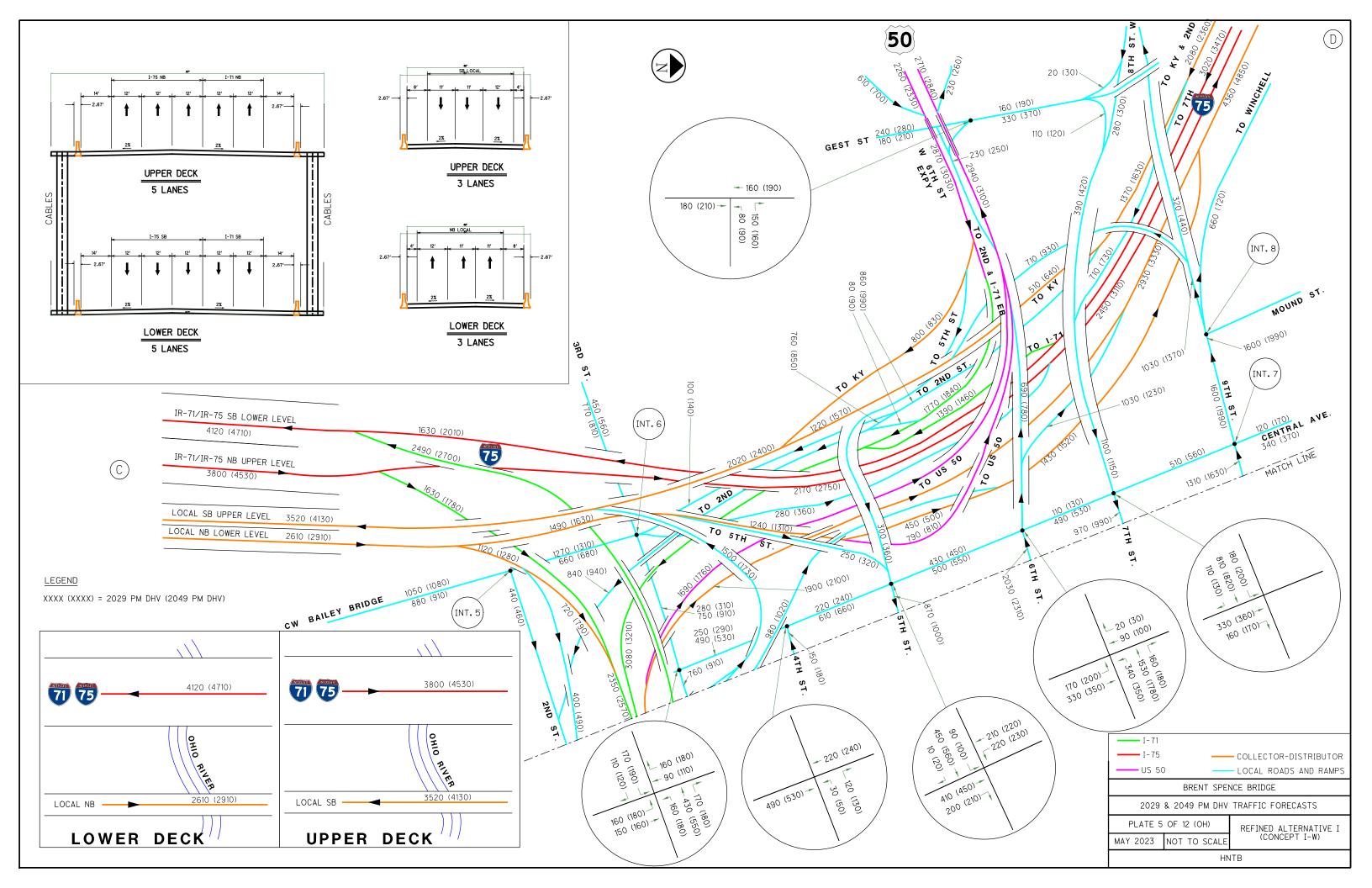


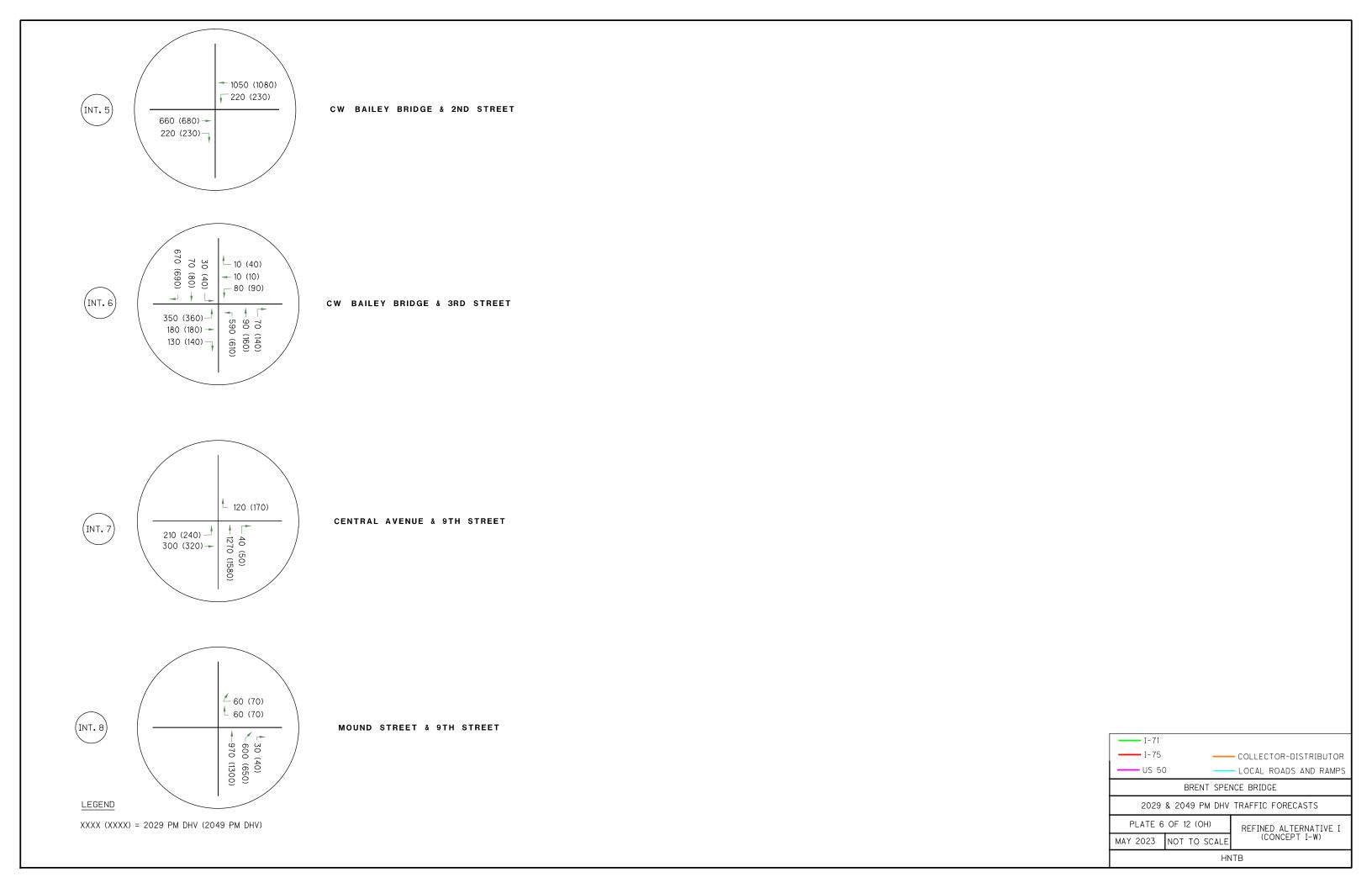


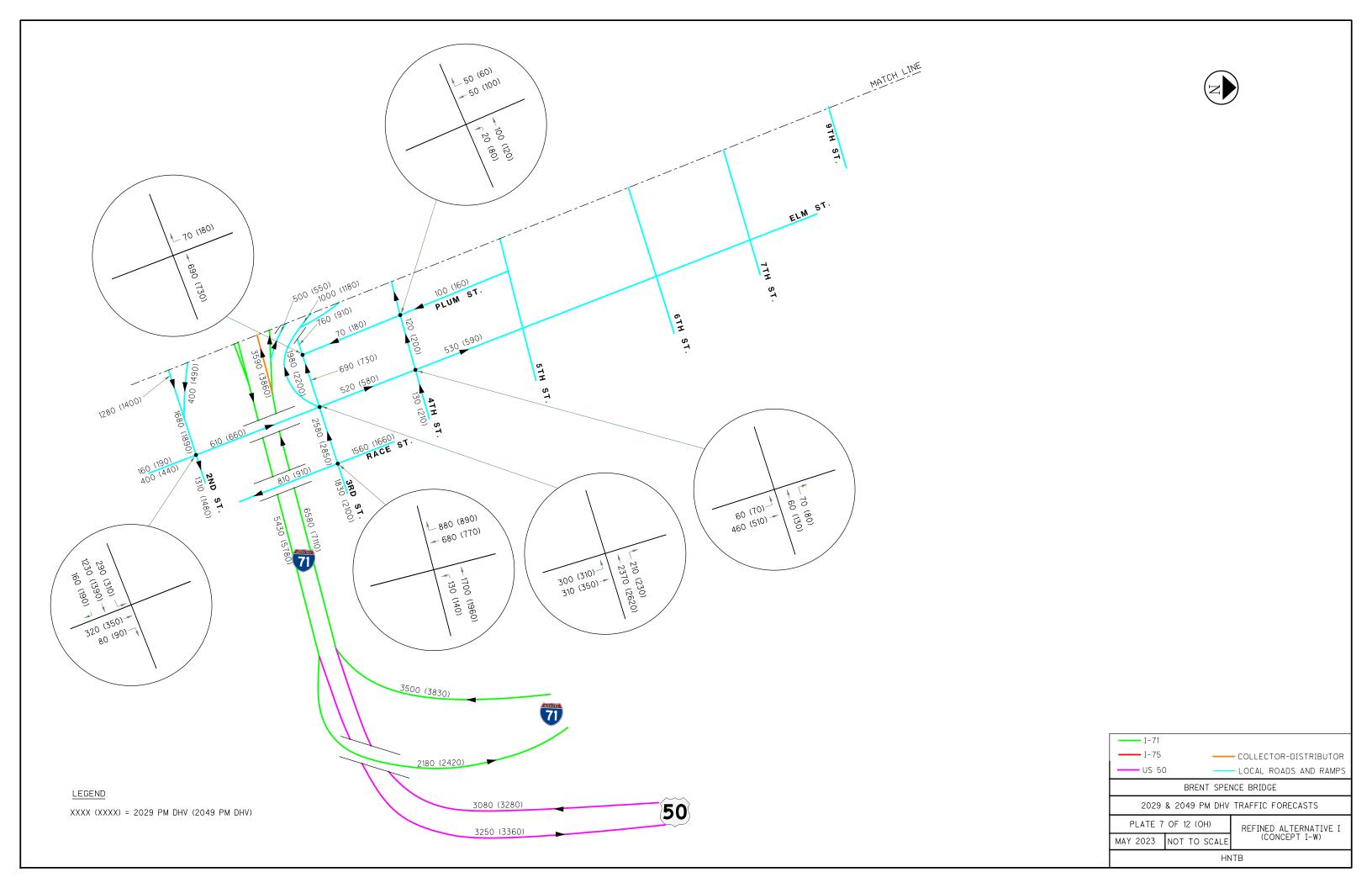


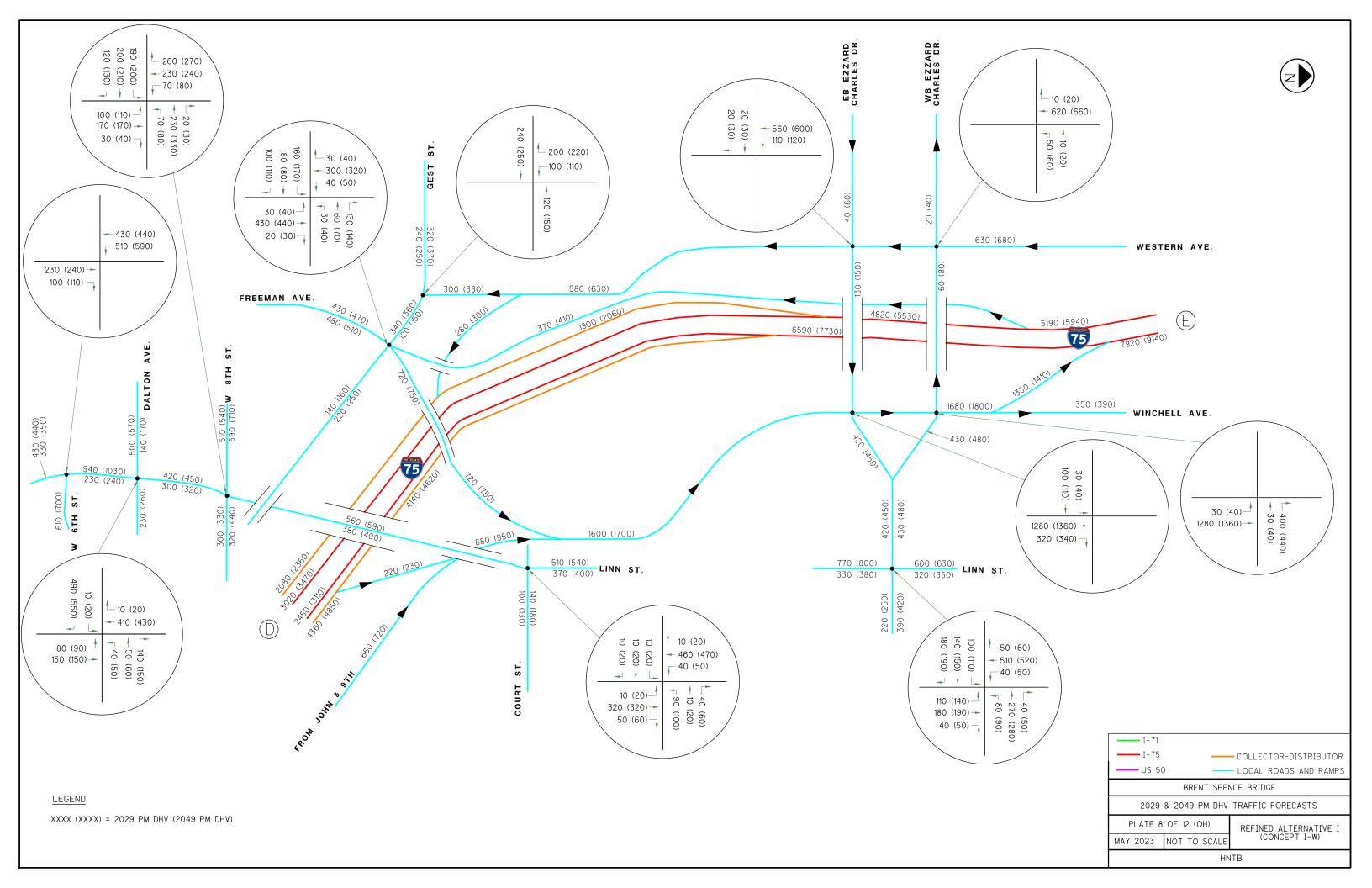


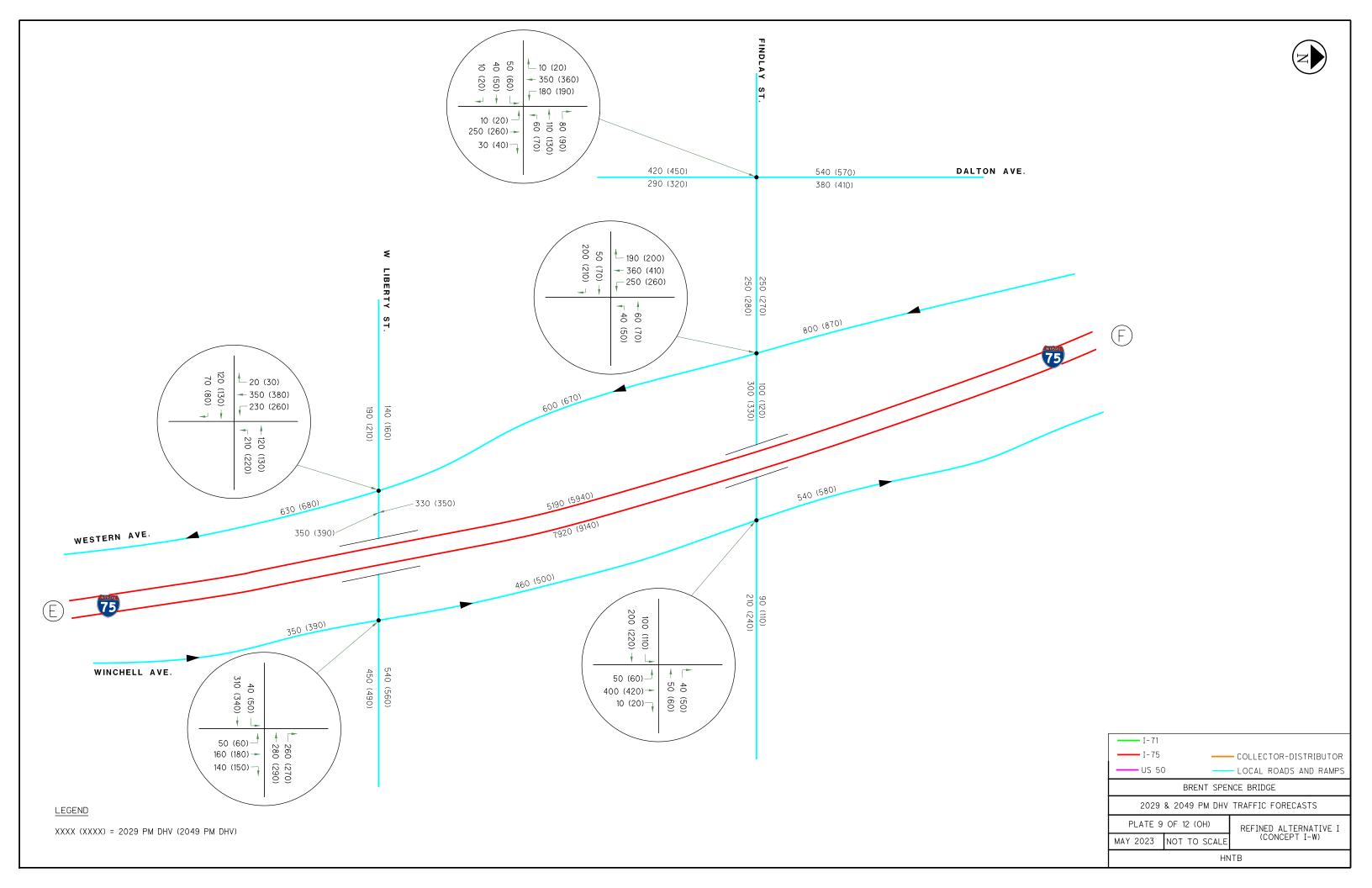


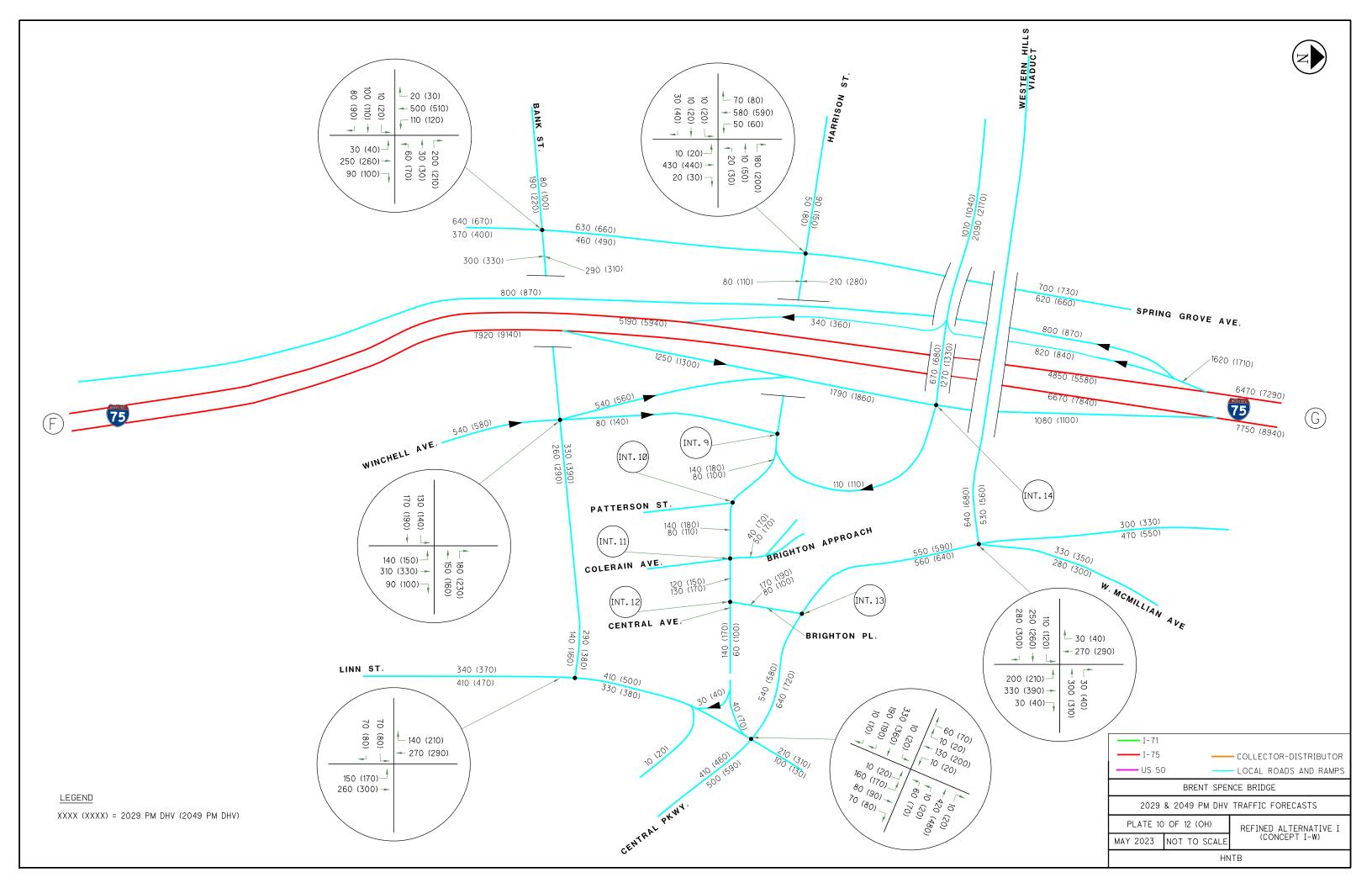


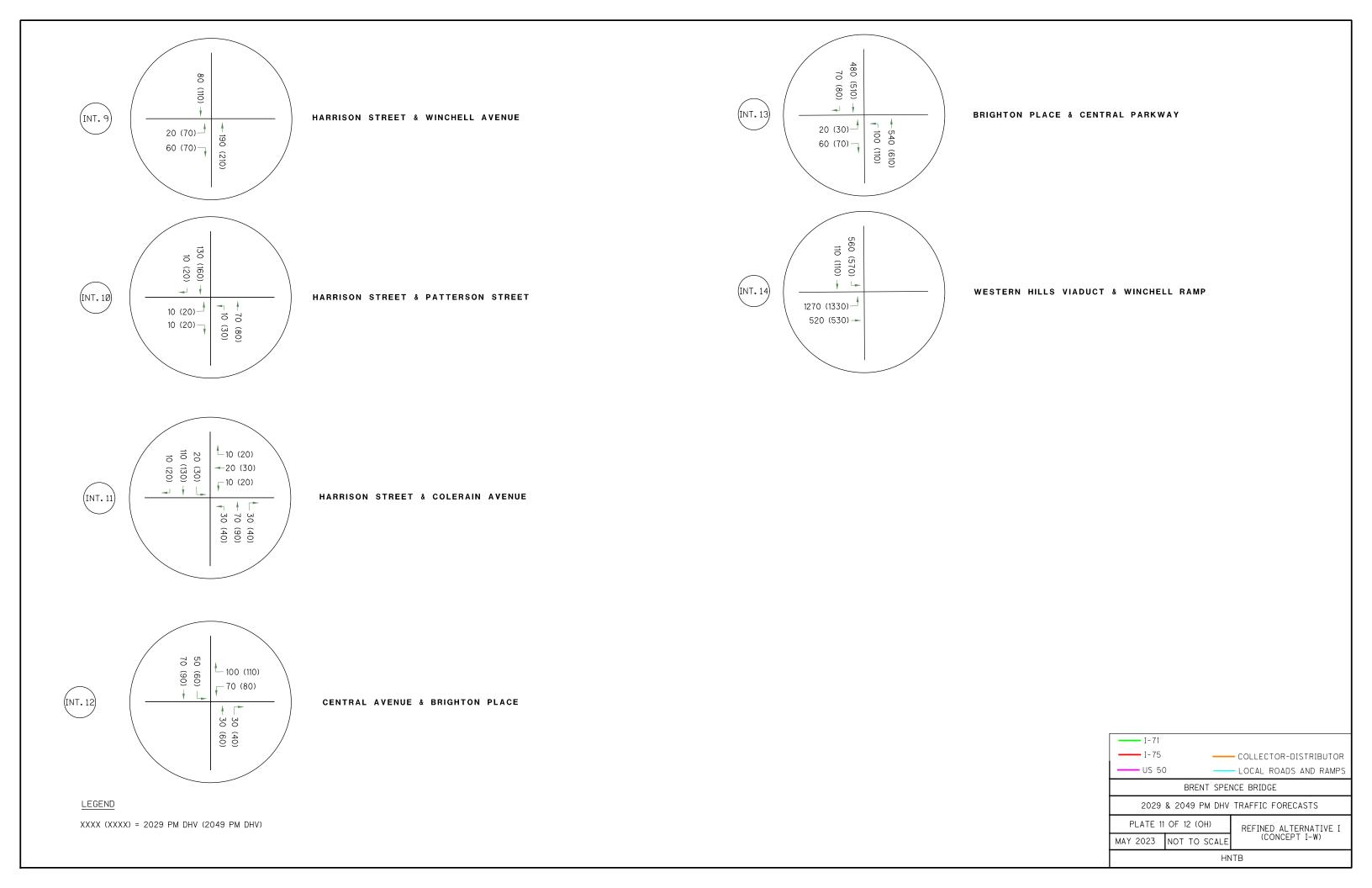


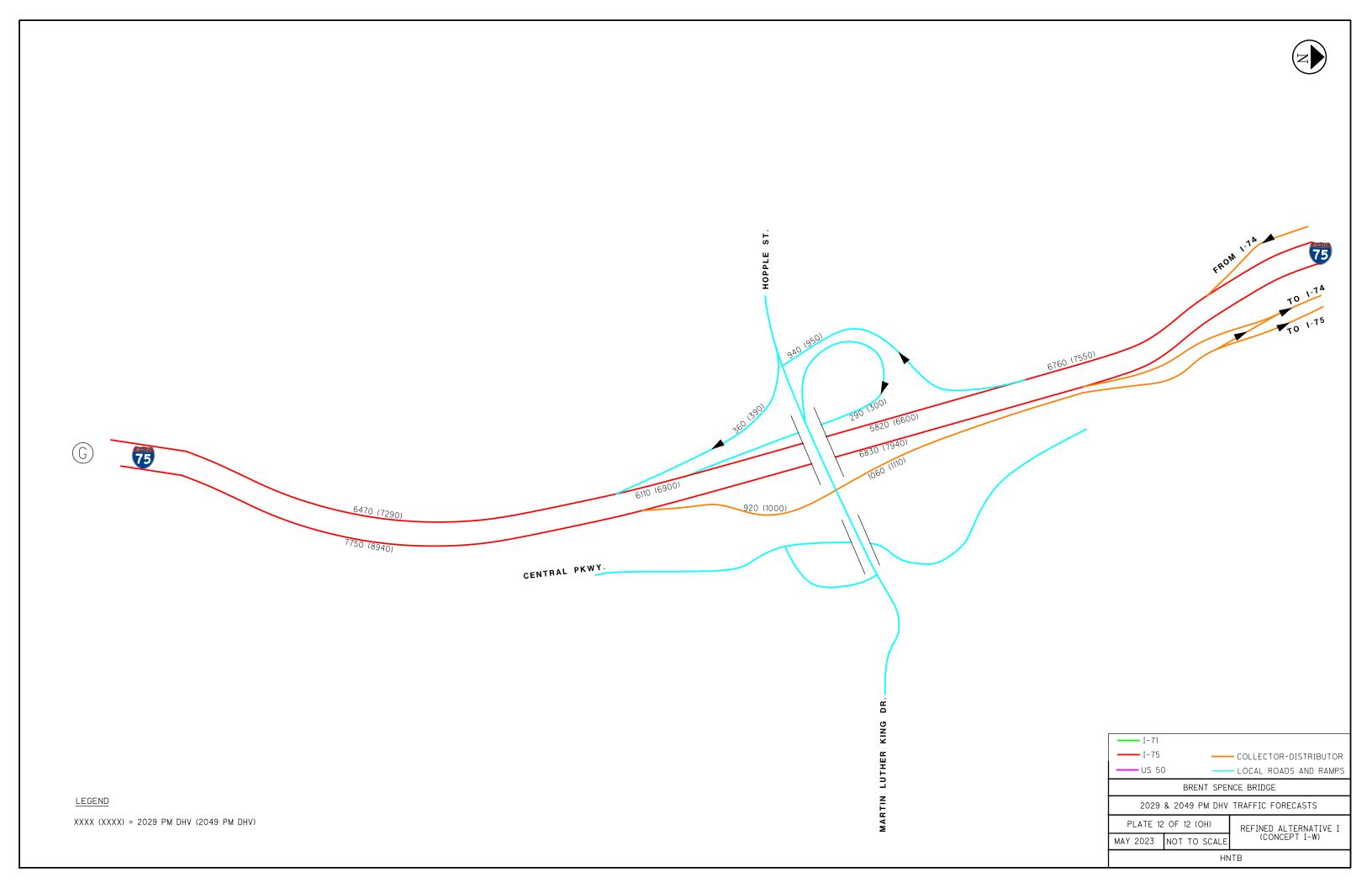


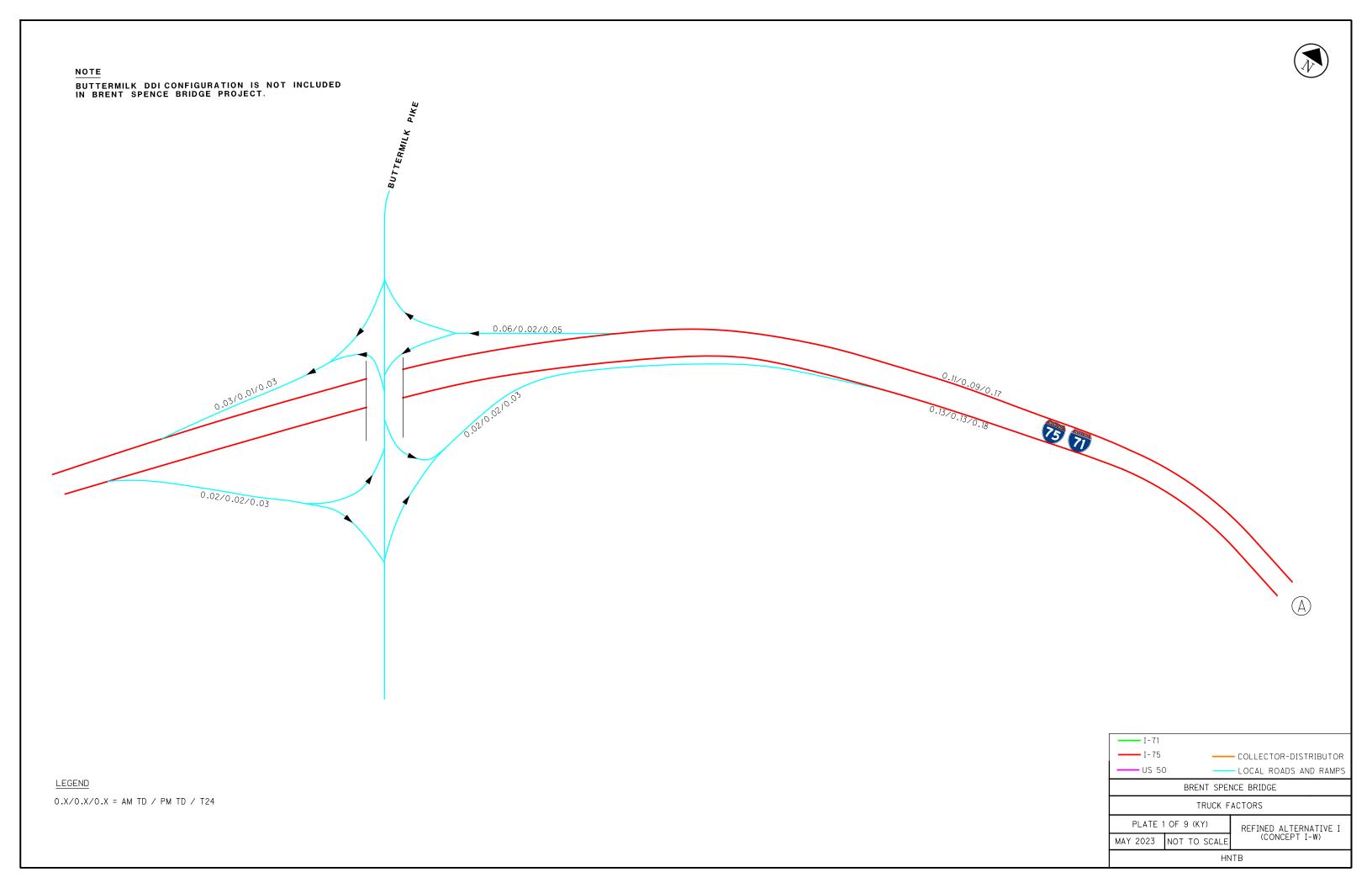


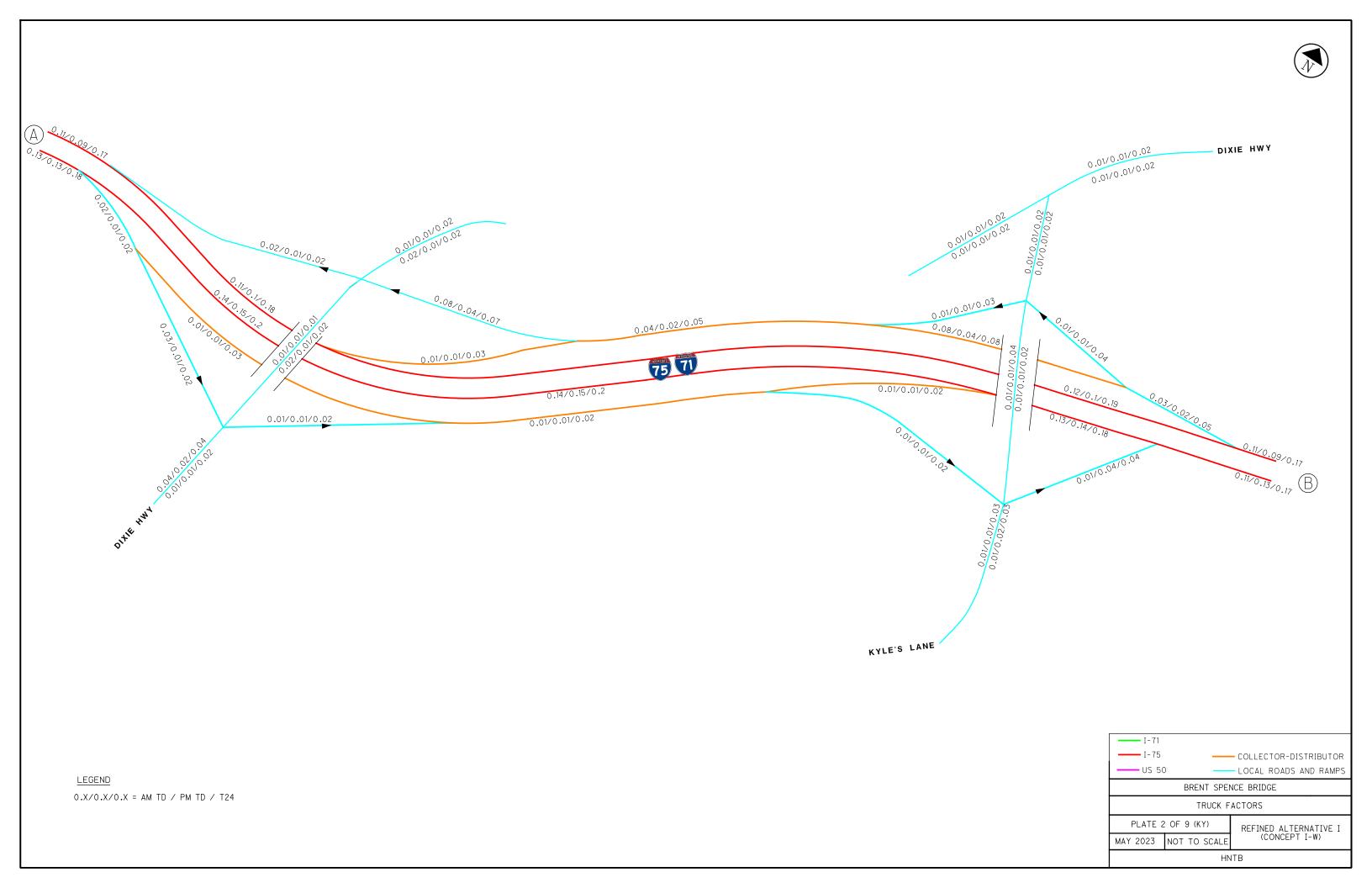


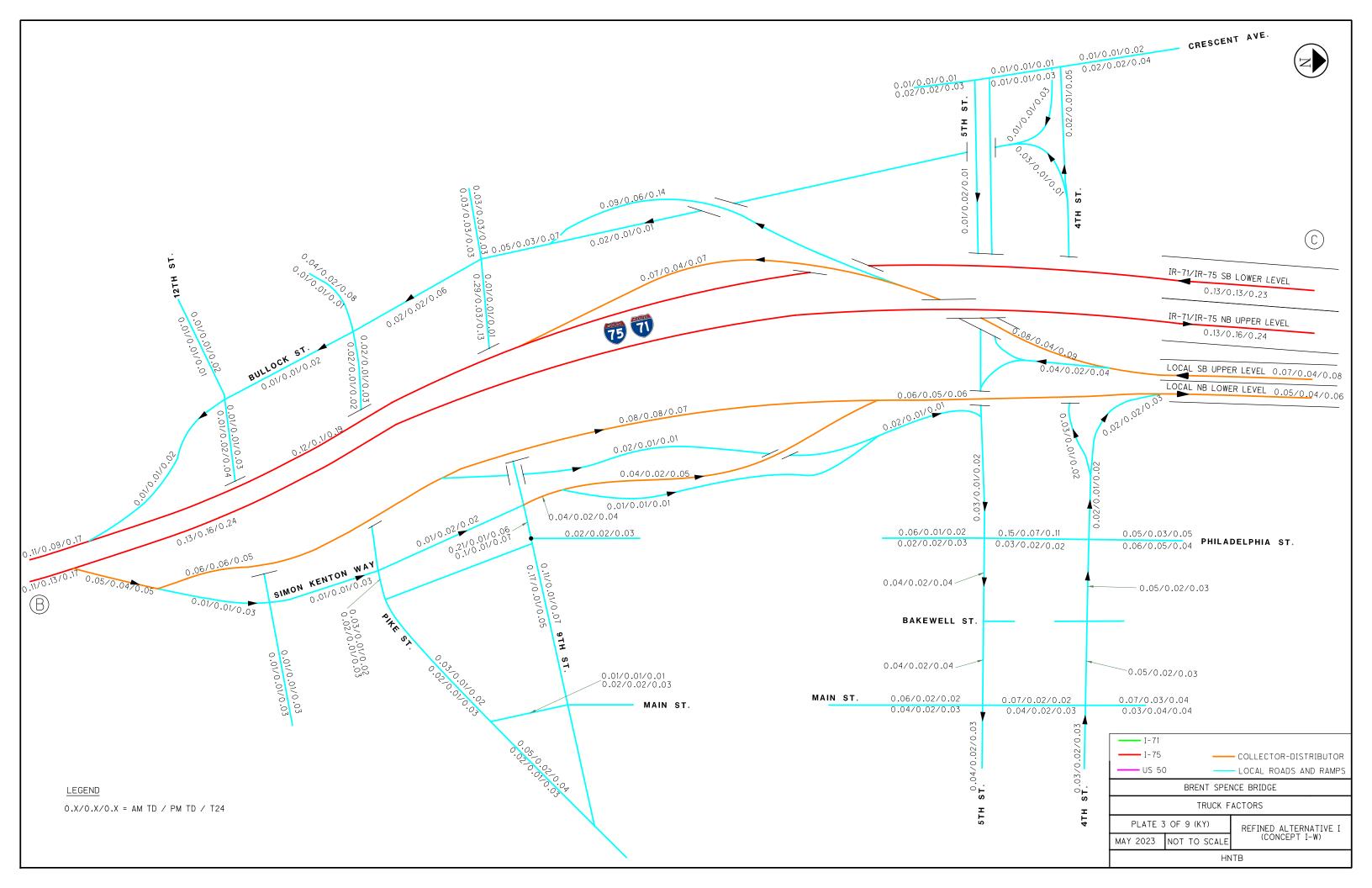


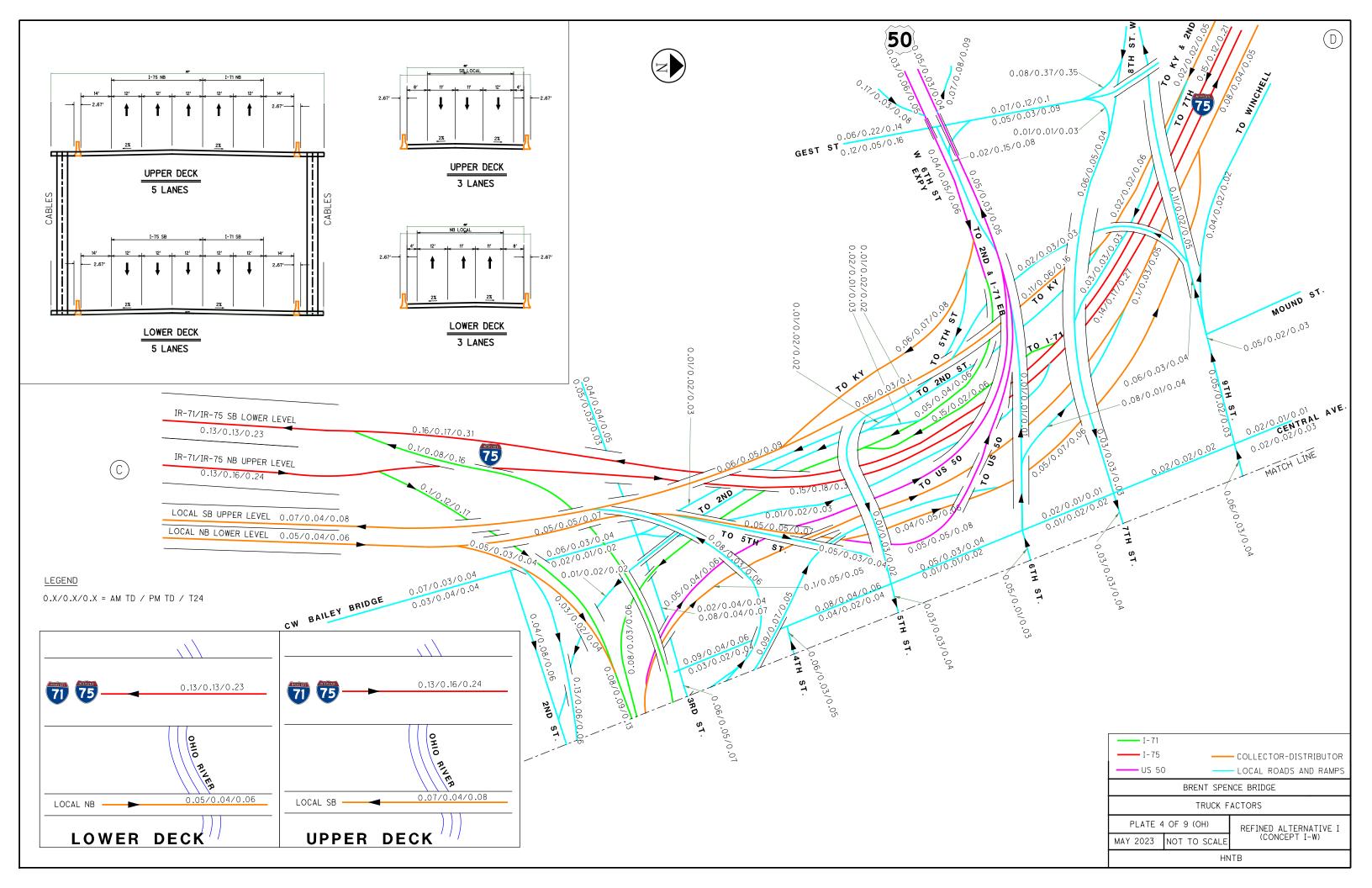


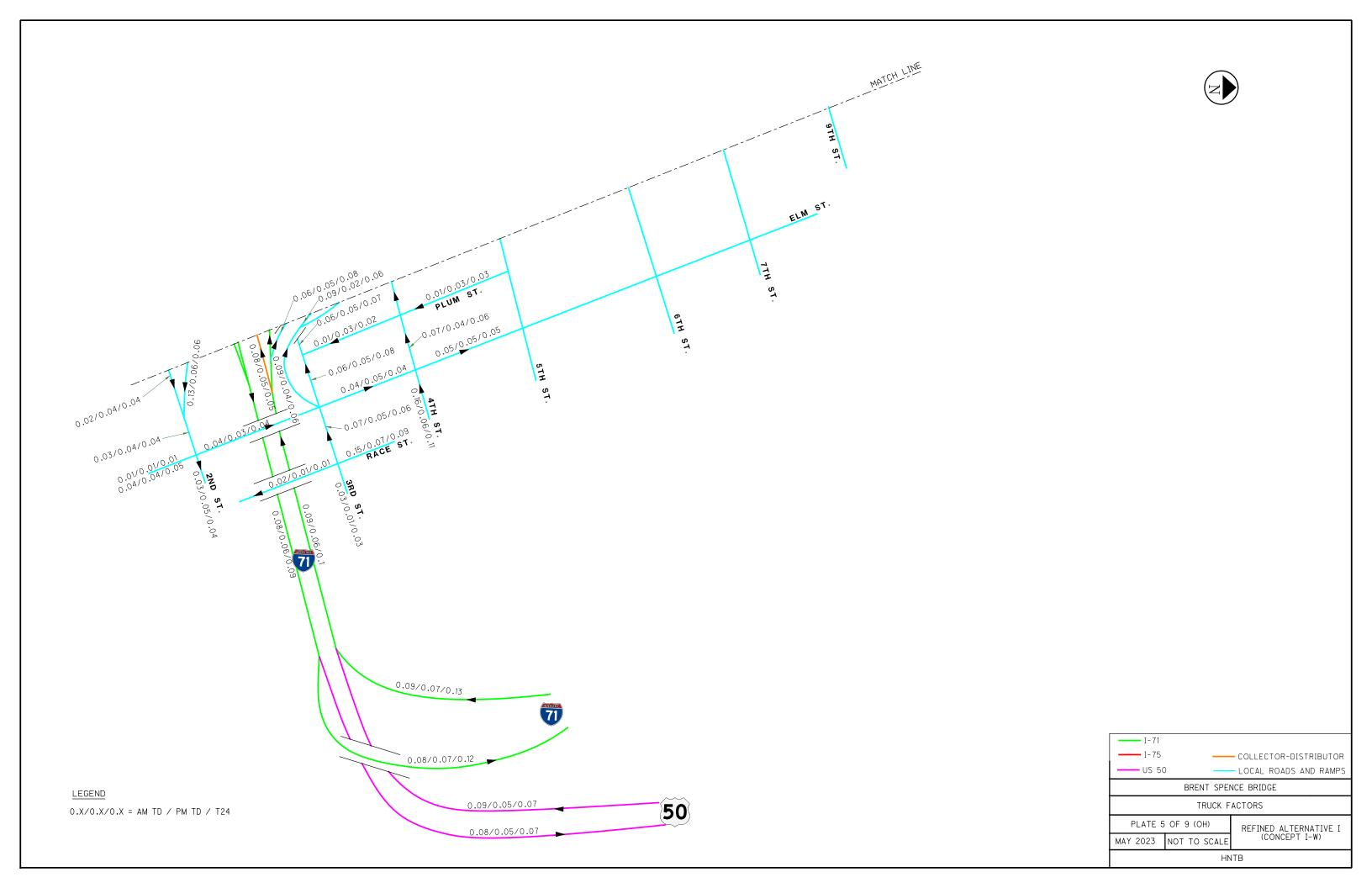


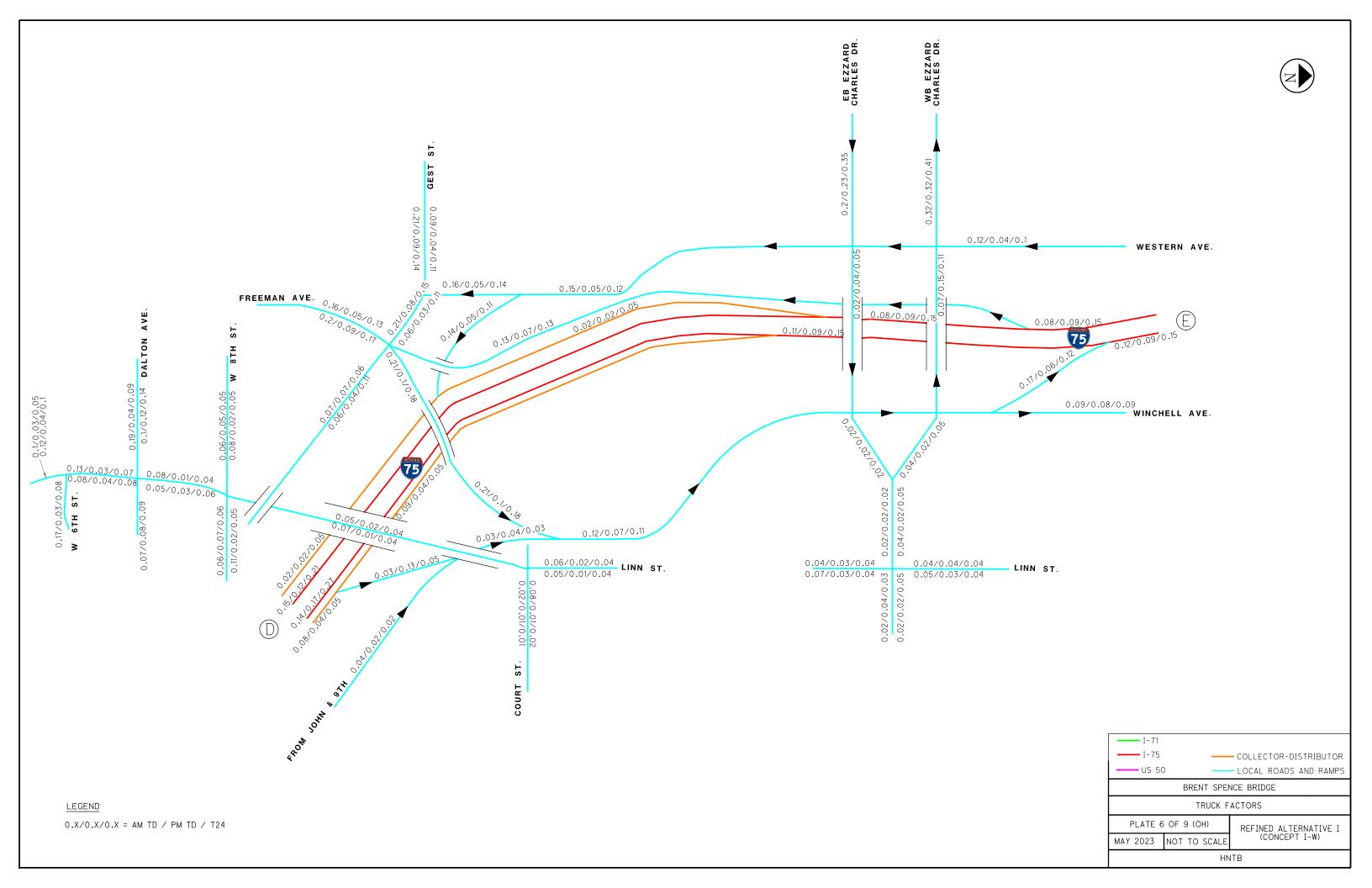


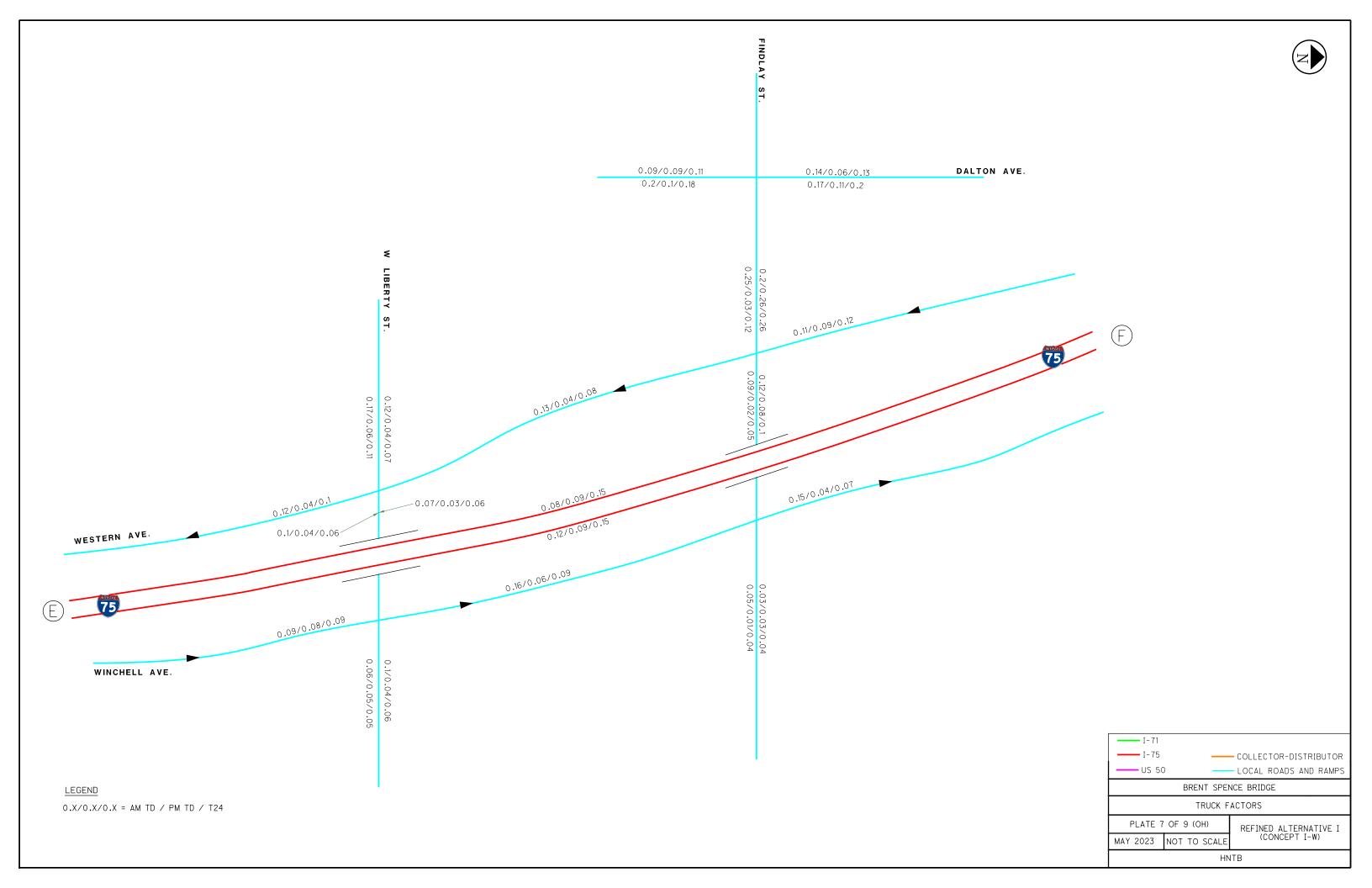


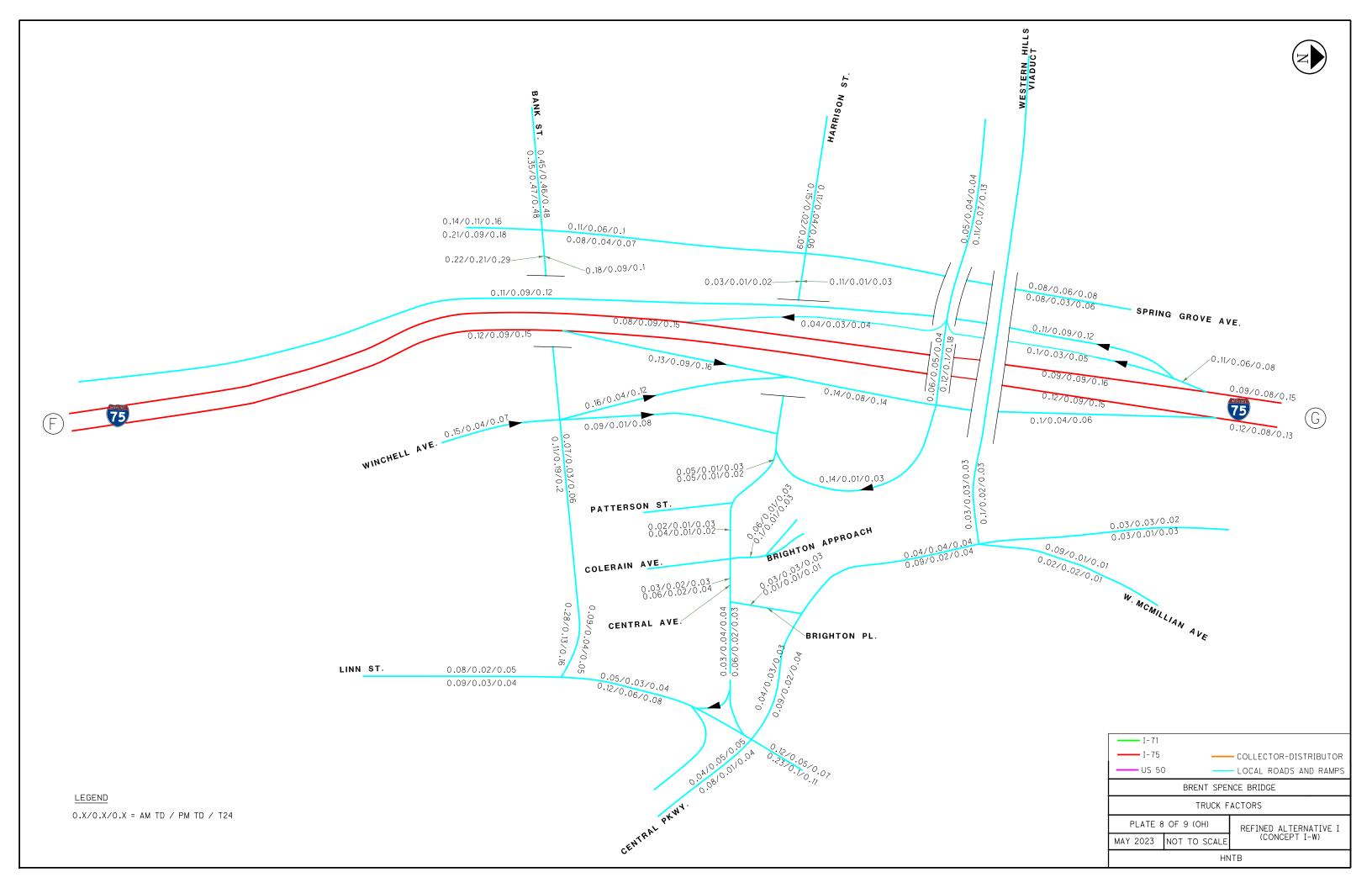


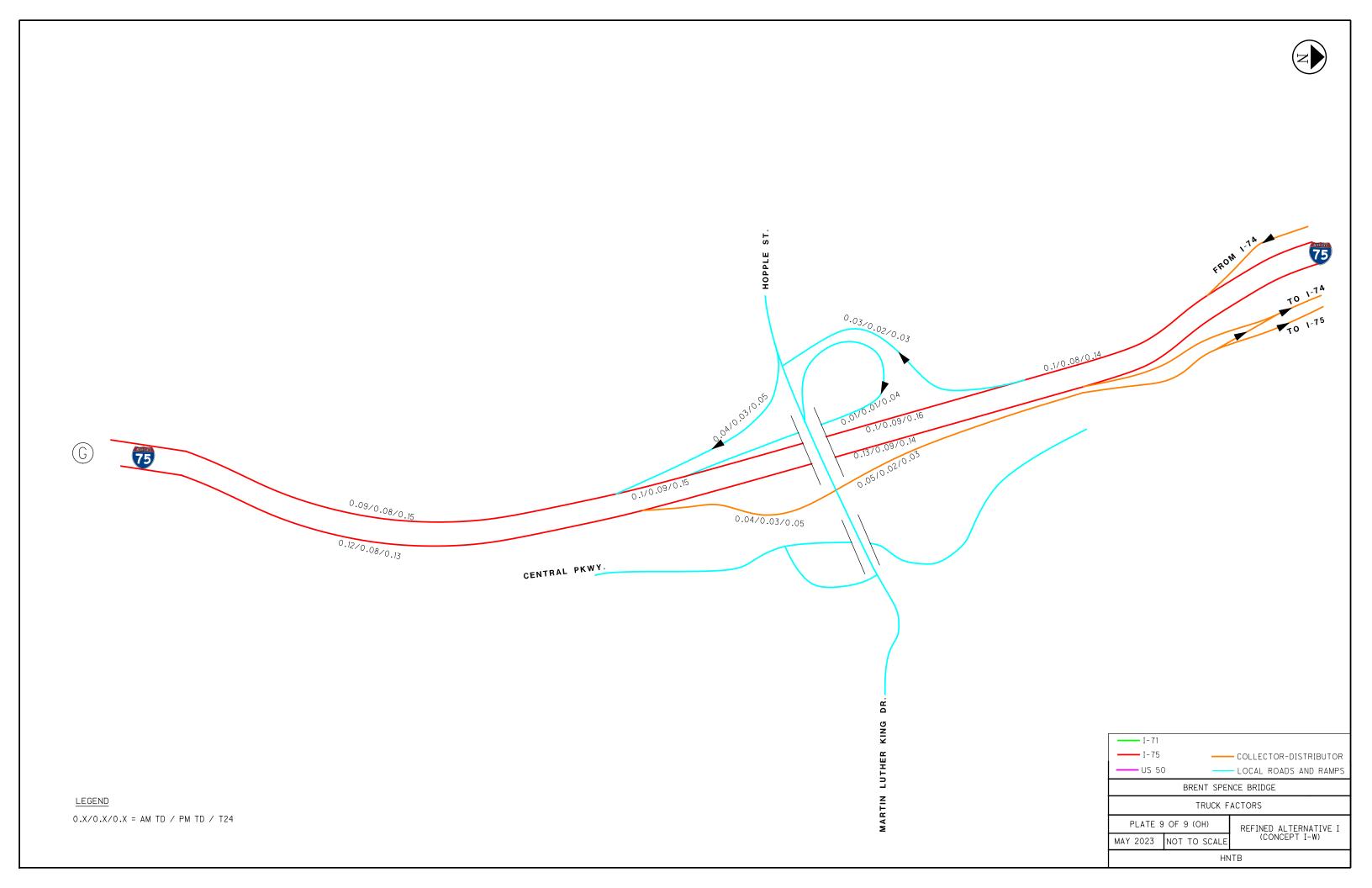












# Appendix B: Reports



BRENT SPENCE BRIDGE CORRIDOR PROJECT

# TRAFFIC COUNT EVALUATION

ODOT PID 89068 | KYTC PROJECT ITEM NO. 6-17 JANUARY 25, 2023







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# **APPENDICES**

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Appendix C: Existing 2019 AADT (Target versus Balanced Volumes)

Appendix D: Seasonal Adjustment Factors

Appendix E: Existing 2019 AM Peak Hour (Target versus Balanced Volumes)

Appendix F: Existing 2019 PM Peak Hour (Target versus Balanced Volumes)



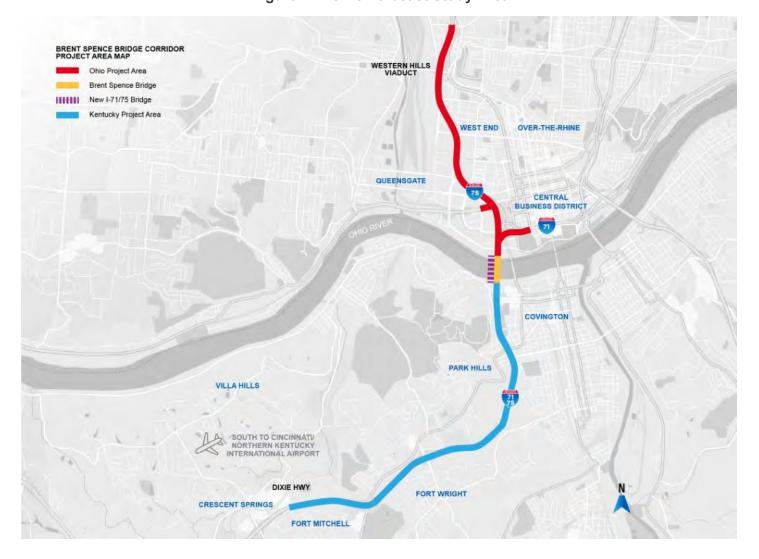
# 1. BACKGROUND

As part of the upcoming Brent Spence Bridge (BSB) Interchange Modification Study (IMS) addendum, certified traffic forecasts including design hours and Annual Average Daily Traffic (AADT) will be developed for years 2029 and 2049 for the project study limits. The study limit includes the I-71 and I-75 interstate between the Buttermilk Pike Interchange on the south and the Hopple Street Interchange on the north, and I-71 between the BSB and the US 50/I-471 Interchange (see Figure 1). Ramp terminal and adjacent arterial intersections are included in the forecast area.

The certified traffic forecasts will follow ODOT's forecasting procedures. One of the first steps of the ODOT procedure is to develop this Traffic Count Evaluation report. This report includes details on the existing traffic counts and proposed adjustment factors to convert the weekday peak hour and daily traffic counts to design hour and AADT volumes. The base count year for the forecast is 2019. Traffic counts were compiled over a 5-year period between 2017 and 2022. Counts taken prior to 2020 were prioritized to avoid the impacts of the COVID-19 pandemic. Due to variability in counts before and after the pandemic, short term growth rates were not applied to count targets to adjust for count years that differ from the base year 2019. Traffic counts used for the project were sourced from ODOT, KYTC, OKI, City of Cincinnati, and project counts including the Brent Spence Bridge Strategic Corridor Study (BSBSC) completed in 2017, and 2022 counts collected by the BSB project team.

In 2021, certified traffic forecasts were developed for the northern portion of the project limits of I-75 from Hopple Street to Linn Street, and at the Western Hills Viaduct Interchange as part of project ID (PID) 114161 and 113361. These forecasts use a base year 2021 with adjustments to pre-COVID conditions. Many of the traffic counts and proposed adjustment factors approved with this previous forecast are also proposed for the BSB forecast.





**Figure 1: Traffic Forecast Study Area** 



# 2. 2019 AADT DEVELOPMENT

The project team reviewed available traffic counts and published AADT data. The available traffic counts vary in years from 2017 to 2022. The project is focused on a pre-COVID base year of 2019, so all available AADT data is adjusted to this base year prior to traffic balancing. Traffic balancing is the practice of smoothing traffic data so the values are in alignment and form a closed system where the traffic "ins" equal the traffic "outs". The 2019 AADT targets were developed through various means based on count year, count type, and count location. The methodology for establishing a 2019 AADT target for each location is described in the sections below. When available, the project team relied on published AADT data. These data sources are often established based on short term or continuous count stations and the data adjusted based on seasonal and day of week considerations to be an estimate of annual average daily volumes. ODOT published seasonal adjustment factors and count expansion factors (for intersection counts) were also used for project traffic counts that do not have a published AADT. These factors are also presented in the proceeding sections. The published AADT for ODOT, KYTC, and OKI are available at the following websites:

- ODOT https://odot.ms2soft.com/TDMS.UI Core/portal
- KYTC <a href="https://transportation.ky.gov/Planning/Pages/Traffic-Counts.aspx">https://transportation.ky.gov/Planning/Pages/Traffic-Counts.aspx</a>
- OKI https://traffic.oki.org/

Tables showing the available traffic data, the 2019 AADT target for the project, and the balanced 2019 project AADT are shown in Appendix A. A schematic view of the traffic count ID's is in Appendix B and a schematic of the target AADT and balanced AADT volumes is in Appendix C. The seasonal adjustment factors used for the project counts are provided in Appendix D.

### **2.1 2021 ODOT Counts**

Certified traffic was completed in June 2021 for PID 114161 and PID 113361, which covers the northern limits of the BSB study area. This forecast used mostly January 2021 traffic counts and developed a base year 2021 AADT consistent with a pre-COVID condition. Thirteen count stations in the project corridor had both 2018 and 2021 traffic counts. The 2021 AADT were developed using a COVID adjustment factor instead of the traditional seasonal adjustment factors to account for traffic reductions in early 2021. The count evaluation memo for this project recommended a factor of 1.08 to convert weekday 2021 counts to 2021 AADT. As some count stations in Ohio have only 2021 counts, it was recommended that this 1.08 factor be applied to these counts to derive an AADT compatible with a 2019 condition. If 2018 ODOT counts were available, the procedure in section 2.2 was used. The count stations used for deriving the 1.08 COVID adjustment factor are shown in Table 1.



Table 1: COVID 19 Pandemic Factor Calculation (PID 114161 & PID 113361)

ODOT Count ID	Site Description	2018 AADT	2021 Daily Count	COVID-19 Factor
79831	EB Western Hills Viaduct to I-75 NB	6,902	8,321	0.83
79631	EB Western Hills Viaduct to I-75 SB	7,060	6,338	1.11
79531	I-75 SB to Western Hills Viaduct WB	6,766	7,133	0.95
89631	I-75 NB to WHV WB	7,327	6,896	1.06
79431	I-75 NB ramp to Hopple St	5,475	4,806	1.14
79331	I-75 NB ramp from Hopple St	8,258	6,628	1.25
138331	Winchell Ave (north of Bank St) to I-75 NB	7,257	6,518	1.11
89931	I-75 SB Exit at Ezzard Charles	3,658	3,076	1.19
81831	81831 I-75 NB entrance from Ezzard Charles		2,283	1.16
90131	90131 Western Entrance ramp to I-75 SB		3,428	0.84
13631	13631 Central Pkwy btw WHV & Linn St		13,003	1.13
81531	81531 I-75 SB Exit to 7th St		3,318	1.35
103199	Findlay St, btw Dalton & I-75	4,986	4,383	1.14
	Total	82,413	76,131	1.08

# **2.2 2018 ODOT Counts**

The Ohio AADT derived by ODOT is published on the MS2 Transportation Data Management System. These published AADT's were used for all available count locations when available. However, some I-75 ramp locations are identified as "adjusted for balancing". As traffic balancing was completed for the project corridor, an AADT target that is not pre-adjusted for balancing was desired for purposes of this project. Therefore, an unadjusted AADT target was calculated for these count locations using the raw traffic counts and the 2018 urban interstate seasonal adjustment factors summarized in Table 2.



Table 2: Seasonal Adjustment Factors for 2018 Traffic Counts

	Group	URBAN INTERSTATE (U01)					
From Year:		2018	To Year:		2018		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.609	1.253	1.053	1.020	1.003	1.032	1.429
Feb	1.570	1.038	0.985	1.037	0.970	0.937	1.258
Mar	1.393	0.992	0.975	0.978	0.936	0.879	1.196
Apr	1.347	0.974	0.963	0.929	0.904	0.862	1.141
May	1.259	1.018	0.916	0.901	0.875	0.835	1.097
Jun	1.232	0.920	0.905	0.883	0.860	0.830	1.072
Jul	1.230	0.924	0.897	0.973	0.872	0.833	1.078
Aug	1.214	0.928	0.907	0.890	0.861	0.821	1.066
Sep	1.304	1.033	0.925	0.908	0.882	0.837	1.108
Oct	1.287	0.950	0.920	0.916	0.879	0.841	1.108
Nov	1.342	0.982	0.933	0.906	1.013	0.914	1.184
Dec	1.398	1.094	1.058	0.945	0.926	0.885	1.172

The published 2018 AADT and the project calculated AADT is summarized in Appendix A.

# 2.3 2017-2019 KYTC Counts

Published AADT data from KYTC traffic count maps were obtained for all available locations. The 2019 count data was prioritized when available. The 2019 AADT target was set equal to published AADT from 2017-2019 with no additional factoring. KYTC derives AADT data from short term and continuous count locations using observed count data and day of week and seasonal adjustment factors based on facility type.



#### 2.4 **2020 KYTC Counts**

Ramp counts at Dixie Hwy and Buttermilk Pike Interchanges were taken in October 2020. These counts are not compatible with year 2019 counts due to the COVID-19 pandemic. Prior to 2020, these ramp counts were last taken in 2014. COVID adjustment factors for these counts were proposed specific for each site based on a comparison of 2014 data. The 2019 AADT targets is set equal to the 2014 count if it is greater than the 2020 count, otherwise the 2020 count is used for 2019 target.

Interchange	Ramp	KYTC Site ID	2020 AADT	2014 AADT	COVID Factor	2019 AADT Target
	SB Entrance	059N08	3,633	4,249	1.17	4,300
Dixie Hwy	SB Exit	059N07	3,084	4,738	1.54	4,700
Dixie riwy	NB Entrance	059N06	5,513	6,774	1.23	6,800
	NB Exit	059N05	2,374	3,385	1.43	3,400
	SB Entrance	059C50	7,872	12,140	1.54	12,100
Double markille	SB Exit	059C49	5,848	8,525	1.46	8,500
Buttermilk Pike	NB Entrance (from WB)	059C48	4,176	1,893	1.00	4,200
FIRE	NB Exit	059C47	6,957	11,109	1.60	11,100
	NB Entrance (from EB)	059C46	1,062	5,871	5.53	5,900

Table 3: 2020 AADT Factors

# 2.5 Short Duration Project Counts

Project traffic counts taken with tube or video detection devices over a short-term period, usually 48-hours, were adjusted to AADT estimates using ODOT's published seasonal and day of week factors. These factors are available by year and facility type. A full list of the seasonal adjustment factors are provided in Appendix D. Only a few interstate ramp counts rely on short term project counts instead of published AADT. These sites and the source of the count information is listed below:

- SB I-71/I-75 Entrance Ramp from 12<sup>th</sup> Street (KY) 2022 count collected for BSB IMS Addendum
- NB I-71/I-75 Entrance Ramp from Pike Street (KY) 2017 BSBSC
- NB I-71/I-75 Exit Ramp to 5<sup>th</sup> Street (KY) 2017 BSBSC
- SB I-71/I-75 Exit Ramp to 9<sup>th</sup> Street (KY) 2017 BSBSC

#### 2.6 OKI Counts

OKI AADT was included for 12 locations in 2018 and 8 locations for 2021. These AADT data points are published on the OKI traffic count website. These AADT targets were set equal to the 2019 AADT targets without additional factoring. In addition to the 20 published AADT locations, OKI provided the project team with year 2019 continuous count data for the BSB and the NB entrance from 4<sup>th</sup> Street and SB exit to 5<sup>th</sup> Street.



AADT estimates for the BSB and the two ramp locations were estimated using available seasonal adjustment factors provided by ODOT. More details on the BSB count target is provided in the next section.

# 2.7 Brent Spence Bridge Counts

ODOT, KYTC, and OKI have published AADT's for the BSB on their websites. A summary of these posted AADT's is provided in the table below. These AADT's were developed using different methods and count sources. The published AADT in 2013, 2014, 2018, 2019, 2020, and 2021 are similar between the reporting agencies. Greater inconsistencies are reported between 2015 and 2017. There are two AADT's published for the count base year of 2019; KYTC published 163,386 and ODOT published 152,333. The ODOT value is identified on the MS2 Count website as being derived from traffic count balancing. The KYTC location is station 059014 and is listed as a full coverage count.

2013 2014 2015 2016 2017 2018 2020 2021 Agency 2019 ODOT 174,200 175,292 134,785 154,626 154,475 151,877 152,333 124,761 148,639 **KYTC** 185,992 180,494 171,476 192,177 154,820 163,386 132,112 OKI 161,036 152,214 139,185 Average 167,618 | 173,384 157,664 167,560 | 173,326 153,349 157,860 128,437 143,912

Table 4: Published AADT's for Brent Spence Bridge

OKI provided the project team continuous count data for May through October 2019. These counts were used as inputs for the AM and PM peak hours and relied on for the microsimulation analysis as the data is provided in 15-minute bins. The project team estimated a BSB AADT for 2019 using this data. An average daily volume was calculated by the project team by first averaging the data by day of week and then averaging again across the seven days without the use of seasonal adjustment data. The resultant from this calculation was an AADT estimate of 159,900. The calculation was repeated with the use of ODOT seasonal adjustment factors for year 2019 and the AADT was estimated as 159,000. As shown from Figure 2, the daily volume varies significantly by day of week with the lowest volume occurring on Sunday and the highest traffic volume occurring on Friday. The day of week averages varied from 138,000 to 180,000.

Based on a review of the published AADT and the continuous count data provided to the project team, the recommended target volume AADT for the BSB was set to 160,000.



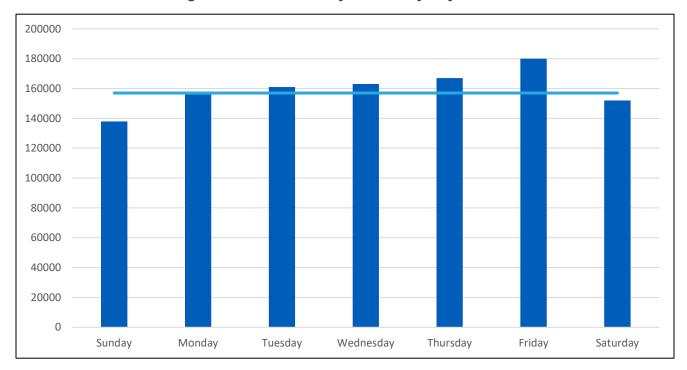


Figure 2: 2019 BSB Daily Volume by Day of Week

# 2.8 Intersection Counts

Intersection turn movement AADT targets were estimated using period traffic counts, count expansion factors, and seasonal adjustment factors (see Appendix D). All the intersection counts include an AM period from 6-10 AM and PM periods that vary by count location (2-7 PM or 3-7 PM or 2-6 PM). The count expansion factors were estimated using adjacent 24-hour counts or default expansion factors based on ODOT's recommended factors for 2019. The expansion factors were calculated separately for auto and truck classes. If auto and truck classification counts are not available, the default factor was applied. The proposed count expansion factors for all turn movements are shown in Appendix A. The default period to daily expansion factors are summarized in Table 5.

6-10 am; 2-7 pm 6-10 am; 2-6 pm 6-10 am; 3-7 pm Facility Auto Truck Auto Truck Auto Truck U01: Urban Interstate 1.65 2.10 2.31 1.82 1.83 2.42 U02: Urban Freeway 1.62 1.98 1.79 2.12 2.28 1.81 2.25 U03: Urban Principal Arterial 1.69 1.94 1.88 2.08 1.91 U04: Urban Minor Arterial 1.92 1.70 1.80 1.91 1.93 2.08

**Table 5: Default Period to Daily Expansion Factors** 

# 2.9 AADT Traffic Smoothing

AADT targets were developed for segment and turn movements using the data and factoring methodologies outlined in sections 2.1 to 2.8. The target and balanced 2019 AADT's are shown in Appendix A and Appendix C. The target AADT's were balanced to have a closed system of traffic volumes where the network "ins" equal the network "outs". The traffic balancing used a combination of automated optimization routines and manual inspection. The balancing optimization routine is similar to ODOT's balancing principle of split the difference method, where the counts are balanced to have values that are the best fit between all of the data points. The algorithm for the balancing optimization is built with the R scripting language and employs the principles of entropy maximization where the best solution is derived through random and iterative factoring of target AADT's. Each factoring step optimizes the solution for a given AADT location. The final solution is derived using a method of successive averages, where each location receives the same number of factoring iterations, which means an equal priority in the balancing process. There are a few exceptions to the equal weight rule that were assigned during the manual inspection to provide a better data fit to priority locations. One of the exceptions is the Brent Spence Bridge, where the bridge balanced volume was forced to equal the target volume. A plot of the final balanced 2019 AADT values compared to the 2019 AADT target values is shown in Figure 3.

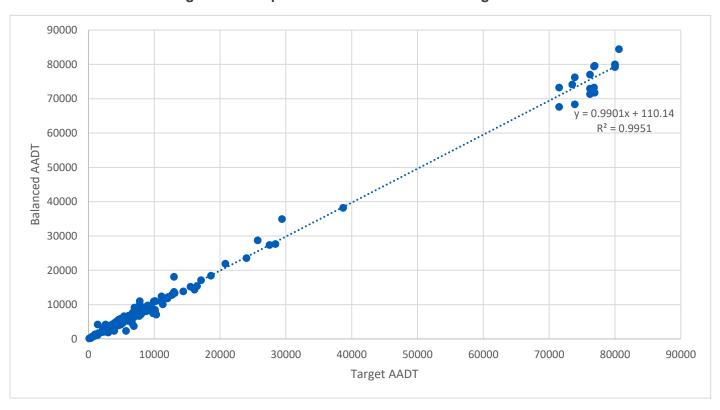


Figure 3: Comparison of 2019 AADT and Target Volumes



As is shown in Figure 3, the target values are on the x-axis and balanced values on Y-axis. The regression line of the data shows a good fit to the data with a slope near 1 and an R<sup>2</sup> of 0.99. Although, the balanced volumes are a good fit to the targets as a whole system, there are some locations with discrepancies between target and balanced volumes due to conflicts between adjacent counts. A list of the count locations that vary by more than 1,000 vehicles and 25% between target and balanced are listed in Table 6.

**Table 6: Target and Balanced Discrepancies** 

Losskian	Target	Balanced	Dancer for difference
Location	AADT	AADT	Reason for difference
Western Ave n/o Ezzard Charles	10,300	7,100	Upstream target = 7,210; Downstream target = 6,350
NB Linn St s/o of Gest	6,900	3,750	Upstream target = 3,100; Downstream Target = 2,900
WB Dixie Hwy w/o of SB I-75	7,700	9,650	Upstream Target = 10,650
EB Gest St e/o Linn St	3,000	1,850	Upstream Target = 1,600, downstream target = 1,080
EB 5 <sup>th</sup> Street e/o Crescent Ave	5,700	2,350	Upstream Target = 1,450
EB Kyles Ln (btwn I-71/75 ramps)	7,800	11,000	Upstream Target = 11,960, downstream target = 11,940
WB 4 <sup>th</sup> Street w/o Philadelphia	13,000	18,100	Upstream Target = 18,290, downstream target = 20,000
NB Philadelphia	6,600	4,650	Upstream Target = 1,570
SB CW Bailey btwn 2 <sup>nd</sup> and 3 <sup>rd</sup> St	7,000	9,150	Upstream Target = 7,807, downstream target = 9,540
EB Bank Street e/o Winchell	3,900	2,350	Upstream Target = 1,300
WB 3 <sup>rd</sup> Street w/o Central Ave	1,400	4,200	Upstream Target = 4,010, downstream 5,010
NB Central btwn 6 <sup>th</sup> and 7 <sup>th</sup> St	2,600	3,900	Upstream Target = 3,240, downstream Target = 5,080
NB Main Street s/o 5 <sup>th</sup> Str	2,600	4,200	Downstream target = 5,080
NBT @ Crescent Ave & 4 <sup>th</sup> St	3,400	5,350	Balancing impacted by 5 <sup>th</sup> Street targets
WBR @ Crescent Ave & 5 <sup>th</sup> St	2,900	5,050	Balancing impacted by 5 <sup>th</sup> Street targets
WBR @ Kyles & I-71/7 NB ramp	8,400	5,900	Balances to ramp target of 6,900
WBR @ Philadelphia & 4 <sup>th</sup> St	800	2,250	Balance influenced by downstream link count
EBL @ Philadelphia & 5 <sup>th</sup> St	1,000	2,700	Balancing impacted by 5 <sup>th</sup> Street targets
EBT @ Philadelphia & 5 <sup>th</sup> St	3,600	6,450	Balancing impacted by 5 <sup>th</sup> Street targets
WBT @ 9 <sup>th</sup> Street & Mound St	4,900	6,350	Balancing impacted by adjacent 9th Street counts
EBR @ CW Bailey & 3 <sup>rd</sup> St	3,800	6,050	EB approach target = 4,270, upstream link target = 7,700
NBT @ Central & 7 <sup>th</sup> St	3,200	2,250	NB approach target = 5,080, upstream link target = 2,600
WBL @ Central & 6 <sup>th</sup> St	1,200	2,300	WB approach target = 7,200, upstream link target = 9,700
WBR @ Main St & 4 <sup>th</sup> St	3,800	5,200	Downstream turn target = 6,450, downstream link = 8,100
EBT @ Main St & 5 <sup>th</sup> St	3,900	6,000	EB approach target = 5,280, upstream link target = 8,800



# 3. PEAK HOUR VOLUME DEVELOPMENT

The objective of the peak hour volume development was to derive a balanced AM and PM peak hour volume that is consistent with a 2019 weekday condition. The balanced 2019 weekday volumes will be adjusted to a design hour volume for the 2029 and 2049 traffic forecasts. These adjustments and the count selection process are described in the sections below.

# 3.1 Traffic Count Selection

Traffic counts from ODOT, KYTC, OKI, City of Cincinnati, project counts from the 2017 BSBSC project, and 2022 counts collected by BSB project team were reviewed for the study limits. The traffic counts between 2017 and 2022 were considered for this project. The analysis year is 2019 to coincide with a pre-COVID pandemic condition. The data was reviewed at each count station and a count target was selected using available data. The methodology for selecting the peak hour weekday counts is detailed below.

### Step 1: Identify traffic count date that best represents a 2019 condition

- In most cases a 2018 or 2019 traffic count is used when available
- ODOT, KYTC, and OKI data is prioritized. Counts collected by study teams and the City of Cincinnati
  are used when other data is not available

# Step 2: Check for multiple days of count data

Yes: Go to step 3

No: Single day is count target

#### Step 3: Check for outlier counts

- Yes: Remove outlier counts
  - Use remaining count if only one day remains
  - Go to step 4 if there are still multiple days
- No: Go to Step 4

# Step 4: Remove counts outside Tuesday, Wednesday, Thursday

# Step 5: Use remaining count or average multiple count days

Summary tables and figures of the traffic counts identified for the peak hour volume development are identified in Appendix B and Appendix C.



# 3.2 Peak Hour Selection

The traffic counts at the intersection, ramps, and arterials indicate system peak hours of 7:30-8:30 AM and 4:30-5:30 PM. The counts from these hours were used as the AM and PM peak hours. Due to freeway traffic congestion, the peak observed traffic volumes on the Brent Spence Bridge and other freeway mainline locations do not align with the identified system peaks. Therefore, the target volumes for the mainline counts were selected using a local peak hour, which varies by site between 6:00 and 9:00 AM and 3:00 and 6:00 PM. The mainline design hour volumes will be further adjusted to align with the design hour volume (described in section 2.4) for the 2029 and 2049 forecasts.

The TransModeler calibration methodology uses FHWA Traffic Analysis Toolbox (TAT) III guidelines that considers a representative day chosen through cluster analysis. The volume of the model is validated at the bottleneck location, which is the BSB for northbound I-71/75 in the AM peak and southbound I-71/75 in the PM peak. The BSB has continuous traffic counts between May 28 and October 31, 2019. This data is used in the cluster analysis to identify the most common travel condition. The chosen representative day for the AM and PM peak periods, which is the condition that most matches the mean of the most common cluster is Wednesday October 2, 2019 for AM period and Wednesday June 12, 2019 for PM period. More details on the cluster analysis will be covered in the TransModeler analysis documentation. The representative day volumes and the variation envelopes which represent one and two standard deviations from the representative day are shown in the figures below. The balanced 2019 peak hour volumes are consistent with the representative day cluster. The AM Peak is 6,360 for NB and 4,585 for SB. The PM peak 5,285 for NB and 6,000 for SB. Latent traffic demand on the BSB is accounted for with the certified traffic process that applies a design hour factor based on the AADT and K30 factor, this methodology is described in section 3.4.



Figure 4: NB BSB Representative Day Volumes – AM Period

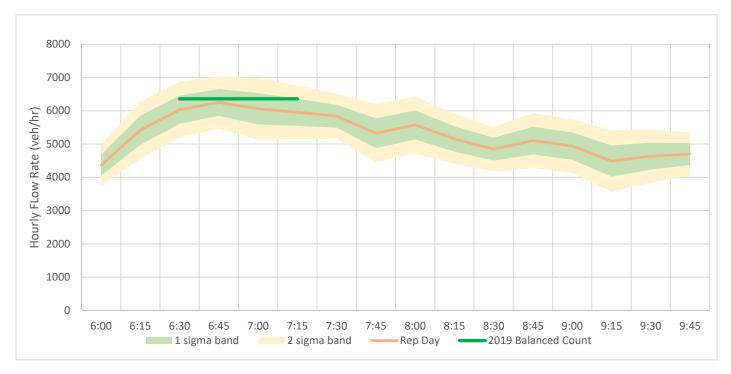


Figure 5: SB BSB Representative Day Volumes - AM Period

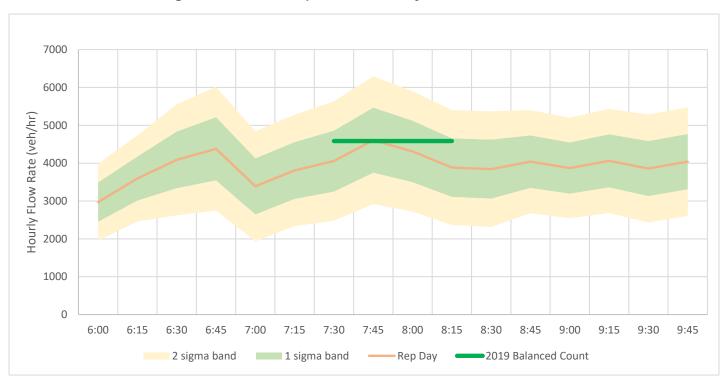




Figure 6: NB BSB Representative Day Volumes - PM Period

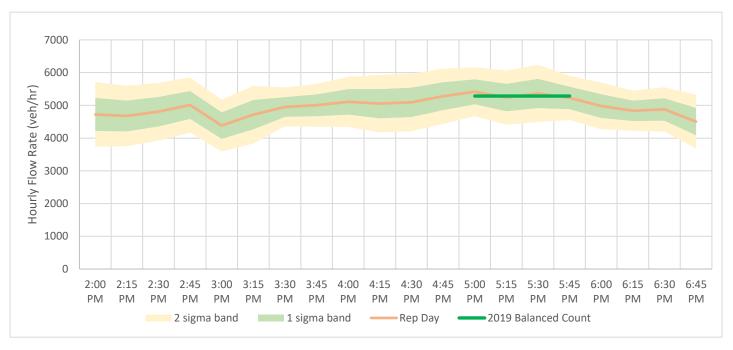
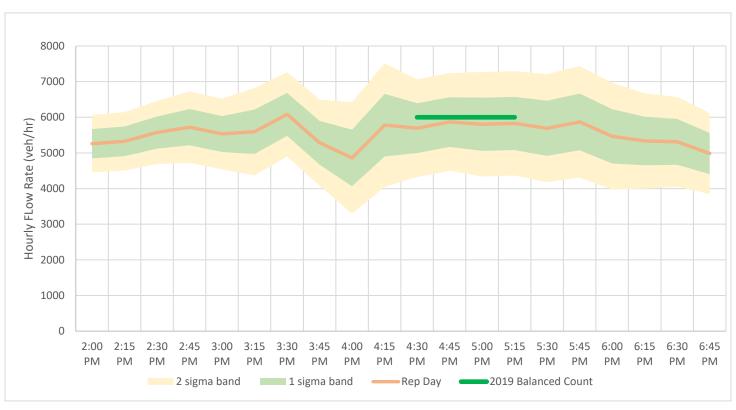


Figure 7: SB BSB Representative Day Volumes – PM Period





#### 3.3 AM and PM Peak Hour Traffic Smoothing

The target AM and PM peak hour volumes were balanced using the same principles as the AADT traffic volumes. The plots of the balanced AM and PM peak hour volumes compared to the target volumes are shown in Figure 8 and Figure 9.

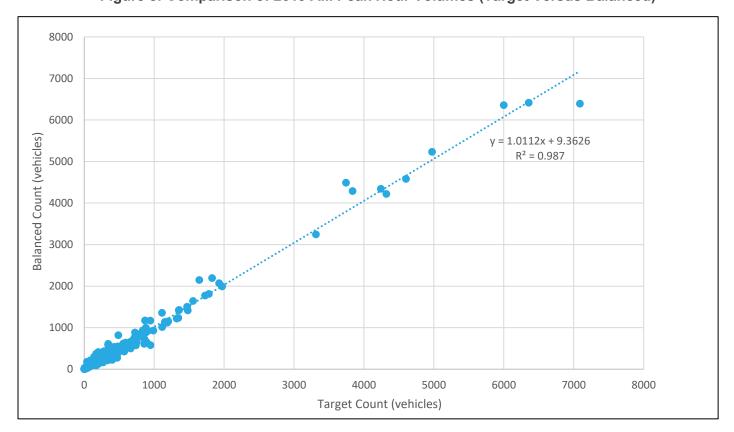


Figure 8: Comparison of 2019 AM Peak Hour Volumes (Target Versus Balanced)

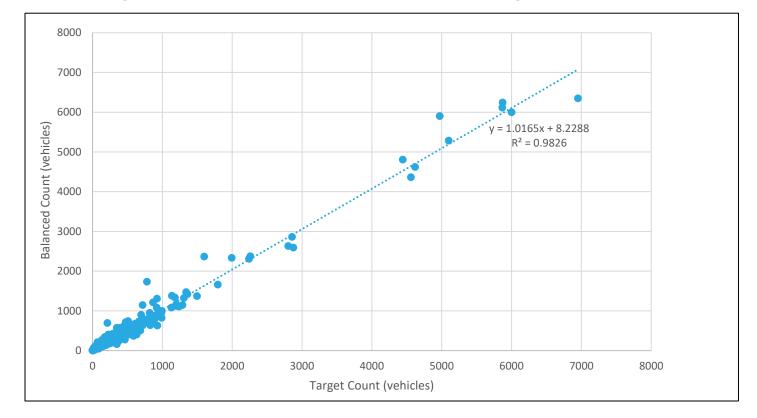


Figure 9: Comparison of 2019 PM Peak Hour Volumes (Target Versus Balanced)

As is shown in the figures, there is a good fit between the target counts and balanced counts with an R² of 0.99 and slope near 1. As discussed with the AADT balancing, although the system balance is a good fit to the target there are select locations with notable differences between target and balanced volumes. One of these locations is the SB I-75 mainline between Hopple Street and the Brent Spence Bridge. The balancing prioritizes the BSB count, which leads to discrepancies at another mainline count site near Findlay Avenue. A comparison the AM peak hour volumes for I-75 ramp and mainline locations between Hopple Street and Brent Spence Bridge are summarized in Table 7.



Table 7: Balancing Example for SB I-75 in AM Peak Hour

Facility	Target	Balanced	Difference
SB I-75 n/o Hopple Street	6,355	6,415	60
Exit to Hopple	875	880	5
Entrance from WB Hopple	240	235	-5
Entrance from EB Hopple	755	735	-20
Exit to WHV	220	230	10
Entrance from WHV	735	720	-15
Exit to Findlay	600	600	0
SB I-75 @ Findlay St	7,085	6,395	-690
Exit to Ezzard Charles	435	430	-5
Exit to Gest	555	550	-5
Entrance from Ezzard Charles	245	290	45
Exit to 7th	1,110	1,360	250
Exit to I-71 & Local Ramps	1,830	2,195	365
SB I-75	1,645	2,150	505
9th Street Entrance Ramp	135	130	-5
Entrance from 6th St	590	640	50
Entrance from 2 <sup>nd</sup> Street	175	235	60
Entrance from I-71	1,360	1,430	70
SB BSB	4,600	4,585	-15

#### 3.4 Design Hour Factors

The methodology for the design hour volumes used the 2019 K&D report<sup>1</sup> for an I-75 mainline traffic count, and statewide peak hour to design hour volume factors provided by ODOT. The I-71 and I-75 mainline design hour volumes were based on the K&D report for ATR site 137131 in Ohio. The I-75 ramps and arterial design hour volumes were calculated using ODOT's peak hour to design hour factors derived from statewide ATR counts. The data sources are listed as follows.

<sup>&</sup>lt;sup>1</sup> https://www.dot.state.oh.us/TechnicalServices/KandDFactors/KandD\_Factors\_19\_HPMS.pdf



#### **ATR Data**

Site 137131 in 2019 Report:

- K-Factor = 8.0%
- D-Factor = 57.9%

#### Statewide Peak Hour to Design Hour Factors

The 2022 Peak Hour to Design Hour Factor tables were used to convert the weekday traffic counts to design hour volumes. The I-75 ramps use the Urban Interstate factors (Table 8), and the remaining road segments use the Urban Arterial factors (Table 9). The tables are based on ATR stations in Ohio with traffic data from 2018, 2019, and 2021. These factors are derived based on day of week and month of traffic counts. Because traffic counts for the project were taken throughout the year and a balanced AM and PM weekday volume set was derived, a consistent design hour factor is recommended based on an average of the Monday-Thursday data. The result of this calculation was a peak hour to design hour factor of 1.15 for arterials and local roads, and a factor of 1.10 for freeway ramps.

Table 8: Design Hour Factor for I-75 Ramps

			JNCTIONA		HOUR FAC CATION = 01u ate)			
Day			Mon	thly Averag	e by Day-of-V	Veek		
Month	Y MON- THUR	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
January	1.22	1.89	1.25	1.23	1.22	1.20	1.16	1.70
February	1.20	1.84	1.24	1.20	1.20	1.17	1.13	1.64
March	1.14	1.66	1.17	1.14	1.13	1.13	1.07	1.53
April	1.10	1.60	1.13	1.11	1.09	1.08	1.06	1.51
May	1.08	1.54	1.11	1.09	1.08	1.06	1.04	1.45
June	1.09	1.52	1.12	1.08	1.08	1.06	1.05	1.46
July	1.09	1.51	1.11	1.09	1.07	1.06	1.06	1.47
August	1.08	1.49	1.11	1.09	1.08	1.05	1.03	1.43
September	1.09	1.56	1.13	1.09	1.09	1.06	1.02	1.47
October	1.08	1.52	1.11	1.08	1.08	1.05	1.02	1.47
November	1.10	1.62	1.13	1.10	1.09	1.09	1.04	1.53
December	1.11	1.61	1.15	1.11	1.10	1.09	1.06	1.51



**Table 9: Design Hour Factors for Arterials** 

#### PEAK HOUR to DESIGN HOUR FACTORS

FUNCTIONAL CLASSIFICATION = 03, 04, 05u

(Urban Principal Arterial, Urban Minor Arterial, & Urban Minor Collector)

Day			Mon	thly Averag	e by Day-of-V	Veek		
Month	Y Mon- Thur	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
January	1.25	1.81	1.27	1.25	1.25	1.23	1.18	1.61
February	1.23	1.78	1.26	1.23	1.23	1.19	1.17	1.58
March	1.18	1.63	1.20	1.18	1.17	1.17	1.12	1.47
April	1.13	1.57	1.15	1.14	1.12	1.11	1.08	1.42
May	1.10	1.47	1.12	1.10	1.10	1.07	1.06	1.35
June	1.14	1.51	1.16	1.14	1.14	1.11	1.10	1.40
July	1.14	1.54	1.16	1.14	1.13	1.14	1.11	1.45
August	1.12	1.49	1.14	1.14	1.12	1.10	1.06	1.41
September	1.12	1.53	1.15	1.13	1.13	1.09	1.05	1.42
October	1.12	1.54	1.15	1.12	1.11	1.10	1.05	1.42
November	1.16	1.63	1.17	1.15	1.15	1.15	1.08	1.52
December	1.16	1.61	1.18	1.16	1.16	1.13	1.10	1.50

# **Appendix A: AADT Worksheets**



# NB I-71/75 AADT WORKSHEET

		Count			2018	3 AADT			202:	1 AADT	2022	BSB Project 2019 AADT	BSB Project 2019	Used for Traffic	
Count ID	Site Description	Source	State	2017 AADT	Published	Calculated	2019 AADT	2020 AADT	Published	Calculated	AADT	Target	Balanced	Balancing	Notes
059799	NB I-71/I-75, south of Buttermilk Pike	KYTC	KENTUCKY	78,854	-	-	76,903	62,090	54,191	-	-	76,900	72,550	Yes	2-way split half
059794	NB I-71/I-75, south of Dixie Hwy	КҮТС	KENTUCKY	63,773	-	-	73,903	59,136	50,289	-	-	73,900	69,150	Yes	2-way split half
059801	NB I-71/I-75, south of Kyles Lane	КҮТС	KENTUCKY	77,563	73,482	-	76,165	51,819	49,824	-	-	76,200	72,150	Yes	2-way split half
059P93	NB I-71/I-75, south of 12th St ramps	КҮТС	KENTUCKY	76,682	75,935	-	76,829	-	-	-	-	76,800	74,050	Yes	2-way split half
059072	NB I-71/I-75, south of 12th St	КҮТС	KENTUCKY	73,091	71,366	-	71,541	55,824	-	-	-	71,500	68,400	Yes	2-way split half
059077	NB I-71/I-75, south of 4th St ramp	КҮТС	KENTUCKY	79,675	-	-	-	-	-	-	-	79,700	69,950	No	
22931	NB I-71/I-75 at Brent Spence Bridge				See count evalua	tion report for discu	ussion on BSB	Counts			-	80,000	80,000	Yes	
105831	I-75 NB, south of 5th St	ODOT	OHIO	38,482 (8)	37,342 (8)	21,353	37,454 (3)	30,675 (3)	20,682	-	-	37,300	36,250	No	The unbalanced counts are outliers
137131	I-75 NB, 250' north of Findlay St	ODOT	ОНЮ	74,065	76,156		73,439	60,147 (3)	68,327 (3)		-	76,200	73,700	Yes	

# SB I-71/75 AADT WORKSHEET

				1				1						1	
					2018	AADT			202	1 AADT		BSB Project	BSB Project		
		Count									2022	2019 AADT	2019	Used for Traffic	
Count ID	Site Description	Source	State	2017 AADT	Published	Calculated	2019 AADT	2020 AADT	Published	Calculated	AADT	Target	Balanced	Balancing	Notes
												, and the second			
HAM1804	SB I-75 N of Hopple St	OKI	OHIO	-	80,623	-	-	-	-	-	-	80,600	84,450	Yes	
	I-75 SB, 250' north of												•		
137131	Findlay St	ODOT	ОНЮ	71,972	73,480	-	69,752	57,127 (3)	64,896 (3)	-	-	73,500	74,150	Yes	
	·						•		• • • •				•		
105331	I-75 SB, btw 7th & 9th	ODOT	ОНЮ	32,424 (3)	29,398	-	29,486 (3)	24,149 (3)	30,093	-	-	29,400	34,900	Yes	
	I-71 SB, south of 3rd														
104431	ramp	ODOT	ОНІО	31,912 (3)	32,094	-	32,190 (3)	26,364 (3)	29,933	-	-	32,100	31,750	Yes	
	I-75 SB, north of Brent														
151631	Spence Bridge	ODOT	ОНІО	-	-	-	-	-	34,108	38,653	-	38,700	38,200	Yes	
	SB I-71/I-75 at Brent			•	•	•		•	1						
22931	Spence Bridge			See	count evaluation r	eport for discussion	on BSB Count	S			-	80,000	80,000	Yes	
	SB I-71/I-75, south of														
059072	12th St	KYTC	KENTUCKY	73,091	71,366	-	71,541	55,824	-	-	-	71,500	73,250	Yes	2-way split half
	SB I-71/I-75, south of											-			
059P93	12th St ramps	KYTC	KENTUCKY	76,682	75,935	-	76,829	-	-	-	-	76,800	79,400	Yes	2-way split half
	SB I-71/I-75, south of														
059801	Kyles Lane	KYTC	KENTUCKY	77,563	73,482	-	76,165	51,819	49,824	-	-	76,200	77,000	Yes	2-way split half
	SB I-71/I-75, south of								·						- 1
059794	Dixie Hwy	KYTC	KENTUCKY	63,773	-	-	73,903	59,136	50,289	-	-	73,900	76,250	Yes	2-way split half
	SB I-71/I-75, south of														
059799	Buttermilk Pike	KYTC	KENTUCKY	78,854	-	-	76,903	62,090	54,191	-	-	76,900	79,600	Yes	2-way split half

# NB I-71/75 RAMPS AADT WORKSHEET

					2018	AADT			2021	AADT		BSB Project	BSB Project	Used for	
		Count		2017				2020			2022	2019 AADT	2019	Traffic	
Count ID	Site Description	Source	State	AADT	Published	Calculated	2019 AADT	AADT	Published	Calculated	AADT	Target	Balanced	Balancing	Notes
	Ramp from I-75 NB to														
059C47	Buttermilk Pike	KYTC	KENTUCKY	-	-	-	-	6,957	-	-	-	11,100	12,400	Yes	Uses COVID factors
	I-75 NB ramp from														
059C46	Buttermilk Pike	KYTC	KENTUCKY	-	-	-	-	1,062	-	-	-	5,900	5,250	Yes	Uses COVID factors
	Ramp from Buttermilk Pike														
059C48	to I-75 NB	KYTC	KENTUCKY	-	-	-	-	4,176	-	-	-	4,200	3,750	Yes	Uses COVID factors
	Ramp from NB I-71/I-75 to														
059N05	Dixie Hwy	KYTC	KENTUCKY	-	-	-	-	2,374	-	-	-	3,400	3,800	Yes	Uses COVID factors
	Ramp from Dixie Hwy to I-														
059N06	75 NB	KYTC	KENTUCKY	-	-	-	-	5,513	-	-	-	6,800	6,800	Yes	Uses COVID factors
	Ramp from I-75 NB to Kyles														
059N01	Lane	KYTC	KENTUCKY	-	-	-	4,226	-	-	-	-	4,200	5,000	Yes	
	Ramp from Kyles Lane to I-													_	
059N02	75 NB	KYTC	KENTUCKY	-	-	-	6,470	-	-	-	-	6,500	6,900	Yes	



					2018	SAADT			2021	. AADT		BSB Project	BSB Project	Used for	
		Count		2017				2020			2022	2019 AADT	2019	Traffic	
Count ID	Site Description	Source	State	AADT	Published	Calculated	2019 AADT	AADT	Published	Calculated	AADT	Target	Balanced	Balancing	Notes
	Ramp from I-75 NB to														
059H34	12th/MLK Blvd	KYTC	KENTUCKY	-	ı	-	4,735	-	-	-	-	4,700	5,650	Yes	
059M55	Ramp, I-75 NB from Pike St	KYTC	KENTUCKY	-	-	-	7,970	-	-	-	-	8,000	7,550	Yes	
BSBSC44	Ramp, I-75 NB to 5th St	BSBSC	KENTUCKY	6,497*	-	-	-	-	-	-	-	6,600	6,000	Yes	Project counts
BSBSC41	12th Street to I-75 NB	BSBSC	KENTUCKY	7,701*	Ī	-	-	-	-	-	-	7,900	7,550	Yes	Project counts
059G86		KYTC	KENTUCKY	-	i	-	3,531	-	-	-	-				Used data provided by
From OKI	Ramp, I-75 NB from 4th St	OKI	KENTUCKY				11,300*				-	11,300	10,050	Yes	OKI for 2019
103631	Ramp, I-71 NB to 2nd St W	ODOT	OHIO	3,199 (3)	3,862	-	3,874 (3)	3,173 (3)	1,353	-	-	3,900	3,700	Yes	
104631	I-71/I-75 NB to I-71 NB	ODOT	OHIO	29,756	28,414	-	28,499	23,341	12,475	-	-	28,400	27,650	Yes	
104831	Ramp, I-75 NB to 5th St	ODOT	OHIO	4,071 (3)	3,657	-	3,668 (3)	3,004 (3)	2,161	-	-	3,700	4,100	Yes	
104931	Ramp, I-75 NB to US-50 WB	ODOT	OHIO	8,237 (3)	8,370	-	8,395 (3)	6,876 (3)	4,236	5,106	-	8,400	8,300	Yes	
105731	Ramp, I-71 SB to US-50 WB	ODOT	OHIO	12,900 (8)	13,118 (8)	12,962	13,433 (3)	11,391 (3)	15,189	-	-	13,000	13,700	Yes	
104331	Ramp, I-71 SB to I-75 NB	ODOT	OHIO	16,693 (8)	17,604 (8)	17,060	17,657 (3)	14,461 (3)	16,295	-	-	17,100	17,100	Yes	
					. , ,										Intersection count
140131	Ramp, US-50 to Gest St	ODOT	ОНЮ	4,116 (3)	4,639	-	4,750 (3)	4,028 (3)	3,750	-	-	4,600	3,950	Yes	indicates a lower AADT
117131	Ramp, 4th to I-75 NB	ODOT	OHIO	5,970 (3)	6,543	-	6,563 (3)	5,375 (3)	7,754	-	-	6,500	5,850	Yes	
81631	Ramp, 6th St to I-75 NB	ODOT	OHIO	4,429 (3)	2,228	-	2,261 (3)	2,039 (3)	3,715	-	-	2,200	2,800	Yes	
	Ramp, I-71/Central Ave to														
139631	Winchell/Ezzard	ODOT	ОНЮ	3,276 (3)	2,492	-	2,499 (3)	2,047 (3)	1,930	-	-	2,500	2,200	Yes	
	Winchell Ave, 350'														
139731	northwest of 9th	ODOT	ОНЮ	6,399 (3)	4,998	-	5,048 (3)	4,422 (3)	3,802	-	-	5,000	4,550	Yes	
	Access Ramp, 6th St to I-75														
105131	NB	ODOT	OHIO	22,974 (3)	23,969	-	24,041 (3)	19,690 (3)	24,581	-	-	24,000	23,550	Yes	
	Ramp from Winchell														
90231	Avenue to I-75 NB	ODOT	OHIO	4,437 (3)	4,571	-	4,585 (3)	3,755 (3)	3,488	-	-	4,600	4,250	Yes	
	I-75 NB entrance from														
81731	Freeman	ODOT	OHIO	5,884 (3)	7,636	-	7,659 (3)	6,273 (3)	7,139	-	-	7,600	7,350	Yes	
	I-75 NB entrance from														
81831	Ezzard Charles	ODOT	OHIO	2,288 (3)	2,638	-	2,646 (3)	2,167 (3)	2,245	-	-	2,600	2,300	Yes	
	Ramp, Winchell Ave (north														
138331	of Bank St) to I-75 NB	ODOT	OHIO	-	6,724 (8)	6,667	6,744 (3)	5,523 (3)	6,396 (8)	-	-	6,700	6,950	Yes	
	EB Western Hills Viaduct to														
79831	I-75 NB	ODOT	OHIO	6,842 (8)	6,192 (8)	6,139	6,211 (3)	5,087 (3)	8,066 (8)	-	-	6,100	6,750	Yes	
89631	Ramp, I-75 NB to WHV WB	ODOT	OHIO	7,470 (8)	6,546 (8)	6,603	6,566 (3)	5,378 (3)	7,630 (8)	-	-	6,600	6,150	Yes	
	I-75 NB ramp from Hopple														
79331	St	ODOT	OHIO	6,691 (8)	7,560 (8)	7,335	7,583 (3)	6,210 (3)	6,456 (8)	-	-	7,300	7,150	Yes	
	Ramp, I-75 NB from Hopple														
81931	St	ODOT	OHIO	4,430 (8)	11,011	-	11,044 (3)	9,045 (3)	11,799	-	-	11,000	10,950	Yes	



# SB I-71/75 RAMPS AADT WORKSHEET

									2021			DCD Drainet	DCD Drainet	Used for	
		Count			2018	S AADT I	-		2021	AADT I	_	BSB Project 2019 AADT	BSB Project 2019	Used for Traffic	
Count ID	Site Description	Source	State	2017 AADT	Published	Calculated	2019 AADT	2020 AADT	Published	Calculated	2022 AADT	Target	Balanced	Balancing	Notes
40231	Ramp I-75 SB to Hopple St	ODOT	OHIO	9,624 (8)	11,901 (8)	12,011	12,020 (3)	10,530 (3)	13,245	-	-	12,000	11,800	Yes	Notes
40231	Ramp, I-75 SB from WB	ODO1	Offic	3,024 (8)	11,901 (8)	12,011	12,020 (3)	10,550 (5)	13,243	_	_	12,000	11,800	163	
85631	Hopple St	ODOT	OHIO	4,202 (8)	3,336 (8)	3,321	3,346 (3)	2,740 (3)	3,227	_	_	3,300	3,350	Yes	
79431	I-75 NB ramp to Hopple St	ODOT	OHIO	6,877 (8)	4,882 (8)	4,860	4,897 (3)	4,011 (3)	4,727	-	_	4,900	5,100	Yes	
73431	I-75 SB to Western Hills	ODOT	OHIO	0,877 (8)	4,002 (0)	4,000	4,697 (3)	4,011 (3)	4,727	-	-	4,900	3,100	163	
79531	Viaduct WB	ODOT	ОНЮ	5,906 (8)	5,983 (8)	6,011	6,001 (3)	4,915 (3)	7,012	-	_	6,000	6,000	Yes	
75551	EB Western Hills Viaduct to I-	ODOT	Offic	3,300 (8)	3,363 (6)	0,011	0,001 (3)	4,515 (5)	7,012	_		0,000	0,000	163	
79631	75 SB	ODOT	ОНЮ	8,093 (8)	6,302 (8)	6,273	6,321 (3)	5,177 (3)	6,234	-	_	6,300	6,500	Yes	
79731	I-75 SB exit to Findlay St.	ODOT	OHIO	6,454 (8)	7,864 (8)	-	7,888 (3)	6,460 (3)	8,588	9,816	_	9,800	7,450	Yes	
89931	I-75 SB Exit at Ezzard Charles	ODOT	OHIO	3,105 (3)	3,658	-	3,669 (3)	3,005 (3)	3,027	-	_	3,700	2,700	Yes	
		ODOT	OHIO								-	1	6,600		
90031	I-75 SB Exit at Freeman	0001	Оню	4,943 (3)	5,399	-	5,480 (3)	4,943 (3)	4,632	-	-	5,400	6,600	Yes	
90131	Western Entrance ramp to I-75 SB	ODOT	ОНІО	3,911 (3)	2,862		2,871 (3)	2,351 (3)	3,370			2,900	2,900	Yes	
		ODOT	OHIO			-		1		-	-		·		
81531	I-75 SB Exit to Seventh St	-		4,994 (3)	4,491	-	4,504 (3)	3,689 (3)	3,265	- 27.510	-	4,500	5,500	Yes	
151531	I-75 SB South of 8th St	ODOT	ОНЮ	-	-	-	-	-	24,284	27,519	-	27,500	27,350	Yes	
100221	Ramp, I-75 SB to 5th St	ODOT	01110	4 205 (2)	4.001		4.002.(2)	2 252 (2)	2 121	2.000		2.700	4.250	Vaa	
108231	(Ohio)	ODOT	OHIO	4,285 (3)	4,081	-	4,093 (3)	3,352 (3)	3,131	3,666	-	3,700	4,350	Yes	
105231	Ramp, 9th to I-75 SB	ODOT	OHIO	3,224 (3)	3,317	-	3,327 (3)	2,725 (3)	2,847	-	-	3,300	3,300	Yes	
108131	Ramp, I-75 SB to 2nd St	ODOT	OHIO	4,408 (3)	5,134	-	5,149 (3)	4,217 (3)	3,691	-	-	5,100	5,150	Yes	
HAM4022	Ramp, I-75 SB to I-71 NB	OKI	OHIO	-	17,381	-	-	-	-	-	-	17,400	17,850	Yes	
105631	Ramp, US-50 EB to I-71 NB	ODOT	OHIO	14,649 (3)	14,447	-	14,794 (3)	12,545 (3)	13,703	-	-	14,400	13,850	Yes	
105431	Ramp, US-50 EB to I-75 SB	ODOT	OHIO	6,246 (3)	6,896	-	6,917 (3)	5,665 (3)	7,793	-	-	6,900	7,200	Yes	
18731	Ramp from US-50 EB to 2nd	ODOT	OHIO	1,221 (3)	1,093	-	1,096 (3)	898 (3)	953	-	-	1,100	1,100	Yes	
104531	Ramp, 3rd WB to I-7I SB	ODOT	OHIO	4,558 (3)	4,929	-	4,944 (3)	4,049 (3)	3,592	-	-	4,900	5,900	Yes	
117031	Ramp, I-71 SB to I-75 SB	ODOT	OHIO	27,277 (3)	25,692	-	25,769 (3)	21,105 (3)	28,125	32,996	-	25,700	28,700	Yes	
059G93	Ramp, SB I-71/I-75 to 5th St.	KYTC	KENTUCKY	-	-	-	11,750	-	-	-	-	6,700	7,000	Yes	Used OKI count
From OKI	Kaiiip, 3B i-71/i-73 to 3tii 3t.	OKI	KENTUCKY	-	-	-	6,700*				-	0,700	7,000	163	Osed Oki count
BSBSC46	Ramp, I-71/I-75 SB to Pike St	BSBSC	KENTUCKY	6,400*	-	-	-	-	-	-	-	6,400	6,600	Yes	Project Count
	Ramp from 4th Street to SB														
059M56	I-71/I-75	KYTC	KENTUCKY	-	-	-	6,675	-	-	-	-	6,700	6,850	Yes	
CSSRamp1	Ramp, I-75 SB from 12th St	BSB	KENTUCKY	-	-	-	-	-	-	-	6,740*	6,700	6,150	Yes	Project Count
	Ramp from I-75 SB to Kyles														
059N03	Lane	KYTC	KENTUCKY	-	-	-	6,739	-	-	-	-	6,700	7,250	Yes	
	Ramp from Kyles Lane to I-														
059N04	75 SB	KYTC	KENTUCKY	-	-	-	4,104	-	-	-	-	4,100	4,850	Yes	
	Ramp from I-75 SB to Dixie	T													
059N07	Hwy	KYTC	KENTUCKY	-	-	-	-	3,084	-	-	-	4,700	5,200	Yes	Use Covid factors
	Ramp from Dixie Hwy to I-75														
059N08	SB	KYTC	KENTUCKY	-	-	-	-	3,633	-	-	-	4,300	4,450	Yes	Use Covid factors
	Ramp from I-75 SB to														
059C49	Buttermilk Pike	KYTC	KENTUCKY	-	-	-	-	5,848	-	-	-	8,500	8,850	Yes	Use Covid factors



					2018	AADT			2021	AADT		BSB Project	BSB Project	Used for	
		Count										2019 AADT	2019	Traffic	
Count ID	Site Description	Source	State	2017 AADT	Published	Calculated	2019 AADT	2020 AADT	Published	Calculated	2022 AADT	Target	Balanced	Balancing	Notes
	Ramp from Buttermilk Pike														
059C50	to I-75 SB	KYTC	KENTUCKY	-	-	-	-	7,872	-	-	-	12,100	12,200	Yes	Use Covid factors

### ARTERIALS AND LOCAL ROAD AADT WORKSHEET

					201	L8 AADT			202:	1 AADT		BSB Project		Used for	
Count ID	Site Description	Count Source	State	2017 AADT	Published	Calculated	2019 AADT	2020 AADT	Published	Calculated	2022 AADT	2019 AADT Target	BSB Project 2019 Balanced	Traffic Balancing	Notes
	EB Kyles Lane btw I-75 and													0	
059D72	Kennedy Rd	KYTC	KENTUCKY	13,438	13,056	-	12,680	11,273	10,856	-	-	12,700	12,850	Yes	2-way split half
	WB Kyles Lane btw I-75 and														
059D72	Kennedy Rd	KYTC	KENTUCKY	13,438	13,056	-	12,680	11,273	10,856	-	-	12,700	12,800	Yes	2-way split half
059D22	EB Kyles Lane at I-75	KYTC	KENTUCKY	7,770	8,036	-	7,772	5,962	8,665	-	-	7,800	9,050	Yes	2-way split half
059D22	WB Kyles Lane at I-75	KYTC	KENTUCKY	7,770	8,036	-	7,772	5,962	8,665	-	-	7,800	11,000	Yes	2-way split half
															Station away from site
050074	EB MLK Blvd btw Main St and	10.750	1/5N/TH 10/0/		7.500				7.500			7.500	0.050	.,	with access drives btwn;
059C71	Lee St	KYTC	KENTUCKY	-	7,608	-	-	-	7,590	-	-	7,600	8,850	Yes	2-way split half
	EB MLK Blvd btw Main St and														Station away from site with access drives btwn;
059C71	Lee St	күтс	KENTUCKY	_	7,608	_	_	_	7,590	_	_	7,600	8,600	Yes	2-way split half
KEN0287	WB Pike, east of I-71/I-75	ОКІ	KENTUCKY	-	-	-	-	-	4,139	-	-	4,100	4,450	Yes	7, 1,
KEN0287	EB Pike, east of I-71/I-75	ОКІ	KENTUCKY	-	-	-	-	-	5,637	-	-	5,600	6,300	Yes	
059D80	SB Main St, south of 9th St	күтс	KENTUCKY	_	3,283	-	-	-	-	-	-	3,300	2,850	Yes	2-way split half
059D80	NB Main St, south of 9th St	күтс	KENTUCKY	-	3,283	-	-	-	-	-	-	3,300	3,900	Yes	2-way split half
KEN0363	5th St, west of Main St	ОКІ	KENTUCKY	-	-	-	-	-	8,795	-	-	8,800	8,050	Yes	
059H28	SB Main St, south of 5th St	KYTC	KENTUCKY	2,611	-	-	-	2,106	-	-	-	2,600	2,900	Yes	2-way split half
059H28	NB Main St, south of 5th St	KYTC	KENTUCKY	2,611	-	-	-	2,106	-	-	-	2,600	4,200	Yes	2-way split half
KEN0348	5th St, west of Johnson St	ОКІ	KENTUCKY	-	-	-	-	-	8,894	-	-	8,900	8,900	Yes	
059C22	4th St, east of Main St	KYTC	KENTUCKY	16,493	_	_	_	9,661	-	_	-	16,500	15,400	Yes	Station away from site with access drives btwn
	4th St, west of Clay Wade							,,,,,							
KEN0346	Bailey	OKI	KENTUCKY	-	-	-	-	-	15,544	-	-	15,500	15,200	Yes	
	SB Philadelphia St btw 3rd St														
059C76	and 4th St	KYTC	KENTUCKY	-	-	-	6,620	-	-	-	-	6,600	5,450	Yes	2-way split half
050676	NB Philadelphia St btw 3rd St	KYTC	KENTUCKY				C C20					6,600	4.650	Vos	2a. anlik half
059C76	and 4th St	KYIC	KENTUCKY	-	-	-	6,620	-	-	-	-	6,600	4,650	Yes	2-way split half Intersection counts
KEN0276	4th St, east of I-71/I-75	ОКІ	KENTUCKY	-	-	-	-	-	12,957	-	-	13,000	18,100	Yes	indicate a higher AADT
	4th St btw I-75 and														-
059D76	Philadephia St	KYTC	KENTUCKY	-	-	-	8,653	-	-	-	-	8,700	8,050	Yes	
059C78	4th St east of Crescent Ave	KYTC	KENTUCKY	-	1,491	-	-	-	2,145	-	-	1,500	1,700	Yes	



					201	8 AADT			2021	L AADT		BSB Project		Used for	
Count ID	Cita Dagarintian	Count	Chaha	2017 AADT			2019 AADT	2020 AADT			2022 AADT	2019 AADT	BSB Project	Traffic	Natas
Count ID	Site Description  5th St btw Crescent Ave and I-	Source	State	2017 AADT	Published	Calculated	AADI	2020 AADT	Published	Calculated	2022 AADT	Target	2019 Balanced	Balancing	Notes Intersection counts
059D75	75	KYTC	KENTUCKY	5,697	-	_	_	5,036	-	_	_	5,700	2,350	Yes	indicate a lower AADT
000010	SB CD exit from I-71/I-75 to			2,001				2,000				3,133	_,		
059M57	Pike St	KYTC	KENTUCKY	-	-	-	7,339	-	-	-	-	7,300	8,150	Yes	
															Station away from site
	WB Dixie Hwy, north of Kyles														with access drives btwn;
059D21	Ln	KYTC	KENTUCKY	9,276	10,008	-	10,076	-	-	-	-	10,100	8,500	Yes	2-way split half
															Station away from site with access drives btwn;
059D21	EB Dixie Hwy, north of Kyles Ln	KYTC	KENTUCKY	9,276	10,008	_	10,076	_	_	_	_	10,100	8,050	Yes	2-way split half
033521	NB Dixie Hwy, north of Kyles	KITC	KENTOCKT	3,270	10,000		10,070					10,100	0,030	163	2 way spire fram
KEN0017	Ln	OKI	KENTUCKY	-	10,115	-	-	-	-	-	-	10,100	11,050	Yes	
KEN0017	SB Dixie Hwy, north of Kyles Ln	OKI	KENTUCKY	-	10,093	-	-	-	-	_	-	10,100	10,900	Yes	
	, , , , , , , , , , , , , , , , , , ,												2,72.2		Station away from site
	WB Dixie Hwy btw Saint Johns														with access drives btwn;
059C19	Rd and Fortside Dr	KYTC	KENTUCKY	6,966	7,204	-	7,690	4,773	8,334	-	-	7,700	9,650	Yes	2-way split half
															Station away from site
050640	EB Dixie Hwy btw Saint Johns	IO/TC	L/ENITH COO.	6.066	7.204		7.600	4.770	0.224			7.700	0.750	v	with access drives btwn;
059C19	Rd and Fortside Dr	KYTC	KENTUCKY	6,966	7,204	-	7,690	4,773	8,334	-	-	7,700	8,750	Yes	2-way split half
124231	SB Clay Wade Bailey Bridge	ODOT	OHIO/KENTUCKY	-	7,501	-	7,576 (3)	6,637 (3)	7,294 (3)	-	-	7,500	7,450	Yes	
124231	NB Clay Wade Bailey Bridge	ODOT	OHIO/KENTUCKY	-	8,111	-	8,192 (3)	7,176 (3)	7,886 (3)	-	-	8,100	8,100	Yes	
110044024	SB Clay Wade Bailey Bridge,	01/1	01110						6.050			7.000	0.450	V	
HAM4034	south of 3rd St  NB Clay Wade Bailey Bridge,	OKI	OHIO	-	-	-	-	-	6,958	-	-	7,000	9,150	Yes	
HAM4034	south of 3rd St	OKI	OHIO	_	_	_	_	_	4,386	_	_	4,400	4,800	Yes	
117 (1414034	WB W 3rd St, btw Gest & Clay	OKI	OTHE						4,300			4,400	4,000	163	
93199	Wade Bailey	ODOT	ОНЮ	4,979	4,061	-	4,102 (3)	3,593 (3)	6,200	7,331	-	4,100	4,150	Yes	
	EB W 3rd St, btw Gest & Clay														
93199	Wade Bailey	ODOT	OHIO	5,250	7,733	-	7,810 (3)	6,842 (3)	7,264	8,587	-	7,700	6,650	Yes	
															Intersection counts plus
15021	WB 3rd btw Clay Wade Bailey & Central Ave	ODOT	OUIO	2 122 (2)	1 404		1 419 (2)	1 242 (2)	4 5 4 4			1 400	4 200	Vos	2021 AADT indicate a
15931	EB 3rd btw Clay Wade Bailey &	0001	OHIO	2,133 (3)	1,404	-	1,418 (3)	1,242 (3)	4,544	-	-	1,400	4,200	Yes	higher AADT
15931	Central Ave	ODOT	ОНЮ	4,327 (3)	2,230	_	2,252 (3)	1,973 (3)	2,640	_	_	2,200	2,350	Yes	
13301	SB Central Ave btw Pete Rose	0001	01110	1,027 (0)	2,230		2,232 (3)	2,373 (3)	2,010			2,200	2,330		
12931	Way & 3rd	ODOT	ОНЮ	2,828 (3)	2,616	-	2,642 (3)	2,314 (3)	1,358	1,570	-	2,600	2,300	Yes	
	NB Central Ave btw Pete Rose														
12931	Way & 3rd	ODOT	OHIO	1,994 (3)	2,035	-	2,055 (3)	1,800 (3)	1,182	1,366	-	2,000	1,950	Yes	
	SB Central Ave btw McFarland														
13031	& 4th	ODOT	OHIO	2,531 (3)	2,274	-	2,297 (3)	2,012 (3)	1,614	-	-	2,300	2,050	Yes	
13031	NB Central Ave btw McFarland & 4th	ODOT	ОНІО	5,186 (3)	5,758	_	5,816 (3)	5,095 (3)	4,866	_	_	5,800	6,150	Yes	
									,			· ·	i i		
9631	SB Central Ave btw 5th & 6th	ODOT	OHIO	2,824 (3)	2,975	-	3,005 (3)	2,632 (3)	2,452	-	-	3,000	2,900	Yes	
9631	NB Central Ave btw 5th & 6th	ODOT	OHIO	3,834 (3)	4,307	-	4,350 (3)	3,811 (3)	3,098	-	-	4,300	3,800	Yes	



Count   D   Site Description   Source   State   2017 AADT   Published   Calculated   ADT   2020 AADT   Published   Calculated   2022 AADT   Taget   2019 Balanced   2022 AADT   Calculated   2029 AADT   Calculated   2022	Traffic Balancing  Yes  Yes  Yes  Yes  Yes  Yes  Yes  No  No  No  Yes	Adjacent intersection counts indicate this is an outlier Adjacent intersection counts indicate this is an outlier
W8 6th Ramp to U5-50 W8, west of Central Ave	Yes Yes Yes Yes Yes Yes Yes No No No Yes	Adjacent intersection counts indicate this is an outlier Adjacent intersection counts indicate this is an
27531   WB 6th to Central Ave   ODOT   OHIO   10,599 (3)   9,722   . 9,819 (3)   8,601 (3)   8,007	Yes Yes Yes Yes Yes No No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
9731 SB Central Ave btw 6th & 7th ODOT OHIO 5,704 (3) 739 - 746 (3) 653 (3) 30 - 700 700 700 701 9731 NB Central Ave btw 6th & 7th ODOT OHIO 814 (3) 2,639 - 2,665 (3) 2,335 (3) 3,756 - 2,600 3,900 9831 EB 7th Ave to Plum St ODOT OHIO 7,079 (3) 9,361 - 9,455 (3) 8,283 (3) 5,690 - 9,400 8,950 12531 WB 9th to Central Ave DODT OHIO 9,566 (3) 9,626 - 9,722 (3) 8,516 (3) 9,077 10,298 - 9,600 9,000 10,900	Yes Yes Yes Yes No No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
9731 NB Central Ave btw 6th & 7th   ODOT   OHIO   814 (3)   2,639   -   2,665 (3)   2,335 (3)   3,756   -   -   2,600   3,900     9831 EB 7th Ave to Plum St   ODOT   OHIO   7,079 (3)   9,361   -   9,455 (3)   8,283 (3)   5,690   -   -   9,400   8,950     12531 WB 9th to Central Ave   ODOT   OHIO   9,566 (3)   9,626   -   9,722 (3)   8,516 (3)   9,077   10,298   -   9,600   9,000     149731 SB Linn St, south of Court St   ODOT   OHIO   -   -   -   -   -   -   8,732   9,318   -   9,300   4,450     149731 NB Linn St, south of Court St   ODOT   OHIO   -   -   -   -   -   -   -   8888   950   -   1,000   950     149931 WB Court St, east of Linn St   ODOT   OHIO   -   -   -   -   -   -   -   -   1,262   1,351   -   1,400   1,550     149931 WB Court St, east of Linn St   ODOT   OHIO   -   -   -   -   -   -   -   -   -	Yes Yes Yes No No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
9831   EB 7th Ave to Plum St   ODOT   OHIO   7,079 (3)   9,361   - 9,455 (3)   8,283 (3)   5,690   9,400   8,950	Yes Yes Yes No No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
9831   EB 7th Ave to Plum St   ODOT   OHIO   7,079 (3)   9,361   - 9,455 (3)   8,283 (3)   5,690   9,400   8,950	Yes Yes No No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
12531   WB 9th to Central Ave   ODOT   OHIO   9,566 (3)   9,626   -   9,722 (3)   8,516 (3)   9,077   10,298   -   9,600   9,000	Yes Yes No No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
150331   WB 9th St, btw Winchell & Central   ODOT   OHIO   -   -   -   -   -   -   9,708   9,885   -   9,900   10,900	Yes No No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
149731         SB Linn St, south of Court St         ODOT         OHIO         -         -         -         -         8,732         9,318         -         9,300         4,450           149731         NB Linn St, south of Court St         ODOT         OHIO         -         -         -         -         10,300         10,992         -         11,000         5,650           149931         WB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         -         1,262         1,351         -         1,400         1,550           149231         EB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         -         1,262         1,351         -         1,400         1,550           Winchell Ave, btw Liberty St & Ezzard Charles         ODOT         OHIO         -         -         -         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St         ODOT         OHIO         -         -         -         -         -         -         -         -         -         -	No No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
149731         NB Linn St, south of Court St         ODOT         OHIO         -         -         -         -         -         10,300         10,992         -         11,000         5,650           149931         WB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         888         950         -         1,000         950           149931         EB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         1,262         1,351         -         1,400         1,550           Winchell Ave, btw Liberty St & Winchell Ave, btw Liberty St & Ezzard Charles         ODOT         OHIO         -         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St         ODOT         OHIO         6,731 (3)         5,425         -         5,463 (3)         5,059 (2)         5,515         -         -         -         5,400         5,700           148831         Bank         ODOT         OHIO         -         -         -         -         -         -         -         -         -         -<	No Yes	counts indicate this is an outlier  Adjacent intersection counts indicate this is an
149731         NB Linn St, south of Court St         ODOT         OHIO         -         -         -         -         -         10,300         10,992         -         11,000         5,650           149931         WB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         888         950         -         1,000         950           149931         EB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         1,262         1,351         -         1,400         1,550           Winchell Ave, btw Liberty St & Winchell Ave, btw Liberty St & Ezzard Charles         ODOT         OHIO         -         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St         ODOT         OHIO         6,731 (3)         5,425         -         5,463 (3)         5,059 (2)         5,515         -         -         -         5,400         5,700           148831         Bank         ODOT         OHIO         -         -         -         -         -         -         -         -         -         -<	No Yes	outlier  Adjacent intersection counts indicate this is an
149731         NB Linn St, south of Court St         ODOT         OHIO         -         -         -         -         -         10,300         10,992         -         11,000         5,650           149931         WB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         888         950         -         1,000         950           149931         EB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         1,262         1,351         -         1,400         1,550           Winchell Ave, btw Liberty St & Winchell Ave, btw Liberty St & Ezzard Charles         ODOT         OHIO         -         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St         ODOT         OHIO         6,731 (3)         5,425         -         5,463 (3)         5,059 (2)         5,515         -         -         -         5,400         5,700           148831         Bank         ODOT         OHIO         -         -         -         -         -         -         -         -         -         -<	No Yes	Adjacent intersection counts indicate this is an
149931         WB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         888         950         -         1,000         950           149931         EB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         1,262         1,351         -         1,400         1,550           Winchell Ave, btw Liberty St & Winchell Ave, btw Liberty St & Ezzard Charles         ODOT         OHIO         -         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St Winchell Ave, btw Findlay & Winchell Ave, btw Findlay & Bank         ODOT         OHIO         -         -         -         -         -         -         5,463 (3)         5,059 (2)         5,515         -         -         -         5,400         5,400           148831         Bank         ODOT         OHIO         -	Yes	counts indicate this is an
149931         WB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         888         950         -         1,000         950           149931         EB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         1,262         1,351         -         1,400         1,550           Winchell Ave, btw Liberty St & Winchell Ave, btw Liberty St & Ezzard Charles         ODOT         OHIO         -         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St Winchell Ave, btw Findlay & Winchell Ave, btw Findlay & Bank         ODOT         OHIO         -         -         -         -         -         -         5,463 (3)         5,059 (2)         5,515         -         -         -         5,400         5,400           148831         Bank         ODOT         OHIO         -	Yes	
149931         WB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         888         950         -         1,000         950           149931         EB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         -         1,262         1,351         -         1,400         1,550           Winchell Ave, btw Liberty St & Winchell Ave, btw Liberty St & Ezzard Charles         ODOT         OHIO         -         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St         ODOT         OHIO         6,731 (3)         5,425         -         5,463 (3)         5,059 (2)         5,515         -         -         -         5,400           Winchell Ave, btw Findlay & Bank         Bank         ODOT         OHIO         -		
149931         EB Court St, east of Linn St         ODOT         OHIO         -         -         -         -         1,262         1,351         -         1,400         1,550           Winchell Ave, btw Liberty St & Liberty St & Ezzard Charles         ODOT         OHIO         -         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St         ODOT         OHIO         6,731 (3)         5,425         -         5,463 (3)         5,059 (2)         5,515         -         -         5,400         5,400           Winchell Ave, btw Findlay & Bank         ODOT         OHIO         -         -         -         -         -         6,198         6,310         -         6,300         5,700           EB Bank St, btw Winchell &         EB Bank St, btw Winchell &         -         -         -         -         -         -         -         6,198         6,310         -         6,300         5,700		
149231   Winchell Ave, btw Liberty St &   DOOT   OHIO   -   -   -   -   -   -   6,100   6,526   -   6,500   6,550	Yes	
149231         Ezzard Charles         ODOT         OHIO         -         -         -         -         6,100         6,526         -         6,500         6,550           30931         NB Winchell Ave to Findlay St         ODOT         OHIO         6,731 (3)         5,425         -         5,463 (3)         5,059 (2)         5,515         -         -         5,400         5,400           Winchell Ave, btw Findlay & Bank         ODOT         OHIO         -         -         -         -         -         6,310         -         6,300         5,700           EB Bank St, btw Winchell &         EB Bank St, btw Winchell &         -         -         -         -         -         -         6,300         5,700	1.03	
Winchell Ave, btw Findlay &	Yes	
Winchell Ave, btw Findlay &	Yes	
EB Bank St, btw Winchell &		
	Yes	
148631   Colerain   ODOT   OHIO   -   -   -   -   -   3,745   3,927   -   3,900   2,350		
	Yes	
WB Bank St, btw Winchell &	Yes	
148631   Colerain   ODOT   OHIO   -   -   -   -   3,923   4,115   -   4,100   3,650	res	
147931 Harrison ODOT OHIO 660 381 - 400 400	Yes	
WB Harrison Ave, btw		
148031         Winchell Ave & Patterson St         ODOT         OHIO         -         -         -         -         940         957         -         1,000         1,350	Yes	
EB Harrison Ave, btw Winchell		
148031 Ave & Patterson St ODOT OHIO 1,342 1,366 - 1,400 1,100	Yes	
SB Patterson St, south of	Yes	
148231   Harrison Ave   ODOT   OHIO   -   -   -   -   235   249   -   200   200	res	
148231 Harrison Ave ODOT OHIO 118 125 - 100 150	Yes	
EB Harrison Ave, east of		
148131 Patterson St ODOT OHIO 1,332 1,356 - 1,400 1,350	Yes	
WB Harrison Ave, east of		
148131         Patterson St         ODOT         OHIO         -         -         -         -         1,143         1,163         -         1,200         1,150		
SB Colerain Ave, south of	Yes	
HAM1945 EB WHV (upper deck) OKI OHIO - 6,697 6,700 7,600	Yes Yes	



					201	8 AADT			2021	L AADT		BSB Project		Used for	
		Count					2019					2019 AADT	BSB Project	Traffic	
Count ID	Site Description	Source	State	2017 AADT	Published	Calculated	AADT	2020 AADT	Published	Calculated	2022 AADT	Target	2019 Balanced	Balancing	Notes
HAM1945	WB WHV (upper deck)	OKI	OHIO	-	8,027	-	-	-	-	-	-	8,000	7,200	Yes	
	SB Central Pkwy, 200' north of														
137631	Brighton Pl	ODOT	OHIO	-	-	-	-	-	6,106	6,199	-	6,200	6,450	Yes	
107601	NB Central Pkwy, 200' north of		0.1110						F 200	5 070		5 400	5.050	.,	
137631	Brighton Pl	ODOT	OHIO	-	-	-	-	-	5,299	5,379	-	5,400	5,850	Yes	
323199	EB McMillan St, east of WHV	ODOT	OHIO	-	3,238	-	3,270 (3)	2,865 (3)	2,933	3,390	-	3,200	3,750	Yes	
323199	WB McMillan St, east of WHV	ODOT	OHIO	-	3,173	-	3,205 (3)	2,808 (3)	3,125	3,612	-	3,200	3,350	Yes	
	SB Central Pkwy btw Addison														
13731	St & Marshall Ave	ODOT	OHIO	6,015 (3)	4,800	-	4,848 (3)	4,247 (3)	4,745	-	-	4,800	4,550	Yes	
13731	NB Central Pkwy btw Addison St & Marshall Ave	ODOT	OHIO	F 674 (2)	3,424		2 450 (2)	2 020 (2)	5,129			3,400	3,950	Vos	
13/31	EB Central Pkwy btw WHV &	ODOT	Uniu	5,674 (3)	3,424	-	3,458 (3)	3,029 (3)	5,129	-	-	3,400	3,950	Yes	
13631	Linn St	ODOT	OHIO	7,646 (3)	7,049	_	7,119 (3)	6,236 (3)	7,154	7,262	_	7,000	6,850	Yes	
13031	WB Central Pkwy btw WHV &	0001	01110	7,040 (3)	7,043		7,113 (3)	0,230 (3)	7,134	7,202		7,000	0,030	163	
13631	Linn St	ODOT	ОНЮ	7,465 (3)	7,684	-	7,761 (3)	6,799 (3)	6,679	6,781	-	7,700	6,500	Yes	
	SB Linn St, south of Central				·			, , ,	·	·		,	·		
148431	Pkwy	ODOT	OHIO	-	-	-	-	-	3,603	3,855	-	3,900	4,250	Yes	
	NB Linn St, south of Central														
148431	Pkwy	ODOT	OHIO	-	-	-	-	-	3,281	3,510	-	3,500	3,500	Yes	
148731	WB Bank St, west of Linn St	ODOT	OHIO	-	-	-	-	-	2,580	2,760	-	2,800	3,450	Yes	
148731	EB Bank St, west of Linn St	ODOT	OHIO	-	-	-	-	-	1,315	1,407	-	1,400	1,450	Yes	
HAM1856	WB WHV (lower deck)	OKI	ОНЮ	-	8,966	-	-	-	-	-	-	9,000	9,750	Yes	
HAM1856	EB WHV (lower deck)	OKI	ОНЮ	-	9,065	-	-	-	-	-	-	9,100	9,500	Yes	
147731	WB WHV at Spring Grove Ave	ODOT	OHIO	-	-	-	-	-	12,251	13,106	-	13,100	13,350	Yes	
147731	EB WHV at Spring Grove Ave	ODOT	OHIO	-	-	-	_	_	15,083	16,136	-	16,100	14,350	Yes	
	WB Harrison Ave, btw I-75 &														
143531	Winchell Ave	ODOT	OHIO	-	-	-	-	-	1,141	1,180	-	1,200	1,250	Yes	
	EB Harrison Ave, btw I-75 &														
143531	Winchell Ave	ODOT	OHIO	-	-	-	-	-	1,124	1,163	-	1,200	1,100	Yes	
	SB Spring Grove Ave, btw														
147831	Harrison Ave & Bank St	ODOT	OHIO	-	-	-	-	-	6,223	6,588	-	6,600	6,300	Yes	
147021	NB Spring Grove Ave, btw Harrison Ave & Bank St	ODOT	OHIO						12 502	12 224		12 200	F F00	No	This is an autlior count
147831	EB Bank St, btw Dalton &	ODOT	Uniu	-	-	-	-	-	12,503	13,234	-	13,200	5,500	INO	This is an outlier count
148531	Winchell	ODOT	OHIO	_	_	_	_	_	2,272	2,314	-	2,300	2,600	Yes	
1.0331	WB Bank St, btw Dalton &	3301	5.110						-,-,-	2,314		2,300	2,000		
148531	Winchell	ODOT	ОНЮ	-	-	-	-	-	3,167	3,224	-	3,200	2,950	Yes	
	SB Dalton Ave, btw Findlay &												-		
5313198	York St	ODOT	OHIO	-	-	-	-	-	5,556	5,874	-	5,900	5,550	Yes	
	NB Dalton Ave, btw Findlay &														
5313198	York St	ODOT	OHIO	-	-	-	-	-	4,794	5,068	-	5,100	4,750	Yes	
	SB Dalton Ave, btw Findlay &	00.5-	015												
5313198	York St	ODOT	OHIO	-	-	-	-	-	5,556	5,748	-	5,700	5,550	Yes	



Project BSB Project 2019 Balanced 2000 4,750 400 2,750	Traffic Balancing Notes  Yes  Yes	
000 4,750	Yes	5
400 2,750	Vac	
2,730		
	Tes	
500 2,100	Yes	
,		
700 5,000	Yes	
400 1,450	Yes	
200 3,250	Yes	
400 2.250	Vos	
400 3,250	Yes	
900 4 150	Yes	
4,130	163	
,300 7,100	Yes	
800	Yes	
600 2,600	Yes	
700 2,350	Yes	
000 3,100	Yes	
700		
700 2,800	Yes	
500 6 100	Ves 2018 is an outli	lier count
500 0,100	2010 13 411 0411	ier courit
000 6,500	Yes 2018 is an outli	lier count
,		
400 9,250	Yes	
000 2,950	Yes	
· ·		
000 1,850	Yes	
200		
200 4,600	Yes	
300 5 100	Ves	
3,100	163	
900 3,750	Yes	
•		
	400     3,250       900     4,150       ,300     7,100       00     800       600     2,600       700     2,350       000     3,100       700     2,800       500     6,100       000     6,500       400     9,250       700     2,750       000     1,850       200     4,600       300     5,100	400       3,250       Yes         900       4,150       Yes         ,300       7,100       Yes         ,300       7,100       Yes         ,300       7,100       Yes         ,600       2,600       Yes         ,700       2,350       Yes         ,700       2,800       Yes         ,500       6,100       Yes       2018 is an outled         ,500       6,500       Yes       2018 is an outled         ,400       9,250       Yes         ,700       2,750       Yes         ,200       4,600       Yes         ,200       4,600       Yes         ,900       3,750       Yes



		Carrat			2018	8 AADT	2010		2021	LAADT		BSB Project		Used for	
Count ID	Site Description	Count Source	State	2017 AADT	Published	Calculated	2019 AADT	2020 AADT	Published	Calculated	2022 AADT	2019 AADT Target	BSB Project 2019 Balanced	Traffic Balancing	Notes
150131	WB 8th St east of Linn St	ODOT	OHIO	-	-	-	-	-	3,604	3,670	-	3,700	4,200	Yes	
151331	Ramp from 7th St to Gest St	ODOT	OHIO	-	-	-	-	-	416	416	-	400	300	Yes	
151431	Ramp from Gest St to 7th St	ODOT	OHIO	-	-	-	-	-	632	632	-	600	750	Yes	
27131	EB Ramp conn US-50 EB to 5th	ODOT	OHIO	3,268 (3)	2,839	-	2,882 (3)	2,600 (3)	2,318	-	-	2,800	3,100	Yes	
HAM0903	WB US-50 E of Gest St	OKI	OHIO	-	22,392	-	-	-	-	-		22,400	20,950	Yes	
HAM1700	WB US-50 E of Linn St	OKI	OHIO	-	18,618	-	-	-	-	-		18,600	18,400	Yes	
HAM1700	EB US-50 E of Linn St	OKI	ОНЮ	-	20,752	-	-	-	-	-		20,800	21,900	Yes	
HAM0903	EB US-50 E of Gest St	OKI	ОНЮ	-	24,803	-	-	-	-	-		24,800	25,250	Yes	
104731	EB US-50, E of I-71 NB	ODOT	OHIO	25,760 (3)	27987	-	28,267 (3)	24,762 (3)	23309	-	-	28,000	27,400	Yes	
104231	WB US-50, to I-71 merge	ODOT	ОНЮ	25,238 (8)	27,266 (8)	27,996	27,539 (3)	24,124 (3)	25,168	-	-	28,000	27,750	Yes	



### INTERSECTION TURN MOVEMENT AADT WORKSHEET

			Αι	utos	Tri	ucks	To	otal		AADT Calcul	ations					Expansio	n Factors						
Intersections	Count ID	Movement	Period	Daily Estimate	Period	Daily Estimate	Period	Daily Estimate	Count Date	Seasonal Adj	AADT Target	AADT Balance	Upstream Count ID	Downstream Count ID	Count Period	Daily Auto	Period Auto	Daily Truck	Period Truck	Daily Total	Period Total	Auto Factor	Truck Factor
	BSBC3	EBR	1791	3267	30	69	1821	3336	1/10/2017	1.083	3613	3050	059C19NEG	059N08Road	6-10 am; 2-6 pm	0	0	0	0	12992	7064	1.82	2.31
	BSBC3	EBT	3035	5536	44	102	3079	5638	1/10/2017	1.083	6106	5700	059C19NEG	0	6-10 am; 2-6 pm	0	0	0	0	8257	4468	1.82	2.31
Dixie Hwy & SB Ramp	BSBC3	SBR	307	560	1	2	308	562	1/10/2017	1.083	609	550	059N07Road	059C19POS	6-10 am; 2-6 pm	0	0	0	0	14089	7881	1.82	2.31
Terminal Intersection	BSBC3	SBL	2260	4122	37	85	2297	4207	1/10/2017	1.083	4556	4650	059N07Road	0	6-10 am; 2-6 pm	0	0	0	0	4238	2184	1.82	2.31
	BSBC3	WBT	4974	9072	88	203	5062	9275	1/10/2017	1.083	10045	9100	0	059C19POS	6-10 am; 2-6 pm	0	0	0	0	9851	5697	1.82	2.31
	BSBC3	WBL	665	1213	11	25	676	1238	1/10/2017	1.083	1341	1400	0	059N08Road	6-10 am; 2-6 pm	0	0	0	0	4735	2596	1.82	2.31
	BSBC4	WBR	4099	7476	51	118	4150	7594	1/10/2017	1.083	8224	6450	0	059N06Road	6-10 am; 2-6 pm	0	0	0	0	7631	3849	1.82	2.31
	BSBC4	WBT	4534	8270	67	155	4601	8425	1/10/2017	1.083	9124	8350	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.82	2.31
Dixie Hwy & NB Ramp	BSBC4	NBR	793	1446	8	18	801	1464	1/10/2017	1.083	1586	1650	059N05Road	0	6-10 am; 2-6 pm	0	0	0	0	3066	1646	1.82	2.31
Terminal Intersection	BSBC4	NBL	1070	1952	24	55	1094	2007	1/10/2017	1.083	2174	2150	059N05Road	0	6-10 am; 2-6 pm	0	0	0	0	3066	1646	1.82	2.31
	BSBC4	EBT	5114	9328	70	162	5184	9490	1/10/2017	1.083	10278	10000	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.82	2.31
	BSBC4	EBL	206	376	8	18	214	394	1/10/2017	1.083	427	350	0	059N06Road	6-10 am; 2-6 pm	0	0	0	0	7631	3849	1.82	2.31
	CSS7	SBT	3441	5807	48	93	3489	5900	9/27/2022	0.945	5576	5250	0	-	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
	CSS7	SBL	3722	6281	64	124	3786	6405	9/27/2022	0.945	6053	5650	0	059D22NEG	6-10 am; 2-7 pm	0	0	0	0	9975	6331	1.69	1.94
Dixie & Kyles Lane	CSS7	WBR	3609	6091	59	115	3668	6206	9/27/2022	0.945	5865	6000	059D22POS	0	6-10 am; 2-7 pm	0	0	0	0	8846	5082	1.69	1.94
	CSS7	WBL	1404	2369	15	29	1419	2398	9/27/2022	0.945	2266	2500	059D22POS	-	6-10 am; 2-7 pm	0	0	0	0	8846	5082	1.69	1.94
	CSS7	NBT	3303	5574	53	103	3356	5677	9/27/2022	0.945	5365	5050	-	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
	CSS7	NBR	1474	2488	11	21	1485	2509	9/27/2022	0.945	2371	2400	-	059D22NEG	6-10 am; 2-7 pm	0	0	0	0	9975	6331	1.69	1.94
	BSBC5	SBR	789	1439	15	35	804	1474	1/10/2017	1.083	1596	1800	059N03POS	059D22POS	6-10 am; 2-6 pm	0	0	0	0	17062	8657	1.82	2.31
	BSBC5	SBL	3098	5651	115	266	3213	5917	1/10/2017	1.083	6408	5450	059N03POS	0	6-10 am; 2-6 pm	0	0	0	0	8217	4159	1.82	2.31
Kyles & SB Ramp	BSBC5	WBT	3165	5773	74	171	3239	5944	1/10/2017	1.083	6437	6700	0	059D22POS	6-10 am; 2-6 pm	0	0	0	0	8846	4499	1.82	2.31
Terminal Intersection	BSBC5	WBL	1443	2632	30	69	1473	2701	1/10/2017	1.083	2925	2350	0	059N04POS	6-10 am; 2-6 pm	0	0	0	0	5097	2526	1.82	2.31
	BSBC5	EBR	1197	2183	30	69	1227	2252	1/10/2017	1.083	2439	2500	059D22NEG	059N04POS	6-10 am; 2-6 pm	0	0	0	0	15072	8219	1.82	2.31
	BSBC5	EBT	2729	4978	66	152	2795	5130	1/10/2017	1.083	5556	5550	059D22NEG	0	6-10 am; 2-6 pm	0	0	0	0	9975	5693	1.82	2.31
	BSBC6	WBR	4105	7487	130	300	4235	7787	1/10/2017	1.083	8433	5900	059D72POS	059N02POS	6-10 am; 2-6 pm	0	0	0	0	20652	11173	1.82	2.31
	BSBC6	WBT	3626	6614	84	194	3710	6808	1/10/2017	1.083	7373	6900	059D72POS	0	6-10 am; 2-6 pm	0	0	0	0	12683	6726	1.82	2.31
Kyles & NB Ramp	BSBC6	NBR	1371	2501	24	55	1395	2556	1/10/2017	1.083	2768	2850	059N01POS	059D72NEG	6-10 am; 2-6 pm	0	0	0	0	16250	8191	1.82	2.31
Terminal Intersection	BSBC6	NBL	1019	1859	25	58	1044	1917	1/10/2017	1.083	2076	2150	059N01POS	0	6-10 am; 2-6 pm	0	0	0	0	5351	2406	1.82	2.31
	BSBC6	EBT	5171	9432	160	369	5331	9801	1/10/2017	1.083	10614	10000	0	059D72NEG	6-10 am; 2-6 pm	0	0	0	0	10899	5785	1.82	2.31
	BSBC6	EBL	652	1189	15	35	667	1224	1/10/2017	1.083	1326	1000	0	059N02POS	6-10 am; 2-6 pm	0	0	0	0	7969	4447	1.82	2.31
W 12 & NB Ramp	BSBC7	WBR	2376	4833	96	172	2472	5005	1/10/2017	1.013	5070	4300	059C71ndir	0	6-10 am; 2-6 pm	8637	4247	570	318	9207	4565	2.03	1.79
Intersection	BSBC7	WBT	2196	4466	63	113	2259	4579	1/10/2017	1.013	4639	4300	059C71ndir	0	6-10 am; 2-6 pm	8637	4247	570	318	9207	4565	2.03	1.79



			Δι	utos	Tri	ıcks	т	otal		AADT Calcul	ations					Fynansio	n Factors						
				atos	1110	JCKS	<u>'</u>	Otai	,	-ADT Calcul	ations					LAPATISIO	ni i actors						
	Count			Daily		Daily		Daily		Conconni	AADT	AADT	Unctroom	Downstroam		Daily	Dorind	Daily	Period	Daily	Dorind	Auto.	Truck
Intersections	Count	Movement	Period	Daily Estimate	Period	Estimate	Period	Estimate	Count Date	Seasonal Adj	Target	Balance	Upstream Count ID	Downstream Count ID	Count Period	Daily Auto	Period Auto	Daily Truck	Truck	Daily Total	Period Total	Auto Factor	Factor
	BSBC7	NBR	1833	4110	53	108	1886	4218	1/10/2017	1.013	4273	3900	059H34Pos	059C71pdir	6-10 am; 2-6 pm	7021	3131	329	162	13461	5995	2.24	2.03
	BSBC7	NBT	771	1470	25	48	796	1518	1/10/2017	1.013	1538	1650	059H34Pos	0	6-10 am; 2-6 pm	0	0	0	0	6111	2702	1.91	1.92
	BSBC7	NBL	58	111	1	2	59	113	1/10/2017	1.013	114	100	059H34Pos		6-10 am; 2-6 pm	0	0	0	0	6111	2702	1.91	1.92
	BSBC7	EBT	2386	5350	104	211	2490	5561	1/10/2017	1.013	5633	4950	0	059C71pdir	6-10 am; 2-6 pm	7021	3131	329	162	7350	3293	2.24	2.03
	BSBC7	EBL	241	460	5	10	246	470	1/10/2017	1.013	476	450	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC8	SBR	62	118	0	0	62	118	1/10/2017	1.013	120	100	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC8	SBT	916	1747	9	17	925	1764	1/10/2017	1.013	1787	1800	0	CSSRamp1	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
W 42 G CD D	BSBC8	SBL	1767	3370	90	173	1857	3543	1/10/2017	1.013	3589	3650	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
W 12 & SB Ramp Intersection	BSBC8	WBT	151	288	4	8	155	296	1/10/2017	1.013	300	250	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
intersection.	BSBC8	WBL	2120	4043	56	108	2176	4151	1/10/2017	1.013	4205	4150	0	CSSRamp1	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC8	EBR	73	139	1	2	74	141	1/10/2017	1.013	143	200	0	CSSRamp1	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC8	EBT	878	1674	13	25	891	1699	1/10/2017	1.013	1721	1750	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC9	WBR	719	1371	11	21	730	1392	1/12/2017	1.029	1432	950	0	BSBSC41	6-10 am; 2-6 pm	0	0	0	0	7701	4615	1.91	1.92
	BSBC9	WBT	1915	3652	58	111	1973	3763	1/12/2017	1.029	3872	3500	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
Simon Konton Way 8	BSBC9	NBR	797	1520	22	42	819	1562	1/12/2017	1.029	1607	1500	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
Simon Kenton Way & Pike St Intersection	BSBC9	NBT	1957	3732	82	157	2039	3889	1/12/2017	1.029	4002	3150	0	BSBSC41	6-10 am; 2-6 pm	0	0	0	0	7701	4615	1.91	1.92
	BSBC9	NBL	766	1461	17	33	783	1494	1/12/2017	1.029	1537	1750	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC9	EBT	2487	4743	68	131	2555	4874	1/12/2017	1.029	5015	4800	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC9	EBL	2151	4102	21	40	2172	4142	1/12/2017	1.029	4262	3450	0	BSBSC41	6-10 am; 2-6 pm	0	0	0	0	7701	4615	1.91	1.92
	BSBC10	SBL	0	0	0	0	709	1203	1/12/2017	1.029	1238	1250	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	BSBC10	SBT	0	0	0	0	1594	2707	1/12/2017	1.029	2786	3000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Bullock St & Pike St	BSBC10	SBR	0	0	0	0	2192	3722	1/12/2017	1.029	3830	3900	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	BSBC10	WBL	0	0	0	0	1230	2088	1/12/2017	1.029	2149	2000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	BSBC10	WBT	0	0	0	0	2168	3681	1/12/2017	1.029	3788	3250	0		6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	BSBC10	EBT	0	0	0	0	4246	7211	1/12/2017	1.029	7420	7000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	BSBC10	EBR	0	0	0	0	291	494	1/12/2017	1.029	509	550	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	BSBC11	SBT	743	1417	7	13	750	1430	1/12/2017	1.029	1471	2100	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC11	SBL	965	1840	27	52	992	1892	1/12/2017	1.029	1947	1900	0	-	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
Crescent & 4th	BSBC11	WBR	555	1058	17	33	572	1091	1/12/2017	1.029	1123	1200	059C78Neg	0	6-10 am; 2-6 pm	0	0	0	0	2293	991	1.91	1.92
Intersection	BSBC11	WBL	164	313	3	6	167	319	1/12/2017	1.029	328	500	059C78Neg	0	6-10 am; 2-6 pm	0	0	0	0	2293	991	1.91	1.92
	BSBC11	NBR	75	143	0	0	75	143	1/12/2017	1.029	147	150	0	-	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC11	NBT	1654	3154	56	108	1710	3262	1/12/2017	1.029	3357	5350	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
Crescent & 5th	BSBC12		285	543	3	6	288	549	1/12/2017	1.029	565	600	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
Intersection	BSBC12	SBL	634	1209	6	12	640	1221	1/12/2017	1.029	1256	2000	0	059D75Pos	6-10 am; 2-6 pm	0	0	0	0	5915	2353	1.91	1.92
	BSBC12	WBR	1439	2744	45	86	1484	2830	1/12/2017	1.029	2912	5050	-	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92



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Intersections	Count ID	Movement	Period	Daily Estimate	Period	Daily Estimate	Period	Daily Estimate	Count Date	Seasonal Adj	AADT Target	AADT Balance	Upstream Count ID	Downstream Count ID	Count Period	Daily Auto	Period Auto	Daily Truck	Period Truck	Daily Total	Period Total	Auto Factor	Truck Factor
	BSBC12	WBL	119	227	1	2	120	229	1/12/2017	1.029	236	400	-	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	BSBC12	NBR	102	195	1	2	103	197	1/12/2017	1.029	203	350	0	059D75Pos	6-10 am; 2-6 pm	0	0	0	0	5915	2353	1.91	1.92
	BSBC12	NBT	246	469	9	17	255	486	1/12/2017	1.029	500	450	0	0	6-10 am; 2-6 pm	0	0	0	0	0	0	1.91	1.92
	CSS1	SBL	0	0	0	0	0	0	9/27/2022	0.918	0	50	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS1	SBR	1249	2121	12	22	1261	2143	9/27/2022	0.918	1967	2800	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Main St & Pike St	CSS1	WBT	898	1525	35	63	933	1588	9/27/2022	0.918	1458	1650	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS1	WBR	207	352	3	5	210	357	9/27/2022	0.918	328	300	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS1	EBL	2611	4434	84	151	2695	4585	9/27/2022	0.918	4209	3600	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS1	EBT	1706	2897	43	77	1749	2974	9/27/2022	0.918	2730	2700	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS2	SBL	236	401	5	9	241	410	9/27/2022	0.918	376	400	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Philadelphia St & 9th St	CSS2	SBR	114	194	4	7	118	201	9/27/2022	0.918	185	200	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS2	WBT	143	243	11	20	154	263	9/27/2022	0.918	241	250	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS2	EBT	218	370	13	23	231	393	9/27/2022	0.918	361	350	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS3	SBL	1045	1775	20	36	1065	1811	9/27/2022	0.918	1662	2150	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS3	SBT	1155	1961	16	29	1171	1990	9/27/2022	0.918	1827	2100	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Main St & 5th	CSS3	NBT	2596	4409	68	122	2664	4531	9/27/2022	0.918	4159	3450	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS3	NBR	559	949	29	52	588	1001	9/27/2022	0.918	919	750	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS3	EBL	426	723	44	79	470	802	9/27/2022	0.918	736	1250	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS3	EBT	2427	4122	83	149	2510	4271	9/27/2022	0.918	3921	6000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS3	EBR	388	659	12	22	400	681	9/27/2022	0.918	625	800	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS4	SBT	1819	3089	22	40	1841	3129	9/27/2022	0.918	2872	3500	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS4	SBR	2053	3486	163	293	2216	3779	9/27/2022	0.918	3469	3950	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Main St & 4th	CSS4	WBL	440	747	11	20	451	767	9/27/2022	0.918	704	750	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS4	WBT	6110	10376	144	259	6254	10635	9/27/2022	0.918	9763	9450	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS4	WBR	2304	3913	127	228	2431	4141	9/27/2022	0.918	3801	5200	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS4	NBL	1328	2255	48	86	1376	2341	9/27/2022	0.918	2149	1800	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS4	NBT	1632	2772	63	113	1695	2885	9/27/2022	0.918	2648	2900	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS5	SBT	529	898	93	167	622	1065	9/27/2022	0.918	978	1000	059C76NEG	0	6-10 am; 2-7 pm	0	0	0	0	9033	5507	1.70	1.80
	CSS5	SBR	2700	4585	51	92	2751	4677	9/27/2022	0.918	4293	4450	059C76NEG	0	6-10 am; 2-7 pm	0	0	0	0	9033	5507	1.70	1.80
Dhiladalphia Ct 9, 4th Ct	CSS5	WBL	591	1004	20	36	611	1040	9/27/2022	0.918	955	950	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Philadelphia St & 4th St Intersection	CSS5	WBT	7494	12727	175	314	7669	13041	9/27/2022	0.918	11972	12000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS5	WBR	515	875	13	23	528	898	9/27/2022	0.918	824	2250	0	059C76POS	6-10 am; 2-7 pm	0	0	0	0	5151	2415	1.70	1.80
	CSS5	NBL	1272	2160	24	43	1296	2203	9/27/2022	0.918	2022	1650	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS5	NBT	468	795	9	16	477	811	9/27/2022	0.918	744	2400	0	059C76POS	6-10 am; 2-7 pm	0	0	0	0	5151	2415	1.70	1.80
	CSS6	SBL	569	966	96	172	665	1138	9/27/2022	0.918	1045	1400	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80



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Intersections	Count	Movement	Period	Daily Estimate	Period	Daily Estimate	Period	Daily Estimate	Count Date	Seasonal Adj	AADT Target	AADT Balance	Upstream Count ID	Downstream Count ID	Count Period	Daily Auto	Period Auto	Daily Truck	Period Truck	Daily Total	Period Total	Auto Factor	Truck Factor
	CSS6	SBT	225	382	3	5	228	387	9/27/2022	0.918	355	550	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS6	NBT	774	1314	4	7	778	1321	9/27/2022	0.918	1213	1350	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Philadelphia St & 5th St	CSS6	NBR	104	177	5	9	109	186	9/27/2022	0.918	171	200	C	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS6	EBL	592	1005	21	38	613	1043	9/27/2022	0.918	957	2700	C	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS6	EBT	2275	3863	35	63	2310	3926	9/27/2022	0.918	3604	6450	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS6	EBR	269	457	6	11	275	468	9/27/2022	0.918	430	750	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS8	SBR	370	639	3	5	373	644	9/27/2022	0.945	609	550	С	150331WB	6-10 am; 2-7 pm	8854	5125	299	173	9153	5298	1.73	1.73
Central Ave & 9th	CSS8	WBT	5245	9125	217	356	5462	9481	9/27/2022	0.945	8960	8650	12531WB	150331WB	6-10 am; 2-7 pm	18533	10653	789	481	19322	11134	1.74	1.64
Intersection	CSS8	WBR	208	364	3	5	211	369	9/27/2022	0.945	349	350	12531WB	0	6-10 am; 2-7 pm	9679	5528	490	308	10169	5836	1.75	1.59
	CSS8	NBL	896	1548	15	26	911	1574	9/27/2022	0.945	1487	1700	С	150331WB	6-10 am; 2-7 pm	8854	5125	299	173	9153	5298	1.73	1.73
	CSS8	NBT	1338	2258	38	74	1376	2332	9/27/2022	0.945	2204	2700	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
	137131	NBT	1961	3017	36	67	1997	3084	12/5/2017	1.028	3170	2250	9731NB	0	6-10 am; 2-7 pm	2669	1735	132	71	2801	1806	1.54	1.86
Central Ave & 7th	137131	NBR	1183	1840	11	17	1194	1857	12/5/2017	1.028	1909	1650	9731NB	9831EB	6-10 am; 2-7 pm	11925	7667	741	468	12666	8135	1.56	1.59
Intersection	137131	EBL	1678	2832	21	41	1699	2873	12/5/2017	1.028	2953	2150	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
	137131	EBT	4876	7608	226	347	5102	7955	12/5/2017	1.028	8178	7300	С	9831EB	6-10 am; 2-7 pm	9256	5932	609	397	9865	6329	1.56	1.54
	137131	EBR	488	774	0	0	488	774	12/5/2017	1.028	796	700	С	9731SB	6-10 am; 2-7 pm	760	479	25	13	785	492	1.59	1.92
	CSS9	SBT	261	405	6	10	267	415	9/27/2022	0.945	392	600	9731SB	9631SB	6-10 am; 2-7 pm	5209	3357	232	139	5441	3496	1.55	1.67
	CSS9	SBR	77	128	2	3	79	131	9/27/2022	0.945	124	100	9731SB	27231WB	6-10 am; 2-7 pm	4880	2930	122	81	5002	3011	1.67	1.51
Central Ave & 6th	CSS9	WBL	758	1175	46	73	804	1248	9/27/2022	0.945	1179	2300	27531WB	9631SB	6-10 am; 2-7 pm	14207	9164	678	426	14885	9590	1.55	1.59
Intersection	CSS9	WBT	3345	5313	87	134	3432	5447	9/27/2022	0.945	5147	4650	27531WB	27231WB	6-10 am; 2-7 pm	13878	8737	568	368	14446	9105	1.59	1.54
	CSS9	WBR	577	894	18	29	595	923	9/27/2022	0.945	872	1050	27531WB	9731NB	6-10 am; 2-7 pm	12427	8021	603	371	13030	8392	1.55	1.63
	CSS9	NBL	660	1086	7	11	667	1097	9/27/2022	0.945	1037	950	9631NB	27231WB	6-10 am; 2-7 pm	7135	4335	306	191	7441	4526	1.65	1.60
	CSS9	NBT	1570	2466	25	44	1595	2510	9/27/2022	0.945	2372	2850	9631NB	9731NB	6-10 am; 2-7 pm	5684	3619	341	194	6025	3813	1.57	1.76
	483324	SBL	1262	1951	23	38	1285	1989	11/14/2017	0.947	1884	1500	9631SB	0	6-10 am; 2-7 pm	4449	2878	207	126	4656	3004	1.55	1.64
	483324	SBT	1328	2053	68	112	1396	2165	11/14/2017	0.947	2050	1400	9631SB	0	6-10 am; 2-7 pm	4449	2878	207	126	4656	3004	1.55	1.64
Central Ave & 5th	483324	NBT	1881	3010	45	76	1926	3086	11/14/2017	0.947	2922	2500	С	9631NB	6-10 am; 2-7 pm	3015	1884	209	123	3224	2007	1.60	1.70
Intersection	483324	NBR	961	1622	59	115	1020	1737	11/14/2017	0.947	1645	1450	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
	483324	EBL	1050	1680	2	3	1052	1683	11/14/2017	0.947	1594	1300	С	9631NB	6-10 am; 2-7 pm	3015	1884	209	123	3224	2007	1.60	1.70
	483324	EBT	7233	12207	149	289	7382	12496	11/14/2017	0.947	11834	10100	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
	483324	EBR	125	211	0	0	125	211	11/14/2017	0.947	200	150	С	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
	CSS10	SBT	809	1298	45	73	854	1371	9/27/2022	0.945	1296	1550	С	13031SB	6-10 am; 2-7 pm	2199	1371	215	133	2414	1504	1.60	1.62
Control Avo 9 4th	CSS10	WBL	260	417	30	48	290	465	9/27/2022	0.945	439	500	С	13031SB	6-10 am; 2-7 pm	2199	1371	215	133	2414	1504	1.60	1.62
Central Ave & 4th Intersection	CSS10	WBT	1636	2738	76	110	1712	2848	9/27/2022	0.945	2691	2700	С	117131RAMP	6-10 am; 2-7 pm	6487	3876	342	236	6828	4112	1.67	1.45
	CSS10	WBR	519	876	18	35	537	911	9/27/2022	0.945	861	950	C	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
	CSS10	NBL	2074	3489	66	102	2140	3591	9/27/2022	0.945	3393	3150	13031NB	117131RAMP	6-10 am; 2-7 pm	12106	7195	836	541	12941	7736	1.68	1.54



			Aı	utos	Trı	ucks	Т	otal		AADT Calcul	ations					Expansio	n Factors	S					
Intersections	Count ID	Movement	Period	Daily Estimate	Period	Daily Estimate	Period	Daily Estimate	Count Date	Seasonal Adj	AADT Target	AADT Balance	Upstream Count ID	Downstream Count ID	Count Period	Daily Auto	Period Auto	Daily Truck	Period Truck	Daily Total	Period Total	Auto Factor	Truck Factor
	CSS10	NBT	1456	2465	42	68	1498	2533	9/27/2022	0.945	2394	3000	13031NB	0	6-10 am; 2-7 pm	5619	3319	494	305	6113	3624	1.69	1.62
	CSS11	SBT	304	460	41	64	345	524	9/27/2022	0.945	495	700	13031SB	12931SB	6-10 am; 2-7 pm	4654	3079	510	327	5164	3406	1.51	1.56
	CSS11	SBR	770	1255	34	60	804	1315	9/27/2022	0.945	1243	1350	13031SB	15931WB	6-10 am; 2-7 pm	3443	2113	555	315	3998	2428	1.63	1.76
	CSS11	WBL	636	914	79	120	715	1034	9/27/2022	0.945	977	1200	0	12931SB	6-10 am; 2-7 pm	2455	1708	295	194	2750	1902	1.44	1.52
Central Ave & 3rd	CSS11	WBT	1265	2121	157	293	1422	2414	9/27/2022	0.945	2281	2400	0	15931WB	6-10 am; 2-7 pm	1244	742	340	182	1584	924	1.68	1.87
Intersection	CSS11	WBR	1512	2560	30	49	1542	2609	9/27/2022	0.945	2466	2700	0	13031NB	6-10 am; 2-7 pm	5619	3319	494	305	6113	3624	1.69	1.62
	CSS11	NBL	323	492	10	18	333	510	9/27/2022	0.945	482	450	12931NB	15931WB	6-10 am; 2-7 pm	3243	2128	501	283	3744	2411	1.52	1.77
	CSS11	NBT	816	1321	44	71	860	1392	9/27/2022	0.945	1315	1500	12931NB	13031NB	6-10 am; 2-7 pm	7618	4705	655	406	8273	5111	1.62	1.61
	CSS11	EBL	1071	1767	36	61	1107	1828	9/27/2022	0.945	1727	1950	15931EB	13031NB	6-10 am; 2-7 pm	7929	4805	706	420	8635	5225	1.65	1.68
	CSS11	EBR	227	339	8	13	235	352	9/27/2022	0.945	333	400	15931EB	12931SB	6-10 am; 2-7 pm	4765	3194	507	309	5272	3503	1.49	1.64
	CSS12	WBT	1712	2907	112	201	1824	3108	9/27/2022	0.918	2853	2900	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
4th St & Elm St	CSS12	WBR	477	810	57	102	534	912	9/27/2022	0.918	837	850	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS12	NBL	661	1123	12	22	673	1145	9/27/2022	0.918	1051	1150	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS12	NBT	1344	2282	35	63	1379	2345	9/27/2022	0.918	2153	2600	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	469704	NBT	671	1140	28	50	699	1190	11/14/2017	0.914	1088	1400	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
2nd St & Elm St	469704	NBR	222	377	25	45	247	422	11/14/2017	0.914	386	400	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	469704	EBL	1461	2481	7	13	1468	2494	11/14/2017	0.914	2280	1700	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	469704	EBT	7374	12523	226	406	7600	12929	11/14/2017	0.914	11817	12000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	469704	EBR	790	1342	9	16	799	1358	11/14/2017	0.914	1241	1250	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	483323	WBT	5815	10916	316	625	6131	11541	11/14/2017	0.914	10548	10200	0	104531Ramp	6-10 am; 2-7 pm	5003	2665	275	139	5278	2804	1.88	1.98
3rd St & Elm St	483323	WBR	1355	2301	80	144	1435	2445	11/14/2017	0.914	2235	2050	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	483323	NBL	983	1845	51	101	1034	1946	11/14/2017	0.914	1779	1400	0	104531Ramp	6-10 am; 2-7 pm	5003	2665	275	139	5278	2804	1.88	1.98
	483323	NBT	1363	2315	84	151	1447	2466	11/14/2017	0.914	2254	1700	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	472684	SBT	2132	3621	25	45	2157	3666	11/14/2017	0.914	3351	3350	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
3rd St & Race St	472684	SBR	1320	2242	270	485	1590	2727	11/14/2017	0.914	2492	2500	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	472684	WBL	707	1201	15	27	722	1228	11/14/2017	0.914	1122	1100	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	472684	WBT	6169	10476	194	349	6363	10825	11/14/2017	0.914	9894	9750	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	483303	WBL	2251	3774	154	288	2405	4062	12/7/2017	0.984	3997	3100	15931WB	HAM4034SB	6-10 am; 2-7 pm	1244	742	340	182	1584	924	1.68	1.87
	483303	WBT	568	940	52	93	620	1033	12/7/2017	0.984	1016	1100	15931WB	93199WB	6-10 am; 2-7 pm	5170	3125	640	358	5810	3483	1.65	1.79
3rd St & CWB Bridge	483303	NBL	1650	2718	40	68	1690	2786	12/7/2017	0.984	2741	3050	HAM4034NB	93199WB	6-10 am; 2-7 pm	3926	2383	300	176	4226	2559	1.65	1.70
Intersection	483303	NBR	1264	1965	33	61	1297	2026	12/7/2017	0.984	1994	1750	HAM4034NB	15931EB	6-10 am; 2-7 pm	2310	1486	212	115	2522	1601	1.55	1.84
	483303	EBT	265	419	31	52	296	471	12/7/2017	0.984	463	600	93199EB	15931EB	6-10 am; 2-7 pm	9696	6138	771	457	10467	6594	1.58	1.69
	483303	EBR	2352	3735	84	137	2436	3872	12/7/2017	0.984	3810	6050	93199EB	HAM4034SB	6-10 am; 2-7 pm	7386	4652	559	342	7945	4993	1.59	1.64
2nd St & CWB Bridge	124231	SBL	600	1013	21	41	621	1054	4/10/2018	0.981	1034	1700	HAM4034SB	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.69	1.94
Intersection	124231	SBT	4589	8293	287	382	4876	8675	4/10/2018	0.981	8510	7450	HAM4034SB	059001NDir	6-10 am; 2-7 pm	6028	3336	1188	892	7216	4228	1.81	1.33



			Δι	utos	Tri	ucks	T	otal		AADT Calcul	ations					Expansion	n Factors						
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	Count			Daily		Daily		Daily		Seasonal	AADT	AADT	Upstream	Downstream		Daily	Period	Daily	Period	Daily	Period	Auto	Truck
Intersections	ID	Movement	Period	Estimate	Period	Estimate	Period	Estimate	Count Date	Adj	Target	Balance	Count ID	Count ID	Count Period	Auto	Auto	Truck	Truck	Total	Total	Factor	Factor
	124231	NBT	3155	5368	72	104	3227	5472	4/10/2018	0.981	5368	4800	059001PDir	HAM4034NB	6-10 am; 2-7 pm	6380	3750	733	508	7112	4257	1.70	1.44
	124231	NBR	2004	3410	190	274	2194	3684	4/10/2018	0.981	3614	3300	059001PDir	0	6-10 am; 2-7 pm	6380	3750	733	508	7112	4257	1.70	1.44
3rd St & Plum St	CSS13	SBR	285	484	3	5	288	489	9/27/2022	0.918	449	600	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS13	WBT	3195	5426	261	469	3456	5895	9/27/2022	0.918	5412	5700	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS14	SBT	192	326	6	11	198	337	9/27/2022	0.918	309	400	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
4th St & Plum St	CSS14	SBR	197	335	4	7	201	342	9/27/2022	0.918	314	300	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS14	WBL	126	214	2	4	128	218	9/27/2022	0.918	200	200	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS14	WBT	2204	3743	123	221	2327	3964	9/27/2022	0.918	3639	3850	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS15	SBT	3430	5825	241	433	3671	6258	9/27/2022	0.918	5745	5700	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS15	SBR	1153	1958	32	57	1185	2015	9/27/2022	0.918	1850	1800	0	HAM1856WB	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Spring Grove & WHV	CSS15	NBL	1112	1888	80	144	1192	2032	9/27/2022	0.918	1865	1950	0	HAM1856WB	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS15	NBT	2782	4725	184	331	2966	5056	9/27/2022	0.918	4641	4100	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS15	EBL	1110	1885	66	119	1176	2004	9/27/2022	0.918	1840	1800	HAM1856EB	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS15	EBR	701	1190	68	122	769	1312	9/27/2022	0.918	1204	1200	HAM1856EB	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS16	SBT	1915	3252	71	128	1986	3380	9/27/2022	0.918	3103	3150	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS16	SBR	96	163	7	13	103	176	9/27/2022	0.918	162	150	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS16	WBL	160	272	13	23	173	295	9/27/2022	0.918	271	250	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Dalton Ave & Linn St	CSS16	WBT	520	883	126	226	646	1109	9/27/2022	0.918	1018	1000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS16	WBR	760	1291	30	54	790	1345	9/27/2022	0.918	1235	1300	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS16	NBL	457	776	34	61	491	837	9/27/2022	0.918	768	700	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS16	NBT	577	980	57	102	634	1082	9/27/2022	0.918	993	1300	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS16	EBL	46	78	2	4	48	82	9/27/2022	0.918	75	100	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS16	EBR	1247	2118	124	223	1371	2341	9/27/2022	0.918	2149	2200	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS17	SBL	1544	2622	110	198	1654	2820	9/27/2022	0.918	2589	2700	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
6th St & Linn St	CSS17	SBT	1776	3016	95	171	1871	3187	9/27/2022	0.918	2926	2900	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS17	NBT	1036	1759	93	167	1129	1926	9/27/2022	0.918	1768	2000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS17	NBR	343	582	48	86	391	668	9/27/2022	0.918	613	650	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	SBL	227	386	9	16	236	402	9/27/2022	0.918	369	350	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	SBT	2131	3619	95	171	2226	3790	9/27/2022	0.918	3479	3500	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	SBR	347	589	13	23	360	612	9/27/2022	0.918	562	550	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Ezzard Charles & Linn St	CSS18	WBL	352	598	13	23	365	621	9/27/2022	0.918	570	550	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
Intersection	CSS18	WBT	949	1612	46	83	995	1695	9/27/2022	0.918	1556	2000	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	WBR	172	292	10	18	182	310	9/27/2022	0.918	285	300	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	NBL	577	980	13	23	590	1003	9/27/2022	0.918	921	950	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	NBT	2162	3672	104	187	2266	3859	9/27/2022	0.918	3543	3550	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80



			Δι	utos	Tri	ucks	т	otal		AADT Calcul	ations					Expansion	on Factors						
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Intersections	Count ID	Movement	Period	Daily Estimate	Period	Daily Estimate	Period	Daily Estimate	Count Date	Seasonal Adj	AADT Target	AADT Balance	Upstream Count ID	Downstream Count ID	Count Period	Daily Auto	Period Auto	Daily Truck	Period Truck	Daily Total	Period Total	Auto Factor	Truck Factor
	CSS18	NBR	398	676	12	22	410	698	9/27/2022	0.918	641	650	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	EBL	235	399	5	9	240	408	9/27/2022	0.918	375	400	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	EBT	1482	2517	33	59	1515	2576	9/27/2022	0.918	2365	2050	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	CSS18	EBR	398	676	0	0	398	676	9/27/2022	0.918	621	700	0	0	6-10 am; 2-7 pm	0	0	0	0	0	0	1.70	1.80
	145431	WBR	<del>5</del>	8	0	0	<del>5</del>	8	<del>1/14/2021</del>	<del>1.08</del>	9	2950	140131WB	0	6-10 am; 3-7 pm	4444	<del>2615</del>	<del>740</del>	<del>337</del>	<del>5184</del>	<del>2952</del>	<del>1.70</del>	<del>2.20</del>
6th St & Gest St	145431	WBL	379	644	102	224	481	868	1/14/2021	1.08	937	1000	140131WB	0	6-10 am; 3-7 pm	4444	2615	740	337	5184	2952	1.70	2.20
Intersection	145431	NBT	1054	2033	123	256	1177	2289	1/14/2021	1.08	2472	2400	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	145431	SBT	633	1221	72	150	705	1371	1/14/2021	1.08	1481	2150	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	145531	EBR	148	285	9	19	157	304	1/21/2021	1.08	328	300	0	150031SB	6-10 am; 3-7 pm	0	0	0	0	4926	2334	1.93	2.08
	145531	EBL	359	692	7	15	366	707	1/21/2021	1.08	764	600	0	149731NB	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
Linn St & Gest St	145531	WBR	632	1219	12	25	644	1244	1/21/2021	1.08	1344	1300	0	149731NB	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
Intersection	145531	WBL	121	233	21	44	142	277	1/21/2021	1.08	299	350	0	150031SB	6-10 am; 3-7 pm	0	0	0	0	4926	2334	1.93	2.08
	145531	NBT	1336	2576	53	110	1389	2686	1/21/2021	1.08	2901	3750	150031NB	149731NB	6-10 am; 3-7 pm	0	0	0	0	6343	2975	1.93	2.08
	145531	SBT	2004	3865	73	152	2077	4017	1/21/2021	1.08	4338	4450	149731SB	150031SB	6-10 am; 3-7 pm	0	0	0	0	4926	2334	1.93	2.08
	145631	EBR	417	814	46	103	463	917	1/20/2021	1.08	990	1050	0	3131WB	6-10 am; 3-7 pm	5190	2657	797	355	5987	3012	1.95	2.25
	145631	EBT	428	816	22	48	450	864	1/20/2021	1.08	933	1150	0	149831EB	6-10 am; 3-7 pm	2397	1258	109	50	2506	1308	1.91	2.17
	145631	EBL	595	1218	141	314	736	1532	1/20/2021	1.08	1655	1550	0	531991-WAY	6-10 am; 3-7 pm	8283	4047	2245	1009	10528	5056	2.05	2.22
	145631	WBR	629	1273	105	236	734	1509	1/20/2021	1.08	1630	1700	149831WB	531991-WAY	6-10 am; 3-7 pm	10770	5323	2545	1130	13315	6453	2.02	2.25
	145631	WBT	436	850	48	119	484	969	1/20/2021	1.08	1047	1050	149831WB	0	6-10 am; 3-7 pm	2487	1276	300	121	2787	1397	1.95	2.48
Freeman Ave & Gest St	145631	WBL	55	107	17	39	72	146	1/20/2021	1.08	158	200	149831WB	3131WB	6-10 am; 3-7 pm	7677	3933	1097	476	8774	4409	1.95	2.30
Intersection	145631	NBR	86	170	3	7	89	177	1/20/2021	1.08	191	250	3131EB	149831EB	6-10 am; 3-7 pm	7963	4026	1068	476	9030	4502	1.98	2.24
	145631	NBT	2387	4851	321	717	2708	5568	1/20/2021	1.08	6013	6000	3131EB	531991-WAY	6-10 am; 3-7 pm	13849	6815	3204	1435	17053	8250	2.03	2.23
	145631	NBL	109	219	8	18	117	237	1/20/2021	1.08	256	250	3131EB	0	6-10 am; 3-7 pm	5566	2768	959	426	6525	3194	2.01	2.25
	145631	SBR	144	308	37	92	181	400	1/20/2021	1.08	432	400	90031RAMP	0	6-10 am; 3-7 pm	5738	2683	590	238	6328	2921	2.14	2.48
	145631	SBT	2067	4230	341	797	2408	5027	1/20/2021	1.08	5429	4850	90031RAMP	3131WB	6-10 am; 3-7 pm	10928	5340	1387	593	12314	5933	2.05	2.34
	145631	SBL	496	1024	60	145	556	1169	1/20/2021	1.08	1263	1350	90031RAMP	149831EB	6-10 am; 3-7 pm	8135	3941	698	288	8833	4229	2.06	2.42
	145731	EBT	1087	2336	155	360	1242	2696	1/20/2021	1.08	2912	2800	149531EB	0	6-10 am; 3-7 pm	2224	1035	274	118	2498	1153	2.15	2.32
Western Ave & Gest St	145731	WBT	694	1462	92	211	786	1673	1/20/2021	1.08	1807	1700	0	149531WB	6-10 am; 3-7 pm	2418	1148	321	140	2739	1288	2.11	2.30
Intersection	145731	SBR	533	1129	63	148	596	1277	1/20/2021	1.08	1379	1400	1496311-WAY	149531WB	6-10 am; 3-7 pm	4660	2200	536	228	5195	2428	2.12	2.35
	145731	SBL	359	765	53	129	412	894	1/20/2021	1.08	966	950	1496311-WAY	0	6-10 am; 3-7 pm	2242	1052	215	89	2457	1141	2.13	2.43
	145831	WBR	131	261	4	8	135	269	1/14/2021	1.08	291	300	150331WB	-	6-10 am; 3-7 pm	8854	4445	299	154	9153	4599	1.99	1.94
Married 0, 014	145831	WBBR	1736	3294	47	89	1783	3383	1/14/2021	1.08	3654	4250	150331WB	139731Ramp	6-10 am; 3-7 pm	14428	7605	376	199	14804	7804	1.90	1.89
Mound & 9th Intersection	145831	WBBL	2178	4339	99	192	2277	4531	1/14/2021	1.08	4893	6350	150331WB	0	6-10 am; 3-7 pm	8854	4445	299	154	9153	4599	1.99	1.94
mersection	145831	SBHR	136	240	1	2	137	242	1/14/2021	1.08	261	300	-	139731Ramp	6-10 am; 3-7 pm	5574	3160	78	45	5652	3205	1.76	1.72
	145831	SBBR	134	258	0	0	134	258	1/14/2021	1.08	279	350	-	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08



			Αι	utos	Tri	ucks	T	otal		AADT Calcul	ations					Expansio	n Factors	s					
										22.031						p							
	Count			Daily		Daily		Daily		Seasonal	AADT	AADT	Upstream	Downstream		Daily	Period	Daily	Period	Daily	Period	Auto	Truck
Intersections	ID	Movement	Period	•	Period	Estimate	Period	Estimate	Count Date	Adj	Target	Balance	Count ID	Count ID	Count Period	Auto	Auto	Truck	Truck	Total	Total	Factor	Factor
	145931	EBT	831	1610	30	60	861	1670	1/12/2021	1.08	1804	2350	1494311-WAY	(	6-10 am; 3-7 pm	2291	1183	99	50	2390	1232	1.94	1.99
EB Ezzard Charles & Winchell Ave	145931	EBL	132	256	8	16	140	272	1/12/2021	1.08	294	250	1494311-WAY	-	6-10 am; 3-7 pm	2291	1183	99	50	2390	1232	1.94	1.99
Intersection	145931	NBR	388	748	5	10	393	758	1/12/2021	1.08	819	800	0	(	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	145931	NBT	1451	2798	199	414	1650	3212	1/12/2021	1.08	3469	3600	0	-	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146031	EBR	383	739	18	37	401	776	1/20/2021	1.08	838	850	0	(	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146031	EBT	1128	2234	101	184	1229	2418	1/20/2021	1.08	2611	2900	0	150131EB	6-10 am; 3-7 pm	3367	1700	216	119	3583	1819	1.98	1.82
	146031	EBL	739	1425	17	35	756	1460	1/20/2021	1.08	1577	2100	0	150031NB	6-10 am; 3-7 pm	0	0	0	0	6343	2975	1.93	2.08
	146031	WBR	151	309	2	4	153	313	1/20/2021	1.08	338	450	150131WB	150031NB	6-10 am; 3-7 pm	3204	1567	195	98	9742	4639	2.05	1.99
	146031	WBT	1037	2121	79	158	1116	2279	1/20/2021	1.08	2461	2450	150131WB	(	6-10 am; 3-7 pm	3204	1567	195	98	3399	1664	2.05	1.99
W 8th St & Linn St	146031	WBL	215	440	9	18	224	458	1/20/2021	1.08	495		150131WB	(	6-10 am; 3-7 pm	3204	1567	195	98	3399	1664	2.05	1.99
Intersection	146031	NBR	90	178	5	9	95	187	1/20/2021	1.08	202	200	0	150131EB	6-10 am; 3-7 pm	3367	1700	216	119	3583	1819	1.98	1.82
	146031	NBT	528	1018	38	79	566	1097	1/20/2021	1.08	1185	1200	0	150031NB	6-10 am; 3-7 pm	0	0	0	0	6343	2975	1.93	2.08
	146031	NBL	622	1199	29	60	651	1259	1/20/2021	1.08	1360	1300	0	C	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146031	SBR	908	1751	43	89	951	1840	1/20/2021	1.08	1987	2050		C	6-10 am; 3-7 pm	0	0	0	0	4926	2334	1.93	2.08
	146031	SBT	840	1620	36	75	876	1695	1/20/2021	1.08	1831	1950		C	6-10 am; 3-7 pm	0	0	0	0	4926	2334	1.93	2.08
	146031	SBL	436	864	9	16	445	880	1/20/2021	1.08	950	1100	150031SB	150131EB	6-10 am; 3-7 pm	3367	1700	216	119	8509	4153	1.98	1.82
	146131	EBR	17	33	3	6	20	39	1/12/2021	1.08	42	50	0	149731SB	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146131	EBT	6	12	0	0	6	12	1/12/2021	1.08	13	50	0	149931EB	6-10 am; 3-7 pm	1238	628	13	7	1251	635	1.97	1.79
	146131	EBL	8	15	2	4	10	19	1/12/2021	1.08	21	50	0	C	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146131	WBR	145	313	5	9	150	322	1/12/2021	1.08	348	350	149931WB	C	6-10 am; 3-7 pm	864	401	16	9	880	409	2.16	1.88
	146131	WBT	13	28	0	0	13	28	1/12/2021	1.08	30	50	149931WB	C	6-10 am; 3-7 pm	864	401	16	9	880	409	2.16	1.88
Court St & Linn St	146131	WBL	219	472	1	2	220	474	1/12/2021	1.08	512	550	149931WB	149731SB	6-10 am; 3-7 pm	864	401	16	9	880	409	2.16	1.88
Intersection	146131	NBR	433	854	3	5	436	859	1/12/2021	1.08	928	1100	149731NB	149931EB	6-10 am; 3-7 pm	1238	628	13	7	1251	635	1.97	1.79
	146131	NBT	1788	3448	59	123	1847	3571	1/12/2021	1.08	3857	4500	149731NB	C	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146131		18	35	1	2	19	37	1/12/2021		40		149731NB		6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146131		9	17	3	6	12	23	1/12/2021	1.08	25	50	0		6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146131		1774	3421	57	118	1831	3539	1/12/2021	1.08		3850		149731SB	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146131		180	355	4	7	184	362	1/12/2021	1.08	391	400	0	149931EB	6-10 am; 3-7 pm	1238	628	13	7	1251	635	1.97	1.79
EB Ezzard Charles &	146231		17	33	12	25	29	58	1/12/2021	1.08	63	50	0	-	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
Western Ave	146231		15	29	11	22	26	51	1/12/2021	1.08	55	100			6-10 am; 3-7 pm	2291	1183	99	50	2390	1232	1.94	1.99
Intersection	146231		2147	4140	234	486	2381	4626	1/12/2021	1.08	4996	5200			6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146231		1041	2017	26	52	1067	2069	1/12/2021	1.08		2500		1494311-WAY			1183	99	50	2390	1232	1.94	1.99
Central Pkwy & WHV	146331		1218	2411	64	117	1282	2528	1/13/2021	1.08			HAM1945EB	137631SB	6-10 am; 3-7 pm		2810	177	97	5740	2907	1.98	1.82
Intersection	146331		1713	3442	26	46	1739	3488	1/13/2021	1.08			HAM1945EB	5253198NB	6-10 am; 3-7 pm		1740	158	89	3655	1829	2.01	1.78
	146331	EBL	614	1066	4	9	618	1075	1/13/2021	1.08	1161	1050	HAM1945EB	13731NB	6-10 am; 3-7 pm	3750	2159	123	56	3873	2215	1.74	2.20



			Δι	utos	Tri	ucks	T	otal		AADT Calcul	ations					Expansio	on Factors						
			70			40N3		- Cui		. ID I Culcul	4 10 13					LAPATISIO	111000						
	Count			Daily		Daily		Daily		Seasonal	AADT	AADT	Unstroom	Downstroam		Daily	Period	Daily	Period	Daily	Period	Auto	Truck
Intersections	Count	Movement	Period	,	Period	Estimate	Period	Estimate	Count Date	Adj	Target	Balance	Upstream Count ID	Downstream Count ID	Count Period	Auto	Auto	Truck	Truck	Total	Total	Auto Factor	Factor
	146331	NBR	81	169	4	8	85	177	1/13/2021	1.08	191	200	137631NB	5253198NB	6-10 am; 3-7 pm	8334	3989	302	156	8635	4145	2.09	1.93
	146331	NBT	1183	2305	39	85	1222	2390	1/13/2021	1.08	2581	2700		13731NB	6-10 am; 3-7 pm	8587	4408	267	123	8854	4531	1.95	2.17
	146331	NBL	946	2035	59	126	1005	2161	1/13/2021	1.08	2334	2950	137631NB	HAM1945WB	6-10 am; 3-7 pm	4837	2249	144	67	4981	2316	2.15	2.14
	146331	SBR	534	958	4	8	538	966	1/13/2021	1.08	1043	1150	13731SB	HAM1945WB	6-10 am; 3-7 pm	5303	2956	124	61	5427	3017	1.79	2.03
	146331	SBT	1300	2450	38	72	1338	2522	1/13/2021	1.08	2724	3300	13731SB	137631SB	6-10 am; 3-7 pm	10866	5766	301	158	11167	5924	1.88	1.91
	146331	SBL	42	79	2	4	44	83	1/13/2021	1.08	90	100	13731SB	5253198NB	6-10 am; 3-7 pm	8800	4696	282	150	9082	4846	1.87	1.88
	146331	WBR	102	194	4	7	106	201	1/13/2021	1.08	217	200	5253198SB	13731NB	6-10 am; 3-7 pm	7171	3769	289	155	7460	3923	1.90	1.87
	146331	WBT	1286	2733	21	35	1307	2768	1/13/2021	1.08	2989	3100	5253198SB	HAM1945WB	6-10 am; 3-7 pm	3421	1610	166	99	3587	1708	2.13	1.69
	146331	WBL	18	37	0	0	18	37	1/13/2021	1.08	40	50	5253198SB	137631SB	6-10 am; 3-7 pm	8983	4420	343	196	9326	4615	2.03	1.75
	146431	EBR	94	181	12	25	106	206	1/13/2021	1.08	222	250	-	147831SB	6-10 am; 3-7 pm	0	0	0	0	6100	3193	1.93	2.08
	146431	EBT	19	40	0	0	19	40	1/13/2021	1.08	43	50	-	143531EB	6-10 am; 3-7 pm	1044	490	33	15	1077	505	2.13	2.20
	146431	EBL	37	71	0	0	37	71	1/13/2021	1.08	77	50	-	C	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146431	WBR	372	860	9	20	381	880	1/13/2021	1.08	950	900	143531WB	С	6-10 am; 3-7 pm	1068	462	25	11	1093	473	2.31	2.27
	146431	WBT	21	49	1	2	22	51	1/13/2021	1.08	55	200	143531WB	-	6-10 am; 3-7 pm	1068	462	25	11	1093	473	2.31	2.27
Spring Grove & Harrison	146431	WBL	58	134	5	11	63	145	1/13/2021	1.08	157	150	143531WB	147831SB	6-10 am; 3-7 pm	1068	462	25	11	7193	3666	2.31	2.27
Intersection	146431	NBR	85	181	0	0	85	181	1/13/2021	1.08	195	200	0	143531EB	6-10 am; 3-7 pm	1044	490	33	15	1077	505	2.13	2.20
	146431	NBT	2388	4605	169	351	2557	4956	1/13/2021	1.08	5352	5100	0	С	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146431	NBL	66	127	8	17	74	144	1/13/2021	1.08	156	200	0	-	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146431	SBR	60	116	1	2	61	118	1/13/2021	1.08	127	150	0	-	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146431	SBT	2440	4705	237	493	2677	5198	1/13/2021	1.08	5614	5900	0	147831SB	6-10 am; 3-7 pm	0	0	0	0	6100	3193	1.93	2.08
	146431	SBL	391	833	9	20	400	853	1/13/2021	1.08	921	850	0	143531EB	6-10 am; 3-7 pm	1044	490	33	15	1077	505	2.13	2.20
	146531	EBT	420	907	8	20	428	927	1/7/2021	1.08	1001	1100	143531EB	148031EB	6-10 am; 3-7 pm	2273	1053	69	28	2342	1081	2.16	2.46
Winchell Ave & Harrison	146531	WBT	362	810	8	17	370	827	1/7/2021	1.08	893	1100	148031WB	143531WB	6-10 am; 3-7 pm	1936	865	44	20	1979	885	2.24	2.18
Intersection	146531	NBR	82	181	6	15	88	196	1/7/2021	1.08	212	250	1479311-WAY	148031EB	6-10 am; 3-7 pm	1568	712	51	20	1618	732	2.20	2.53
	146531	NBL	63	145	4	9	67	154	1/7/2021	1.08	166	150	1479311-WAY	143531WB	6-10 am; 3-7 pm	1407	611	40	18	1446	629	2.30	2.19
	146631	EBR	36	79	4	9	40	88	1/7/2021	1.08	95	100	148031EB	148231SB	6-10 am; 3-7 pm	1445	660	51	22	1496	682	2.19	2.37
	146631	EBT	466	1015	14	40	480	1055	1/7/2021	1.08	1139	1250	148031EB	148131EB	6-10 am; 3-7 pm	2455	1127	66	23	2521	1150	2.18	2.85
Patterson St & Harrison	146631	WBT	362	776	7	14	369	790	1/7/2021	1.08	853	1050	148131WB	148031WB	6-10 am; 3-7 pm	1919	896	45	22	1963	917	2.14	2.07
Intersection	146631	WBL	44	94	0	0	44	94	1/7/2021	1.08	102	100	148131WB	148231SB	6-10 am; 3-7 pm	1267	590	41	21	1308	611	2.15	1.95
	146631	NBR	37	82	1	3	38	85	1/7/2021	1.08	92	100	148231NB	148131EB	6-10 am; 3-7 pm	1338	605	34	12	1371	617	2.21	2.79
	146631	NBL	4	9	0	0	4	9	1/7/2021	1.08	10	50	148231NB	148031WB	6-10 am; 3-7 pm	979	443	23	11	1002	454	2.21	2.05
	146731	EBR	47	105	1	3	48	108	1/7/2021	1.08	117	100	148131EB	148331SB	6-10 am; 3-7 pm	1652	738	54	22	1706	760	2.24	2.51
Colerain Ave & Harrison	146731	EBT	396	861	13	38	409	899	1/7/2021	1.08	971	1100	148131EB	С	6-10 am; 3-7 pm	1226	564	30	10	1256	574	2.17	2.95
Intersection	146731	EBL	63	137	1	3	64	140	1/7/2021	1.08	151	150	148131EB	С	6-10 am; 3-7 pm	1226	564	30	10	1256	574	2.17	2.95
	146731	WBR	58	112	1	2	59	114	1/7/2021	1.08	123	100	0	C	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08



			Λ.	utos	Tro	ucks	т	otal		AADT Calcul	ations					Evnancio	n Factors	•					
			A	utus	Trucks Total					-ADT Calcul	ations					LAParisio	יון מכנטוצ	,					
	Count			Doily		Daily		Daily		Concend	AADT	AADT	Linetroom	Downstroom		Dailu	Dorind	Doily	Period	Daily	Dorind	Auto	Truck
Intersections	Count	Movement	Period	Daily Estimate	Period	Estimate	Period	Estimate	Count Date	Seasonal Adj	Target	Balance	Upstream Count ID	Downstream Count ID	Count Period	Daily Auto	Period Auto	Daily Truck	Truck	Daily Total	Period Total	Auto Factor	Factor
	146731	WBT	352	750	5	10	357	760	1/7/2021	1.08	821	1000	0	148131WB	6-10 am; 3-7 pm	1051	493	26	13	1077	506	2.13	2.08
	146731	WBL	103	252	6	13	109	265	1/7/2021	1.08	286	250	0	148331SB	6-10 am; 3-7 pm	426	174	25	12	451	186	2.45	2.13
	146731	SBR	55	117	2	4	57	121	1/7/2021	1.08	131	150	0	148131WB	6-10 am; 3-7 pm	1051	493	26	13	1077	506	2.13	2.08
	146731	SBT	55	135	1	2	56	137	1/7/2021	1.08	148	150	0	148331SB	6-10 am; 3-7 pm	426	174	25	12	451	186	2.45	2.13
	146731	SBL	41	79	3	6	44	85	1/7/2021	1.08	92	100	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146831	EBR	58	110	114	224	172	334	1/7/2021	1.08	361	350	0	5313198SB	6-10 am; 3-7 pm	4729	2488	593	302	5322	2790	1.90	1.96
	146831	EBT	103	216	136	304	239	520	1/7/2021	1.08	562	750	0	148531EB	6-10 am; 3-7 pm	1556	742	587	262	2143	1004	2.10	2.24
	146831	EBL	80	154	39	81	119	235	1/7/2021	1.08	254	250	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	146831	WBR	966	1958	45	83	1011	2041	1/7/2021	1.08	2204	2150	148531WB	0	6-10 am; 3-7 pm	2694	1329	291	159	2985	1488	2.03	1.84
	146831	WBT	25	51	95	174	120	225	1/7/2021	1.08	243	150	148531WB	0	6-10 am; 3-7 pm	2694	1329	291	159	2985	1488	2.03	1.84
Spring Grove & Bank St	146831	WBL	120	233	30	58	150	291	1/7/2021	1.08	314	300	148531WB	5313198SB	6-10 am; 3-7 pm	7423	3817	884	461	8307	4278	1.94	1.92
Intersection	146831	NBR	250	523	89	194	339	717	1/7/2021	1.08	774	1100	5313198NB	148531EB	6-10 am; 3-7 pm	5285	2529	1450	665	6735	3194	2.09	2.18
	146831	NBT	1364	2846	115	246	1479	3092	1/7/2021	1.08	3339	3100	5313198NB	0	6-10 am; 3-7 pm	3729	1787	863	403	4592	2190	2.09	2.14
	146831	NBL	63	131	168	360	231	491	1/7/2021	1.08	530	550	5313198NB	0	6-10 am; 3-7 pm	3729	1787	863	403	4592	2190	2.09	2.14
	146831	SBR	72	139	63	131	135	270	1/7/2021	1.08	292	300		0	6-10 am; 3-7 pm	0	0	0	0	6100	3193	1.93	2.08
	146831	SBT	2142	4071	167	328	2309	4399	1/7/2021	1.08	4751	4900	147831SB	5313198SB	6-10 am; 3-7 pm	4729	2488	593	302	11422	5983	1.90	1.96
	146831	SBL	345	724	41	92	386	816	1/7/2021	1.08	881	1100		148531EB	6-10 am; 3-7 pm	1556	742	587	262	8243	4197	2.10	2.24
	146931	EBT	301	632	93	208	394	840	1/7/2021	1.08	907	1650	148531EB	148631EB	6-10 am; 3-7 pm	1556	742	587	262	5779	2753	2.10	2.24
	146931	EBL	406	910	172	443	578	1353	1/7/2021	1.08	1461	1300	148531EB	138331RAMP	6-10 am; 3-7 pm	7876	3513	1524	591	9400	4104	2.24	2.58
Winchell Ave & Bank St	146931	WBR	903	2060	32	91	935	2151	1/7/2021	1.08	2323	2450		138331RAMP	6-10 am; 3-7 pm	6320	2771	937	329	11067	4943	2.28	2.85
Intersection	146931	WBT	509	1032	60	110	569	1142	1/7/2021	1.08	1233	1200	148631WB	148531WB	6-10 am; 3-7 pm	2694	1329	291	159	6795	3330	2.03	1.84
	146931	NBR	161	335	14	25	175	360	1/7/2021	1.08	389	700	1488311-way	148631EB	6-10 am; 3-7 pm	5334	2566	509	287	9480	4602	2.08	1.77
	146931	NBT	1470	3210	87	204	1557	3414	1/7/2021	1.08	3687	3600	1488311-way	138331RAMP	6-10 am; 3-7 pm	11654	5337	1446	616	13100	5953	2.18	2.35
	146931	NBL	612	1262	108	194	720	1456	1/7/2021	1.08	1572	1400	1488311-way	148531WB	6-10 am; 3-7 pm	8028	3895	800	446	8828	4340	2.06	1.80
	147031		126	243	2	4		247	1/14/2021	1.08		300		148431SB	6-10 am; 3-7 pm	3446	0	124	56		1678	1.93	2.23
	147031		305	588	25	52	330	640	1/14/2021	1.08	691	700	0	13631NB	6-10 am; 3-7 pm	0	0	0	0	7707	3976	1.93	2.08
	147031		59	114	1	2	60	116	1/14/2021	1.08	125	150	0		6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	147031		463	893	45	94	508	987	1/14/2021	1.08		1250	0		6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
Central Pkwy & Linn St	147031		40	77	0	0	40	77	1/14/2021	1.08	83	100	0		6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
Intersection	147031		67 1750	129	3	148	70	135	1/14/2021	1.08		150	0		6-10 am; 3-7 pm	0	0	0	0	7707	2076	1.93	2.08
	147031		1759	3392	71	148		3540	1/14/2021	1.08		4000		13631NB	6-10 am; 3-7 pm	0	0	0	0	7707	3976	1.93	2.08
	147031		43	83	12	<u>4</u>	45	87	1/14/2021	1.08	94	100	0		6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
			227	438	12	25 7	239	463	1/14/2021	1.08	500	550	149421ND	0	6-10 am; 3-7 pm	2120	1424	121	U E 4	2250	1/177	1.93	2.08
	147031		50 107	110	3	•	53	117	1/14/2021	1.08	126		148431NB	-	6-10 am; 3-7 pm	3129	1424	121	54	3250	1477	2.20	2.26
	147031	INFRK	197	433	48	109	245	542	1/14/2021	1.08	585	550	148431NB	1 0	6-10 am; 3-7 pm	3129	1424	121	54	3250	1477	2.20	2.26



			Αι	utos	Tri	ucks	T	otal	,	AADT Calcul	ations					Expansio	n Factors	Expansion Factors									
																,											
	Count			Daily		Daily		Daily		Seasonal	AADT	AADT	Upstream	Downstream		Daily	Period	Daily	Period	Daily	Period	Auto	Truck				
Intersections	ID	Movement	Period	•	Period	Estimate	Period	Estimate	Count Date	Adj	Target	Balance	Count ID	Count ID	Count Period	Auto	Auto	Truck	Truck	Total	Total	Factor	Factor				
	147031	NEBT	383	842	37	84	420	926	1/14/2021	1.08	1000	1000	148431NB	0	6-10 am; 3-7 pm	3129	1424	121	54	3250	1477	2.20	2.26				
	147031	NEBL	740	1627	21	47	761	1674	1/14/2021	1.08	1808	1800	148431NB	13631NB	6-10 am; 3-7 pm	3129	1424	121	54	10957	5453	2.20	2.26				
	147031	NEBHL	1	2	0	0	1	2	1/14/2021	1.08	2	50	148431NB	0	6-10 am; 3-7 pm	3129	1424	121	54	3250	1477	2.20	2.26				
	147031	SEBHR	24	46	2	4	26	50	1/14/2021	1.08	54	50	13631SB	0	6-10 am; 3-7 pm	0	0	0	0	7070	4068	1.93	2.08				
	147031	SEBR	811	1564	22	46	833	1610	1/14/2021	1.08	1739	2150	13631SB	0	6-10 am; 3-7 pm	0	0	0	0	7070	4068	1.93	2.08				
	147031	SEBT	2114	4077	67	139	2181	4216	1/14/2021	1.08	4553	4550	13631SB	0	6-10 am; 3-7 pm	0	0	0	0	7070	4068	1.93	2.08				
	147031	SEBL	17	33	29	60	46	93	1/14/2021	1.08	100	100	13631SB	0	6-10 am; 3-7 pm	0	0	0	0	7070	4068	1.93	2.08				
	147131	SBR	569	2845	43	90	612	2935	1/13/2021	1.08	3170	2200	148431SB	148731WB	6-10 am; 3-7 pm	5845	1169	281	135	6126	2926	5.00	2.09				
	147131	SBT	1057	2038	23	51	1080	2089	1/13/2021	1.08	2256	2050	148431SB	0	6-10 am; 3-7 pm	3446	0	124	56	3570	1678	1.93	2.23				
Linn St & Bank St	147131	NBT	1052	2312	32	72	1084	2384	1/13/2021	1.08	2575	2750	0	148431NB	6-10 am; 3-7 pm	3129	1424	121	54	3250	1477	2.20	2.26				
Intersection	147131	NBL	625	1283	33	66	658	1349	1/13/2021	1.08	1457	1250	0	148731WB	6-10 am; 3-7 pm	2399	1169	157	79	2556	1248	2.05	1.99				
	147131	EBR	279	600	30	53	309	653	1/13/2021	1.08	705	700		0	6-10 am; 3-7 pm	1132	527	171	97	1303	624	2.15	1.76				
	147131	EBL	239	522	68	132	307	654	1/13/2021	1.08	706	750		148431NB	6-10 am; 3-7 pm	4261	1950	292	151	4553	2101	2.18	1.94				
	147231	EBT	997	2226	38	83	1035	2309	1/6/2021	1.08	2494	2650		0	6-10 am; 3-7 pm	2857	1280	126	58	2983	1338	2.23	2.17				
	147231	EBL	254	541	25	46	279	587	1/6/2021	1.08	634	600	148931EB	1488311-way	6-10 am; 3-7 pm	8191	3845	635	345	8826	4190	2.13	1.84				
Winchell Ave & Findlay	147231	WBR	259	538	15	27	274	565	1/6/2021	1.08	610	550	0	1488311-way	6-10 am; 3-7 pm	5334	2566	509	287	5843	2853	2.08	1.77				
St Intersection	147231	WBT	255	567	7	14	262	581	1/6/2021	1.08	627	650	0	148931WB	6-10 am; 3-7 pm	1184	532	132	65	1316	597	2.22	2.03				
	147231	NBR	22	43	3	6	25	49	1/6/2021	1.08	53	50	,	0	6-10 am; 3-7 pm	5754	2958	517	269	6271	3227	1.95	1.92				
	147231	NBT	1760	3533	189	349	1949	3882	1/6/2021	1.08	4193	4550	· · · · · · · · · · · · · · · · · · ·	1488311-way	6-10 am; 3-7 pm	11088	5524	1026	556	12114	6080	2.01	1.85				
	147231	NBL	232	461	59	115	291	576	1/6/2021	1.08	622	800	,	148931WB	6-10 am; 3-7 pm	6937	3490	649	334	7586	3824	1.99	1.94				
	147331	EBR	440	820	71	145	511	965	1/6/2021	1.08	1042	1450		5393198SB	6-10 am; 3-7 pm	6611	3545	592	289	7203	3834	1.86	2.05				
	147331	EBT	290	576	21	45	311	621	1/6/2021	1.08	671	650	103199EB	148931EB	6-10 am; 3-7 pm	5416	2726	387	179	5803	2905	1.99	2.16				
Western Ave & Findlay	147331	WBT	320	697	61	132	381	829	1/6/2021	1.08	895	900		103199WB	6-10 am; 3-7 pm	2983	1369	942	435	3925	1804	2.18	2.17				
St Intersection	147331	WBL	167	332	7	14	174	346	1/6/2021	1.08	374	550		5393198SB	6-10 am; 3-7 pm	5235	2631	463	233	5698	2864	1.99	1.99				
	147331		534	1017	231	485	765	1502	1/6/2021	1.08			79731RAMP	103199WB	6-10 am; 3-7 pm			1879		11301	5842	1.91	2.10				
	147331		1131	2127	76	153	1207	2280	1/6/2021	1.08			79731RAMP	5393198SB	6-10 am; 3-7 pm		6208				6902	1.88	2.02				
	147331		951	1850	44	90	995	1940	1/6/2021	1.08			79731RAMP	148931EB	6-10 am; 3-7 pm	10480	5389	1195		11675	5972	1.94	2.05				
	147431	EBR	39	75	2	4	41	79	1/6/2021	1.08	85	100			6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08				
	147431		78	138	2	4	80	142	1/6/2021	1.08	153	200		103199EB	6-10 am; 3-7 pm	2559	1446	261	121	2820	1567	1.77	2.16				
	147431		157	303	2	4	159	307	1/6/2021	1.08	332	350			6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08				
Dalton Ave & Findlay St	147431		340	731	146	320	486	1051	1/6/2021	1.08	1135		103199WB	0	6-10 am; 3-7 pm		837	810	370	2609	1207	2.15	2.19				
Intersection	147431		142	305	108	236	250	541	1/6/2021	1.08	584		103199WB	-	6-10 am; 3-7 pm	1799	837	810	370	2609	1207	2.15	2.19				
	147431		334	718	24	53	358	771	1/6/2021	1.08	833		103199WB		6-10 am; 3-7 pm	1799	837	810	370	2609	1207	2.15	2.19				
	147431		150	265	14	30	164	295	1/6/2021	1.08	319	400		103199EB	6-10 am; 3-7 pm	2559	1446	261	121		1567	1.77	2.16				
	147431	NBT	1184	2283	232	482	1416	2765	1/6/2021	1.08	2986	3150	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08				



			Δι	utos	Tri	ucks	T	otal		AADT Calcul	ations					Fxnansio	n Factors						
			Autos			usits		o tui		- E- Calcul	410113					-Aparisio	actors						
Intersections	Count ID	Movement	Period	Daily Estimate	Period	Daily Estimate	Period	Daily Estimate	Count Date	Seasonal Adj	AADT Target	AADT Balance	Upstream Count ID	Downstream Count ID	Count Period	Daily Auto	Period Auto	Daily Truck	Period Truck	Daily Total	Period Total	Auto Factor	Truck Factor
	147431	NBL	42	81	34	71	76	152	1/6/2021	1.08	164	150	0	-	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	147431	SBR	83	160	4	8	87	168	1/6/2021	1.08	181	200	0	-	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	147431	SBT	1698	3274	224	466	1922	3740	1/6/2021	1.08	4039	3850	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	147431	SBL	497	880	71	153	568	1033	1/6/2021	1.08	1116	1500	0	103199EB	6-10 am; 3-7 pm	2559	1446	261	121	2820	1567	1.77	2.16
	147531	EBR	233	449	41	85	274	534	1/14/2021	1.08	577	850	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	147531	EBT	496	1012	60	109	556	1121	1/14/2021	1.08	1211	1300	0	149031EB	6-10 am; 3-7 pm	4276	2097	300	165	4575	2262	2.04	1.82
Western Ave & Liberty	147531	WBT	719	1520	48	100	767	1620	1/14/2021	1.08	1750	1700	149031WB	0	6-10 am; 3-7 pm	2972	1406	168	81	3140	1487	2.11	2.07
St Intersection	147531	WBL	440	930	27	56	467	986	1/14/2021	1.08	1065	1550	149031WB	0	6-10 am; 3-7 pm	2972	1406	168	81	3140	1487	2.11	2.07
	147531	SBR	65	125	6	12	71	137	1/14/2021	1.08	148	150	5393198SB	0	6-10 am; 3-7 pm	4052	2099	331	168	4383	2267	1.93	1.97
	147531	SBT	784	1513	110	217	894	1730	1/14/2021	1.08	1868	2000	5393198SB	0	6-10 am; 3-7 pm	4052	2099	331	168	4383	2267	1.93	1.97
	147531	SBL	1133	2249	64	121	1197	2370	1/14/2021	1.08	2560	2850	5393198SB	149031EB	6-10 am; 3-7 pm	8327	4196	631	333	8958	4529	1.98	1.89
	147631	EBT	1528	3116	87	158	1615	3274	1/13/2021	1.08	3536	3900	149031EB	0	6-10 am; 3-7 pm	4276	2097	300	165	4575	2262	2.04	1.82
	147631	EBL	100	198	15	28	115	226	1/13/2021	1.08	244	250	149031EB	309311-way	6-10 am; 3-7 pm	10029	5055	817	434	10846	5489	1.98	1.88
Winchell Ave & Liberty	147631	WBR	1233	2398	53	102	1286	2500	1/13/2021	1.08	2700	2750	0	309311-way	6-10 am; 3-7 pm	5754	2958	517	269	6271	3227	1.95	1.92
St Intersection	147631	WBT	896	1894	60	124	956	2018	1/13/2021	1.08	2179	2500	0	149031WB	6-10 am; 3-7 pm	2972	1406	168	81	3140	1487	2.11	2.07
	147631	NBR	438	897	30	51	468	948	1/13/2021	1.08	1024	1100	1492311-WAY	0	6-10 am; 3-7 pm	5616	2741	428	252	6043	2993	2.05	1.70
	147631	NBT	1025	2045	155	281	1180	2326	1/13/2021	1.08	2512	2400	1492311-WAY	309311-way	6-10 am; 3-7 pm	11369	5699	945	521	12314	6220	1.99	1.81
	147631	NBL	311	644	20	36	331	680	1/13/2021	1.08	734	750	1492311-WAY	149031WB	6-10 am; 3-7 pm	8587	4147	596	333	9183	4479	2.07	1.79
	150931	WBR	1080	2083	37	77	1117	2160	1/12/2021	1.08	2333	2950	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
WB Ezzard Charles & Winchell Ave	150931	WBT	179	387	16	37	195	424	1/12/2021	1.08	458	550	0	1493311-WAY	6-10 am; 3-7 pm	686	317	68	30	753	347	2.16	2.29
Intersection	150931	NBT	1507	2906	188	391	1695	3297	1/12/2021	1.08	3561	3600	-	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	150931	NBL	86	186	18	41	104	227	1/12/2021	1.08	245	250	-	1493311-WAY	6-10 am; 3-7 pm	686	317	68	30	753	347	2.16	2.29
WD 5   1 Cl   1 0	151031	WBT	21	45	13	30	34	75	1/12/2021	1.08	81	100	1493311-WAY	0	6-10 am; 3-7 pm	686	317	68	30	753	347	2.16	2.29
WB Ezzard Charles & Western Ave	151031	WBL	248	536	23	53	271	589	1/12/2021	1.08	636	700	1493311-WAY	-	6-10 am; 3-7 pm	686	317	68	30	753	347	2.16	2.29
Intersection	151031	SBR	18	33	13	25	31	58	1/12/2021	1.08	63	100	1491311-WAY	0	6-10 am; 3-7 pm	8626	4702	895	474	9521	5176	1.83	1.89
	151031	SBT	2928	5372	241	455	3169	5827	1/12/2021	1.08	6293	7000	1491311-WAY	-	6-10 am; 3-7 pm	8626	4702	895	474	9521	5176	1.83	1.89
	151831	EBR	226	447	9	16	235	463	4/13/2021	1.08	500	450	137631SB	0	6-10 am; 3-7 pm	5563	2810	177	97	5740	2907	1.98	1.82
	151831	EBT	2980	5899	112	204	3092	6103	4/13/2021	1.08	6591	6000	137631SB	13631SB	6-10 am; 3-7 pm	5563	2810	177	97	12810	6975	1.98	1.82
Central Pkwy & Brighton	151831	WBT	2687	5779	113	242	2800	6021	4/13/2021	1.08	6503	5700	13631NB	137631NB	6-10 am; 3-7 pm	4837	2249	144	67	12688	6292	2.15	2.14
Pl Intersection	151831	WBL	335	638	14	31	349	669	4/13/2021	1.08	723	800	13631NB	0	6-10 am; 3-7 pm	0	0	0	0	7707	3976	1.91	2.25
	151831	NBR	330	629	0	0	330	629	4/13/2021	1.08	679	850	0	13631SB	6-10 am; 3-7 pm	0	0	0	0	7070	4068	1.91	2.25
	151831	NBL	70	151	1	2	71	153	4/13/2021	1.08	165	150	0	137631NB	6-10 am; 3-7 pm	4837	2249	144	67	4981	2316	2.15	2.14
Harrison Ct O Dutable	151731	EBT	200	386	7	15	207	401	4/13/2021	1.08	433	400	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
Harrison St & Brighton Pl Intersection	151731	EBL	353	681	1	2	354	683	4/13/2021	1.08	738	800	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
T intersection	151731	WBR	105	202	1	2	106	204	4/13/2021	1.08	220	200	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08

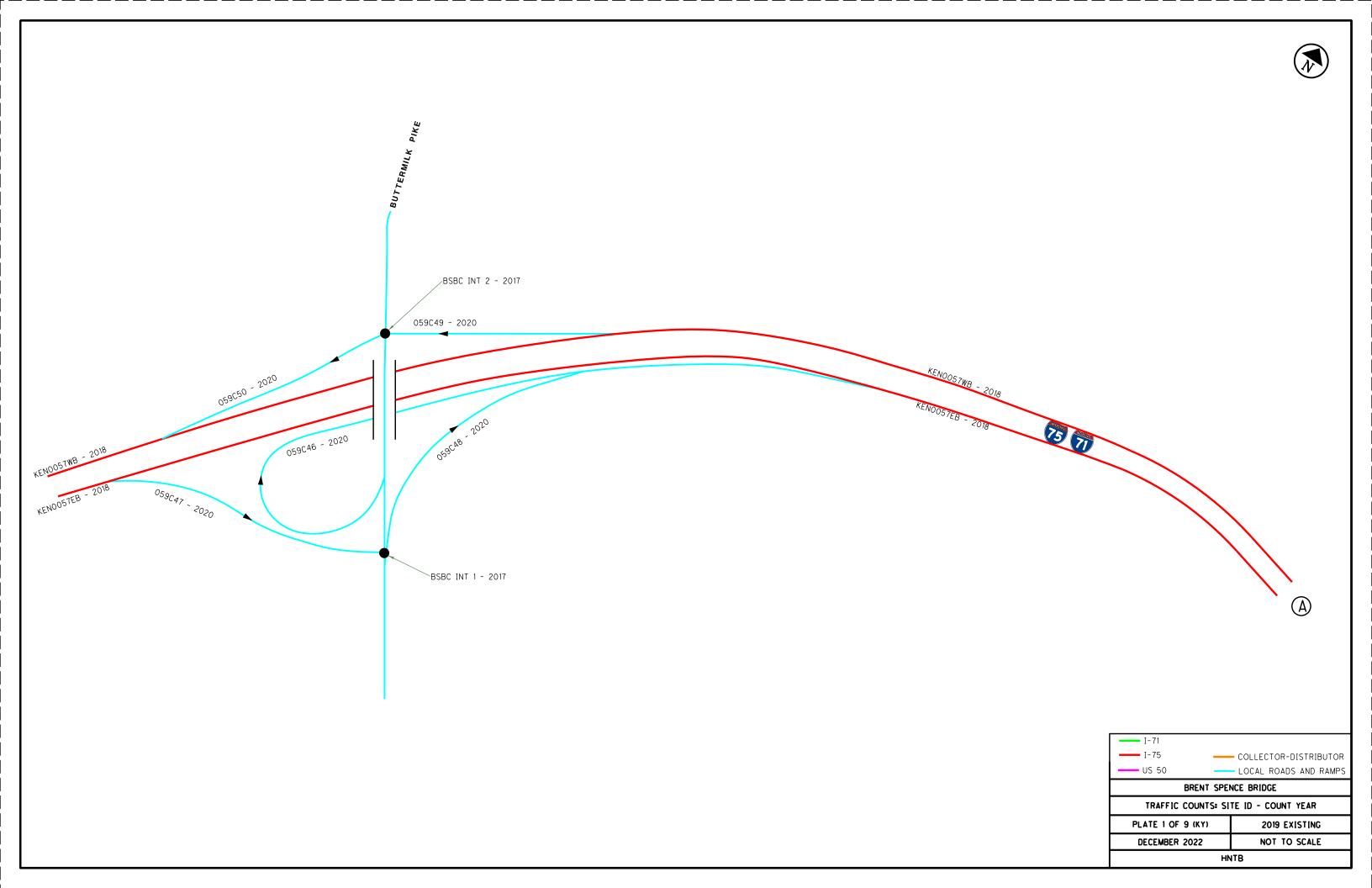


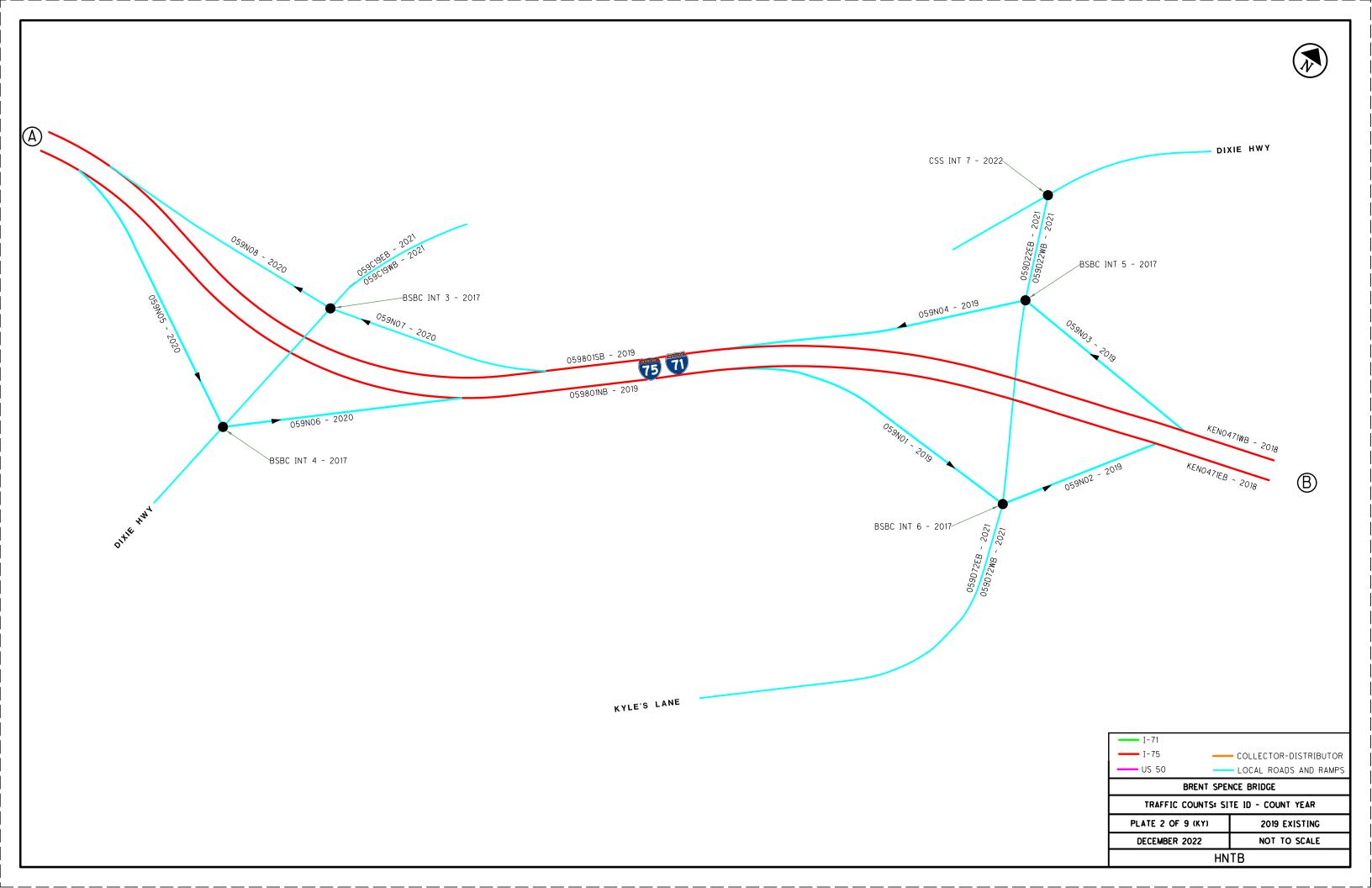
			А	Autos		ucks	Total		A	AADT Calcula	ations		Expansion Factors										
	Count			Daily		Daily		Daily		Seasonal	AADT	AADT	Upstream	Downstream		Daily	Period	Daily	Period	Daily	Period	Auto	Truck
Intersections	ID	Movement	Period	Estimate	Period	Estimate	Period	Estimate	Count Date	Adj	Target	Balance	Count ID	Count ID	Count Period	Auto	Auto	Truck	Truck	Total	Total	Factor	Factor
	151731	WBT	208	401	12	25	220	426	4/13/2021	1.08	460	500	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	151731	SBR	360	694	19	39	379	733	4/13/2021	1.08	792	850	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08
	151731	SBL	197	380	4	8	201	388	4/13/2021	1.08	419	400	0	0	6-10 am; 3-7 pm	0	0	0	0	0	0	1.93	2.08

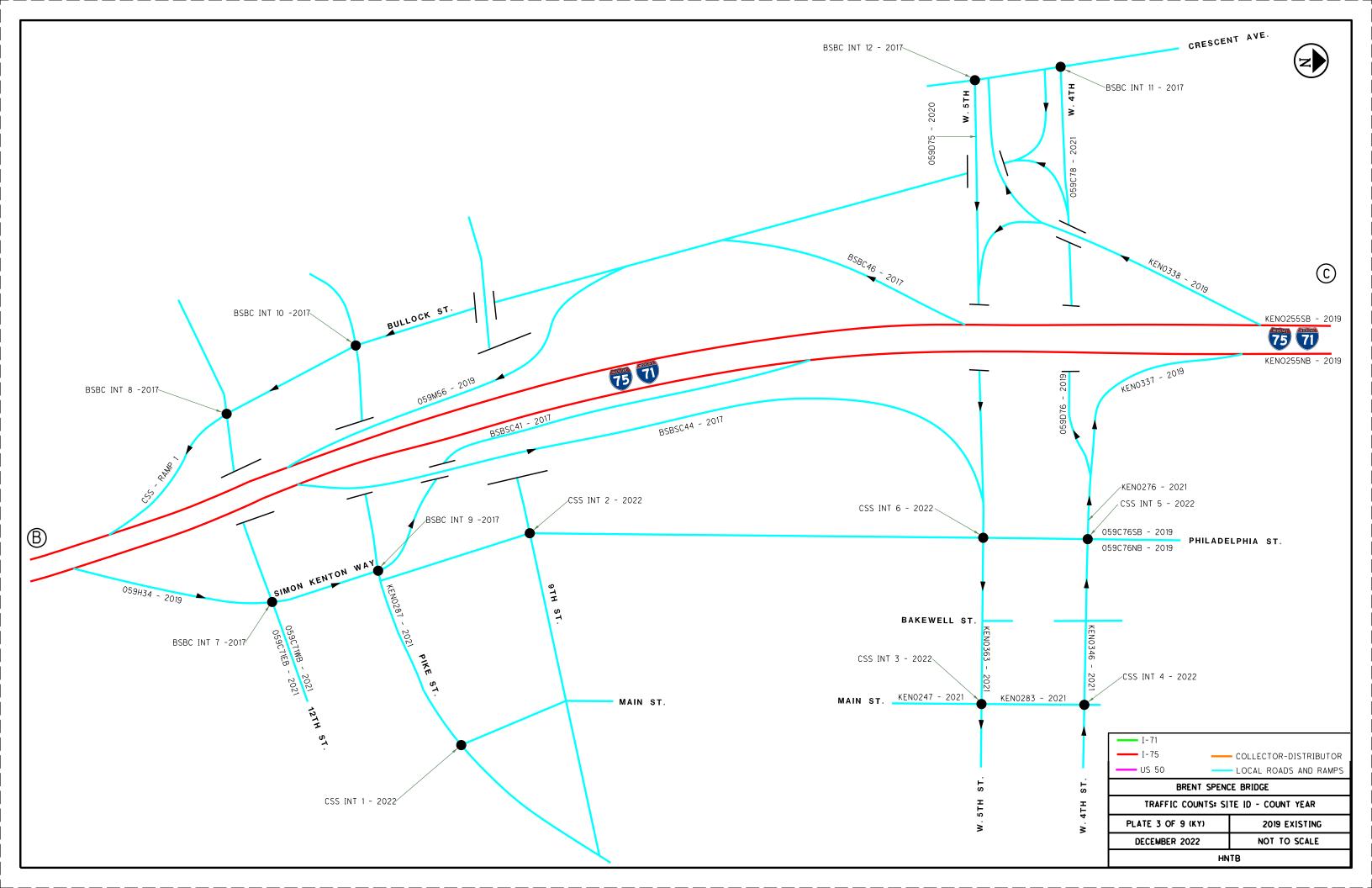


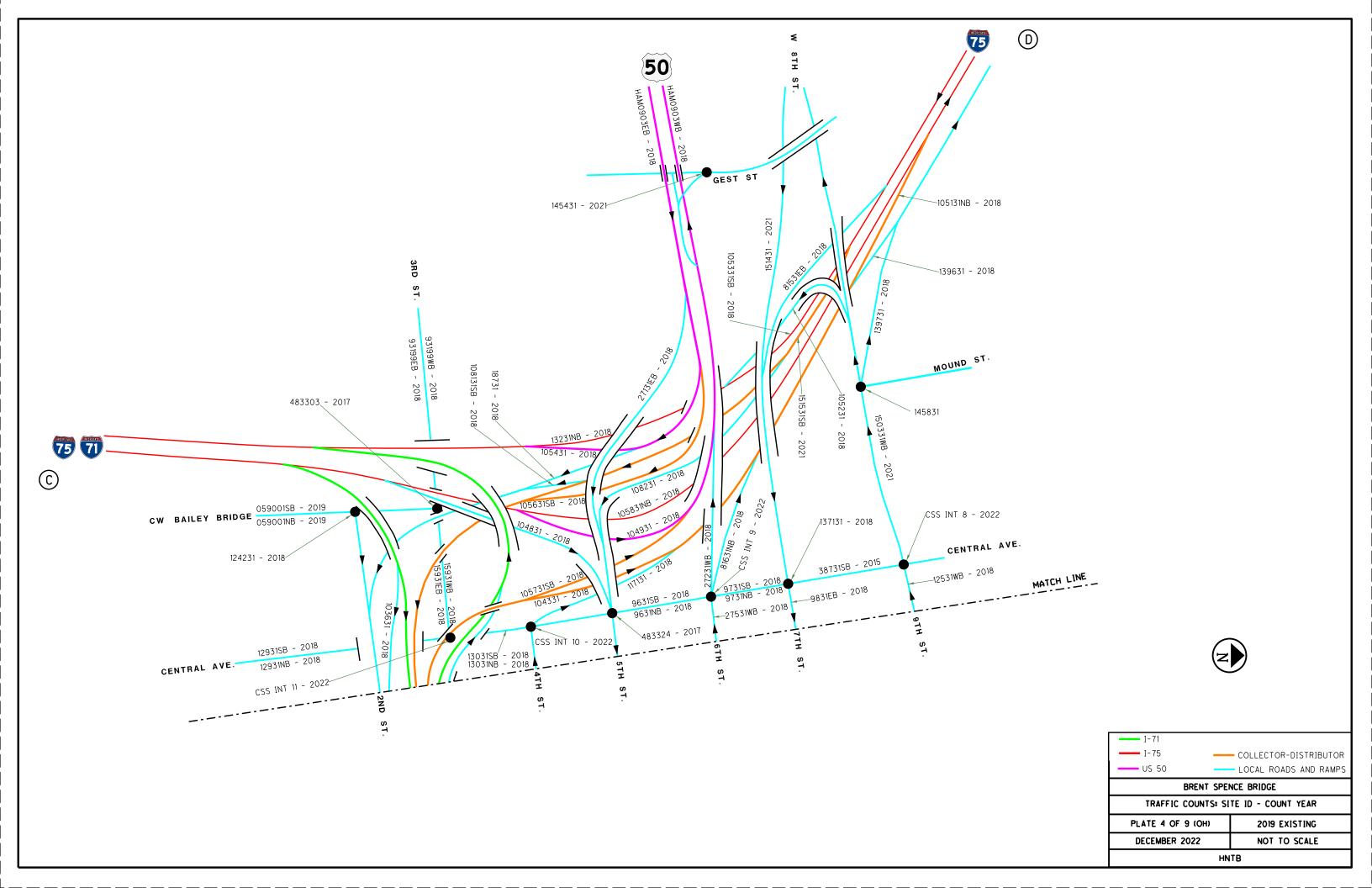
# **Appendix B: Traffic Count Schematic**

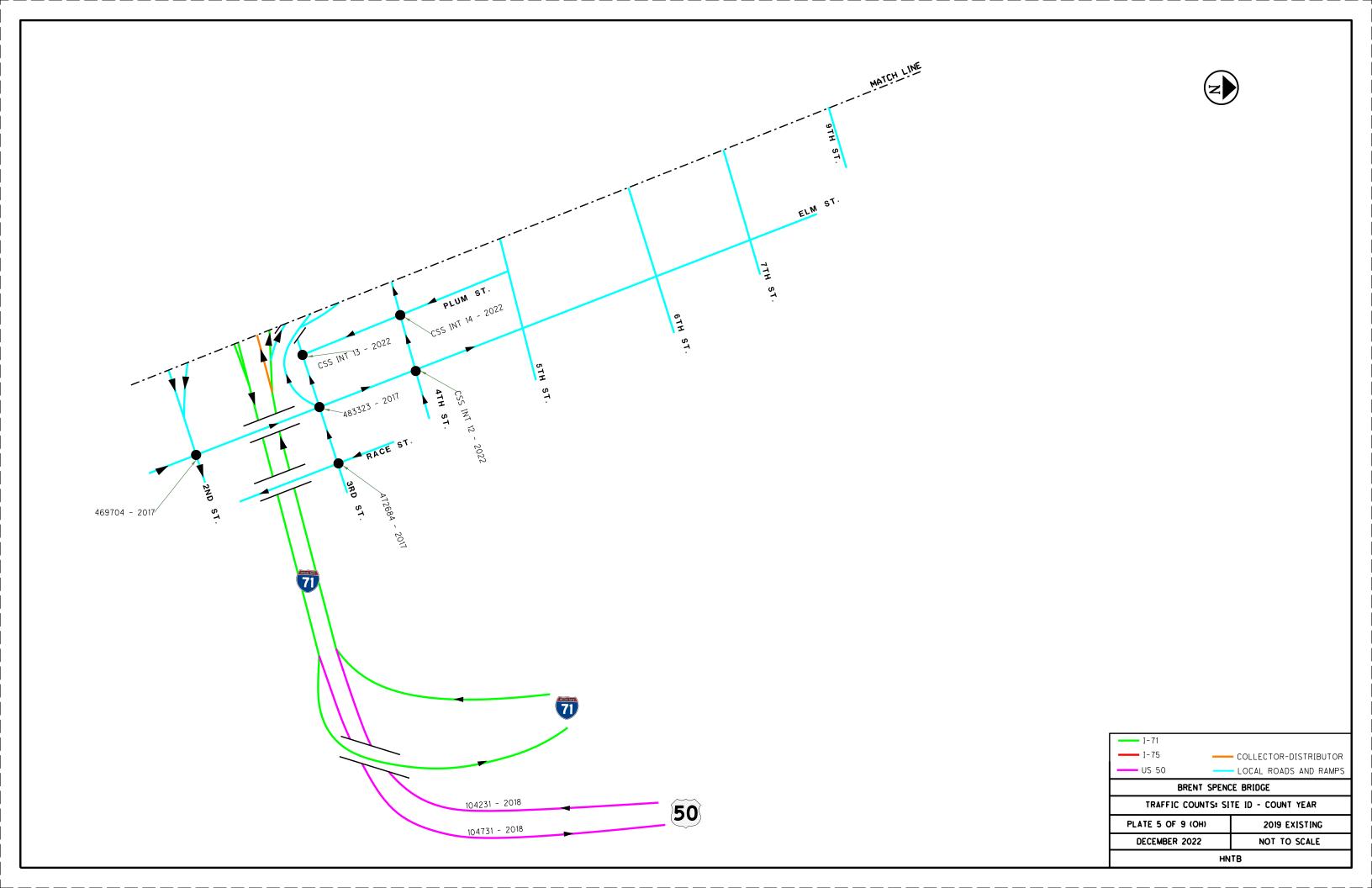


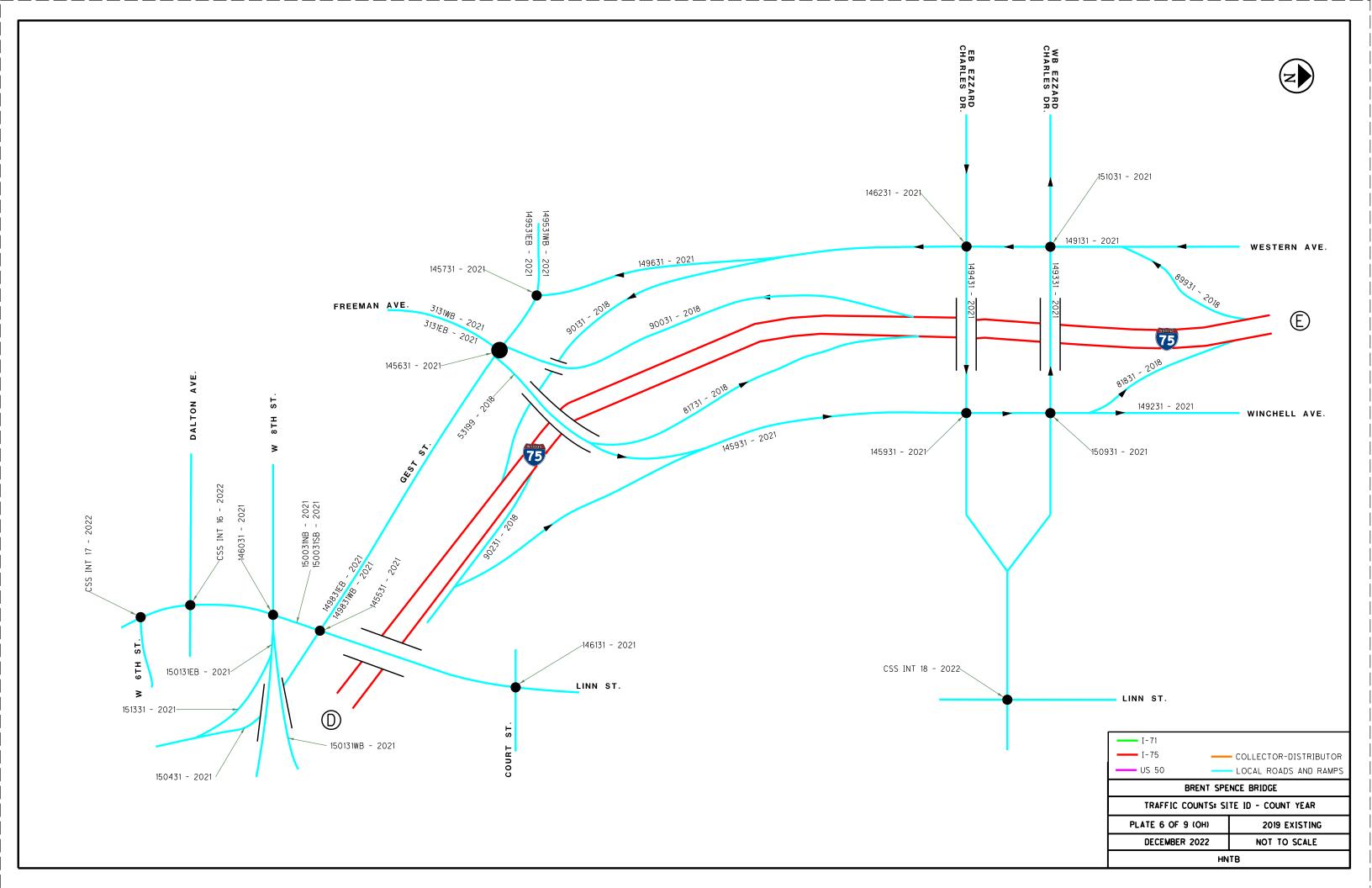


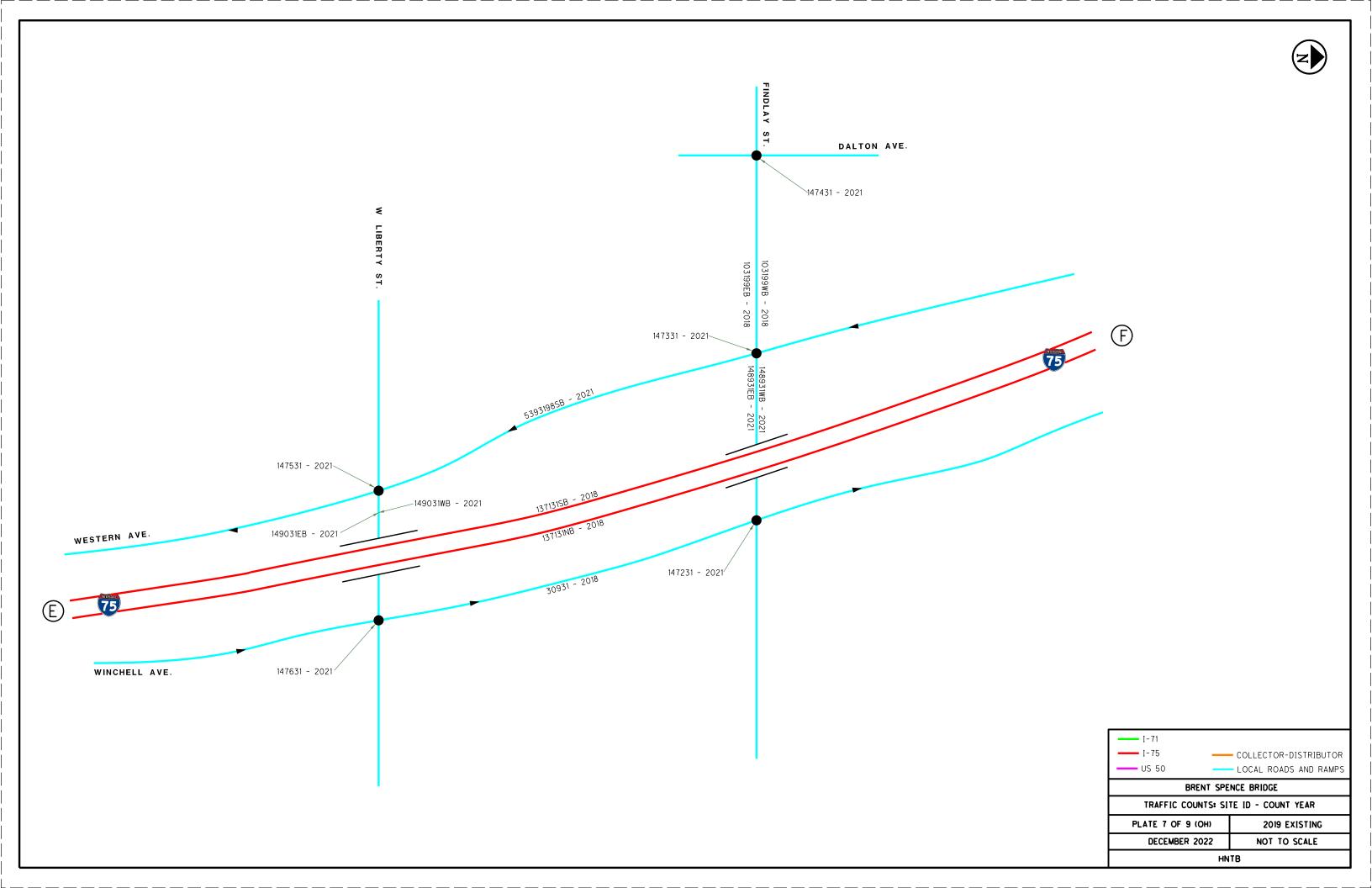


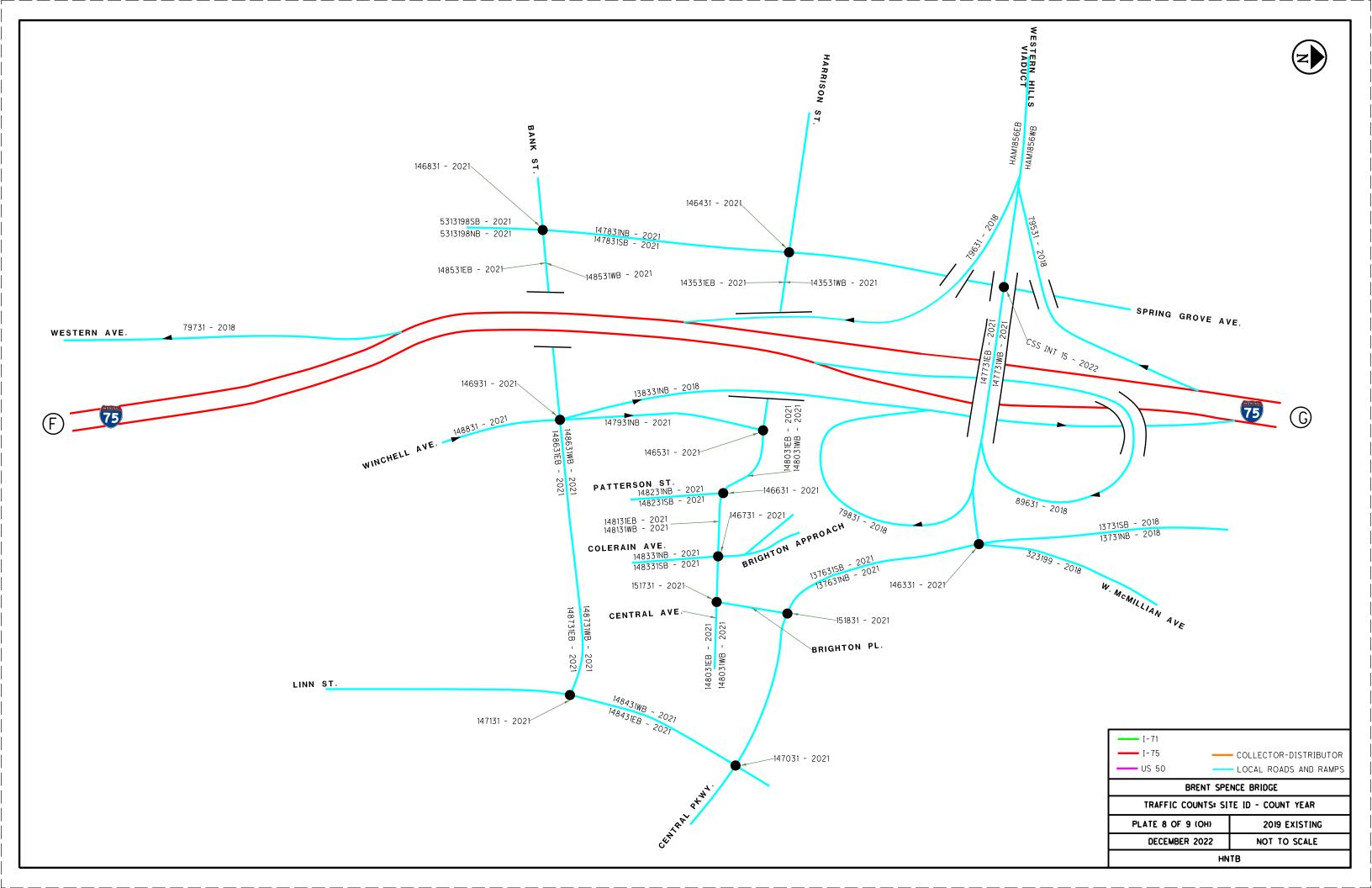


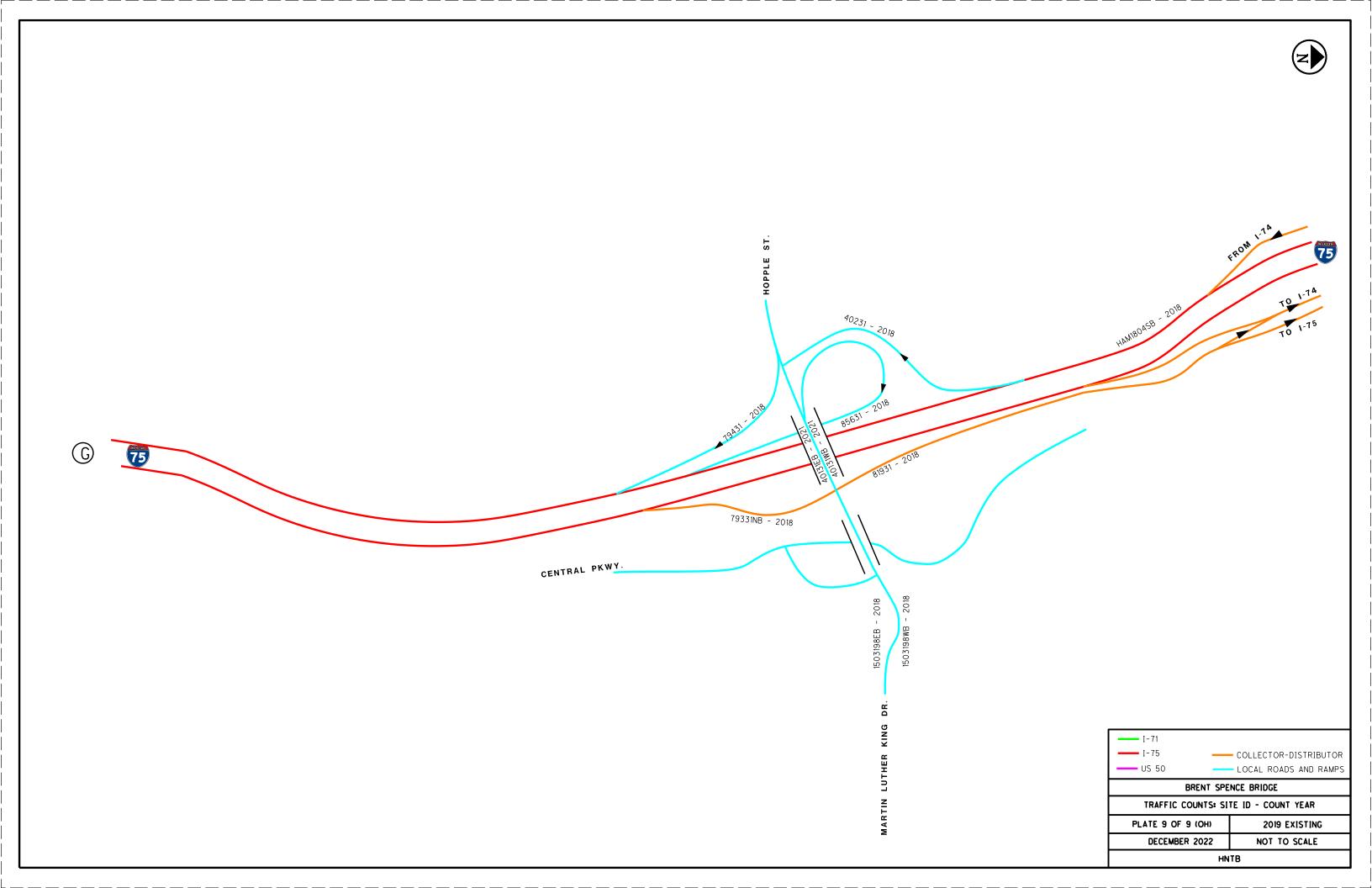






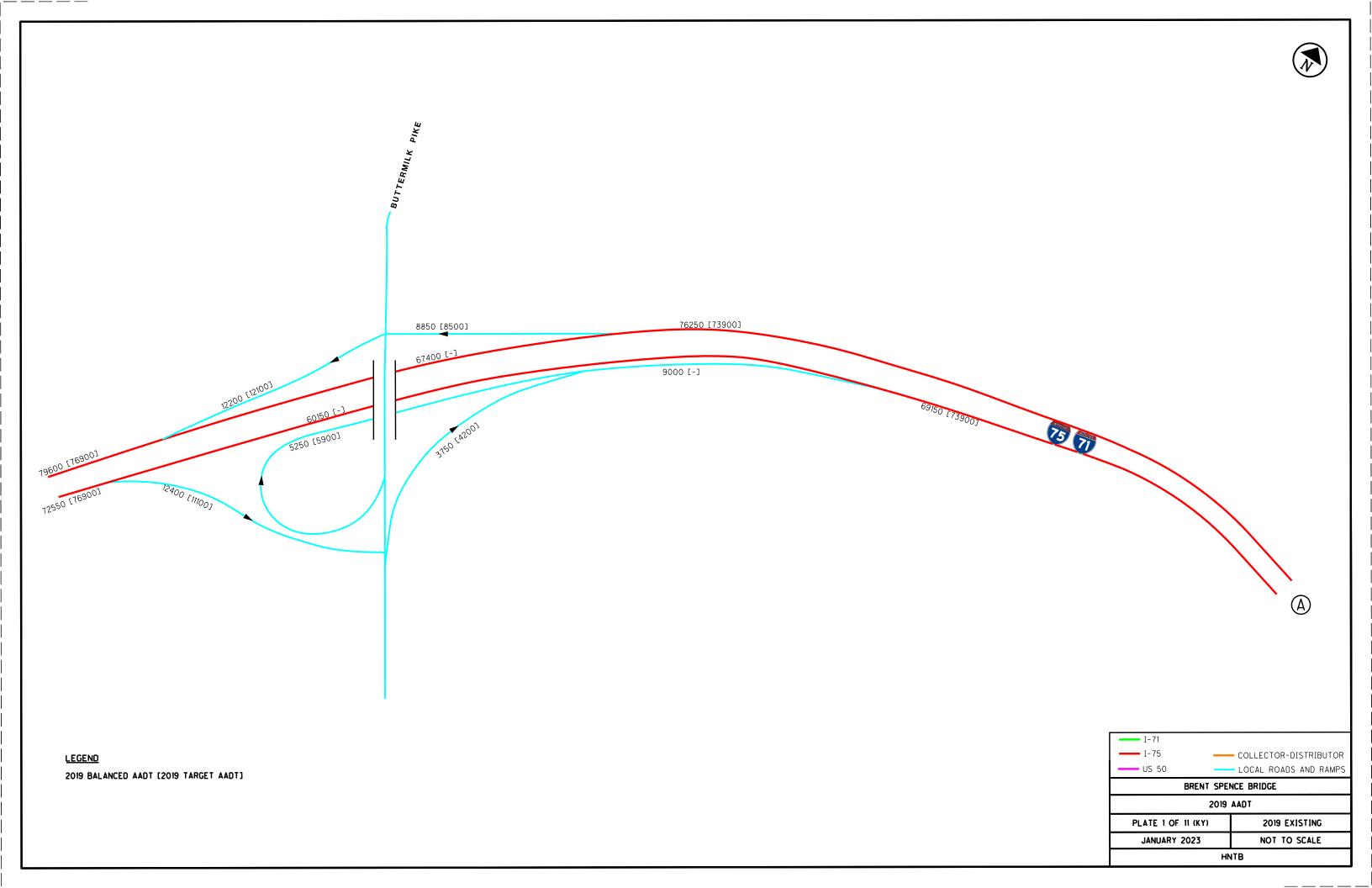


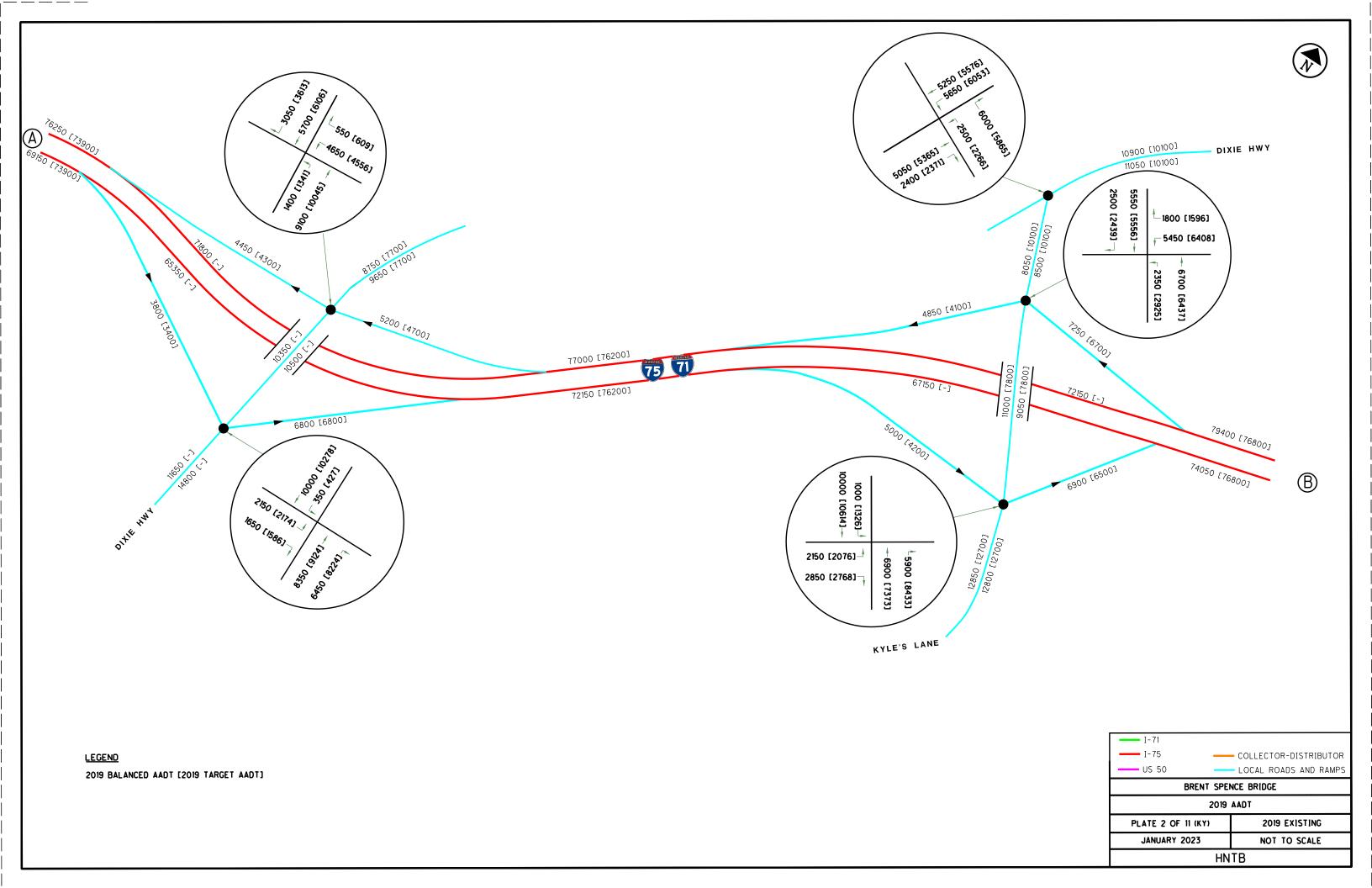


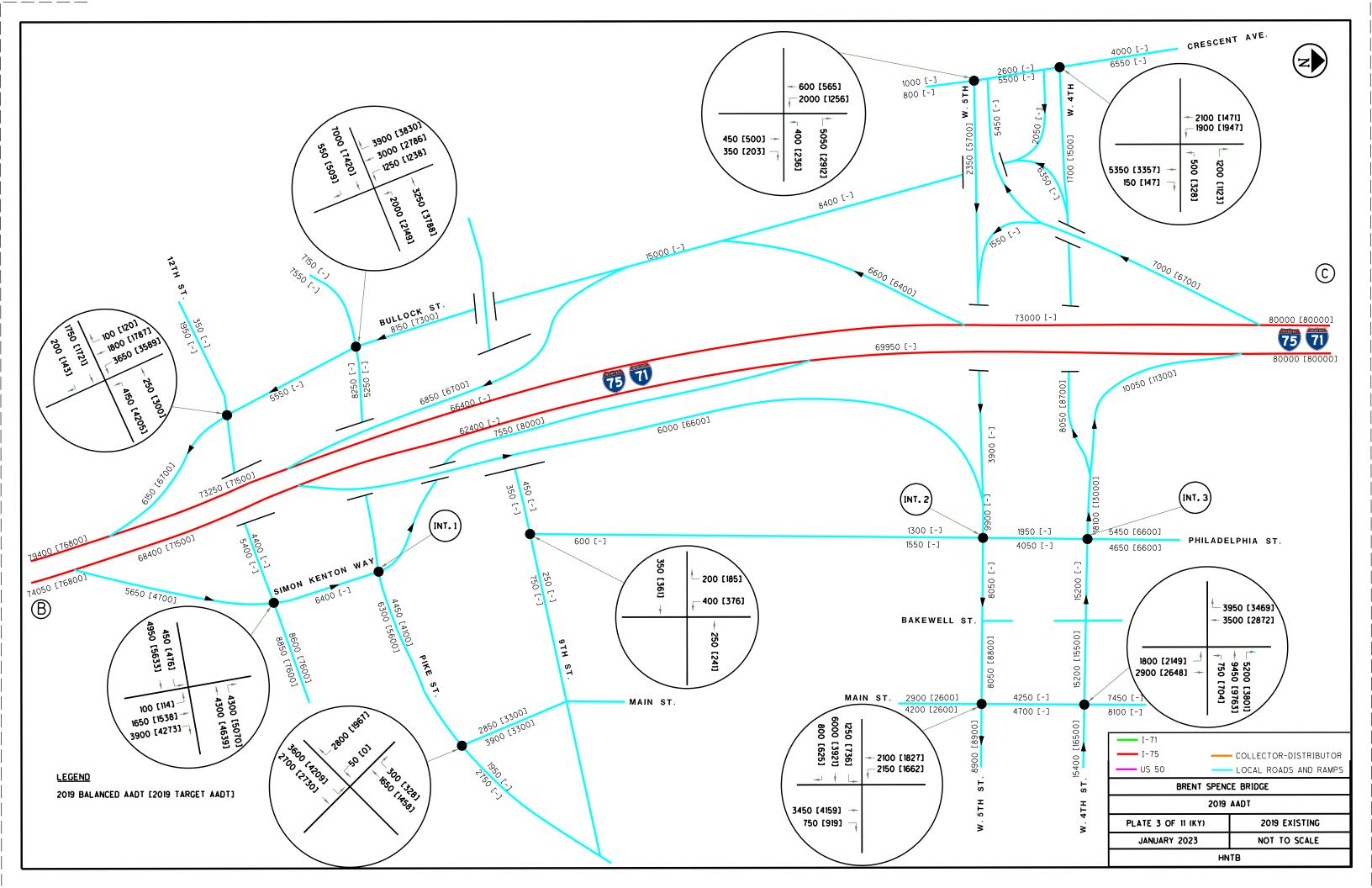


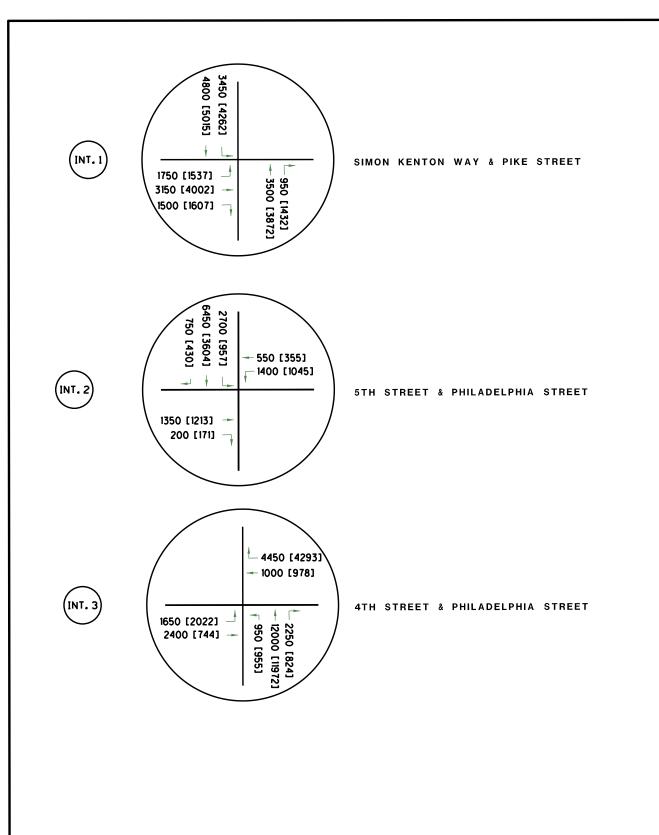
## Appendix C: Existing 2019 AADT (Target versus Balanced Volumes)

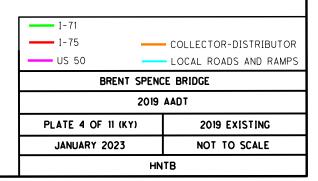


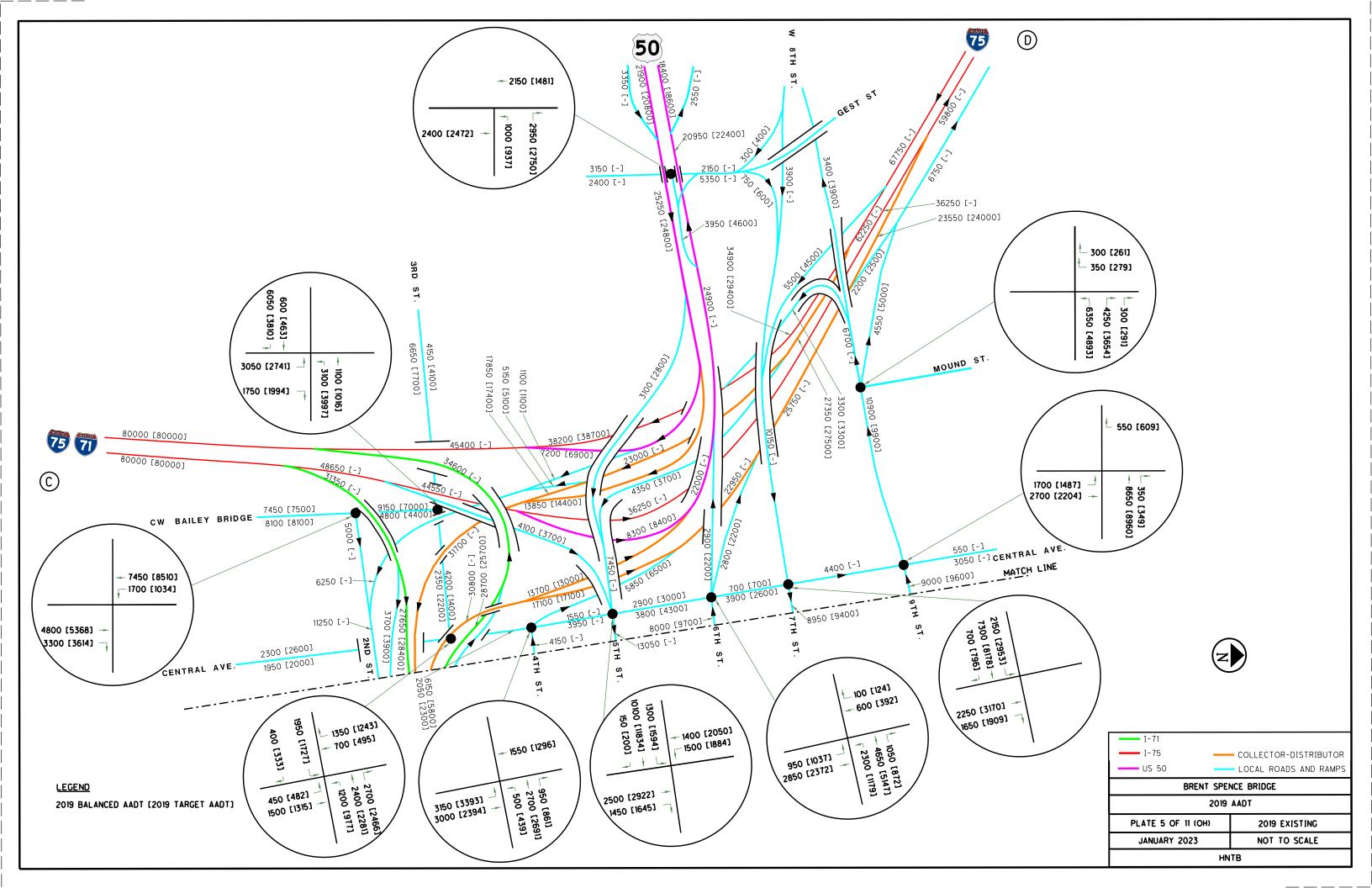


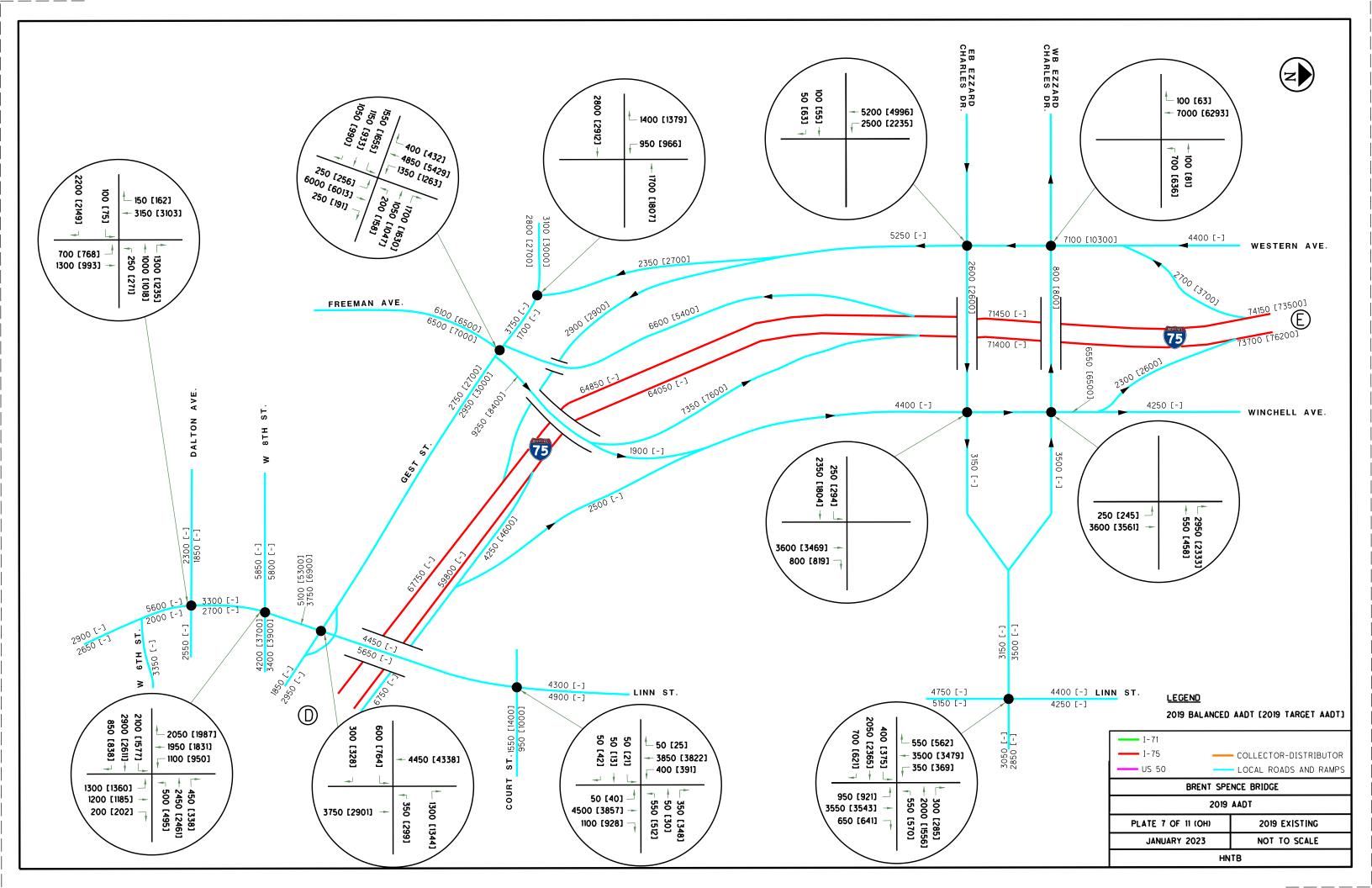


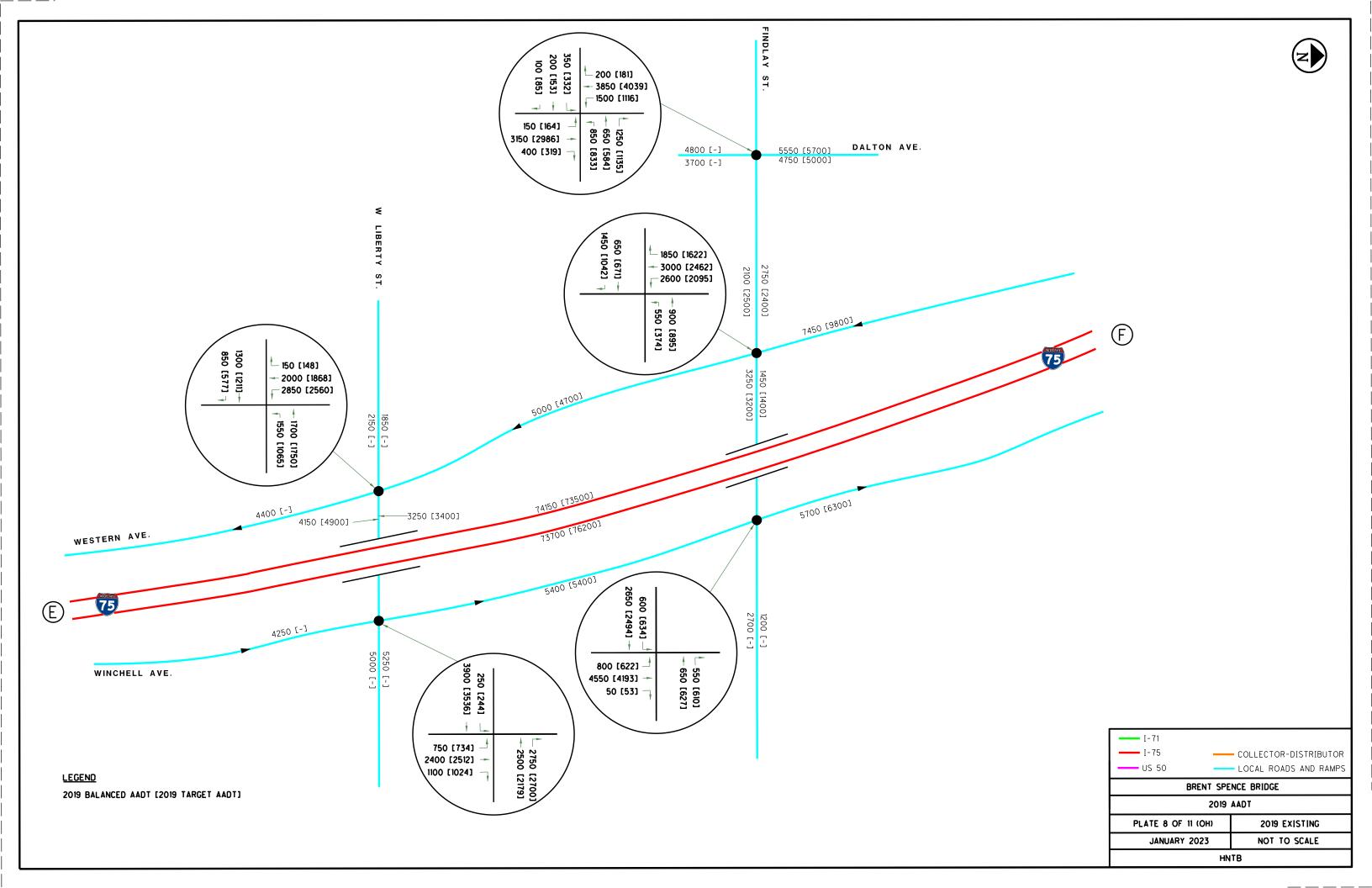


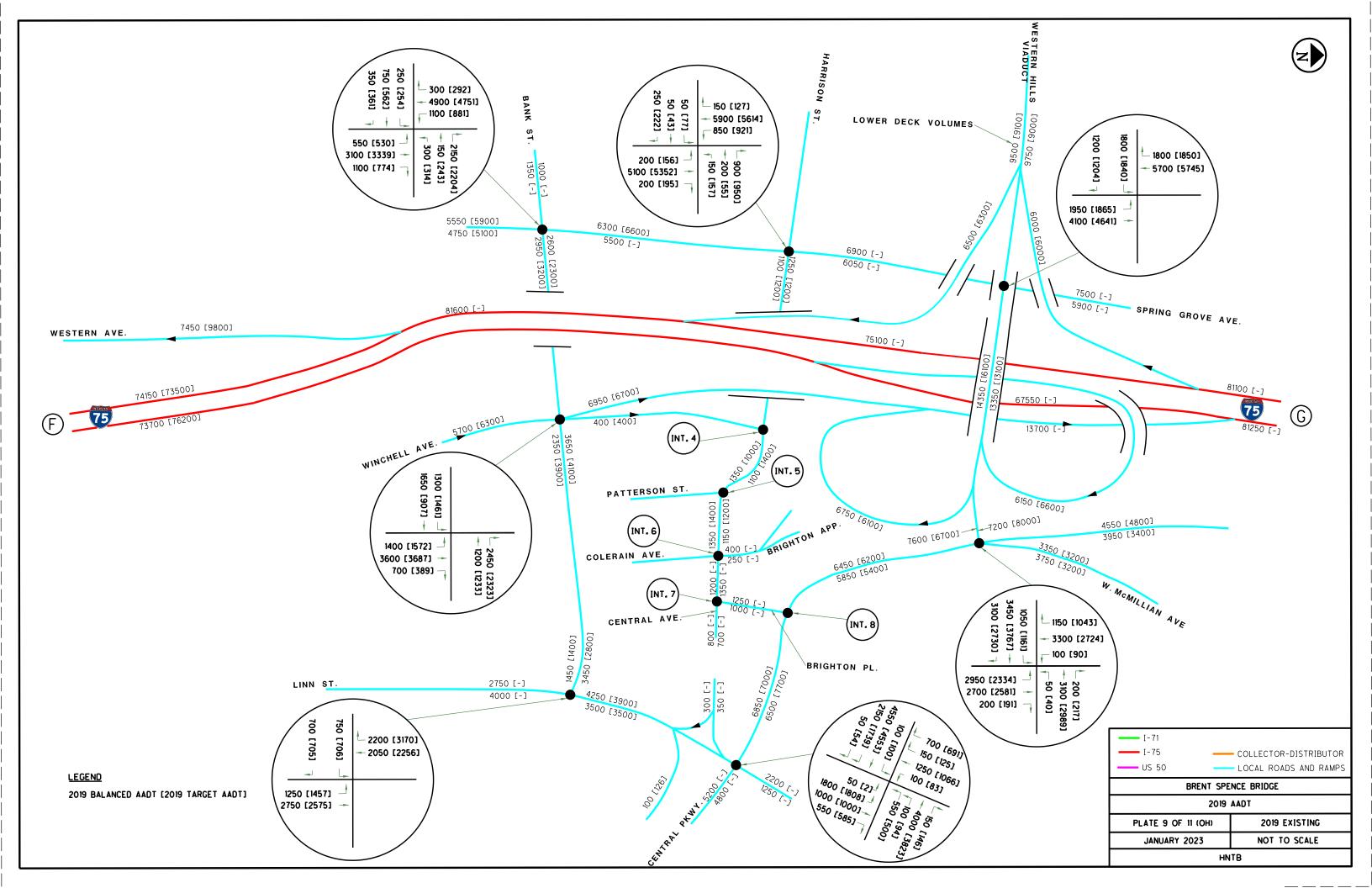


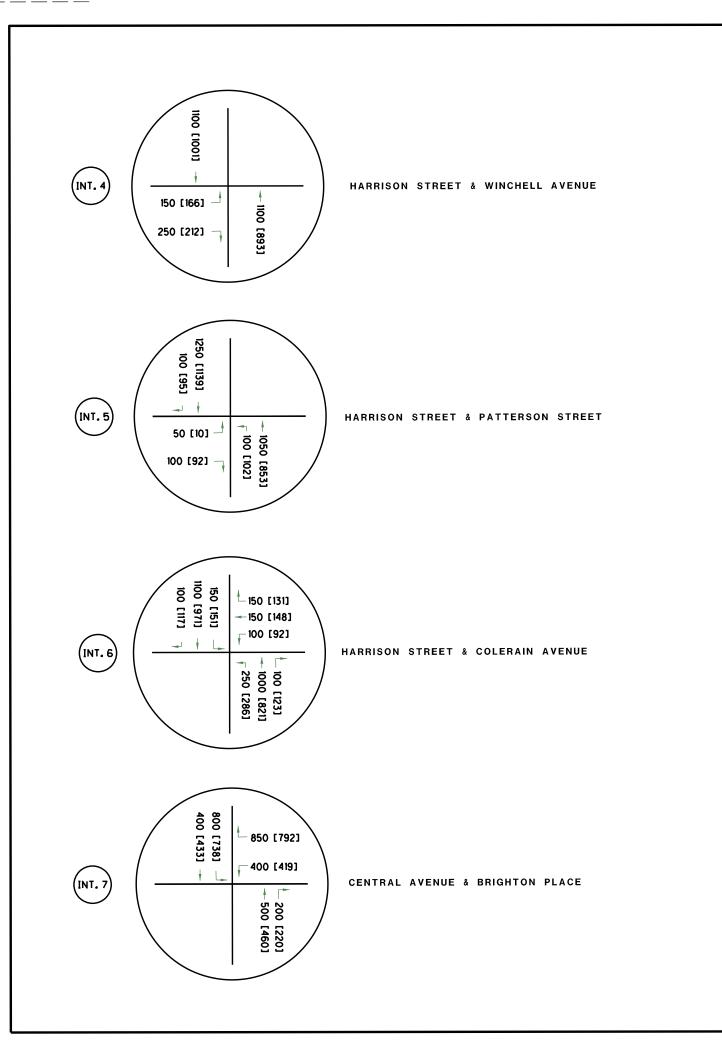


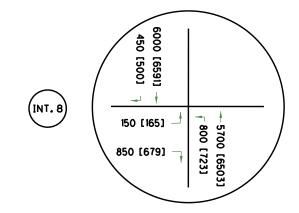




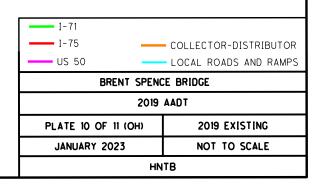


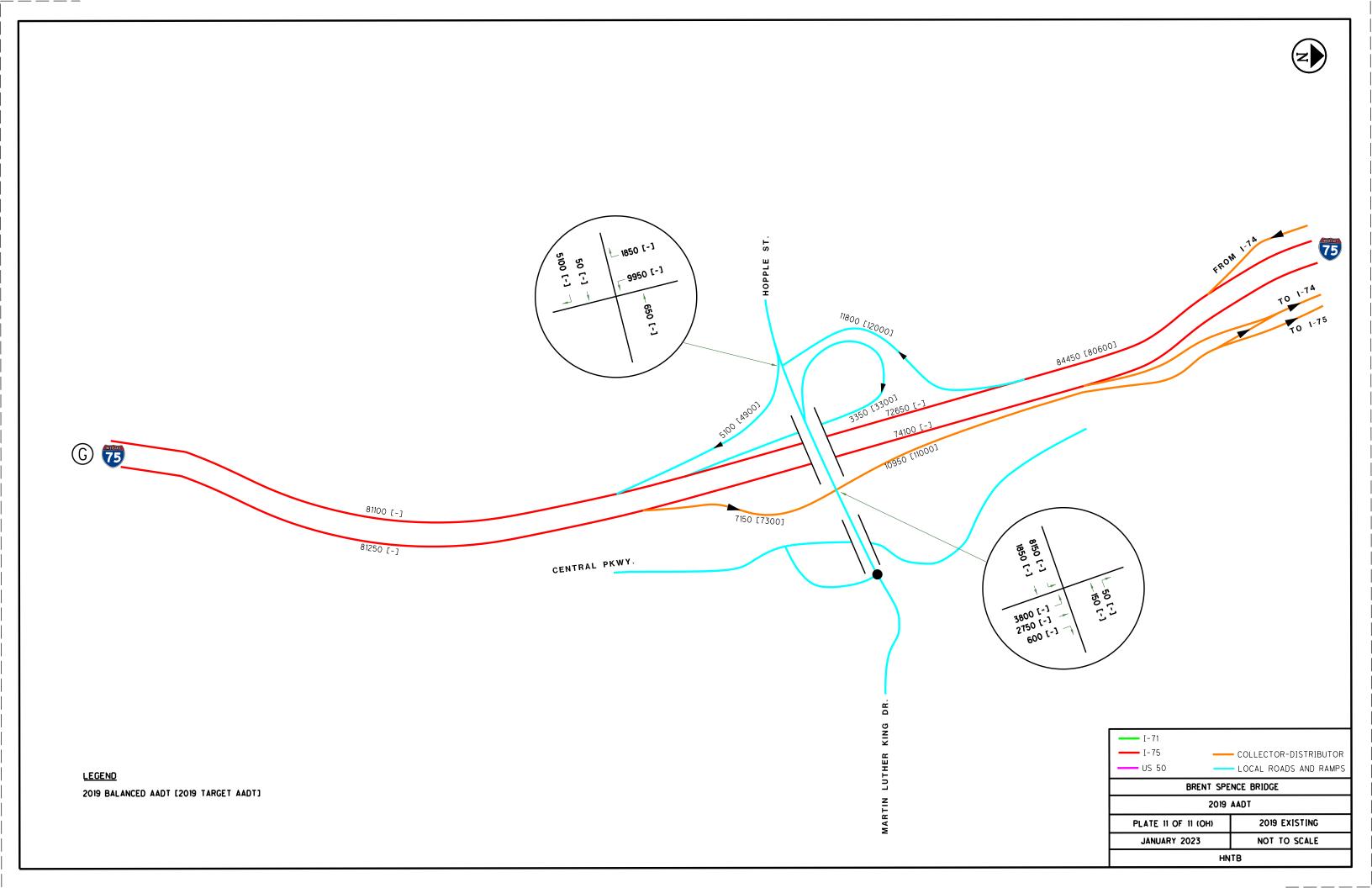






BRIGHTON PLACE & CENTRAL PARKWAY





## **Appendix D: Seasonal Adjustment Factors**



### 2017 Urban Seasonal Adjustment Factors (All Vehicles)

	Group	URBAN INT	TERSTATE (	U01)			
ı	From Year:	2017		To Year:	2017		
	Sun	Mon	Tue Wed		Thu	Fri	Sat
Jan	1.614	1.159	1.083	1.020	1.034	0.976	1.337
Feb	1.485	1.033	1.006	1.002	0.987	0.922	1.218
Mar	1.391	1.023	1.043	0.987	0.940	0.911	1.179
Apr	1.277	0.963	0.943	0.923	0.902	0.872	1.144
May	1.282	1.005	0.921	0.904	0.893	0.847	1.099
Jun	1.244	0.932	0.905	0.889	0.864	0.839	1.077
Jul	1.229	0.953	1.003	0.892	0.883	0.842	1.075
Aug	1.222	0.939	0.905	0.891	0.873	0.833	1.065
Sep	1.290	1.028	0.940	0.925	0.896	0.843	1.113
Oct	1.290	0.968	0.942	0.920	0.891	0.840	1.111
Nov	1.374	0.969	0.925	0.922	0.980	0.923	1.206
Dec	1.525	1.107	1.007	0.971	0.943	0.913	1.246

	Group	URBAN OT	URBAN OTHER PRINCIPAL ARTERIAL (U03)							
ı	From Year:	2017	To Year:		2017					
	Sun	Mon	Tue Wed		Thu	Fri	Sat			
Jan	1.511	1.148	1.079	1.032	1.047	0.964	1.199			
Feb	1.351	1.039	1.015	1.019	1.006	0.903	1.098			
Mar	1.325	1.035	1.041	0.992	0.964	0.900	1.089			
Apr	1.244	0.968	0.954	0.926	0.917	0.852	1.029			
May	1.227	0.989	0.926	0.908	0.899	0.835	1.016			
Jun	1.225	0.957	0.944	0.923	0.895	0.842	1.014			
Jul	1.242	0.978	1.029	0.938	0.926	0.866	1.055			
Aug	1.224	0.963	0.939	0.921	0.899	0.837	1.013			
Sep	1.266	1.051	0.961	0.948	0.924	0.839	1.069			
Oct	1.285	0.997	0.963	0.953	0.915	0.856	1.057			
Nov	1.369	0.985	0.947	0.947	1.022	0.908	1.148			
Dec	1.435	1.134	1.028	0.999	0.984	0.911	1.154			

	Group	URBAN FRI	EEWAY EXP	RESSWAY (	(U02)		
1	From Year:	2017	To Year:		2017		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.709	1.141	1.038	0.994	1.016	0.963	1.340
Feb	1.550	1.009	0.973	0.976	0.971	0.911	1.225
Mar	1.480	0.986	0.996	0.950	0.923	0.902	1.196
Apr	1.354	0.933	0.909	0.892	0.887	0.865	1.140
May	1.336	0.988	0.899	0.887	0.883	0.845	1.104
Jun	1.310	0.922	0.897	0.883	0.865	0.850	1.083
Jul	1.315	0.937	0.995	0.886	0.884	0.851	1.118
Aug	1.310	0.917	0.891	0.876	0.868	0.843	1.101
Sep	1.360	1.020	0.904	0.893	0.878	0.837	1.117
Oct	1.387	0.942	0.905	0.899	0.877	0.840	1.107
Nov	1.460	0.944	0.901	0.905	0.971	0.918	1.218
Dec	1.525	1.072	0.997	0.968	0.943	0.900	1.235

	Group	URBAN MI	NOR ARTER	RIAL, COLLE	CTORS, LO	CAL (U04,0	5,06,07)
I	From Year:	2017		To Year:	2017		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.652	1.124	1.013	0.981	1.029	0.977	1.379
Feb	1.523	1.026	0.963	0.963	0.979	0.907	1.255
Mar	1.452	0.954	0.954	0.938	0.914	0.902	1.185
Apr	1.323	0.918	0.893	0.873	0.893	0.869	1.130
May	1.272	0.957	0.885	0.871	0.882	0.836	1.089
Jun	1.300	0.938	0.922	0.923	0.886	0.872	1.076
Jul	1.305	0.953	1.022	0.920	0.930	0.887	1.012
Aug	1.284	0.928	0.893	0.877	0.871	0.847	1.082
Sep	1.304	0.997	0.894	0.887	0.874	0.822	1.107
Oct	1.362	0.942	0.902	0.889	0.878	0.836	1.120
Nov	1.434	0.939	0.914	0.916	0.973	0.911	1.229
Dec	1.484	1.079	1.011	0.975	0.985	0.903	1.281

## 2018 Urban Seasonal Adjustment Factors (All Vehicles)

	Group	URBAN IN	TERSTATE (	U01)			
ı	From Year:	2018		To Year:	2018		
	Sun	Mon	Tue Wed		Thu	Fri	Sat
Jan	1.609	1.253	1.053	1.020	1.003	1.032	1.429
Feb	1.570	1.038	0.985	1.037	0.970	0.937	1.258
Mar	1.393	0.992	0.975	0.978	0.936	0.879	1.196
Apr	1.347	0.974	0.963	0.929	0.904	0.862	1.141
May	1.259	1.018	0.916	0.901	0.875	0.835	1.097
Jun	1.232	0.920	0.905	0.883	0.860	0.830	1.072
Jul	1.230	0.924	0.897	0.973	0.872	0.833	1.078
Aug	1.214	0.928	0.907	0.890	0.861	0.821	1.066
Sep	1.304	1.033	0.925	0.908	0.882	0.837	1.108
Oct	1.287	0.950	0.920	0.916	0.879	0.841	1.108
Nov	1.342	0.982	0.933	0.906	1.013	0.914	1.184
Dec	1.398	1.094	1.058	0.945	0.926	0.885	1.172

		F
Sat		
1.429		Jan
1.258		Feb
1.196		Mar
1.141		Apr
1.097		May
1.072		Jun
1.078		Jul
1.066		Aug
1.108		Sep
1.108		Oct
1.184		Nov
1.172		Dec
	I	

	Group	URBAN OT	HER PRINC	IPAL ARTER	RIAL (U03)		
ı	From Year:	2018	To Year:		2018		
	Sun	Mon	Tue Wed		Thu	Fri	Sat
Jan	1.483	1.307	1.087	1.047	1.008	1.011	1.308
Feb	1.439	1.044	0.989	1.041	0.977	0.917	1.134
Mar	1.268	0.997	0.997	1.003	0.944	0.870	1.075
Apr	1.299	0.967	0.981	0.938	0.906	0.838	1.048
May	1.228	1.007	0.908	0.898	0.870	0.815	1.043
Jun	1.259	0.954	0.937	0.922	0.884	0.835	1.058
Jul	1.275	0.973	0.942	1.010	0.918	0.863	1.076
Aug	1.231	0.955	0.946	0.925	0.896	0.829	1.027
Sep	1.314	1.058	0.950	0.942	0.913	0.846	1.091
Oct	1.301	0.980	0.945	0.941	0.901	0.841	1.081
Nov	1.321	0.999	0.951	0.932	1.048	0.901	1.133
Dec	1.362	1.094	1.096	0.971	0.947	0.890	1.126

	Group	URBAN FREEWAY EXPRESSWAY			(U02)		
F	rom Year:	2018		To Year:	2018		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.676	1.236	1.031	0.992	0.974	1.014	1.446
Feb	1.634	1.013	0.952	1.017	0.948	0.928	1.270
Mar	1.461	0.960	0.953	0.962	0.929	0.897	1.215
Apr	1.434	0.950	0.946	0.909	0.887	0.853	1.164
May	1.344	1.015	0.898	0.884	0.868	0.841	1.137
Jun	1.343	0.920	0.897	0.885	0.862	0.843	1.120
Jul	1.333	0.920	0.892	0.978	0.884	0.850	1.117
Aug	1.313	0.905	0.888	0.873	0.855	0.824	1.103
Sep	1.386	1.034	0.895	0.878	0.863	0.829	1.128
Oct	1.378	0.923	0.889	0.884	0.862	0.828	1.128
Nov	1.439	0.955	0.916	0.896	1.001	0.909	1.221
Dec	1.468	1.058	1.040	0.938	0.915	0.884	1.199

	Group	URBAN MI	NOR ARTER	RIAL, COLLE	CTORS, LO	CAL (U04,0	5,06,07)
-	From Year:	2018	To Year:		2018		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.643	1.301	1.096	1.015	1.001	1.007	1.520
Feb	1.610	1.027	0.930	1.023	0.947	0.915	1.280
Mar	1.381	0.937	0.957	0.991	0.929	0.878	1.177
Apr	1.370	0.924	0.928	0.884	0.856	0.814	1.117
May	1.238	0.957	0.864	0.859	0.841	0.802	1.061
Jun	1.302	0.923	0.933	0.906	0.889	0.853	1.080
Jul	1.323	0.929	0.912	0.975	0.902	0.874	1.128
Aug	1.257	0.894	0.890	0.894	0.860	0.834	1.095
Sep	1.347	1.018	0.888	0.882	0.875	0.838	1.119
Oct	1.382	0.922	0.891	0.903	0.869	0.854	1.163
Nov	1.408	0.968	0.937	0.921	1.042	0.915	1.242
Dec	1.418	1.032	1.081	0.976	0.947	0.912	1.229

### 2019 Urban Seasonal Adjustment Factors (All Vehicles)

	Group	JRBAN INT	ERSTATE (L	(101)			
From Year:		2019	To Year:		2019		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.888	1.107	1.128	1.077	1.033	0.944	1.588
Feb	1.580	1.046	1.003	1.029	0.956	0.948	1.239
Mar	1.437	1.010	0.966	0.949	0.930	0.879	1.168
Apr	1.329	0.959	0.929	0.912	0.887	0.873	1.137
May	1.268	1.011	0.918	0.901	0.880	0.829	1.084
Jun	1.237	0.940	0.902	0.895	0.870	0.818	1.078
Jul	1.208	0.924	0.903	0.877	0.959	0.861	1.093
Aug	1.202	0.929	0.921	0.893	0.859	0.817	1.062
5ep	1.271	0.998	0.926	0.910	0.885	0.834	1.089
Oct	1.246	0.953	0.927	0.920	0.897	0.830	1.100
Nov	1.379	0.982	0.946	0.913	0.996	0.904	1.186
Dec	1.353	1.008	1.057	1.075	0.948	0.889	1.155

Group		JRBAN FRE	EWAY EXP	RESSWAY (	U02)		
- 1	From Year:	2019		To Year:			
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.967	1.069	1.107	1.061	1.011	0.928	1.536
Feb	1.650	1.017	0.962	0.999	0.923	0.935	1.245
Mar	1.543	0.984	0.943	0.928	0.923	0.881	1.206
Apr	1.434	0.933	0.899	0.884	0.877	0.878	1.147
May	1.372	1.014	0.898	0.882	0.872	0.834	1.118
Jun	1.330	0.929	0.888	0.885	0.872	0.827	1.112
Jul	1.322	0.913	0.893	0.874	0.957	0.872	1.135
Aug	1.304	0.912	0.899	0.874	0.855	0.821	1.107
Sep	1.361	0.995	0.887	0.876	0.860	0.824	1.116
Oct	1.372	0.931	0.896	0.892	0.879	0.830	1.137
Nov	1.471	0.953	0.925	0.907	0.996	0.901	1.232
Dec	1.491	0.988	1.033	1.047	0.941	0.890	1.205

Group		JRBAN OTHER PRINCIPAL ARTERIAL (U03)									
F	rom Year:	2019	To Year:		2019						
	Sun	Mon	Tue	Wed	Thu	Fri	Sat				
Jan	1.733	1.109	1.150	1.110	1.054	0.933	1.424				
Feb	1.456	1.053	1.013	1.036	0.951	0.928	1.146				
Mar	1.378	1.024	0.987	0.973	0.961	0.883	1.093				
Apr	1.306	0.960	0.937	0.916	0.902	0.861	1.038				
May	1.240	1.000	0.915	0.903	0.888	0.817	1.016				
Jun	1.242	0.962	0.926	0.927	0.908	0.835	1.050				
Jul	1.250	0.943	0.929	0.901	0.978	0.875	1.078				
Aug	1.221	0.946	0.945	0.912	0.881	0.826	1.033				
Sep	1.283	1.013	0.934	0.922	0.900	0.846	1.067				
Oct	1.257	0.969	0.939	0.934	0.907	0.834	1.056				
Nov	1.353	0.991	0.959	0.943	1.030	0.893	1.158				
Dec	1.380	1.003	1.045	1.081	0.953	0.891	1.132				

	Group	URBAN MIN	OR ARTER	IAL, COLLE	CTORS, LOC	AL (U04,05	,06,07)
- 1	From Year:	2019		To Year:	2019		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.947	1.076	1.132	1.080	1.031	0.916	1.570
Feb	1.631	1.029	0.950	1.007	0.928	0.950	1.273
Mar	1.489	0.954	0.917	0.907	0.907	0.888	1.182
Apr	1.375	0.898	0.880	0.860	0.864	0.870	1.119
May	1.278	0.972	0.870	0.861	0.855	0.810	1.062
Jun	1.312	0.929	0.898	0.902	0.908	0.861	1.114
Jul	1.326	0.916	0.909	0.875	1.010	0.876	1.114
Aug	1.261	0.907	0.906	0.873	0.866	0.827	1.096
Sep	1.338	0.976	0.882	0.879	0.864	0.835	1.115
Oct	1.378	0.940	0.886	0.891	0.873	0.848	1.159
Nov	1.446	0.948	0.946	0.926	1.038	0.910	1.245
Dec	1.480	0.994	1.032	1.097	0.966	0.921	1.237

### 2021 Urban Seasonal Adjustment Factors (All Vehicles)

From Year:

Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sun

1.884

1.678

1.456

1.397

1.312

1.252

1.291

1.286

1.478

1.426

0.968

0.972

Group		URBAN INTERSTATE (U01)								
From Year:		2021 To Year:		2021						
	Sun	Mon	Tue	Wed	Thu	Fri	Sat			
Jan	1.808	1.169	1.113	1.097	1.075	1.031	1.358			
Feb	1.615	1.288	1.284	1.100	1.108	1.004	1.296			
Mar	1.371	1.038	0.995	0.972	0.985	0.906	1.118			
Apr	1.289	0.978	0.951	0.955	0.936	0.871	1.112			
May	1.224	0.974	0.942	0.921	0.883	0.847	1.048			
Jun	1.155	0.939	0.907	0.903	0.870	0.835	1.029			
Jul	1.175	0.931	0.908	0.884	0.862	0.817	1.020			
Aug	1.175	0.938	0.917	0.896	0.872	0.827	1.022			
Sep	1.229	0.954	0.935	0.926	0.881	0.828	1.057			
Oct	1.237	0.961	0.924	0.905	0.887	0.841	1.054			
Nov	1.351	0.970	0.929	0.926	0.916	0.857	1.104			
Dec	1.332	0.987	0.947	0.937	0.923	0.877	1.128			

May	1.224	0.974	0.942	0.921	0.883	0.847	1.048
Jun	1.155	0.939	0.907	0.903	0.870	0.835	1.029
Jul	1.175	0.931	0.908	0.884	0.862	0.817	1.020
Aug	1.175	0.938	0.917	0.896	0.872	0.827	1.022
Sep	1.229	0.954	0.935	0.926	0.881	0.828	1.057
Oct	1.237	0.961	0.924	0.905	0.887	0.841	1.054
Nov	1.351	0.970	0.929	0.926	0.916	0.857	1.104
Dec	1.332	0.987	0.947	0.937	0.923	0.877	1.128
F	Group rom Year:	URBAN OT 2021	HER PRINC	PAL ARTER	2021		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.740	1.135	1.084	1.072	1.056	0.997	1.272
Feb	1.564	1.239	1.246	1.067	1.091	0.983	1.228
A PROPERTY.		3 - 25	2.2.7.1	E CAL	1 2 5 3 3	1000	10.00

Oct	1.352	0.937	0.897	0.881	0.871	0.843	1.097
Nov	1.480	0.948	0.909	0.898	0.900	0.853	1.147
Dec	1.435	0.956	0.926	0.918	0.901	0.866	1.162
	Group	URBAN MIN	IOR ARTER	IAL, COLLE	CTORS, LOC	AL (U04,0	5,06,07)
1	From Year:	2021		To Year:	2021		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	1.831	1.129	1.026	1.012	1.007	0.959	1.329
Feb	1.608	1.248	1.307	1.044	1.077	0.982	1.289
Mar	1.384	0.960	0.923	0.908	0.936	0.880	1.110
Apr	1.317	0.913	0.881	0.903	0.900	0.850	1.117
May	1.260	0.922	0.891	0.879	0.849	0.838	1.038
Jun	1.254	0.937	0.892	0.910	0.881	0.872	1.079
Jul	1.308	0.929	0.910	0.896	0.907	0.869	1.122
Aug	1.279	0.918	0.909	0.900	0.880	0.857	1.088
Sep	1.324	0.948	0.918	0.924	0.870	0.829	1.083
Oct	1.377	0.954	0.913	0.904	0.901	0.873	1.122

0.941

0.954

0.928

0.958

0.953

0.932

Group URBAN FREEWAY EXPRESSWAY (U02)

Tue

1.077

1.228

0.960

0.918

0.911

0.898

0.900

0.897

0.905

To Year:

Wed

1.059

1.061

0.944

0.928

0.899

0.897

0.881

0.887

2021

Thu

1.044

1.068

0.962

0.927

0.871

0.877

0.873

0.871

0.865

Fri

1.005

0.984

0.902

0.876

0.855

0.846

0.838

0.833

Sat

1.376

1.304

1.140

1.142

1.082

1.071

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1.086 1.097 1.147 1.162

1.197

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2021

Mon

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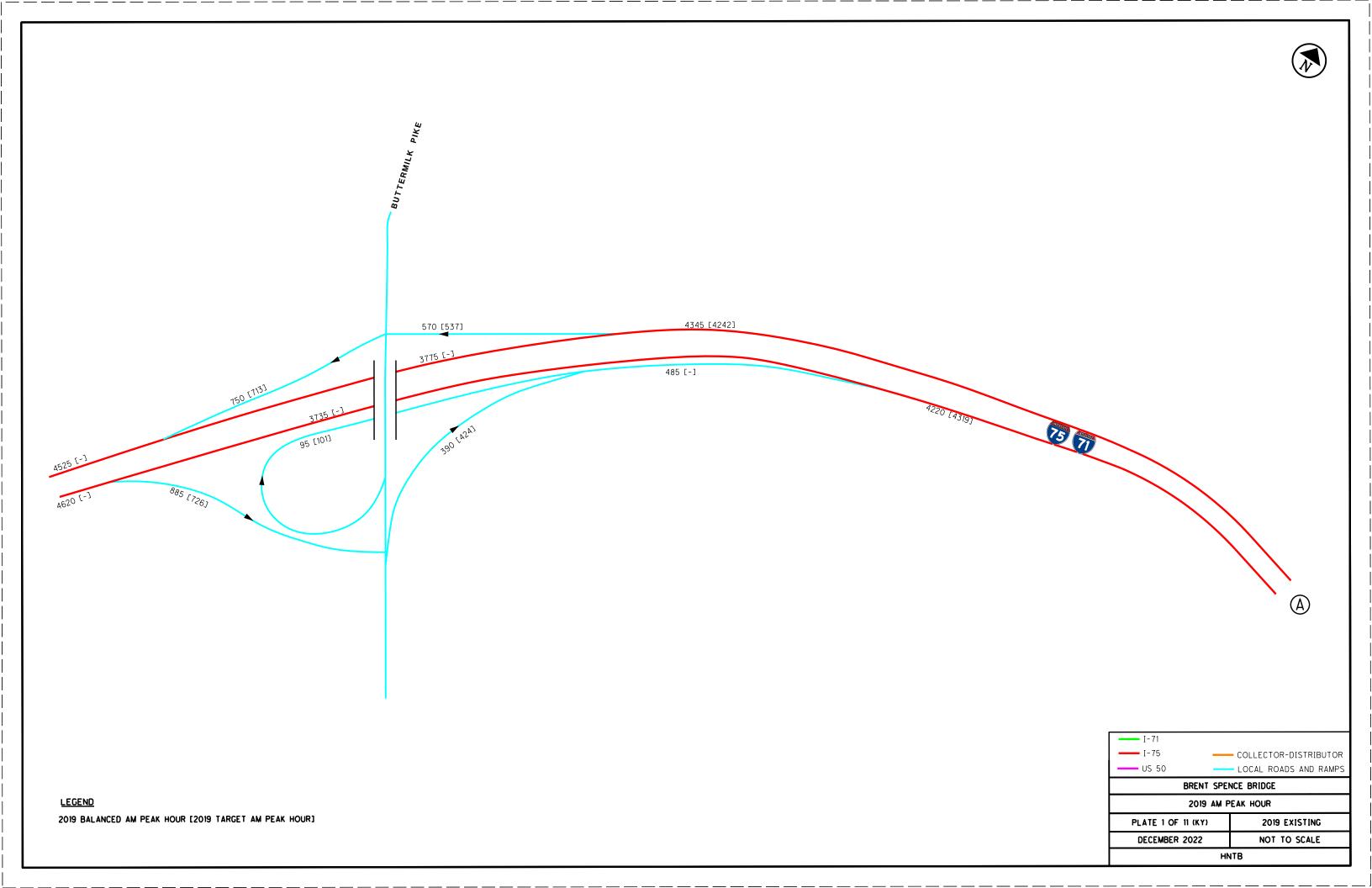
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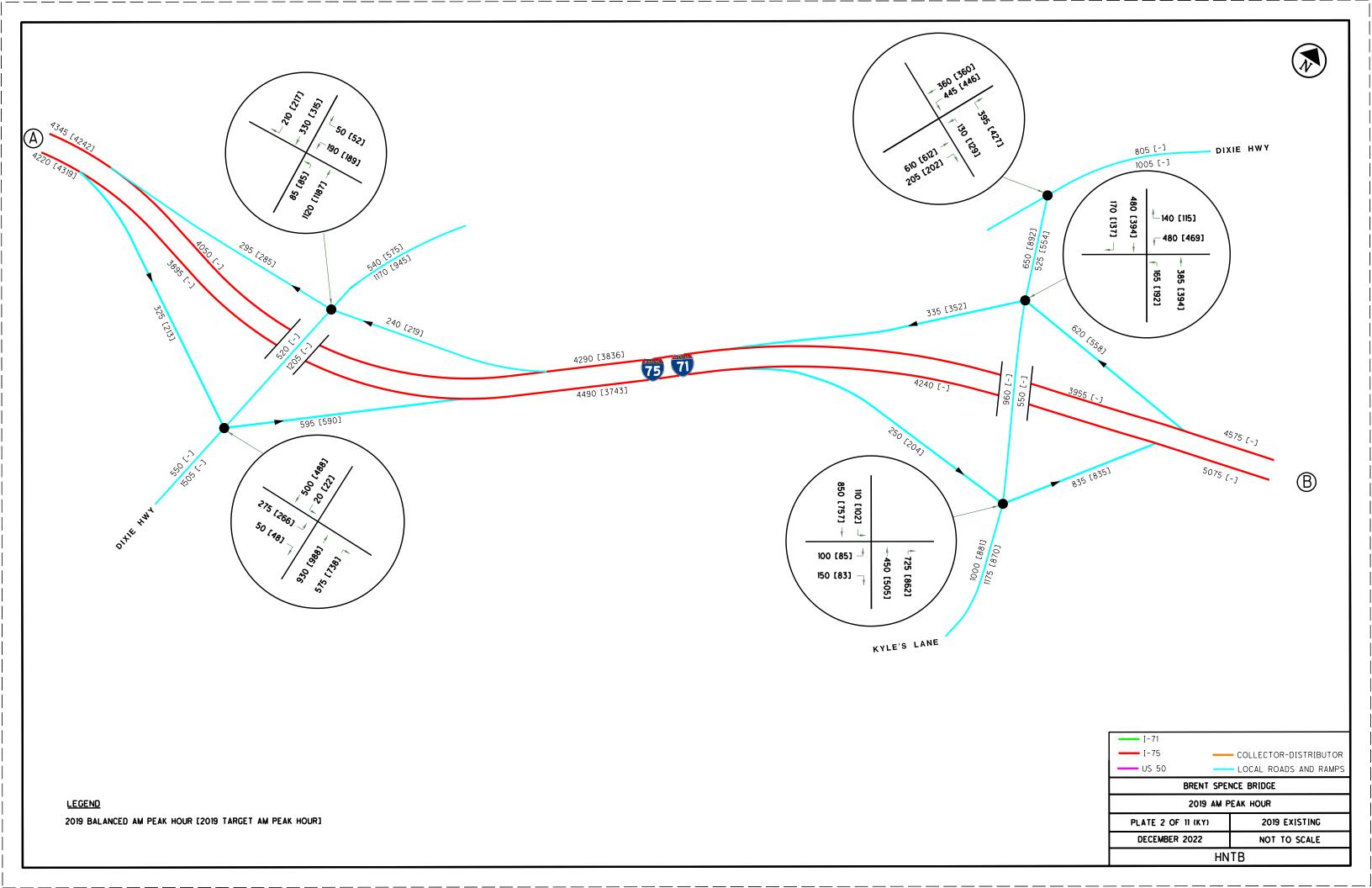
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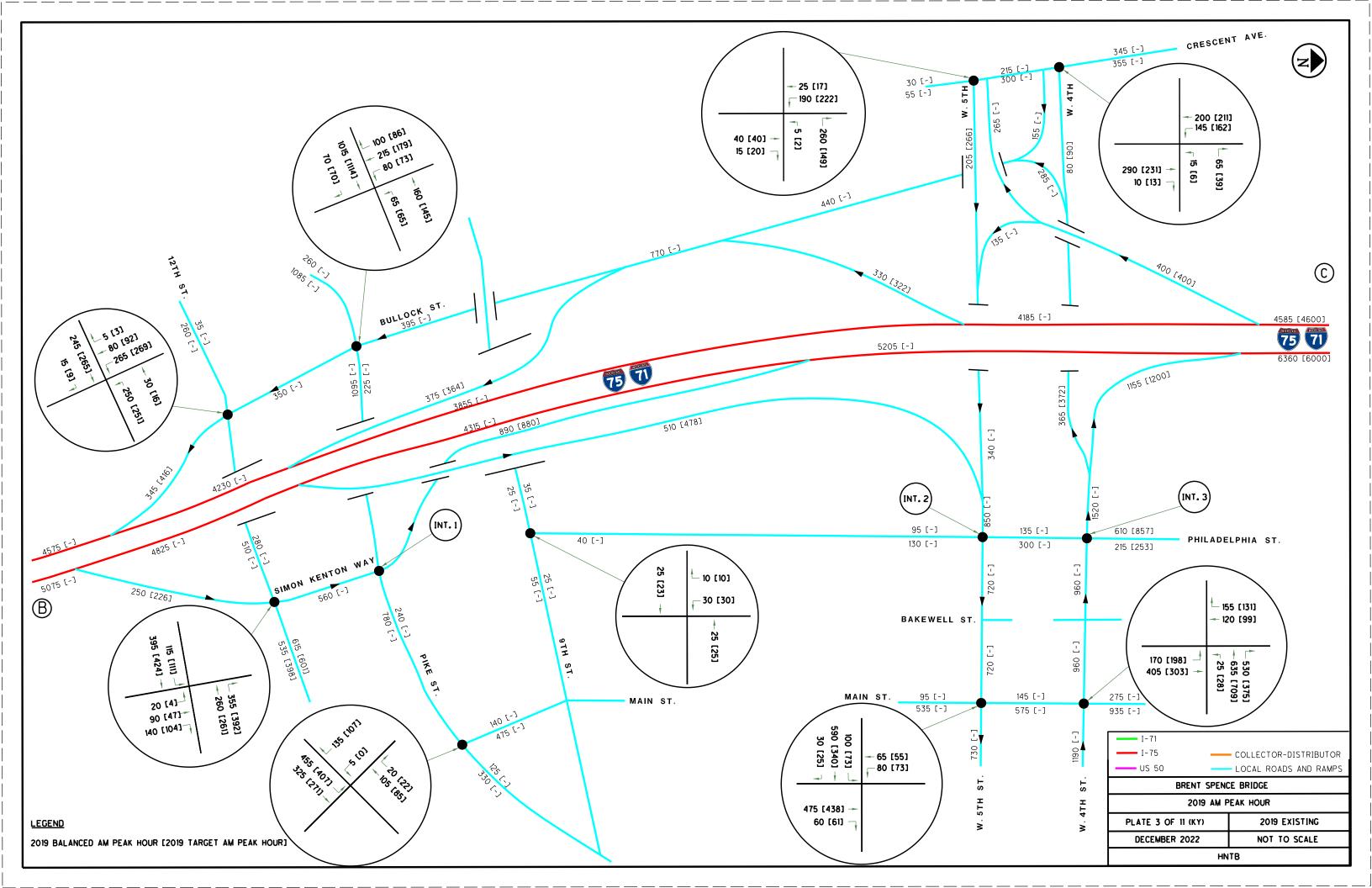
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		2021	To Year:		2021					
	Sun	Mon	Tue	Wed	Thü	Fri	Sat			
Jan	1.740	1.135	1.084	1.072	1.056	0.997	1.272			
Feb	1.564	1.239	1.246	1.067	1.091	0.983	1.228			
Mar	1.375	1.005	0.968	0.943	0.976	0.899	1.078			
Apr	1.332	0.959	0.919	0.936	0.933	0.862	1.061			
May	1.247	0.952	0.920	0.909	0.877	0.852	1.020			
Jun	1.227	0.948	0.912	0.915	0.888	0.854	1.027			
Jul	1.285	0.952	0.921	0.905	0.893	0.842	1.046			
Aug	1.257	0.953	0.931	0.920	0.893	0.846	1.026			
Sep	1.295	0.960	0.945	0.935	0.900	0.841	1.061			
Oct	1.331	0.973	0.936	0.920	0.906	0.852	1.068			
Nov	1.393	0.957	0.934	0.917	0.921	0.855	1.093			
Dec	1.364	0.973	0.941	0.926	0.918	0.863	1.109			

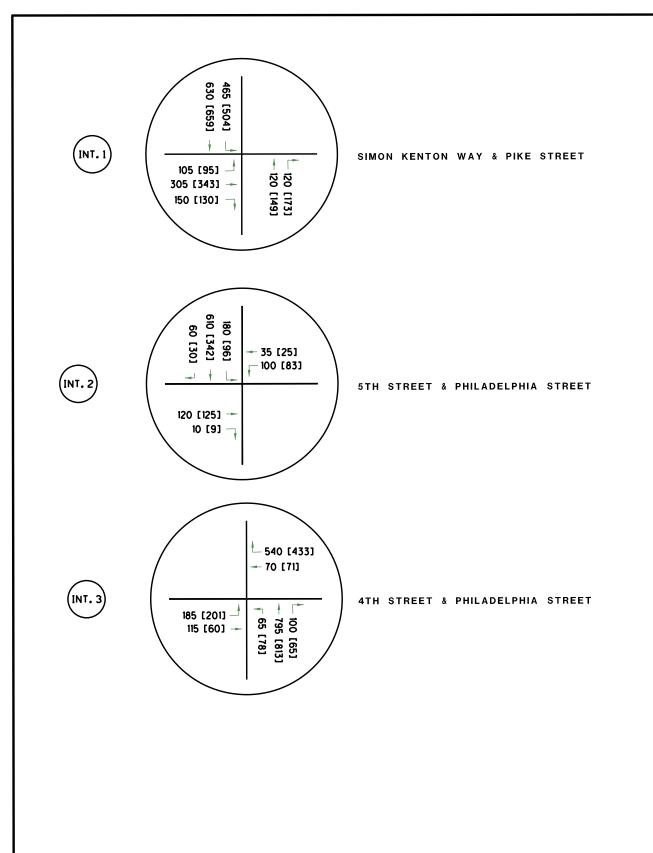
# **Appendix E: Existing 2019 AM Peak Hour (Target versus Balanced Volumes)**

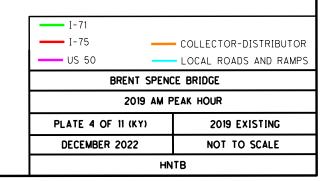


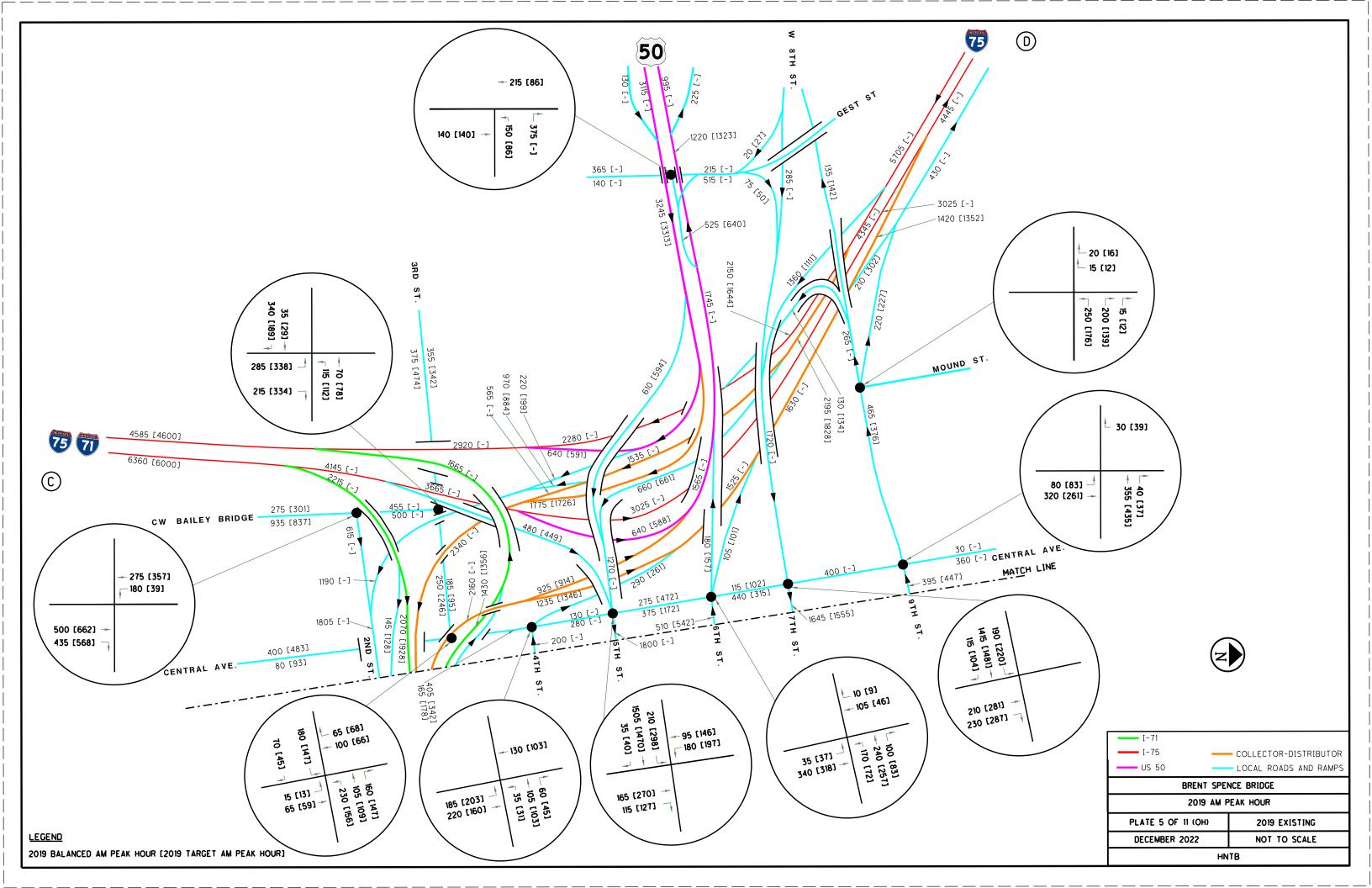


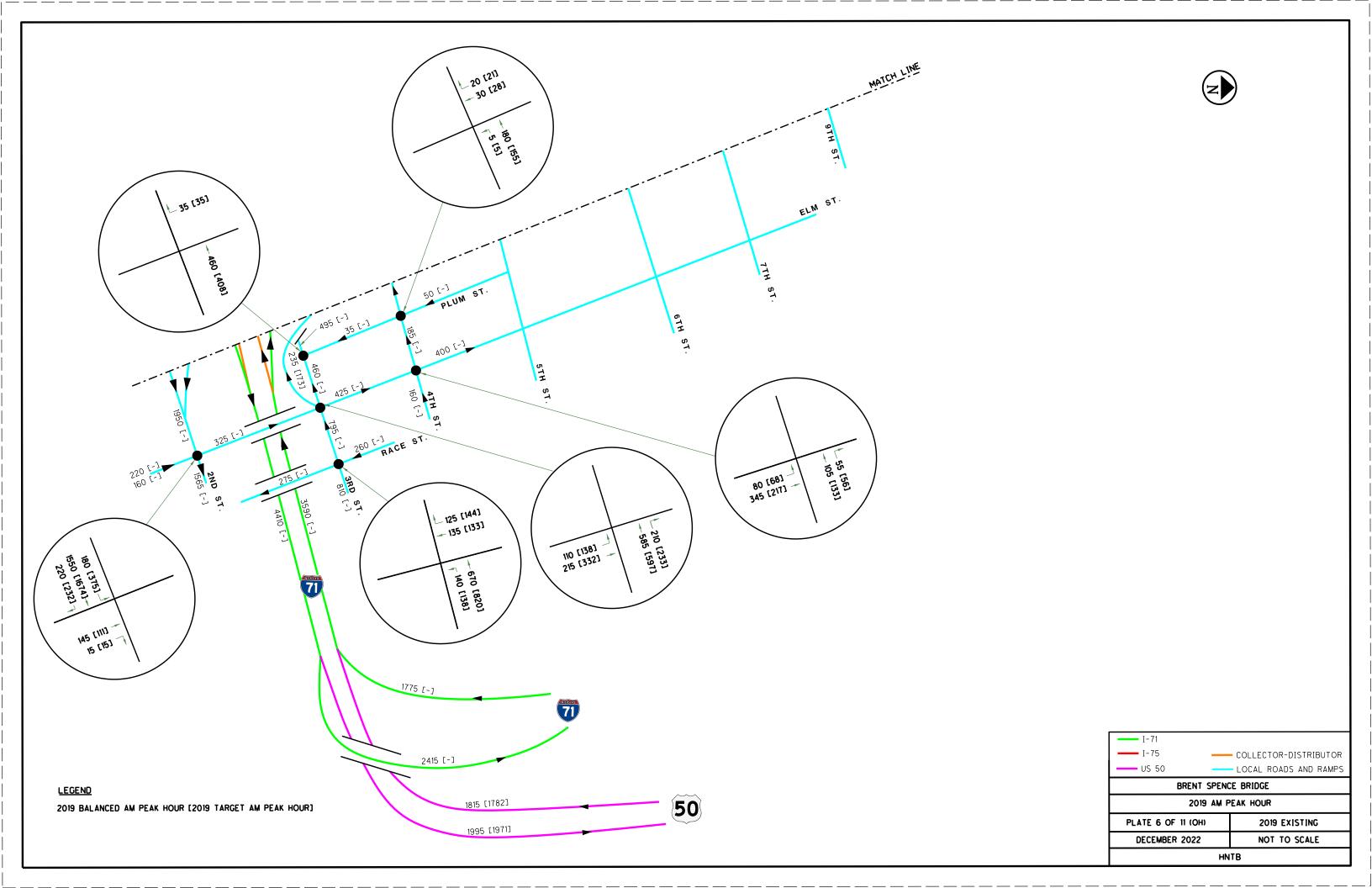


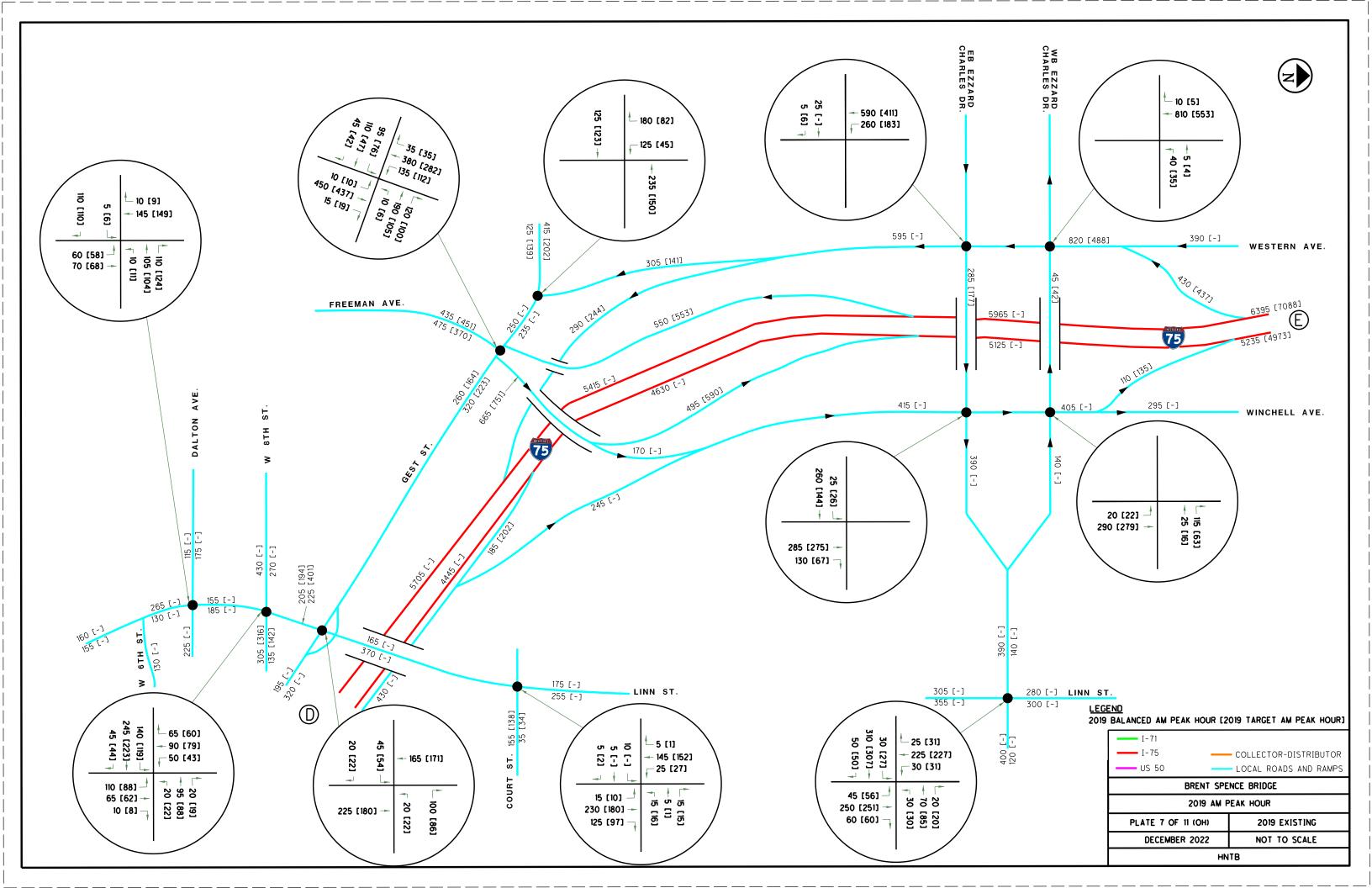


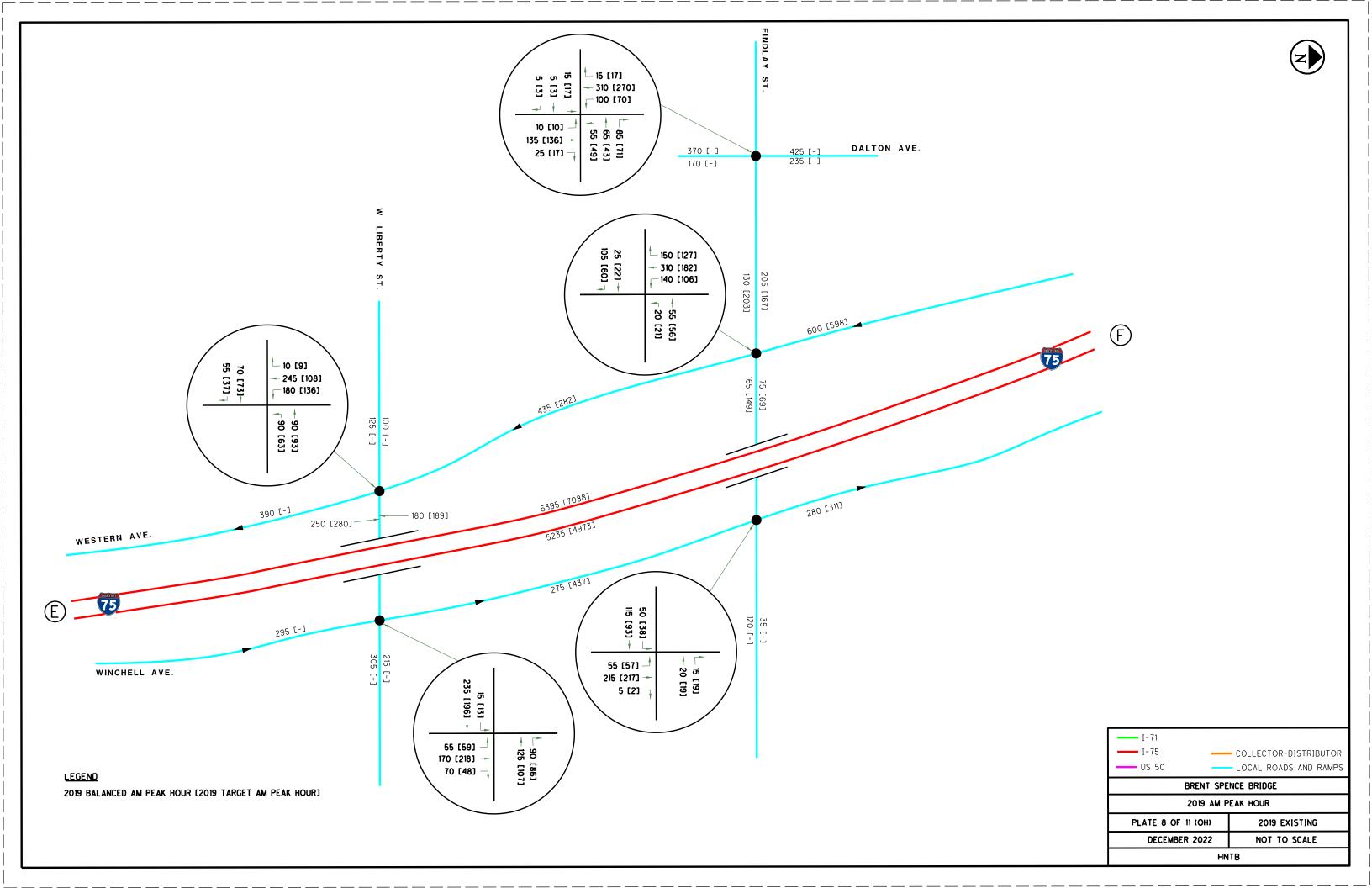


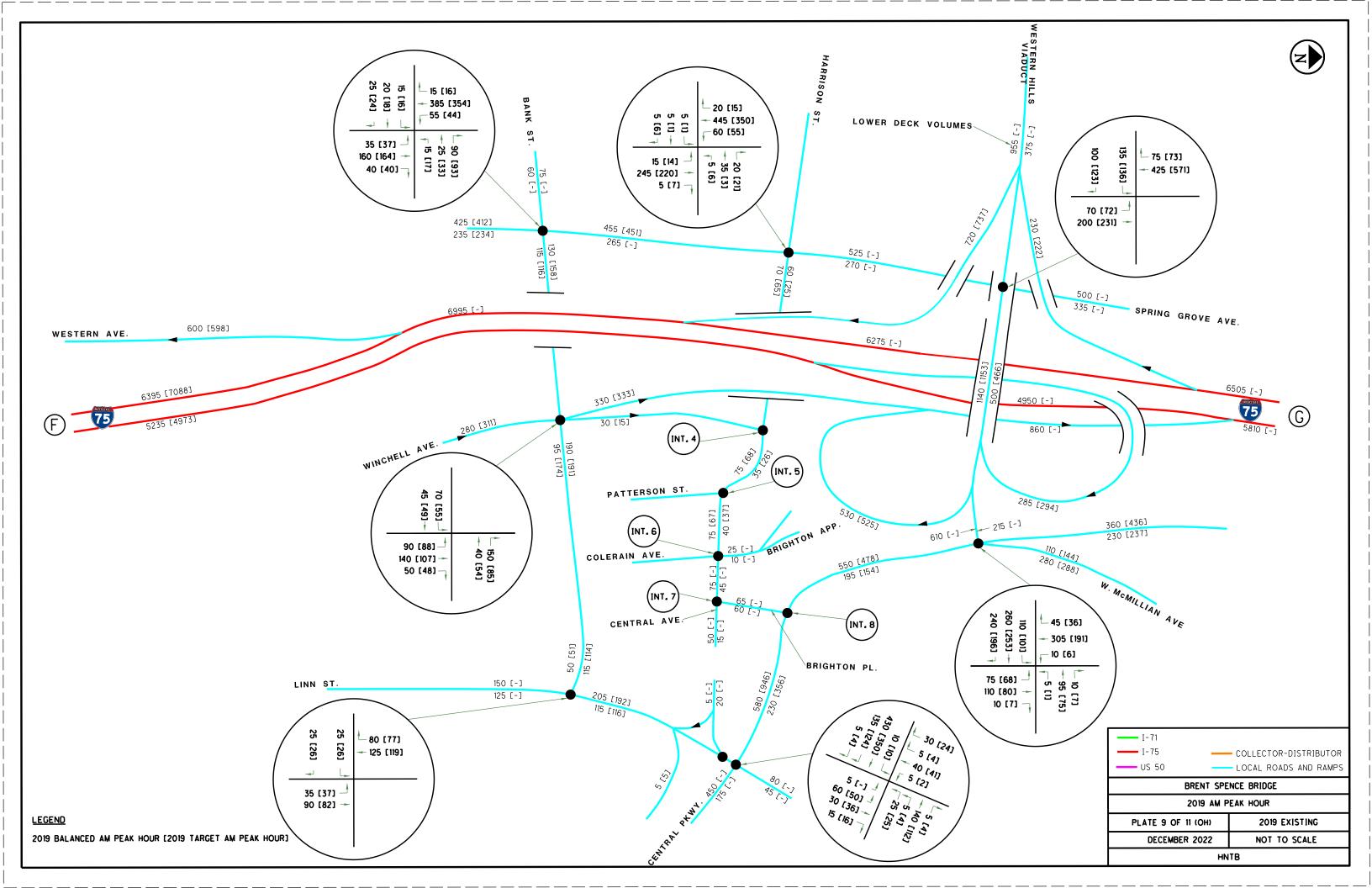


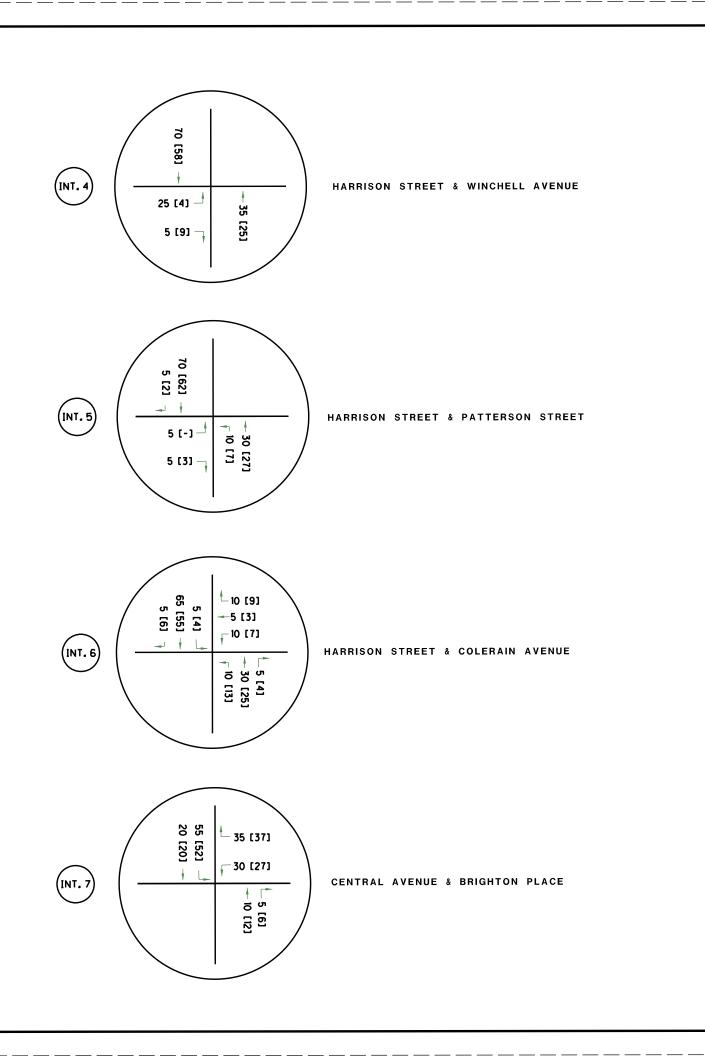


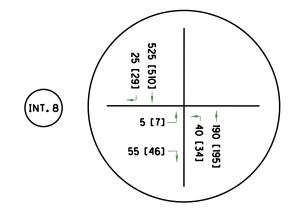




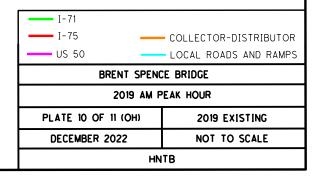


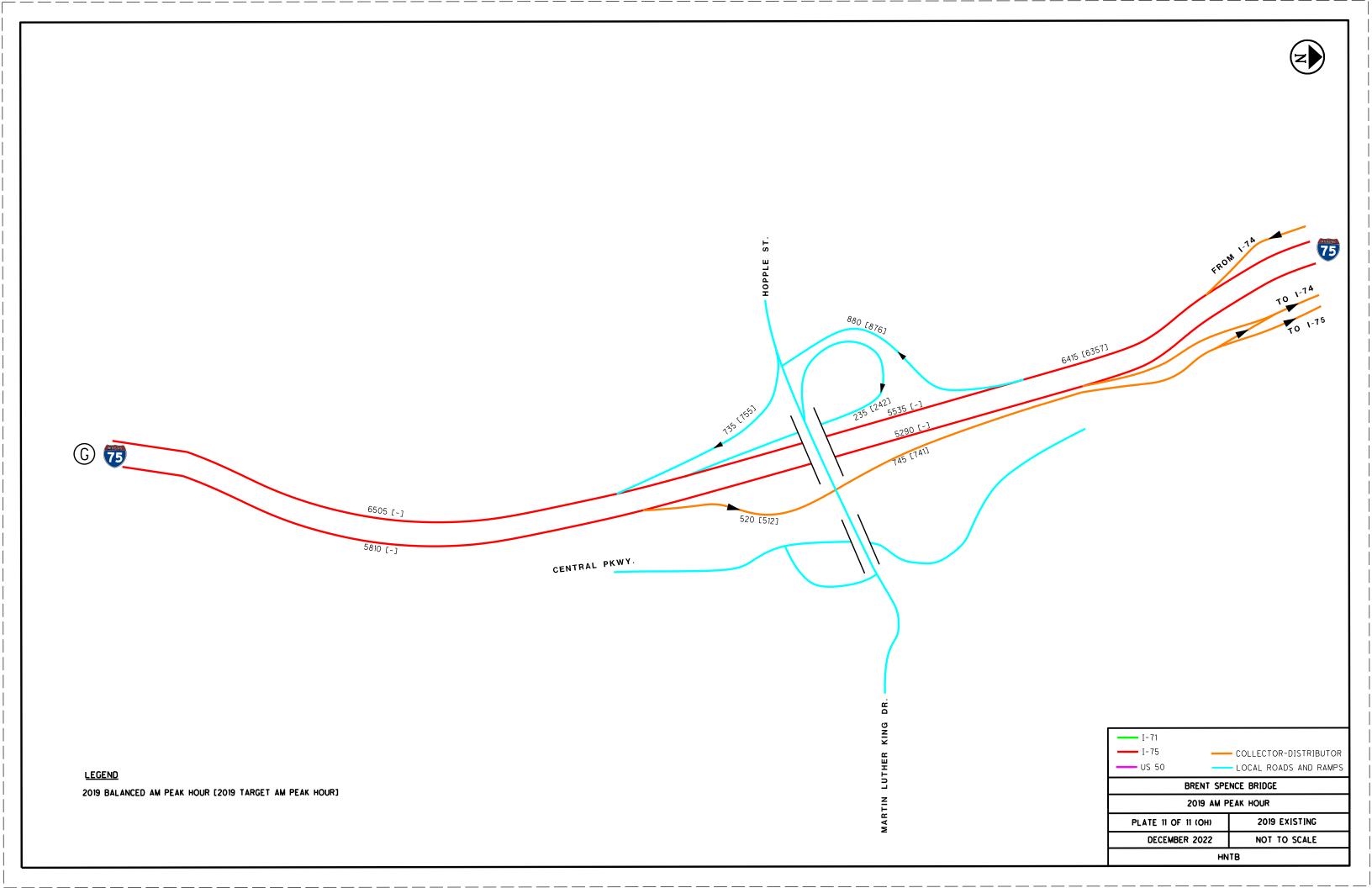






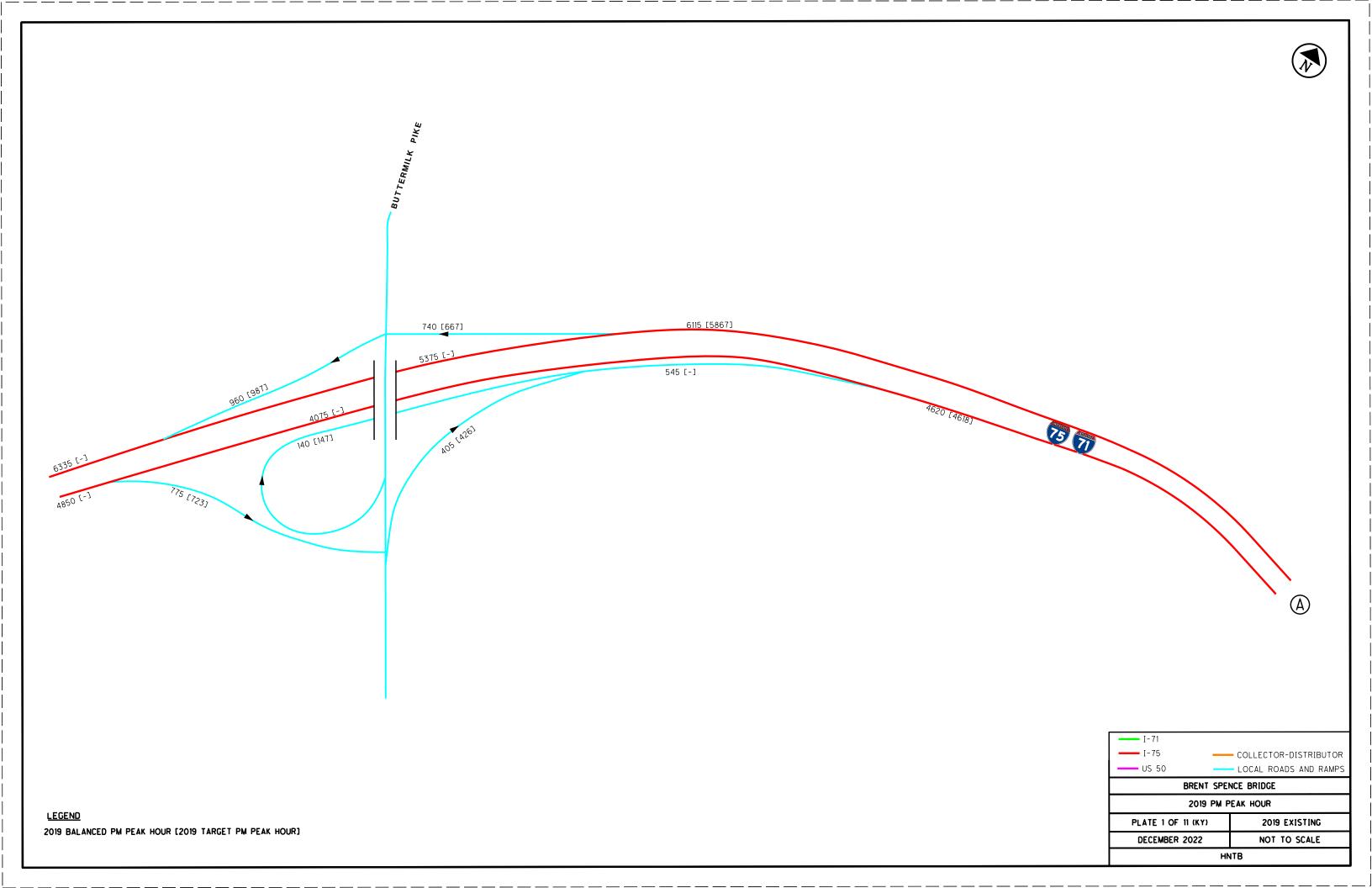
BRIGHTON PLACE & CENTRAL PARKWAY

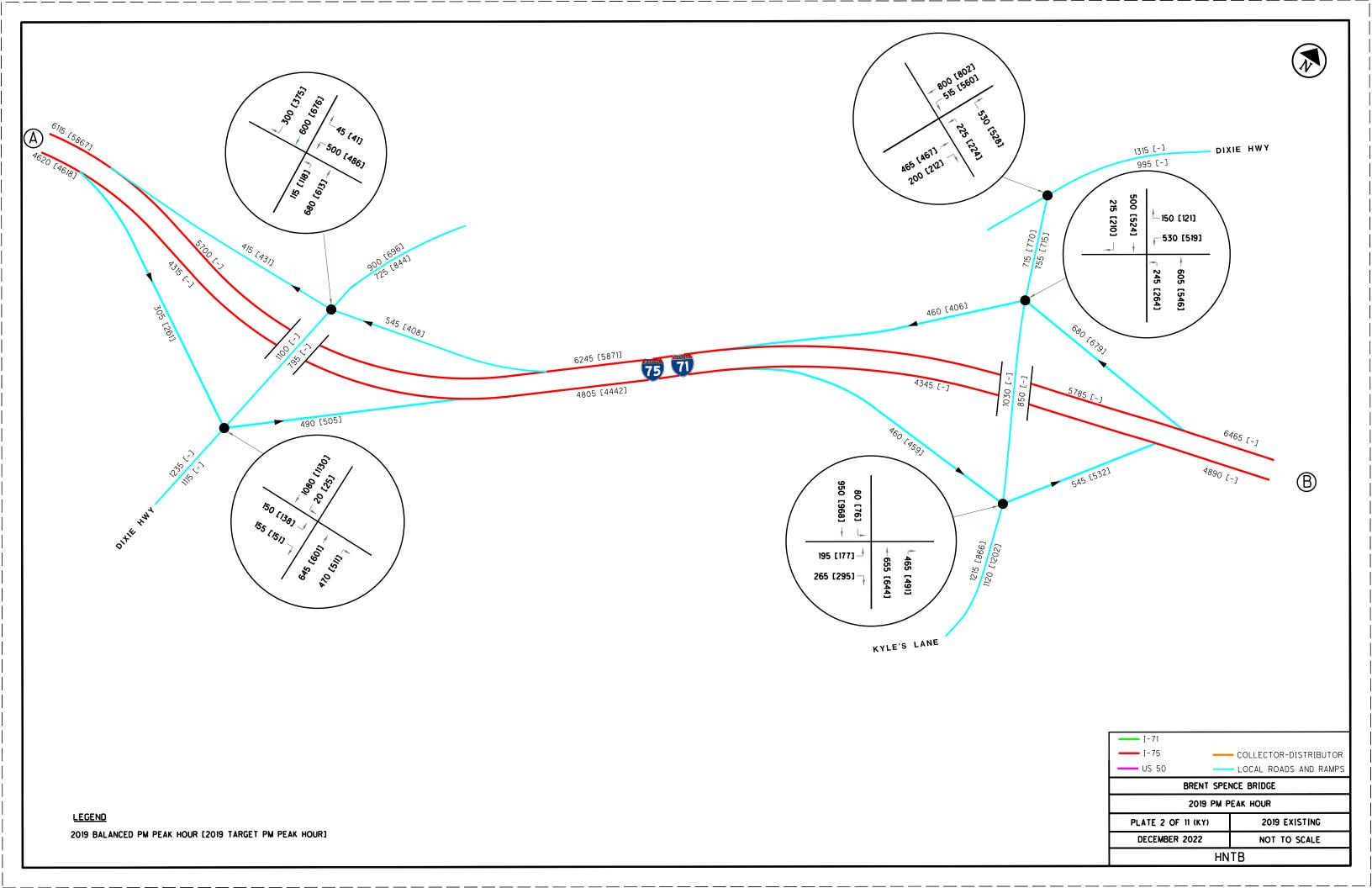


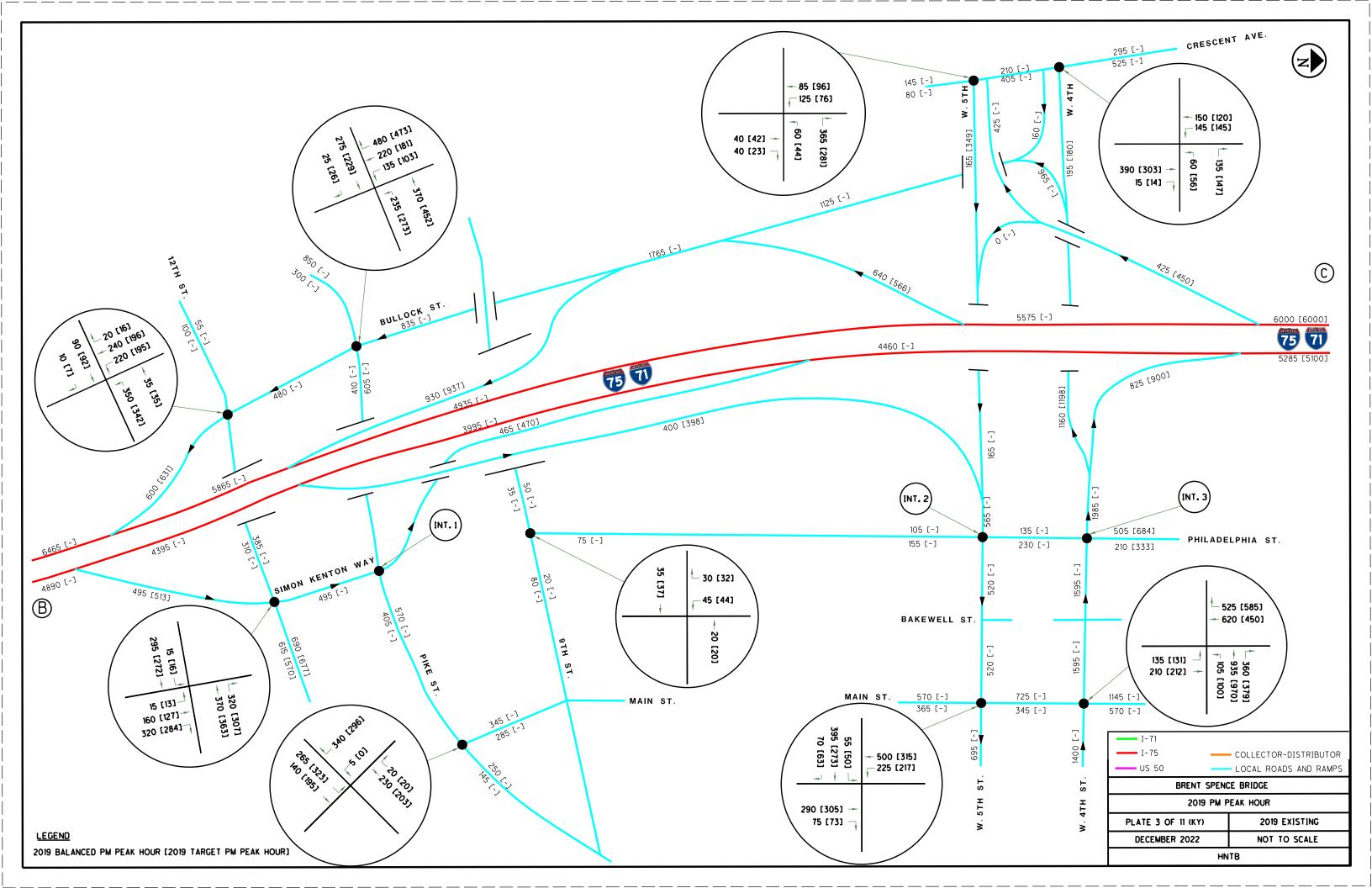


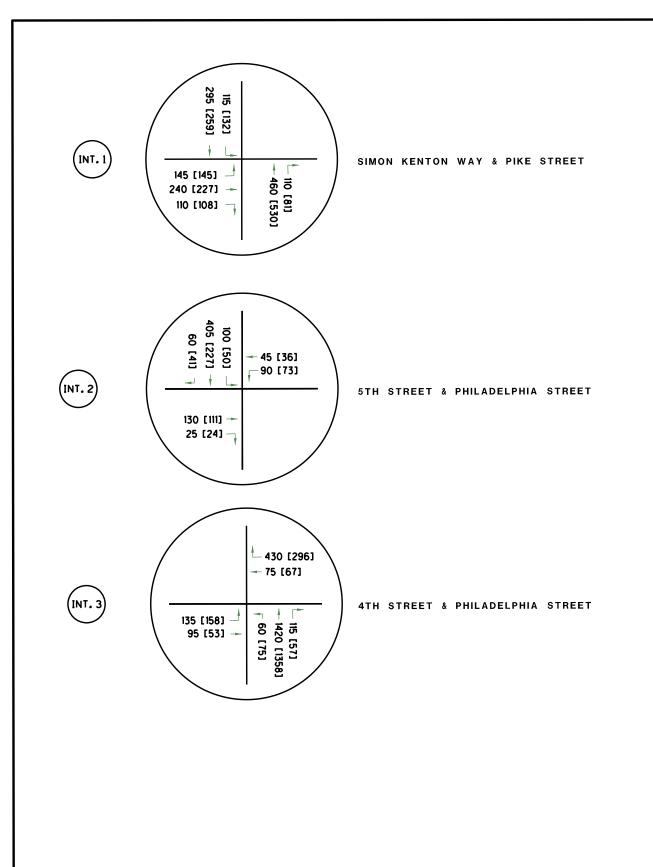
# **Appendix F: Existing 2019 PM Peak Hour (Target Versus Balanced Volumes)**

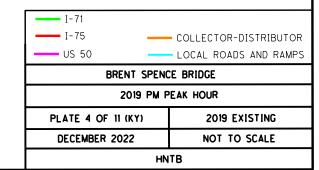


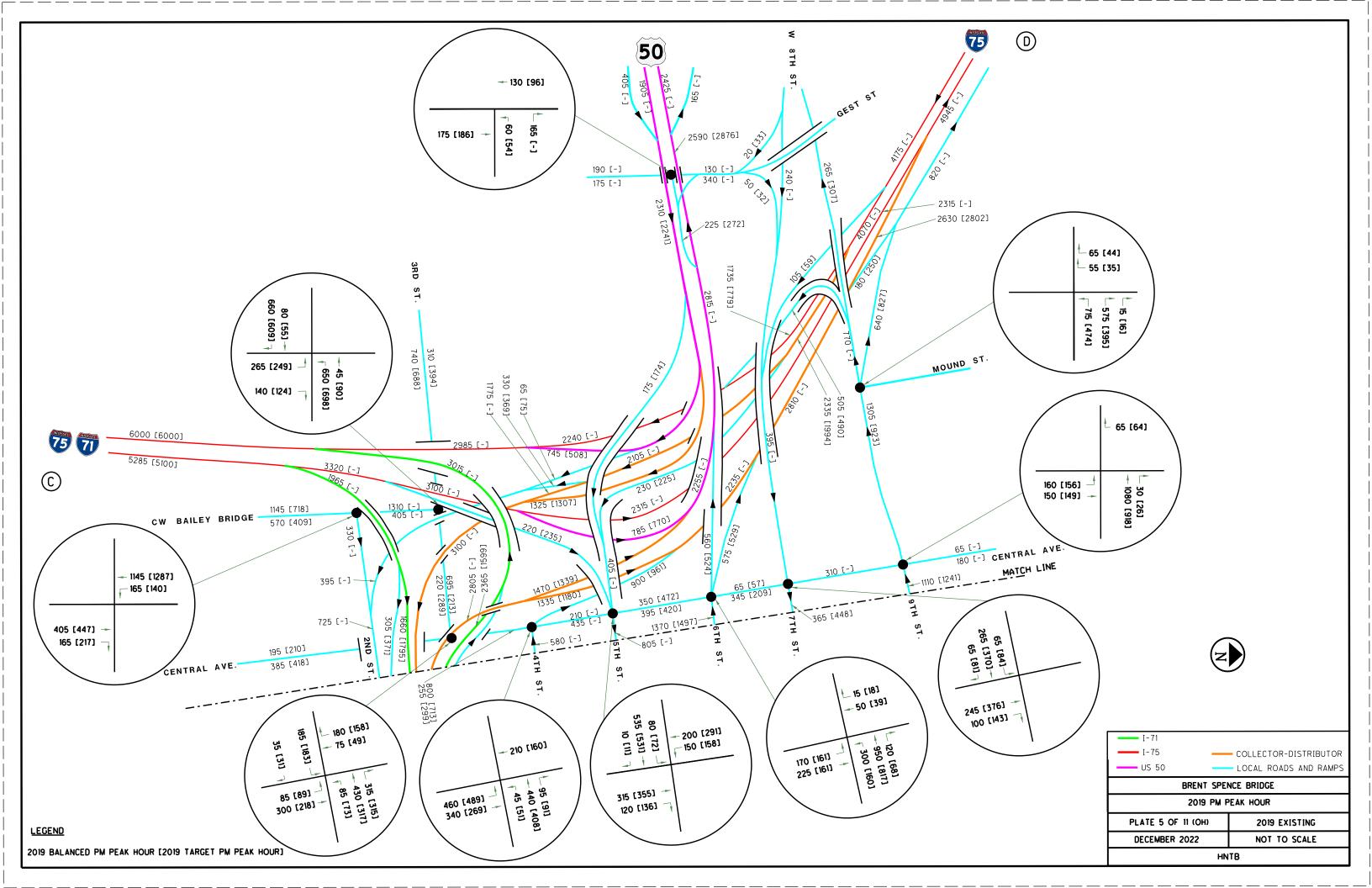


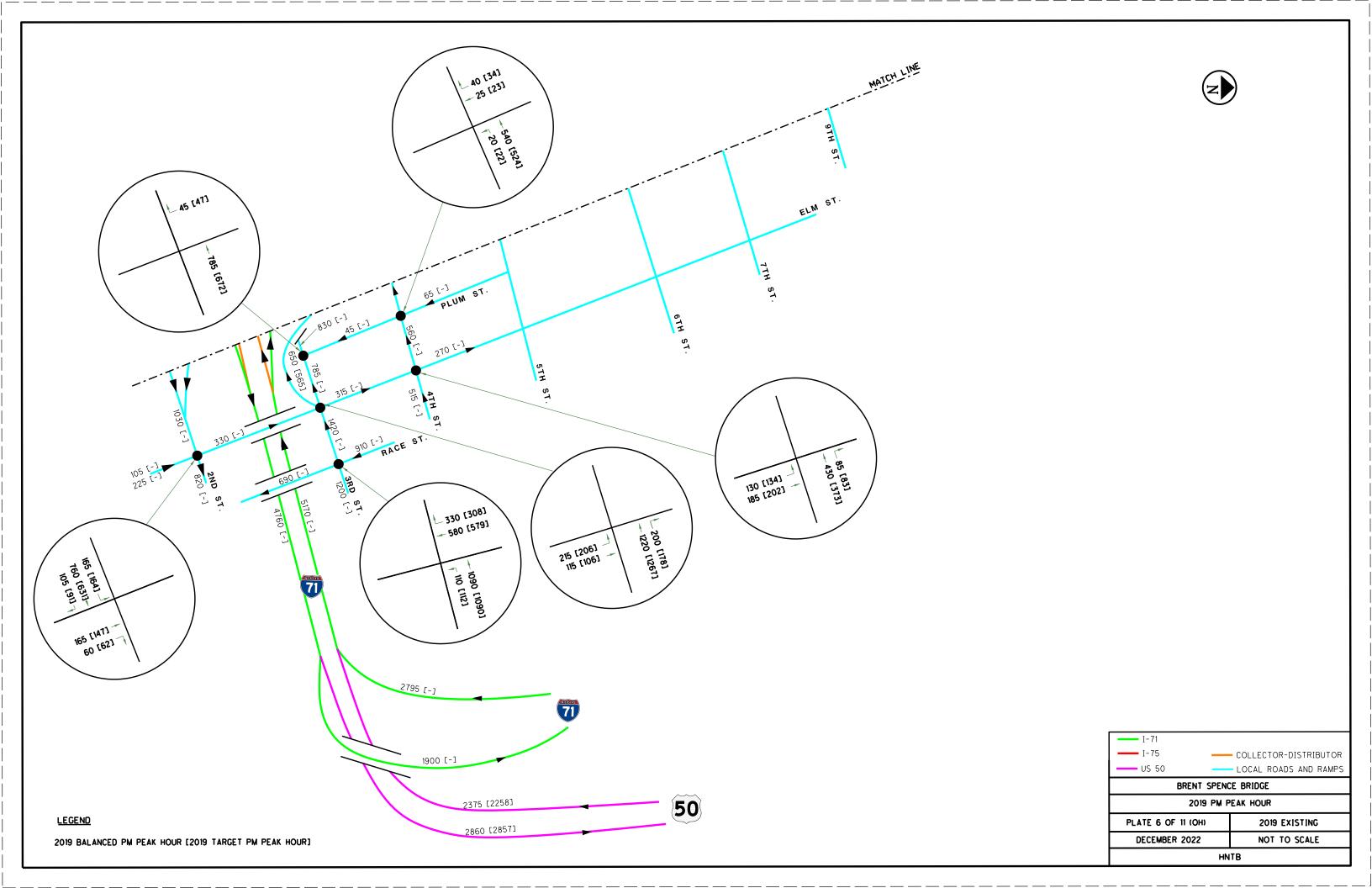


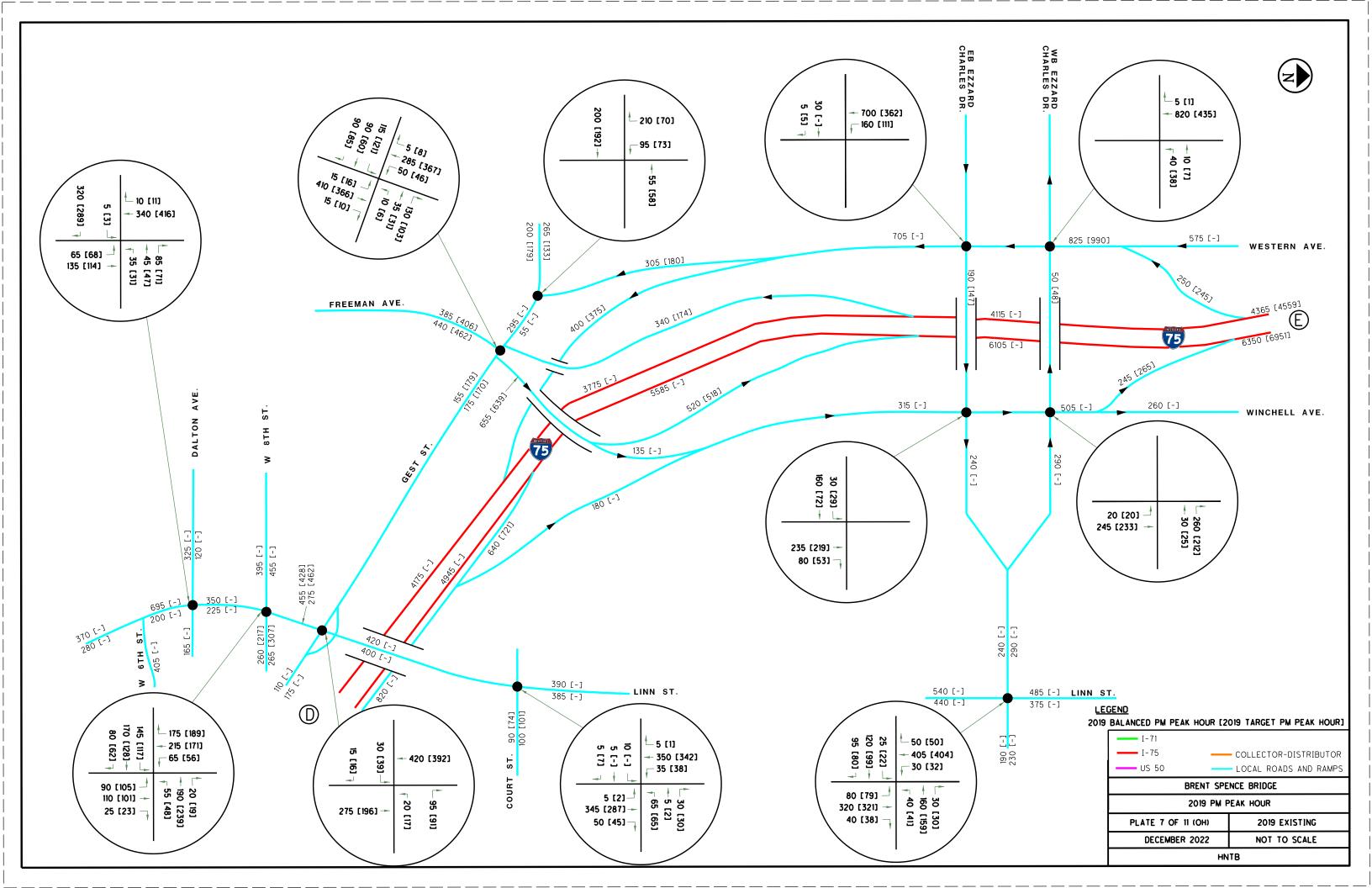


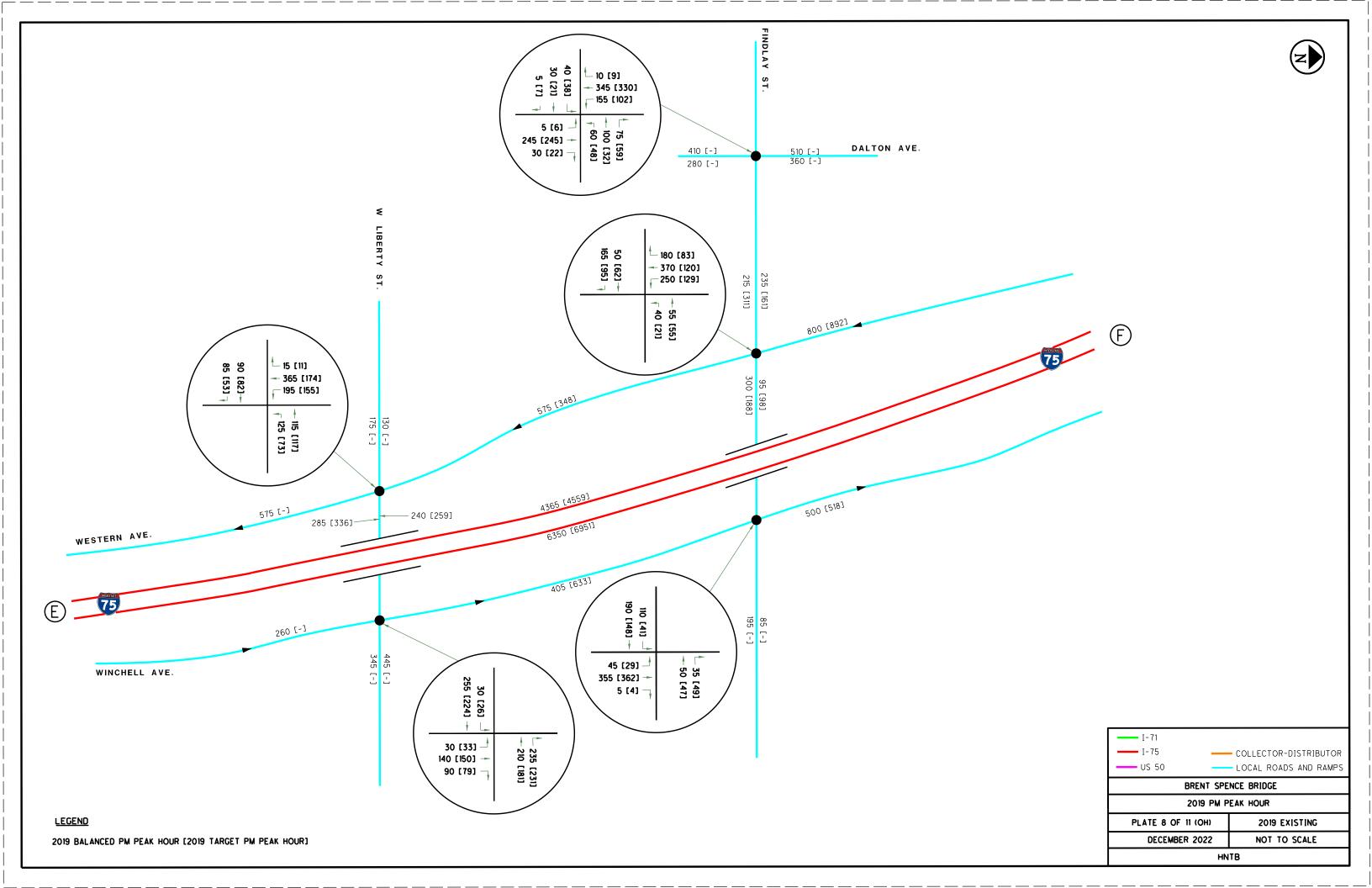


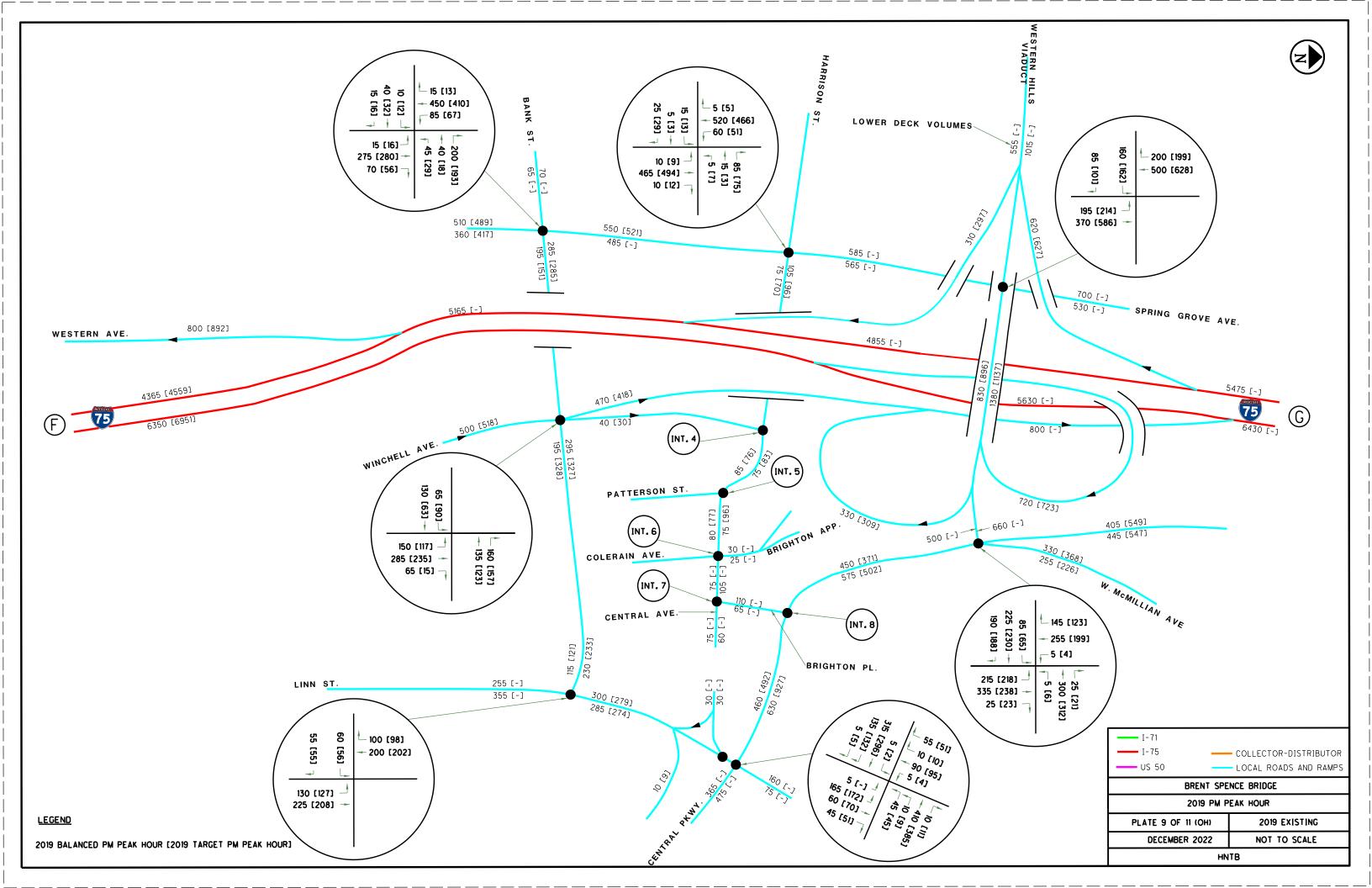


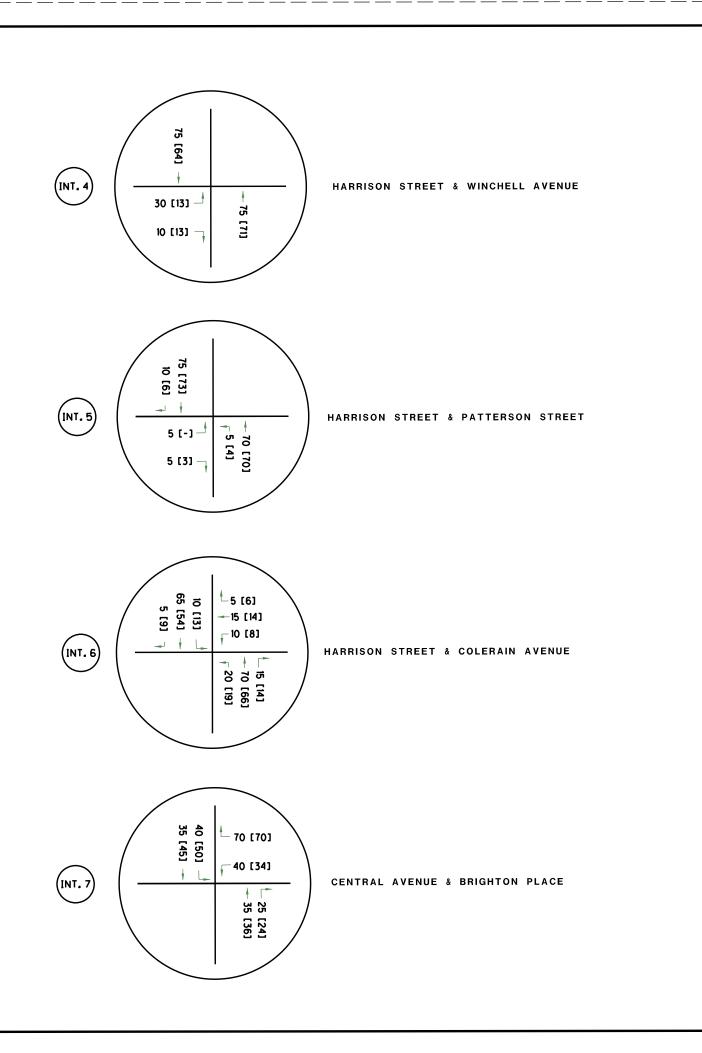


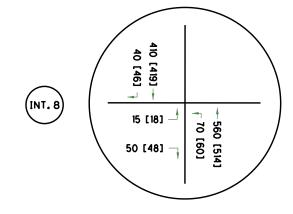




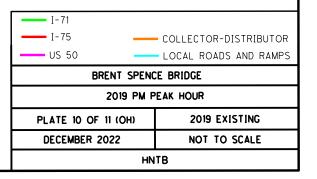


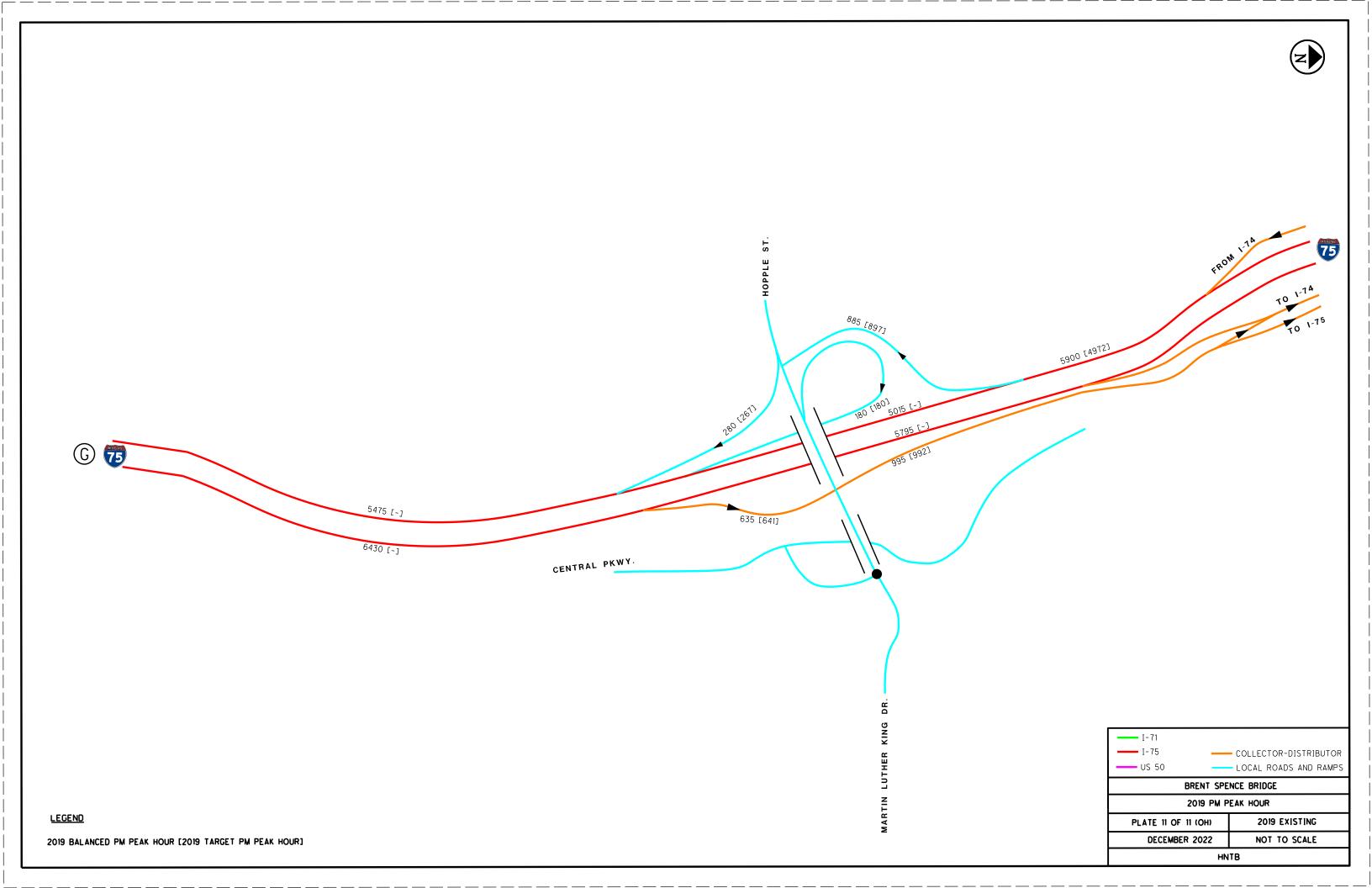






BRIGHTON PLACE & CENTRAL PARKWAY





## Memorandum – Update by ODOT January 20, 2023

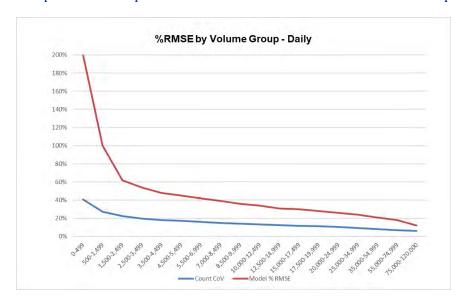
To: Ohio DOT From: CDM Smith

Date: October 31, 2022 – updated January 20, 2023

Subject: Brent Spence Bridge Project- OKI Subarea Validation Report

Note that the original memo was dated 10/31/22 and was written by CDM Smith, who was contracted by ODOT. In response to comments received from FHWA. ODOT has updated this memo to include additional analyses and comments.

It is worth noting that the model results are but one input to the Certified Design Traffic, as noted in the Certified Design Traffic Procedures memo dated 9/29/22 from ODOT and HNTB to FHWA. As noted in NCHRP Report 255 Highway Traffic Data for Urbanized Area Project Planning and Design, and affirmed in NCHRP Report 765 Analytical Travel Forecasting Approaches for Project-Level Planning and Design, while model refinements are conducted for project level analysis, the additional procedures to generate a traffic forecast for design "enable the analyst to reduce the expected link traffic variations to reasonable ranges." (255, Chapter 2) In general, travel models may have systemic biases which persist into their future forecasts. Care is taken in model development and refinement to not over-specify the model. While it is possible to modify model parameters to match traffic counts, such over-specification leads to inflexible traffic responses to future year conditions. Figure 0 show ODOT's desired % Root Mean Square Error (%RMSE) compared to the Coefficient of Variation (CoV) for traffic counts. In general, a model's %RMSE should never be less that the CoV that is inherent in traffic counts, as that is an indicator that your model is potentially over-specified. So, given that a model's error is expected to be greater than those found in traffic counts, the model volumes are not used directly, but rather used in the NCHRP 765 procedures to produce a forecast that has the least amount of expected variation.



**Figure 0**: Model % RMSE vs. Count Coefficient of Variation.

CDM Smith has contracted with the Ohio DOT Division of Planning to provide services for helping validate and document the combined OKI-MVRPC regional travel demand model.

This work was done under the auspices of VAR- Statewide Travel Demand Model Update Contract No. 2021-1, PID No. 113346 and Agreement No. 35417 where CDM Smith is a subconsultant to WSP. The individual task orders follow:

- TDM21-1-8 OKI-BSB Modeling
- TDM21-1-10 Marysville Project Simulations 100% Scenarios and BSB Part 2.

This memorandum focuses on the development of a subarea of the regional model that will be used for analysis of potential improvements to I-71/I-75 at the Brent Spence Bridge (BSB).

The memorandum has the following parts:

- Study Area and Traffic Counts
- Land Use Data and Traffic Analysis Zone Refinement
- Regional Model Statistics
- Subarea Model Validation Statistics

Liren Zhuo, the Travel Demand Model Manager for the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) confirmed by email to ODOT on 10/24/22 that the model used for all BSB project analysis is the current Model of Record (MOR). OKI noted that they had made numerous updates from the 2015 model validation to the 2020, Existing and Committed and future year networks and that the 2015 model is not comparable to the current circa 2020 MOR. OKI is using 2020 as the base year for traffic analysis. 2020 has not yet been fully validated due to the lack of final Census data and the need to re-collect traffic counts originally scheduled for 2020.

Also of note is that many counts on the circa-2020 network outside of the BSB study area are <u>not</u> 2020 counts, but remain from 2015. Therefore, full model statistics are included for reference, but are not used when determining the suitability of the model for the BSB project.

#### **Study Area and Traffic Counts**

**Figure 1** shows the established study area for the BSB traffic study within the larger region. **Figure 2** shows the 557 study area links with average daily traffic (ADT) counts. **Figure 3** provides a closer view of the BSB and the other nearby Ohio River crossings between Ohio and Kentucky.

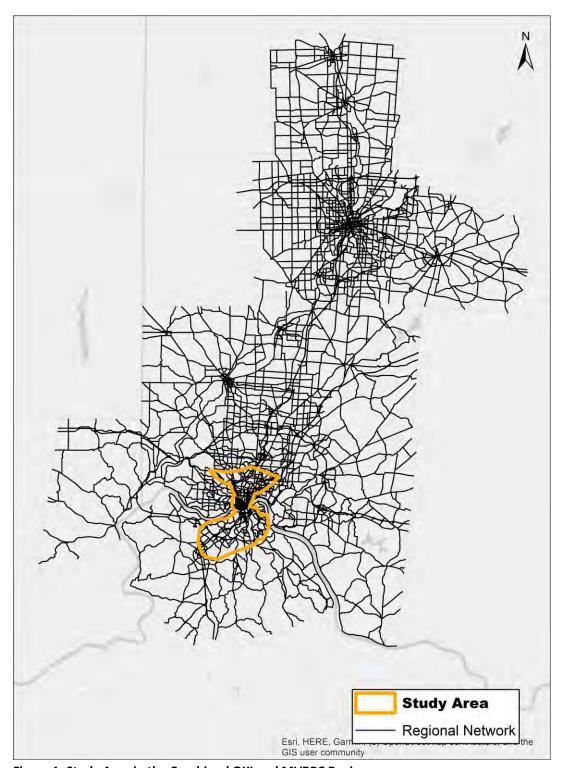
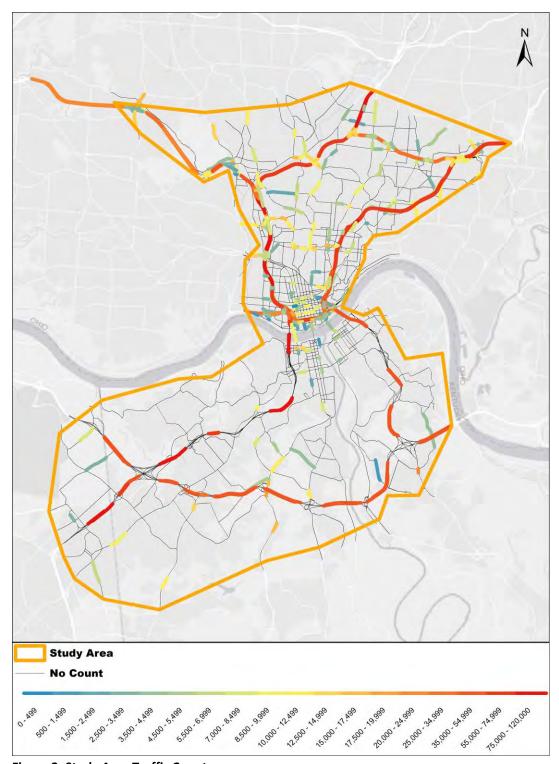
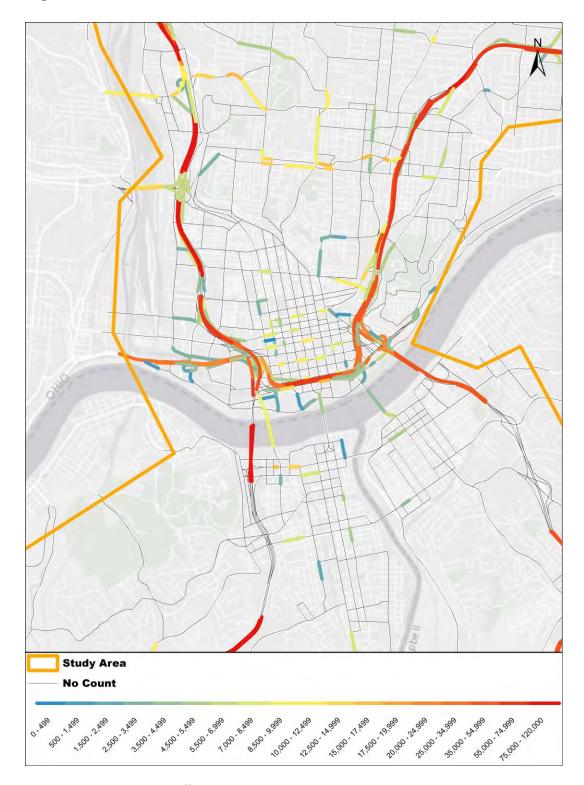


Figure 1: Study Area in the Combined OKI and MVRPC Region



**Figure 2: Study Area Traffic Counts** 



**Figure 3: River Crossing Traffic Counts** 

## Land Use Data and Traffic Analysis Zone Refinement

Before initiating the appropriate validation checks it was deemed necessary to refine the underlying traffic analysis zone (TAZ) geography along the I-71/I-75 corridor. Figure 4 and Figure 5

show the refined TAZs (in red) and the original TAZs (in green) which were sourced from the OKI Model of Record at the initiation of the Study in September 2021. The refinement of the TAZ geography was intended to better capture the traffic entering and exiting the model network. Total population and employment were held constant with the original TAZ input population and employment data. Data from the US Census, the Quarterly Census of Employment and Wages (QCEW) in Ohio, and the Longitudinal Employer-Household Dynamics (LEHD) survey in Kentucky were used to estimate proportions of population and employment in each of the refined TAZs.

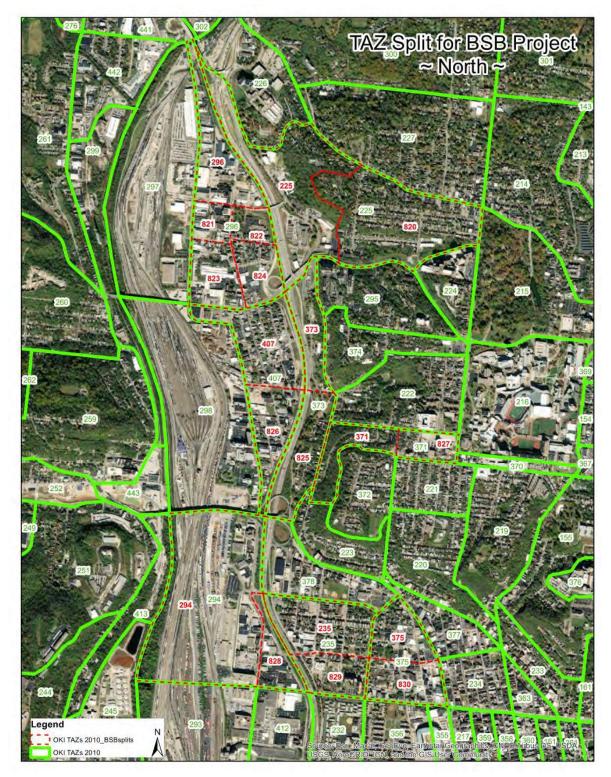


Figure 4: OKI Traffic Analysis Zone Splits – North

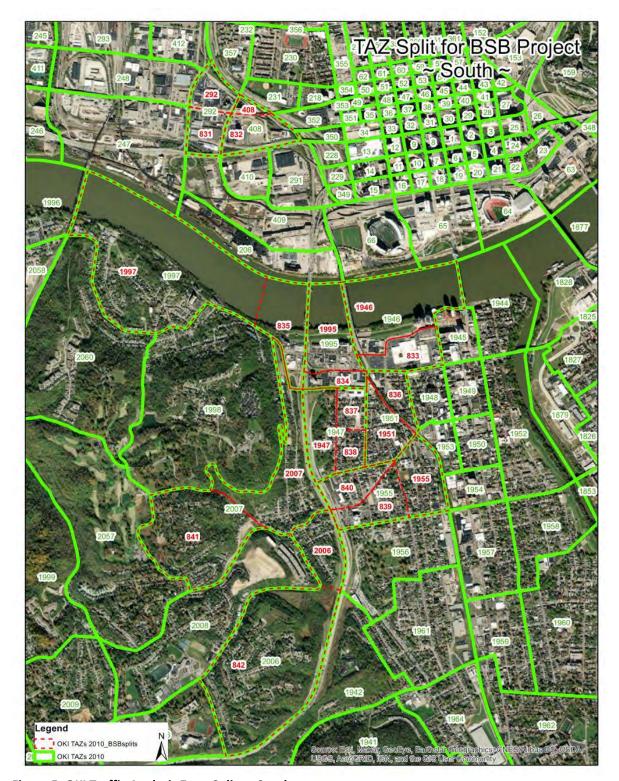


Figure 5: OKI Traffic Analysis Zone Splits – South

# **Regional Validation Statistics**

During the course of the validation of the OKI model for use in this study, a need for improvement in the underlying destination-choice model calibration was identified. While ODOT has begun the

process to address this need, full model re-calibration goes beyond the scope of this individual study. At this time, while the model does not meet all of ODOT's recommended standards for validation, results comes close to the validation criteria and this model is considered the OKI MOR as discussed in the Introduction of this memorandum.

The validation checks presented in this memo, including percent root mean square error (%RMSE), vehicle miles traveled (VMT), Screenlines, and Volume-to-Ground Count Ratio (V/G), are presented for completeness.

#### % RMSE

**Table 1** and **Figure 6** show the % RMSE for the combined OKI and MVRPC Region. As noted above, many of the established volume groups do not meet the validation targets, but most groups are near the threshold.

Table 1: Daily % RMSE by Volume Group for the Combined OKI and MVRPC Region

rable in Dally 70 mine	- <del> </del>	<u> </u>	***************************************	<u> </u>	TTTT C TTCB	• : <u> </u>	
Count Range:	# Links	Avg. Count	Avg. Model	# Diff	% Diff	% RMSE	MAX % RMSE
0-499	260	294	401	107	36%	199.85%	200%
500-1,499	755	960	1,033	73	8%	115.79%	100%
1,500-2,499	553	1,966	1,896	-69	-4%	82.93%	62%
2,500-3,499	490	2,986	2,891	-95	-3%	64.05%	54%
3,500-4,499	453	3,975	3,867	-107	-3%	58.48%	48%
4,500-5,499	363	4,962	4,420	-541	-11%	48.16%	45%
5,500-6,999	471	6,191	5,972	-219	-4%	48.29%	42%
7,000-8,499	371	7,720	7,191	-529	-7%	44.29%	39%
8,500-9,999	300	9,237	9,031	-206	-2%	45.05%	36%
10,000-12,499	345	11,159	10,557	-602	-5%	36.07%	34%
12,500-14,999	146	13,642	13,783	141	1%	38.08%	31%
15,000-17,499	94	16,022	16,797	775	5%	40.84%	30%
17,500-19,999	46	18,664	17,107	-1,556	-8%	31.37%	28%
20,000-24,999	61	22,256	20,260	-1,996	-9%	26.97%	26%
25,000-34,999	91	29,719	29,866	147	0%	24.57%	24%
35,000-54,999	114	44,244	42,972	-1,272	-3%	32.43%	21%
55,000-74,999	103	63,332	63,177	-155	0%	22.66%	18%
75,000-120,000	21	79,196	78,503	-693	-1%	13.91%	12%
Total	5,037	8,140	7,926	-214	-3%	52.27%	

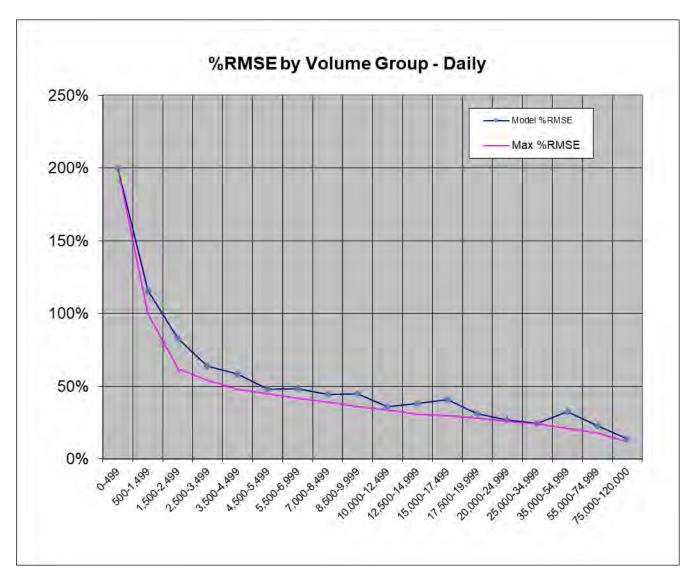


Figure 6: Daily % RMSE by Volume Group for the Combined OKI and MVRPC Region

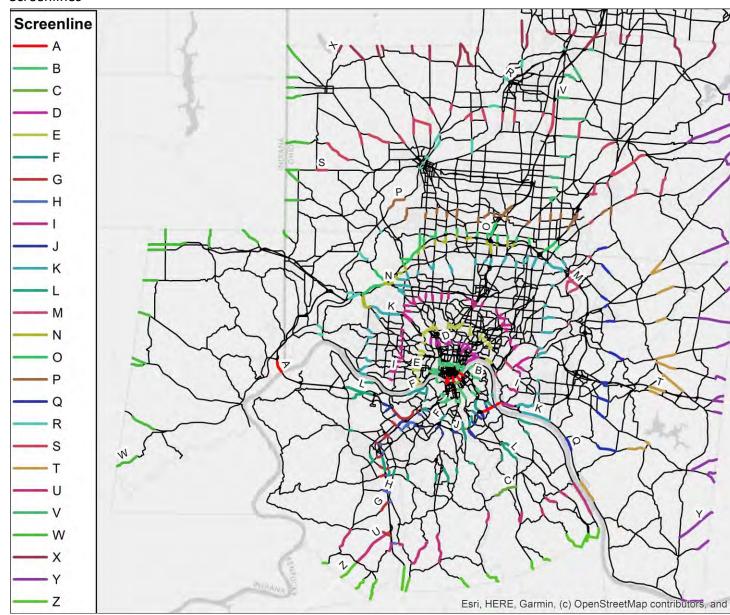
## VMT

**Table 2** shows the comparison of count versus modeled VMT by functional class for the entire combined OKI and MVRPC region. Overall, modeled VMT was lower than counted VMT (slightly below the established threshold).

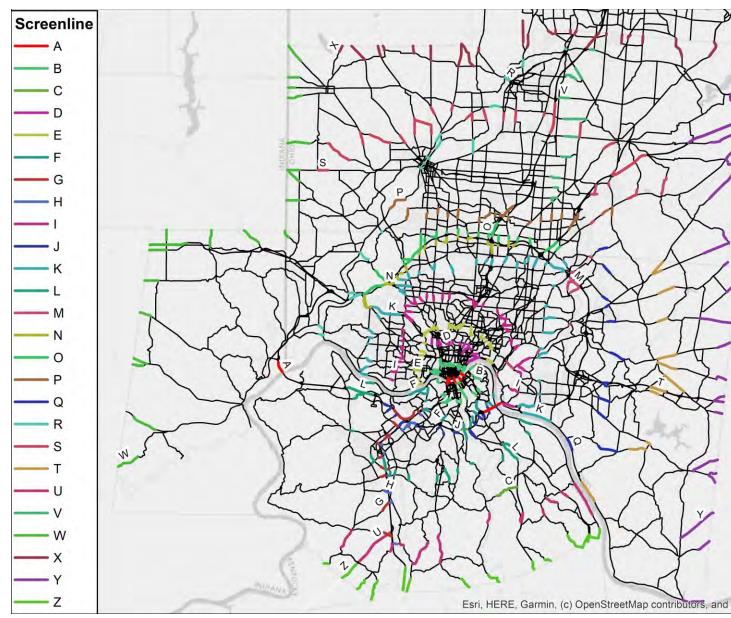
Table 2: Daily Observed vs. Modeled VMT by Functional Class for the Combined OKI and MVRPC Region

	Observed	l Traffic				Modeled 7	Traffic			Abs Diff	Percent I	Difference		
Facility Type	# Links	Count	Count VMT	Count %	Count VMT	Volume	Model VMT	Volume %	Model VMT	Volume	Volume	VMT	Max. % VMT	% RMSE
1 Interstate	375	16,719,496	14,080,085	45%	63%	16,393,553	13,899,493	46%	64%	-325,943	-2%	-1%	7%	27%
2 Expressway	69	973,294	768,832	3%	3%	845,384	681,841	2%	3%	-127,910	-13%	-11%	10%	36%
3 Arterial	2,087	15,176,325	5,352,824	41%	24%	14,910,532	5,120,217	42%	24%	-265,793	-2%	-4%	10%	48%
4 Collector	1,486	3,788,354	1,996,736	10%	9%	3,198,792	1,656,553	9%	8%	-589,562	-16%	-17%	15%	70%
5 Local	400	402,807	237,116	1%	1%	377,399	211,415	1%	1%	-25,408	-6%	-11%	15%	139%
Total	4,417	37,060,276	22,435,594			35,725,660	21,569,519			-1,334,616	-3.6%	-3.9%	3%	52%

## Screenlines



**Figure** 7 shows the screenlines for the OKI region. **Table 3** shows the difference in counted versus modeled volume for each screenline. Note that Screenline A (red



**Figure** 7) covers all of the regional crossings of the Ohio River, including the 5 bridges within the Study Area and two I-275 bridges to the East and West of the Study Area.

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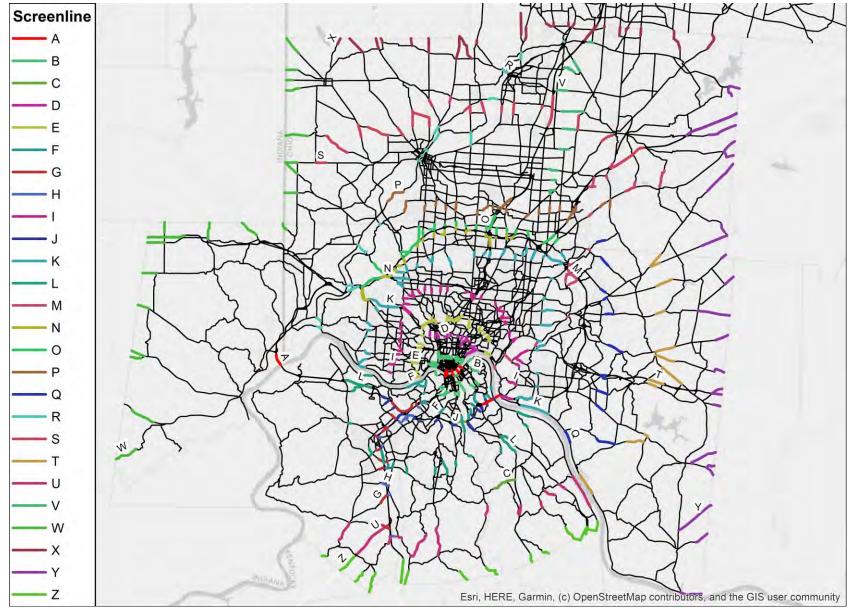


Figure 7: Screenlines for the OKI Region

**Table 3: OKI Region Screenline Daily Counts vs. Model Volumes** 

Tuble of our			To		T							
SCREENLINE	# Links (1-WAY)	Count	Model	# Diff	% Diff		Count	Model		# Diff	% Diff	% RMSE
A	18	509,054	488,121	-20,933	-4%		28,281	27,118	ıΕ	-1,163	-4%	33%
В	16	433,474	425,018	-8,456	-2%		27,092	26,564	П	-529	-2%	93%
С	3	55,980	28,060				18,660	9,353	П			34%
D	12	586,684	466,208	-120,476	-21%		48,890	38,851	ſΓ	-10,040	-21 %	53%
E	23	448,881	433,826	-15,055	-3%		19,517	18,862	ſΤ	-655	-3%	70%
F	12	289,200	272,784	-16,416	-6%		24,100	22,732	ΙT	-1,368	-6%	82%
G	4	98,686	84,069		¥,7=		24,672	21,017	П	-,	4,7-	71%
Н	4	116,879	72,279				29,220	18,070	ıΤ			65%
I	35	626,582	540,686	-85,896	-14%		17,902	15,448	ıΤ	-2,454	-14%	43%
J	8	112,990	101,463	-11,527	-10%		14,124	12,683	ıΙ	-1,441	-10%	14%
K	30	661,120	638,366	-22,754	-3%		22,037	21,279	H	-758	-3%	79%
L	8	79,360	64,925	-14,435	-18%		9,920	8,116	ſΤ	-1,804	-18%	178%
M	14	190,028	149,455	-40,573	-21%		13,573	10,675	П	-2,898	-21 %	55%
N	14	275,727	277,207	1,480	1%		19,695	19,801	П	106	1%	42%
0	15	496,809	481,818	-14,991	-3%		33,121	32,121	ιГ	-999	-3%	52%
P	11	250,346	261,195	10,849	4%		22,759	23,745	ιГ	986	4%	45%
Q	2	5,420	10,214				2,710	5,107	ſΤ			65%
R	6	108,075	98,857	-9,218	-9%		18,013	16,476	ſΤ	-1,536	-9%	59%
S	12	214,150	267,235	53,085	25%		17,846	22,270	ı٢	4,424	25%	80%
T	2	17,890	17,358				8,945	8,679	ΙT			47%
U	4	5,720	4,439				1,430	1,110	ıΤ			37%
V	18	125,940	114,568	-11.372	-9%		6,997	6,365	止	-632	-9%	75%
W	0	0	0				0	0	ιt			31%
X	8	36,250	39,856	3,606	10%		4,531	4,982	ιt	451	10%	88%
Y	13	53,220	50,997	-2,223	-4%		4,094	3,923	ιt	-171	-4%	83%
Z	0	0	0	,,	,-	-	0	0	ιt		,-	0%

#### Volume-to-Ground Count Ratio

**Figure 8** shows daily V/G for the links in the combined OKI and MVRPC regions. Darker blue colors indicate model volumes significantly lower than counted volumes and darker reds indicate model volumes significantly higher than counted volumes.

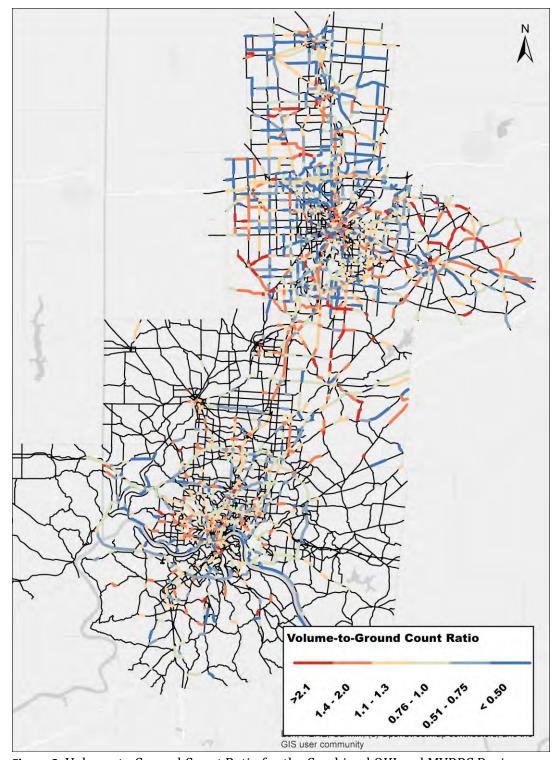
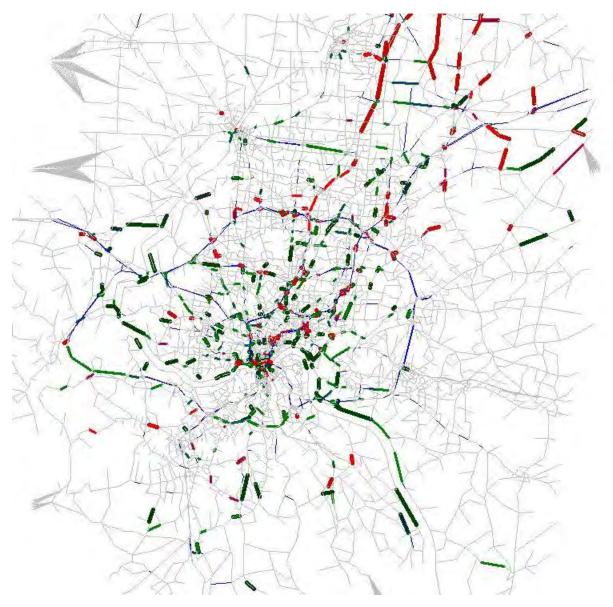


Figure 8: Volume-to Ground Count Ratio for the Combined OKI and MVRPC Region



Dark Red	V/G < 1.5
Red	1.25 < V/G < 1.5
Blue	0.75 < V/G < 1.25
Green	0.5 < V/G < 1.75
Dark Green	0.5 < V/G

Figure 8a: Volume-to Ground Count Ratio for OKI

It is worth noting here that the freeways within the IR 275 outerbelt are almost all close to the ground counts. The exception is that volumes on IR 275 through Kentucky are lower than the traffic counts.

#### **Subarea Validation Statistics**

The following subsections outline similar checks focused specifically on the BSB Study Area.

ODOT reviewed some of the traffic counts in the subarea and found them to be mis-coded. In other words, the counts were coded to a link either before or after a merge/diverge and therefore was not attributed to the correct location. The tables and figures in this section have been updated from the October memo.

The subarea of the Model of Record performs somewhat better than the entire model overall and indeed the subarea %RMSE of 30.6% is under the 40% threshold.

#### % RMSE

**Table 4** and **Figure** 9 show the % RMSE results for the BSB Study Area. With some exceptions for lower volumes, most volume groups fall within a couple percentage points of the established thresholds.

Table 4: Daily % RMSE by Volume Group for the BSB Study Area

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Count Range:	# Links	Avg. Count	Avg. Model	# Diff	% Diff	% RMSE	MAX % RMSE
0-499	1	210	15			0.0%	200%
500-1,499	15	1,140	871	-269	-24%	64.0%	100%
1,500-2,499	26	2,053	1,699	-354	-17%	54.5%	62%
2,500-3,499	40	3,027	2,799	-227	-8%	83.1%	54%
3,500-4,499	49	3,980	3,637	-344	-9%	59.6%	48%
4,500-5,499	37	5,054	4,493	-562	-11%	46.8%	45%
5,500-6,999	48	6,249	5,805	-444	-7%	43.5%	42%
7,000-8,499	47	7,784	6,331	-1,453	-19%	46.6%	39%
8,500-9,999	45	9,330	8,305	-1,025	-11%	37.3%	36%
10,000-12,499	50	11,121	10,945	-175	-2%	39.4%	34%
12,500-14,999	31	13,894	12,760	-1,133	-8%	33.5%	31%
15,000-17,499	22	16,027	12,055	-3,972	-25%	35.4%	30%
17,500-19,999	10	18,491	16,286	-2,204	-12%	36.2%	28%
20,000-24,999	13	22,621	22,316	-304	-1%	29.5%	26%
25,000-34,999	29	29,589	28,836	-753	-3%	16.9%	24%
35,000-54,999	37	47,058	42,492	-4,567	-10%	22.3%	21%
55,000-74,999	39	64,481	60,258	-4,223	-7%	16.7%	18%
75,000-120,000	18	79,271	76,502	-2,769	-3%	14.8%	12%
Total	557	17,987	16,625	-1,362	-8%	30.6%	40%

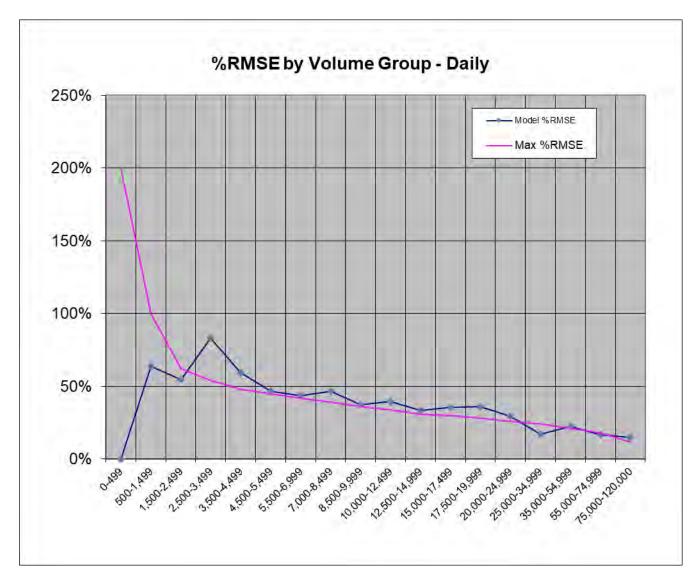


Figure 9: Daily % RMSE by Volume Group for the BSB Study Area

**Figure 10** shows the absolute relative difference associated with each count in the study area (analogous to the volume group curve in **Figure 9**). Approximately 34% of counts fall above the maximum relative difference line (in red).

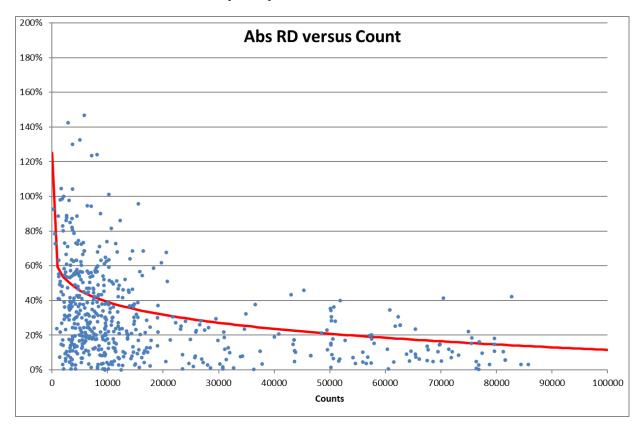


Figure 10: Daily Absolute Relative Difference Total Volume for the BSB Study Area

**Figure 11** shows the same metric for truck volumes in the BSB study area. Just over 20% of study area counts fall above the established threshold.

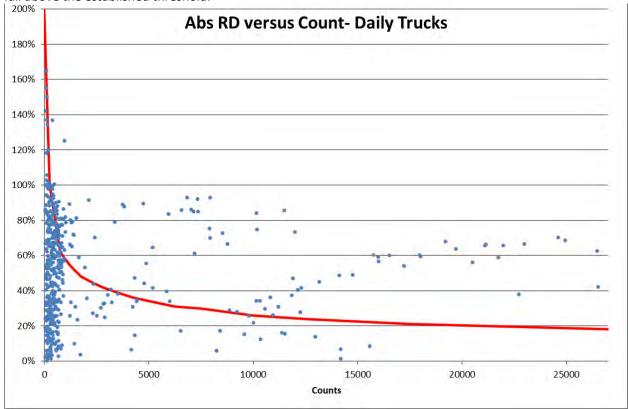


Figure 11: Daily Absolute Relative Difference Truck Volume for the BSB Study Area

**Figure 12** through **Figure 15** show the absolute relative difference for each of the four model periods. On average each period has approximately 41% of counts falling above the established threshold (in red).

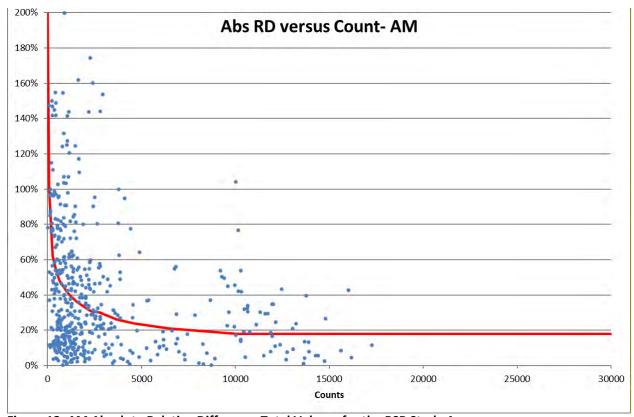


Figure 12: AM Absolute Relative Difference Total Volume for the BSB Study Area

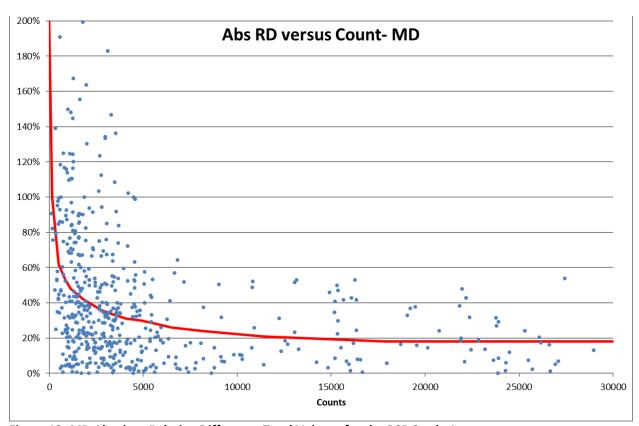


Figure 13: MD Absolute Relative Difference Total Volume for the BSB Study Area

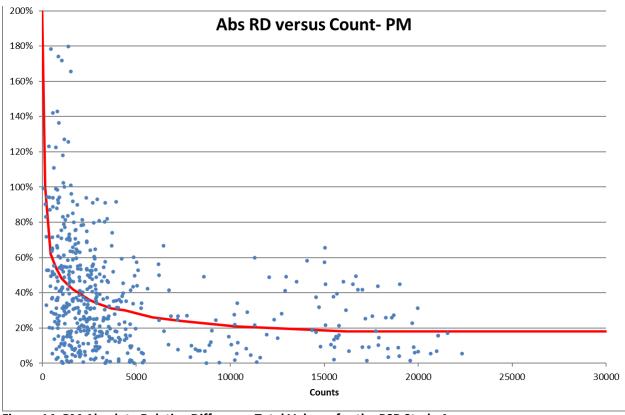


Figure 14: PM Absolute Relative Difference Total Volume for the BSB Study Area

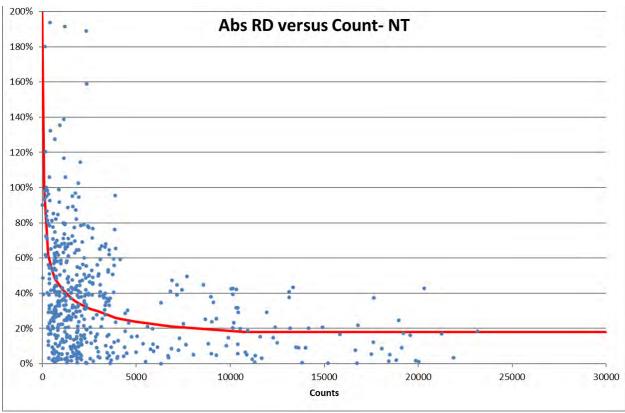


Figure 15: NT Absolute Relative Difference Total Volume for the BSB Study Area

#### VMT

**Table 5** shows the VMT comparison for the BSB study area by functional class. Overall, traffic in the entire study area is low by 7%. Given that VMT is low for all functional classes, ODOT determined that this is a systemic error which can be accounted for in the Certified Design Traffic procedures. As is visible in the upcoming V/G map (**Figure 16**), this under estimation on Interstates is largely due to the underestimation of traffic on the I-275 bypass, which is likely related to the underlying model calibration issues indicated above. As seen in **Figure 17**, downtown Cincinnati bridges are matching traffic counts well, with the Clay Wade Bailey Bridge, which does not have a significant amount of traffic.

Table 5: Daily Observed vs. Modeled VMT by Functional Class for the BSB Study Area

Daily	Observed	Traffic				Modeled T	raffic			Abs Diff	Percent I	Difference		
Facility Type	# Links	Count	Count VMT	Count %	Count VMT	Volume	Model VMT	Volume %	Model VMT	Volume	Volume	VMT	Max. % VMT	% RMSE
1 Interstate	125	6,550,679	3,562,259	65%	83%	6,133,349	3,305,320	66%	83%	-417,330	-6%	-7%	7%	18%
2 Expressway	0	0	0	0%	0%	0	0	0%	0%	0	#DIV/0!	#DIV/0!	10%	0%
3 Ramp	124	1,044,568	273,060	10.4%	6%	1,120,629	292,687	12.1%	7%	76,061	7%	7%	15%	37%
4 Arterial	266	2,251,008	437,773	22%	10%	1,826,936	348,196	20%	9%	-424,072	-19%	-20%	10%	44%
5 Collector	36	156,560	38,586	2%	1%	167,315	32,683	2%	1%	10,755	7%	-15%	15%	78%
6 Local	6	15,900	4,182	0%	0%	11,954	2,953	0%	0%	-3,946	-25%	-29%	15%	77%
Total	557	10,018,715	4,315,859			9,260,184	3,981,838			-758,531	-7.6%	-7.7%	3%	31%

#### Volume-to-Ground Count Ratio

**Figure 16** shows the V/G for the links in the BSB study area. **Figure 18** shows a closer view of the V/G around the Ohio River crossings. Figures 16a and 17a show the same areas, but with a different color scheme.

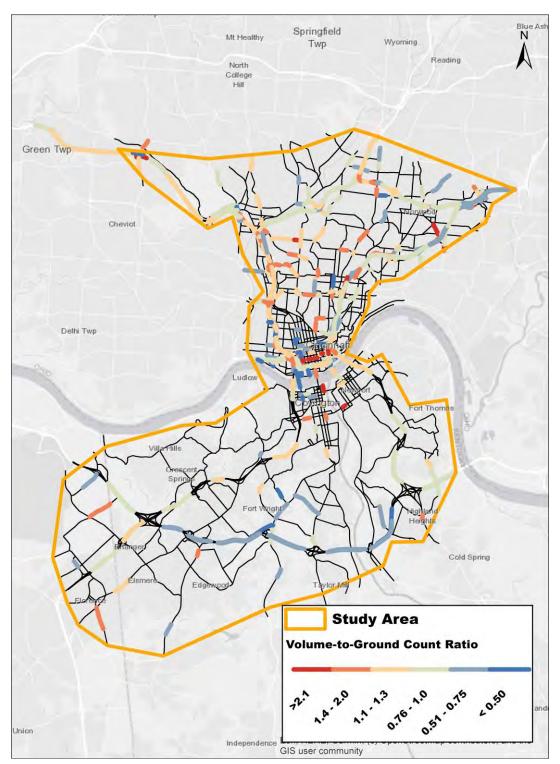
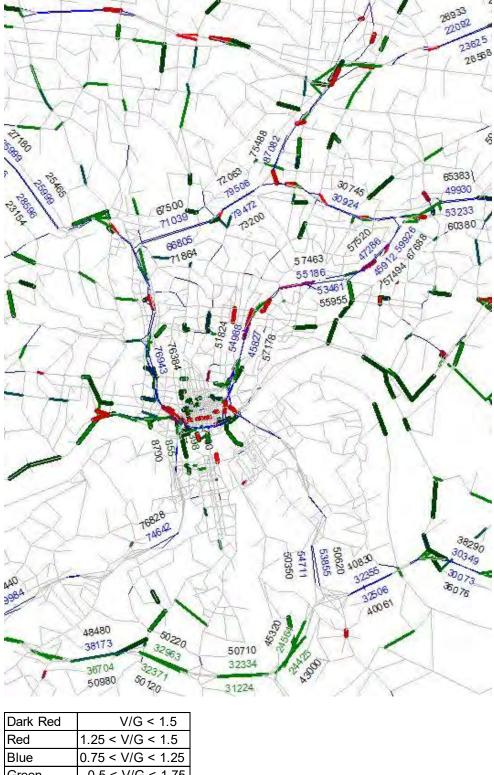


Figure 16: Volume-to Ground Count Ratio for the BSB Study Area

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Dark Red	V/G < 1.5
Red	1.25 < V/G < 1.5
Blue	0.75 < V/G < 1.25
Green	0.5 < V/G < 1.75
Dark Green	0.5 < V/G

Volumes in color. Counts in black.

Figure 17a: Volume-to Ground Count Ratio for the BSB Study Area

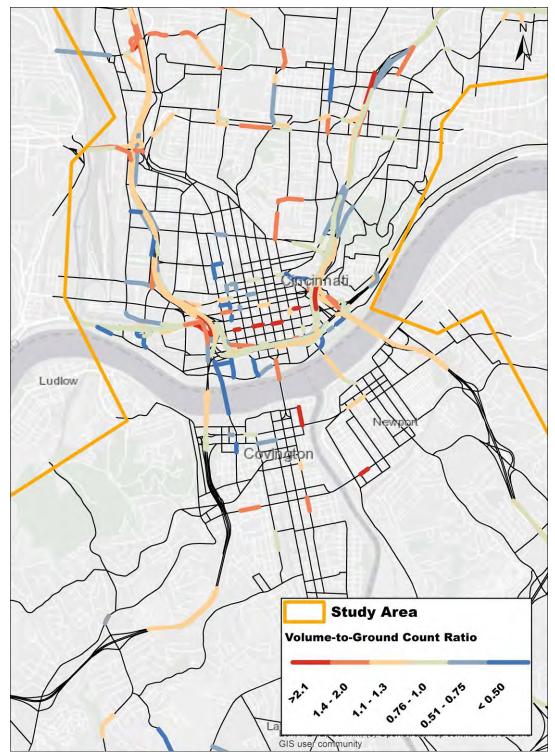


Figure 18: Volume-to Ground Count Ratio for River Crossings

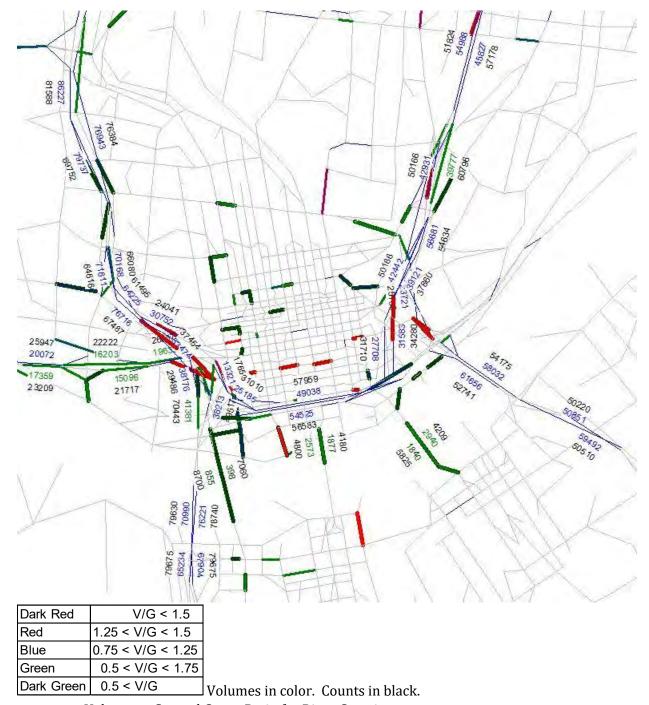


Figure 19a: Volume-to Ground Count Ratio for River Crossings

## **Select Link Review**

At FHWA's request, ODOT conducted select link analysis of traffic crossing the BSB and compared the model distribution with those from StreetLight. **Figures 18** and **19** show percent of total traffic by township crossing the BSB. **Figures 20** and **21** show only truck traffic.

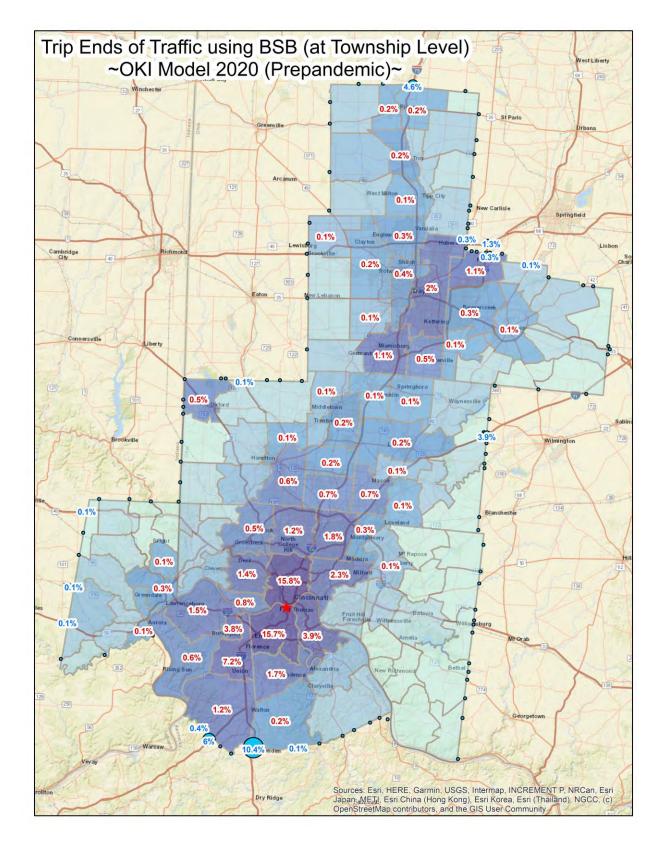


Figure 18: BSB Traffic by Township - Model Traffic

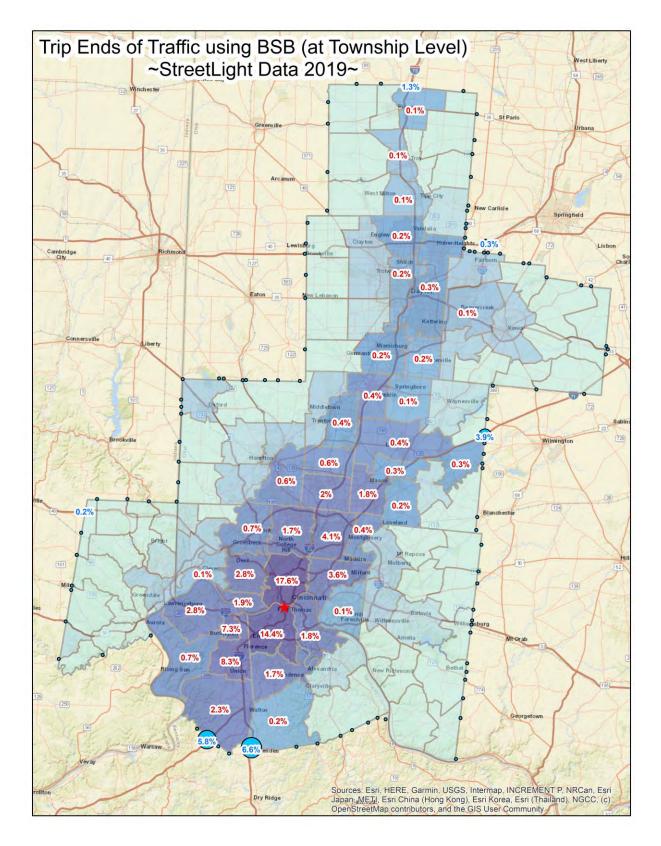


Figure 19: BSB Traffic by Township – StreetLight Traffic

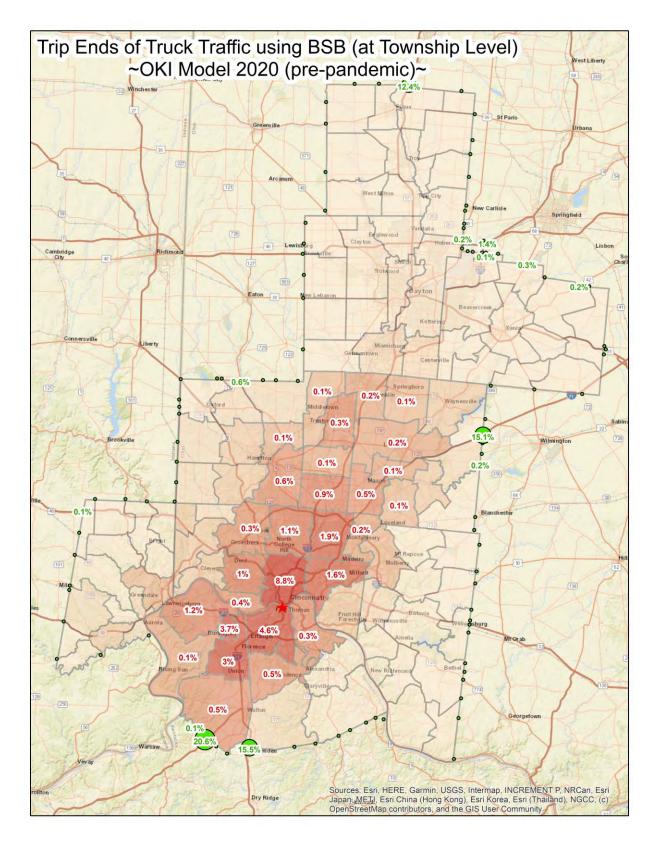


Figure 20: BSB Truck Traffic by Township – Model Traffic

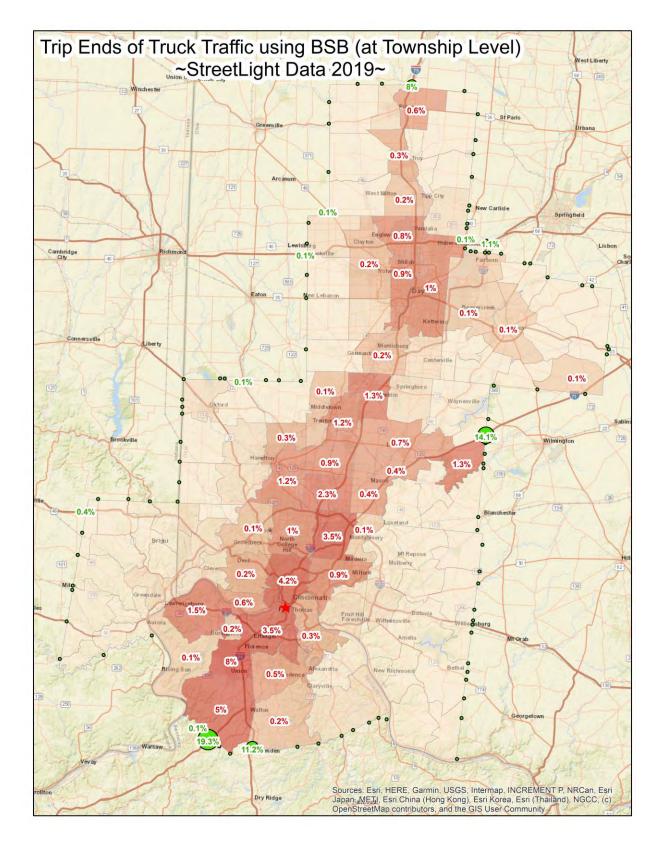


Figure 21: BSB Truck Traffic by Township – Model Traffic

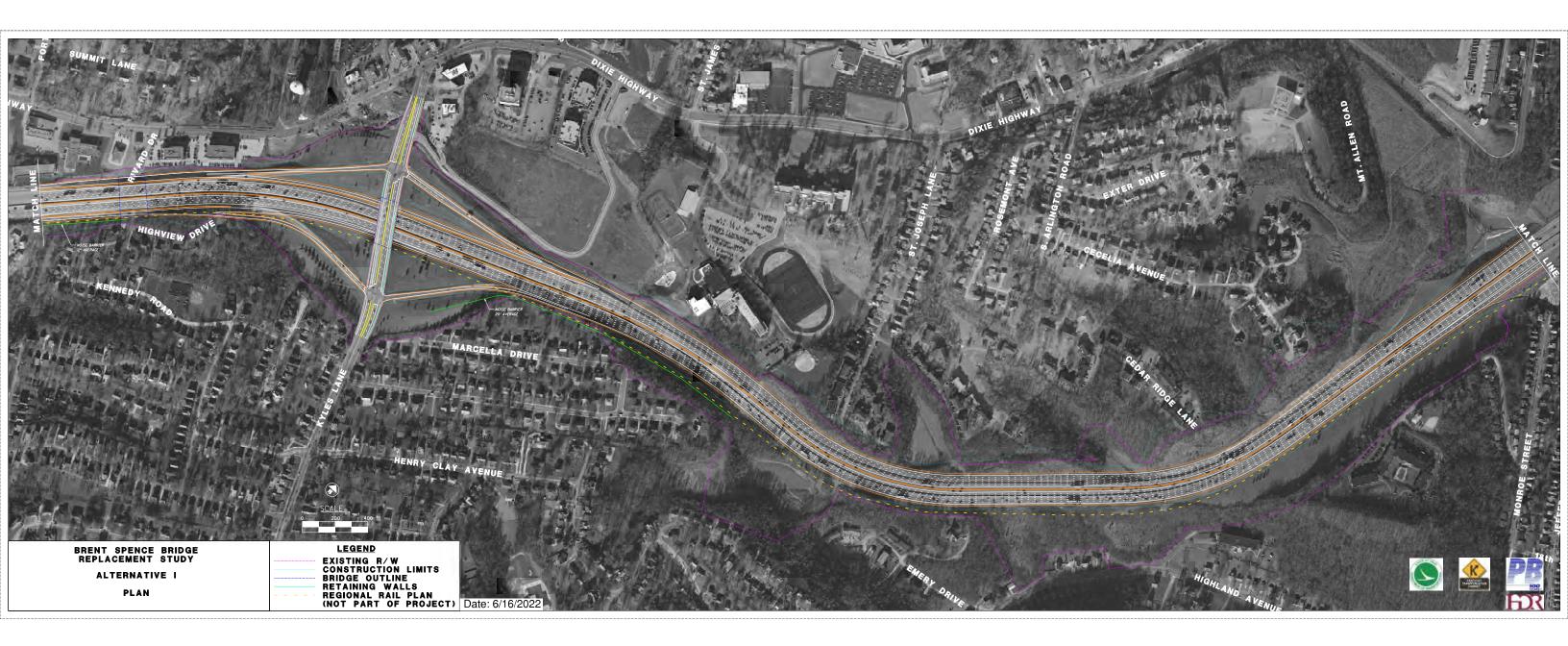
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Several observations are noted. First, truck traffic traveling through the entire region on IR 75 appears to be about 4% higher than that noted from the StreetLight analysis. Second, passenger car traffic from Montgomery County is over-represented and passenger car traffic from Warren County is under-represented in the model when compared to the StreetLight analysis. Third, the truck traffic coming from the Cincinnati airport (which is given its own zone) is generally missing from the StreetLight analysis. Initial thoughts are that the freight companies located near the airport are missing from StreetLight's LBS dataset.

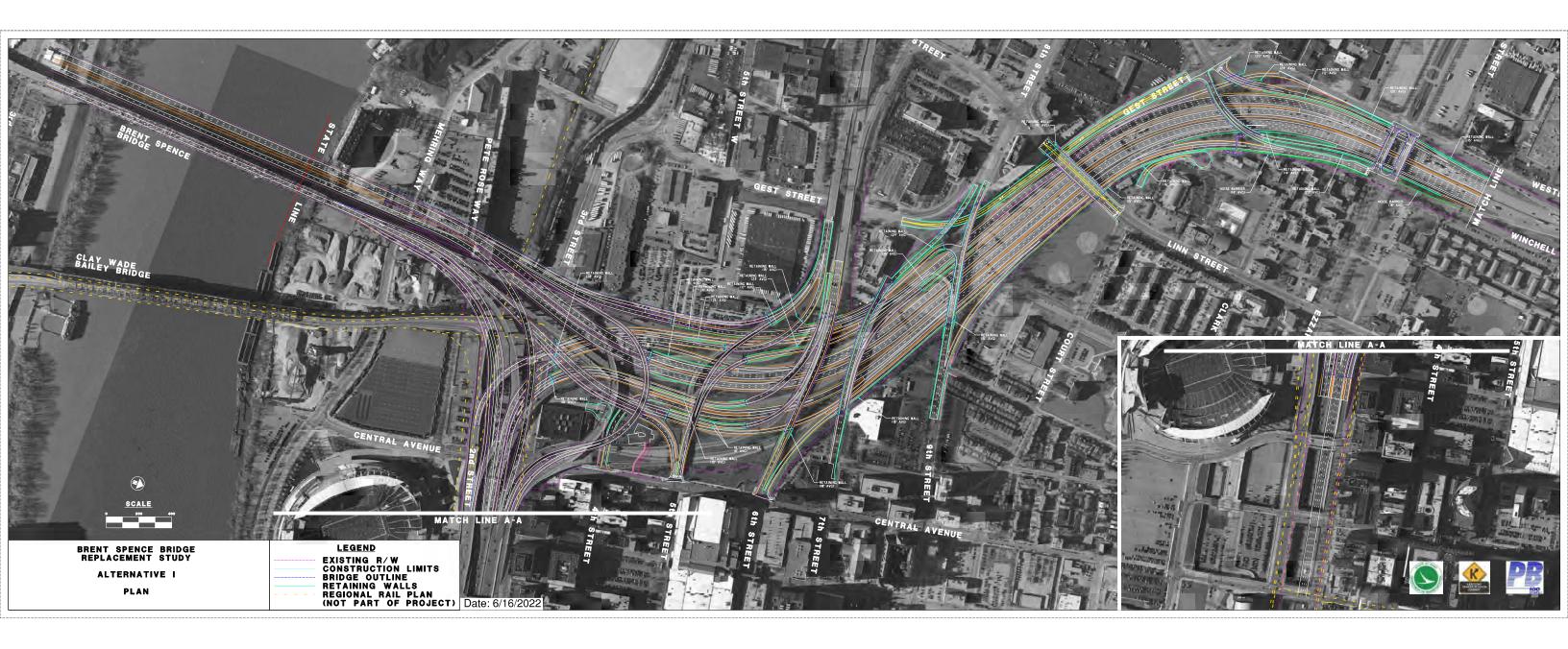
## **Appendix C: Exhibits**



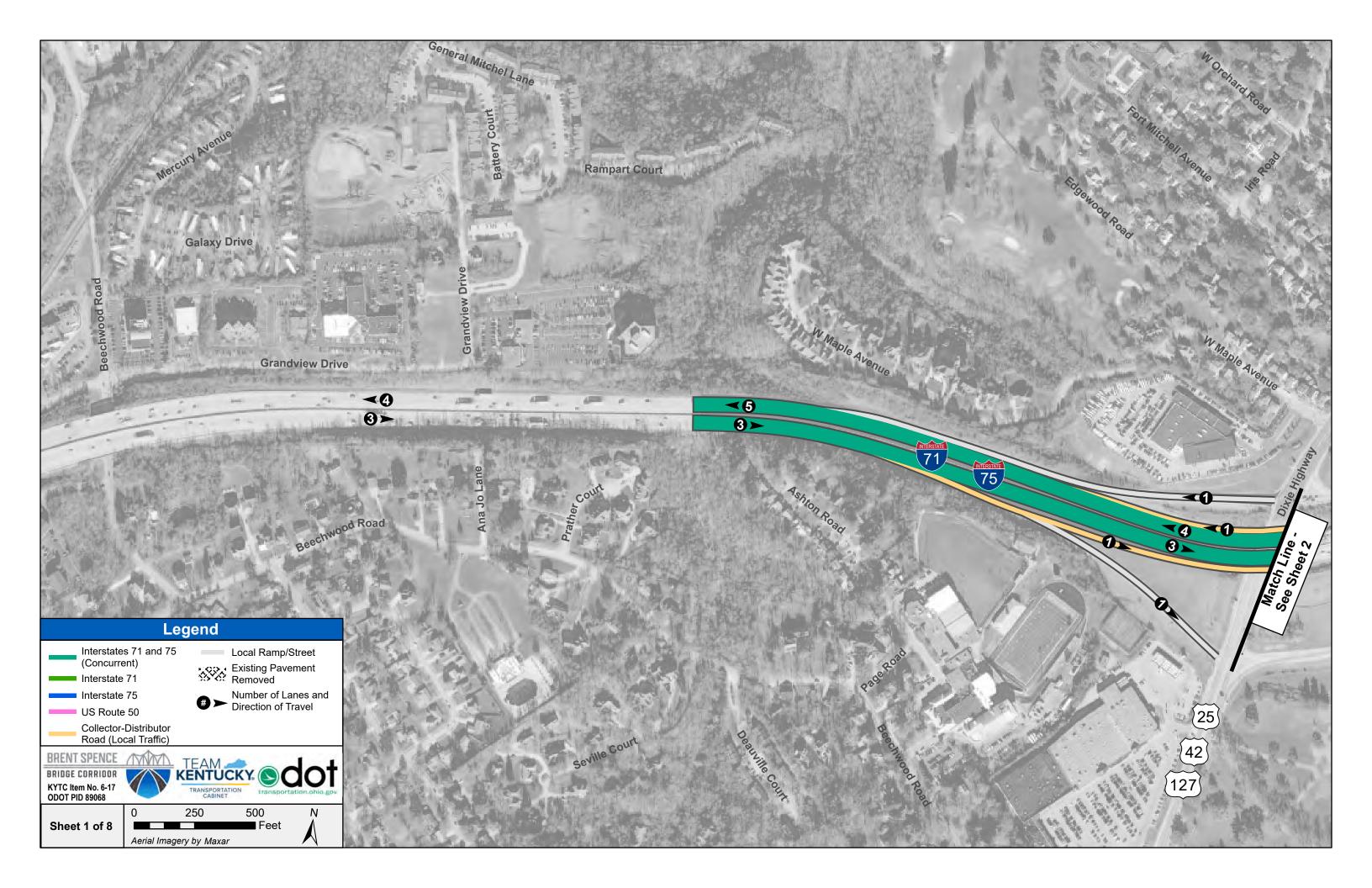


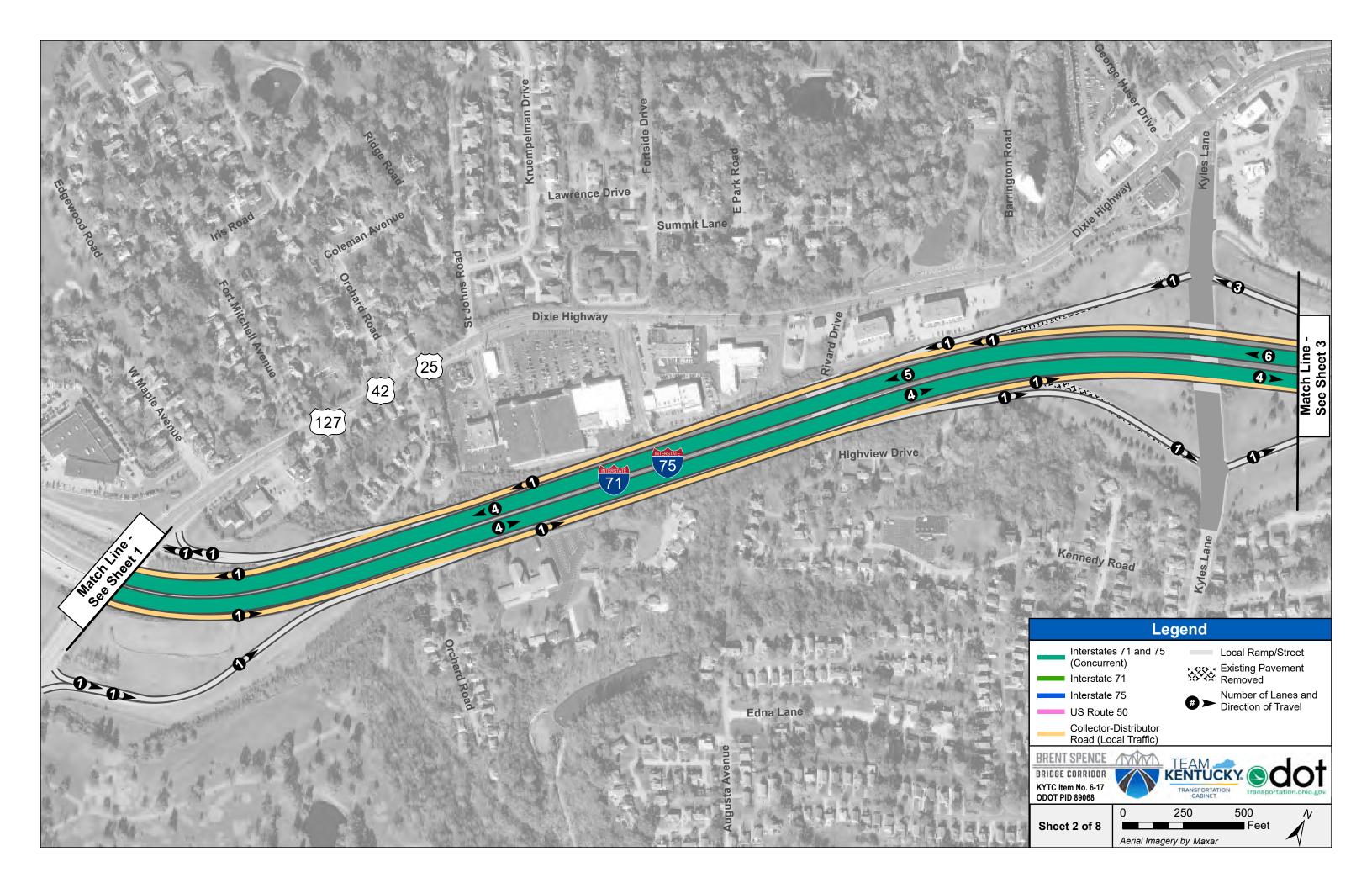


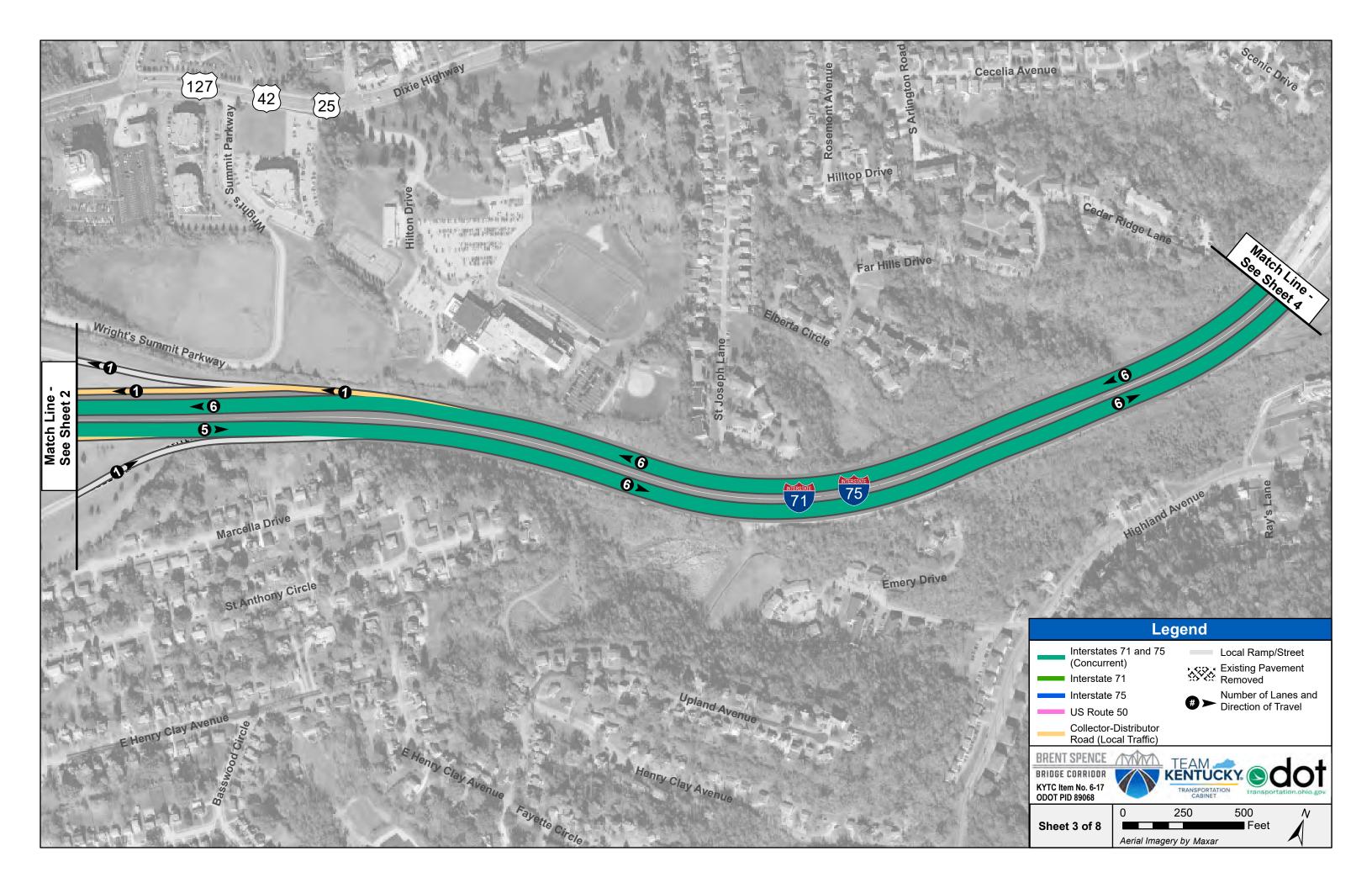


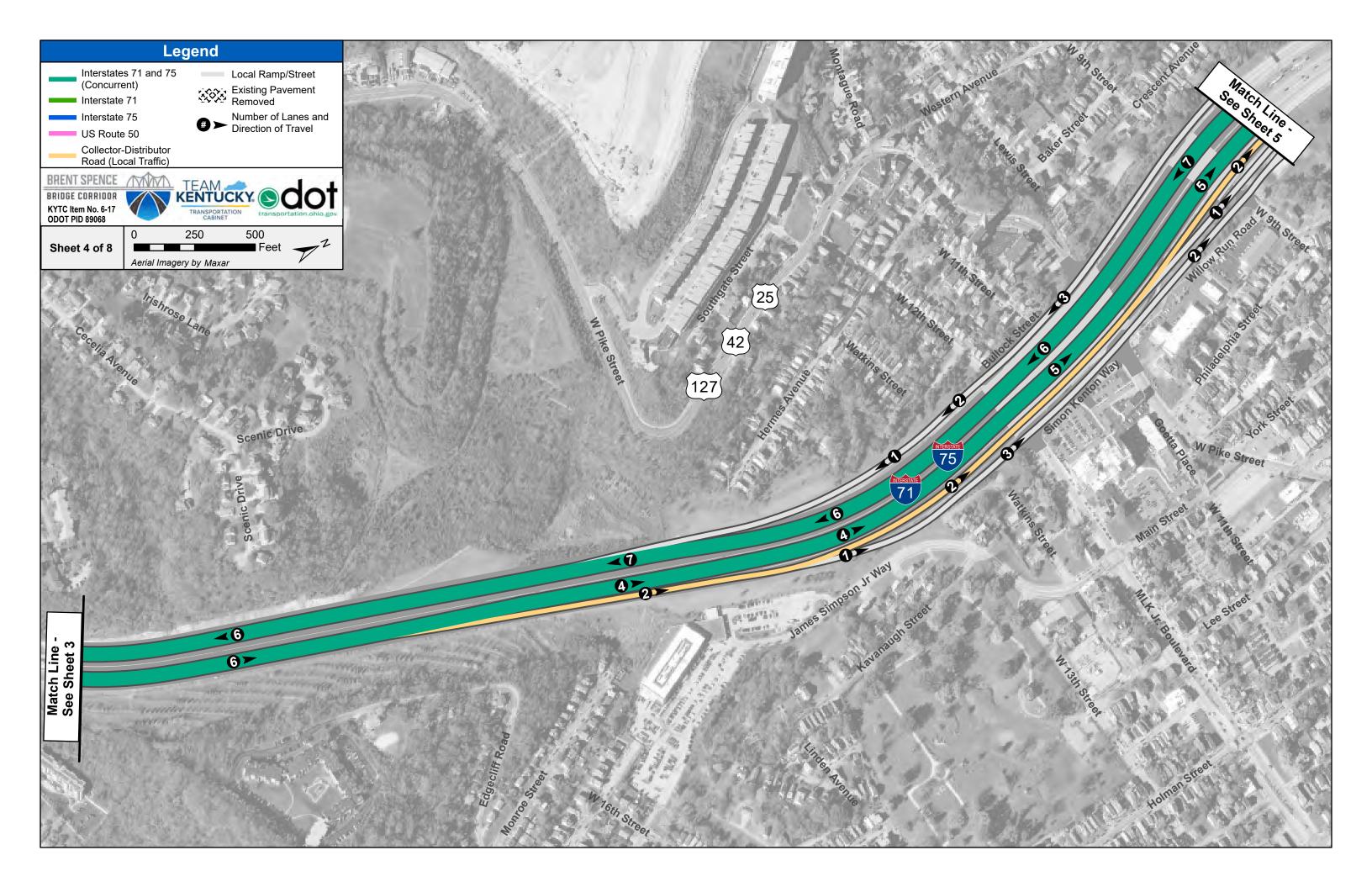


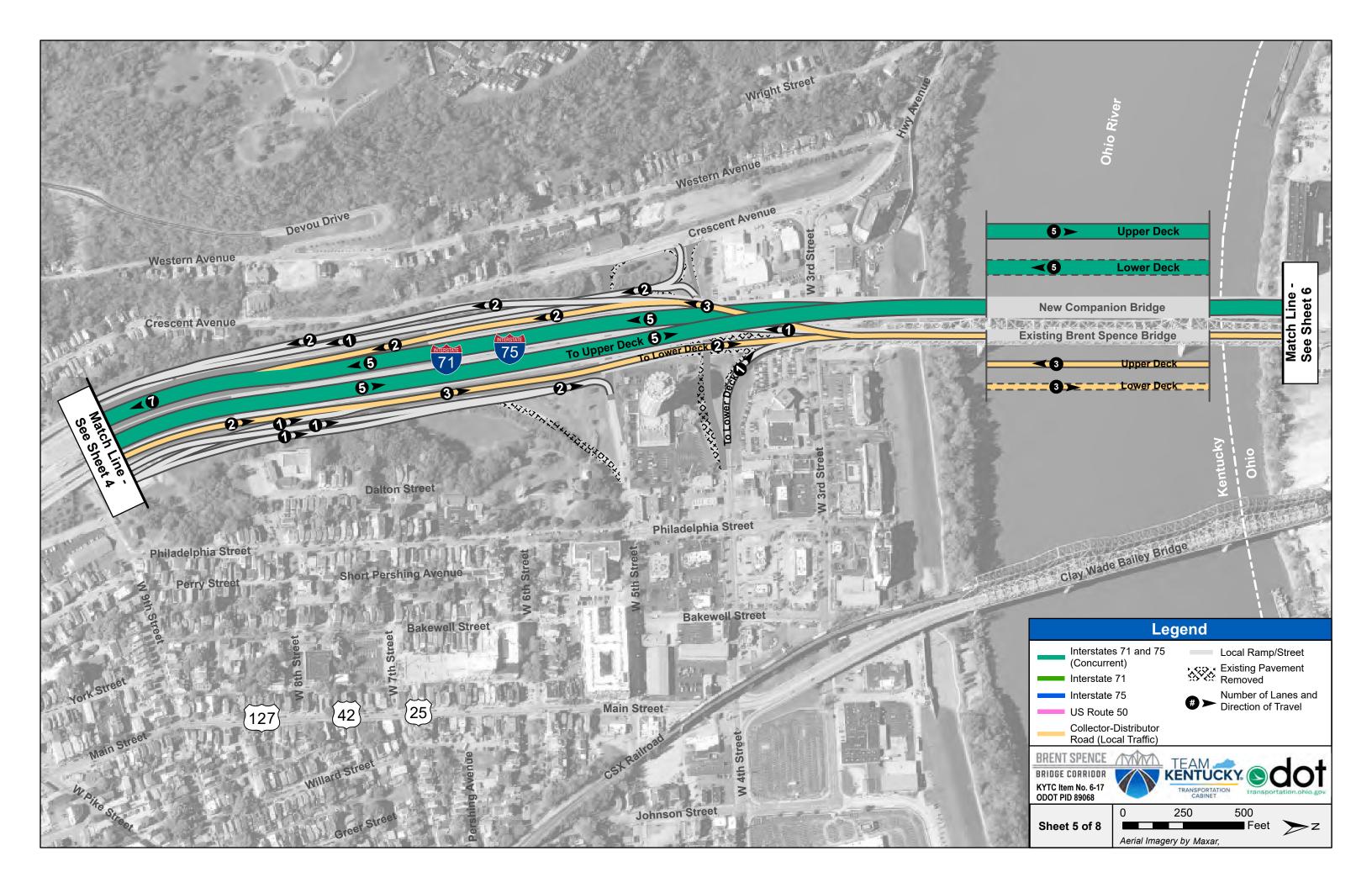


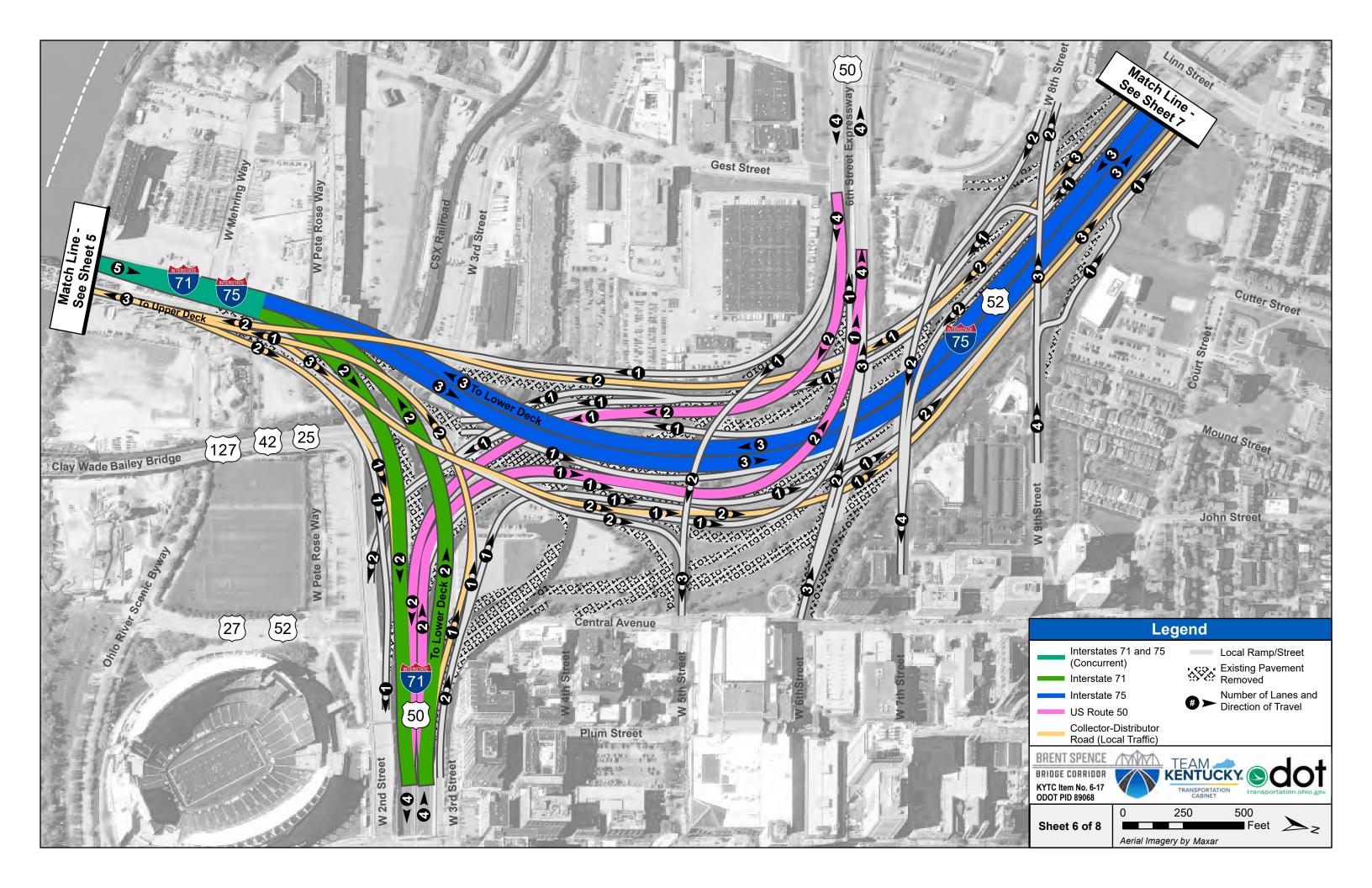


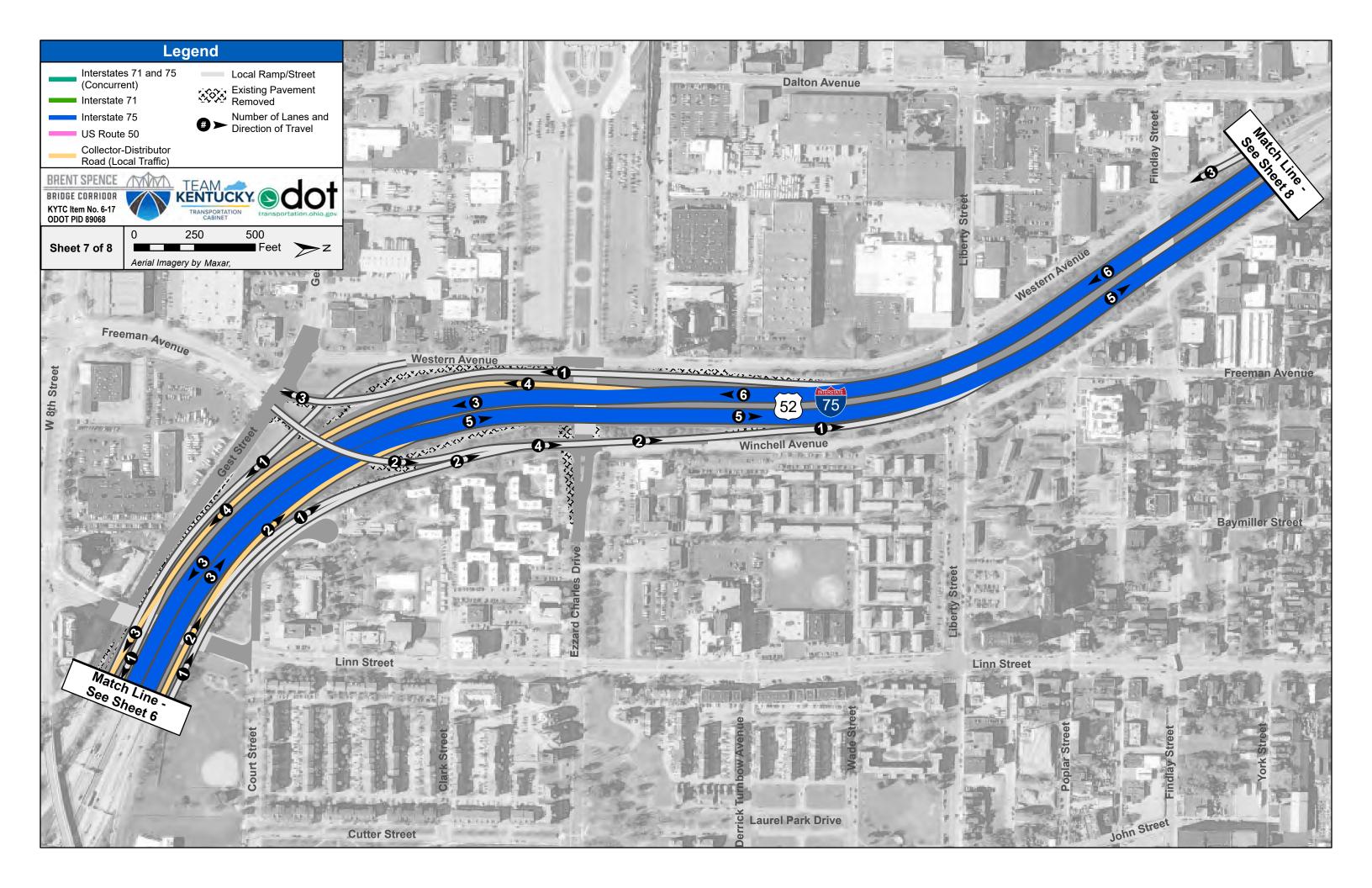


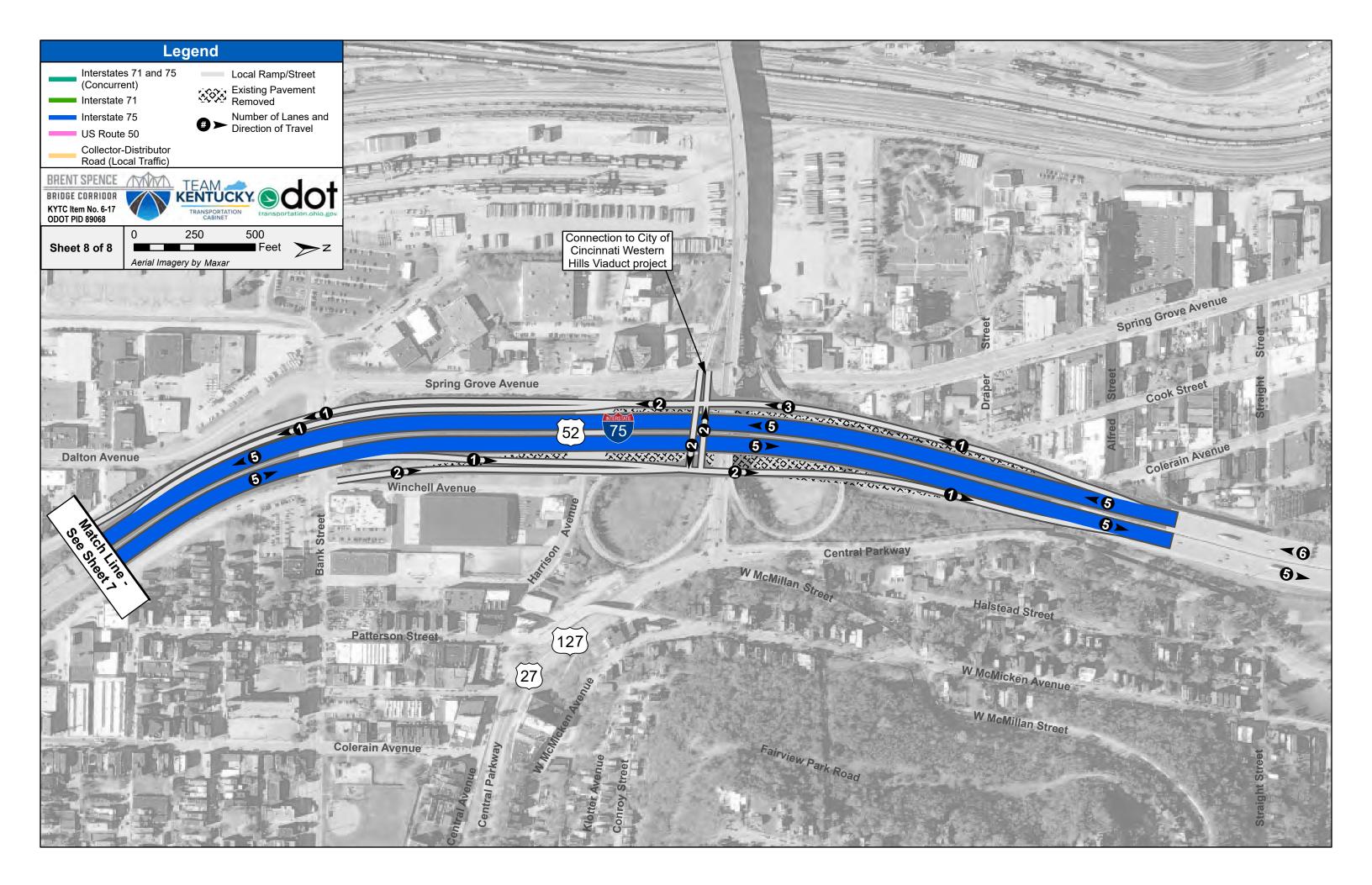


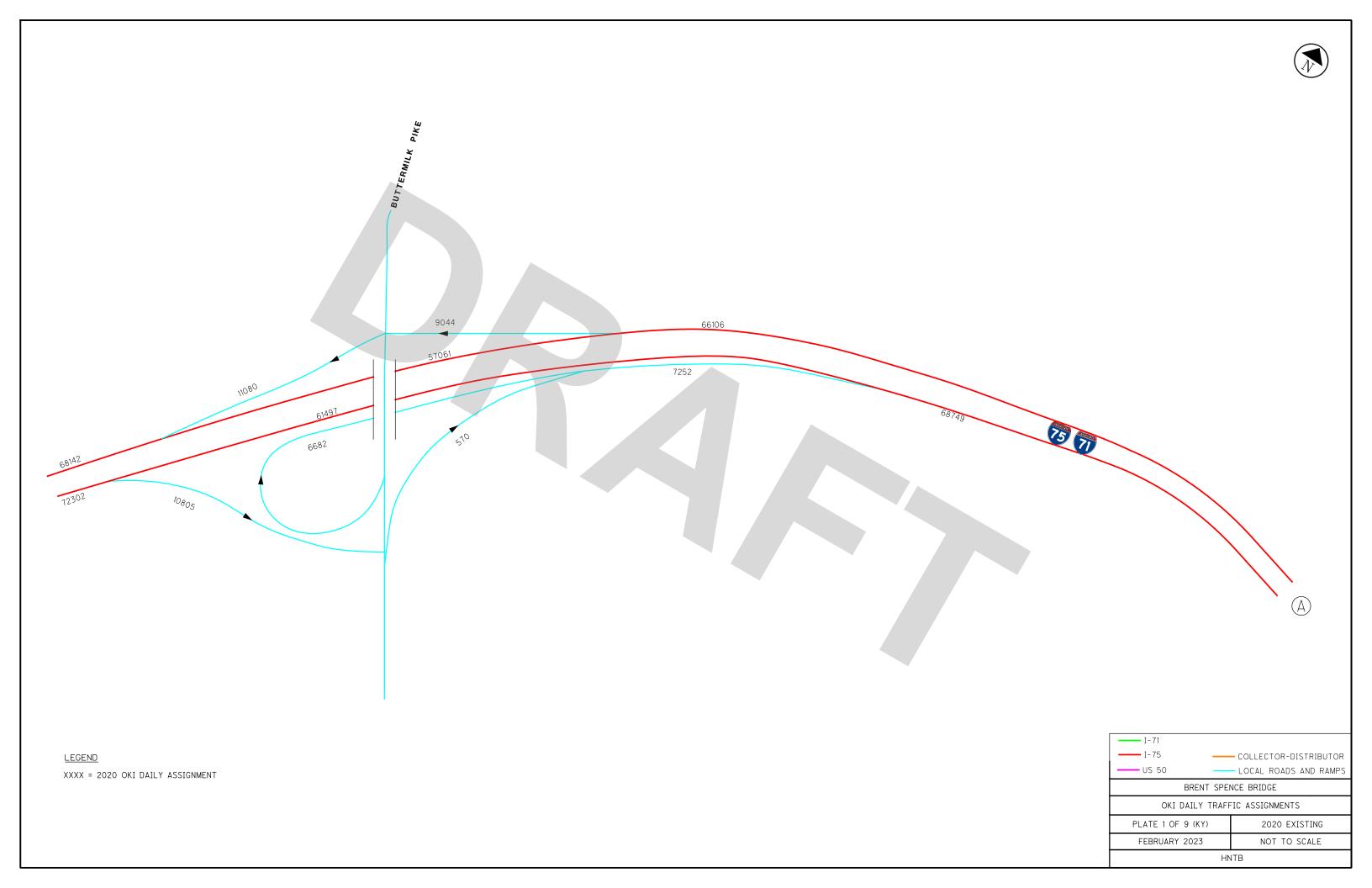


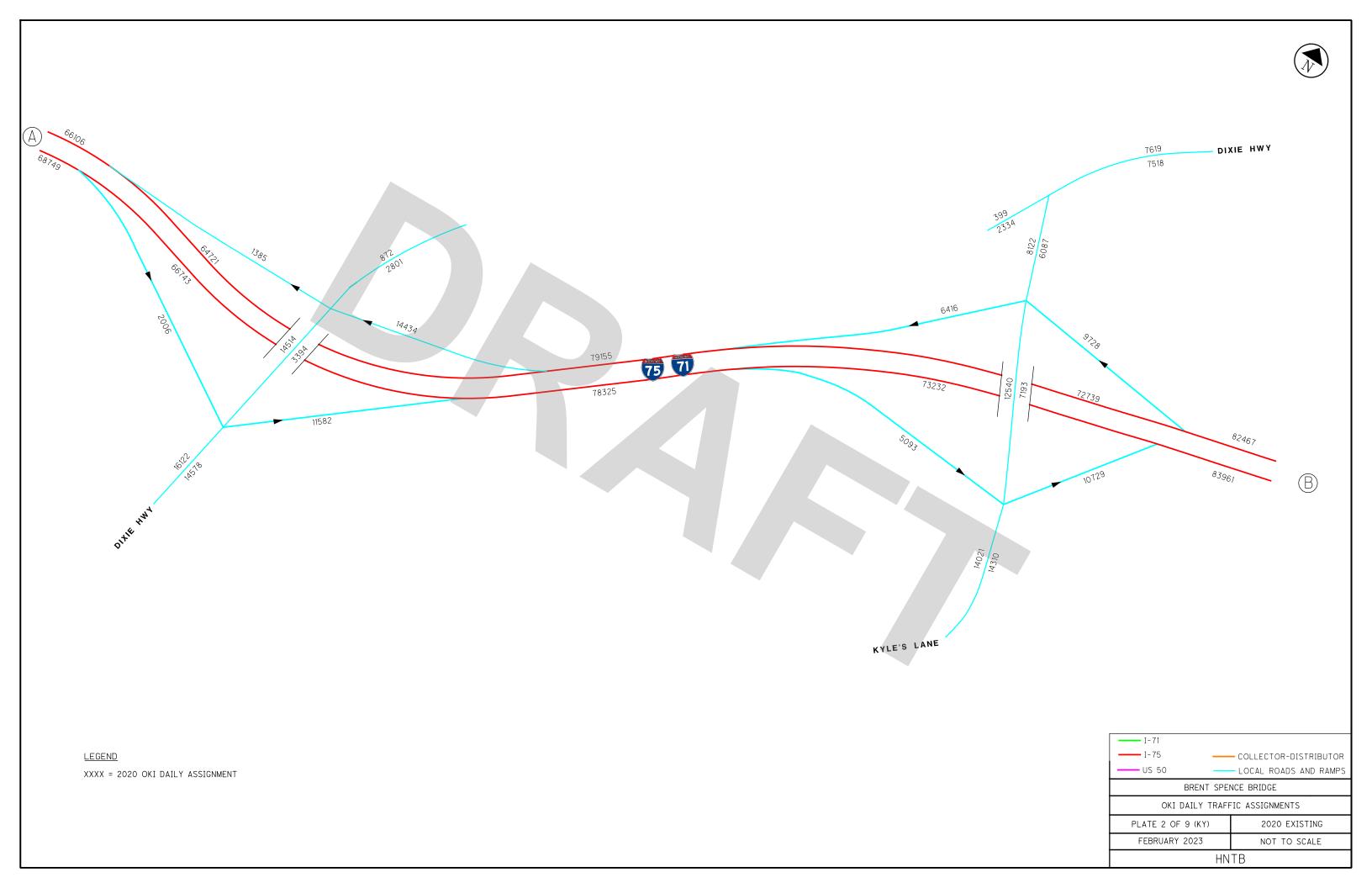


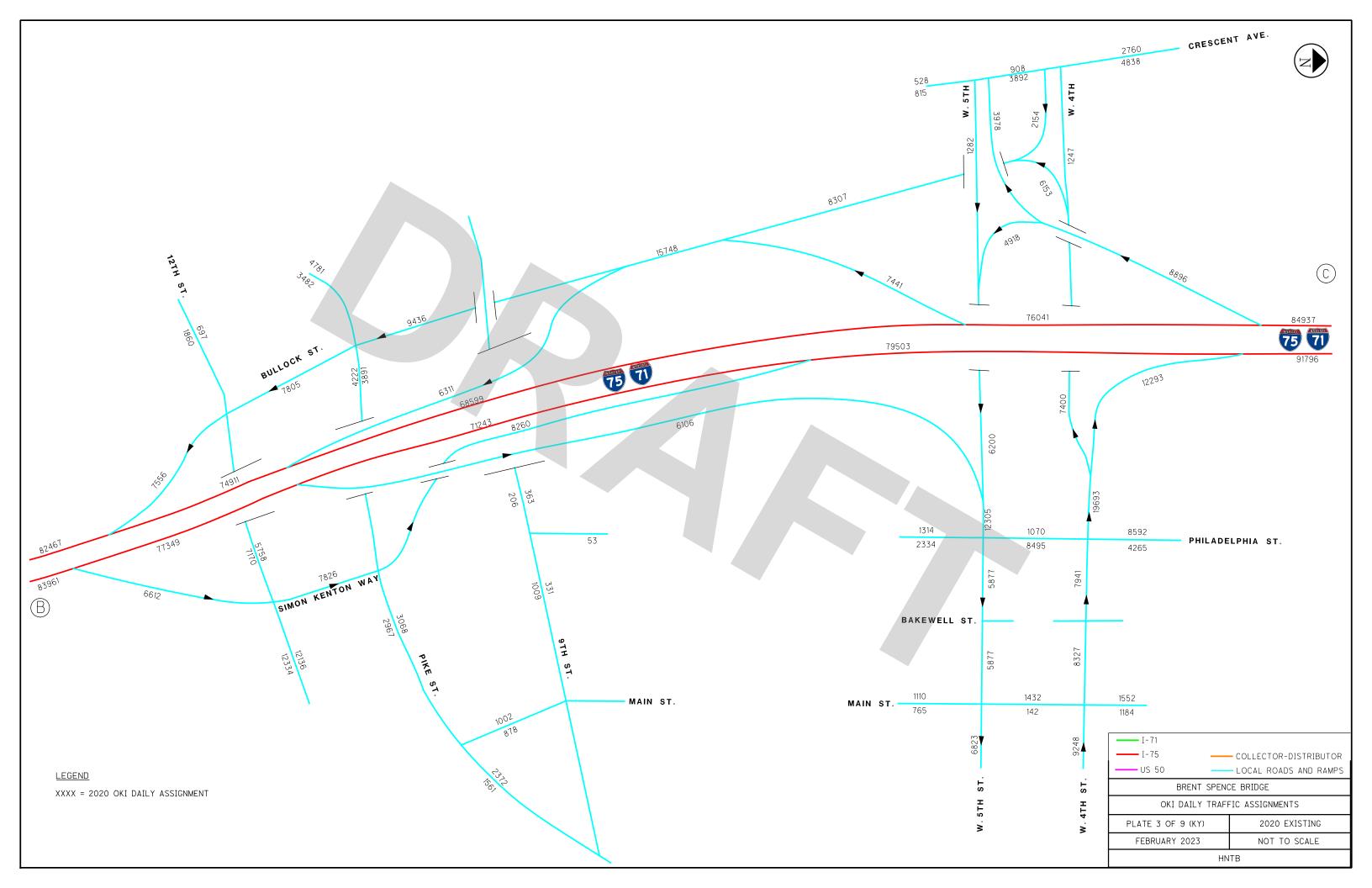


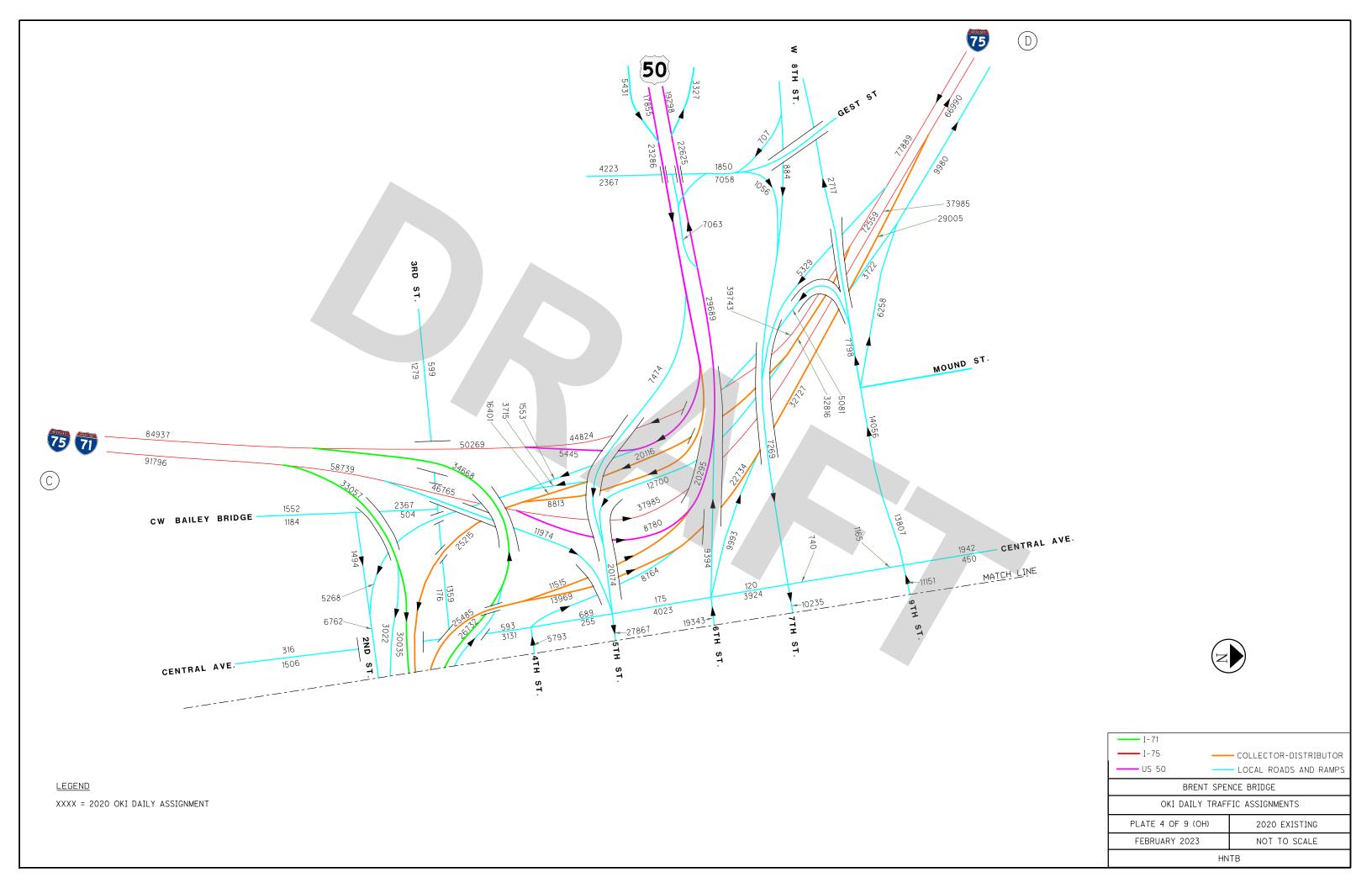


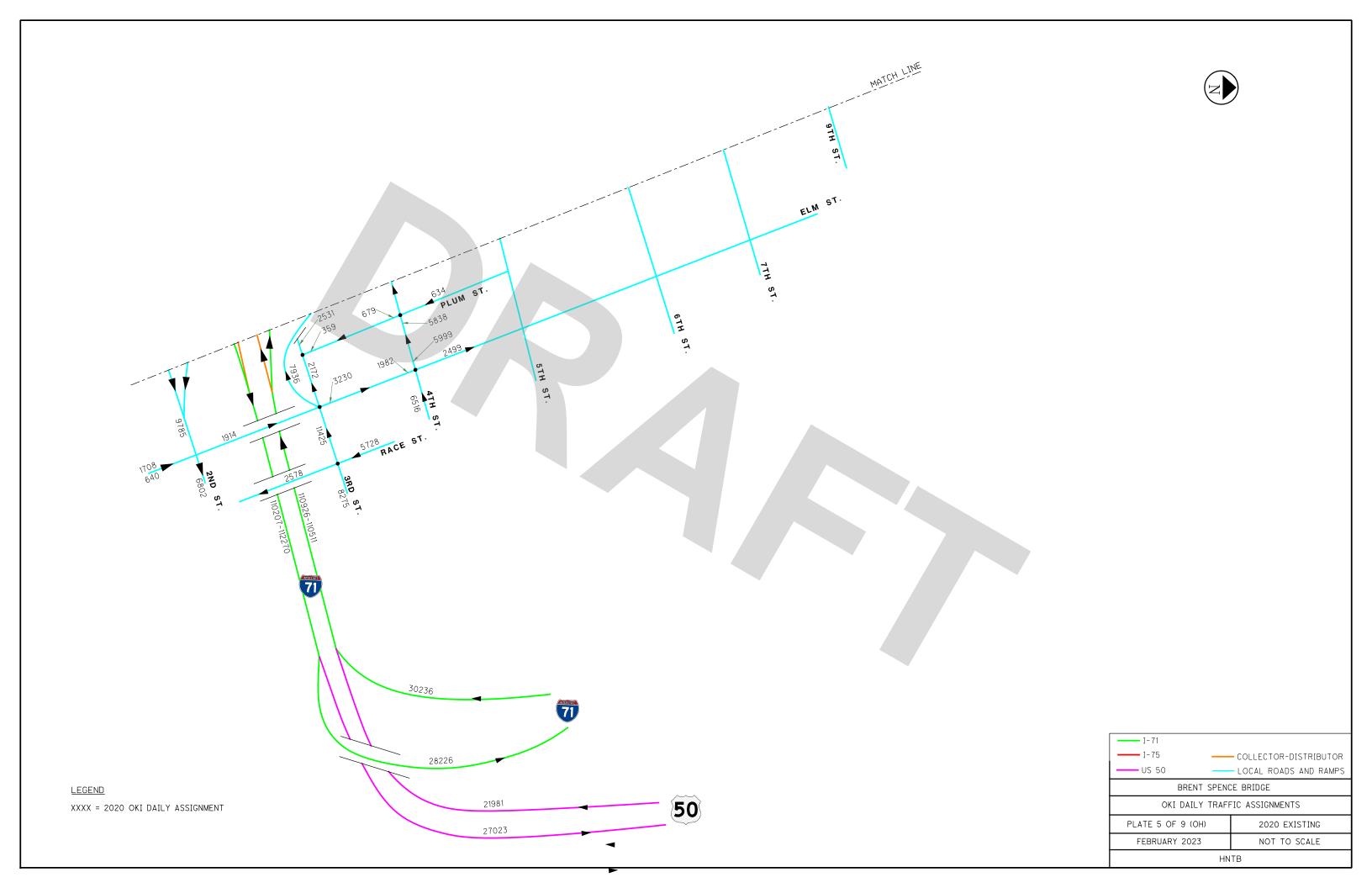


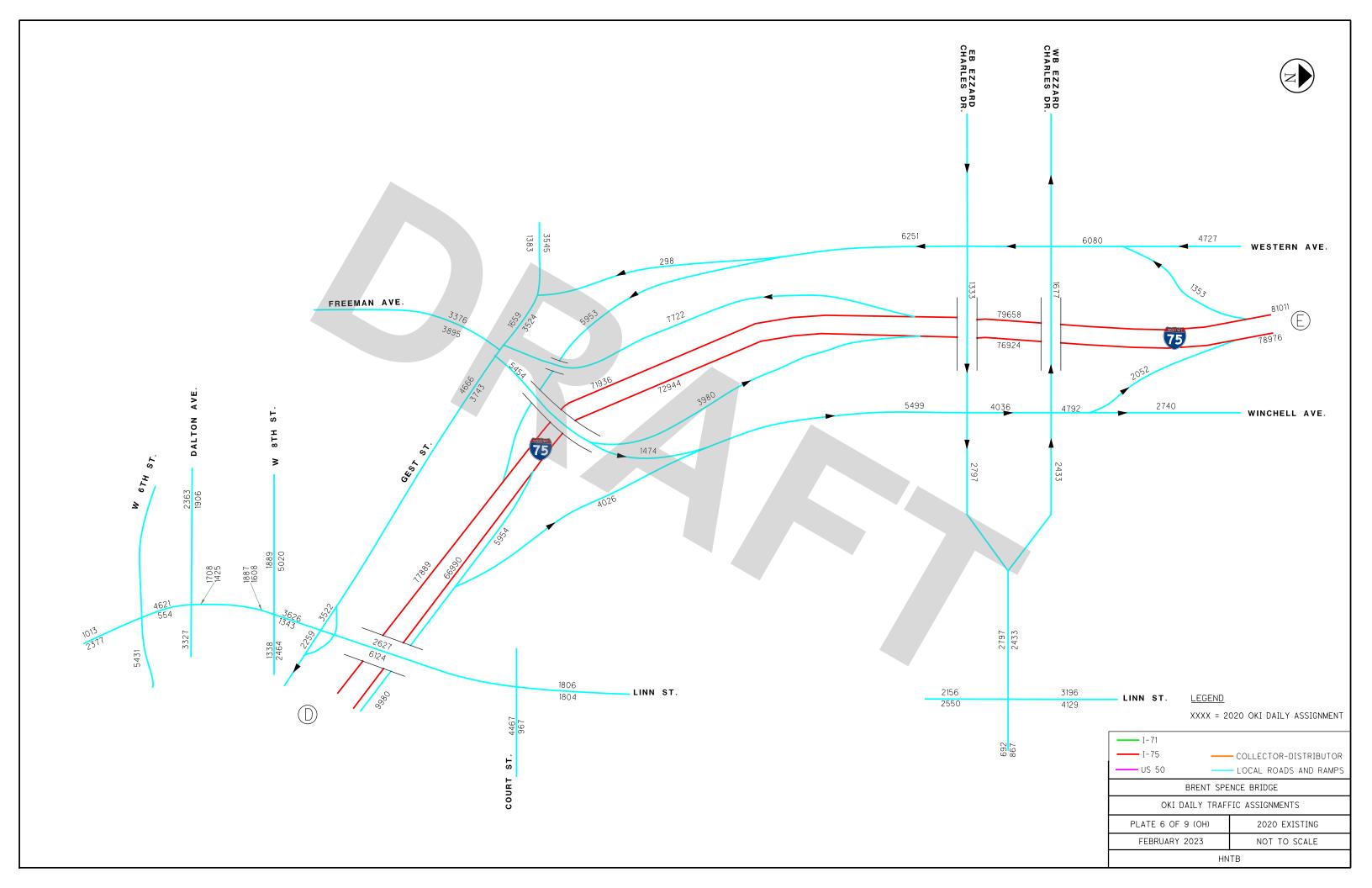


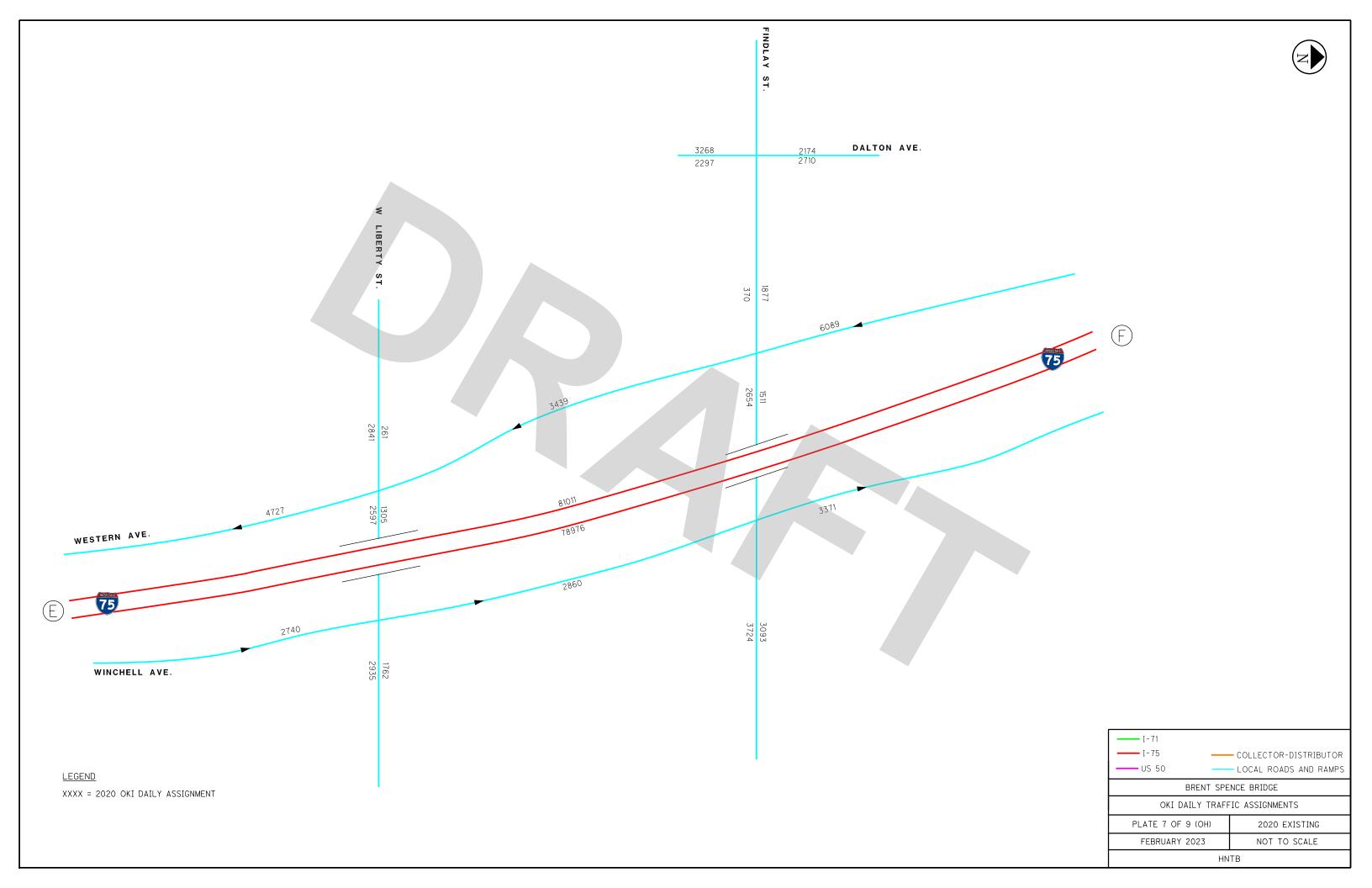


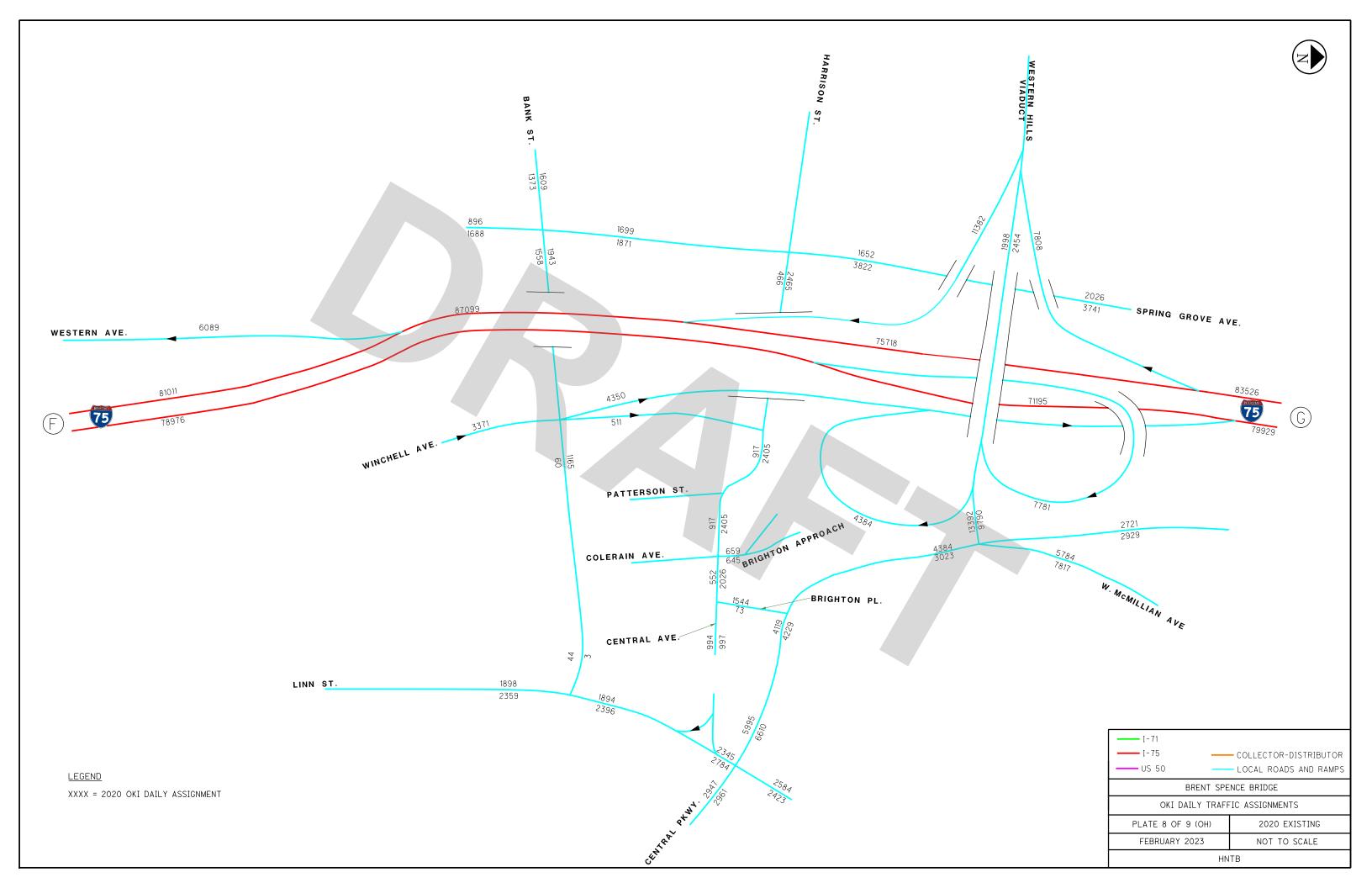


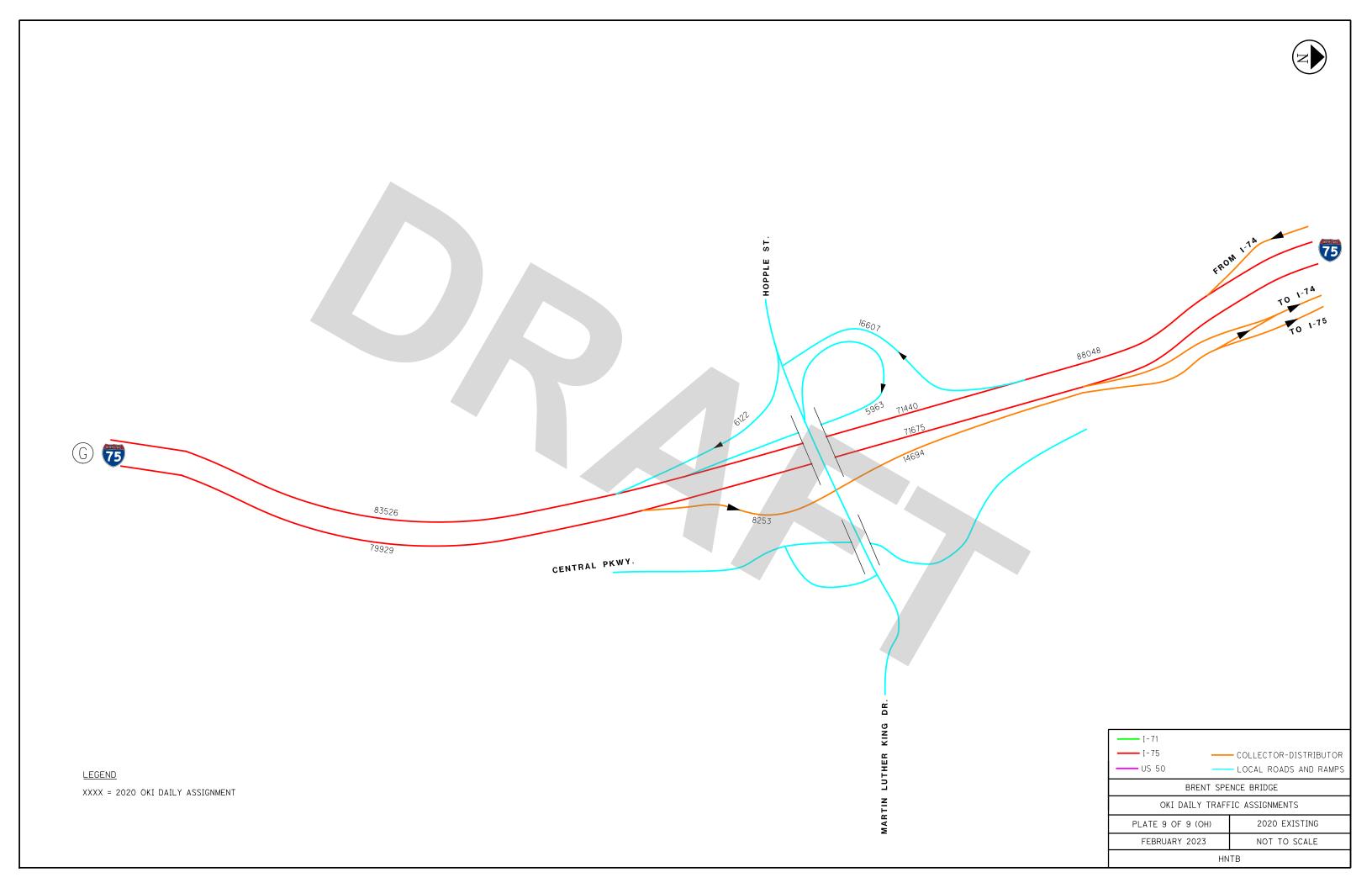


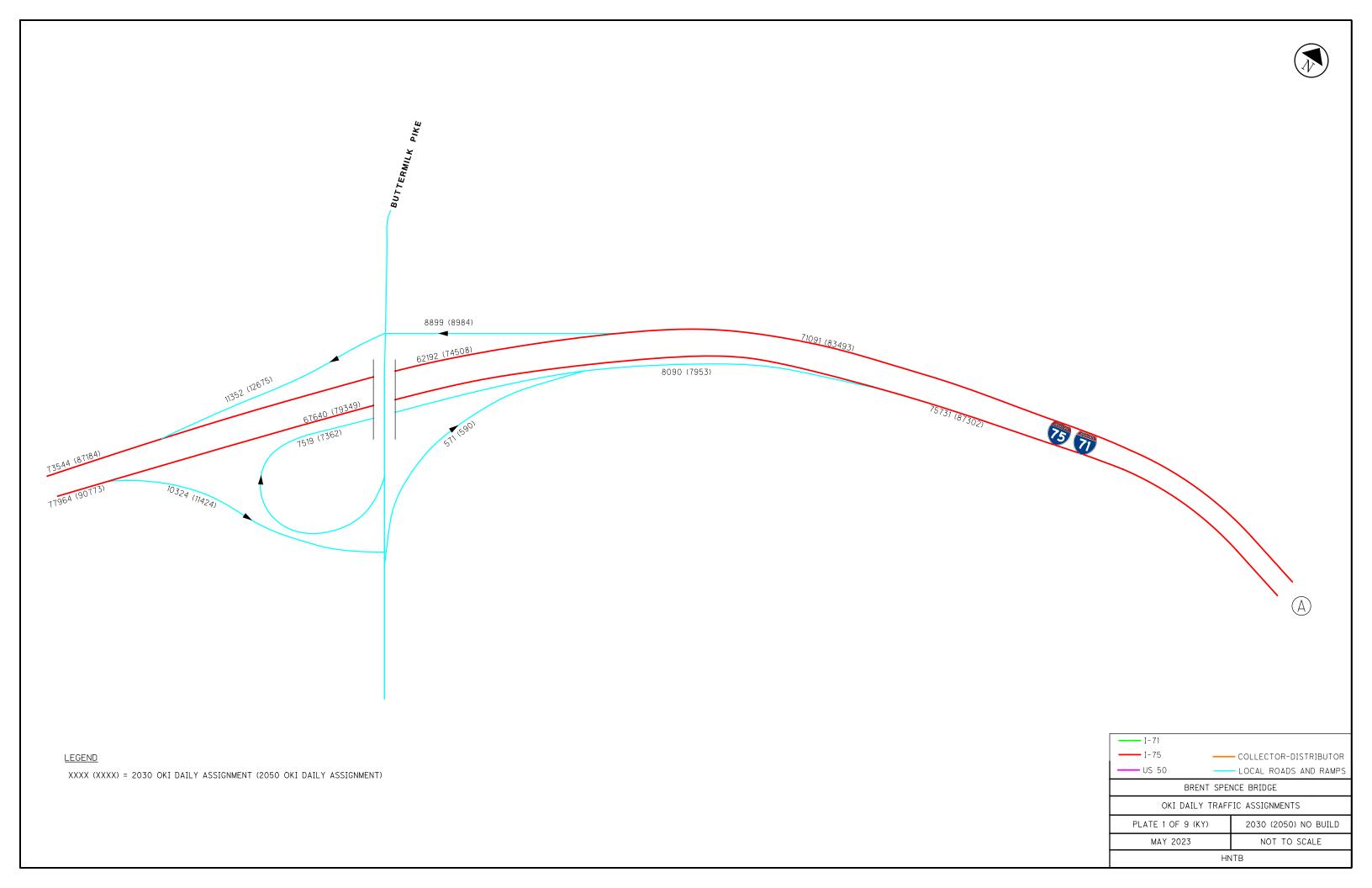


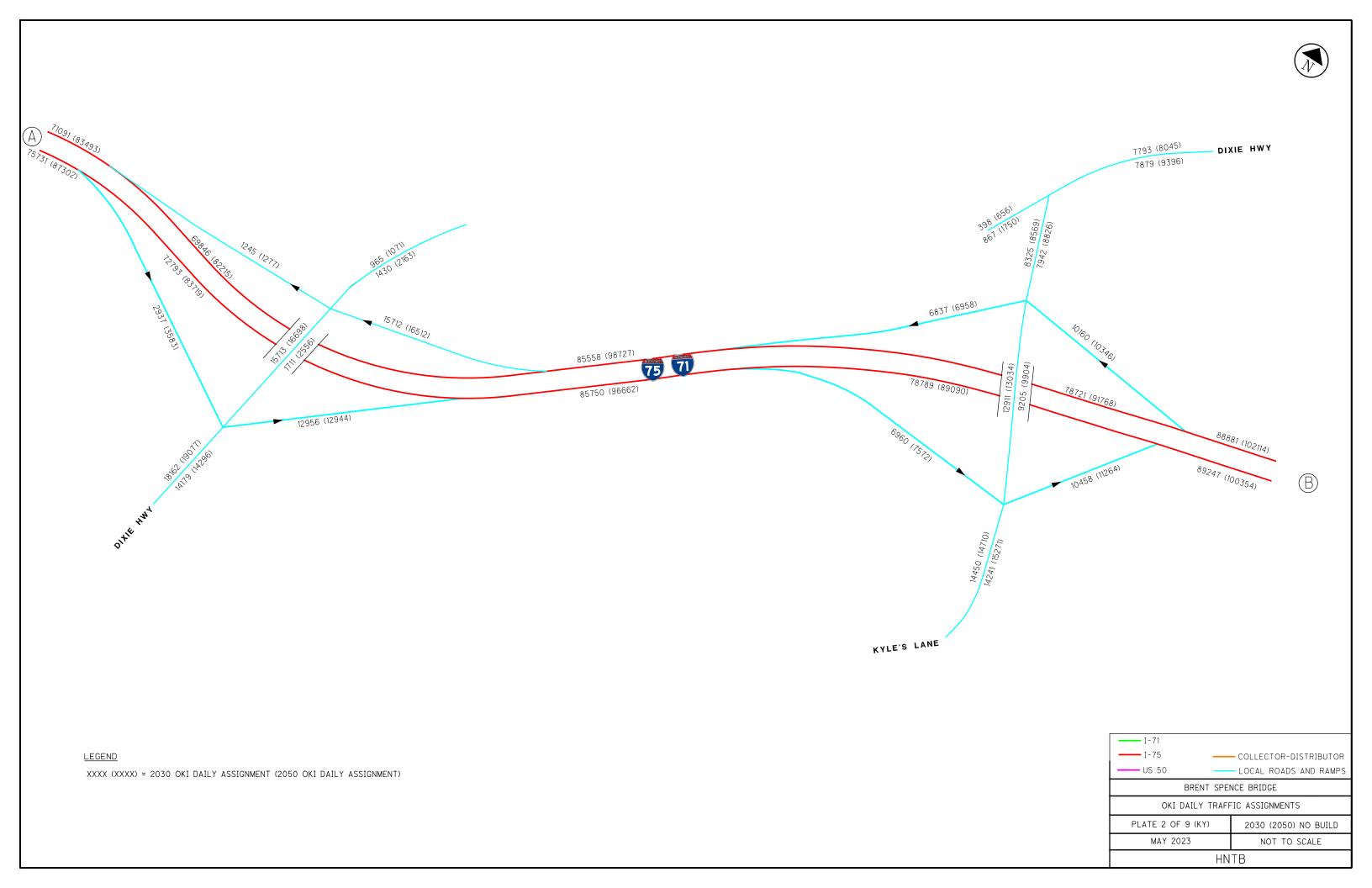


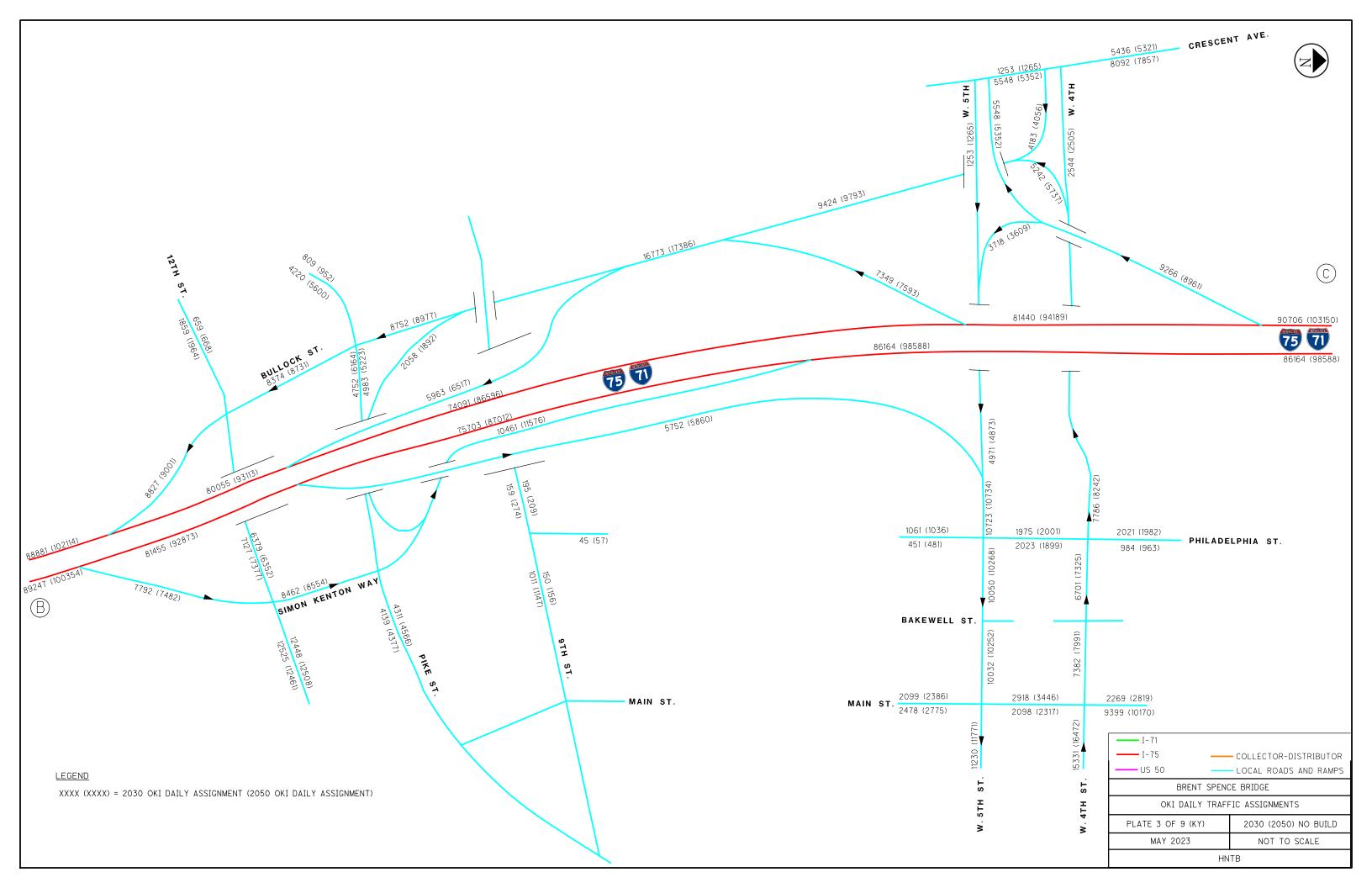


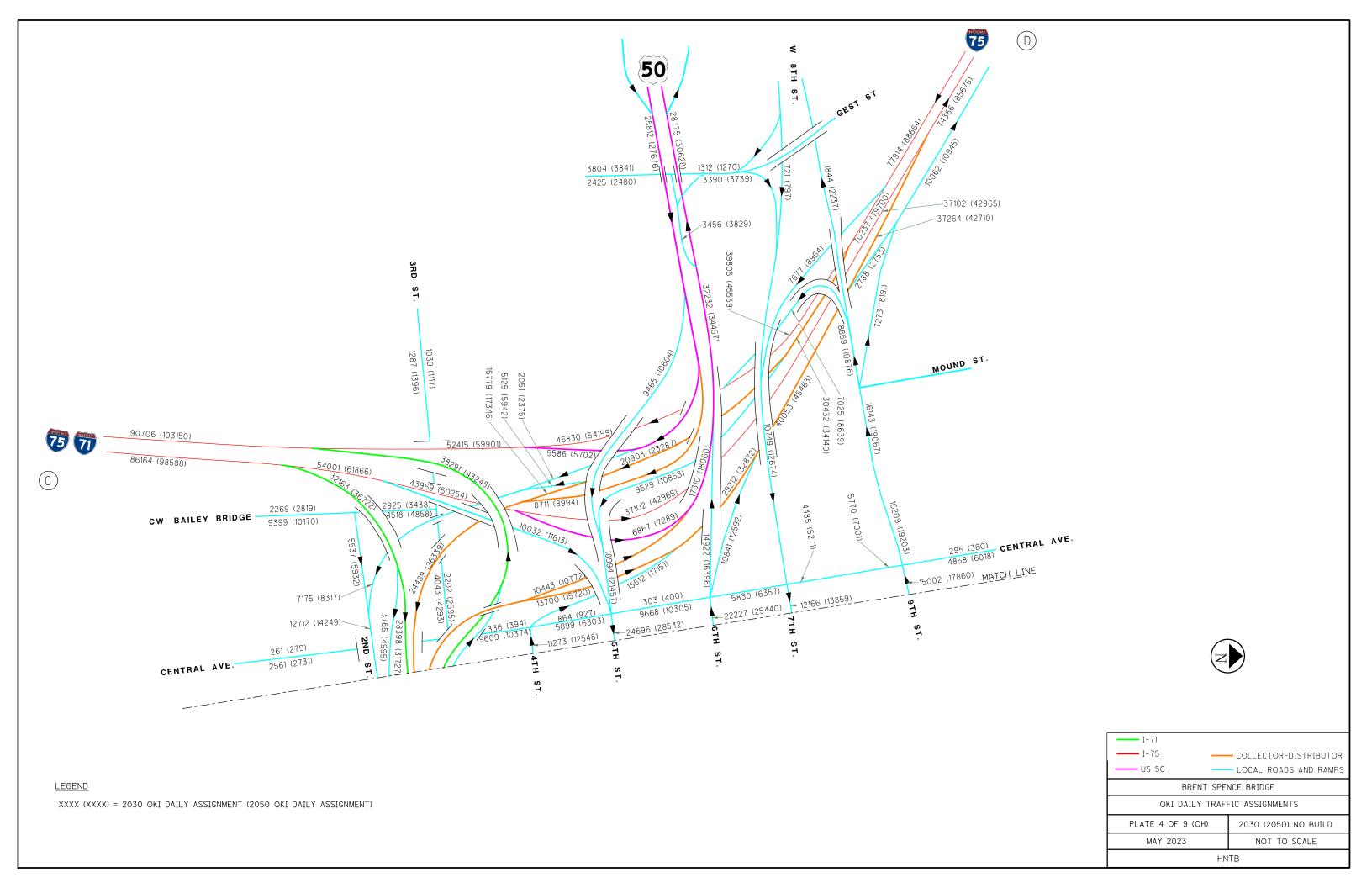


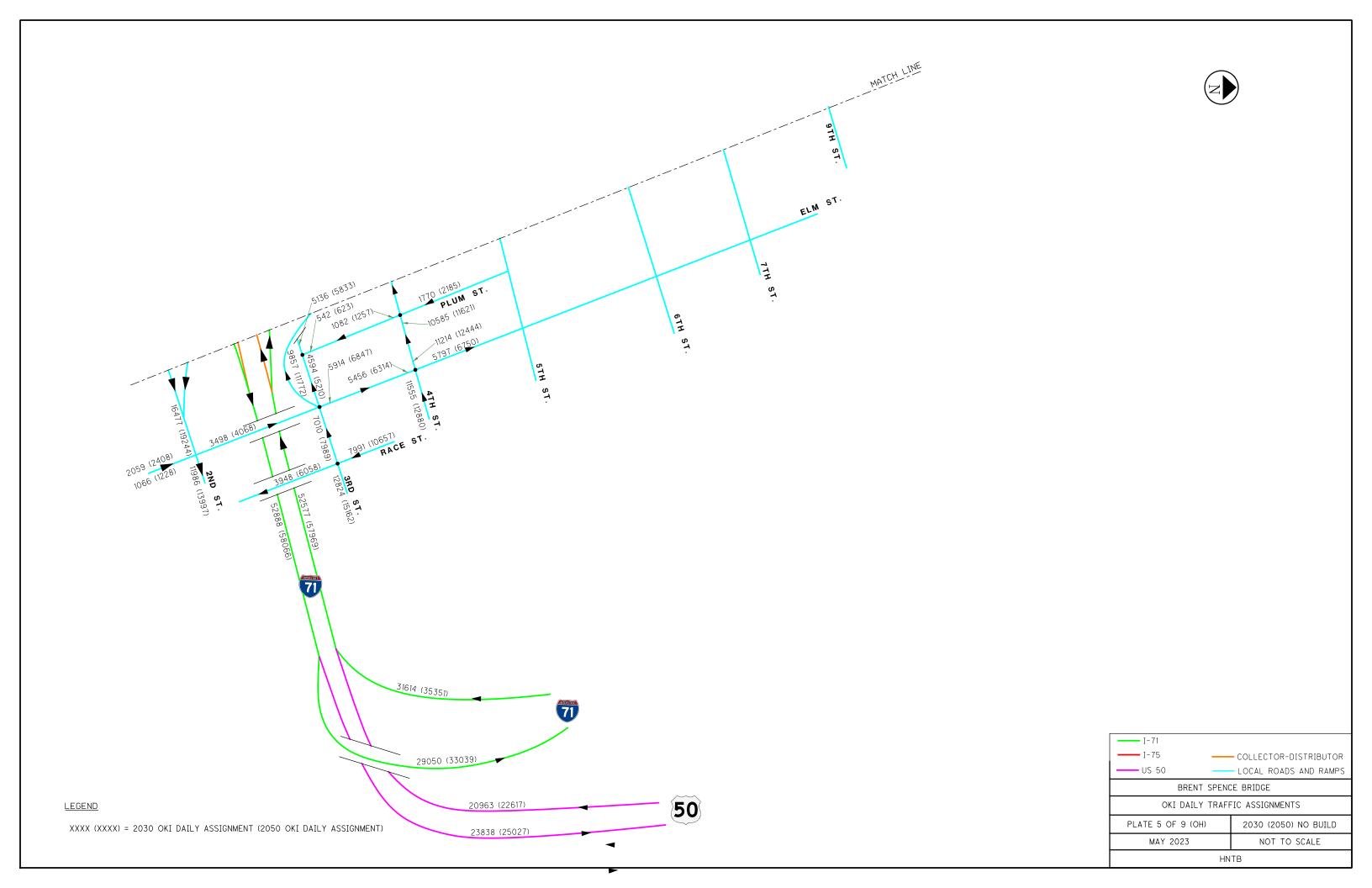


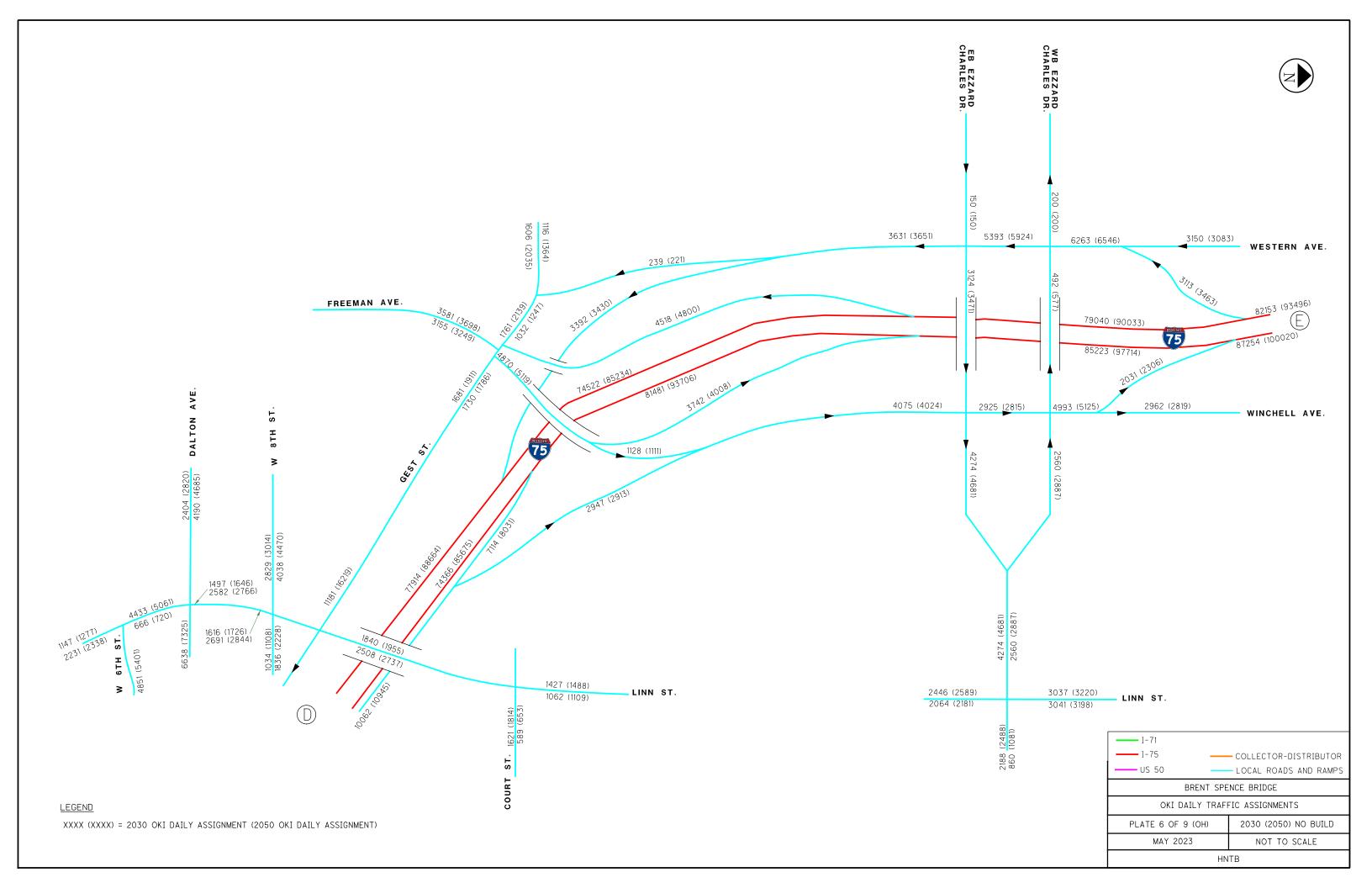


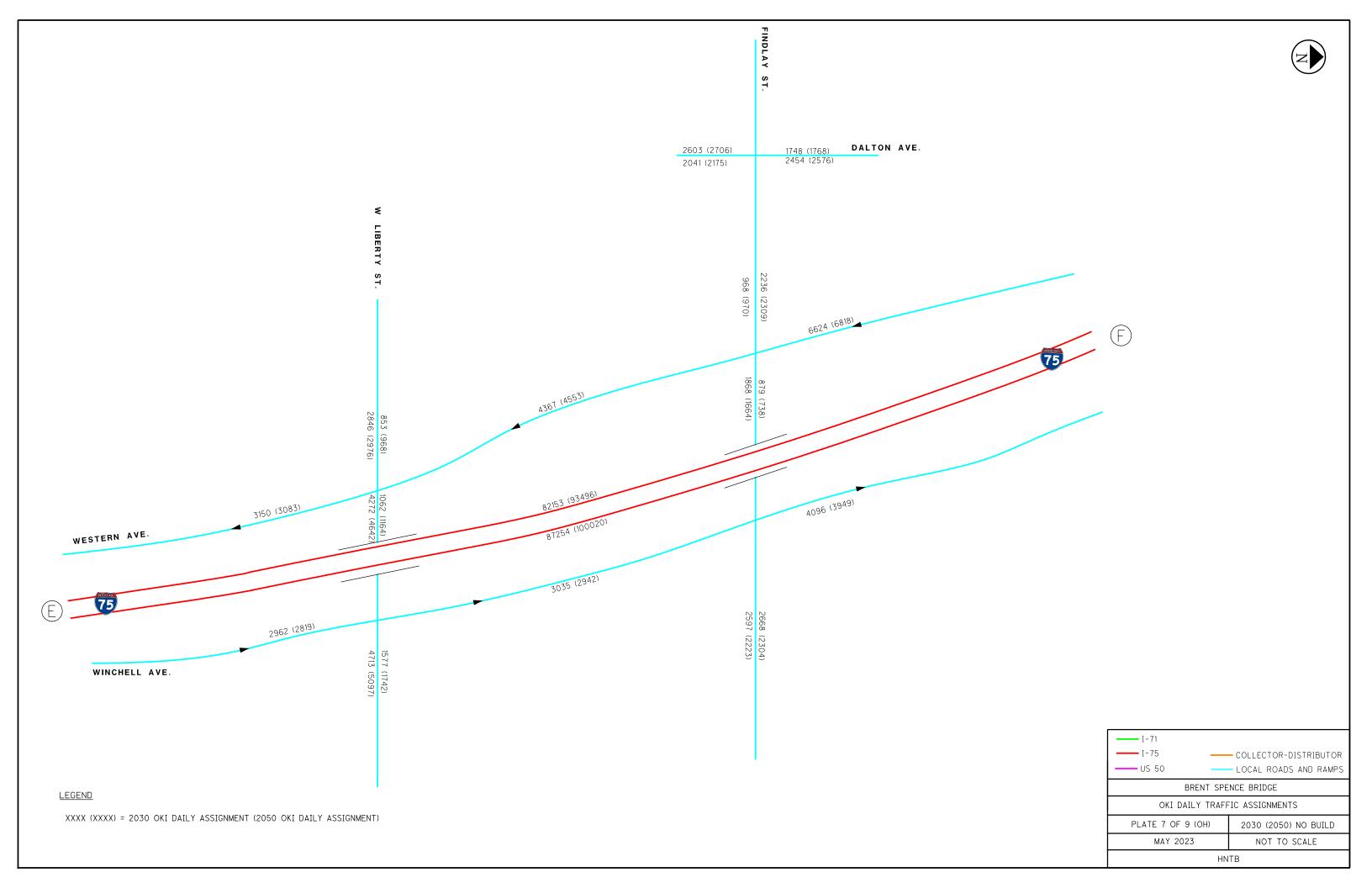


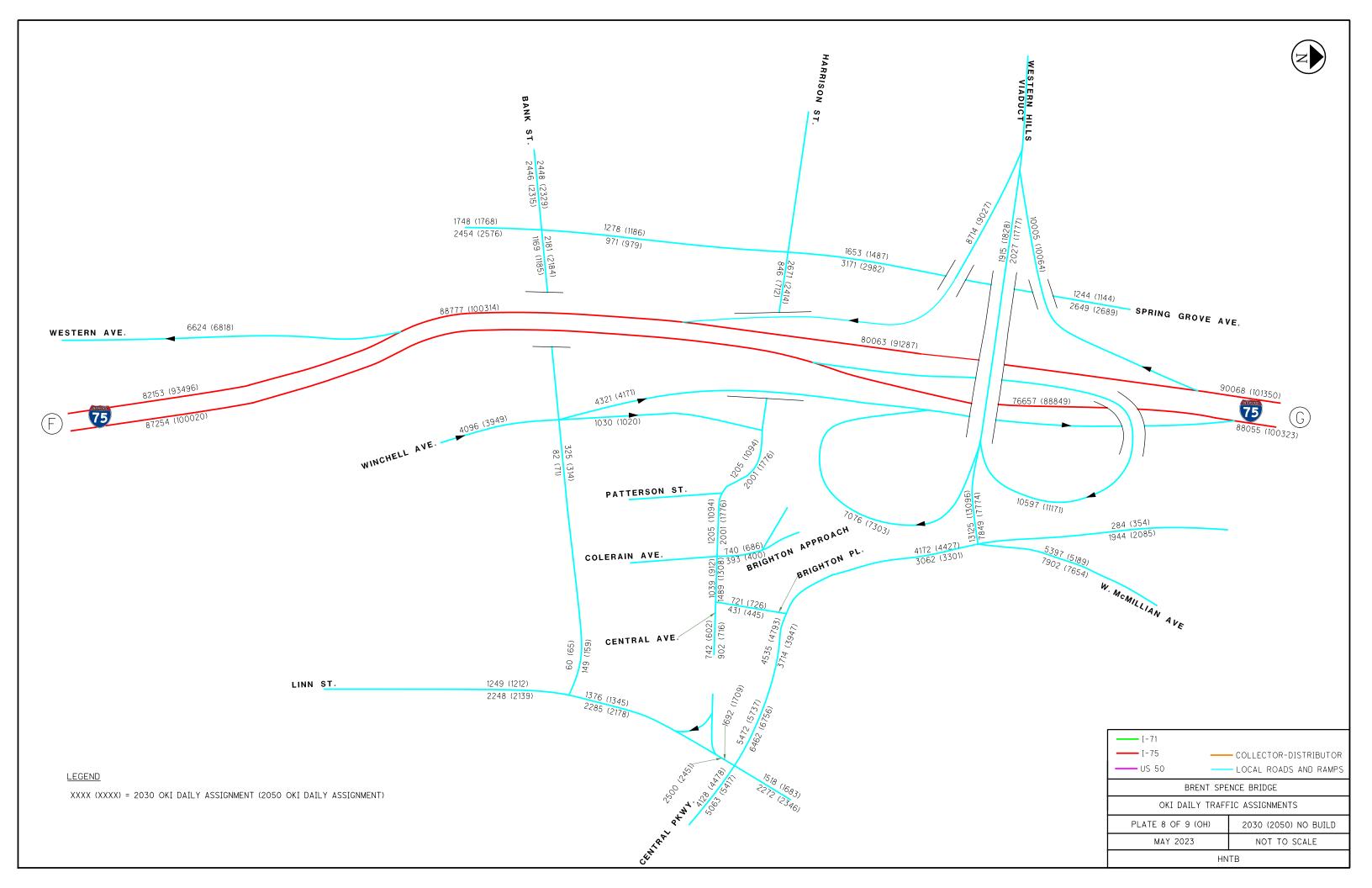


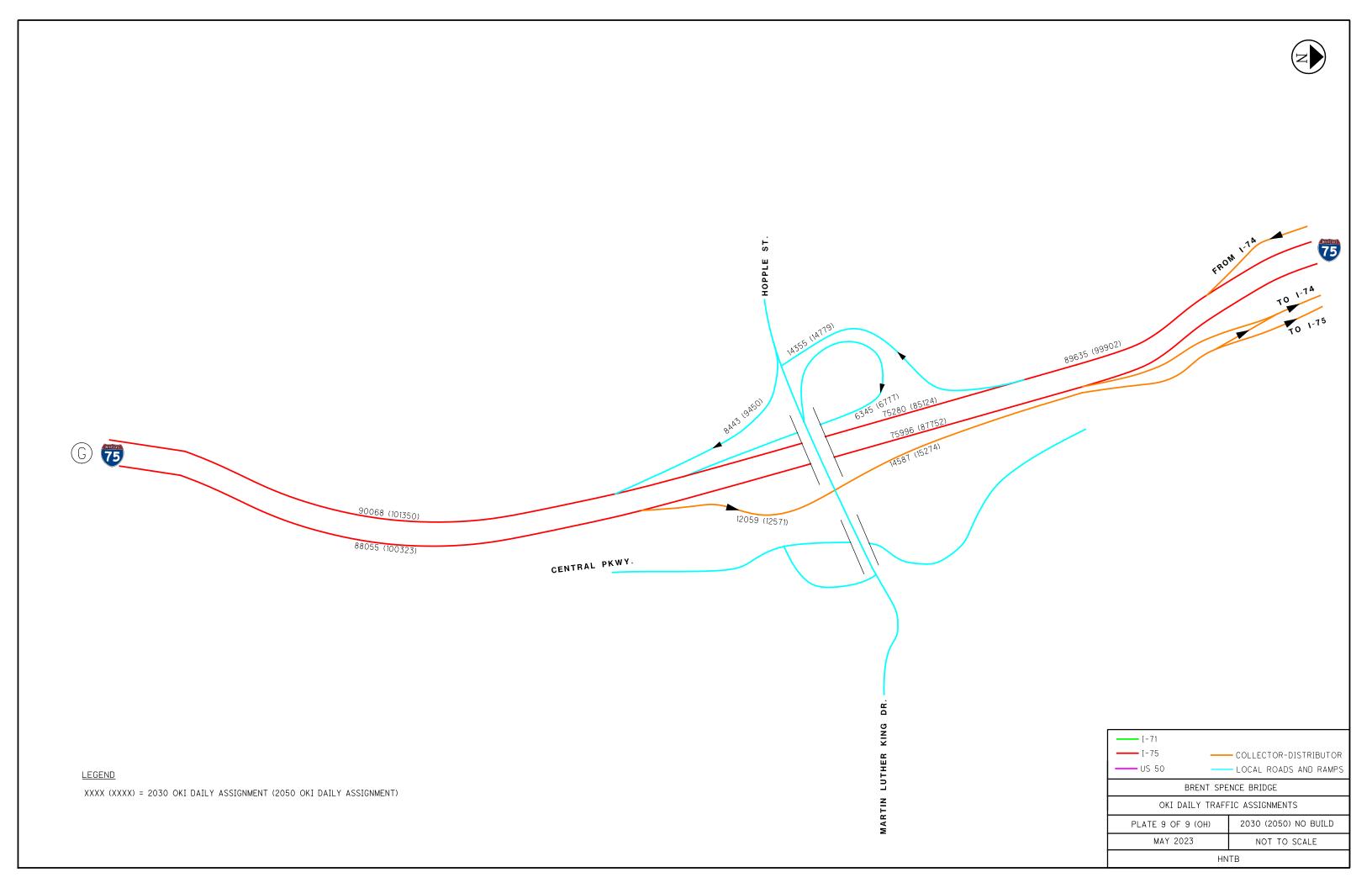


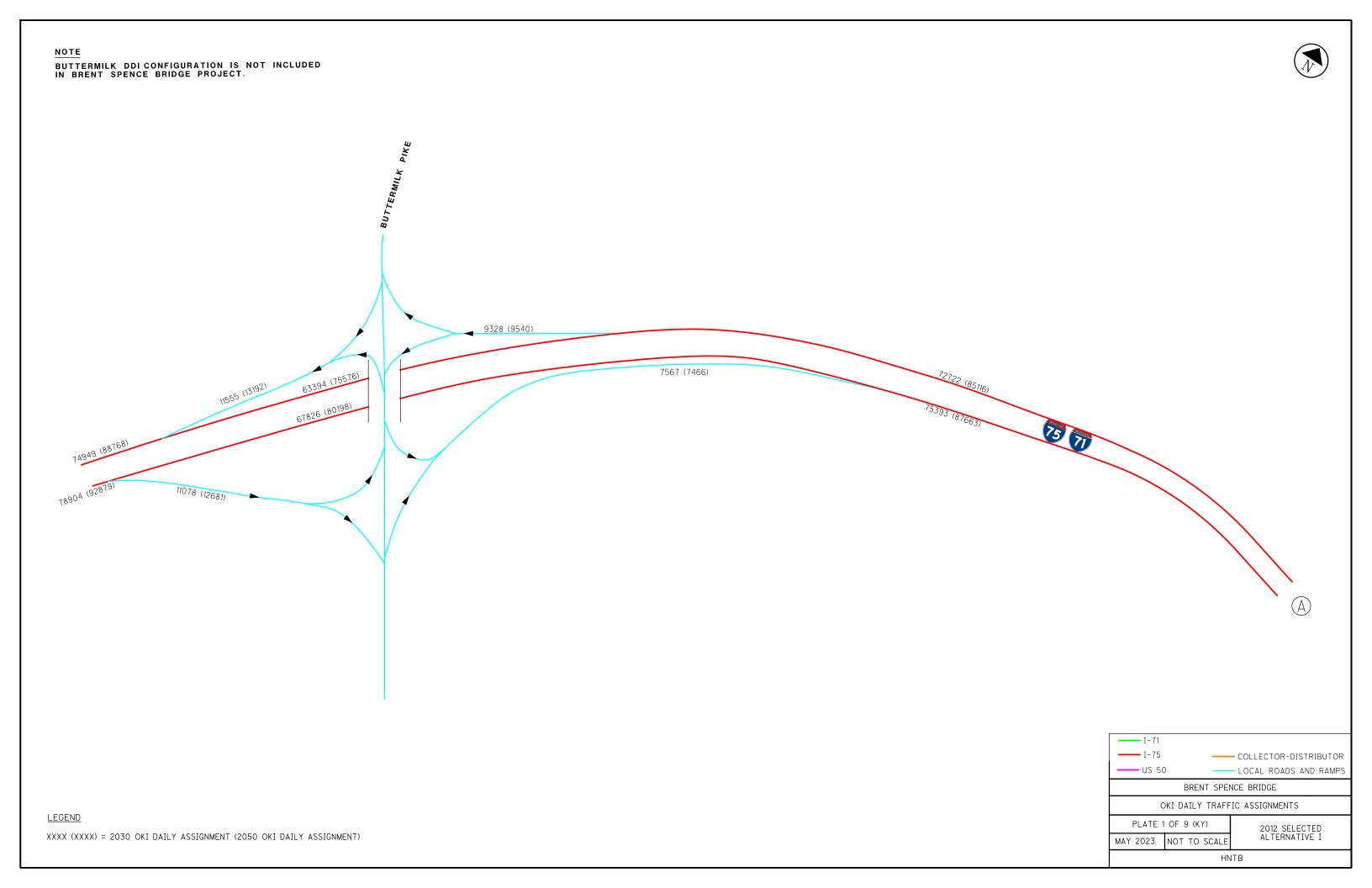


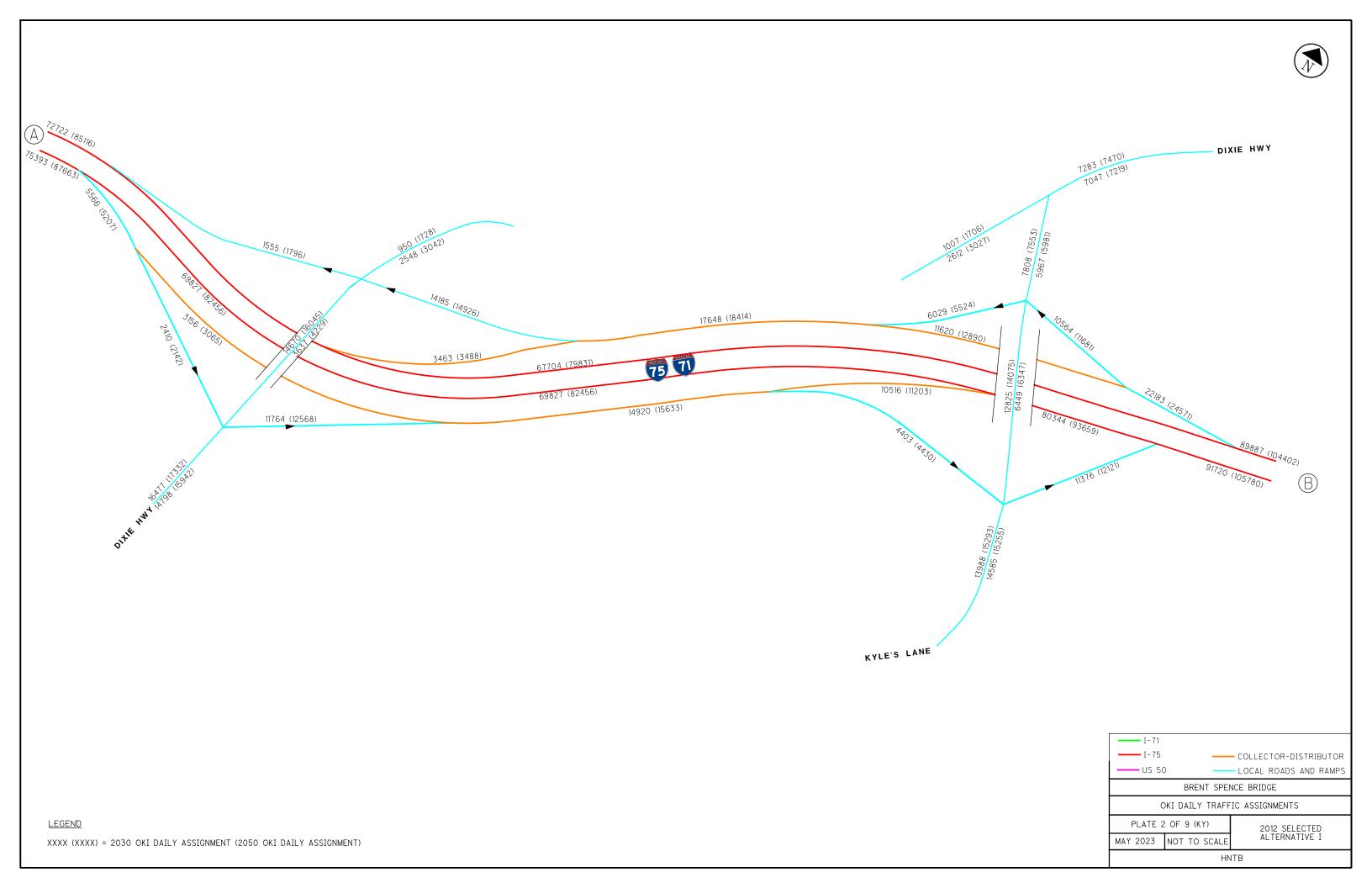


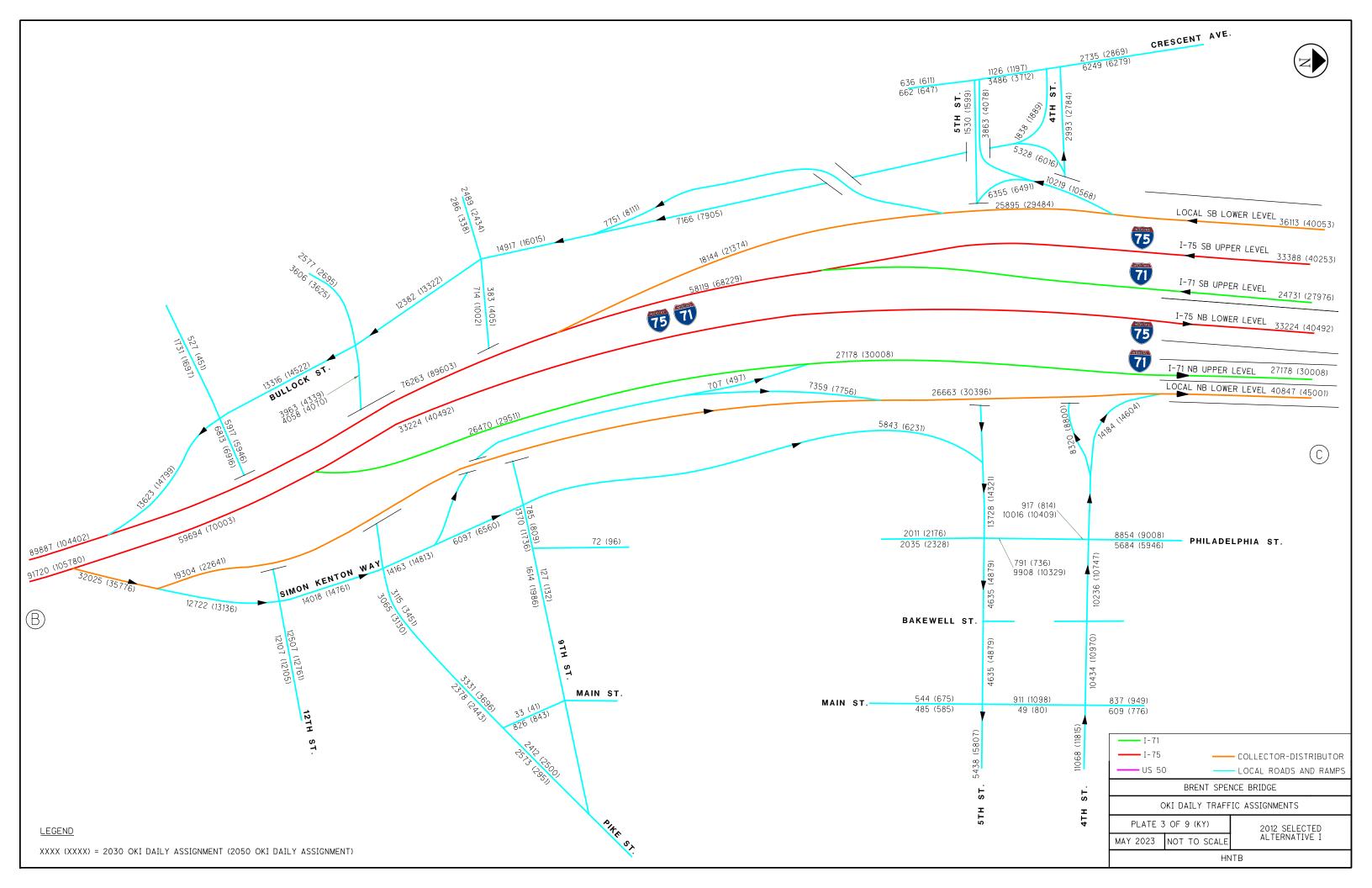


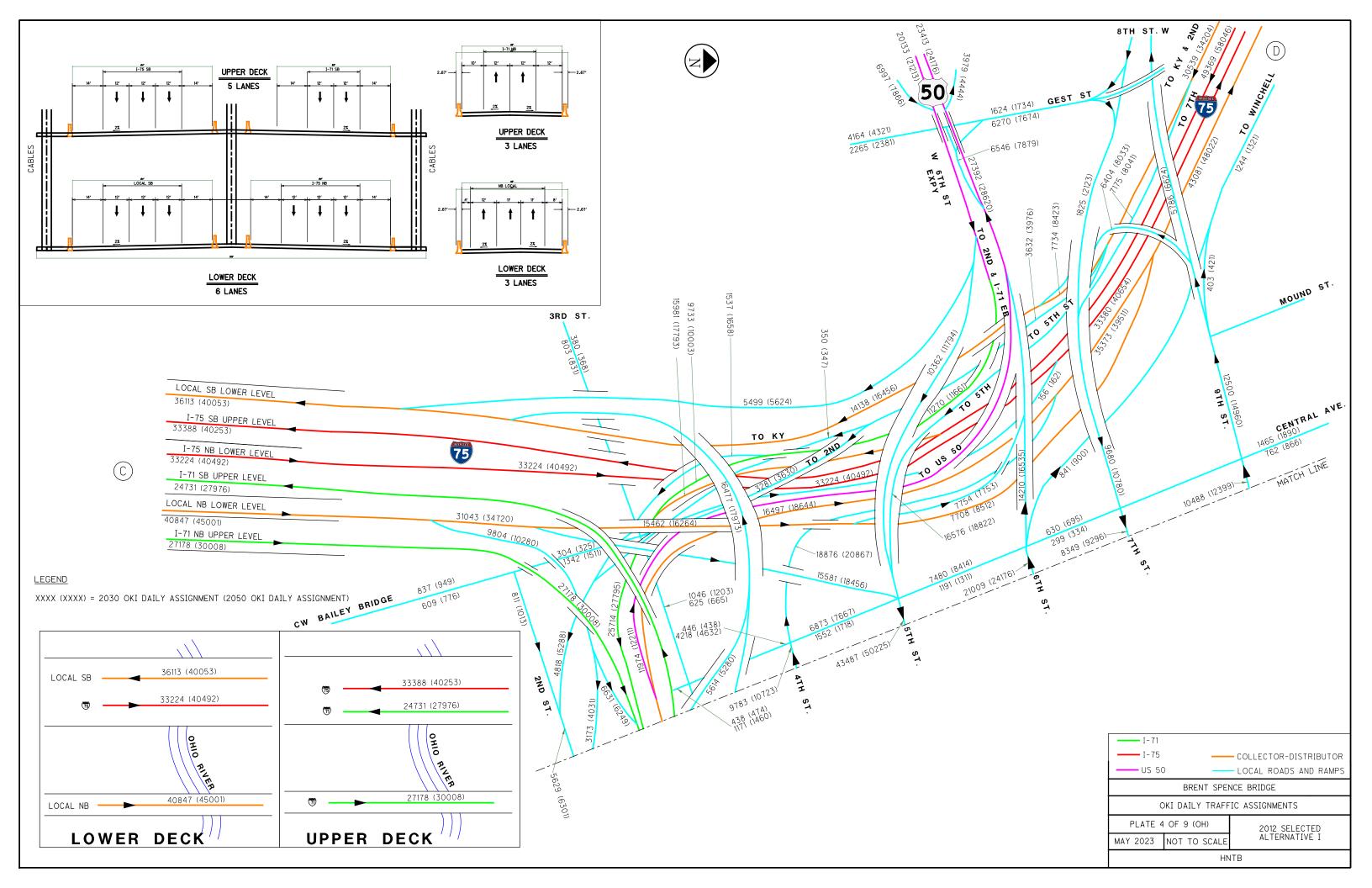


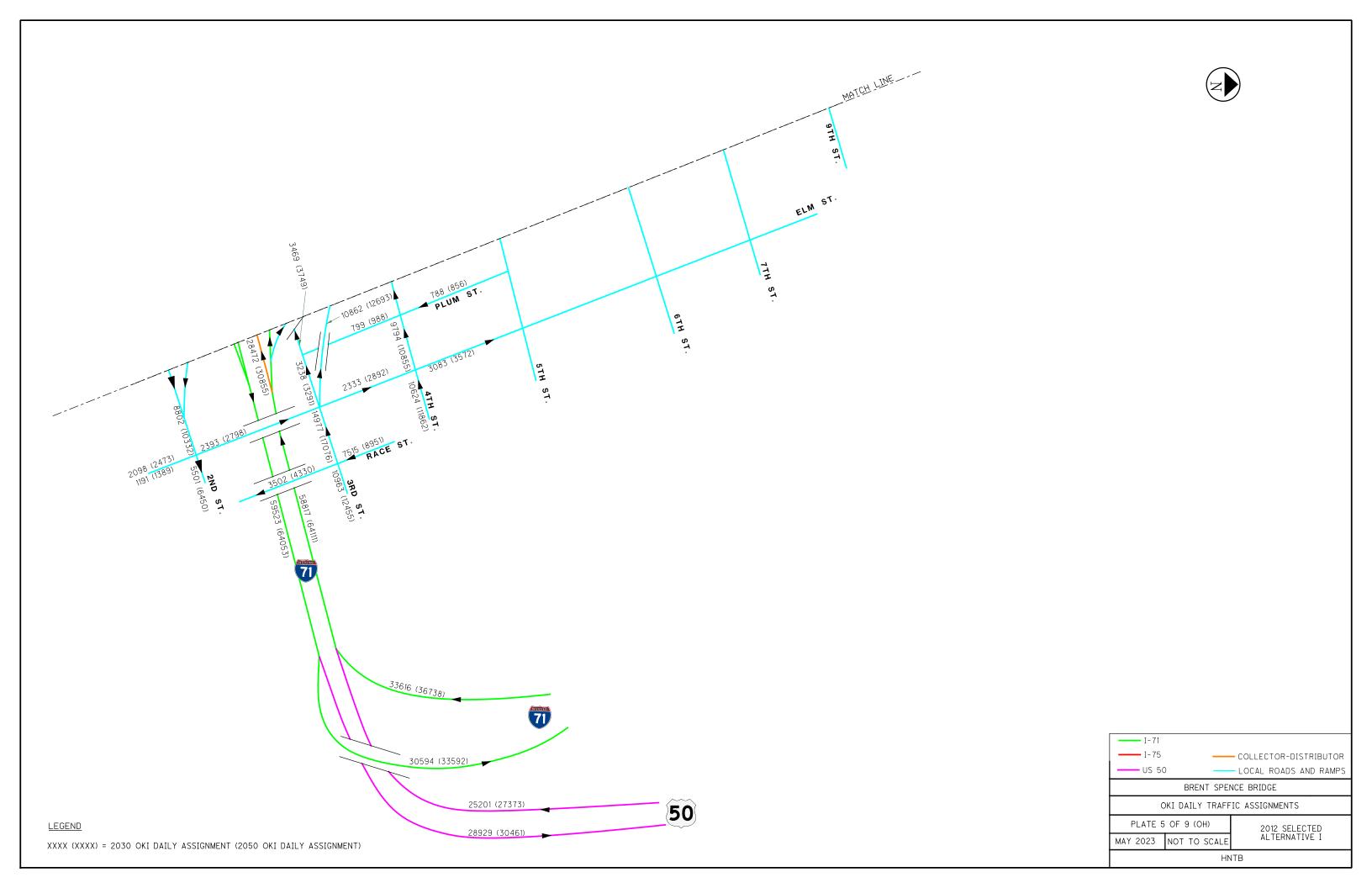


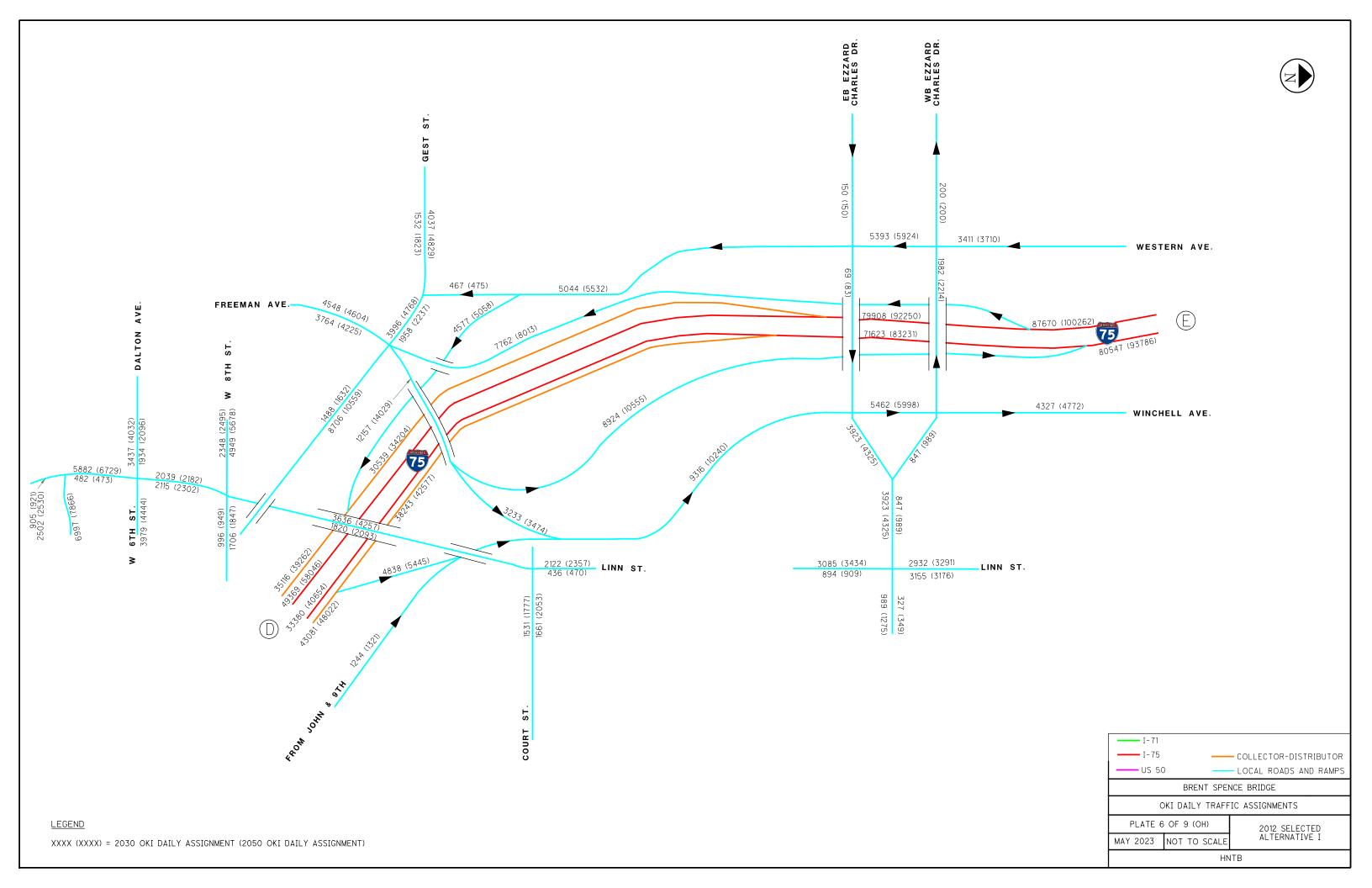


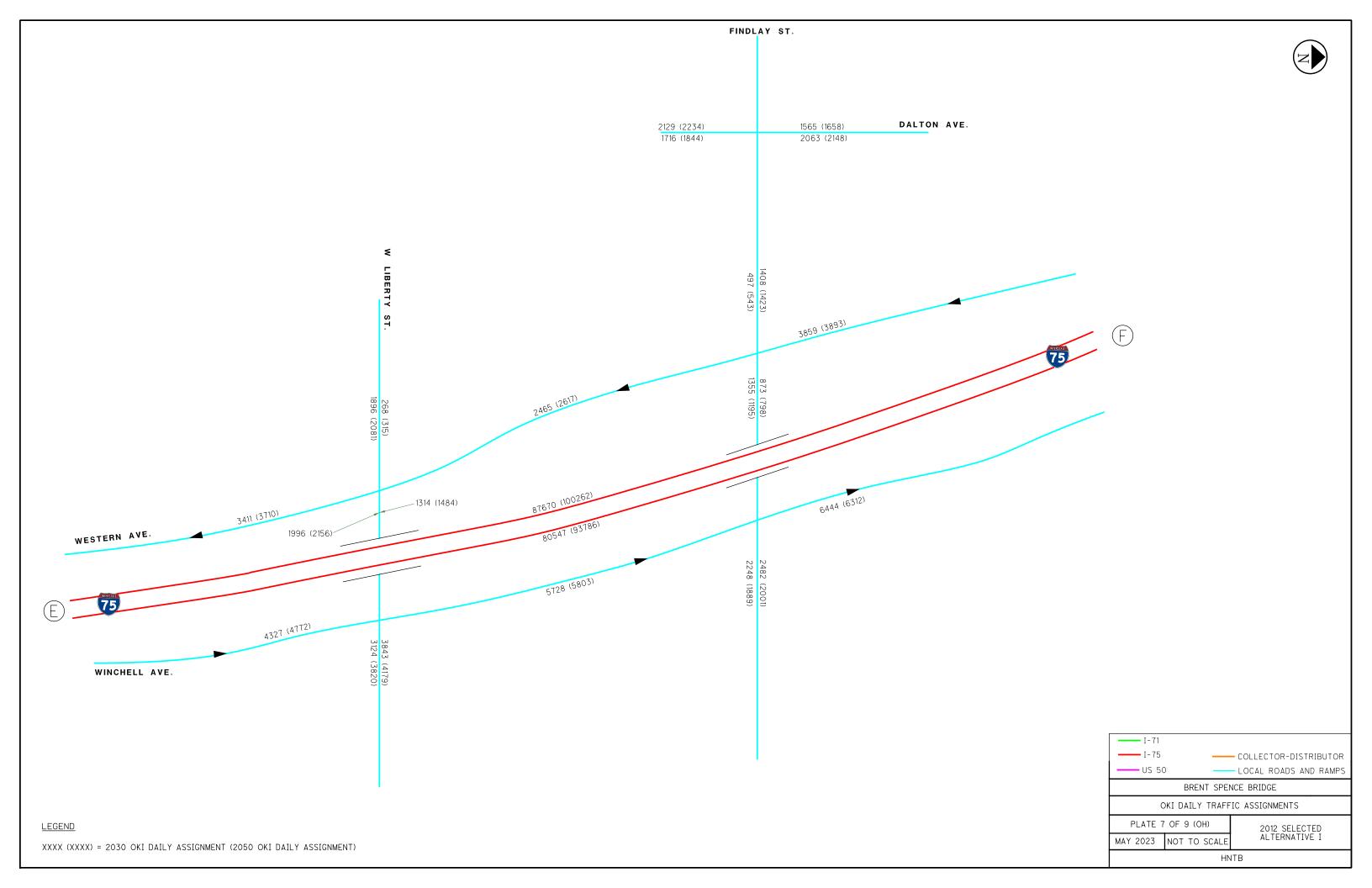


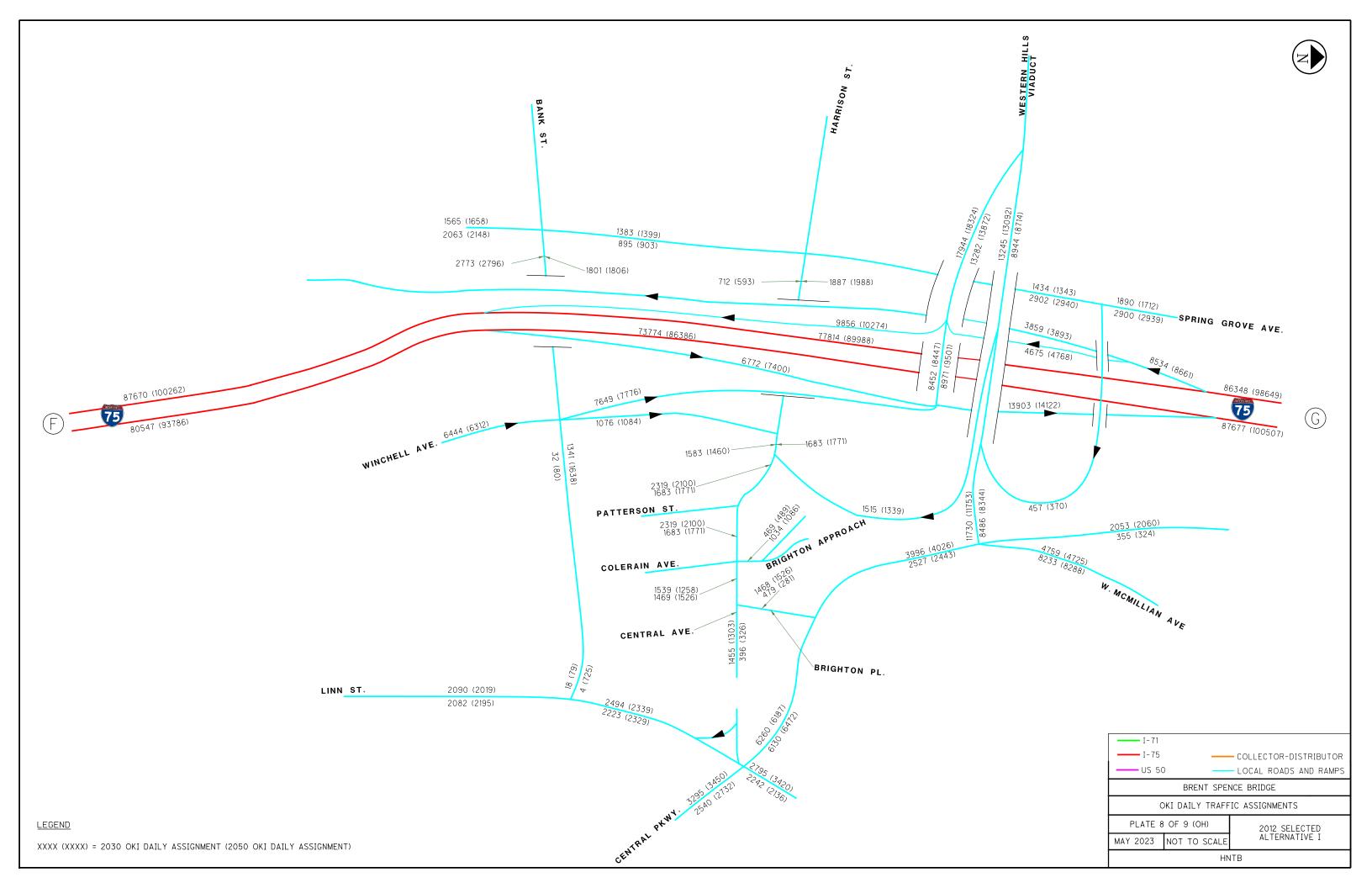


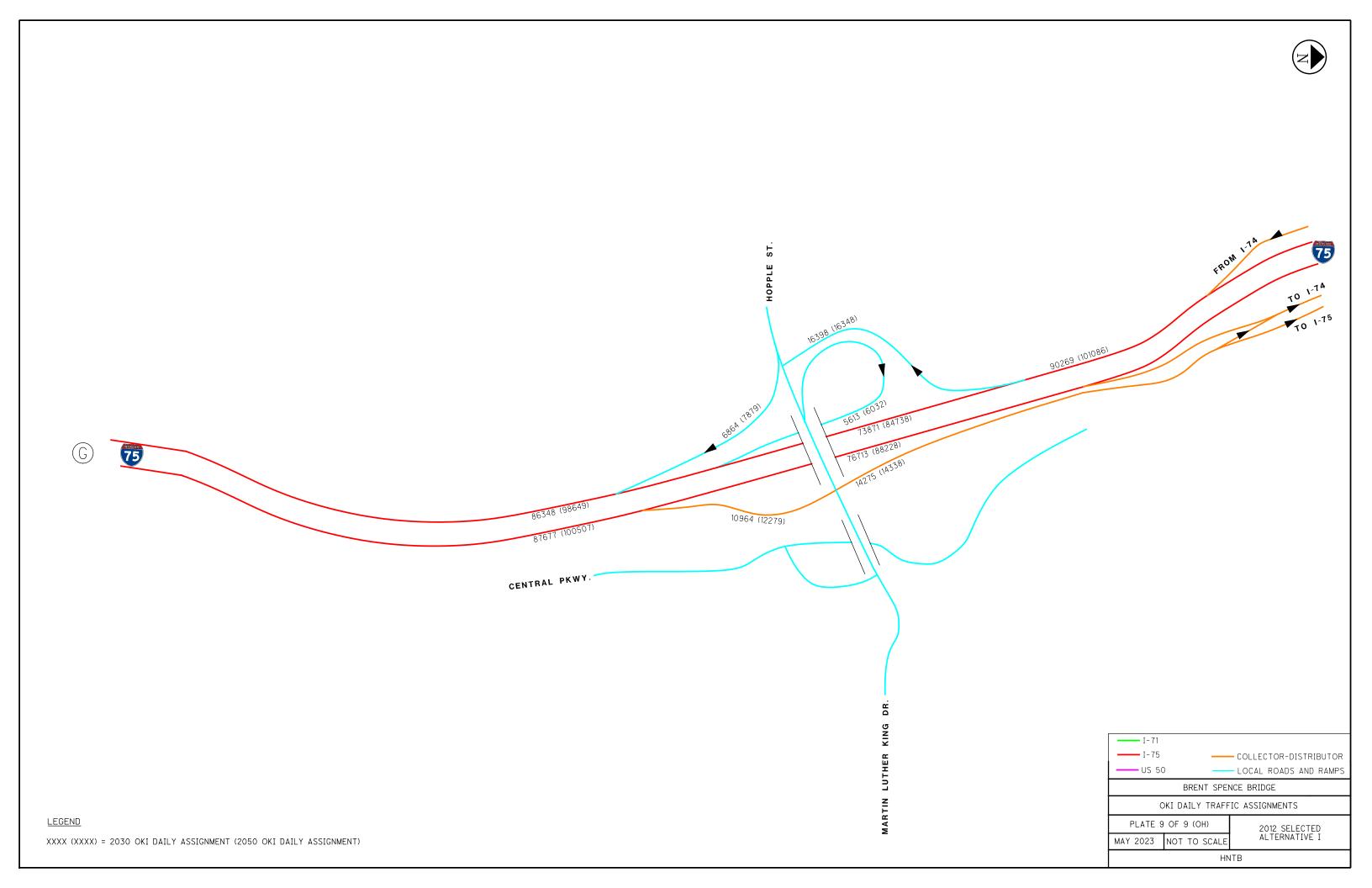


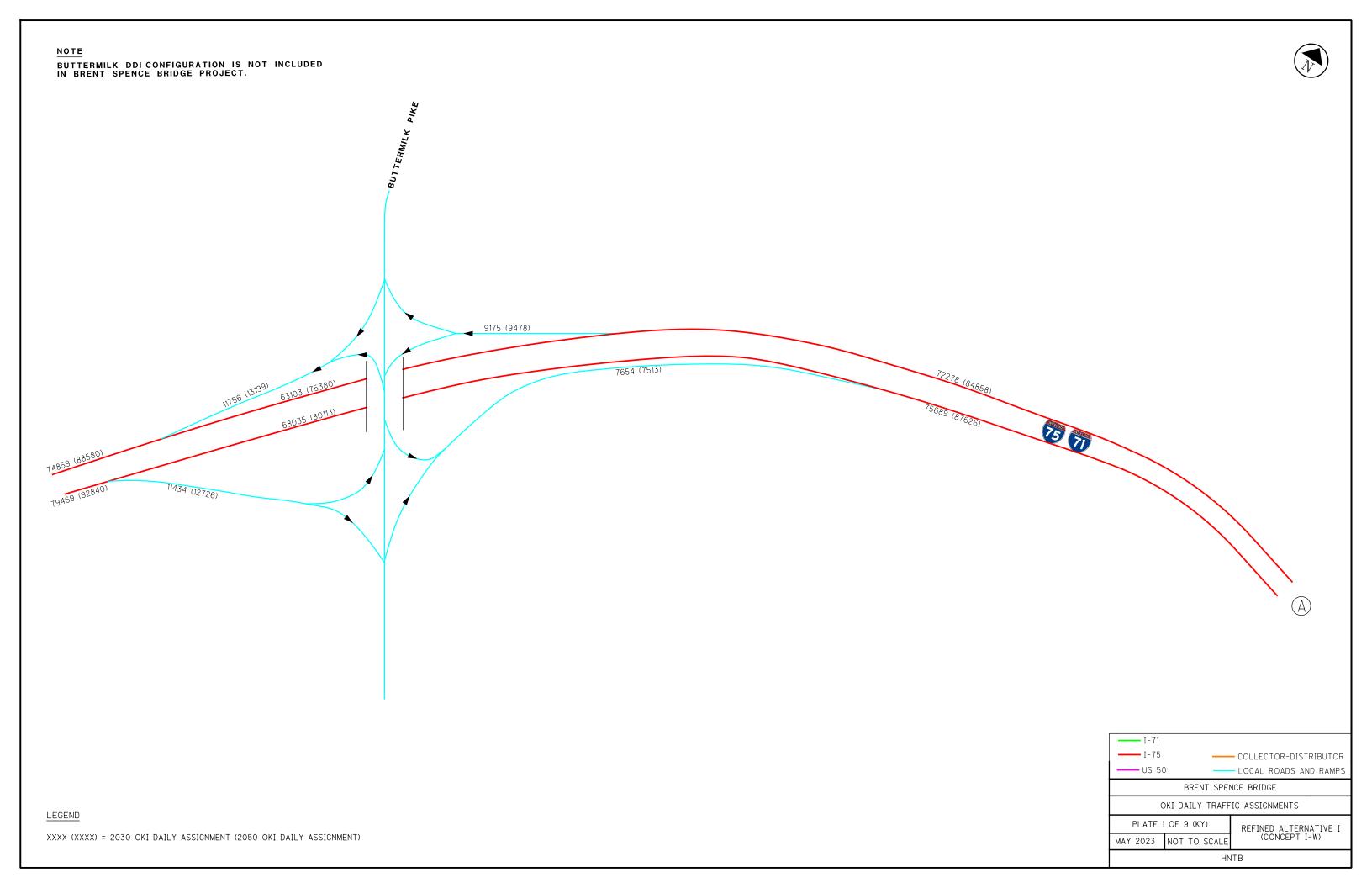


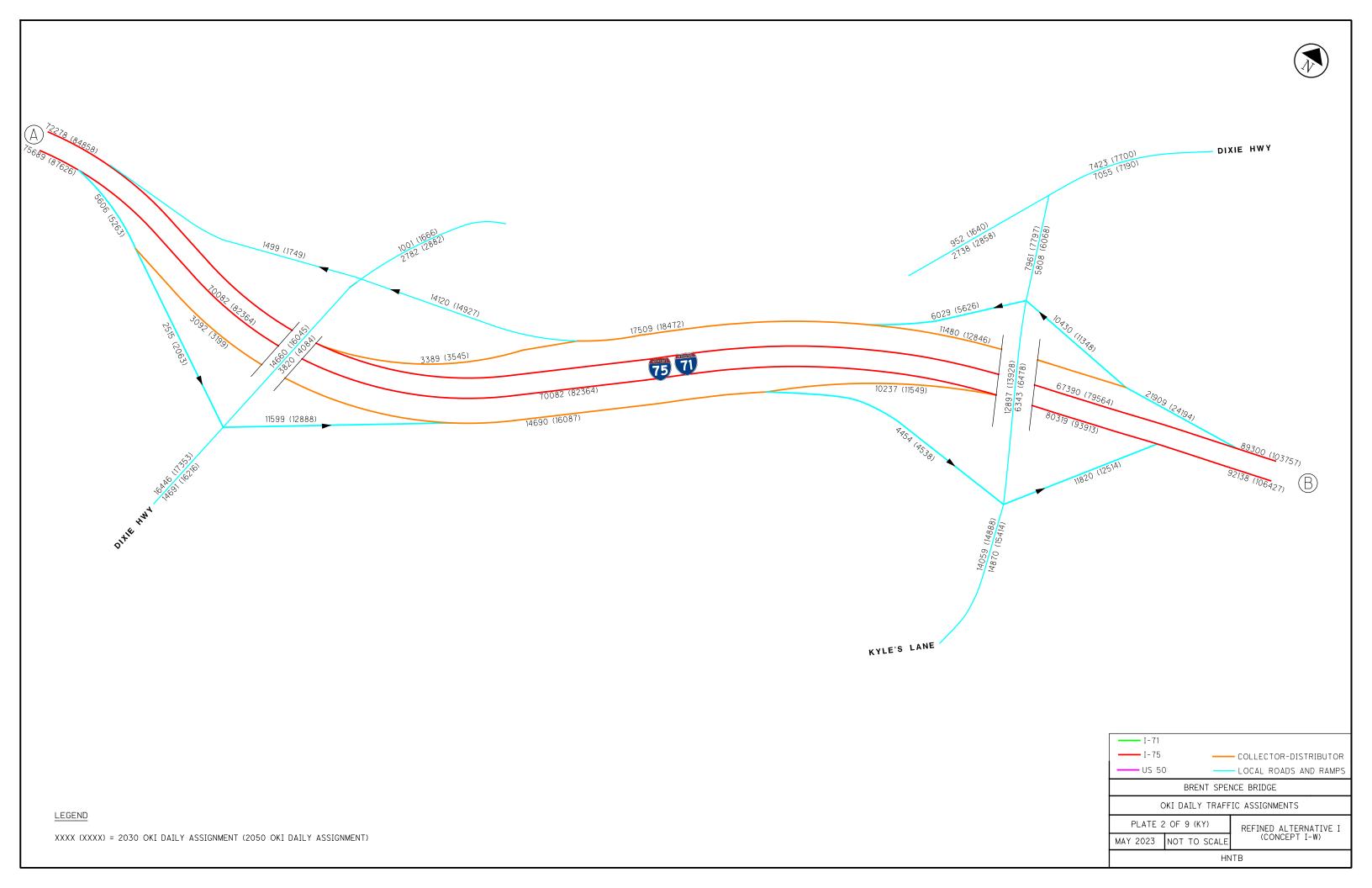


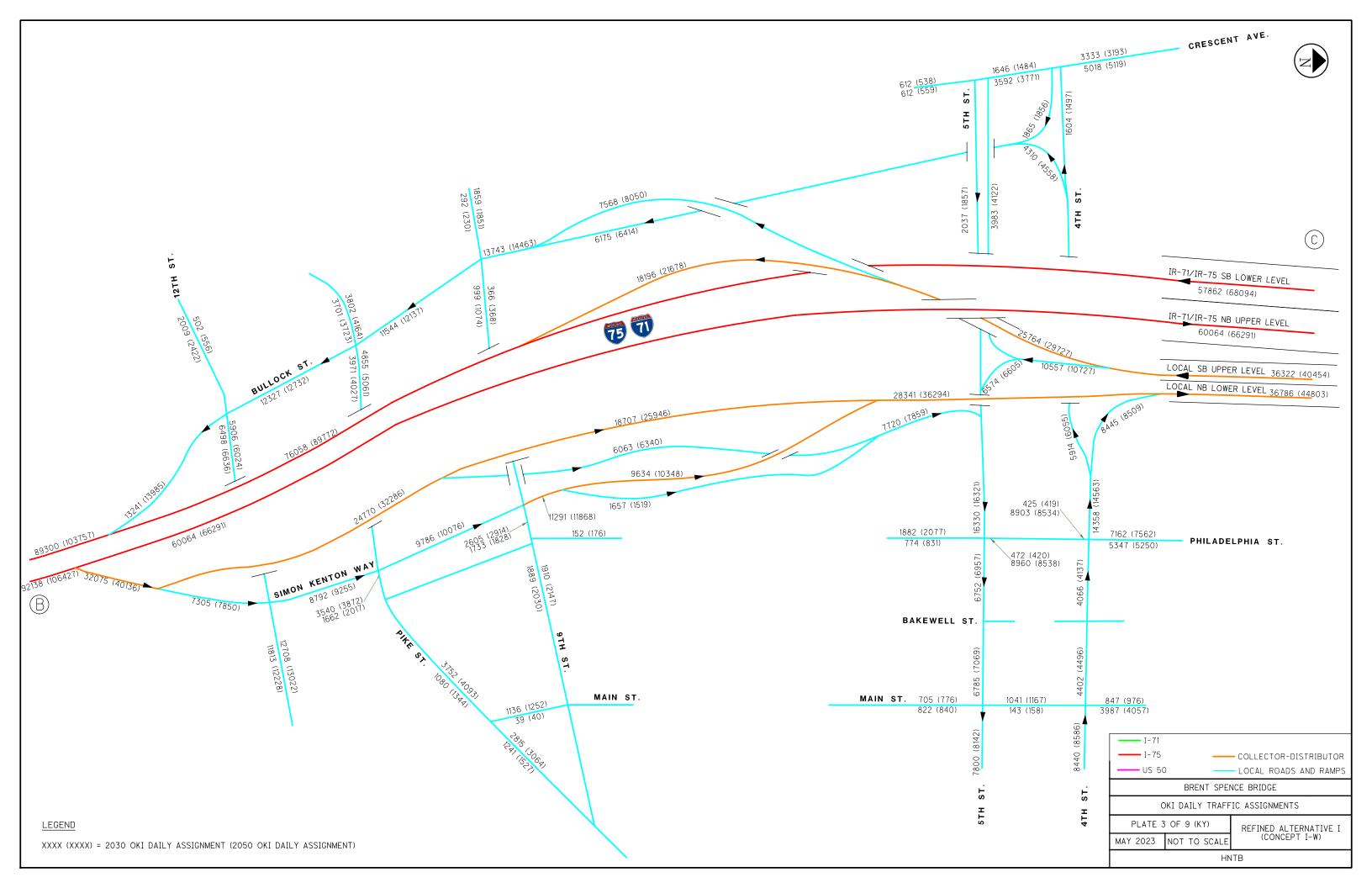


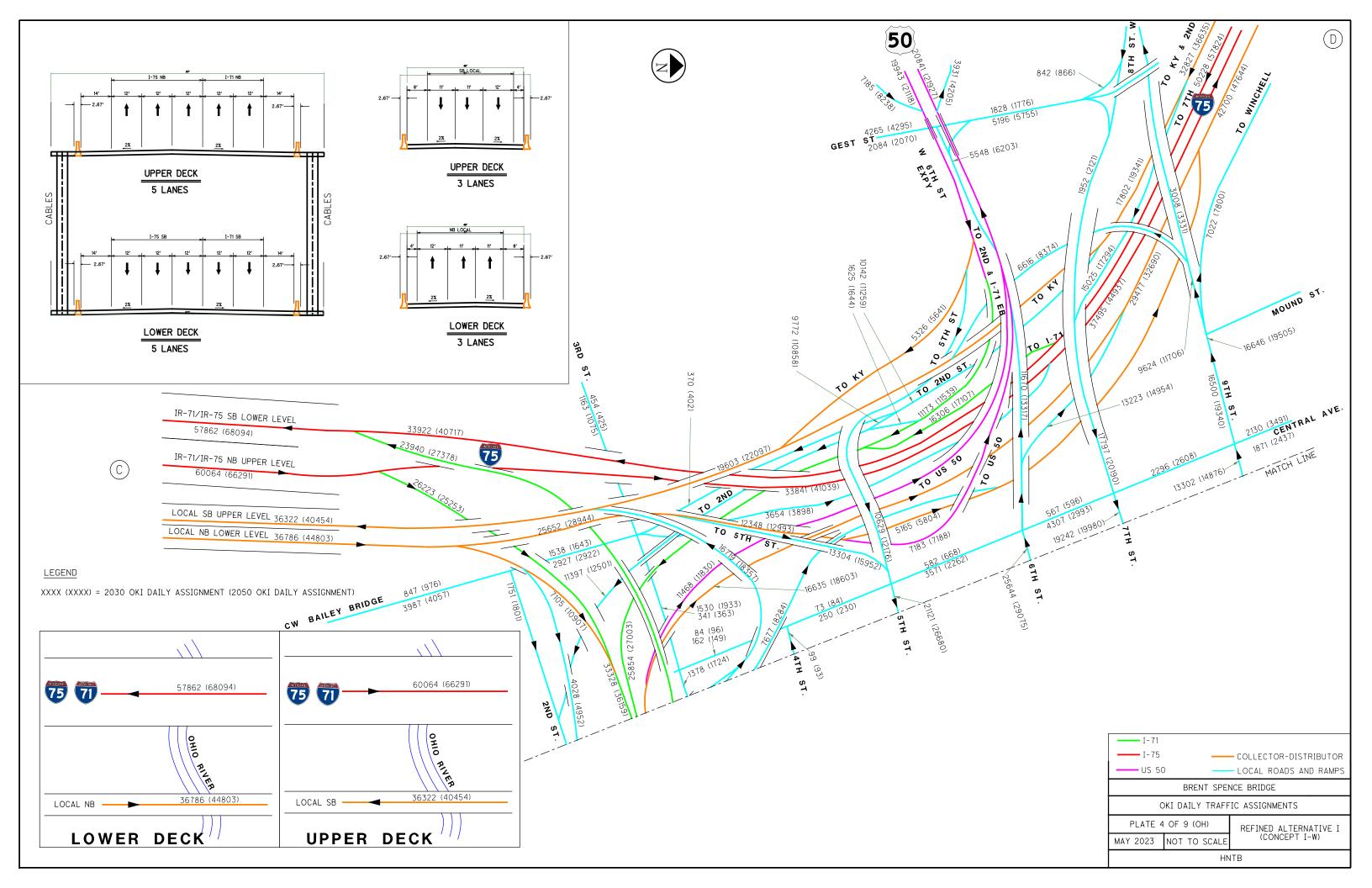


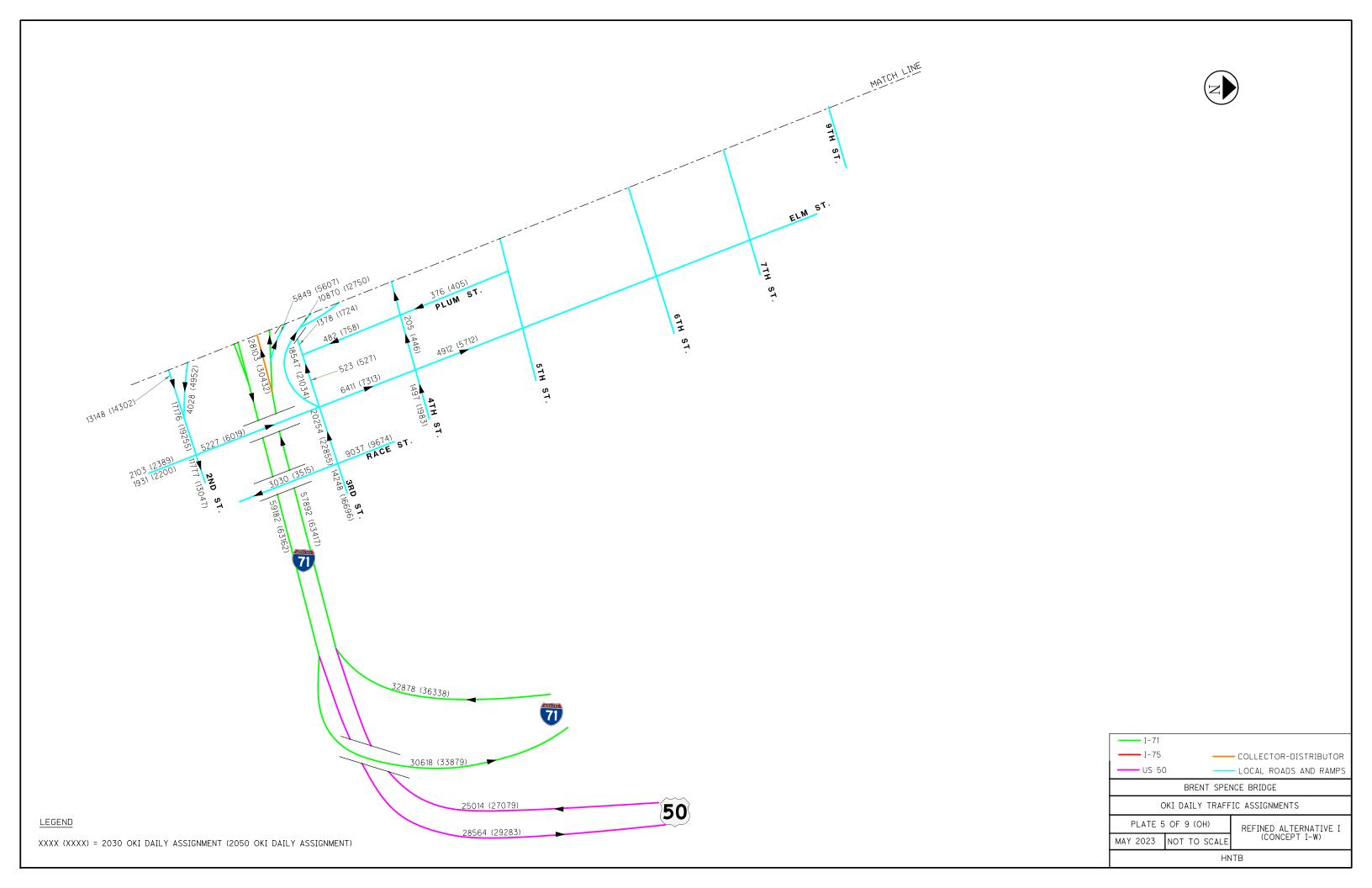


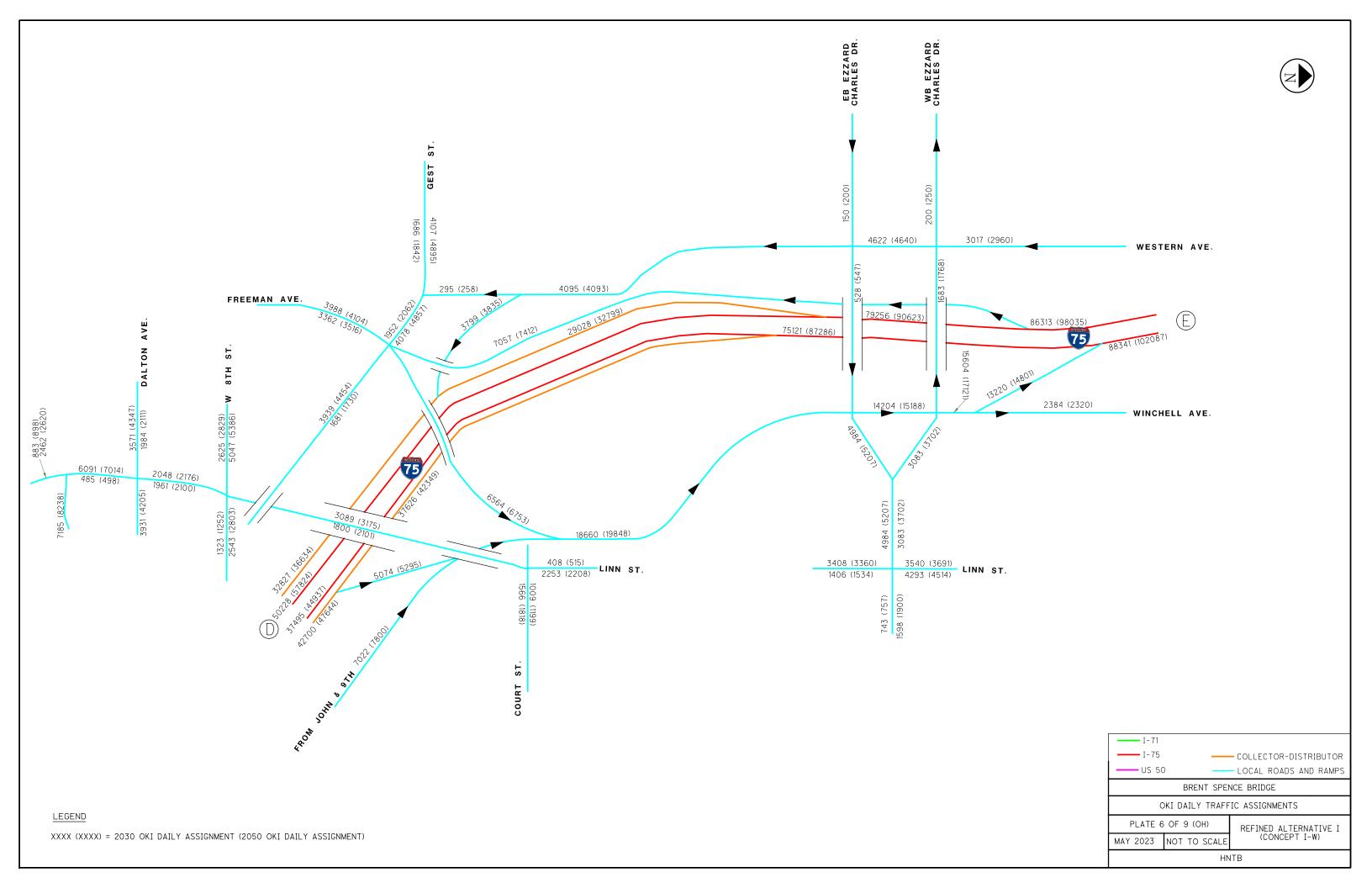


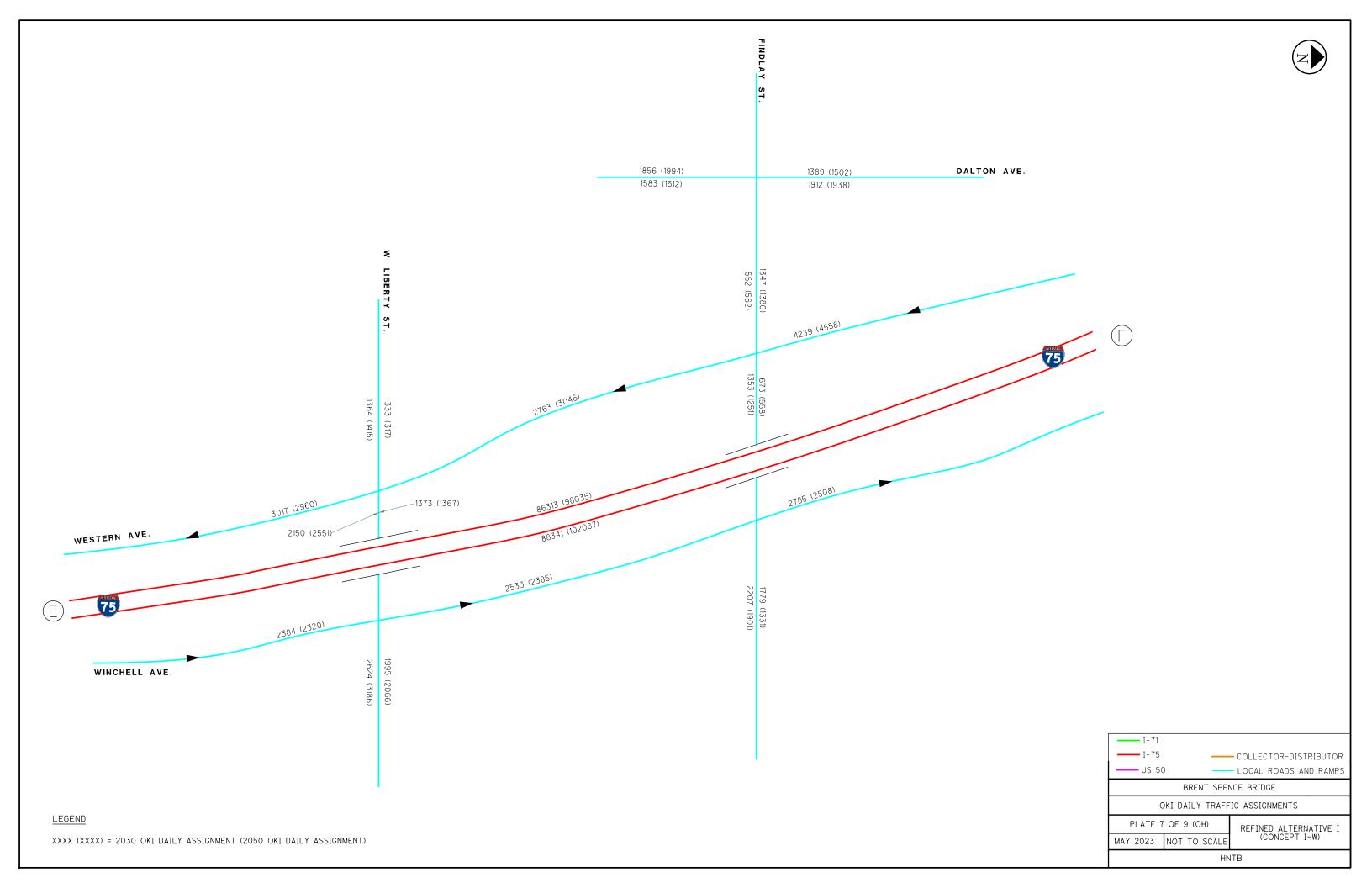


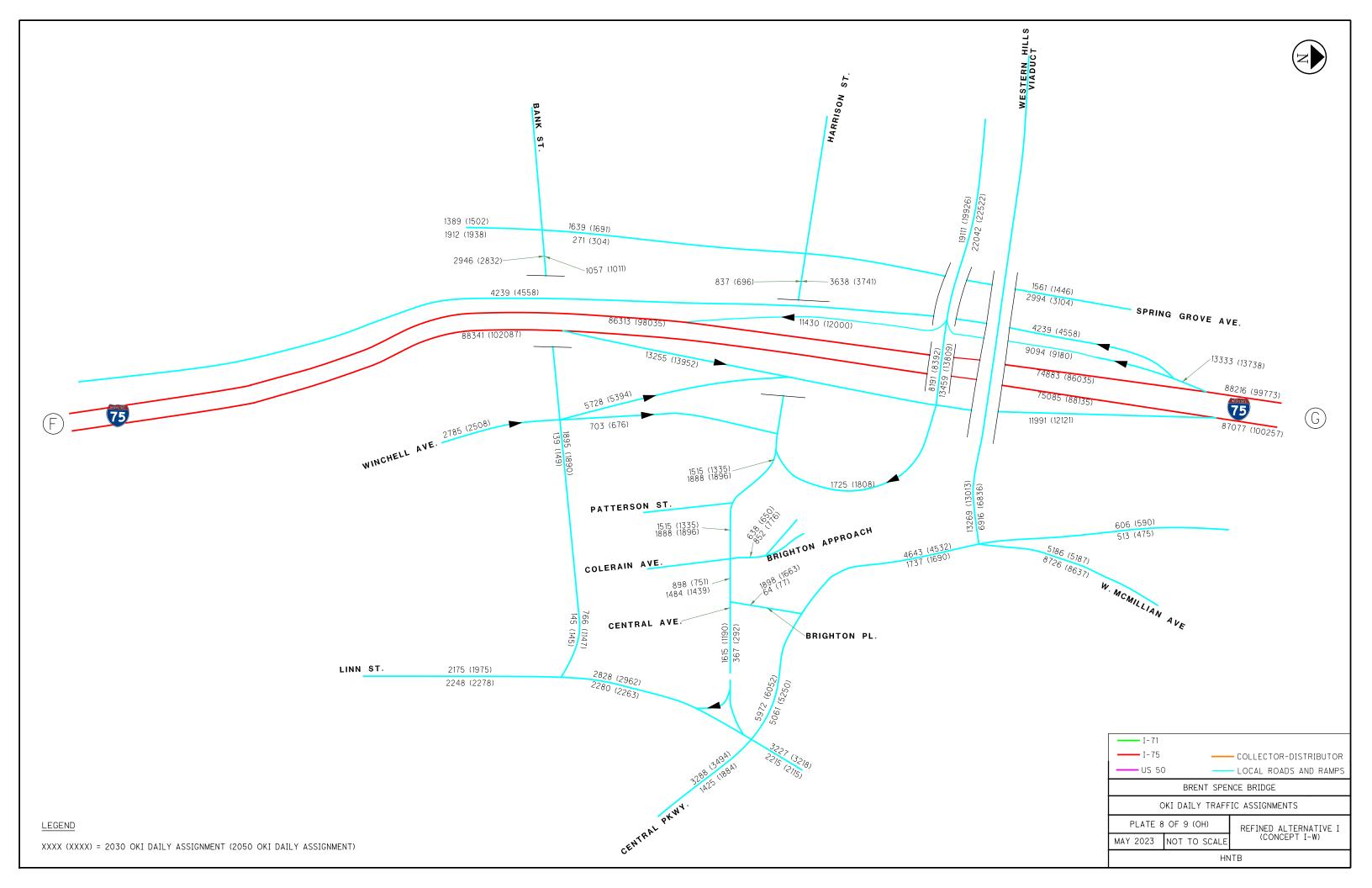


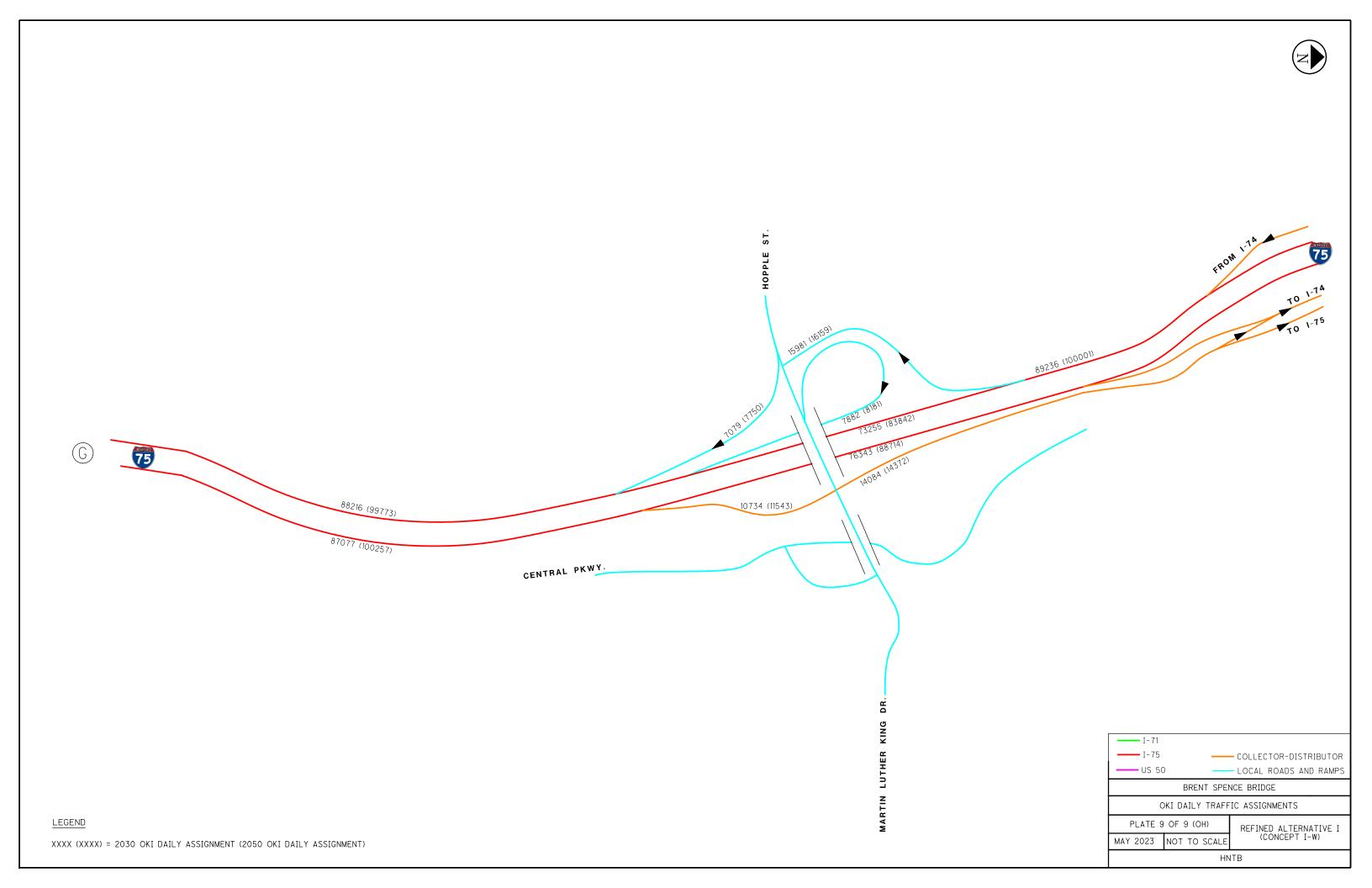












													7						
Adjuster Spreadsheet	Turn	AM29 A	M49	Adjuster Spreadsheet Target PM29 PM49 DY29	DY49	Exist AM19	ting 2019 Volume	es DT19 AM29		Adjusted Fored		S DY29 DY49	Notes on minimum overrides	AM29 /	AM49	Balanced PM29	Forecasts PM49	DY29 [	DY49
Alti VolumeAdjuster 12th at I-75 NB.xlsm	EBL	170	180			580 115	_	450	95 10	_	37	530 580		100	120	30	40		600
AltI VolumeAdjuster 12th at I-75 NB.xlsm	EBT	400	390			4680 395		4950	400 410		330	4950 5000		430	430	380	410	5000	5100
AltI_VolumeAdjuster_12th at I-75 NB.xlsm	WBR	360	350	380 400	1480 4	4660 355	5 320	4300	360 370	0 380	400	4480 4660		360	380	400	420	4500	4650
AltI_VolumeAdjuster_12th at I-75 NB.xlsm	WBT	340	320			1470 260	370	4300	340 350	0 420	440	4430 4480		330	350	430	450	4550	4600
AltI_VolumeAdjuster_12th at I-75 NB.xlsm	NBL	20	20			100 20	0 15	100	20 30	20	30	110 160		20	30	20	30	100	150
AltI_VolumeAdjuster_12th at I-75 NB.xlsm AltI_VolumeAdjuster_12th at I-75 NB.xlsm	NBT NBR	740 170	820 170			3200 90 4030 140	100		740 820 204 214		530 400	7710 8200 4080 4130		720 200	760 200	500 370	520 380	7800 4100	8200 4150
Alti VolumeAdjuster 12th at I-75 NB.xism  Alti VolumeAdjuster 12th at I-75 SB.xism	EBT	300	340			1620 245		1750	286 296		100	1750 1800		270	280	80	90	1750	1750
AltI VolumeAdjuster 12th at I-75 SB.xlsm	EBR	10	10			170 15	5 10	200	15 25		30	230 280		20	30	20	30	250	300
AltI_VolumeAdjuster_12th at I-75 SB.xlsm	SBR	0	0	10 10	30	30 5	5 20	100	5 1	5 5	15	100 150		10	20	10	20	100	150
AltI_VolumeAdjuster_12th at I-75 SB.xlsm	SBT	350	330			3700 80	0 240	1800	380 390		1030	7590 8700		400	400	680	790	6450	7350
AltI_VolumeAdjuster_12th at I-75 SB.xlsm	SBL	270	250			3560 265	5 220		270 280		250	3650 3700		260	270	330	360	3800	3950
AltI_VolumeAdjuster_12th at I-75 SB.xlsm AltI_VolumeAdjuster_12th at I-75 SB.xlsm	WBT WBL	290	290			240 30 4340 250	0 350	250 4150	50 60 290 300	0 33	45 440	280 330 4250 4340		300	310	30 420	40 440	250 4400	300 4450
Alti VolumeAdjuster 2nd at CWB Bridge.xlsm	SBT	290	290			5840 275			337 34		1231	7450 7500		330	350	1060	1100	7450	7550
AltI_VolumeAdjuster_2nd at CWB Bridge.xlsm	SBL	200	210			1440 180		1700	200 210		190	1700 1750		210	220	190	190	1750	1750
AltI_VolumeAdjuster_2nd at CWB Bridge.xlsm	NBT	550	590			1620 500	0 405		550 590		480	4800 4850		550	580	470	490	4800	4850
AltI_VolumeAdjuster_2nd at CWB Bridge.xlsm	NBR	490	530			3070 435		3300	490 530		180	3300 3350		530	580	170	170	3350	3350
AltI_VolumeAdjuster_2nd at Elm.xlsm	EBL EBT	200 1890	210			1250 180 1390 1550			198 210 1818 2050		175 820	1700 1750 12000 12050		200 1580	210 1730	170 750	180 800	1700 11600	1750 11800
AltI_VolumeAdjuster_2nd at Elm.xlsm AltI_VolumeAdjuster_2nd at Elm.xlsm	EBR	290	2170 350			2450 220	-	1250	290 350		200	2070 2450		270	320	160	200	2050	2450
AltI_VolumeAdjuster_2nd at Elm.xlsm	NBT	210	240			2260 145			210 240		260	2020 2260		210	240	240	260	2000	2250
AltI_VolumeAdjuster_2nd at Elm.xlsm	NBR	30	30	80 80	440	460 15	5 60	400	30 40	0 79	89	440 490		30	40	80	90	450	500
AltI_VolumeAdjuster_3rd at Central.xlsm	EBL	200	220			2050 180	0 185	1950	200 220		220	2010 2060		180	200	200	200	1900	1950
AltI_VolumeAdjuster_3rd at Central vism	EBR SBR	110 40	100 40			630 70	35		110 120 65 7		70	620 670 1350 1400		130	140	80	90	800	850 1500
AltI_VolumeAdjuster_3rd at Central.xlsm  AltI_VolumeAdjuster_3rd at Central.xlsm	SBT	100	100			1280 65 620 100	5 180 0 75	1350 700	65 7: 100 110	5 210	220 90	1350 1400 700 750		100	100	190 90	200 90	1450 700	1500 800
Alti VolumeAdjuster_Srd at Central.xism  Alti VolumeAdjuster 3rd at Central.xism	WBR	250	300			1430 160			250 300		530	4310 4430		210	240	460	470	3300	3400
AltI_VolumeAdjuster_3rd at Central.xlsm	WBT	110	110			2180 105			110 120		392	2400 2450		150	160	430	450	2750	2850
AltI_VolumeAdjuster_3rd at Central.xlsm	WBL	270	270			1210 230	0 85		216 220	6 100	110	1200 1250		230	240	120	130	1250	1300
AltI_VolumeAdjuster_3rd at Central.xlsm	NBL	20	20			420 15	5 85	450	21 3:		84	450 500		20	30	70	80	450	500
AltI_VolumeAdjuster_3rd at Central.xlsm  AltI_VolumeAdjuster_3rd at Elm.xlsm	NBT WBR	230	90 280			1470 65 2450 210	5 300 0 200	1500 2050	70 90 230 280		265 240	1500 1550 2060 2450		90 240	130 280	250 260	280 260	1650 2150	1750 2550
Alti VolumeAdjuster 3rd at Elm.xism	WBT	830	850			5460 585			830 850		2130	13700 15460		800	840	1730	1910	13450	15050
AltI VolumeAdjuster 3rd at Elm.xlsm	NBL	130	150			2010 110		1400	130 150		290	1860 2010		150	160	250	260	1850	1950
AltI_VolumeAdjuster_3rd at Elm.xlsm	NBT	300	340	110 120 1	1700 1	1970 215	5 115	1700	300 340	0 115	125	1700 1970		260	290	160	180	1850	2050
AltI_VolumeAdjuster_3rd at Plum.xlsm	SBR	40	50			710 35	5 45	600	40 50		55	600 710		50	70	60	80	750	900
AltI_VolumeAdjuster_3rd at Plum.xlsm	WBT SBR	580	620 170			5820 460		5700	580 620		1050	6760 6820		540	570	950	970	6550	6650
AltI_VolumeAdjuster_3rd at Race.xlsm AltI_VolumeAdjuster_3rd at Race.xlsm	SBT	170 160	170			3940 125 5120 135		2500 3350	170 180 212 222		709 840	3350 3940 4230 5120		210	180 220	560 760	680 840	3300 4250	3900 5100
AltI VolumeAdjuster 3rd at Race.xlsm	WBT	870	950			4000 670		9750	870 950		1560	12440 14000		870	940	1430	1490	12300	13700
AltI_VolumeAdjuster_3rd at Race.xlsm	WBL	160	160	130 130 1	1190 1	1220 140	110	1100	160 170	0 130	140	1190 1240		160	170	130	140	1200	1250
AltI_VolumeAdjuster_3rd at US-42.xlsm	SBR	0	0	0 0	30	30 (	0 0	0	2 17	2 2	12	30 80		10	10	10	20	50	100
AltI_VolumeAdjuster_3rd at US-42.xlsm	SBT	10	10	10 10	30	30 (	0 0	0	5 1	5 5	15	30 80		10	10	10	10	50	50
AltI_VolumeAdjuster_3rd at US-42.xlsm AltI_VolumeAdjuster_3rd at US-42.xlsm	SBL EBL	10	10	20 20 10 10	330 40	320 (		0	7 1	7 7	30 17	330 380 40 90		40 10	50 10	30 10	30 10	350 50	350 50
AltI_VolumeAdjuster_3rd at US-42.xlsm	EBT	50	50			800 35	5 80	600	50 60	0 100	110	790 840		70	80	130		950	1050
AltI_VolumeAdjuster_3rd at US-42.xlsm	EBR	370	370			340	0 660	6050	370 380	0 710	720	6050 6100		400	410	690	700	6050	6100
AltI_VolumeAdjuster_3rd at US-42.xlsm	WBT	80	80			1070 70	0 45	1100	80 90		64	1100 1150		100	100	100	100	1350	1450
AltI_VolumeAdjuster_3rd at US-42.xlsm AltI_VolumeAdjuster_3rd at US-42.xlsm	WBR WBL	10 120	10 130			300 - 2870 115	 5 650	3100	15 25 136 146	5 52	62 517	290 340 3100 3150		10	20 150	40 550	50 580	200 3100	250 3150
Alti_VolumeAdjuster_3rd at US-42.xlsm  Alti_VolumeAdjuster_3rd at US-42.xlsm	NBL	310	320			2870 115 2850 285		3050	310 320		310	3050 3100		310	310	290		3000	3050
AltI_VolumeAdjuster_3rd at US-42.xlsm	NBT	40	60			550 -			40 60		104	520 570		40	60	60	60	400	400
AltI_VolumeAdjuster_3rd at US-42.xlsm	NBR	240	260	160 160 1	1680 1	1710 215	5 140	1750	240 260		170	1750 1800		200	210	120		1400	1400
AltI_VolumeAdjuster_4th at Central.xlsm	SBR	220	260			7220 (	0 0	0	324 334		600	6470 7220		270	280				6550
AltI_VolumeAdjuster_4th at Central.xlsm  AltI_VolumeAdjuster_4th at Central.xlsm	SBT WBR	100 120	110 140			1460 130 1680 60			130 140 120 140		240 140	1550 1600 1600 1680		130 120	130 130	230 130	230 140	1600 1550	1700 1700
Alti_VolumeAdjuster_4th at Central.xism  Alti_VolumeAdjuster_4th at Central.xism	WBT	230	310			5680 105	33		252 310		840	5040 5680		240	310	820		4850	5550
AltI_VolumeAdjuster_4th at Central.xism  AltI_VolumeAdjuster_4th at Central.xism	WBL	40	40			440 35	5 45	500	40 50	0 50	60	500 550		40	50	50	60	550	600
AltI_VolumeAdjuster_4th at Central.xlsm	NBL	220	270	570 590 3		3920 185	5 460	3150	220 270		590	3580 3920		160	200	370	410	2600	2800
AltI_VolumeAdjuster_4th at Central.xlsm	NBT	280	310			3720 220	-		280 310		450	3640 3720		320	370	540	540		4300
AltI_VolumeAdjuster_4th at Elm.xlsm AltI_VolumeAdjuster_4th at Elm.xlsm	WBR WBT	90 280	110 360			1260 55 7140 105	5 65	850 2900	90 110 312 360		140 860	1070 1260 6230 7140		90 300	110 370	110 840	140 940	1050 5850	1250 6550
Alti_volumeAdjuster_4th at Elm.xism  Alti_volumeAdjuster_4th at Elm.xism	NBL	100	110			7140 105 1400 80	0 130	1150	100 110		160	1150 1400		90	110	130	140	1050	1250
AltI_VolumeAdjuster_4th at Elm.xlsm	NBT	420	450			3370 345			420 450		290	3010 3370		410	460	290			3350
AltI_VolumeAdjuster_4th at Plum.xlsm	SBR	10	10	50 50	280	290 20	0 40	300	20 30	0 50	60	300 350		20	30	50	60	250	300
AltI_VolumeAdjuster_4th at Plum.xlsm	SBT	40	40			600 30	0 25	400	40 50		50	550 600		40	50	40	50	550	650
Alti_VolumeAdjuster_4th at Plum.xlsm	WBT	390	500			3310 180	540		390 500		1040	7460 8310		380	460				7550
AltI_VolumeAdjuster_4th at Plum.xlsm AltI_VolumeAdjuster_5th at Central.xlsm	WBL EBL	230	10 240			270 5 1300 210	5 20 0 80	200 1300	230 240	20	30 90	200 270 1300 1350		10 220	20	20 70		200 1150	250 1250
Alti VolumeAdjuster_5th at Central.xism  Alti VolumeAdjuster 5th at Central.xism	EBT	2230	2550			9710 1505			2230 2550		1360	16030 19710		2360	2810	970			19550
AltI_VolumeAdjuster_5th at Central.xlsm	EBR	10	10	10 10	30	30 35	-	150	5 1		15	150 200		10	20	10		150	200
AltI_VolumeAdjuster_5th at Central.xlsm	SBT	330	390			3820 95	200		401 41:		860	8020 8820		390	390	860	880	7300	8050
AltI_VolumeAdjuster_5th at Central.xlsm	SBL	290	290			2280 180			290 300		230	2140 2280		270	290	220	230	2250	2350
AltI_VolumeAdjuster_5th at Central.xlsm AltI_VolumeAdjuster_5th at Central.xlsm	NBT NBR	270 150	300 160			3530 165 1870 115		2500 1450	270 300 150 160		430 180	3420 3530 1820 1870		270 170	310 190	470 200	480 200	3600 2200	3800 2200
Alti_VolumeAdjuster_5th at Central.xism  Alti_VolumeAdjuster_6th at Central.xism	SBR	10	100	170 170 1 10 10	90	80 10	0 15	100	10 20	0 1/0	180 25	100 150		1/0	190	200	30	100	150
Alti_VolumeAdjuster_oth at Central.xism  Alti_VolumeAdjuster_6th at Central.xism	SBT	180	180			1190 105	5 50	600	180 190	0 70	80	1120 1190		180	180	70	70	1050	1100
AltI_VolumeAdjuster_6th at Central.xlsm	WBR	80	80	130 140	860	870 100		1050	100 110		140	1050 1100		90	100	120	130	1000	1050
AltI_VolumeAdjuster_6th at Central.xlsm	WBT	120	150			3980 240		4650	240 250		716	4650 4700		260	320	670	820	4350	4800
AltI_VolumeAdjuster_6th at Central.xlsm	WBL	430	480	990 930 9	9040	9900 170	300	2300	452 480	0 990	1000	9040 9900		480	500	1010	1040	8500	9300

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Alt!_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm       EBL       20       20       20       20       350       350       20       30       350       400       30       30       30       350         Alt!_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm       EBT       550       510       1260       1540       10080       11260       550       560       1260       1540       10080       11260       550       560       150       1170       1410       9950       1         Alt!_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm       WBR       750       870       490       470       6560       720       575       470       6450       750       870       490       500       6560       7200       500       520       6600         Alt!_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm       WBT       1120       1200       730       760       8370       8720       930       645       8350       1120       1200       730       760       8370       8720       930       645       8350       1120       1200       730       760       8370       8720       930       645       8350       1120       1200       730       760       8370       8720       930							_	_	30			_		_						
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AltI_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm         WBR         750         870         490         470         6560         720         575         470         6450         750         870         490         490         500         6560         7200           AltI_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm         WBT         1120         1200         730         760         8370         8720         930         645         8350         1120         1200         730         740         8400	- , - ,								1080		550 56					560	570			
Alti_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm WBT 1120 1200 730 760 8370 8720 930 645 8350 1120 1200 730 760 8370 8720 930 645 8350 1120 1200 730 760 8370 8720 930 645 8370 930 645 8370 930 930 930 930 930 930 930 930 930 93							_							_						
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INIL YOUNGCHURSE DIRECTORY 9 C 7/2 TRANSIN INDE I 3501 9901 1001 1001 23901 2/31 1301 2301 2401 1001 1/01 23901 2/31 2	AltI VolumeAdjuster Dixie Hwy at I-75 NB.xlsm	NBL	390	440	160		-	_		2150				_	2590	380	400	210	220	

		Adjuster Spreadsheet Target	Existing 2019 \		djusted Forecast Targets	Notes on minimum overrides		Balanced Forecasts
Adjuster Spreadsheet	Turn	AM29 AM49 PM29 PM49 DY29	DY49 AM19 PM19			DY49	AM29 AM49	PM29 PM49 DY29 DY49
AltI_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm	NBR	80 10 180 210 18	0 1350 50 1	55 1650 94 104	180 210 1880	1930	90 90	240 270 1950 1950
AltI_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	EBT	380 390 710 880 56	0 6310 330 60	00 5700 380 390	710 880 5700	6310	370 380	760 960 5700 6450
AltI_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	EBR	230 240 340 350 31	0 3250 210 30	00 3050 230 240	340 350 3100	3250	220 230	370 380 3150 3250
AltI_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	SBR	50 60 50 50 5.	0 560 50 4	45 550 50 60	50 60 550	600	50 60	40 50 550 600
AltI_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	SBL	200 190 560 620 46	0 4970 190 50	00 4650 234 244	560 620 4680	4970	210 220	430 480 4600 4850
AltI_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	WBT	1370 1490 760 790 92	0 9700 1120 68	80 9100 1370 1490	760 790 9210	9700	1380 1480	780 820 9300 9750
AltI_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	WBL	140 150 120 130 15	0 1640 85 1:	15 1400 140 150	120 130 1530	1640	130 140	130 140 1550 1650
AltI_VolumeAdjuster_Gest at 6th.xlsm	SBT	250 250 140 150 19	0 2020 215 1	30 2150 250 260	140 150 2150	2200	240 270	150 190 2500 2650
AltI_VolumeAdjuster_Gest at 6th.xlsm	WBR	360 430 110 280 23	0 3400 375 16	65 2950 375 430	165 280 2950	3400	350 420	140 200 2650 3050
AltI_VolumeAdjuster_Gest at 6th.xlsm	WBL	170 180 80 80 10	0 1100 150	60 1000 170 180	80 90 1080	1130	170 190	80 90 1150 1150
AltI_VolumeAdjuster_Gest at 6th.xlsm	NBT	160 170 190 220 22	0 2410 140 1	75 2400 160 170	190 220 2400	2450	160 180	190 280 2350 2700
AltI_VolumeAdjuster_Gest at Freeman.xlsm	EBL	20 40 200 210 20			200 210 2010	2100	90 110	180 190 1950 2150
AltI_VolumeAdjuster_Gest at Freeman.xlsm	EBT	210 220 90 100 9		90 1150 169 203	90 100 1150	1200	150 160	80 90 1000 1000
AltI_VolumeAdjuster_Gest at Freeman.xlsm	EBR	140 140 100 110 10		90 1050 140 150	100 110 1050	1100	110 120	100 110 1050 1100
AltI_VolumeAdjuster_Gest at Freeman.xlsm	SBR	50 60 10 10 5		5 400 50 60	27 37 530	620	50 60	20 30 450 550
AltI_VolumeAdjuster_Gest at Freeman.xlsm	SBT	550 540 370 380 61			370 380 6130	6180	530 550	350 360 5450 5650
AltI_VolumeAdjuster_Gest at Freeman.xlsm	SBL	30 30 10 10 3		50 1350 56 66	50 60 1350	1400	60 60	40 50 1050 1100
AltI_VolumeAdjuster_Gest at Freeman.xlsm	WBR	140 150 200 370 23			200 370 2300	2990	160 180	190 280 2350 2700
AltI_VolumeAdjuster_Gest at Freeman.xlsm	WBT	240 290 50 70 12		35 1050 229 288	64 74 1270	1600	240 290	70 80 1400 1750
AltI_VolumeAdjuster_Gest at Freeman.xlsm	WBL	10 10 20 30 3		10 200 16 26	20 30 310	360	20 30	20 40 350 400
AltI_VolumeAdjuster_Gest at Freeman.xlsm	NBL	10 10 20 20 1		15 250 10 20	20 30 250	300	10 20	20 30 250 300
AltI_VolumeAdjuster_Gest at Freeman.xlsm	NBT	650 710 1070 1170 103			1070 1170 10300	11480	760 860	980 1070 10300 11600
Alti_VolumeAdjuster_Gest at Freeman.xlsm	NBR	20 20 20 20 2		25 250 20 50	20 30 250	300	20 30	20 30 200 250
AltI_VolumeAdjuster_Kyles at I-75 NB.xlsm	EBL	140 130 80 80 10		80 1000 140 150	80 90 1040	1090	130 140	90 100 1050 1100
AltI_VolumeAdjuster_Kyles at I-75 NB.xlsm	EBT	800 810 1240 1420 101			1240 1420 10170	11370	910 940	1170 1310 10050 11150
AltI_VolumeAdjuster_Kyles at I-75 NB.xlsm	WBR	1160 1250 430 410 63			465 475 6380	6930	990 1110	540 570 6400 6950
Alti_VolumeAdjuster_Kyles at I-75 NB.xlsm	WBT	500 510 710 710 65			710 720 6900	6950	480 490	710 730 6900 6950
Alti_VolumeAdjuster_Kyles at I-75 NB.xlsm	NBL	40 10 180 180 17			195 205 2150	2200	100 110	180 180 2200 2250
Alti_VolumeAdjuster_Kyles at I-75 NB.xlsm	NBR	120 80 300 300 25			300 310 2850	2900	160 160	270 280 2900 2950
Alti_VolumeAdjuster_Kyles at I-75 SB.xlsm	EBT	580 580 590 600 54			590 600 5550	5680	560 570	600 620 5600 5800
AltI_VolumeAdjuster_Kyles at I-75 SB.xlsm	EBR	180 160 230 140 23			230 240 2500	2550	180 190	220 230 2550 2550
AltI_VolumeAdjuster_Kyles at I-75 SB.xlsm	SBR	190 180 230 230 23			230 240 2360	2420	190 210	210 220 2300 2350
AltI_VolumeAdjuster_Kyles at I-75 SB.xlsm	SBL	390 400 720 860 570			720 860 5700	6600	480 510	660 790 5500 6450
AltI_VolumeAdjuster_Kyles at I-75 SB.xlsm	WBT	320 280 640 660 59			640 660 6700	6750	400 410	640 650 6700 6800
AltI_VolumeAdjuster_Kyles at I-75 SB.xlsm	WBL	180 180 260 240 22			260 270 2350	2400	180 190	250 260 2400 2400
AltI_VolumeAdjuster_Kyles at US-25.xlsm	SBT	420 420 930 1090 53	<del>                                     </del>		930 1058 5310	5880	420 430	930 1060 5300 5900
AltI_VolumeAdjuster_Kyles at US-25.xlsm	SBL	510 480 570 450 53			570 580 5650	5700	500 510	580 590 5650 5700
Alti_VolumeAdjuster_Kyles at US-25.xlsm	WBR	350 290 550 560 53			550 560 6000	6050	410 430	540 550 6000 6000
Alti_VolumeAdjuster_Kyles at US-25.xlsm	WBL	170 180 320 320 30			320 330 3010	3140	180 190	310 320 3000 3150
Alti_VolumeAdjuster_Kyles at US-25.xlsm	NBT NBR	780 880 530 550 52 240 250 240 250 25			530 550 5200	5490	780 880	530 550 5200 5500 240 260 2500 2650
Alti_VolumeAdjuster_Kyles at US-25.xlsm	EBL	240 250 240 250 25 130 160 180 190 20			240 250 2500 180 190 2100	2640 2220	240 250 140 160	240 260 2500 2650 180 190 2400 2450
Alti_VolumeAdjuster_Linn at 8th.xlsm	EBT					2950	140 160 320 330	190 200 2950 3000
AltI_VolumeAdjuster_Linn at 8th.xlsm AltI_VolumeAdjuster_Linn at 8th.xlsm	EBR	300   280   200   200   28   120   140   110   120   14		70 2900 300 310 80 850 120 140	200 210 2900 110 120 1430	1490	110 120	190 200 2950 3000 110 130 1450 1600
Alti VolumeAdjuster_Linn at 8th.xism	SBR	80 100 330 400 27			330 400 2760	3320	130 150	330 390 2650 3150
Alti VolumeAdjuster_Linn at 8th.xism	SBT	40 40 250 240 14			250 260 1950	2000	90 100	270 270 1850 2100
Alti VolumeAdjuster Linn at 8th.xlsm	SBL	70 60 60 60 7		65 1100 70 80	65 75 1100	1150	70 80	60 70 1100 1100
Alti VolumeAdjuster_Linn at 8th.xism	WBR	20 20 20 20 4		20 450 23 33	23 33 450	500	20 30	20 30 500 550
Alti VolumeAdjuster_Linn at 8th.xism	WBT	300 340 610 690 55		90 2450 300 340	610 690 5570	6360	300 330	
Alti VolumeAdjuster_Linn at 8th.xlsm	WBL	30 30 60 60 5		55 500 30 40	60 70 510	560	30 330	60 80 500 600
Alti VolumeAdjuster_Linn at 8th.xlsm	NBL	130 130 100 100 12		90 1300 130 140	100 110 1300	1370	140 150	110 120 1350 1500
Alti VolumeAdjuster Linn at 8th.xlsm	NRT	120 150 170 160 17	0 1820 65 1	10 1200 120 150	170 180 1720	1820	130 150	
Alti VolumeAdjuster_Linn at 8th.xism  Alti VolumeAdjuster Linn at 8th.xism	NBR	10 10 30 30 1		25 200 10 20	30 40 200	250	10 20	30 40 200 300
Alti VolumeAdjuster_Linn at Bank.xlsm	EBL	30 30 60 60 7		50 750 36 46	60 70 750	800	40 50	
Alti VolumeAdjuster_Linn at Bank.xism	EBR	30 30 70 70 7		55 700 36 46	70 80 710	760	40 50	
Alti VolumeAdjuster_Linn at Bank.xism	SBR	90 100 120 120 21			120 130 2200	2830	110 120	
Alti VolumeAdjuster_Linn at Bank.xlsm	SBT	170 140 250 270 22			250 270 2240	2290	160 190	
Alti VolumeAdjuster Linn at Bank.xlsm	NBL	40 40 150 150 12			150 160 1250	1310	60 70	150 160 1250 1300
Alti VolumeAdjuster Linn at Bank.xlsm	NBT	120 150 210 200 24			225 235 2750	2800	130 160	
Alti VolumeAdjuster Linn at Central.xlsm	EBL	10 10 10 10		5 100 10 20	10 20 100	150	10 20	10 20 100 150
Alti VolumeAdjuster Linn at Central.xlsm	EBT	620 620 400 430 50			400 430 5020	5130	580 580	
AltI_VolumeAdjuster_Linn at Central.xlsm	EBR	190 160 170 190 23	<del>                                     </del>		170 190 2350	2400	170 190	
AltI_VolumeAdjuster_Linn at Central.xlsm	SBR	80 100 60 60 9		55 700 80 100	60 70 950	1000	70 90	60 70 900 950
AltI_VolumeAdjuster_Linn at Central.xlsm	SBT	50 50 110 110 12		90 1250 63 73	110 120 1260	1940	60 70	
AltI_VolumeAdjuster_Linn at Central.xlsm	SBL	10 10 10 10		5 100 10 20	10 20 100	150	10 20	
AltI_VolumeAdjuster_Linn at Central.xlsm	WBR	10 10 10 10 1		10 150 10 20	10 20 150	200	10 20	
AltI_VolumeAdjuster_Linn at Central.xlsm	WBT	80 90 530 550 35			530 550 4000	4050	160 170	510 530 3750 3850
AltI_VolumeAdjuster_Linn at Central.xlsm	WBL	10 10 60 60 5		45 550 30 40	60 70 590	640	30 40	
Alti VolumeAdjuster Linn at Central.xlsm	EBL	90 110 150 140 15			165 175 1800	1850	80 90	
AltI_VolumeAdjuster_Linn at Central.xlsm	EBT	30 30 80 70 10		60 1000 53 63	80 90 1050	1100	40 70	70 90 1100 1150
AltI_VolumeAdjuster_Linn at Central.xlsm	EBR	20 20 60 60 5		45 550 27 37	60 70 550	600	30 30	60 70 550 600
Alti VolumeAdjuster Linn at Court.xlsm	EBL	10 10 10 10		10 50 9 19	9 19 50	100	10 20	10 20 50 100
Alti VolumeAdjuster Linn at Court.xlsm	EBT		0 50 5	5 50 9 19	9 19 50	100	10 20	
AltI_VolumeAdjuster_Linn at Court.xlsm	EBR		0 50 5	5 50 9 19	9 19 50	100	10 20	
Alti VolumeAdjuster Linn at Court.xlsm	SBR		0 60 5	5 50 10 20	10 20 60	110	10 20	
AltI VolumeAdjuster Linn at Court.xlsm	SBT	170 190 460 470 41			460 470 4160	4390	220 240	
Alti VolumeAdjuster Linn at Court.xlsm	SBL	30 30 40 40 4		35 400 30 40	40 50 400	450	30 40	40 50 400 450
AltI_VolumeAdjuster_Linn at Court.xlsm	WBR	20 20 40 40 3		30 350 20 30	40 50 350	400	20 30	40 50 350 400
AltI_VolumeAdjuster_Linn at Court.xlsm	WBT	10 10 10 10	0 50 5	5 50 9 19	9 19 50	100	10 20	10 20 50 100
AltI_VolumeAdjuster_Linn at Court.xlsm	WBL	40 40 190 230 11	0 1520 15 6	65 550 59 69	190 230 1170	1520	60 70	190 230 1200 1600
AltI_VolumeAdjuster_Linn at Court.xlsm	NBL	20 20 10 10	0 50 15	5 50 9 19	9 19 50	100	10 20	10 20 50 100
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		Adjuster Spreadsheet Target	Existing 2019 Volumes Adjusted Forecast Targets	Notes on minimum overrides	Balanced Forecasts
Adjuster Spreadsheet	Turn	AM29 AM49 PM29 PM49 DY29	DY49 AM19 PM19 AADT19 AM29 AM49 PM29 PM49 DY29	DY49	AM29 AM49 PM29 PM49 DY29 DY49
AltI_VolumeAdjuster_Linn at Court.xlsm	NBT	180 180 290 290 313	30 3150 230 345 4500 230 240 345 355	500 4550	210 240 320 340 4000 4200
AltI_VolumeAdjuster_Linn at Court.xlsm	NBR	40 50 30 30 37		100 1150	70 80 50 60 1000 1050
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	EBL	40 40 30 40 46		460 510	40 50 30 50 450 500
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	EBT	420 440 130 150 237		370 2590	440 450 150 170 2250 2500
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	EBR	110 130 140 150 127		270 1390	110 130 160 180 1250 1350
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	SBR	10 20 30 40 27		550 600	20 30 40 50 500 550
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	SBT	280 300 520 540 396		960 4230	280 300 520 540 3950 4250
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	SBL	40 40 30 40 35		350 400	40 50 30 40 350 400
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	WBR	30 20 40 40 32		320 370	30 40 40 50 300 350
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	WBT	50 50 120 120 144		000 2050	70 80 120 130 1800 1950
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	WBL	30 20 40 40 55		550 600	30 40 40 50 550 600
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	NBL	20 20 40 40 43		950 1000	40 50 60 70 850 900
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	NBT	200 180 260 260 105		550 3600	190 200 190 200 3550 3600
AltI_VolumeAdjuster_Linn at Ezzard Charles.xlsm	NBR	70 70 40 40 61		550 700	70 80 40 50 650 700
AltI_VolumeAdjuster_Main at 4th.xlsm	SBR	180 170 560 570 370		950 4000	170 180 510 530 3950 4000
AltI_VolumeAdjuster_Main at 4th.xlsm	SBT	120 120 660 670 303		500 3550	160 170 550 570 3500 3550
AltI_VolumeAdjuster_Main at 4th.xlsm	WBR	590 650 400 400 471		200 5250	610 680 400 410 5250 5250
AltI_VolumeAdjuster_Main at 4th.xlsm	WBT	960 930 1160 1260 1198		980 12520	930 960 1210 1300 12250 12800
AltI_VolumeAdjuster_Main at 4th.xlsm	WBL	20 30 120 130 67		750 810	30 40 110 120 750 800
AltI_VolumeAdjuster_Main at 4th.xlsm	NBL	200 200 150 150 179		800 1850	190 210 160 170 1800 1850
AltI_VolumeAdjuster_Main at 4th.xlsm	NBT	450 460 240 240 281		900 2950	470 480 240 250 2900 2950
AltI_VolumeAdjuster_Main at 5th.xlsm	EBL	110 110 60 60 125		250 1300	120 130 70 80 1200 1250
AltI_VolumeAdjuster_Main at 5th.xlsm	EBT	590 620 350 390 503		000 6050	620 670 410 420 5850 6000
AltI_VolumeAdjuster_Main at 5th.xlsm	EBR	30 30 80 80 32		800 850	40 40 60 70 800 850
AltI_VolumeAdjuster_Main at 5th.xlsm	SBT	50 60 600 620 185		100 2150	100 110 400 420 2100 2150
AltI_VolumeAdjuster_Main at 5th.xlsm	SBL	80 80 230 240 187		150 2200	90 100 260 270 2150 2200
AltI_VolumeAdjuster_Main at 5th.xlsm	NBT	540 540 330 330 336		450 3500	540 560 330 340 3500 3550
AltI_VolumeAdjuster_Main at 5th.xlsm	NBR	40 50 70 80 54		750 800	60 70 80 90 750 800
AltI_VolumeAdjuster_Mound at 9th.xlsm	BHR	20 20 80 80 30		300 350	10 20 40 40 250 250
AltI_VolumeAdjuster_Mound at 9th.xlsm	BBR	20 20 60 60 35		350 400	20 30 60 70 350 400
AltI_VolumeAdjuster_Mound at 9th.xlsm	WBR	20 20 20 20 30		300 350	20 30 20 30 300 350
AltI_VolumeAdjuster_Mound at 9th.xlsm	BBR	30 30 30 20 27	70 290 200 575 4250 30 40 30 40	270 320 ramp access change	20 30 20 40 200 300
AltI_VolumeAdjuster_Mound at 9th.xlsm	BBL	530 580 1430 1760 1041	10         12750         250         715         6350         530         580         1430         1760         1	410 12750	540 600 1340 1630 10500 12350
AltI_VolumeAdjuster_Patterson at Harrison.xlsm	EBT	70 70 100 80 102	20 870 70 75 1250 70 80 100 110	250 1300	140 170 190 200 2250 2400
AltI_VolumeAdjuster_Patterson at Harrison.xlsm	EBR	10 10 10 10 10	00 100 5 10 100 10 20 10 20	100 150	20 30 10 30 150 200
AltI_VolumeAdjuster_Patterson at Harrison.xlsm	WBT	10 10 80 80 73	30 770 30 70 1050 37 47 80 90	050 1100	30 30 60 80 700 750
AltI_VolumeAdjuster_Patterson at Harrison.xlsm	WBL	10 10 10 10 10	00 100 10 5 100 10 20 10 20	100 150	10 20 20 30 150 200
AltI_VolumeAdjuster_Patterson at Harrison.xlsm	NBL	10 10 10 10 5	50 50 5 5 50 9 19 9 19	50 100	10 10 10 10 50 50
AltI_VolumeAdjuster_Patterson at Harrison.xlsm	NBR	10 10 10 10 10	00 100 5 5 100 10 20 10 20	100 150	20 30 10 30 150 200
AltI_VolumeAdjuster_Philadelphia at 4th.xlsm	SBR	680 680 500 530 476	60 4920 540 430 4450 680 690 500 530	760 4920	650 680 510 540 4800 4950
AltI_VolumeAdjuster_Philadelphia at 4th.xlsm	SBT	60 60 80 70 83		000 1050	70 80 80 90 1050 1100
AltI_VolumeAdjuster_Philadelphia at 4th.xlsm	WBR	120 120 140 140 245		450 2500	130 140 170 180 2450 2500
AltI_VolumeAdjuster_Philadelphia at 4th.xlsm	WBT	1090 1070 1670 1770 1454		540 15220	1080 1110 1640 1740 14550 15100
AltI_VolumeAdjuster_Philadelphia at 4th.xlsm	WBL	90 80 70 60 94		950 1000	80 100 70 80 1000 1050
AltI_VolumeAdjuster_Philadelphia at 4th.xlsm	NBL	230 270 150 150 178		780 1850	230 280 160 170 1750 1800
AltI_VolumeAdjuster_Philadelphia at 4th.xlsm	NBT	250 260 170 190 341		410 3620	270 270 180 200 3250 3450
AltI_VolumeAdjuster_Philadelphia at 5th.xlsm	EBL	360 390 160 160 377		770 3850	380 420 210 220 3600 3800
AltI_VolumeAdjuster_Philadelphia at 5th.xlsm	EBT	620 650 360 420 525		450 6500	660 700 430 440 6250 6400
AltI_VolumeAdjuster_Philadelphia at 5th.xlsm	EBR	90 90 100 120 128		280 1450	100 110 110 130 1200 1400
AltI_VolumeAdjuster_Philadelphia at 5th.xlsm	SBT	40 40 50 50 64		640 690	40 60 70 80 650 700
AltI_VolumeAdjuster_Philadelphia at 5th.xlsm	SBL	110 110 90 80 114		400 1450	110 120 80 90 1400 1450
AltI_VolumeAdjuster_Philadelphia at 5th.xlsm	NBT	120 130 130 150 111		350 1400	120 130 130 150 1400 1450
AltI_VolumeAdjuster_Philadelphia at 5th.xlsm	NBR	10 10 30 30 19		200 250	10 20 30 40 200 250
AltI_VolumeAdjuster_Philadelphia at 9th.xlsm	EBT	80 100 190 230 151		510 1870	70 100 190 250 1450 1750
AltI_VolumeAdjuster_Philadelphia at 9th.xlsm	SBR	20 10 40 40 24		240 290	50 60 60 70 400 450
Alti_VolumeAdjuster_Philadelphia at 9th.xlsm	SBL	30 30 50 50 38		400 450	30 40 50 60 400 450
AltI_VolumeAdjuster_Philadelphia at 9th.xlsm	WBT			250 300	40 50 20 30 400 450
AltI_VolumeAdjuster_Pike at I-75 NB.xlsm	EBL	590 550 180 170 413		130 4180	580 600 230 240 4100 4100
AltI_VolumeAdjuster_Pike at I-75 NB.xlsm	EBT	660 670 280 280 405		800 4850	660 680 310 330 4700 4750
AltI_VolumeAdjuster_Pike at I-75 NB.xlsm	WBR	120 120 100 100 66		950 1000	160 170 110 120 950 1000
AltI_VolumeAdjuster_Pike at I-75 NB.xlsm	WBT	160 160 560 600 380		300 4160	220 240 570 620 3850 4250
AltI_VolumeAdjuster_Pike at I-75 NB.xlsm	NBL	80 90 180 190 153		750 1800	90 100 190 200 1850 1900
AltI_VolumeAdjuster_Pike at I-75 NB.xlsm	NBT	800 860 560 580 817		170 8770	770 840 560 590 8500 9000
AltI_VolumeAdjuster_Pike at I-75 NB.xlsm	NBR	310 320 180 180 240		400 2450	320 320 180 190 2500 2550
AltI_VolumeAdjuster_Pike at I-75 SB.xlsm	EBT	1170 1160 340 330 712		120 7170	1160         1190         360         370         7500         7500
AltI_VolumeAdjuster_Pike at I-75 SB.xlsm	EBR	80 80 30 30 55		550 600	80 90 40 50 650 700
AltI_VolumeAdjuster_Pike at I-75 SB.xlsm	SBR	40 30 240 250 151		900 3950	100 120 360 380 3900 3950
AltI_VolumeAdjuster_Pike at I-75 SB.xlsm	SBT	440 410 700 850 767		8490	460 460 630 720 7100 7750
AltI_VolumeAdjuster_Pike at I-75 SB.xlsm	SBL	60 50 130 130 86		250 1300	80 90 180 200 1300 1350
AltI_VolumeAdjuster_Pike at I-75 SB.xlsm	WBT	150 170 450 460 307		250 3300	180 200 410 420 3100 3150
AltI_VolumeAdjuster_Pike at I-75 SB.xlsm	WBL	90 80 290 330 218		180 2460	130 140 350 400 2600 3000
AltI_VolumeAdjuster_Pike at Main.xlsm	EBL	520 520 300 300 356		3650	520 520 290 300 3550 3600
AltI_VolumeAdjuster_Pike at Main.xlsm	EBT	470 480 210 220 372		720 3810	460 480 200 220 3650 3700
AltI_VolumeAdjuster_Pike at Main.xlsm	SBR	370 380 360 380 256		300 2850	280 290 380 400 2950 2950
AltI_VolumeAdjuster_Pike at Main.xlsm	SBL		80 100 5 5 50 10 20 10 20	80 130	10 20 10 20 100 150
AltI_VolumeAdjuster_Pike at Main.xlsm	WBR	30 20 20 20 31		310 360	30 40 20 30 300 350
AltI_VolumeAdjuster_Pike at Main.xlsm	WBT	130 150 280 320 177		770 2190	100 120 300 340 1850 2300
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	EBL	10 20 10 10 5		250 300	10 20 10 20 250 300
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	EBT	40 30 100 90 120		200 1250	60 60 90 100 1150 1200
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	EBR	20 20 20 20 36		360 410	30 40 20 30 350 400
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	SBR	10 10 20 20 25	50 240 15 15 300 15 25 20 30	350 350	20 20 20 30 300 350

				Adjuster Sprea	dsheet Targe	at .		Evisting '	2019 Volum	nes		Δdiu	sted Forecast	Targets		Notes on minimum overrides			Ralancec	l Forecasts		
Adjuster Spreadsheet	Turn	AM29	AM49		A49 DY		1A 0			ADT19 AM	29 AM4		129 PM49		Y29 DY49	Notes on minimum overrides	AM29	AM49	PM29	PM49	DY29	DY49
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	SBT	420	440	510	510	4710	4790	385	450	4900	420	440	510	520	4900 4950		400	410	500	510	4750	4800
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	SBL	70	, ,	100	100	1100	1100	55	85	1100	70	80		110	1100 1150		60	70	90	100		1050
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	WBR	60	70	230	220	1980	1940	90	200	2150	99	109		240	2150 2200		110	110	230	240		2100
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	WBT WBL	70	) /(	50	60 50	350 290	390 290	25	40	150 300	63 20	73	60	70 60	350 400 300 350		70	80	60	60	400	450 350
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm  AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	NBL	40	) 40	20	20	560	610	25	15	550	40	50	20	38	560 610		40	50	30	40	550	600
AltI VolumeAdjuster Spring Grove at Bank.xlsm	NBT	160	160		280	2660	2690	160	275	3100	160	170	275	285	3100 3150		160	170	260	70		2850
AltI_VolumeAdjuster_Spring Grove at Bank.xlsm	NBR	70	1	100	100	1450	1530	40	70	1100	73	83		110	1450 1530		70	80	90			1450
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	EBL	10	10	20	20	50	50	5	15	50	9	19	9	19	50 100		10	20	10	20	50	100
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	EBT	10	) 10	10	10	50	50	5	5	50	9	19	9	19	50 100		10	20	10	20	100	150
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	EBR	10	, 10	30	30	250	250	5	25	250 150	13	23 30	30	40	250 300		10	20	30	40	250	300 150
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm  AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	SBR SBT	20 420		580	70 580	150 5440	150 5460	445	520	5900	20 420	430	27 580	37 590	150 200 5440 5490	WHV access change	20 410	30			100 5350	5400
AltI VolumeAdjuster Spring Grove at Harrison.xlsm	SBL	70	70	20	20	1180	1030	60	60	850	70	80	60	70	1180 1230	Will access change	60	60	60	60	900	900
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	WBR	10	) 10	20	20	300	300	20	85	900	10	20	20	30		WHV access change	20	30	50	60		650
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	WBT	40	) 40	20	20	200	200	35	15	200	36	46	20	30	200 250		70	80	60	70	350	550
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	WBL	40		10	10	210	210	5	5	150	38	48	11	21	210 260		60	60	20	40		500
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	NBL	20			10	200	200	15	10	200	20	30	10	20	200 250	hading 1	20	30	10	20	200	300
AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm AltI_VolumeAdjuster_Spring Grove at Harrison.xlsm	NBT NBR	220	220	460	450 10	4120 200	4130 200	245	465	5100 200	220	230	460	470 20	4120 4170 200 250	WHV changes	250	250	480	490	4700	4700 250
Alti VolumeAdjuster Western at Ezzard CharlesEB.xlsm	EBT	20	) 20	30	40	80	90	25	30	100	14	24	14	24	100 150		20	30	30	40	200	300
AltI_VolumeAdjuster_Western at Ezzard CharlesEB.xlsm	EBR	10	) 10	30	40	40	40	5	5	50	7	17	7	17	50 100		10	20	10	20		100
AltI_VolumeAdjuster_Western at Ezzard CharlesEB.xlsm	SBT	590	630	660	780	4180	4580	590	700	5200	590	630	660	780		Ramp changes	500	560	640	700		4850
AltI_VolumeAdjuster_Western at Ezzard CharlesEB.xlsm	SBL	170	180		30	680	700	260	160	2500	170	180	30	40		Ramp changes	180	180	60	70	1250	1300
Alti_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm	SBR	10	10	10	10	90	100	10	5	100	10	20	10	20	100 150	Damp shanges	10	10	10	20	100	150
AltI_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm AltI_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm	SBT WBT	760	790	660	750 10	4720 90	5170 100	810	820 10	7000 100	760 10	790 20	660 10	750 20	4720 5170 100 150	Ramp changes	610	650	630		4900	5150 100
Alti VolumeAdjuster_Western at Ezzard CharlesWB.xlsm  Alti VolumeAdjuster Western at Ezzard CharlesWB.xlsm	WBL	30	) 3(	30	30	460	510	40	40	700	40	50	40	50	700 750		70	90	70	1		1000
Alti_VolumeAdjuster_Western at Findlay.xlsm	EBT	30	30		50	560	550	25	50	650	30	40	50	60	650 700		30	30	50	- 00		700
AltI_VolumeAdjuster_Western at Findlay.xlsm	EBR	130	140	210	220	1660	1730	105	165	1450	130	140	210	220	1660 1730		160	170	230	240	1700	1750
AltI_VolumeAdjuster_Western at Findlay.xlsm	SBR	140			200	1480	1500	150	180	1850	150	160	190	200	1850 1900		150		190		1750	1850
AltI_VolumeAdjuster_Western at Findlay.xlsm	SBT	230			430	2140	2340	310	370	3000	310	320		421	3000 3050		350		330		2900	3000
AltI_VolumeAdjuster_Western at Findlay.xlsm AltI_VolumeAdjuster_Western at Findlay.xlsm	SBL WBT	90	) 80	180	170 50	1380 770	1230 760	140	250	2600 900	140 60	150	248	258 65	2600 2650 900 950		140	150	250	260	2500 950	2550 1000
AltI VolumeAdjuster Western at Findlay.xlsm	WBL	10	) 10	30	30	320	280	20	40	550	20	30	40	50	550 600		30	40	50	60	550	600
AltI VolumeAdjuster Western at Gest.xlsm	EBT	160	180		250	2930	3230	125	200	2800	160	180	230	250	2930 3230		200	230	240	250		3200
AltI_VolumeAdjuster_Western at Gest.xlsm	SBR	210	210	240	250	1420	1440	180	210	1400	210	220	240	250	1420 1470		150	190	210	220	1200	1350
AltI_VolumeAdjuster_Western at Gest.xlsm	SBL	140		+	150	1100	1090	125	95	950	140	150	140	150	1100 1150		150		120			1050
AltI_VolumeAdjuster_Western at Gest.xlsm	WBT	300	370		100	1970	2440	235	55	1700	300	370	99	109	1970 2440		300	370	110			2600
AltI_VolumeAdjuster_Western at Liberty.xlsm AltI_VolumeAdjuster_Western at Liberty.xlsm	EBT EBR	30	) /(	120	120 60	1380 470	1390 530	70 55	90 85	1300 850	70 55	80 65	120 85	130 95	1380 1430 850 900		100	90 110	120		1350 950	1400 1000
Alti VolumeAdjuster Western at Liberty.xism	SBR	10	) 10	20	20	150	150	10	15	150	10	20	20	30	150 200		100	20	20	30	150	200
AltI_VolumeAdjuster_Western at Liberty.xlsm	SBT	260	270		400	1650	1640	245	365	2000	260	270	297	307	2000 2050		360	390	350	380	2250	2350
AltI_VolumeAdjuster_Western at Liberty.xlsm	SBL	120	140	210	230	2020	2210	180	195	2850	180	190	210	230	2850 2900		170	170	240	260	2750	2800
AltI_VolumeAdjuster_Western at Liberty.xlsm	WBT	120	120		130	1710	1750	90	115	1700	120	130		140	1710 1760		100	120	130		1700	1750
AltI_VolumeAdjuster_Western at Liberty.xlsm	WBL EBL	90	, 100	+	170 120	1540 2070	1690 2050	90	125 65	1550 1300	90 120	100 130		170 140	1550 1690 2070 2120		160 100	160	180			1950 1900
AltI_VolumeAdjuster_Winchell at Bank.xlsm  AltI_VolumeAdjuster_Winchell at Bank.xlsm	EBT	120			150	1620	1670	70 45	130	1650	81	91		160	1650 1700		90	110 100	120	170		1800
Alti VolumeAdjuster_Winchell at Bank.xism	WBR	170		210	170	2640	2820	150	160	2450	170	180	210	220	2640 2820		140		180			2450
AltI_VolumeAdjuster_Winchell at Bank.xlsm	WBT	50	50	150	150	1170	1290	40	135	1200	59	69	150	160	1200 1290		60	70	140	160	1100	1200
AltI_VolumeAdjuster_Winchell at Bank.xlsm	NBL	130			180	1660	1550	90	150	1400	130	140	190	200	1660 1710		140		200			1700
AltI_VolumeAdjuster_Winchell at Bank.xlsm	NBT	400		570	600	6930	6910	140	285	3600	400	420	570	600	6930 6980		360	380	520			6500
AltI_VolumeAdjuster_Winchell at Bank.xlsm AltI_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	NBR EBL	60	, ,	,	80 10	700 30	700 30	50	65 30	700 250	60	70 15	80	90 15	700 750 250 300		70 10	80	90	100		800 200
Alti VolumeAdjuster Winchell at Ezzard CharlesEB.xism	EBT	180		·	50	1420	1430	260	160	2350	256	266	160	170	2350 2400		190		80			
Alti VolumeAdjuster Winchell at Ezzard CharlesEB.xism	NBT	480			420	5310	5850	285	235	3600	480	600		440	5310 5850		460		1			5250
AltI_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	NBR	400			250	2360	2660	130	80	800	400	420		250	2360 2660		400		1			2950
AltI_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm	WBR	10	10	90	90	850	860	115	260	2950	115	125	153	163	2950 3000		100	120	1			2800
AltI_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm	WBT	30	50	30	40	530	650	25	30	550	30	50	30	40	550 650		30	40	40			600
AltI_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm  AltI_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm	NBL NBT	50 440	, ,	380	40 370	400 4750	450 5210	20 290	20	250 3600	50 440	60 570	40 380	50 390	400 450 4750 5210		50 420	540	410		.50	500 4950
AltI VolumeAdjuster_Winchell at Findlay.xlsm  AltI VolumeAdjuster Winchell at Findlay.xlsm	EBL	60		+	130	600	600	50	110	600	60	70		118	600 650		50					600
AltI_VolumeAdjuster_Winchell at Findlay.xlsm	EBT	80		120	120	1360	1200	115	190	2650	115	125	190	200	2650 2700		120					
AltI_VolumeAdjuster_Winchell at Findlay.xlsm	WBR	20	20	40	40	570	420	15	35	550	29	39	40	50	570 620		30	30	40	1		600
AltI_VolumeAdjuster_Winchell at Findlay.xlsm	WBT	10		, 50	30	380	350	20	50	650	20	30	50	60	650 700		20		50			700
AltI_VolumeAdjuster_Winchell at Findlay.xlsm	NBL	60			50	800	800	55	45	800	60	70	50	60	800 850		60		50			900
AltI_VolumeAdjuster_Winchell at Findlay.xlsm AltI_VolumeAdjuster_Winchell at Findlay.xlsm	NBT NBR	530		+	670 10	7590 40	7860 30	215	355	4550 50	530	570 17	650	670 17	7590 7860 50 100		490 10		670			7800 100
Alti_VolumeAdjuster_Winchell at Findlay.xism  Alti_VolumeAdjuster_Winchell at Harrison.xism	I EBT	90			100	1350	1230	70	75	1100	90	100	120	130	1350 1400		10 80					1300
AltI_VolumeAdjuster_Winchell at Harrison.xlsm	WBT	20	) 20	90	90	770	810	35	75	1100	39	49	90	100	1100 1150		100					1300
AltI_VolumeAdjuster_Winchell at Harrison.xlsm	NBL	40	) 40		40	290	310	25	30	150	40	50	40	50	290 340		50		30	40		400
AltI_VolumeAdjuster_Winchell at Harrison.xlsm	NBR	30	30	,	60	620	620	5	10	250	31	41	60	70	620 670		30	30	50		550	550
AltI_VolumeAdjuster_Winchell at Liberty.xlsm	EBL	20			40	250	250	15	30	250	20	30	40	50	250 300		20		40			300
AltI_VolumeAdjuster_Winchell at Liberty.xlsm	EBT WBR	160 290			330 470	3140 4830	3340 5010	235	255	3900 2750	235 290	245 300		330 470	3900 3950 4830 5010		220 270					3900 4650
AltI_VolumeAdjuster_Winchell at Liberty.xlsm AltI_VolumeAdjuster_Winchell at Liberty.xlsm	WBT	140	1	+	260	4830 2480	2640	90 125	235 210	2500	140	160		260	4830 5010 2500 2640		170		1			2700
AltI VolumeAdjuster Winchell at Liberty.xlsm	NBL	70	) 70	0 40	40	770	780	55	30	750	70	80	40	50	770 820		90					1000
AltI_VolumeAdjuster_Winchell at Liberty.xlsm	NBT	250	270		200	3200	3090	170	140	2400	250	270	220	230	3200 3250		270		280			3850
AltI_VolumeAdjuster_Winchell at Liberty.xlsm	NBR	140	1	+	190	1860	2400	70	90	1100	140	230		200	1860 2400		160		1			2900
AltI_VolumeAdjuster_6th at Linn EB.xlsm	SBT	160			420	2790	2810			2900	160	170		430	2900 2950		180					
AltI_VolumeAdjuster_6th at Linn EB.xlsm	SBL	160	180	500	580	3930	4690	105	325	2700	197	207	500	580	3930 4690		200	210	480	540	3700	4250

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				djuster Spre			21112		ng 2019 Vol				usted Forecast Targets		Notes on minimum overrides			Balanced F			
Adjuster Spreadsheet AltI VolumeAdjuster 6th at Linn EB.xlsm	Turn NBT	AM29 150	AM49 I	PM29 F	PM49 220	DY29 1930			PM19 200	2000 AM2	9 AM4	9 PI	M29 PM49 DY 220 230	2000	DY49 2050	AM29 150	AM49 160		PM49 D'	2000 DY	DY49 2100
AltI VolumeAdjuster_6th at Linn EB.xlsm  AltI VolumeAdjuster 6th at Linn EB.xlsm	NBR	30	30	100	110		750	130 25	80	650	37	47	100 110	730	780	150	160	100	110	750	800
Alti VolumeAdjuster Spring Grove at WHV.xlsm	SBT	470	480	610	590		5850	23	60	000	470	480	610 620	5940	5990	490	510	650	660	6350	6450
AltI VolumeAdjuster Spring Grove at WHV.xlsm	SBL	70	70	190	190		1350				72	82	190 200	1430	1480	70	80	190	200	1450	1500
AltI VolumeAdjuster Spring Grove at WHV.xlsm	NBT	290	280	500	510	5030	5080				290	300	500 510	5030	5080	270	280	510	530	5200	5250
AltI VolumeAdjuster Spring Grove at WHV.xlsm	NBR	0	0	50	50	160	160				8	18	29 39	160	210	10	20	30	40	150	200
AltI_VolumeAdjuster_WHV at I-75 NB.xlsm	EBL	980	1000	580	590	11390	11380				980	1000	580 590	11390	11440	870	900	580	590	10400	10450
AltI_VolumeAdjuster_WHV at I-75 NB.xlsm	NBL	510	620	840	840	7210	7700				510	620	840 850	7210	7700	410	470	770	800	6900	7150
AltI_VolumeAdjuster_WHV at I-75 NB.xlsm	NBT	440	460	560	570	8290	8570				440	460	560 570	8290	8570	520	540	740	770	9600	9900
AltI_VolumeAdjuster_9th at Simon Kenton.xlsm	EBL	0	0	0	0	0	0	40	20	200	20	20	30 30	200	250						
AltI_VolumeAdjuster_9th at Simon Kenton.xlsm	EBT	50	70	130	170	880					50	70	130 170	880	1190	40	60	130	180	800	1050
AltI_VolumeAdjuster_9th at Simon Kenton.xlsm	WBR	80	100	40	30	530	530				80	95	40 50	530	580	40	50	50	40	400	450
AltI_VolumeAdjuster_9th at Simon Kenton.xlsm	WBT	50	40	60	60	450	470				50	60	60 70	450	500	50	60	50	60	400	450
AltI_VolumeAdjuster_9th at Simon Kenton.xlsm	NBL	10	10	10	10	30					5	15	5 15	30	80	10	20	10	20	50	100
AltI_VolumeAdjuster_9th at Simon Kenton.xlsm	NBT	620	710	340	350	4930	5280				620	710	340 350	4930	5280	530	560		310	5450	5700
AltI_VolumeAdjuster_9th at Simon Kenton.xlsm	NBR	30	40	60	60	600	670				30	40	60 70	600	670	30	40	60	70	650	700
Alti_VolumeAdjuster_9th at Bullock.xlsm	EBT	30	30	40	40	90	90				16	26	16 26	90	140	20	30	20	30	150	200
Alti_VolumeAdjuster_9th at Bullock.xlsm	EBR SBR	20 90	30 80	10	20	470	540				24	34	24 34	470	540	20	30	30	50	600	700
AltI_VolumeAdjuster_9th at Bullock.xlsm AltI_VolumeAdjuster_9th at Bullock.xlsm	SBT	510	470	260 1220	260 1390	2060 10380	2020 11200				103 519	113 529	260 270 1220 1390	2060 10380	2110 11200	120 580	130 590	320 1110	320 1210	2200 11400	2200 11950
	SBL	30	470	110	1590	600	840				30	40	108 150	600	840	40	50	130	180	800	
AltI_VolumeAdjuster_9th at Bullock.xlsm  AltI_VolumeAdjuster_9th at Bullock.xlsm	WBT	40	40	50	£U T20	170	150				31	41	31 41	170	220	20	30	30	40	150	1050 150
Alti VolumeAdjuster 9th at Bullock.xism	WBL	100	80	20	30	340	390				61	71	20 30	340	390	40	50	30	40	300	400
Alti VolumeAdjuster WHV at Harrison.xlsm	EBT	80	80	110	90		960				80	90	110 120	1100	1150	110	130		160	1750	1850
AltI VolumeAdjuster WHV at Harrison.xlsm	SBR	100	90	40	40	780	700				100	110	40 50	780	830	60	60		40	450	500
Alti VolumeAdjuster WHV at Harrison.xism	SBL	70	70	50	40	740					70	80	50 60	740	790	50	70	70	70	650	750
Alti VolumeAdjuster WHV at Harrison.xism	WBT	20	20	90	90	770	810				39	49	90 100	770	820	40	40	70	90	750	800
Misc Ramps Alternative I.xlsm	SB I-75 Entrance from Buttermilk Pike	843	958	1079	1226	12467	14165	750	960	12200	843	958	1079 1226	12467	14165	840	960	1080	1230	12450	14150
Misc Ramps Alternative I.xlsm	NB I-75 Exit to Buttermilk Pike	979	1113	858	974	12476	14172	885	775	12400		1113	858 974	12476	14172	980	1110	860	970	12500	14150
Misc Ramps Alternative I.xlsm	NB I-75 Entrance from Buttermilk Pike	554	547	622	615	9342	9230	485	545	9000	554	564	622 632	9342	9392	650	660	660	680	9500	9550
Misc Ramps Alternative I.xlsm	SB I-75 Exit to Buttermilk Pike	644	659	836	855	9089	9299	570	740	8850	644	659	836 855	9089	9299	640	660	810	830	9150	9350
Misc Ramps Alternative I.xlsm	SB I-75 South of Buttermilk Pike	5294	6207	7412	8690	84659	99266	4525	6335	79600	5294	6207	7412 8690	84659	99266	5570	6540	7320	8540	84200	98500
Misc Ramps Alternative I.xlsm	NB I-75 South of Buttermilk Pike	5403	6382	5672	6700	76279	90113	4620	4850	71750	5403	6382	5672 6700	76279	90113	5790	6880	5830	6900	77650	91650
Misc Ramps Alternative I.xlsm	SB I-75 North of Buttermilk Pike	5418	6288	7234	8396	81271	94314	4345	6115	76250	5418	6288	7234 8396	81271	94314	5370	6240	7050	8140	80900	93700
Misc Ramps Alternative I.xlsm	NB I-75 North of Buttermilk Pike	5407	6306	5486	6398	73116	85273	4220	4620	68350		6306	5486 6398	73116	85273	5460	6430	5630	6610	74650	87050
Misc Ramps Alternative I.xlsm	SB I-75 Entrance from Dixie Highway	334	352	555	584	4581	4822	295	490	4450	334	352	555 584	4581	4822	350	370	500	520	4700	4900
Misc Ramps Alternative I.xlsm	NB I-75 Exit to Dixie Highway	412	376	691	631	4379	3999	325	545	3800	412	422	691 701	4379	4429	470	490	450	490	4400	4600
Misc Ramps Alternative I.xlsm	NB I-75 Entrance from Dixie Highway	661	723	461	504		7512	595	415	6800	661	723	461 504	6864	7512	700	820	520	550	6950	7600
Misc Ramps Alternative I.xlsm	SB I-75 Exit to Dixie Highway	258	272	328	346	5079	5360	240	305	5200	258	272	328 346	5200	5360	260	280	470	530	5150	5450
Misc Ramps Alternative I.xlsm	SB I-75 Entrance from Kyle's Lane	351	322	482	442		4233	335	460	4850 5000	351	361	482 492	4850	4900	360	380	470	490	4950	4950
Miss Ramps Alternative Lulem	NB I-75 Exit to Kyle's Lane	240 977	241 1060	441 637	444 692	4358 7336	4385 7961	250 835	460 545	6900	250 977	260 1060	460 470 637 692	5000 7336	5050 7961	260 1120	270 1250	450 630	460 670	5100 7450	5200 8050
Miss Ramps Alternative Lylem	NB I-75 Entrance from Kyle's Lane SB I-75 Exit to Kyle's Lane	737	830	808	910	7831	8824	620	680	7250	737	830	808 910	7831	8824	670	720	870	1010	7800	8800
Misc Ramps Alternative I.xlsm Misc Ramps Alternative I.xlsm	SB I-75 North of Kyle's Lane	5360	6260	7576	8848		98770	4575	6466	79400		6260	7576 8848	84566	98770	5590	6490	7420	8670	84200	98100
Misc Ramps Alternative LxIsm	NB I-75 North of Kyle's Lane	5988	6998	5770	6743	78574	91829	5075	4890	73250		6998	5770 6743	78574	91829	6550	7740	5880	6880	79550	92900
Misc Ramps Alternative I.xlsm	SB I-75 Entrance from 12th Street	700	768	1217	1335	11341	12442	345	600	6150	700	768	1217 1335	11341	12442	720	740	1120	1260	11100	12100
Misc Ramps Alternative I.xlsm	NB I-75 Exit to 12th Street	833	861	981	1015	11608	12005	250	495	11650	833	861	981 1015	11650	12005	940	990	890	930	12000	12500
Misc Ramps Alternative I.xlsm	SB I-75 Exit to 5th Street	508	528	540	561	8084	8400	400	425	7000	508	528	540 561	8084	8400	640	660	770	800	7700	7950
Misc Ramps Alternative I.xlsm	NB I-75 Exit to 5th Street	534	570	419	447	5713	6097	510	400	6000	534	570	419 447	6000	6097	590	630	350	380	6000	6350
Misc Ramps Alternative I.xlsm	SB I-75 Exit to Bullock Street	376	395	729	765	6835	7176	330	640	6600	376	395	729 765	6835	7176	330	340	570	610	6200	6650
Misc Ramps Alternative I.xlsm	WB Exit from 4th to Bullock Street	271	305	917	1034	5486	6185	285	965	6350	285	305	965 1034	6350	6400	260	270	770	840	5900	6050
Misc Ramps Alternative I.xlsm	EB Exit from Crescent Ave to Bullock Street	146	151	151	155	1761	1810	155	160	2050	155	165	160 170	2050	2100	150	160	220	260	2300	2500
Misc Ramps Alternative I.xlsm	NB I-75 Entrance from 4th Street	1470		1050	1085	11631	12016			10050		1519	1050 1085	11631	12016	1500	1580			11800	12200
Misc Ramps Alternative I.xlsm	WB Entrance from 6th Street to US-50	366		1138	1424		6703	180		2900	366	458	964 1207	5356	6703	350	440		1090	5850	6550
Misc Ramps Alternative I.xlsm	WB US-50 Exit to Gest Street	503	659	216	282	3442	4507	525	225	3950	525	659	225 282	3950	4507	520	610	220	280	3750	4250
Misc Ramps Alternative I.xlsm	WB US-50 Exit to Linn Street	296	337	217	247		3474	225		2550	296	337	217 247	3054	3474	300	350	230	260	3200	3550
Misc Ramps Alternative I.xlsm	EB US-50 Entrance from Linn Street	193	225	601	701		5268	130		3350	226	236	601 701	4523	5268	240	250	+ +	650	4450	5050
Misc Ramps Alternative Lulen	EB 8th Street Exit to Gest Street	5	3	5	3	62	47	20	20	300 750	11	21	11 21	300	350	10	20	10	20	250	300
Miss Ramps Alternative Lulem	EB 8th Street Entrance from Gest Street	1200	1208	49	34	667	459	75 1100	50	750 6250	75	1124	50 60	750	800	1000	100		430	900	900
Miss Ramps Alternative Lylsm	SB Exit to 2nd Street	1200	1308	398	434		6245	1190		6250 3700		1124	398 434	6250	6300 4670	1090	1220	380	420 400	6100 4150	6200 4700
Misc Ramps Alternative I.xlsm Misc Ramps Alternative I.xlsm	NB Exit to 2nd Street  NB Exit to 5th Street	162 744	201 948	340 341	423 434		4670 7360	145 480	305 220	4100	187 744	201 948	340 423 341 434	3747 5777	7360	750	240 930	340 360	400	6350	8000
Misc Ramps Alternative I.xism  Misc Ramps Alternative I.xism	EB US-50 Exit to 5th Street	1004	1191	288	342		7360 5504	480 610	175	3100	835	948	288 342	4637	5504	830	930	310	380	4750	5700
Misc Ramps Alternative Lxism  Misc Ramps Alternative Lxism	SB Exit to 5th Street	1004	1228	358	428		7356	660	230	4350		1228	358 428	6153	7356	1010	1170	380	480	6000	7300
Misc Ramps Alternative Lxism  Misc Ramps Alternative Lxism	9th Street Exit to SB I-75	1027	245	711	951	4223	5652	130	505	3300	211	245	711 951	4223	5652	210	240		890	4300	5500
Misc Ramps Alternative LxIsm	Western Avenue Exit to SB I-75	246	272	340	376	2240	2476	290	400	2900	290	300	400 410	2900	2950	210	230	320	360	2400	2550
Misc Ramps Alternative LxIsm	SB Ramp from Ezzard to Gest Street	361	332	361	332	2532	2323	305	305	2350	361	371	361 371	2532	2582	300	350	330	360	2200	2400
Misc Ramps Alternative LxIsm	SB I-75 Exit to Freeman Avenue	606	627	374	388		6841	550	340	6600	606	627	374 388	6608	6841	640	670		440	6950	7300
Misc Ramps Alternative I.xlsm	NB Freeman Avenue Exit to NB I-75	919		966	1110		14267	495	520	7350		1057	966 1110	12408	14267	730	840		1290	11300	12950
Misc Ramps Alternative I.xlsm	SB I-75 Exit to WHV	155	158	418	427	3681	3754	230	620	6000	230	240	620 630	6000	6050	240	250	610	640	5700	5850
Misc Ramps Alternative I.xlsm	NB I-75 North of Ezzard	5755	6762	6981	8202	72856	85599	5235	6350	72900	5755	6762	6981 8202	72900	85599	6180	7320	7300	8460	74400	87250
Misc Ramps Alternative I.xlsm	SB I-75 North of Ezzard	7471	8617	5099	5881	78744		6395	4365	74150		8617	5099 5881	78744	90828	7300	8390	5150	5940	76250	87800
Misc Ramps Alternative I.xlsm	SB I-75 Exit to Western Avenue	451	455	602	607	5096	5135	600	800	7450	600	610	800 810	7450	7500	640	680	770	840	7150	7400
Misc Ramps Alternative I.xlsm	NB I-75 Entrance North of WHV	1332	1350	1239	1256	19296	19551	860	800	13700	1332	1350	1239 1256	19296	19551	1390	1440	1320	1360	20000	20350
Misc Ramps Alternative I.xlsm	NB I-75 North of WHV	7097	8149	7854	9019	86205	98984	5810	6430	80450		8149	7854 9019	86205	98984	7160	8290		9020	87500	100450
Misc Ramps Alternative I.xlsm	SB I-75 North of WHV	7526		6334	7265		94399	6505	5475	81100		8632	6334 7265	82311	94399	7470	8600		7110	82400	94350
IVIISC Namps Atternative LAISIII		004	1043	340	397	5637	6579	735	280	5100	894	1043	340 397	5637	6579	900	1050	330	390	5550	6500
Misc Ramps Alternative I.xlsm	SB I-75 Entrance from Hopple Street	894																			2250
Misc Ramps Alternative Lxlsm Misc Ramps Alternative Lxlsm	SB I-75 Entrance from Martin Luther King Drive	236	261	181	200		3385	235	180	3350	236	261	181 200	3350	3400	230	260		200	3250	3350
Misc Ramps Alternative I.xlsm Misc Ramps Alternative I.xlsm Misc Ramps Alternative I.xlsm	SB I-75 Entrance from Martin Luther King Drive SB I-75 Exit to Hopple Street	236 957	261 954	181 962	959	11666	3385 11630	880	885	11800	957	967	962 972	11800	11850	960	970	960	970	11800	11850
Misc Ramps Alternative Lxlsm Misc Ramps Alternative Lxlsm	SB I-75 Entrance from Martin Luther King Drive	236	261 954 852	181		11666 9403	3385		885 635									960 930			

## Alt I

			A	Adjuster Sprea	dsheet Targe	et		Existin	ıg 2019 Volu	umes		Ad	ljusted Fore	cast Target	:S		Notes on minimum overrides			Balanced	l Forecasts		
Adjuster Spreadsheet	Turn	AM29	AM49	PM29 Pf	V149 DY	/29 D\	′49 A	AM19	PM19	AADT19 A	AM29 A	M49 F	PM29 P	M49	DY29 DY	19		AM29	AM49	PM29	PM49	DY29	DY49
Misc Ramps Alternative I.xlsm	SB I-75 Entrance from WHV	689	718	296	309	5652	5892	720	310	6500	720	730	310	320	6500	6550		710	720	310	31	0 6700	0 6700
Misc Ramps Alternative I.xlsm	NB I-75 Exit to WHV	272	2 298	688	752	5345	5843	285	720	6150	285	298	720	752	6150	6200		410	470	770	80	0 6900	0 7150
Misc Ramps Alternative I.xlsm	NB I-75 Entrance from WB Buttermilk Plke	431	1 430	448	447	3767	3762	390	405	3750	431	441	448	458	3767	3817	,	400	400	410	42	0 3900	0 3900
Misc Ramps Alternative I.xlsm	NB I-75 Entrance from EB Buttermilk Pike	110	105	162	154	5522	5264	95	140	5250	276	286	276	286	5522	5572		250	260	250	26	0 5600	0 5650
Misc Ramps Alternative I.xlsm	NB I-75 Entrance from Pike Street	955	5 977	499	510	7364	7535	890	465	7550	955	977	499	510	7550	7600		940	990	530	55	0 7400	0 7600
Misc Ramps Alternative I.xlsm	NB I-75 Pike Entrance to 71	57	7 59	30	31	443	454				57	67	30	40	443	493	3	60	70	30	4	0 450	0 500
Misc Ramps Alternative I.xlsm	NB I-75 Pike Entrance to local	898	918	469	479	6921	7081				898	918	469	479	6921	7081		880	920	500	51	0 6950	0 7100
Misc Ramps Alternative I.xlsm	NB I-71 from BSB	2626	5 2823	2329	2504	31763	34146	2215	1965	31350	2626	2823	2329	2504	31763	34146	5	2690	2970	2470	270	0 33600	0 36650
Misc Ramps Alternative I.xlsm	NB I-71 from local	559	9 437	455	341	9213	8107				559	569	461	471	9213	9263	3	570	580	510	51	0 9950	0 10000
Misc Ramps Alternative I.xlsm	WB US-50	2356	5 2539	3083	3322	30788	33175	1775	2795	31750	2356	2539	3083	3322	31750	33175	5	2300	2520	2920	314	0 30500	0 32300
Misc Ramps Alternative I.xlsm	SB I-71	2263	3 2470	3563	3890	34597	37766	1815	2375	27750	2263	2470	3563	3890	34597	37766	i e	2210	2450	3370	368	0 33250	0 36800
Misc Ramps Alternative I.xlsm	NB I-71	3000	3278	2360	2579	33917	37066	1995	2860	27400	3000	3278	2860	2870	33917	37066	i e	3120	3360	2520	263	0 33950	0 38000
Misc Ramps Alternative I.xlsm	EB US-50	2471	1 2602	3543	3731	29012	30547	2415	1900	31950	2471	2602	3543	3731	31950	32000		2560	2680	3130	341	0 31950	0 32600
Misc Ramps Alternative I.xlsm	SB I-71 to BSB	1855	5 2028	3068	3355	31818	34796	1430	2365	28700	1855	2028	3068	3355	31818	34796	5	1870	2090	2600	287	0 30350	0 33450
Misc Ramps Alternative I.xlsm	SB I-71 local	206	5 120	487	533	5052	5525				253	263	487	533	5052	5525	5	250	250	540	57	0 5600	0 5850
Misc Ramps Alternative I.xlsm	3rd to KY	359	9 432	993	1194	8195	9856	235	650	5900	410	432	993	1194	8195	9856	i e	410	430	1030	120	0 8750	0 10350
Misc Ramps Alternative I.xlsm	Entrance from 6th to Winchell	10	11	56	60	249	267	105	575	2800	10	20	56	66	249	299	6th Street ramp only goes to frontage in Build alt	10	20	40	5	0 250	0 300
Misc Ramps Alternative I.xlsm	EB US-50	4059	9 4342	2890	3091	28715	30717	3245	2310	25250	4059	4342	2890	3091	28715	30717	7	3890	4130	2910	303	0 28500	0 29900
Misc Ramps Alternative I.xlsm	WB US-50	1609	1684	3415	3576	25114	26297	1220	2590	20950	1609	1684	3415	3576	25114	26297	7	1600	1650	3320	345	0 25650	0 26250
Misc Ramps Alternative I.xlsm	Connection to Winchell	353	378	280	300	3587	3838	170	135	1900	353	378	280	300	3587	3838	3	280	310	240	25	0 3300	0 3500
Misc Ramps Alternative I.xlsm	BSB Total NB Bridge	C	0 0	0	0	0	0	6360	5285	80000	0	10	0	10	80000	80050		8050	9320	6710	774	0 86750	0 100200
Misc Ramps Alternative I.xlsm	NB I-75	2566	2963	2264	2615	30429	35137				2566	2963	2264	2615	30429	35137	7	2530	2950	2200	258	0 29750	0 34700
Misc Ramps Alternative I.xlsm	NB I-71 from BSB	2067	7 2386	1874	2163	22550	26039				2067	2386	1874	2163	22550	26039		2120	2390	1960	219	0 23650	0 26650
Misc Ramps Alternative I.xlsm	NB Local	3441	1 3973	2571	2969	33817	39050				3441	3973	2571	2969	33817	39050		3400	3980	2550	297	0 33350	0 38850
Misc Ramps Alternative I.xlsm	BSB Total SB Bridge	C	0 0	0	0	0	0	4585	6000	80000	0	10	0	10	80000	80050		5840	6750	7640	882	0 87000	0 100600
Misc Ramps Alternative I.xlsm	SB I-75	2331	1 2696	2782	3218	32295	37363				2331	2696	2782	3218	32295	37363	3	2080	2570	1960	234	0 28150	0 34100
Misc Ramps Alternative I.xlsm	SB I-71 main bridge	1649	1908	1851	2141	22445	25967				1649	1908	1851	2141	22445	25967	7	1620	1840	2060	230	0 24750	0 27600
Misc Ramps Alternative I.xlsm	SB Local	1846	2135	2991	3459	32135	37177				1846	2135	2991	3459	32135	37177	7	2140	2340	3620	418	0 34100	0 38900
Misc Ramps Alternative I.xlsm	SB Exit to 7th St	1582	1775	150	168	7128	7994	1360	105	5500	1283	1439	356	366	7128	7994		1430	1600	340	35	0 7000	0 8000
Misc Ramps Alternative I.xlsm	NB Entrance from 9th	17	7 17	48	50	311	325	220	640	4550	17	27	48	58	311	361	9th ramp access changes to reduction is expected	30	50	60	8	0 450	0 550
Misc Ramps Alternative I.xlsm	NB Entrance at Winchell (WHV)	548	556	780	791	10492	10639	330	470	6950	548	558	780	791	10492	10639		520	540	740	77		
Misc Ramps Alternative I.xlsm	SB I-75 to 2nd Street	957	7 1043	325	355	4617	5034	970	330	5150	831	906	330	355	5150	5200		880	980	310	34	0 4950	0 5000
Misc Ramps Alternative I.xlsm	US 50 to 2nd Street	237	7 260	70	77	1076	1180	220	65	1100	194	212	70	80	1100	1180		210	240	70	8	0 1150	0 1200
Misc Ramps Alternative I.xlsm	SB I-75 to EB I-71	600	665	1247	1384	17227	19108	565	1175	17850	861	871	1247	1384	17850	19108	3	860	880	1400	155	0 17200	0 18550
Misc Ramps Alternative I.xlsm	US-50 to EB I-71	2098	2146	1566	1602	14885	15222	1775	1325	13850	2098	2146	1566	1602	14885	15222	2	2130	2190	1780	179	0 15100	0 15400
Misc Ramps Alternative I.xlsm	NB I-71 to WB US 50	1050	1069	1669	1699	14138	14396	925	1470	13700	1050	1069	1669	1699	14138	14396		1080	1110	1800	183	0 14600	0 14850
Misc Ramps Alternative I.xlsm	NB 4th Street Entrance	628	694	1948	2154	11508	12728	290	900	5850	628	694	1948	2154	11508	12728	3	670	790	1830	198	0 13300	0 14900
Misc Ramps Alternative I.xlsm	EB US 50 to KY	708	722	824	841	7242	7386	640	745	7200	708	722	824	841	7242	7386	5	720	740	750	78	0 7500	7600
Misc Ramps Alternative I.xlsm	NB I-75 to US 50	626	626	768	768	7386	7385	640	785	8300	640	650	785	795	8300	8350		690	710	810	81	0 8950	
Misc Ramps Alternative I.xlsm	SB I-75 Exit to WB 5th St	541	1 567	867	909	5294	5548				541	567	867	909	5294	5548	3	340	360	550	58	0 5400	0 5550
Misc Ramps Alternative I.xlsm	SB I-75 Exit to EB 5th St	586	603	325	335	2169	2233				390	402	325	335	2169	2233	3	300	300	220	22	0 2300	0 2400
Misc Ramps Alternative W.xlsm	I-71 to US 50	1050	1069	1669	1699	14138	14396				1050	1069	1669	1699	14138	14396	5	1080	1110	1800	183	0 14600	0 14850
Misc Ramps Alternative W.xlsm	I-71 WB to I-71 NB	1638	1833	1770	1981	19380	21690				1638	1833	1770	1981	19380	21690		1560	1770	1890	212	0 18800	0 20800

		Adioates Co.	and the sat Towns	- 2010 V-lumas		Delevered Francisco
Adjuster Spreadsheet	Turn	Adjuster Spi AM29 AM49 PM29		g 2019 Volumes Adjusted Forecast Targe PM19 AADT19 AM29 AM49 PM29 PM49	DY29 DY49 Notes on minimum overrides	Balanced Forecasts AM29 AM49 PM29 PM49 DY29 DY49
AltI-W VolumeAdjuster 12th at I-75 NB.xlsm	EBL		0 20 420 410 115	15 450 76 86 21 31	1 450 500	90 100 30 40 500 550
AltI-W_VolumeAdjuster_12th at I-75 NB.xlsm	EBT	390 410 32	0 310 4490 4600 395	295 4950 395 410 320 330	0 4950 5000	410 440 350 360 5000 5050
AltI-W_VolumeAdjuster_12th at I-75 NB.xlsm	WBR	400 420 43	0 390 4660 4820 355	320 4300 400 420 410 420	0 4660 4820	440 490 480 490 4950 5000
AltI-W_VolumeAdjuster_12th at I-75 NB.xlsm	WBT		450 4410 4530 260	370 4300 310 320 440 450		310 330 460 470 4650 4750
AltI-W_VolumeAdjuster_12th at I-75 NB.xlsm	NBL		20 20 120 100 20	15 100 20 30 20 30	0 110 170	20 30 20 30 100 150 140 180 230 240 2350 2700
AltI-W_VolumeAdjuster_12th at I-75 NB.xlsm AltI-W_VolumeAdjuster_12th at I-75 NB.xlsm	NBT NBR	140 220 22 190 200 33		160 1650 140 220 220 230 320 3900 200 210 370 390		140 180 230 240 2350 2700 200 210 330 350 4000 4200
Alti-W_VolumeAdjuster_12th at I-75 NB.xism  Alti-W_VolumeAdjuster_12th at I-75 NB.xism	EBT		0 90 1450 1440 245	90 1750 245 255 90 100		230 250 90 100 1750 1800
AltI-W VolumeAdjuster 12th at I-75 SB.xlsm	EBR		0 240 620 1050 15	10 200 31 41 112 189		30 40 120 190 650 1100
AltI-W_VolumeAdjuster_12th at I-75 SB.xlsm	SBR	10 10 2	0 30 70 90 5	20 100 10 20 13 23	3 100 150	10 20 20 30 100 150
AltI-W_VolumeAdjuster_12th at I-75 SB.xlsm	SBT	<del>                                     </del>	620 6660 6880 80	240 1800 360 370 640 650		310 330 540 550 6000 6550
AltI-W_VolumeAdjuster_12th at I-75 SB.xlsm	SBL	280 290 24		220 3650 280 290 240 250		270 290 290 300 3750 3800
AltI-W_VolumeAdjuster_12th at I-75 SB.xlsm	WBT		20 180 190 30	35 250 30 40 32 42		30 50 30 40 200 300
AltI-W_VolumeAdjuster_12th at I-75 SB.xlsm	WBL SBT		40     440     4400     4480     250       40     1260     6740     6870     275	350 4150 300 310 440 450 1145 7450 337 347 1213 1237		300 310 450 460 4550 4600 340 350 1050 1080 7450 7600
AltI-W_VolumeAdjuster_2nd at CWB Bridge.xlsm AltI-W VolumeAdjuster 2nd at CWB Bridge.xlsm	SBL	310 310 123 210 220 19		1145 7450 337 347 1213 1237 165 1700 210 220 190 200		340   350   1050   1080   7450   7600     250   270   220   230   1900   2050
Alti-W_VolumeAdjuster_2nd at CWB Bridge.xism  Alti-W VolumeAdjuster_2nd at CWB Bridge.xism	NBT		00 670 7220 7220 500	405 4800 760 790 700 710		700 750 660 680 6750 6850
AltI-W VolumeAdjuster 2nd at CWB Bridge.xlsm	NBR	530 540 21		165 3300 530 540 210 220		540 550 220 230 3800 3850
AltI-W_VolumeAdjuster_2nd at Elm.xlsm	EBL	440 560 29	0 310 3140 3610 180	165 1700 440 560 290 310	0 3140 3610	440 560 290 310 3150 3600
AltI-W_VolumeAdjuster_2nd at Elm.xlsm	EBT	2650 2950 113	0 1190 17770 19270 1550	760 12000 2650 2950 1130 1190	0 17770 19270	2090 2110 1230 1390 16550 18200
AltI-W_VolumeAdjuster_2nd at Elm.xlsm	EBR	<del>                                     </del>	0 190 2080 2370 220	105 1250 290 360 160 190		290 360 160 190 2050 2350
AltI-W_VolumeAdjuster_2nd at Elm.xlsm	NBT	220 240 32		165         1400         220         240         320         350		220 240 320 350 2800 3100
AltI-W_VolumeAdjuster_2nd at Elm.xlsm	NBR		80 80 450 460 15	60 400 23 33 80 90	1 11 111	20 30 80 90 450 500
AltI-W_VolumeAdjuster_3rd at Central.xlsm AltI-W_VolumeAdjuster_3rd at Central.xlsm	EBL EBR		00         190         1780         1770         180           60         60         600         640         70	185 1950 200 210 200 210 35 400 100 110 60 70		200   220   170   190   2000   2100   140   160   110   120   1300   1350
Alti-W_VolumeAdjuster_3rd at Central.xism  Alti-W VolumeAdjuster 3rd at Central.xism	SBR		00 200 1020 1030 65	180 1350 65 75 184 194	1 111 111	60 70 160 180 1150 1250 1350 1350
Alti-W_VolumeAdjuster_3rd at Central.xism  Alti-W VolumeAdjuster_3rd at Central.xism	SBT		70 70 520 520 100	75 700 94 104 75 85		90 100 90 110 650 700
Alti-W_VolumeAdjuster_3rd at Central.xism	WBR		0 230 680 680 160	315 2700 40 50 230 240		40 50 170 180 600 650
AltI-W_VolumeAdjuster_3rd at Central.xlsm	WBT	150 160 50		430 2400 150 160 472 533	· · ·	100 170 430 550 2750 3200
Alti-W_VolumeAdjuster_3rd at Central.xlsm	WBL		00 100 1210 1220 230	85 1200 218 228 100 110		280 300 160 180 1600 1800
AltI-W_VolumeAdjuster_3rd at Central.xlsm	NBL		.0 120 580 630 15	85 450 29 39 104 114		160 190 160 180 1600 1800
AltI-W_VolumeAdjuster_3rd at Central.xlsm	NBT	20 20 21		300 1500 20 30 210 220	1 0	20 30 150 160 1000 1050
AltI-W_VolumeAdjuster_3rd at Elm.xlsm	WBR	280 300 20		200 2050 280 300 200 210		280 300 210 230 2350 2550
AltI-W_VolumeAdjuster_3rd at Elm.xlsm AltI-W VolumeAdjuster 3rd at Elm.xlsm	WBT NBI	1020 1120 237 180 200 35		1220 10200 1020 1120 2370 2620 215 1400 180 200 350 370		990 1070 2370 2620 17900 20100 160 200 300 310 1900 2050
Alti-W_VolumeAdjuster_3rd at Elm.xism  Alti-W VolumeAdjuster 3rd at Elm.xism	NBT	480 610 28		115 1700 480 610 280 310		500 600 310 350 4050 4650
AltI-W VolumeAdjuster 3rd at Plum.xlsm	SBR		30 170 1130 1500 35	45 600 60 70 80 170		50 70 70 180 900 1350
AltI-W_VolumeAdjuster_3rd at Plum.xlsm	WBT	430 440 75		785 5700 430 440 750 760		370 450 690 730 4050 4300
AltI-W_VolumeAdjuster_3rd at Race.xlsm	SBR	260 300 89	00 830 5220 5420 125	330 2500 261 300 890 900	0 5220 5420	260 290 880 890 5050 5200
AltI-W_VolumeAdjuster_3rd at Race.xlsm	SBT	130 140 76	790         3780         4270         135	580 3350 189 199 680 769	9 3780 4270	190 200 680 770 3800 4250
AltI-W_VolumeAdjuster_3rd at Race.xlsm	WBT	1030 1110 173		1090 9750 1030 1110 1710 2020		1010 1080 1700 1960 15200 17450
AltI-W_VolumeAdjuster_3rd at Race.xlsm	WBL	160 160 13		110 1100 160 170 130 140		160 170 130 140 1150 1200
AltI-W_VolumeAdjuster_3rd at US-42.xlsm AltI-W_VolumeAdjuster_3rd at US-42.xlsm	EBL EBT		10	- 16 26 40 50 80 600 50 60 90 100		10 20 30 40 250 300 40 50 70 80 500 550
Alti-W_VolumeAdjuster_3rd at US-42.xism  Alti-W_VolumeAdjuster_3rd at US-42.xism	EBR	380 380 72		660 6050 380 390 720 730		370 380 670 690 5800 5900
AltI-W VolumeAdjuster 3rd at US-42.xlsm	SBR	0 0	0 10 30 30	- 2 12 2 12		10 30 10 40 100 300
AltI-W_VolumeAdjuster_3rd at US-42.xlsm	SBT	10 10 1	.0 10 50 60	- 9 19 9 19	9 50 100	10 10 10 10 50 50
AltI-W_VolumeAdjuster_3rd at US-42.xlsm	SBL	40 40 2	20 320 340	- 40 50 20 30	0 320 370	90 110 80 90 1300 1350
AltI-W_VolumeAdjuster_3rd at US-42.xlsm	WBR		30 150 720 990	- 36 46 80 150		40 50 70 140 550 850
AltI-W_VolumeAdjuster_3rd at US-42.xlsm	WBT		50 50 1070 1060 70	45 1100 80 90 54 64		70 150 90 160 1450 1700
AltI-W_VolumeAdjuster_3rd at US-42.xlsm	WBL	<del>                                     </del>	00 730 2670 2810 115	650 3100 134 144 481 506		210 230 590 610 3500 3700
AltI-W_VolumeAdjuster_3rd at US-42.xlsm AltI-W VolumeAdjuster 3rd at US-42.xlsm	NBT NBT	320 330 33 200 220 23	.0 310 2930 2920 285 0 200 2600 2610	265 3050 320 330 310 320 200 220 230 240		340 350 350 360 3350 3400 150 180 180 180 1900 1900
Alti-W_VolumeAdjuster_Srd at US-42.xlsm	NBR		60 160 1690 1690 215	140 1750 240 250 160 170		210 220 130 140 1500 1550
Alti-W_VolumeAdjuster_4th at Central.xlsm	SBT		0 220 1120 1130 130	210 1550 130 140 202 212		130 140 220 240 1550 1600
AltI-W_VolumeAdjuster_4th at Central.xlsm	WBR	60 50 12		95 950 60 70 120 130		90 110 120 130 1050 1200
AltI-W_VolumeAdjuster_4th at Central.xlsm	NBT		00 400 3040 3030 220	340 3000 220 230 400 410		260 300 490 530 3600 3800
AltI-W_VolumeAdjuster_4th at Elm.xlsm	WBR		30   90   380   440   55	85         850         55         65         68         79	9 850 900	60 70 70 80 850 900
AltI-W_VolumeAdjuster_4th at Elm.xlsm	WBT		30 100 560 770 105	430 2900 30 60 80 100		30 50 60 130 500 850
AltI-W_VolumeAdjuster_4th at Elm.xlsm	NBT NBT		0         170         2000         2190         80           .0         470         5720         6520         345	130 1150 190 200 170 180		70 80 60 70 650 750
AltI-W_VolumeAdjuster_4th at Elm.xlsm AltI-W VolumeAdjuster_4th at Plum.xlsm	NBT SBR		0 470 5720 6520 345 0 50 270 270 20	185 2600 530 590 410 470 40 300 20 30 49 59	0 5720 6520 9 300 350	710 820 460 510 5750 6450 20 30 50 60 350 400
Alti-W_VolumeAdjuster_4th at Plum.xlsm  Alti-W VolumeAdjuster 4th at Plum.xlsm	SBT		0 20 250 270 30	25 400 30 40 25 35		40 50 50 100 700 900
Alti-W VolumeAdjuster 4th at Plum.xlsm	WBT		0 10 60 60 180	540 3850 10 20 10 20		90 110 100 120 950 1150
AltI-W_VolumeAdjuster_4th at Plum.xlsm	WBL		0 100 220 470 5	20 200 11 21 20 85		10 20 20 80 200 450
#N/A	EBT		00 190 3100 2930	- 390 400 190 200	0 3100 3150	410 440 190 210 3100 3200
#N/A	SBR		7 480 5439 5601 265	425 5450 291 301 467 480		300 310 510 520 5400 5600
#N/A	SBL		1 122 2281 2297 135	0 1550 219 229 121 131		230 240 120 130 2200 2250
Alti-W_VolumeAdjuster_5th at Central.xlsm	EBL		.0 100 1180 740 210	80 1300 210 220 110 120		240 250 90 100 1200 1250
AltI-W_VolumeAdjuster_5th at Central.xlsm	EBT EBR		0 540 7360 9360 1505 0 10 150 150 35	535 10100 1190 1590 450 540 10 150 40 50 10 20		1190 1550 450 560 7700 9850 40 50 10 20 150 200
AltI-W_VolumeAdjuster_5th at Central.xlsm  AltI-W VolumeAdjuster 5th at Central.xlsm	SRT		.0 10 150 150 35 00 230 1350 1360 95	10 150 40 50 10 20 200 1400 100 110 230 240	1 11 11	
Alti-W_volumeAdjuster_5th at Central.xism  Alti-W VolumeAdjuster_5th at Central.xism	SBL	270 290 21		150 1500 270 290 210 220		90 90 210 220 1400 1400 270 290 220 230 1950 2000
Alti-W_VolumeAdjuster_5th at Central.xism	NBT		00 390 2480 2460 165	315 2500 180 190 390 400		200 240 410 450 2950 3200
Alti-W_VolumeAdjuster_5th at Central.xism	NBR		0 150 1480 1470 115	120 1450 140 150 150 160		150 170 200 210 1700 1800
Alti-W_VolumeAdjuster_6th at Central.xlsm	SBR		20 20 140 140 10	15 100 10 20 20 30		10 20 20 30 150 200
AltI-W_VolumeAdjuster_6th at Central.xlsm	SBT		90 1010 1030 105	50 600 170 185 90 100	0 1010 1060	170 180 90 100 1000 1000
AltI-W_VolumeAdjuster_6th at Central.xlsm	WBR		0 200 1590 1580 100	120 1050 150 170 190 200		180 200 160 180 1650 1700
AltI-W_VolumeAdjuster_6th at Central.xlsm	WBT	320 410 142		950         4650         513         523         1420         1510		500 540 1530 1780 9400 12250
AltI-W_VolumeAdjuster_6th at Central.xlsm	WBL	190 200 35		300 2300 190 200 350 360		190 200 340 350 2350 2400
AltI-W_VolumeAdjuster_6th at Central.xlsm	NBL		00 200 660 650 35	170 950 35 45 119 129		40 50 170 200 900 950
AltI-W_VolumeAdjuster_6th at Central.xlsm	NBT	370 310 28	30 280 2780 1750 340	225 2850 370 380 280 290	0 2850 2900	400 440 330 350 3250 3500

			Adjuster Sprea	adsheet Tara	ret .		visting 2010	Volumes		A =	ljusted Foreca	ast Targets					Palar	iced Forecasts	
Adjuster Spreadsheet	Turn	AM29 AM49			DY29 DY		Existing 2019 PM19		AM29			M49 DY2	29 D	DY49 Notes on minimum overrides	AM29	AM4			DY29 DY49
AltI-W_VolumeAdjuster_6th at Linn EB.xlsm	SBT	160	150 420		2770	2780 -	-	-	160	170	420	430	2770	2820	20	00	220	430 44	0 2900 3050
AltI-W_VolumeAdjuster_6th at Linn EB.xlsm	SBL	190	220 500	570	4140	4980 -	-	-	207	220	500	570	4140	4980	21	LO	230	510 59	0 4200 5000
AltI-W_VolumeAdjuster_6th at Linn EB.xlsm	NBT	150	150 220	230	1930	1940 -	-	-	150	160	220	230	1930	1980	15	50	170	230 24	
AltI-W_VolumeAdjuster_6th at Linn EB.xlsm	NBR	30	40 100		720	780 -	-	-	36	- "	100	110	720	780	4	10		100 11	
AltI-W_VolumeAdjuster_6th at Linn WB.xlsm	EBL	10	10 10		110	130	5	5 100		20	10	20	110	160	1	10	20	10 2	0 100 150
AltI-W_VolumeAdjuster_6th at Linn WB.xlsm  AltI-W VolumeAdjuster 6th at Linn WB.xlsm	EBR SRR	160	180 500 10 10		3340 150	4090 150		320 2200 10 150			500 10	560 20	3340 150	4090 200	16	10	170 20	490 55 10 2	0 3200 3950 0 150 200
Alti-W_VolumeAdjuster_6th at Linn WB.xism  Alti-W VolumeAdjuster 6th at Linn WB.xism	SBT	210	220 410		3600			340 3150			410	420	3600	3770	24	10		410 43	
AltI-W VolumeAdjuster 6th at Linn WB.xlsm	WBR	170	180 160		1900			85 1300			160	170	1900	2040	17			140 15	
Alti-W VolumeAdjuster 6th at Linn WB.xlsm	WBT	130	130 60		1090			45 1000			60	70	1090	1180	12		130	50 6	0 1000 1100
AltI-W_VolumeAdjuster_6th at Linn WB.xlsm	WBL	10	10 40	40	220	240	10	35 250	11	21	40	50	250	300	1	10	20	40 5	0 250 300
AltI-W_VolumeAdjuster_6th at Linn WB.xlsm	NBL	70	70 80	80	660	670	60	65 700	70	80	80	90	700	750	7	70	80	80 9	0 700 750
AltI-W_VolumeAdjuster_6th at Linn WB.xlsm	NBT	80	80 150		1270	1270		135 1300			150	160	1300	1350	8	~~		150 15	
AltI-W_VolumeAdjuster_7th at Central.xlsm	EBL	270	260 100		2680			65 2150			134	144	2680	2940	29			180 20	
AltI-W_VolumeAdjuster_7th at Central.xlsm	EBT		2980 780					265 7300			846	940	16910	19030	211	_		810 82	
AltI-W_VolumeAdjuster_7th at Central.xlsm	EBR	+ + + - +	200 110		1150			65 700			110	120	1150	1200	18			110 13	
AltI-W_VolumeAdjuster_7th at Central.xlsm  AltI-W_VolumeAdjuster_7th at Central.xlsm	NBT NBR	450 220	470 350 170 130		3260 1370			245 2250 100 1650			350 130	360 140	3260 1650	3310 1700	38			330 36 160 17	
Alti-W_VolumeAdjuster_7th at Central.xisin  Alti-W VolumeAdjuster_9th at Central.xisin	SBR	10	20 110		620	1440		65 550			110	150	620	1440	3	30		120 17	
Alti-W VolumeAdjuster 9th at Central.xism	WBR	60	60 40		450	710		30 350		70	40	50	450	710	6	50	70	40 5	0 450 700
AltI-W VolumeAdjuster 9th at Central.xlsm	WBT	600	620 1080					080 8650		620	1080	1300	10460	11660	56	50	620 1	270 158	
AltI-W_VolumeAdjuster_9th at Central.xlsm	NBL	80	110 240	270	2150	2320	80	160 1700	108		240	270	2150	2320	10	00	110	210 24	
Alti-W_VolumeAdjuster_9th at Central.xlsm	NBT	640	650 220	210	4000	4300	320	150 2700	640	650	220	230	4000	4300	57	70	620	300 32	0 4000 4350
AltI-W_VolumeAdjuster_Brighton at Central Avenue.xlsm	EBL	60	60 50	50	800	820	55	40 800		70	50	60	800	850	7	70	80	50 6	030 300
AltI-W_VolumeAdjuster_Brighton at Central Avenue.xlsm	EBT	30	20 80		730	580		35 400			80	90	730	780		50	70	70 9	0 850 950
AltI-W_VolumeAdjuster_Brighton at Central Avenue.xlsm	SBR	30	20 120		920	950		70 850			120	130	920	970	5	50		100 11	
AltI-W_VolumeAdjuster_Brighton at Central Avenue.xlsm	SBL	50	30 60		660	420		40 400			60	70	660	710	7	/0	80	70 8	0 800 850
AltI-W_VolumeAdjuster_Brighton at Central Avenue.xlsm  AltI-W VolumeAdjuster Brighton at Central Avenue.xlsm	WBR WBT	10	10 30 10 20		190 190	190 150		25 200 35 500			30 34	40	200 500	250 550	1	20	20 30	30 4	0 200 250 0 400 500
Alti-W_VolumeAdjuster_Brighton at Central Avenue.xism  Alti-W VolumeAdjuster Brighton at Central Parkway.xlsm	EBT	600	590 430		5570			410 6000			430	460	6000	6050	63	20	50	480 51	
Alti-W VolumeAdjuster Brighton at Central Parkway.xism	EBR	110	80 80		1120	860		40 450			80	90	1120	1170	8	30	90	70 8	0 950 1000
AltI-W VolumeAdjuster Brighton at Central Parkway.xlsm	WBT	250	270 510		3860			560 5700			510	520	3860	3910 WHV Changes	31	10		540 61	0 5200 5400
Alti-W VolumeAdjuster Brighton at Central Parkway.xlsm	WBL	10	10 110		640	640		70 800			110	120	800	850	4			100 11	
AltI-W_VolumeAdjuster_Brighton at Central Parkway.xlsm	NBL	10	10 20	20	140	140	5	15 150	10	20	20	30	150	200	1	10	20	20 3	0 150 200
AltI-W_VolumeAdjuster_Brighton at Central Parkway.xlsm	NBR	60	60 60	60	850	870	55	50 850	60	70	60	70	850	900	7	70	80	60 7	900 950
AltI-W_VolumeAdjuster_Central at WHV.xlsm	EBL	120	120 110	110	1020	1020		85 1050	120	130	110	120	1050	1100	12	20		110 12	
AltI-W_VolumeAdjuster_Central at WHV.xlsm	EBT	380	370 250		4010			225 3450			250	260	4010	4060	38			250 26	
AltI-W_VolumeAdjuster_Central at WHV.xlsm	EBR	360	320 270		4010			190 3100			270	280	4010	4060	37	70		280 30	
AltI-W_VolumeAdjuster_Central at WHV.xlsm	SBR	40	40 10		160	140		145 1150			29	39	1150	1200	6	50	70	30 4	0 1150 1200
AltI-W_VolumeAdjuster_Central at WHV.xlsm  AltI-W_VolumeAdjuster_Central at WHV.xlsm	SBT WBR	330	340 240 10 30		2590 210	2600		255 3300 25 200			255 30	265 40	3300 210	3350 260	34	10	350 20	270 29 30 4	0 3250 3450 0 200 250
Alti-W_VolumeAdjuster_Central at WHV.xlsm	WBT	120	110 300			2760		300 3100			300	310	3100	3150	16	50		300 31	0 3100 3150
Alti-W VolumeAdjuster Central at WHV.xlsm	NBL		140 170		2010	1940		215 2950			215	225	2950	3000	14			200 21	
AltI-W VolumeAdjuster Central at WHV.xlsm	NBT	120	120 370		2460			335 2700			370	380	2700	2750	17	_		330 39	
AltI-W_VolumeAdjuster_Central at WHV.xlsm	NBR	10	10 30		210	210		25 200	11	21	30	40	210	260	1	10	20	30 4	0 200 250
AltI-W_VolumeAdjuster_Colerain at Central.xlsm	EBL	10	10 20	20	250	230	5	10 150	13	23	20	30	250	300	1	LO	20	20 3	0 250 300
AltI-W_VolumeAdjuster_Colerain at Central.xlsm	EBT	100	60 120	120	1510	1360	65	65 1100		110	120	130	1510	1560	11	10		110 13	
AltI-W_VolumeAdjuster_Colerain at Central.xlsm	EBR	10	10 10		100	100	5	5 100		20	10	20	100	150	1	LO	20	10 2	0 100 150
AltI-W_VolumeAdjuster_Colerain at Central.xlsm	SBR	20	30 10		160	170	10	5 150		30	10	20	160	210	2	20	30	10 2	0 150 200
AltI-W_VolumeAdjuster_Colerain at Central.xlsm	SBT	10	10 20		150	150		15 150		20	20	30	150	200	1	10	20	20 3	0 150 200
AltI-W_VolumeAdjuster_Colerain at Central vism	SBL WBR	10	10 10		60	60		10 100 15 100		20	10 20	20	100 110	150 160	1	10	20	20 4	0 100 150 0 150 200
AltI-W_VolumeAdjuster_Colerain at Central.xIsm AltI-W VolumeAdjuster Colerain at Central.xIsm	WBT	20	20 70		110 710	710		70 1000		46	70	80	1000	1050	1	10	40	70 9	0 150 200 0 850 900
Alti-W VolumeAdjuster_Colerain at Central.xism	WBL	10	10 20		250	250		20 250		23	20	30	250	300	2	20	30	30 4	0 300 350
Alti-W_VolumeAdjuster_Crescent at 4th.xlsm	SBT	400	360 180					150 2100			180	190	2810	2860	39	90	50	180 19	
Alti-W_VolumeAdjuster_Crescent at 4th.xlsm	SBL		140 160		1800			145 1900			160	170	1900	1950	14			190 20	
Alti-W_VolumeAdjuster_Crescent at 4th.xlsm	WBR	100	90 140			1420		135 1200			140	150	1490	1540	14			220 23	
AltI-W_VolumeAdjuster_Crescent at 4th.xlsm	WBL	20	20 80		580	550		60 500			80	90	580	630	3	30	40	80 9	0 550 600
Alti-W_VolumeAdjuster_Crescent at 4th.xlsm	NBT	180	180 480					390 5350			480	490	5350	5430	28	30		440 45	
AltI-W_VolumeAdjuster_Crescent at 4th.xlsm	NBR	10	10 20		150	150		15 150		20	20	30	150	200	1	10	20	20 3	0 150 200
AltI-W_VolumeAdjuster_Crescent at 5th.xlsm	SBT	30	30 120		660	630		85 600			119	129	660	710	4			120 13	
AltI-W_VolumeAdjuster_Crescent at 5th.xlsm	SBL WBR	370	340 140		2690 5010			125 2000 365 5050			140	150	2690	2740 5230	38			140 150 440 450	
AltI-W_VolumeAdjuster_Crescent at 5th.xlsm  AltI-W_VolumeAdjuster_Crescent at 5th.xlsm	WBL	170	160 450 10 70		430	5230 390		365 5050 60 400			450 70	460 80	5050 430	480	27		30	70 79	0 5000 5100 0 400 500
Alti-W_volumeAdjuster_Crescent at 5th.xism  Alti-W VolumeAdjuster Crescent at 5th.xism	NBT	10	10 70		100	90		40 450			18	28	450	500		20	30	20 3	0 450 500
Alti-W VolumeAdjuster_Crescent at 5th.xism	NBR	20	20 50			370		40 450			50	60	410	460	2	30	40	50 6	0 450 500
Alti-W VolumeAdjuster_crescent at 5th.aisin  Alti-W VolumeAdjuster Dalton at Findlay.xlsm	EBL	20	20 50		350	350		40 350			50	60	350	400	2	20	30	50 6	0 350 400
AltI-W_VolumeAdjuster_Dalton at Findlay.xlsm	EBT	10	10 40		200	200	5	30 200			36	46	200	250		LO	20	40 5	0 200 250
AltI-W_VolumeAdjuster_Dalton at Findlay.xlsm	EBR	10	10 10		100	100	5	5 100	10	20	10	20	100	150	1	LO	20	10 2	0 100 150
AltI-W_VolumeAdjuster_Dalton at Findlay.xlsm	SBR	20	20 10		200	200		10 200			10	20	200	250	2		30	10 2	0 200 250
AltI-W_VolumeAdjuster_Dalton at Findlay.xlsm	SBT	310	320 320		2810			345 3850			345	355	3850	3900	31			350 36	
AltI-W_VolumeAdjuster_Dalton at Findlay.xlsm	SBL	110	110 180		1750			155 1500			180	190	1750	1800	13	_		180 19	
AltI-W_VolumeAdjuster_Dalton at Findlay.xlsm	WBR	80	70 80			1090		75 1250			80	90	1250	1300	8	~~	90	80 9	
AltI-W_VolumeAdjuster_Dalton at Findlay.xlsm	WBT	80	80 110		650	650		100 650			110	120	650	700		30 50		110 13	
AltI-W_VolumeAdjuster_Dalton at Findlay.xlsm AltI-W VolumeAdjuster Dalton at Findlay.xlsm	WBL NBL	40	40 40		610	640 150		60 850 5 150			60 10	70	850 150	900 200		,,,	60 20	10 2	0 850 900
AltI-W_VolumeAdjuster_Dalton at Findlay.xism  AltI-W VolumeAdjuster Dalton at Findlay.xism	NBT NBT	10	10 10 90 230		150 2370	150 2410	135	5 150 245 3150			10 245	20 255	150 3150	3200	16	10		250 26	0 150 200 0 3150 3200
Alti-W_volumeAdjuster_Dalton at Findlay.xism  Alti-W VolumeAdjuster Dalton at Findlay.xism	NBR	30	30 30		330	320		30 400			30	40	400	450	16	10	50	30 4	0 400 450
Alti-W_VolumeAdjuster_Daiton at Findiay.xisin  Alti-W VolumeAdjuster Dixie Hwy at I-75 NB.xlsm	EBL	20	20 20		350	360		20 350			20	30	350	400	2	20	30	20 3	0 350 400
Alti-W_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm	EBT	590	510 1240					080 10000			1240	1530	10070	11270	59	90	50	170 140	
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm	WBR	610	900 500		6410			470 6450			500	510	6450	7440	60			500 53	
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm	WBT	1140	1180 750		8430	8670		645 8350	1140		750	770	8430	8670	115	50	1190	730 75	

		۸d	juster Spreadsl	neet Target		Existing 2019 Vo	lumes	۸۵	justed Forecast Tar	note			Ralanced	Forecasts
Adjuster Spreadsheet	Turn	AM29 AM49			DY49 AM		AADT19 AM29		M29 PM49	DY29 DY49	Notes on minimum overrides	AM29 AM49		Forecasts PM49 DY29 DY4
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm	NBL	450 430	160	170 2480	2510	275 150		446 456	160 1				420 200	
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm	NBR	70 10	200	210 1850	1360	50 155	1650	93 103	200 2	10 1850 190	00	90	100 270	
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	EBT	390 400	710	870 5750	6310	330 600	5700	390 400	710 8	70 5750 63:	10	390	400 750	950 5800
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	EBR	230 230	340	350 3100	3190	210 300		230 240	340 3				230 370	
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	SBR	50 60	50	50 550	560	50 45	550	50 60	50			50	60 40	50 550
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	SBL	210 180	550	620 4650	4970	190 500		233 243	550 6				230 440	
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	WBT	1450 1460	780	780 9460	9560	1120 680		1450 1460	780 7				1470 800	
AltI-W_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	WBL	140 150	110	140 1460	1650	85 115		140 150	115 1				140 130	
AltI-W_VolumeAdjuster_Gest at 6th.xlsm	SBT	290 260	140	140 2130	2070	215 130		290 300	140 1				260 160	
AltI-W_VolumeAdjuster_Gest at 6th.xlsm AltI-W VolumeAdjuster Gest at 6th.xlsm	WBR WBL	330 410 160 180	80 80	90 1940 80 1030	2300 1070	375 165 150 60	2950 1000	349 410 160 180	165 1°	75 2950 300 90 1030 108			410 150 170 80	
Alti-W_volumeAdjuster_Gest at 6th.xism  Alti-W VolumeAdjuster Gest at 6th.xism	NBT	160 160	170	170 2120	2100	140 175		160 170	175 1				190 180	
Alti-W_VolumeAdjuster_Gest at oth.xisiii  Alti-W VolumeAdjuster Gest at Freeman.xism	EBL	130 140	150	160 1860	1960	95 115		130 140	150 1	+			140 160	
Alti-W_volumeAdjuster_Gest at Freeman.xism	FRT	120 130	100	100 1150	1250	110 90	1150	120 130	100 1				120 80	
Alti-W VolumeAdjuster Gest at Freeman.xlsm	EBR	50 50	100	90 1020	960	45 90	1050	51 61	100 1			50	60 100	
AltI-W VolumeAdjuster Gest at Freeman.xlsm	SBR	50 70	10	20 570	710	35 5	400	50 70	29			50	70 30	
AltI-W VolumeAdjuster Gest at Freeman.xlsm	SBT	530 510	330	360 5480	5710	380 285	4850	530 540	330 3	50 5480 57	10	480	480 300	320 5000
AltI-W_VolumeAdjuster_Gest at Freeman.xlsm	SBL	40 30	10	10 320	310	135 50	1350	58 68	50	50 1350 140	00	60	70 40	50 1100
AltI-W_VolumeAdjuster_Gest at Freeman.xlsm	WBR	130 130	110	100 1310	1250	120 130	1700	130 140	130 1	10 1700 17	50	130	140 130	140 1850
AltI-W_VolumeAdjuster_Gest at Freeman.xlsm	WBT	230 310	50	60 1250	1560	190 35	1050	225 281	63	73 1250 150	60	220	260 60	70 1300
AltI-W_VolumeAdjuster_Gest at Freeman.xlsm	WBL	20 10	30	30 320	310	10 10	200	20 30	30		70	20	30 30	
AltI-W_VolumeAdjuster_Gest at Freeman.xlsm	NBL	10 10	30	30 200	260	10 15	250	10 20	30		00	10	20 30	70 250
AltI-W_VolumeAdjuster_Gest at Freeman.xlsm	NBT	430 420	420	440 5350	5480	450 410		450 460	420 4				490 430	
AltI-W_VolumeAdjuster_Gest at Freeman.xlsm	NBR	20 20	20	20 250	250	15 15		20 30	20		00	20	30 20	
AltI-W_VolumeAdjuster_Kyles at I-75 NB.xlsm	EBL	160 170	90	100 1130	1230	110 80		160 170	90 1				160 100	
AltI-W_VolumeAdjuster_Kyles at I-75 NB.xlsm	EBT	820 780	1200	1390 10150	11020	850 950		850 860	1200 13				940 1140	
AltI-W_VolumeAdjuster_Kyles at I-75 NB.xlsm	WBR	1200 1250	460	420 6600	7070	725 465		1188 1250	465 4				1100 550	
AltI-W_VolumeAdjuster_Kyles at I-75 NB.xlsm	WBT NBI	490 500	710	700 6550 190 1590	6530	450 655		490 500	710 7: 195 2:				480 720 100 180	
AltI-W_VolumeAdjuster_Kyles at I-75 NB.xlsm AltI-W VolumeAdjuster Kyles at I-75 NB.xlsm	NBR	10 10 110 80	190 290	190 1590 310 2700	1740 2620	100 195 150 265		100 110 150 160	195 290 3	+			100 180 170 260	
Alti-W_VolumeAdjuster_kyles at 1-75 NB.xism  Alti-W VolumeAdjuster Kyles at 1-75 SB.xlsm	FRT	610 630	590	630 5620	5840	480 500		610 630	590 6				600 610	
Alti-W_VolumeAdjuster_Kyles at I-75 SB.xism	EBR	190 180	230	140 2370	2160	170 215		190 200	230 2				200 220	
Alti-W VolumeAdjuster Kyles at I-75 SB.xlsm	SBR	180 170	200	200 2280	2360	140 150		180 190	200 2	+			210 180	
Alti-W_VolumeAdjuster_Kyles at I-75 SB.xlsm	SBL	410 370	690	840 5660	6370	480 530		480 490	690 8				500 630	
Alti-W VolumeAdjuster Kyles at I-75 SB.xlsm	WBT	270 300	640	650 5870	6090	385 605		385 395	640 6				400 640	
AltI-W_VolumeAdjuster_Kyles at I-75 SB.xlsm	WBL	170 170	270	240 2190	2140	165 245	2350	170 180	270 2	30 2350 240	00	170	180 260	270 2450
AltI-W_VolumeAdjuster_Kyles at US-25.xlsm	SBT	420 420	920	1100 5280	5870	360 800	5250	420 430	920 10	57 5280 58	70	420	430 920	1060 5300
AltI-W_VolumeAdjuster_Kyles at US-25.xlsm	SBL	550 520	590	470 5470	5240	445 515	5650	550 560	590 6	00 5650 570	00	540	550 600	620 5750
AltI-W_VolumeAdjuster_Kyles at US-25.xlsm	WBR	290 310	530	540 5210	5370	395 530	6000	395 405	530 5	10 6000 609	50	410	420 520	520 5950
AltI-W_VolumeAdjuster_Kyles at US-25.xlsm	WBL	170 180	310	320 2990	3090	130 225	2500	170 180	310 3	20 2990 309	90	170	190 300	310 2950
AltI-W_VolumeAdjuster_Kyles at US-25.xlsm	NBT	850 850	530	530 5360	5340	610 465		850 860	530 5				860 530	
AltI-W_VolumeAdjuster_Kyles at US-25.xlsm	NBR	240 260	230	250 2490	2630	205 200		240 260	230 2				250 230	
AltI-W_VolumeAdjuster_Linn at 8th.xlsm	EBL ERT	130 140 320 330	180 200	190 2100 200 3020	2320 3000	140 145 245 170		140 150 320 330	180 19 200 2				160 190 330 200	
AltI-W_VolumeAdjuster_Linn at 8th.xlsm AltI-W VolumeAdjuster Linn at 8th.xlsm	EBR	140 140	120	120 1450	1460	45 80	850	140 150	200 2 120 1				130 120	
Alti-W VolumeAdjuster Linn at 8th.xlsm	SBR	60 50	250	210 2100	2160	65 175		105 115	250 2	+			120 260	
Alti-W VolumeAdjuster Linn at 8th.xlsm	SBT	60 60	230	240 1430	1520	90 215		90 100	230 2	+			110 230	
AltI-W VolumeAdjuster Linn at 8th.xlsm	SBL	50 40	70	60 880	820	50 65	1100	50 60		30 1100 11		50	60 70	
AltI-W_VolumeAdjuster_Linn at 8th.xlsm	WBR	20 20	20	20 450	450	20 20	450	23 33	23	33 450 50	00	30	40 20	30 550
AltI-W_VolumeAdjuster_Linn at 8th.xlsm	WBT	140 140	240	340 2470	2710	95 190	2450	140 150	240 3	10 2470 27	10	130	130 230	330 2450
AltI-W_VolumeAdjuster_Linn at 8th.xlsm	WBL	30 30	70	80 550	580	20 55	500	30 40	70	550 60	00	30	40 70	80 550
AltI-W_VolumeAdjuster_Linn at 8th.xlsm	NBL	130 130	100	90 1250	1310	110 90	1300	130 140	100 1	1300 13	50	130	140 100	110 1250
AltI-W_VolumeAdjuster_Linn at 8th.xlsm	NBT	120 120		160 1650	1730	65 110		120 130	170 1			120	130 170	
Alti-W_VolumeAdjuster_Linn at 8th.xlsm	NBR	10 20	30	30 220	210	10 25		11 21	50	-	70	10	20 30	
AltI-W_VolumeAdjuster_Linn at Bank.xlsm	EBL	30 30	60	70 820	830	25 60	750	41 51	60	70 820 83		40	60 70	
AltI-W_VolumeAdjuster_Linn at Bank.xlsm	EBR	30 30	70	70 730	720	25 55		37 47			80	40	50 70	
AltI-W_VolumeAdjuster_Linn at Bank.xlsm	SBR SBT	110 160 170 150	140 300	220 2870 270 2320		80 100 125 200		144 160 170 180	144 2: 300 3:	+			160 140 200 270	
AltI-W_VolumeAdjuster_Linn at Bank.xlsm AltI-W VolumeAdjuster Linn at Bank.xlsm	NBT	170 150 40 50	150	170 2320 170 1320	1380	125 200 35 130		170 180 66 76	300 3: 150 1:			70	80 150	
Alti-W_VolumeAdjuster_Linn at Bank.xism  Alti-W VolumeAdjuster Linn at Bank.xism	NBT	110 180	230	190 2550	2520	90 225		128 180	230 2				200 260	
Alti-W_volumeAdjuster_Linn at Central.xlsm	EBL	10 10	10	10 80	80	10 5	100	10 20	10		50	10	20 10	
Alti-W_volumeAdjuster_Linn at Central.xism	EBT	540 550		420 4630		430 315		540 550	370 4				510 330	
Alti-W_VolumeAdjuster_Linn at Central.xlsm	EBR	190 180	220	200 2500	2330	135 135		190 200	220 2	+			190 190	
AltI-W_VolumeAdjuster_Linn at Central.xlsm	SBR	90 90	60	40 900	780	30 55	700	90 100	60		50		100 60	
AltI-W_VolumeAdjuster_Linn at Central.xlsm	SBT	60 80	120	190 1880	2140	40 90	1250	94 104	120 1	90 1880 214	40	100	110 130	200 1850
AltI-W_VolumeAdjuster_Linn at Central.xlsm	SBL	10 10	10	10 90	90	5 5	100	10 20	10			10	20 10	20 100
AltI-W_VolumeAdjuster_Linn at Central.xlsm	WBR	10 10	10	10 150	150	5 10	150	10 20	10		00	10	20 10	
AltI-W_VolumeAdjuster_Linn at Central.xlsm	WBT	60 90	430	500 2210		140 410		140 150	398 4				190 420	
AltI-W_VolumeAdjuster_Linn at Central.xlsm	WBL	10 20	60	60 590	610	25 45		30 40			40	30	40 60	
AltI-W_VolumeAdjuster_Linn at Central.xlsm	EBL	80 150		130 1690		60 165		85 150	165 1				120 160	
AltI-W_VolumeAdjuster_Linn at Central.xlsm	EBT	40 30	80	80 1160		30 60		58 68		00 1160 12:		40	50 80	
AltI-W_VolumeAdjuster_Linn at Central.xlsm	EBR	40 20	80	80 840	780	15 45	550	42 52		90 840 89		40	50 70	00 000
AltI-W_VolumeAdjuster_Linn at Court.xlsm	EBL	10 10	10	10 50	50	10 10		9 19	9		00	10	20 10	
AltI-W_VolumeAdjuster_Linn at Court.xlsm	EBT	10 10	10	10 50		5 5	50 50	9 19	9		00	10	20 10	,,
AltI-W_VolumeAdjuster_Linn at Court.xlsm	EBR SBR	10 10	10	10 50 10 60	50	5 5	50	10 20	10		00	10	20 10	
Alti-W_VolumeAdjuster_Linn at Court.xlsm	SBT	10 10	10 470		60 4260	145 350		10 20 215 225					20 10 230 460	
AltI-W_VolumeAdjuster_Linn at Court.xlsm AltI-W VolumeAdjuster Linn at Court.xlsm	SBI	200 180 30 30	470 40	440 4290 40 410	4260	145 350 25 35	400	215 225 30 40		30 4290 43 50 410 46		30	40 40	
Alti-W_volumeAdjuster_Linn at Court.xism  Alti-W VolumeAdjuster Linn at Court.xism	WBR	20 20	40	60 370	440	15 30	350	20 30	40		40	20	30 40	
Alti-W_volumeAdjuster_Linn at Court.xism  Alti-W VolumeAdjuster Linn at Court.xism	WBT	10 10	10	10 50	50	5 5	50	9 10	9		00	10	20 10	20 50
Alti-W_volumeAdjuster_Linn at Court.xism  Alti-W VolumeAdjuster_Linn at Court.xism	WBL	20 20	90	80 560	670	15 65		28 38	90 1		70	30	40 90	
AltI-W VolumeAdjuster Linn at Court.xlsm	NBL	20 20	10	10 50	50	15 5	50	9 19	9		00	10	20 10	20 50
		20	10		55	1		- 1	~ <u> </u>	. 55 10	1		10	_0 50

			Adjustor Spra	adchoot Tar	raot		Evicting	z 2010 Volumos		۸۵۱	justed Forecast Tar	rants				Balancos	l Forecasts	
Adjuster Spreadsheet	Turn	AM29	Adjuster Spre			DY49 AN		g 2019 Volumes M19 AADT19 A	M29 AM		usted Forecast Tar M29 PM49	DY29	DY49 Notes on minimum overrides	AM29	AM49		PM49	DY29 DY49
AltI-W VolumeAdjuster Linn at Court.xlsm	NBT	170	170 280				230	345 4500	230	240	345 35			230	24			3850 4000
AltI-W_VolumeAdjuster_Linn at Court.xlsm	NBR	40	40 30	30	370	440	125	50 1100	67	77	50 6	60 1100	1150	60	7	0 50	60	950 1050
AltI-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm	EBL	80	130 90	90	1130	1240	30	25 400	80	130	90 10	00 1130	1240	90	14	0 100	110	1150 1250
AltI-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm	EBT	360	360 130				310	120 2050	360	370		40 2120	2170	380	39	_		2100 2200
Alti-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm	EBR	130	130 160				50	95 700	130	140		70 1430	1480	140	15	_		1450 1500
AltI-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm  AltI-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm	SBR SBT	30	40 50 310 510				25 225	50 550 405 3500	30 330	340	50 6 510 52	60 550	600	30	34			600 650 4000 4150
Alti-W_volumeAdjuster_Linn at Ezzard Charles.xism	SBL	30	310 510 40 40		370	+	30	30 350	30	340 40		20 4010 50 370	4130 420	330	4	-		4000 4150 350 400
AltI-W VolumeAdjuster Linn at Ezzard Charles.xism	WBR	30	30 40				20	30 300	30	40		50 370		30	4			350 400
AltI-W VolumeAdjuster Linn at Ezzard Charles.xlsm	WBT	110	130 270				70	160 2000	127	137	270 28	80 2540		140	15	0 270	280	2800 3250
AltI-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm	WBL	20	20 80	40	700	590	30	40 550	35	45	80 9	90 700	750	40	5	0 80	90	700 750
AltI-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm	NBL	70	70 110	140	1120	1270	45	80 950	70	80	110 14	40 1120	1270	70	9	0 110	140	1200 1400
AltI-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm	NBT	190	200 260				250	320 3550	182	192		92 3550	3600	180	19			3550 3600
AltI-W_VolumeAdjuster_Linn at Ezzard Charles.xlsm	NBR	70	70 40		010	+	60	40 650	70	80		50 650		70	8			650 700
AltI-W_VolumeAdjuster_Main at 4th.xlsm	SBR	190	190 560				155	525 3950	190	200		80 3950		190	20			3850 3900
AltI-W_VolumeAdjuster_Main at 4th.xlsm	SBT	120 840	120 660				120	620 3500	152	162	547 56		3550	150	15			3600 3700
AltI-W_VolumeAdjuster_Main at 4th.xlsm AltI-W VolumeAdjuster Main at 4th.xlsm	WBR WBT	310	880 670 300 750				530 635	360 5200 935 9450	840 310	880 320	670 68 750 76	80 8030 60 5340	8090   5400   Fewer vehicles using 4th Street ramp in favor of CWB	820 340	86 37	-		7750 7850 5350 5750
Alti-W VolumeAdjuster_Main at 4th.xism	WBL	20	20 120				25	105 750	42	52		40 840	·	40	5			800 850
Alti-W VolumeAdjuster Main at 4th.xlsm	NBL	200	200 160		1830		170	135 1800	200	210	160 17		1880	210	22			1850 1900
AltI-W_VolumeAdjuster_Main at 4th.xlsm	NBT	450	460 240	240	2870	2880	405	210 2900	450	460	240 25	50 2900	2950	420	44	0 230	250	2800 2850
AltI-W_VolumeAdjuster_Main at 5th.xlsm	EBL	120	120 60	60	1260	1260	100	55 1250	120	130	63	73 1260	1310	90	11	0 60	80	1200 1250
AltI-W_VolumeAdjuster_Main at 5th.xlsm	EBT	890	960 500				590	395 6000	890	960	500 51			880	92			7400 7600
AltI-W_VolumeAdjuster_Main at 5th.xlsm	EBR	50	40 80		550	+	30	70 800	50	60		73 800		50	6			800 850
AltI-W_VolumeAdjuster_Main at 5th.xlsm	SBT	60	60 610				65	500 2100	100	110	360 37		2150	80	8			2200 2300
AltI-W_VolumeAdjuster_Main at 5th.xlsm	SBL	80	80 230				80 475	225 2150	93	103	230 25	_	2200	110	12			2200 2250
AltI-W_VolumeAdjuster_Main at 5th.xlsm  AltI-W_VolumeAdjuster_Main at 5th.xlsm	NBT NBR	530	540 340 60 90			+	475 60	290 3450 75 750	530 60	540 70	340 35 90 10	50 3450 00 820	3500 870	540	55 7	-		3450 3500 800 850
Alti-W_volumeAdjuster_Main at 5th.xism  Alti-W VolumeAdjuster Mound at 9th.xism	BHR	20	20 80				20	65 300	20	30		64 300	350	20	3			300 350
Alti-W VolumeAdjuster_Mound at 9th.xlsm	BBR	20	20 60		350		15	55 350	20	30		70 350	400	20	3	00		350 400
AltI-W VolumeAdjuster Mound at 9th.xlsm	WBR	20	20 20	1	300		15	15 300	20	30		30 300		20	3			300 350
AltI-W_VolumeAdjuster_Mound at 9th.xlsm	BBR	250	320 670		4880	5560	200	575 4250	250	320	670 72	20 4880	5560	260	30	0 600	650	4800 5450
AltI-W_VolumeAdjuster_Mound at 9th.xlsm	BBL	390	400 1090	1520	7970	9920	250	715 6350	399	409	1090 152	20 7970	9920	410	44	970	1300	8000 9850
AltI-W_VolumeAdjuster_Patterson at Harrison.xlsm	EBT	120	80 150		1930		70	75 1250	120	130	150 16	60 1930		120	15	0 130	160	1850 2000
AltI-W_VolumeAdjuster_Patterson at Harrison.xlsm	EBR	10	10 10	1	100		5	10 100	10	20		20 100		10	2			100 150
AltI-W_VolumeAdjuster_Patterson at Harrison.xlsm	WBT	20	20 80				30	70 1050	41	51		90 1050	1100	40	4	-	1	850 900
AltI-W_VolumeAdjuster_Patterson at Harrison.xlsm	WBL NBI	10	10 10		100 50	+	10	5 100 5 50	10	20	10 2	20 100	150	20	2			150 200 50 100
AltI-W_VolumeAdjuster_Patterson at Harrison.xlsm AltI-W_VolumeAdjuster_Patterson at Harrison.xlsm	NBR	10	10 10				5	5 100	10	20	10 3	20 100		10	2			50 100 100 150
AltI-W VolumeAdjuster_Fatterson at Harrison.xism	SBR	550	610 410				540	430 4450	550	610		40 4450		530	59			4650 4800
AltI-W VolumeAdjuster Philadelphia at 4th.xlsm	SBT	50	50 30	1	350		70	75 1000	63	73	63	73 1000		70	8			1000 1050
AltI-W_VolumeAdjuster_Philadelphia at 4th.xlsm	WBR	120	120 130	130	2250	2250	100	115 2250	120	130	130 14	40 2250	2300	140	15	0 180	190	2400 2450
AltI-W_VolumeAdjuster_Philadelphia at 4th.xlsm	WBT	580	580 1350	1350	7140	7260	795	1420 12000	580	590	1350 136	60 7140	7260 Fewer vehicles using 4th Street ramp in favor of CWB	530	56	0 1200	1250	7700 8100
AltI-W_VolumeAdjuster_Philadelphia at 4th.xlsm	WBL	70	70 60		810		65	60 950	70	80		70 950		70	8			950 1000
AltI-W_VolumeAdjuster_Philadelphia at 4th.xlsm	NBL	230	190 110				185	135 1650	230	240		20 1390	·	190	21	_		1500 1550
AltI-W_VolumeAdjuster_Philadelphia at 4th.xlsm	NBT	240	180 150				115	95 2400	240	250	165 17		3340	270	27	_		3550 3600
AltI-W_VolumeAdjuster_Philadelphia at 5th.xlsm	EBL EBT	420 930	310 160			-	180	100 2700	420	430 1000		06 3920	3970	370	38	-		3700 3750 7850 8050
AltI-W_VolumeAdjuster_Philadelphia at 5th.xlsm AltI-W_VolumeAdjuster_Philadelphia at 5th.xlsm	EBR	930	1000 570 90 90				610	405 6450 60 750	930	1000	570 59 90 11		8210 1390	920	96 10			7850 8050 1250 1400
AltI-W VolumeAdjuster_Philadelphia at 5th.xism	SBT	40	40 50		570		35	45 550	40	50		60 570	620	50	5	-	1	600 650
AltI-W VolumeAdjuster Philadelphia at 5th.xlsm	SBL	100	100 50	1	790		100	90 1400	100	110		00 1400		90	11		90	1350 1400
AltI-W VolumeAdjuster Philadelphia at 5th.xlsm	NBT	40	50 40		460		120	130 1350	83	93	83	93 1350	1400	90	10		100	1350 1400
AltI-W_VolumeAdjuster_Philadelphia at 5th.xlsm	NBR	10	10 30		180		10	25 200	10	20		40 200		10	2	_	40	200 250
AltI-W_VolumeAdjuster_Philadelphia at 9th.xlsm	EBT	100	90 250	250	1880	1980	25	35 350	100	110	250 26	60 1880	1980	120	14	0 240	260	2150 2250
AltI-W_VolumeAdjuster_Philadelphia at 9th.xlsm	SBR	20	30 40				10	30 200	20	30		50 310		40	5			450 500
AltI-W_VolumeAdjuster_Philadelphia at 9th.xlsm	SBL	30	30 50				30	45 400	30	40		60 400		30	4			400 450
AltI-W_VolumeAdjuster_Philadelphia at 9th.xlsm	WBT	240	270 110				25	20 250	240	270		20 1830		460				2650 2800
AltI-W_VolumeAdjuster_Pike at I-75 NB.xlsm AltI-W_VolumeAdjuster_Pike at I-75 NB.xlsm	EBL EBT	620 620	620 180 640 240				465 630	115 3450 295 4800	620 630	630 640	222 23 295 30	32 4430 05 4800	4480 4850	740 610	76 62			4650 4700 4650 4700
Alti-W_VolumeAdjuster_Pike at I-75 NB.xism  Alti-W_VolumeAdjuster_Pike at I-75 NB.xism	WBR	620 an	90 80				120	110 950	65	75		75 4800 75 950		80	9	_		4650 4700 950 1000
Alti-W_VolumeAdjuster_Pike at I-75 NB.xism  Alti-W_VolumeAdjuster_Pike at I-75 NB.xism	WBT	250	230 550				120	460 3500	250	260		80 4540		260				4500 4750
AltI-W VolumeAdjuster_Fike at I-75 NB.xlsm	NBL	130	100 200				105	145 1750	130	140	200 23			120	13			1850 1900
AltI-W_VolumeAdjuster_Pike at I-75 NB.xlsm	NBT	360	390 340				305	240 3150	360	390	340 35			390	39			4450 4800
AltI-W_VolumeAdjuster_Pike at I-75 NB.xlsm	NBR	170	280 110				150	110 1500	170	280		20 1500		160				
AltI-W_VolumeAdjuster_Pike at I-75 SB.xlsm	EBT	1180	1190 320	330	7210	7240	1015	275 7000	1180	1190	361 37	71 7210	7260	1260	128	0 420	430	7900 7950
AltI-W_VolumeAdjuster_Pike at I-75 SB.xlsm	EBR	80	80 30				70	25 550	80	90		40 550		80	9	-		650 700
AltI-W VolumeAdjuster Pike at I-75 SB.xlsm	SBR	30	20 330				100	480 3900	110	120		70 3900		200				3950 4000
_ , _	SBT	410	400 570				215	220 3000	410	420		80 6480		370				6500 6900
AltI-W_VolumeAdjuster_Pike at I-75 SB.xlsm	CD1	40	40 100 200 510				160	135 1250	330	90	112 12			90	10	_		1400 1450
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm	SBL	220		530	3890		160 65	370 3250 235 2000	230 140	240 150	510 53 235 24			240 140	25 15			3650 3750 2700 2900
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm	WBT	230			2400			Z331 ZUUU	140	120								2700 2900
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm	552	140	120 230	230					470	480	2651 2	75 36NN	* *					3500 3550
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm	WBT WBL EBL		120 230 470 230	230	2770	2770	455	265 3600	470 325	480 420		75 3600 50 2700	3650	460	47	0 250	260	3500 3550 2650 2700
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm	WBT WBL	140 470	120 230 470 230 420 100	230 230 100	2770 2060	2770 2430			470 325 150	480 420 160	140 15		3650 2750		47 40	0 250 0 130	260 140	2650 2700
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm	WBT WBL EBL EBT	140 470 320	120 230 470 230 420 100	230 230 100 400	2770 2060 2800	2770 2430 2900	455 325	265 3600 140 2700	325	420	140 15 400 43	50 2700	3650 2750 2900	460 310	47 40	0 250 0 130 0 410	260 140 0 420	2650 2700
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm	WBT WBL EBL EBT SBR	140 470 320	120 230 470 230 420 100 140 400	230 230 100 100 400 30	2770 2060 2800 180	2770 2430 2900 210	455 325	265 3600 140 2700 340 2800	325 150	420 160	140 15 400 42 20 3	50 2700 10 2800	3650 2750 2900 230	460 310	47 40 17	0 250 0 130 0 410 0 20	260 140 420 30	2650 2700 3150 3250
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm	WBT WBL EBL EBT SBR SBL	140 470 320	120 230 470 230 420 100 140 400 10 20	230 230 100 0 400 0 30 0 20	2770 2060 2800 180 290	2770 2430 2900 210 290	455 325 135 5	265 3600 140 2700 340 2800 5 50	325 150 10	420 160 20	140 15 400 47 20 3 20 3	50 2700 10 2800 30 180	3650 2750 2900 230 350	460 310 160 10	47 40 17 2 3	0 250 0 130 0 410 0 20 0 20	260 140 420 30 30	2650 2700 3150 3250 200 250 300 350 2300 2500
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm	WBT WBL EBL EBT SBR SBL WBR WBT EBL	140 470 320 150 10 20	120 230 470 230 420 100 140 400 10 20 20 20 20 180 230 10 10	230 230 100 100 100 100 100 100 100 100 100 1	2770 2060 2800 180 290 2040 50	2770 2430 2900 210 290 2260 50	455 325 135 5 20 105	265 3600 140 2700 340 2800 5 50 20 300 230 1650 10 250	325 150 10 20 180	420 160 20 30 190	140 15 400 42 20 3 20 3 230 26 9 3	50 2700 10 2800 30 180 30 300 60 2040 19 250	3650 2750 2900 230 350 2260 300	460 310 160 10 20	47 40 17 2 3 19	0 250 0 130 0 410 0 20 0 20 0 240 0 10	260 140 420 30 30 30 270 20	2650 2700 3150 3250 200 250 300 350 2300 2500 200 250
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Spring Grove at Bank.xlsm Alti-W_VolumeAdjuster_Spring Grove at Bank.xlsm	WBT WBL EBL EBT SBR SBL WBR WBT EBL EBT	140 470 320 150 10 20	120 230 470 230 420 100 140 400 10 20 20 20 180 233 10 10 40 110	230 230 100 400 30 20 260 10	2770 2060 2800 180 290 2040 50	2770 2430 2900 210 290 2260 50	455 325 135 5 20 105 15 20	265 3600 140 2700 340 2800 5 50 20 300 230 1650 10 250 40 750	325 150 10 20 180 9	420 160 20 30 190 19 78	140 19 400 43 20 3 20 3 20 3 230 26 9 110 12	50 2700 10 2800 30 180 30 300 60 2040 19 250 20 1350	3650 2750 2900 230 350 2260 300 1400	460 310 160 10 20 180 10	47 40 17 2 3 19 2	0 250 0 130 0 410 0 20 0 20 0 20 0 240 0 100	260 140 420 30 30 270 0 20	2650         2700           3150         3250           200         250           300         350           2300         2500           200         250           1350         1400
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Spring Grove at Bank.xlsm Alti-W_VolumeAdjuster_Spring Grove at Bank.xlsm Alti-W_VolumeAdjuster_Spring Grove at Bank.xlsm Alti-W_VolumeAdjuster_Spring Grove at Bank.xlsm	WBT WBL EBL EBT SBR SBL WBR WBT EBL EBT EBT	140 470 320 150 10 20	120 230 470 233 420 100 140 400 10 20 20 20 180 233 10 10 40 110 50 80	230 230 100 400 30 20 260 10 90	2770 2060 2800 180 290 2040 50 1350	2770 2430 2900 210 290 2260 50 1210 1150	455 325 135 5 20 105 15 20 25	265 3600 140 2700 340 2800 5 50 20 300 230 1650 10 250 40 750 15 350	325 150 10 20 180 9 68 55	420 160 20 30 190 19 78 65	140 19 400 43 20 3 20 3 20 3 230 26 9 110 12 80 9	50 2700 10 2800 30 180 30 300 60 2040 19 250 20 1350 90 1090	3650 2750 2900 230 350 2260 300 1400 1150	460 310 160 10 20 180 10 70	47 40 17 2 3 19 2 8 6	0 250 0 130 0 410 0 20 0 20 0 20 0 240 0 100 0 80	260 140 420 30 30 270 20 110	2650         2700           3150         3250           200         250           300         350           2300         2500           200         250           1350         1400           1100         1150
Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at I-75 SB.xlsm Alti-W_VolumeAdjuster_Pike at Main.xlsm Alti-W_VolumeAdjuster_Spring Grove at Bank.xlsm Alti-W_VolumeAdjuster_Spring Grove at Bank.xlsm	WBT WBL EBL EBT SBR SBL WBR WBT EBL EBT	140 470 320 150 10 20	120 230 470 230 420 100 140 400 10 20 20 20 180 233 10 10 40 110	230 230 100 400 30 20 260 10 90 90 90	2770 2060 2800 180 290 2040 50 1350 1090	2770 2430 2900 210 290 2260 50 1210 1150 290	455 325 135 5 20 105 15 20	265 3600 140 2700 340 2800 5 50 20 300 230 1650 10 250 40 750	325 150 10 20 180 9	420 160 20 30 190 19 78	140 19 400 43 20 3 20 3 20 3 210 20 20 3 210 20	50 2700 10 2800 30 180 30 300 60 2040 19 250 20 1350	3650 2750 2900 230 350 2260 300 1400 1150 350	460 310 160 10 20 180 10	47 40 17 2 3 19 2 8 6	0 250 0 130 0 410 0 20 0 20 0 20 0 240 0 100 0 80 0 20	260 140 420 30 30 270 20 110 90	2650         2700           3150         3250           200         250           300         350           2300         2500           200         250           1350         1400

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Adjuster Spreadsheet	Turn	AM29	Adjuster Spre AM49 PM29			DY49 AM		x 2019 Volumes M19 AADT19	AM29		ljusted Forecas		DY	Y49 Notes on minimum overri	des	AM29	AM49	Balanced I PM29		DY29 DY49
AltI-W VolumeAdjuster Spring Grove at Bank.xlsm	SBL	70	80 120			1290	55	85 1100	70	80	120		270	1320		70	80	110	120	1250 1300
AltI-W_VolumeAdjuster_Spring Grove at Bank.xlsm	WBR	20	20 170	170	1430	1430	90	200 2150	90	100	200	210 21	150	2200		100	110	200	210	2000 2050
AltI-W_VolumeAdjuster_Spring Grove at Bank.xlsm	WBT	30	30 50	50	150	150	25	40 150	27	37	27	37 1	150	200		20	20	30	30	100 200
AltI-W_VolumeAdjuster_Spring Grove at Bank.xlsm	WBL	20	20 50			280	15	45 300	20		50		300	350		20	30	60	70	350 400
AltI-W_VolumeAdjuster_Spring Grove at Bank.xlsm	NBL	40	40 20			550	35	15 550	40		28		550	600		40	50		40	550 600
AltI-W_VolumeAdjuster_Spring Grove at Bank.xlsm	NBT NBR	160	160 270 60 100			2620	160	275 3100 70 1100	160 66		275 100		100	3150 1360		140	150		260 100	2600 2700 1300 1350
AltI-W_VolumeAdjuster_Spring Grove at Bank.xlsm AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm	FBI	10	60 100 10 20	_	50	1330	40 5	70 1100 15 50	9	76 19	9	19	310 50	100		10	20	90	20	1300 1350 50 100
Alti-W VolumeAdjuster Spring Grove at Harrison.xlsm	EBT	10	10 10		50	50	5	5 50	9	19	9	19	50	100		10	20	10	20	50 100
AltI-W VolumeAdjuster Spring Grove at Harrison.xlsm	EBR	10	10 30	_	250	250	5	25 250	13	23	30	40 2	250	300		10	20	30	40	250 300
AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm	SBR	20	20 70	70	150	150	20	5 150	20	30	70	80 1	150	200 WHV changes		20	30	70	80	150 200
AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm	SBT	420	410 580	580		5460	445	520 5900	420	430	580	590 54	440	5490		420	430	580	590	5600 5650
AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm	SBL	90	50 30			1150	60	60 850	90		30		330	1380		90	100	50	60	1250 1300
AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm	WBR	30	30 190			1430	20	85 900	30	40	190		380	1430		80	90		200	1600 1650
AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm	WBT	40	40 20			200	35	15 200	36	46	20		200	250		30	50	10	50	300 500
AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm	WBL NBL	30	90 20			410 200	15	5 150 10 200	60 20		20 10		400 200	450		30	90	20 10	30	500 550 250 300
AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm  AltI-W_VolumeAdjuster_Spring Grove at Harrison.xlsm	NBT	180	20 10 180 390			3530	245	465 5100	180		390		500	250 3550 WHV changes		220	230		440	4300 4400
AltI-W VolumeAdjuster Spring Grove at Harrison.xlsm	NBR	100	10 10		200	200	5	10 200	100		10		200	250		10	200	20	30	250 300
AltI-W VolumeAdjuster Western at Ezzard CharlesEB.xlsm	EBT	30	30 30	_	60	60	25	30 100	11	_	11		100	150		20	30	20	30	150 250
AltI-W_VolumeAdjuster_Western at Ezzard CharlesEB.xlsm	EBR	10	10 40	40	70	70	5	5 50	10	20	13	23	70	120		10	30	20	30	100 150
AltI-W_VolumeAdjuster_Western at Ezzard CharlesEB.xlsm	SBT	550	560 600	630	3900	3900	590	700 5200	550	560	600	630 39	900	3950 Ramp changes		480	490	560	600	4100 4250
AltI-W_VolumeAdjuster_Western at Ezzard CharlesEB.xlsm	SBL	190	190 80			1220	260	160 2500	190		80		200	1250 Ramp changes		180	190	110	120	1500 1550
Alti-W_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm	SBR	10	10 10			100	10	5 100	10		10		100	150		10	20	10	20	100 150
AltI-W_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm	SBT	730	740 620			3950	810	820 7000	730		620		950	4000 Ramp changes		600	610	620	660	4750 4900
AltI-W_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm	WBT	10	10 10			100	5	10 100	10	20	10		700	150		10	30	10	20	100 150
AltI-W_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm AltI-W_VolumeAdjuster_Western at Findlay.xlsm	WBL EBT	20	20 30 30 50	_	500	380 540	40 25	40 700 50 650	40 30	50 40	40 50		700 650	750 700		60 30	70 50	50 50	70	850 900 650 750
Alti-W_volumeAdjuster_western at Findlay.xism  Alti-W VolumeAdjuster_Western at Findlay.xism	EBR EBR	120	120 190		550	1750	105	165 1450	120		190		730	1780		150	160	200	210	1750 1800
AltI-W VolumeAdjuster_Western at Findlay.xism	SBR	130	120 190	_		1470	150	180 1850	150		190		850	1900		150	160	190	200	1800 1850
AltI-W VolumeAdjuster Western at Findlay.xlsm	SBT	270	340 430			3110	310	370 3000	310		430		000	3110		350	350		410	2850 2950
AltI-W_VolumeAdjuster_Western at Findlay.xlsm	SBL	100	90 190	190	1380	1290	140	250 2600	140	150	248	258 26	600	2650		140	150	250	260	2500 2550
AltI-W_VolumeAdjuster_Western at Findlay.xlsm	WBT	50	50 40	50	760	750	55	55 900	55	65	55	65 9	900	950		60	70	60	70	900 950
AltI-W_VolumeAdjuster_Western at Findlay.xlsm	WBL	10	10 20			180	20	40 550			40		550	600		30	40		50	550 600
AltI-W_VolumeAdjuster_Western at Gest.xlsm	EBT	150	170 240			3250	125	200 2800	155		240		100	3250		170	190	240	250	3100 3300
Alti-W_VolumeAdjuster_Western at Gest.xlsm	SBR	210	210 240			1420	180	210 1400	210		240	250 14		1460		160	160	200	220	1100 1200
AltI-W_VolumeAdjuster_Western at Gest.xlsm	SBL WBT	140 290	140 110	_		900 2510	125 235	95 950 55 1700	140 290		110 101		950 020	1000 2510		120 280	130 350	100 120	110 150	800 850 2050 2400
AltI-W_VolumeAdjuster_Western at Gest.xlsm AltI-W_VolumeAdjuster_Western at Liberty.xlsm	EBT	70	400 90 80 120			1310	70	55 1700 90 1300	290 70		120		300	1350		280	90	120	130	1300 1350
Alti-W_volumeAdjuster_western at Liberty.xisin  Alti-W VolumeAdjuster_Western at Liberty.xisin	EBR	30	30 50			320	55	85 850	55		59		850	900		100	110	70	80	950 1000
AltI-W VolumeAdjuster Western at Liberty.xlsm	SBR	10	10 20		150	150	10	15 150	10	20	20		150	200		10	20	20	30	150 200
AltI-W_VolumeAdjuster_Western at Liberty.xlsm	SBT	240	240 380		1640	1590	245	365 2000	245	255	295	305 20	000	2050		360	360	350	380	2200 2300
AltI-W_VolumeAdjuster_Western at Liberty.xlsm	SBL	150	180 210	240	2380	2770	180	195 2850	180	190	210	240 28	850	2900		160	170	230	260	2800 2850
AltI-W_VolumeAdjuster_Western at Liberty.xlsm	WBT	130	130 130			1760	90	115 1700			130		770	1820		110	120	120	130	1700 1750
AltI-W_VolumeAdjuster_Western at Liberty.xlsm	WBL	80	90 180			1560	90	125 1550	90		180		550	1600		150	160	210	220	1700 1750
AltI-W_VolumeAdjuster_Winchell at Bank.xlsm	EBL	120	120 140			2020	70	65 1300	120		140	150 21		2180		120	130	130	140	2150 2200
AltI-W_VolumeAdjuster_Winchell at Bank.xlsm  AltI-W_VolumeAdjuster_Winchell at Bank.xlsm	EBT WBR	170	60 150 210 210			1740	45 150	130 1650 160 2450	87 170		150 210		730	1780		90 170	110 200	170 180	190 230	1750 1850 3050 3100
Alti-W_volumeAdjuster_winchell at Bank.xism  Alti-W VolumeAdjuster Winchell at Bank.xism	WBT	50	210 210 60 160			3050 1320	40	135 1200	67		160		040 340	3090 1390		60	70	150	160	3050 3100 1200 1300
Alti-W_VolumeAdjuster_Winchell at Bank.xism  Alti-W_VolumeAdjuster_Winchell at Bank.xism	NBL	60	60 80	_	800	780	90	150 1400	90		144		400	1450		80	90	140	150	1250 1350
AltI-W VolumeAdjuster Winchell at Bank.xlsm	NBT	220	180 340			3340	140	285 3600	220		340		700	3750		210	220	310	330	3750 3850
AltI-W VolumeAdjuster Winchell at Bank.xlsm	NBR	60	60 80		700	700	50	65 700	60	70	80		700	750		60	70	90	100	700 750
AltI-W_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	EBL	30	30 40	40	320	350	25	30 250	30	40	40	50	320	370		20	30	30	40	250 300
AltI-W_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	EBT	190	190 50		1460	1460	260	160 2350		270	160	170 23	350	2400		180	190	100	110	1400 1500
AltI-W_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	NBT	780	850 1250			14560	285	235 3600			1250	1310 136		14560		900	980		1360	15000 16050
AltI-W_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	NBR	420	510 320			3450	130	80 800	420		320	330 32		3450		430			340	3300 3450
AltI-W_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm	WBR	180	200 440			4630	115	260 2950		209	440		980	4630		210			440	4050 4700
AltI-W_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm  AltI-W_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm	WBT NBL	30	40 20			410 360	25 20	30 550 20 250	30 40	40	30 30		550 350	400		30 40	50 50	30 30	40	550 600 400 450
AltI-W_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm AltI-W VolumeAdjuster Winchell at Ezzard CharlesWB.xlsm	NBT	770	40 30 850 1270		330	14660	290	20 250 245 3600	40 770		1270	1330 136	350 660	14660		40 880	960		1360	400 450 14850 15900
Alti-W_VolumeAdjuster_Winchell at Ezzaru CharlesWB.xisin  Alti-W VolumeAdjuster Winchell at Findlay.xism	EBL	60	60 130			600	50	110 600	60		108		600	650		60	70	100	110	600 650
AltI-W VolumeAdjuster Winchell at Findlay.xism	EBT	80	70 130			1260	115	190 2650	115		190		650	2700		110	130		220	2550 2650
Alti-W_VolumeAdjuster_Winchell at Findlay.xlsm	WBR	20	10 40			270	15	35 550	20		40		550	600		30	40		50	550 600
AltI-W_VolumeAdjuster_Winchell at Findlay.xlsm	WBT	10	10 20			240	20	50 650			50		650	700		30	40	50	60	650 700
AltI-W_VolumeAdjuster_Winchell at Findlay.xlsm	NBL	60	60 50	50	800	800	55	45 800	60	70	50	60 8	800	850	·	60	70	50	60	800 850
AltI-W_VolumeAdjuster_Winchell at Findlay.xlsm	NBT	260	230 380	_	4440	4500	215	355 4550	260	270	380	390 45	550	4600		260	270		420	4550 4700
AltI-W_VolumeAdjuster_Winchell at Findlay.xlsm	NBR	10	10 10			30	5	5 50	7	17	7		50	100		10	20	10	20	50 100
AltI-W_VolumeAdjuster_Winchell at Harrison.xlsm	EBT	110	60 120			1340	70	75 1100			120		480	1530		110	140		110	1550 1700
AltI-W_VolumeAdjuster_Winchell at Harrison.xlsm	WBT	30	30 80	_		870	35	75 1100	43		80		100	1150		160	180		210	2200 2400
AltI-W_VolumeAdjuster_Winchell at Harrison.xlsm  AltI-W VolumeAdjuster Winchell at Harrison.xlsm	NBL NBR	30	30 40 10 40			130 410	25	30 150 10 250	20 22		20 40		150 440	200 490		20	50 30	20 60	70	200 300 400 450
Alti-W_volumeAdjuster_Winchell at Liberty.xlsm  Alti-W VolumeAdjuster Winchell at Liberty.xlsm	RBI FRI	10	20 40			250	15	30 250	22		40	30	250	300		20	30	40	70	250 300
Alti-W_volumeAdjuster_winchell at Liberty.xism  Alti-W VolumeAdjuster Winchell at Liberty.xism	EBT	190	240 290			3820	235	255 3900	235		290		900	3950		220	30		340	3850 3900
Alti-W VolumeAdjuster Winchell at Liberty.xism	WBR	150	130 280			3040	90	235 2750			280		970	3040		160	170		270	3000 3050
Alti-W_VolumeAdjuster_Winchell at Liberty.xlsm	WBT	140	140 260			2510	125	210 2500			260		510	2560		180	190		290	2650 2700
AltI-W_VolumeAdjuster_Winchell at Liberty.xlsm	NBL	80	80 40			810	55	30 750	80		41		810	860		80	90	50	60	750 800
AltI-W_VolumeAdjuster_Winchell at Liberty.xlsm	NBT	150	140 110		1850	1620	170	140 2400	170	180	140	150 24	400	2450		150	160	160	180	2150 2300
AltI-W_VolumeAdjuster_Winchell at Liberty.xlsm	NBR	90	90 120			1390	70	90 1100	90		120	130 12		1390		80	90	140	150	1150 1250
AltI-W_VolumeAdjuster_Pike at I-75 SB.xlsm	SBT	410	400 570			6650	215	220 3000	410		570		480	6650		370	400		550	6500 6900
AltI-W_VolumeAdjuster_Pike at I-75 SB.xlsm	WBL	140	120 230			2670	65	235 2000	140	150	235		460	2670		140	150		280	2700 2900
AltI-W_VolumeAdjuster_Pike at I-75 NB.xlsm	WBR	90 360	90 80			390	120	110 950		75	65		950	1000		80	90	90	100	950 1000
AltI-W_VolumeAdjuster_Pike at I-75 NB.xlsm	NBT	360	390 340	330	4090	4330	305	240 3150	360	390	340	350 40	090	4330		390	390	450	460	4450 4800

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Adjuster Spreadsheet	Turn	AM29			idsheet Tar PM49		OY49 A		ng 2019 Volun PM19 AA	mes ADT19 AM2	29 AM4		ted Forecas		29 [	Y49 Notes on minimum overrides	AM29	AM49	PM29	ced Forecas	DY29	DY49
Misc Ramps Alternative W.xlsm	SB I-75 Entrance from Buttermilk Pike	858	959	1098			14181	750	960	12200	858	959	1098	1227	12685	14181	860	9		100 12		2700 14200
Misc Ramps Alternative W.xlsm	NB Exit to Buttermilk Pike	1010	1117	885			14233	885	775	12400	1010	1117	885	978	12866	14233	1010	11	_			2850 14250
Misc Ramps Alternative W.xlsm	NB I-75 Entrance from Buttermilk Pike	559	550	629	618	9437	9280	485	545	9000	559	569	629	639	9437	9487	680	7	00	660	680	9550 9650
Misc Ramps Alternative W.xlsm	EB Buttermilk to NB I-75	111	109	164	161	5579	5481	95	140	5250	279	289	279	289	5579	5629	290	3	00	250 2	260	5750 5800
Misc Ramps Alternative W.xlsm	WB Buttermilk to NB I-75	432	428	449			3745	390	405	3750	432	442	449	459	3777	3827	390					3800 3850
Misc Ramps Alternative W.xlsm	SB Exit to Buttermilk Pike	633	654	822			9236	570	740	8850	633	654	822	849	8937	9236	640	6				9200 9550
Misc Ramps Alternative W.xlsm	SB I-75 South of Buttermilk Pike	5289	6196	7405			99089	4525	6335	79600	5289	6196	7405	8674	84582	99089	5670	65	_			4950 99550
Misc Ramps Alternative W.xlsm	NB I-75 South of Buttermilk Pike	5445	6382	5716			90107	4620	4850	71750	5445	6382	5716	6700	76871	90107	5740	67				7050 90200
Misc Ramps Alternative W.xlsm Misc Ramps Alternative W.xlsm	SB I-75 North of Buttermilk Pike NB I-75 North of Buttermilk Pike	5388 5430	6271 6304	7194 5509		80812 73428	94054 85255	4345 4220	6115 4620	76250 68350	5388 5430	6271 6304	7194 5509	8373 6396	80812 73428	94054 85255	5450 5410	63 63	_			1450 94900 3750 85600
Misc Ramps Alternative W.xism	SB I-75 Entrance from Dixie Highway	330	348	549			4779	295	490	4450	330	348	549	579	4529	4779	350	3	_			4700 5000
Misc Ramps Alternative W.xlsm	NB Exit to Dixie Highway	429	368	719		4556	3908	325	545	3800	429	439	719	729	4556	4606	510					4400 4500
Misc Ramps Alternative W.xlsm	NB I-75 Entrance from Dixie Highway	644	745	449			7739	595	415	6800	644	745	449	520	6800	7739	620	8	_	_		6850 7800
Misc Ramps Alternative W.xlsm	SB Exit to Dixie Highway	257	272	326			5360	240	305	5200	257	272	326	346	5200	5360	270					5150 5450
Misc Ramps Alternative W.xlsm	SB I-75 Entrance from Kyle's Lane	350	327	481	449	4609	4302	335	460	4850	350	360	481	491	4850	4900	360	3	80	480 5	500	5050 5150
Misc Ramps Alternative W.xlsm	NB Exit to Kyle's Lane	242	247	445	454	4400	4483	250	460	5000	250	260	460	470	5000	5050	260	2	70	440	460	5000 5100
Misc Ramps Alternative W.xlsm	NB I-75 Entrance from Kyle's Lane	1024	1102	668	719	7693	8278	835	545	6900	1024	1102	668	719	7693	8278	1150	12	60	650 6	680	7700 8300
Misc Ramps Alternative W.xlsm	SB Exit to Kyle's Lane	618	799	678	877	6571	8497	620	680	7250	620	799	680	877	7250	8497	640	7	10	810	980	7550 8550
Misc Ramps Alternative W.xlsm	SB I-75 North of Kyle's Lane	5326	6223	7528	8795	84035	98183	4575	6466	79400	5326	6223	7528	8795	84035	98183	5650	65	50 7			4400 98750
Misc Ramps Alternative W.xlsm	NB I-75 North of Kyle's Lane	6015	7041	5795			92393	5075	4890	73250	6015	7041	5795	6785	78920	92393	6410	76				8900 92100
Misc Ramps Alternative W.xlsm	SB I-75 Entrance from 12th Street	681	724	1185			11738	345	600	6150	681	724	1185	1260	11042	11738	640					1200 12250
Misc Ramps Alternative W.xlsm	NB Exit to 12th Street	302	326	597	646		6707	250	495	5650	310	326	597	646	6197	6707	360		_			6450 7050
Misc Ramps Alternative W.xlsm	NB Exit to 5th Street	699	712	548			7610	510	400	6000	699	712	548	558	7473	7610	740					7500 7750
Misc Ramps Alternative W.xlsm	from 9th	572	583	448			6226		+	4909	572	583	448	458	6114	6226	600	6	_			5900 6100
Misc Ramps Alternative W.xlsm	from I-71	135	138	106 710			1471	220	640	1160	135	145	106	116	1444	1494	140					1600 1650
Misc Ramps Alternative W.xlsm	SB Exit to Bullock Street	366	391	710			7116	330	640	6600	366	391	710	759	6661	7116	320	3				6050 6400
Misc Ramps Alternative W.xlsm Misc Ramps Alternative W.xlsm	WB Exit from 4th to Bullock Street  EB Exit from Crescent Ave to Bullock Street	225 149	237 148	761 154			4808 1782	285 155	965 160	6350 2050	285 155	295 165	820 160	830 170	6350 2050	2100	280 150		_			5600 5650 2200 2300
Misc Ramps Alternative W.xlsm  Misc Ramps Alternative W.xlsm	NB I-75 Entrance from 4th Street	805	893	575			7062	1155	825	10050	805	893	575	638	6368	7062 Some of this traffic uses CWB	800					6100 6600
Misc Ramps Alternative W.xism	NB Entrance from 6th to I-75	232	303	1270			7354	105	575	2800	281	303	1012	1324	5623	7354	310	3	_			6150 8100
Misc Ramps Alternative W.xlsm	WB I-71 to SB I-75	1822	2013	3013			34525	1430	2365	28700	1822	2013	3013	3329	31253	34525	1870	20				3150 36100
Misc Ramps Alternative W.xlsm	I-71 span	1512	1671	2501		25940	28656	2.50	2505	20700	1512	1671	2501	2763	25940	28656	1550	17		490 27		7650 30050
Misc Ramps Alternative W.xlsm	local span	310	342	512			5869				310	342	512	566	5313	5869	320	3	_	_		5500 6050
Misc Ramps Alternative W.xlsm	I-71 span	1806	1965	1602	1743	21846	23772				1806	1965	1602	1743	21846	23772	1810	19	90 1	630 17	780 2	2350 24350
Misc Ramps Alternative W.xlsm	local span	780	849	692	753	9435	10267				780	849	692	753	9435	10267	770	8	50	720	790 9	9700 10500
Misc Ramps Alternative W.xlsm	WB from 6th Street to US-50	263	319	819	992	3857	4669	180	560	2900	263	319	694	840	3857	4669	240	2	90	690	780	4300 5300
Misc Ramps Alternative W.xlsm	WB US-50 to Gest Street	455	508	195	218	3109	3478	525	225	3950	525	535	225	235	3950	4000	520	5	80	230 2	250	3850 4000
Misc Ramps Alternative W.xlsm	WB US-50 Exit to Linn Street	294	318	216	233	3031	3278	225	165	2550	294	318	216	233	3031	3278	300	3	30	230 2	260	3150 3400
Misc Ramps Alternative W.xlsm	EB US-50 Entrance from Linn Street	199	238	620	741	4663	5572	130	405	3350	233	243	620	741	4663	5572	250	2	80	610		4900 5750
Misc Ramps Alternative W.xlsm	EB 8th Street Exit to Gest Street	27	28	27	28	364	376	20	20	300	27	37	27	37	364	414	30		40	20	30	300 350
																	30		_			
Misc Ramps Alternative W.xlsm	WB 8th Street Entrance from Gest Street	165	182	110			1652	75	50	750	165	182	110	121	1496	1652	160	1				1600 1650
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street	2508	2744	832	911	11973	13100	75 1190	50 395	750 6250	165 2155	2358	110 832	911	1496 11973	1652 13100	1800	1 19	70	840 9	940 1:	1500 12650
Misc Ramps Alternative W.xlsm Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street	2508 198	2744 240	832 415	911 504	11973 4582	13100 5557	145	50 395 305	750 6250 3700	165 2155 229	2358 240	110 832 415	911 504	1496 11973 4582	1652 13100 5557	1800 230	1 19 2	70 i	840 9 400 4	940 1: 490 4	1500 12650 4550 5600
Misc Ramps Alternative W.xlsm Misc Ramps Alternative W.xlsm Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 5th Street	2508 198 587	2744 240 755	832 415 269	911 504 346	11973 4582 4561	13100 5557 5859	145 480	50 395 305 220	750 6250 3700 4100	165 2155 229 587	2358 240 755	110 832 415 269	911 504 346	1496 11973 4582 4561	1652 13100 5557 5859	1800 230 590	1 19 2 7	70 3 40 4 80 3	840 9 400 4 250 3	940 1: 490 4 320 4	1500 12650 4550 5600 4400 5650
Misc Ramps Alternative W.xlsm Misc Ramps Alternative W.xlsm Misc Ramps Alternative W.xlsm Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 5th Street EB US-50 Exit to 5th Street	2508 198 587 1041	2744 240 755 1247	832 415 269 299	911 504 346 358	11973 4582 4561 4809	13100 5557 5859 5761	145 480 610	50 395 305 220 175	750 6250 3700 4100 3100	165 2155 229 587 866	2358 240 755 1037	110 832 415 269 299	911 504 346 358	1496 11973 4582 4561 4809	1652 13100 5557 5859 5761	1800 230 590 880	1 19 2 7 10	70 4 40 4 80 2 70 3	840 9 400 4 250 3 300 3	940 1: 490 4 320 4 360 4	1500 12650 4550 5600 4400 5650 4650 5650
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 5th Street EB US-50 Exit to 5th Street 9th Street Exit to SB I-75	2508 198 587 1041 190	2744 240 755 1247 257	832 415 269 299 739	911 504 346 358 1000	11973 4582 4561 4809 4389	13100 5557 5859 5761 5938	145 480 610 130	50 395 305 220 175 505	750 6250 3700 4100 3100 3300	165 2155 229 587 866 219	2358 240 755 1037 257	110 832 415 269 299 739	911 504 346 358 1000	1496 11973 4582 4561 4809 4389	1652 13100 5557 5859 5761 5938	1800 230 590 880 240	1 19 2 7 10 2	70 4 40 4 80 2 70 6	840 9 400 4 250 3 300 3 710 9	940 1: 490 4 320 4 360 4 930 4	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 5th Street BB US-50 Exit to 5th Street 9th Street Exit to 5B I-75 Western Avenue Exit to SB I-75	2508 198 587 1041	2744 240 755 1247 257 210	832 415 269 299 739 287	911 504 346 358 1000 290	11973 4582 4561 4809 4389 1894	13100 5557 5859 5761 5938 1911	145 480 610 130 290	50 395 305 220 175 505 400	750 6250 3700 4100 3100 3300 2900	165 2155 229 587 866 219 290	2358 240 755 1037 257 300	110 832 415 269 299 739 341	911 504 346 358 1000 351	1496 11973 4582 4561 4809 4389 2900	1652 13100 5557 5859 5761 5938 2950 Western Ramp	1800 230 590 880 240 210	1 19 2 7 10 2	70 40 40 40 40 40 40 40 40 40 40 40 40 40	840 9 400 4 250 3 300 3 710 9	940 1: 490 4 320 4 360 4 930 4	1500         12650           4550         5600           4400         5650           4650         5650           4800         6400           2300         2350
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street	2508 198 587 1041 190 208	2744 240 755 1247 257	832 415 269 299 739 287 336	911 504 346 358 1000 290 331	11973 4582 4561 4809 4389 1894 2352	13100 5557 5859 5761 5938 1911 2315	145 480 610 130 290 305	50 395 305 220 175 505 400 305	750 6250 3700 4100 3100 3300 2900 2350	165 2155 229 587 866 219 290 336	2358 240 755 1037 257	110 832 415 269 299 739	911 504 346 358 1000 351 346	1496 11973 4582 4561 4809 4389 2900 2352	1652 13100 5557 5859 5761 5938 2950 Western Ramp	1800 230 590 880 240	1 19 2 7 10 2 2 2	70 40 40 40 40 40 40 40 40 40 40 40 40 40	840 9 400 4 250 3 300 3 710 9 280 3 300 3	940 11 490 4 320 4 360 4 930 4 330 3	1500         12650           4550         5600           4400         5650           4650         5650           4800         6400           2300         2350           1900         2050
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 5th Street BB US-50 Exit to 5th Street 9th Street Exit to 5B I-75 Western Avenue Exit to SB I-75	2508 198 587 1041 190 208 336	2744 240 755 1247 257 210 331	832 415 269 299 739 287	911 504 346 358 1000 290 331 359	11973 4582 4561 4809 4389 1894 2352	13100 5557 5859 5761 5938 1911	145 480 610 130 290	50 395 305 220 175 505 400	750 6250 3700 4100 3100 3300 2900	165 2155 229 587 866 219 290	2358 240 755 1037 257 300 346	110 832 415 269 299 739 341 336	911 504 346 358 1000 351	1496 11973 4582 4561 4809 4389 2900	1652 13100 5557 5859 5761 5938 2950 Western Ramp	1800 230 590 880 240 210 280	1 19 2 7 10 2 2 2	70 40 40 40 40 40 40 40 40 40 40 40 40 40	840 <u>9</u> 400 <u>4</u> 400 <u>5</u> 300 <u>3</u> 300 <u>3</u> 300 <u>3</u> 3300 <u>3</u> 340 <u>5</u>	940 110 490 4 320 4 360 4 930 4 330 3330 3	1500         12650           4550         5600           4400         5650           4650         5650           4800         6400           2300         2350
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue	2508 198 587 1041 190 208 336 553	2744 240 755 1247 257 210 331 581	832 415 269 299 739 287 336 342	911 504 346 358 1000 290 331 359	11973 4582 4561 4809 4389 1894 2352 6032 79820	13100 5557 5859 5761 5938 1911 2315 6336	145 480 610 130 290 305 550	50 395 305 220 175 505 400 305 340	750 6250 3700 4100 3100 3300 2900 2350 6600	165 2155 229 587 866 219 290 336 553	2358 240 755 1037 257 300 346 581	110 832 415 269 299 739 341 336 342	911 504 346 358 1000 351 346 359	1496 11973 4582 4561 4809 4389 2900 2352 6600	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650	1800 230 590 880 240 210 280 590	1 19 2 7 10 2 2 2 2	70	840 9 4400 4 2250 3 300 3 710 9 280 3 300 3 370 4 920 92	940 11 490 4 320 4 360 4 930 4 300 3 330 3 410 6	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400 2300 2350 1900 2050 6600 6850
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB U5-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard	2508 198 587 1041 190 208 336 553 6305	2744 240 755 1247 257 210 331 581 7351	832 415 269 299 739 287 336 342 7648	911 504 346 358 1000 290 331 359 8916	11973 4582 4561 4809 4389 1894 2352 6032 79820	13100 5557 5859 5761 5938 1911 2315 6336 93057	145 480 610 130 290 305 550 5235	50 395 305 220 175 505 400 305 340 6350	750 6250 3700 4100 3100 3300 2900 2350 6600 72900	165 2155 229 587 866 219 290 336 553 6305	2358 240 755 1037 257 300 346 581 7351	110 832 415 269 299 739 341 336 342 7648	911 504 346 358 1000 351 346 359 8916	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057	1800 230 590 880 240 210 280 590 6560	1 19 2 7 10 2 2 2 2 6 6 76	70	840 9 4400 4 2250 3 300 3 710 9 280 3 300 3 370 4 920 92	940 11 490 4 320 4 360 6 930 6 330 2 3410 6 140 7 940 7	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 5th Street EB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard	2508 198 587 1041 190 208 336 553 6305	2744 240 755 1247 257 210 331 581 7351 8431 1050	832 415 269 299 739 287 336 342 7648 5026	911 504 346 358 1000 290 331 359 8916 5755	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868	145 480 610 130 290 305 550 5235 6395	50 395 305 220 175 505 400 305 340 6350 4365	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150	165 2155 229 587 866 219 290 336 553 6305 7364	2358 240 755 1037 257 300 346 581 7351 8431	110 832 415 269 299 739 341 336 342 7648 5026	911 504 346 358 1000 351 346 359 8916 5755 1103	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868	1800 230 590 880 240 210 280 590 6560	1 19 2 7 10 2 2 2 2 2 6 76 86	70	840 9400 4400 4400 4400 4400 4400 4400 4	940 11 490 4 320 4 360 4 930 5 300 5 330 5 410 0 140 79 440 7	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 77900 89450
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  SB I-75 North of Ezzard  NB I-75 Exit to Fezard  NB I-75 Exit to Fezard  NB I-75 Exit to Fezard  NB I-75 Forthance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue	2508 198 587 1041 190 208 336 553 6305 7364 952 834	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516	832 415 269 299 739 287 336 342 7648 5026 1000 821 646	911 504 346 358 1000 290 331 359 8916 5755 1103 840 688	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826	145 480 610 130 290 305 550 5235 6395 495 665 600	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600	2358 240 755 1037 257 300 346 581 7351 8431 1050 853 610	110 832 415 269 299 739 341 336 342 7648 5026 1000 821 800	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500	1800 230 590 880 240 210 280 590 6560 7560 780 720 640	1 19 2 7 10 2 2 2 6 6 86 86 88	70	840	940 1: 490 4 320 4 360 4 330 3 330 3 3410 6 1440 75 940 77 4410 14	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  SB I-75 Forth of Ezzard  NB I-75 Entrance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Entrance North of WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207	832 415 269 299 739 287 336 342 7648 5026 1000 821 646	911 504 346 358 1000 290 331 359 8916 5755 1103 840 688	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787	145 480 610 130 290 305 550 5235 6395 495 665 600 860	50 395 305 220 175 505 400 305 344 6350 4365 520 655 800 800	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196	2358 240 755 1037 257 300 346 581 7351 8431 1050 853	110 832 415 269 299 739 341 336 342 7648 5026 1000 821	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810	1496 11973 4582 4561 4809 4389 2900 2352 6600 77621 16868 10546 7450 17325	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500	1800 230 590 880 240 210 280 590 6560 7560 780 720 640	1 19 2 7 10 2 2 2 2 6 6 76 86 86 8 7	70	840	940 1: 490 4 320 4 320 4 330 4 330 5 330 5 4410 7 940 7 7410 1 755 9 870 1 100 1	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 10200 7150 7350 6300 16600
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  BB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  SB I-75 North of Ezzard  NB I-75 Exit to Freeman Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 41196	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207	832 415 269 299 739 287 336 342 7648 5026 1000 821 646 1113	911 504 346 358 1000 290 331 359 8916 5755 1103 688 688 1123	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 17325 7148	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481	145 480 610 130 290 305 550 5235 6395 495 665 600 860 230	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357	2358 240 755 1037 257 300 346 581 7351 8431 1050 853 610 1207 367	110 832 415 269 739 341 336 342 7648 5026 1000 821 800 1113 812	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 16868 10546 7450 17325 7148	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140	1 19 2 7 10 2 2 2 2 6 6 76 8 8 8 7 7 6	70	8840	940 1: 490 4 320 4 320 4 360 4 930 6 330 6 330 7 410 7 410 7 410 1 45750 6 3870 6	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6300 16600 6800 6900
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  BB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 Entrance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to WHV  NB I-75 Exit to WHV  NB I-75 Exit to WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129	832 415 269 299 739 336 342 7648 5026 1000 821 646 1113 812 7800	911 504 346 358 1000 290 331 359 8916 5755 1103 840 6888 1123 821	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225	145 480 610 130 290 305 550 5235 6395 495 665 600 860 230	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048	2358 240 755 1037 257 300 346 581 7351 1050 853 610 1207 8129	110 832 415 269 299 739 341 336 342 5026 1000 821 800 1113 812 7800	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 17325 7148 85608	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350	1 19 2 7 10 2 2 2 2 6 6 76 86 88 7 7 6	70	840	940 1: 490 4 320 4 320 6 930 6 9330 7 410 1 140 7 940 7 950 9 960 1 160 1	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 93300 7900 89450 4850 16250 9950 10200 7150 7350 6600 6600 6600 6900 5550 98850
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Forth of Ezzard  NB I-75 North of Ezzard  NB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 North of WHV  SB I-75 North of WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730	832 415 269 299 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473	911 504 346 358 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111	13100 5557 5859 5761 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467	145 480 610 130 290 305 550 5235 6395 495 665 600 860 230 5810 6505	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048	2358 240 755 1037 257 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730	110 832 415 269 299 341 336 342 7648 5026 1000 821 800 1113 812 7800 6473	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736	1800 230 590 880 240 210 280 590 6560 7560 720 640 1140 350 7120	1 19 2 7 10 2 2 2 2 6 6 76 86 86 8 7 6 6 11 11 11 3 8 8 8 8 8 8 8 8 8 8 8 8 8 8	70 440 480 770 660 330 990 775 660 550 11770 660 660 1660 660 7710 660 660 660 7710 660 660 660 7710 660 660 660 7710 660 660 660 7710 660 660 660 660 660 660 660 660 660 6	840	940 1: 490 4 320 4 320 4 330 4 330 4 330 5 330 7 4410 7 940 7 4410 1 4750 9 4870 1 100 1 8840 6 8940 8 8290 8	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7990 89450 4850 16250 9950 10200 7150 7350 6800 6900 5550 98850 5050 96500
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 North of Ezzard  NB I-75 Entrance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  SB I-75 North of WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 3011 7048 7691	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027	832 415 269 299 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473	911 504 346 358 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 6481	145 480 610 130 290 305 550 5235 6395 665 600 860 230 5810 6505 735	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691	2358 240 755 1037 257 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027	110 832 415 269 299 739 341 336 342 7648 5026 1000 821 800 1113 812 7800 6473 354	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8926 7347	1496 11973 4582 4561 4809 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 998736	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740	1 19 2 7 10 2 2 2 2 6 86 86 86 11 11 3 81 88	70	840	940 1: 490 4 320 4 330 4 330 4 330 4 330 7 3410 6 4410 7 4410 7 4410 1 4410	1500 12650 4550 5600 4400 5650 4650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6300 16600 6800 6900 5550 98850 5650 96500
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street EB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard NB I-75 Exit to Freeman Avenue NB I-75 Exit to Freeman Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 North of WHV SB I-75 Extrance from Hopple Street SB I-75 Entrance from Hopple Street	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391	832 415 269 739 287 336 342 7648 5026 1000 821 646 61113 812 7800 6473 354 285	911 504 346 348 1000 290 331 359 8916 5755 1103 840 688 1123 821 821 896 7347 391 299	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5889	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467	145 480 610 130 290 305 550 5235 6395 495 665 660 230 5810 6505 5735 235	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 5100	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929	2358 240 755 1037 257 300 346 581 8431 1050 853 610 1207 367 8129 8730 1027 391	110 832 415 269 739 341 336 5026 1000 821 1113 812 7800 6473 354 285	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 18868 10546 7450 17325 7148 85608 84111 5859	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 99367 6481 5064	1800 230 590 880 240 210 280 590 6560 7560 780 720 6440 1140 350 7120 7740 930	1 19 2 7 10 2 2 2 6 6 76 86 86 7 6 11 3 81 88 81 3	770	840	940 1: 490 4 320 4 320 4 320 4 330 4 330 5 330 5 330 7 4410 7 4410 7 750 7 4410 1 4750 1 8840 6 8840 6 8840 88 3390 88	1500 12650 4550 5600 4400 5650 44650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 6800 6900 5550 98850 5050 96500 5800 6450 4850 5650
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 2nd Street  RB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  SB I-75 North of Ezzard  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Sorth of WHV  SB I-75 Exit to Free Hopple Street  SB I-75 Entrance from Hopple Street  SB I-75 Entrance from Martin Luther King Drive  SB I-75 Exit to Hopple Street	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 487 7691 929 372	2744 240 755 1247 257 210 331 581 1050 853 8431 1050 853 853 1207 305 8129 8730 1027 391 943	832 415 269 299 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938	911 504 346 358 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948	11973 4582 4561 4809 4389 1894 2352 6032 77621 16868 10546 5468 17325 7148 85608 84111 85508 8415 11369	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064	145 480 610 130 290 305 550 5395 6395 665 600 230 5810 6505 735 880	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372	2358 240 755 1037 257 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943	110 832 415 269 299 739 341 336 342 5026 1000 821 800 6473 354 285 938	911 504 346 348 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930	1 19 2 7 10 2 2 2 2 6 6 76 86 8 7 7 6 11 11 3 8 8 11 10 3 10 10 10 10 10 10 10 10 10 10 10 10 10	770	840	940 1: 490 4 320 4 330 4 330 5 330 5 410 6 140 7 410 1 140 7 5 5 9 100 1 1840 8 9 40 8 9 9 8 9 9 100 1	1500 12650 4550 5600 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 7900 89450 4850 16250 9950 10200 7500 16600 6800 6900 5550 98850 5050 96500 4850 11850
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 Entrance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  NB I-75 Exit to WHV  SB I-75 North of WHV  SB I-75 Exit to Hopple Street  NB C-D South of Martin Luther King Drive	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801	832 415 269 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938	911 504 346 358 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948 978	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496	145 480 610 130 290 305 550 5395 6495 665 600 860 230 5810 6505 735 880 520	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 337 933 740	2358 240 755 1037 257 300 346 581 7351 1050 853 610 1207 8129 8730 1027 391 943 801	110 832 415 269 739 341 336 342 5026 1000 821 800 1113 812 7800 6473 354 938 904	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978	1496 11973 4582 4561 4809 4389 2900 2352 6600 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064 11850 10015	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370	1 19 2 7 10 2 2 2 2 2 6 6 86 86 8 7 7 6 11 3 3 81 88 10 9 9 9 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10	770	8840	940 1: 490 4 490 4 490 4 490 4 490 4 490 4 490 4 490 6 490 6 490 7 490 7 490 7 410 1	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6600 6600 6300 16600 6300 6900 5550 9850 5050 96500 5800 6450 4800 5050 1800 11850 9250 10050
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  BB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Forth of Ezzard  NB I-75 North of Ezzard  NB I-75 Forth of Ezzard  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  NB I-75 Exit to WHV  NB I-75 North of WHV  SB I-75 Exit to Unpple Street  NB C-D South of Martin Luther King Drive  NB C-D North of Martin Luther King Drive	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 487 7691 929 372	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802	832 415 269 299 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 904	911 504 346 346 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948 978	11973 4582 4561 4809 4389 1894 2352 6032 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496 10015 10714	145 480 610 130 290 305 550 5235 6395 665 660 860 230 5810 6505 735 235	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 180 180 180 180 180 180 1	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786	2358 240 755 1037 257 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943	110 832 415 269 299 739 341 336 342 5026 1000 821 800 6473 354 285 938	911 504 346 348 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948	1496 11973 4582 4561 4809 4389 2900 2352 6600 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930	1 19 2 2 2 2 2 2 6 6 86 86 8 7 6 6 11 11 3 88 10 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	770 44 40 48 80 770 66 330 990 79 660 55 50 11 660 46 660 71 660 60 67 10 66 60 90 90 90 90 90 90 90 90 90	8840	940 1: 490 4 490 4 490 4 490 4 490 4 490 4 490 4 490 4 490 6 490 6 490 6 490 6 490 7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1500 12650 4550 5600 4400 5650 4400 6550 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6300 6900 5550 98850 5050 96500 5800 6450 4800 5050 9250 10050 9950 11300
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 Entrance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  NB I-75 Exit to WHV  SB I-75 North of WHV  SB I-75 Exit to Hopple Street  NB C-D South of Martin Luther King Drive	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801	832 415 269 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938	911 504 346 348 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948 978 1071 10	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 54139 4815 11369 9252 10499 6483	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496	145 480 610 130 290 305 550 5395 6495 665 600 860 230 5810 6505 735 880 520	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 337 933 740	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802	110 832 415 269 299 739 341 336 5026 1000 821 800 1113 812 7800 6473 354 285 938 904	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071	1496 11973 4582 4561 4809 4389 2900 2352 6600 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064 11850 10015	1800 230 590 880 240 210 280 590 6560 7560 720 640 1140 350 7120 7740 930 370 930 730	1 19 2 7 100 2 2 2 2 2 6 6 86 88 8 8 111 3 3 81 81 88 100 3 9 9 7 7	770	840	940 1: 490 4 320 4 320 4 320 4 320 4 320 4 320 5 320 4 320 6 320 6 320 6 320 7	1500 12650 4550 5600 4400 5650 44650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 77900 89450 4850 16250 9950 10200 7150 7350 6300 16600 6800 6900 5550 98850 5050 96500 5800 6450 4800 5050 1800 11850 09950 11300 6800 7200
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street EB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard SB I-75 Sorth of Ezzard NB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 North of WHV SB I-75 Sit to WHV NB I-75 North of WHV SB I-75 Exit to WHO SB I-75 Exit to WHO SB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street NB C-D South of Martin Luther King Drive NB C-D North of Martin Luther King Drive	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 3011 7048 7691 929 372 933 740 786 790	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845	832 415 269 739 739 287 336 5026 1000 821 646 1113 812 7800 6473 354 285 938 904 1049 340	911 504 346 348 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948 978 978 978 978 978 978 978 97	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252 10499 6483 10825	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 6481 5064 11496 10015 10714 6937	145 480 610 130 290 305 550 5235 6395 665 600 860 230 5810 6505 735 235 880 520 745	50 395 305 220 175 505 400 305 344 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 843 1027 391 943 801 802 845	110 832 415 269 299 739 341 336 5026 1000 821 1113 812 7800 1113 354 285 938 904 1049	911 504 346 358 1000 351 346 359 8916 5755 1103 840 1123 822 8996 7347 391 299 948 978 1071 364	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 995467 6481 5064 11850 10015 11000 6937	1800 230 590 880 240 210 280 590 6560 7560 780 720 6440 1140 350 7120 7740 930 370 930 730	1 19 2 2 2 2 2 2 2 2 6 6 86 88 7 7 6 6 11 11 3 8 8 11 10 3 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	770	840	940 1: 490 4 320 4 330 4 330 4 330 5 330 5 330 6 4410 1 4410 1 4550 5 8840 6 840 6 840 6 850 6 850 6 860 6 860 6 860 6 860 6 860 6 860 6 860 6	1500 12650 4550 5600 4400 5650 44650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 77900 89450 4850 16250 9950 10200 7150 7350 6300 16600 6800 6900 5550 98850 5050 96500 5800 6450 4800 5050 1800 11850 09950 11300 6800 7200
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street BB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard SB I-75 North of Ezzard NB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 Exit to WHV SB I-75 Exit to Why NB I-75 Exit to Why NB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street NB C-D South of Martin Luther King Drive NB I-75 Exit now Hopple Street NB C-D North of Martin Luther King Drive SB I-75 Exit now Hoy NB I-75 Exit now Hoy	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845 585	832 415 269 739 287 336 342 7648 5026 1000 821 6473 812 7800 6473 354 285 938 904 1049 1049 1049 1049 1049 1049 1049	911 504 346 348 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948 978 1071 364 1071 364 1071	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252 10499 6483 10825 12685	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496 10015 10714 6937 11472	145 480 610 130 290 305 550 5235 6395 665 660 230 5810 6505 735 880 520 745 820 523 880 520 523 523 523 523 523 523 523 523	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150	165 2155 229 587 866 219 290 336 553 553 6305 7364 952 834 952 837 7048 7691 929 372 933 740 786 790 552	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 8845	110 832 415 269 299 739 341 336 5026 1000 821 113 812 7800 6473 354 285 938 904 1049 340	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 10825	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 66881 5064 11850 10015 11000 6937	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370 930 780	1 19 2 7 100 2 2 2 2 2 2 6 6 86 86 8 8 7 7 6 6 111 3 3 8 100 3 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	770	840	940 1: 490 4 320 4 330 4 330 5 330 5 3410 6 140 7 1410 1 140 7 150 9 160 1 1750 9 1750 9 1840 8 1840 6 1840	1500 12650 4550 5600 4400 5650 44650 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6300 16600 6800 6900 5550 98850 5050 96500 5800 6450 4800 11850 9250 10050 1800 11850 9250 10050
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street BB US-50 Exit to 5th Street 9th Street Exit to 5B 1-75 Western Avenue Exit to SB 1-75 SB Ramp from Ezzard to Gest Street SB 1-75 Exit to Freeman Avenue NB 1-75 Forth of Ezzard SB 1-75 North of Ezzard NB 1-75 North of Ezzard NB 1-75 Exit to Western Avenue NB 1-75 Exit to WHV SB 1-75 Exit to WHV SB 1-75 Exit to WHV SB 1-75 Sorth of WHV SB 1-75 Exit to WHV SB 1-75 Exit to Why SB 1-75 Exit to Why SB 1-75 Exit to Hopple Street SB 1-75 Exit to Hopple Street NB C-0 South of Martin Luther King Drive SB 1-75 Exit to MHV NB 1-75 Exit to MARTIN Luther King Drive NB C-0 North of Martin Luther King Drive SB 1-75 Exit to MHV SB 1-75 Exit to WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 41196 301 7048 7691 929 372 933 740 786 790	2744 240 755 1247 257 210 331 581 1050 853 61207 305 8129 8730 8730 802 802 805 805 805 805 805 805 805 805	832 415 269 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938 904 1049 1394	911 504 346 358 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948 978 1071 364 1477 1477 1277 3293	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252 10499 6483 10825 12685 30612	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 10015 10714 6937 11472 14181	145 480 610 130 305 550 5235 6395 495 665 600 860 230 5810 6505 735 880 520 745 720	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 620 6430 5475 280 180 885 635 995 310 720 960	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 552 858	2358 240 755 1037 257 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 845 959	110 832 415 269 739 341 336 342 5026 1000 821 800 6473 354 285 938 904 1049 340 1394	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064 11850 10015 11000 6937 11472	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370 930 730 810 580	1 19 2 7 7 100 2 2 2 2 2 2 6 6 76 6 86 8 8 8 7 7 6 111 3 3 8 110 100 100 100 100 100 100 100 100 1	770	8840	940 1: 490 4 940 1: 490 4 940 6 930 6 930 6 930 6 930 7 9410 10 9410 1	1500 12650 4550 5600 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 6600 6900 5550 9850 6600 6900 5550 96500 6800 6500 11850 9250 10050 0950 11850 9250 11050 0850 7200 0850 11050
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  BB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 North of Ezzard  NB I-75 Entrance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  NB I-75 North of WHV  SB I-75 North of WHV  SB I-75 Exit to Hopple Street  NB C-D South of Martin Luther King Drive  NB C-D North of Martin Luther King Drive  SB I-75 Exit to WHV  SB I-75 Exit to Hopple Street  NB C-D North of Martin Luther King Drive  SB I-75 Exit to Hopple Street  NB C-D North of Martin Luther King Drive  SB I-75 Exit to WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845 585 959 2516	832 415 269 739 287 336 342 7648 5026 1000 821 6473 354 427 7800 6473 354 298 904 1049 340 1398 3065	911 504 346 346 358 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948 978 1071 364 1477	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252 10499 6483 10825 30612 33857	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496 10015 10714 6937 11472 14181 32884	145 480 610 130 290 305 550 5395 665 660 860 230 5810 6505 735 235 880 520 745 720 285 750	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 620 6430 5475 280 180 885 635 995 310 720 960 2375	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150 12200 31750	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 552 858	2358 240 755 1037 257 300 346 581 7351 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 845 585 959 2516	110 832 415 269 299 739 341 336 342 5026 1000 821 800 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293	1496 11973 4582 4561 4809 4389 2900 2352 6600 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685 31750	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064 11850 10015 11000 6937 11472 14181 32884	1800 230 590 880 240 210 280 590 6560 7560 720 640 1140 350 7120 7740 930 370 930 780 880 860 2330	1 19 2 7 100 2 2 2 2 2 2 6 6 86 8 8 7 7 6 111 3 3 8 100 7 7 7 8 8 8 8 8 8 8 8 8 100 100 100 100 100 1	770	840	940 1: 490 4 490 4 490 4 490 4 490 4 490 4 490 4 490 4 490 6 490 6 490 6 490 6 490 7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6600 6900 5550 9850 5050 96500 5800 6450 4800 5050 1800 11850 9250 10050 0950 11300 6800 7200 0950 114200 2200 33550
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Forth of Ezzard  NB I-75 North of Ezzard  NB I-75 Forth of Ezzard  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  NB I-75 Exit to WHV  SB I-75 Exit to Hopple Street  SB I-75 Exit to Hopple Street  NB C-D South of Martin Luther King Drive  NB C-D North of Martin Luther King Drive  SB I-75 Entrance from WHV  NB I-75 Entrance from WHV  NB I-75 Entrance from WHV  NB I-75 Exit to WHV  SB I-75 Exit to Hopple Street  NB C-D North of Martin Luther King Drive  SB I-75 Exit to WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858	2744 240 755 1247 257 210 331 581 1050 853 516 1207 305 8129 8730 8730 802 893 894 894 895 895 995 2516 2444 3301 2512	832 415 269 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 349 404 1098 3065 3487 2359 3513	911 504 346 348 1000 290 331 359 8916 5755 1103 840 123 821 821 8396 7347 391 299 948 1071 364 1477 1227 3293 3849 259 3691 3894 3894 3894 3894 3894 3894 3894 3894 3894 3894 3894 3994	11973 4582 4561 4809 4389 1894 2352 6032 77621 16868 10546 5468 17325 7148 85608 84111 11369 9252 10499 6483 10825 10825 10825 30612 33857 33907 28765	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496 10015 10714 6937 11472 14181 32884 37370	145 480 610 130 290 305 550 5235 6395 665 660 860 230 5810 6505 735 235 880 520 745 720 285 745 745 745 745 745 745 745 74	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 3350 11800 7150 10950 6500 6150 12200 31750 27760 27400	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 5552 858 2342 2215 2999	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 802 845 585 959 959 2516 2444	110 832 415 269 299 739 341 336 5026 1000 821 800 1113 812 7800 1113 812 7800 1413 354 285 938 934 1049 340 1394 1049 340 1394 1049 340 1394 1049 340 1394 1049 1059 10	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293 3849	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685 31750 33857	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 99467 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000	1800 230 590 880 240 210 280 590 6560 7560 720 640 1140 350 7120 7740 930 370 930 730 780 810 580 860 2330	1 19 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 2 2 5 2 2 4	770	840	940 1: 490 4 320 4 330 4 330 5 330 5 330 5 410 6 410 7 410 1 410 6 410 7 410 1 410 6 410 7 410 1 410 7 410 1 410 6 410 7 410 1 410 6 410 7 410 1 410 7 410 1 410 6 410 7 410 1 410 7 410 1 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6600 6900 5550 98850 5050 96500 5800 6450 9850 11850 9950 11300 6800 7200 0550 11300 6800 7200 0550 114200 22700 14200 22700 14200 2200 33550
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  BE US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 Exit to Freeman to Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Exit to HOPU  SB I-75 Exit to WHV  SB I-75 Exit to HOPU  SB I-75 Exit to WHV  SB I-71  EB US-50  9th NB Entrance to BSB Local	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858 2342 2215	2744 240 755 1247 257 210 331 581 8431 1050 853 516 1207 305 8129 8730 8730 1027 391 943 801 802 845 585 585 959 2516 2444 3301 2512 1580	832 415 269 739 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 3487 2353 3513 1046	911 504 346 348 1000 290 331 359 8916 5755 1103 840 688 8996 7347 391 299 948 978 1071 1227 3293 3849 1477 1	11973 4582 4561 4809 4389 1894 2352 6032 77621 16868 10546 5468 17325 7148 85608 84111 11369 9252 10499 6483 10825 10825 10825 30612 33857 33907 28765	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496 10015 10714 6937 11472 14181 32884 37370 37329 29487 9389	145 480 610 130 290 305 550 5235 6395 495 665 600 860 230 5810 6505 735 880 520 520 520 520 520 520 520 52	50 395 395 305 220 175 505 400 305 340 6350 4365 520 655 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150 12200 31750 27400 31950 7550	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 7691 929 372 933 740 786 790 5552 858 2342 2215	2358 240 755 1037 300 346 581 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301	110 832 415 269 299 739 341 336 342 7648 5026 1000 821 800 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 1099	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293 3849 2597 3601 1129	1496 11973 4582 4561 4809 4389 2900 2352 66000 77621 16868 10546 7450 17325 7148 85608 84111 5859 11800 9252 10950 6500 10825 12685 31750 33857 33907 33907	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 332000 9389	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370 930 780 810 580 860 2330 2210	1 19 2 7 7 100 2 2 2 2 2 2 6 6 86 8 8 7 7 6 6 8 111 13 3 8 8 8 8 8 8 8 8 8 8 8 8 8 8	770	840	940 1: 490 4 320 4 330 4 330 5 330 5 330 5 410 6 410 7 410 1 410 6 410 7 410 1 410 6 410 7 410 1 410 7 410 1 410 6 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 1 410 7 410 1 410 7 410 1 410 1 410 7 410 1 410 1 410 7 410 1	1500 12650 4550 5600 4400 5650 44650 5650 4800 6400 2300 2350 1900 2050 6800 6850 9800 93300 7900 89450 4850 16250 9950 10200 6800 6900 5550 98850 6600 6450 4800 5050 1800 11850 9250 10950 11300 6600 7200 0550 11050 2700 14200 2700 14200 2200 33550 4350 38100 3050 36750
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  BB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 Entrance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  NB I-75 Exit to WHV  SB I-75 North of WHV  SB I-75 Exit to Hopple Street  NB C-D South of Martin Luther King Drive  NB C-D North of Martin Luther King Drive  SB I-75 Exit to WHV  SB I-75 Exit to Hopple Street  NB C-D North of Martin Luther King Drive  SB I-75 Exit to WHV  SB I-75 Exit to Hopple Street  NB C-D North of Martin Luther King Drive  SB I-75 Exit to WHV  SB I-75 Exit to	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 1580 1234	832 415 269 299 297 336 342 7648 5026 1000 821 6473 354 427 7800 6473 354 1049 340 1049 340 1049 340 1094 340 1094 1094 1094 1094 1094 1094 1094 10	911 504 346 358 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 299 948 978 1071 364 1477 1477 1277 3293 3849 2597 3601 1129 3008	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252 10499 6483 10825 30612 33857 33907 8705	13100 5557 5859 5761 1911 2315 6336 93057 58868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496 10015 10714 6937 11472 14181 32884 37370 37329 29487 9389 9389	145 480 610 130 290 305 550 5395 665 660 860 230 5810 6505 735 235 245 745 750 1815 1775 2415 1995	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150 12200 31750 27750 27400 31950 7550	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 5552 858 858 2342 2215 2299 2450 1465	2358 240 755 1037 300 346 581 7351 1050 853 610 1207 8129 8730 1027 391 802 845 585 959 2516 2444 3301 2512 1580	110 832 415 269 299 739 341 336 5026 1000 821 800 1113 812 7800 6473 354 285 938 1049 340 1394 1098 3487 2359 3513 1046 2854	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293 3849 2597 3601 1129 3008	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685 33857 33857 33907 31950 8705	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 993546 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000 9389 20746	1800 230 590 880 240 210 280 590 6560 7560 720 640 1140 350 7120 7740 930 370 930 780 810 580 860 2330 2210 3040 2480	1 19 2 2 2 2 2 2 2 2 6 6 86 8 8 7 7 6 1 11 3 3 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9	770	8840	940 1: 490 4 320 4 380 6 330 6 330 6 330 7 330 7 410 1 40 7 50 9 870 1 100 1 1	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6600 6800 6900 5550 98850 5050 96500 5800 6450 4800 5050 1800 11850 9250 10050 0950 11300 6800 7200 0550 11050 2700 14200 2200 33550 4350 38100 3050 36750 110750 9500 10750 99500 10750
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street EB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard SB I-75 Sexit to Freeman Avenue NB I-75 Exit to Freeman Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 Exit to WHO SB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street NB C-D South of Martin Luther King Drive NB I-75 Exit to WHV NB I-75 Exit to WHV SB I-75 Exit to WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858 82342 2215 2999 2450 1465	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 1580 1280 1291 1292 1293 1294 1294 1295	832 415 269 739 739 287 336 5026 1000 821 646 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3405 3487 2359 3513 1046 2456 2456 2456 2456 2456 2456 2456 24	911 504 346 348 1000 290 331 359 8916 5755 1103 840 840 892 8936 1123 821 8936 7347 391 1071 364 1477 1227 3293 3849 2597 3601 1129 3088 2408	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 11369 9252 10499 6483 10825 12685 13857 33907 28765 8705	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 10015 10015 10071 4937 11472 14181 32884 37370 37329 29487 9389 20746 25165	145 480 610 130 290 305 550 5235 6495 665 660 860 230 5810 6505 735 235 880 520 745 720 285 750 750 750 750 750 750 750 75	50 395 305 220 175 505 400 305 3440 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150 12200 31750 27750 27400 31950 7550 18400 21900	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 929 372 933 740 786 790 552 858 82342 2215 2999 2450 1465 1171 3737	2358 240 755 1037 300 346 581 8431 1050 853 610 1207 367 8129 8431 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 1580	110 832 415 269 739 341 336 5026 1000 821 800 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 365 3487 2359 3513 1046 2854 2285	911 504 346 358 1000 351 346 359 8916 5755 1103 840 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293 349 2597 3601 1129 3008 2408	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685 31750 33857 33907 31950 8705 19687	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 99467 6481 5064 11850 1000 6937 11472 14181 32884 37370 37329 32000 9389 20746 25165	1800 230 590 880 240 210 280 590 6560 7560 780 720 6440 1140 350 7120 7740 930 370 930 780 810 580 860 2330 2210 3040 2480 1470 1120	1 19 2 7 7 100 2 2 2 2 2 6 6 86 88 8 7 7 6 6 111 3 3 8 110 3 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	770	840	940 1: 490 4 320 4 320 4 320 4 320 4 320 4 320 4 320 5 320 4 320 5 320 6 320 7	1500 12650 4550 5600 4400 5650 44650 5650 4800 6400 2300 2350 1900 2050 6800 6850 9800 93300 7900 89450 4850 16250 9950 10200 6800 6900 5550 98850 6600 6450 4800 5050 1800 11850 9250 1000 6800 7200 0550 11300 6800 7200 0550 11300 6800 7200 0550 11350 6800 7200 0550 11500 14200 0550 11500 2700 14200 0550 38100 3050 36750 1100 31450 0250 10750
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street BB US-50 Exit to 5th Street EB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard NB I-75 North of Ezzard NB I-75 Exit to Western Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 Exit to Why NB I-75 North of WHV SB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street NB C-D South of Martin Luther King Drive NB C-D North of Martin Luther King Drive SB I-75 Entrance from WHV NB I-75 Exit to WHV SB I-75 Entrance from Buttermilk Pike WB US-50 SB I-71 NB I-71 EB US-50 9th NB Entrance to BSB Local US 50 WB US 50 EB US-50 to KY	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 552 858 2342 2215 2999 2450 1465 1171 3737 687	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 853 1050 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 1580 1234	832 415 269 739 287 336 342 7648 5026 1000 821 6473 3812 7800 6473 354 285 938 904 1049 1394 1394 1394 1394 1394 1096 3487 2359 3513 1046 2854 800	911 504 346 348 1000 290 331 359 8916 5755 1103 840 688 1123 821 821 829 948 978 978 948 978 301 1227 3293 3601 1129 3008 2408 841	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252 10499 6483 10825 12685 30612 33857 33907 28765 8705	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 10015 10715 10714 11472 14181 32884 37370 37329 29487 9389 20746 25165 7393	145 480 610 1300 305 550 550 5395 6495 665 600 860 230 5810 6505 735 880 520 745 750 1815 1775 2415 1995 1155 995 3115 640	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150 12200 31750 27750 27400 31950 7550 18400 21900 7200	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 845 585 959 2516 2344 3301 2512 1580 1234 723	110 832 415 269 299 739 341 336 342 7648 5026 1000 821 800 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 3487 2359 3513 1046 2854 285 800	911 504 346 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293 3849 2597 3601 1129 3008 841	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 1800 9252 10950 10825 12685 31750 33857 33907 31950 8705	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 99367 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000 93389 20746 25165 7393	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370 930 780 810 580 860 2230 2210 3040 2480 1470 1120 3650 720	1 19 2 2 2 2 2 2 2 2 6 6 76 86 88 8 7 7 6 6 11 11 3 3 8 1 10 0 3 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	770	840	940 1: 490 4 320 4 330 4 330 4 330 5 330 5 3410 1 4	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6800 6850 9800 93300 7900 89450 4850 16250 9950 10200 5800 6600 5800 6900 5550 98850 5050 96500 5800 6450 4800 11850 9250 10050 9250 11050 2700 14200 2200 33550 2700 14200 2200 33550 38100 3050 36750 1100 31450 0250 10750 02550 10750 02550 10750 02550 10750 02550 10750 02550 10750 02550 10750
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 2nd Street  RB Exit to 5th Street  EB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  SB I-75 North of Ezzard  NB I-75 Intrance from Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Sorth of WHV  SB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Exit to Hopple Street  SB I-75 Exit to Hopple Street  NB C-0 South of Martin Luther King Drive  SB I-75 Exit to WHV  NB I-75 Exit to WHV  NB I-75 Exit to WHV  NB I-75 Exit to WHV  SB I-75 Entrance from WHV  NB I-75 Exit to WHV  SB I-75 Entrance from WHV  NB I-75 Exit to WHV  SB I-75 Entrance from Buttermilk Pike  WB US-50  SB I-71  NB I-71  EB US-50  9th NB Entrance to BSB Local  US 50 WB  US 50 EB  US-50 to KY  KY to US-50	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 487 691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687	2744 240 755 1247 257 210 331 581 1050 853 516 1207 305 8129 8730 801 801 802 845 585 959 2516 2444 3301 2512 1580 1234 3937 723 583	832 415 269 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 349 404 1098 3065 3487 2359 3513 1046 2854 2285 800 715	911 504 346 346 358 1000 290 331 359 8916 5755 1103 840 821 821 8996 7347 391 299 948 1071 364 1477 1227 3293 3849 1129 3849 1129 3849 1129 3849 1129 3849 112	11973 4582 4561 4809 4389 1894 2352 6032 77621 16868 10546 5468 17325 7148 85608 84111 1369 9252 10499 6483 10825 10265 30612 33857 33907 28705 19687 23884 7030 6871	13100 5557 5859 5761 1911 2315 6336 1901 2315 6336 18612 10787 5826 17481 7225 98736 95467 6481 10015 10714 6937 11472 14181 32884 37370 37329 29487 9389 20746 25165 7393 6876	145 480 610 1300 305 550 550 5395 6495 665 600 8300 5810 6505 735 880 520 745 750 1815 1775 2415 1995 1155 995 3115 640	50 395 395 305 220 175 505 400 305 340 6350 4365 520 655 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425 1905 745	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 3350 11800 7150 10950 6500 6150 12200 31750 27400 31950 7550 18400 21900 7200 8300	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 640	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 23301 2512 1580 1234 3937 723 650	110 832 415 269 739 341 336 342 7648 5026 1000 821 800 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 3487 2359 3513 1046 2854 2285 800 785	911 504 346 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293 3849 1477 1227 3293 3849 1477 1227 3293 3849 3601 1129 3008 2408 841 795	1496 11973 4582 4561 4809 4389 2900 2352 6600 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 10825 12685 31750 33857 33857 33907 31950 8705	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 99467 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000 9389 20746 25165 7393 8350	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370 930 730 780 810 580 860 2330 2210 3040 2480 1470 1120 3650 720 660	1 19 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3	770	8400	940 1: 490 4 320 4 330 4 330 5 330 5 3410 6 4410 1	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 69800 93300 7900 89450 4850 16250 9950 10200 6800 6900 5550 9850 5050 96500 5800 6450 4800 5050 11850 9250 10050 0950 11050 02700 14200 2200 33550 6305 36750 1100 31450 0250 10750 9500 20550 1100 31450 0250 10750 9500 20550 1100 31450 0250 10750 9500 20550 1800 8800 8800 8800
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  BB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 Exit to Freeman to Ezzard Charles  NB ramp from Freeman to Ezzard Charles  SB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Sorth of WHV  SB I-75 Sorth of WHV  SB I-75 Exit to Hopple Street  NB C-D South of Martin Luther King Drive  SB I-75 Exit to Hopple Street  NB C-D South of Martin Luther King Drive  NB C-D South of Martin Luther King Drive  NB I-75 Exit to WHV  SB I-75 Exit to WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 583	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 801 801 802 845 585 959 2516 2444 3301 2512 1580 1234 3937 723 583	832 415 269 739 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 3487 2353 3513 1046 2854 2854 2855 867	911 504 346 346 346 3588 1000 290 331 359 8916 5755 1103 840 688 8996 7347 391 123 3293 3849 978 1071 1227 3293 3849 1129 3008 2408 841 715	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252 10499 6483 10825 12685 30612 33857 33957 28765 8705	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496 10015 10714 6937 11472 14181 32884 37370 37329 29487 9389 20746 25165 7393 6876 5529	145 480 610 130 290 305 550 5235 6395 665 600 860 230 5810 6505 735 285 720 745 720 1815 1775 2415 1995 1155 995 3115 640 640	50 395 395 305 220 175 505 400 305 340 6350 4365 520 655 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425 1905 745 785	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150 12200 31750 27400 31950 7550 18400 21900 7200 8300 5850	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 6640 290	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 1580 1234 3937 723 301	110 832 415 269 2739 341 336 342 5026 1000 821 800 821 811 812 7800 6473 354 285 938 904 1049 340 1098 3065 3487 2359 3513 1046 2854 2285 800 785	911 504 346 358 1000 351 346 359 8916 5755 1103 840 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293 3849 2597 3601 1129 3008 8401 1299 3008 841 795 936	1496 11973 4582 4561 4809 4389 2900 2352 6600 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685 31750 33857 33907 33907 23884 7200 8300 5850	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000 9389 20746 25165 7393 8350 5900	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 730 730 930 2330 2210 3040 2480 1470 1120 3650 720 660 310	1 19 2 2 2 2 2 2 2 2 2 3 86 86 88 7 7 66 81 81 88 88 9 9 9 25 24 3 3 3 3 3 9 7 7 7 7 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8	770	840	940 1: 490 4 320 4 330 4 330 330 330 330 330 330 330 330 330 330	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 7900 89450 4850 16250 9950 10200 7150 7350 6300 16600 6800 6900 5550 98850 5050 96500 4800 11850 9250 10050 0950 11300 6800 7200 0550 11300 6800 7200 0550 11050 2700 14200 22200 33550 4850 38100 3050 36750 1100 31450 0250 10750 9500 20550 3850 24800 9500 20550 3850 24800 8400 8000 88400 8050
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street  NB Exit to 2nd Street  NB Exit to 5th Street  BB US-50 Exit to 5th Street  9th Street Exit to SB I-75  Western Avenue Exit to SB I-75  SB Ramp from Ezzard to Gest Street  SB I-75 Exit to Freeman Avenue  NB I-75 Exit to Freeman Avenue  NB I-75 North of Ezzard  NB I-75 Entrance from Ezzard Charles  NB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to Western Avenue  NB I-75 Exit to WHV  NB I-75 Exit to WHV  SB I-75 North of WHV  SB I-75 Exit to WHV  SB I-75 Exit to WHV  NB I-75 Exit to WHV  SB I-75 Exit to Hopple Street  NB C-D South of Martin Luther King Drive  NB C-D North of Martin Luther King Drive  NB C-D North of Martin Luther King Drive  SB I-75 Exit to WHV  SB I-75 Exit to WHV  SB I-75 Exit to Hopple Street  NB C-D North of Martin Luther King Drive  SB I-75 Exit to WHV  SB I-75 Exit	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 583 279	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 393 393 723 393 393 393 434 393 434 434	832 415 269 739 739 287 336 340 5026 1000 821 646 646 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 340 1394 1098 340 1394 1098 340 1394 1098 340 340 340 340 340 340 340 340 340 340	911 504 346 348 1000 290 331 359 8916 5755 1103 840 840 123 821 821 821 821 821 821 821 821 821 821	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 51359 4815 11369 9252 10499 6483 10825 12685 30612 33857 33907 28765 19687 23884 7030 6871 5123 8197	13100 5557 5859 5761 1911 2315 6336 93057 58868 18612 10787 5826 17481 7225 98736 95467 6481 5064 11496 10015 10714 6937 11472 14181 32884 37370 37329 29487 9389 20746 25165 7393 6876 6876 6876 6876 6876 6875	145 480 610 130 290 305 550 550 665 660 860 860 230 5810 6505 735 235 745 720 285 750 1815 1775 2415 1995 1155 995 3115 640 640 290	50 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425 1905 745 785	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 7450 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150 12200 331750 27750 27400 31950 7550 18400 21900 7200 8300 5850 5900	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 640 290 410	2358 240 755 1037 300 346 581 7351 1050 853 610 1207 8129 8730 1027 391 802 845 585 959 2516 2444 3301 2512 1580 1234 3937 723 650 301 434	110 832 415 269 739 341 336 5026 1000 821 821 821 800 1113 812 7800 1413 354 285 938 938 934 1049 340 1394 1098 340 1394 1098 340 1394 1098 340 1394 1098 340 1394 1098 340 1394 1098 340 1394 1098 340 1394 1099 340 1399 3513 1046 2854 285 800 785	911 504 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 3293 3849 2597 3601 1129 3008 2408 841 841 842 843 844 845 845 846 847 847 848 848 848 849 849 849 849 849	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685 33857 33907 31950 8705 19687 23884 7200 8300 8300 8197	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 995467 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000 9389 20746 25165 7393 8850	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 780 810 580 860 2330 2210 3040 2480 1470 1120 3650 720 6660 310 470	1 19 2 2 7 7 100 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	770	840	940 1: 490 4 320 6 320 6 320 6 320 6 320 6 320 7	1500 12650 4550 5600 4400 5650 4400 5650 4400 6505 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 7150 7350 6600 6800 6900 5550 98850 5050 96500 5800 6450 4800 5050 1800 11850 9250 10050 0950 11300 6800 7200 0950 11300 6800 7200 14200 2200 33550 4350 38100 3050 36750 1100 1100 31450 0250 10750 9500 20550 3850 24800 7800 8000 8550 8000 8550 36550
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street EB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard SB I-75 North of Ezzard Charles SB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 North of WHV SB I-75 Exit to Whople Street SB I-75 Exit to Hopple Street NB C-D South of Martin Luther King Drive NB C-D North of Martin Luther King Drive SB I-75 Exit to WHV NB I-75 Exit to WHV SB I-75 Exit to WHV	2508 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 583 279 359 359	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 1580 1234 3937 723 583 301 434 377	832 415 269 739 739 287 336 342 7648 5026 1000 821 646 646 1113 812 7800 6473 4285 938 904 1049 340 1394 1098 3065 3487 2359 3513 1046 2285 800 715 800 800 800 800 800 800 800 800 800 80	911 504 346 348 1000 290 331 359 8916 5755 1103 840 840 123 821 8996 1123 8996 1123 391 1971 364 1477 1227 3293 3601 1129 3608 2408 841 715 936	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5413 99252 10499 6483 10825 12685 33612 33857 33907 28765 8705 8705 8705 8705 8705 8705 8705 870	13100 5557 5859 5761 5938 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 1496 10015 10714 4181 32884 37370 37329 29487 9389 20746 25165 7393 6876 5529 9904 3498	145 480 610 130 290 305 550 5235 6395 665 660 860 860 230 5810 6505 735 235 235 880 520 745 720 285 750 1815 1775 2415 1955 1955 1155 640 640 640 290 235	50 395 305 220 175 505 400 305 400 305 3440 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425 1905 745 785 990	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 5100 3350 11800 7150 10950 6500 6150 12200 31750 27750 27400 31950 7550 18400 21900 7200 8300 5850 5900 2500	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 640 290 410 357	2358 240 755 1037 300 346 581 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 845 585 959 2516 23444 3301 2512 1580 2343 337 723 650 301 377	110 832 415 269 299 739 341 336 342 7648 5026 1000 821 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 3487 2359 3513 1046 2285 800 785 900 993 262	911 504 346 346 358 1000 351 346 359 8916 5755 1103 840 810 1123 822 8996 7347 391 299 948 978 1071 364 1477 1227 3293 3601 1129 2597 3601 1129 2698 2798 277	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685 31750 33857 33907 31950 8705 19687 23884 7200 8300 5850 8197 3311	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 99467 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000 9389 20746 25165 7393 8350 5900 9904 3498	1800 230 590 880 240 210 280 590 65660 7560 780 720 6440 1140 350 7120 7740 930 370 930 780 810 580 860 2330 2210 3040 2480 1470 1120 3650 720 6660 310 470	1 19 2 7 7 100 2 2 2 2 6 6 86 86 8 8 8 111 3 3 9 9 7 7 7 8 6 9 9 9 9 9 9 9 9 9 1 1 1 1 1 1 1 1 1 1	770	840	940 1: 490 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 4 320 6 320 6 320 6 320 6 320 6 320 6 320 7	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6800 6850 9800 93300 7900 89450 4850 16250 9950 10200 6800 6900 5550 98850 5050 96500 5800 6450 4800 5050 11850 9250 11300 6800 7200 0555 11050 2700 14200 0550 11050 2700 14200 0550 11500 31450 0250 36750 1100 31450 0250 36750 1100 31450 0250 3650 3850 24800 7800 8000 8400 8550 3850 24800 7800 8000 8400 8550 6250 6300
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street BB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard SB I-75 North of Ezzard NB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street NB C-D South of Martin Luther King Drive SB I-75 Exit to WHV NB I-75 Exit to WHV NB I-75 Exit to WHV NB I-75 Exit to WHV SB I-75 Exit to WHV NB I-75 Exit to WHV NB I-75 Exit to WHV NB I-75 Exit to WHV SB I-75 Entrance from WHV NB I-75 Exit to WHV SB I-75 Entrance from Buttermilk Pike WB US-50 SB I-71 NB I-71 EB US-50 9th NB Entrance to BSB Local US 50 WB US 50 EB US-50 to KY KY to US-50 3rd Entrance to I-75 3rd to I-71 NB Exit to Ezzard Charles NB Entrance from 9th	2508 198 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 583 279 359	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 1580 1234 13937 723 583 301 434 377	832 415 269 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 235 3513 1046 285 800 715 867 999 909 715 867 999 909 909 909 909 909 909 909 909 90	911 504 346 348 1000 290 331 359 8916 5755 1103 840 8916 1123 821 821 821 8299 948 978 1071 1277 3293 3601 1129 3008 841 715 936 1200 2777 896	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 5859 4815 11369 9252 10499 6483 10825 30612 33857 33907 29765 8705 19687 19	13100 5557 5859 5761 1911 2315 6336 1907 88868 18612 10787 5826 17481 7225 98736 95467 6481 10015 10714 6937 11472 14181 32884 37370 37329 29487 9389 20746 5529 9904 4895 5792	145 480 610 1300 305 550 5395 6495 665 600 8600 230 5810 6505 735 880 520 745 750 1815 1775 2415 1995 1155 995 3155 995 3155 640 640 290 235	50 395 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425 2425 1905 745 785 900 650 180	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 3350 11800 7150 10950 6500 6150 12200 31750 27400 31950 7550 18400 21900 7200 8300 5850 5900 4550	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 640 290 410 357 271	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 2516 2444 3301 2512 1580 1234 3397 723 650 301 434 377	110 832 415 269 299 739 341 336 342 7648 5026 1000 821 800 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 3387 2285 800 785 900 993 262 790	911   504   346   346   358   1000   351   346   359   8916   5755   1103   840   810   1123   822   8996   7347   391   299   948   978   1071   364   1477   1227   3293   3849   2597   3601   1129   3008   841   795   936   1200   277   896   896	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 10825 12685 31750 33857 33907 31950 8705 19687 23884 7200 8300 5850 8197 3311	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000 9388 20746 25165 7393 8350 5900 9904 3498 5792	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370 930 730 780 810 580 860 2330 2210 3040 2480 1470 1120 3650 720 660 310 470 330 280	1 19 2 2 2 2 2 2 2 2 2 6 6 7 6 8 8 8 8 7 7 6 6 11 11 3 3 8 1 10 0 3 9 9 9 9 9 9 9 9 9 9 9 9 7 7 7 7 8 8 9 9 9 9	770	840	940 1: 490 4 320 4 330 4 330 5 330 5 330 5 410 6 410 7 410 1 410 6 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 1 410 7 410 7 410 1 410 7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 6800 6900 5550 9850 5050 96500 5800 6450 4800 11850 9250 10050 6800 7200 0550 1100 0550 11050 2700 14200 2200 33550 1100 31450 0250 10750 9500 10750 9500 10750 9500 10750 9500 10750 9500 10750 9500 20550 1100 31450 0250 10750 9500 20550 1100 31450 0250 10750 9500 20550 1100 31450 0250 10750 9500 10750 9500 10750 9500 10750 9500 11550 3250 6300
Misc Ramps Alternative W.xlsm Misc R	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street BB LS-50 Exit to 5th Street EB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 Forth of Ezzard SB I-75 North of Ezzard NB I-75 Forth of Ezzard NB I-75 Exit to Western Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 Fortrance North of WHV SB I-75 Fortrance From Hopple Street SB I-75 Exit to WHV SB I-75 Exit to WHV SB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street NB C-0 South of Martin Luther King Drive SB I-75 Exit to WHV NB I-75 Exit to WHV SB I-7	2508 198 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 6790 552 858 2342 2215 2999 2450 1465 1171 3737 687 583 279 359 357 271	2744 240 755 1247 257 210 331 581 1050 853 8431 1050 853 8129 8730 8129 8730 801 801 802 845 585 959 2516 2444 3301 2512 1580 1234 3937 723 583 301 434 377 308	832 415 269 739 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938 904 1049 3065 347 2359 3513 1046 2854 225 359 3513 1046 2854 285 800 715 867 993 333	911 504 346 348 1000 290 331 359 8916 5755 1103 840 688 1123 821 8996 7347 391 391 393 393 393 1071 1227 3293 3849 2499 3008 2408 3404 3715	11973 4582 4561 4809 4389 1894 2352 6032 79820 77621 16868 10546 5468 17325 7148 85608 84111 1369 9252 10499 6483 10825 12685 30612 33857 2387 5798 3997 3997 3997 3997 3997 3997 3997 3	13100 5557 5859 5761 1911 2315 6336 93057 88868 18612 10787 5826 17481 7225 98736 95467 6481 10015 10714 6937 11472 14181 32884 37370 37329 29487 9389 20746 25165 5529 9904 3498 5792 8178	145 480 610 130 290 305 550 5235 6395 665 660 860 860 230 5810 6505 735 235 235 880 520 745 720 285 750 1815 1775 2415 1955 1955 1155 640 640 640 290 235	50 395 305 220 175 505 400 305 400 305 3440 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425 1905 745 785 990	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 3350 11800 7150 10950 6500 6150 12200 31750 277400 31950 7550 18400 21900 7200 8300 5850 5900 6950	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 2342 2215 2999 2450 1465 1171 3737 687 640 290 410 357 271	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 33301 2512 1580 1234 3937 723 650 301 434 377 308	110 832 415 269 739 341 336 342 7648 5026 1000 821 800 1113 812 7800 6473 354 285 938 904 1049 1394 1098 3065 3487 2359 3513 1046 2854 2285 800 785 900 993 900 993 262 790 430	911   504   346   358   1000   351   346   358   359   358   359   359   351   346   359   351   346   359   351	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 6500 10825 12685 31750 33857 33957 33957 33997 33990 8705 19687 23884 7200 8300 5850 8197 3311 5104	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 99346 11850 10015 11000 6937 11472 14181 32884 37370 37329 33200 9389 20746 25165 7393 88350 5900 9904 3498 5792 8640	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370 930 730 780 210 580 860 2330 2210 3040 2480 1470 1120 3650 7720 660 310 470 330 280	1 19 2 2 2 2 2 2 2 2 2 2 3 86 86 11 11 3 3 81 88 86 9 9 2 5 5 15 15 15 15 15 15 15 15 15 15 15 15	770	840	940 1: 490 4 490 4 490 4 490 4 490 4 490 4 490 4 490 4 490 4 490 6 490 6 490 6 490 6 490 6 490 6 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 7 490 8 400 8	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 6800 6900 5550 9850 5050 96500 1800 11850 9250 10050 0850 11050 2700 14200 2200 33550 1100 31450 0250 10750 9500 20550 1100 31450 0250 10750 9500 20550 11500 8850
Misc Ramps Alternative W.xlsm	SB Exit to 2nd Street NB Exit to 2nd Street NB Exit to 2nd Street BB US-50 Exit to 5th Street 9th Street Exit to SB I-75 Western Avenue Exit to SB I-75 SB Ramp from Ezzard to Gest Street SB I-75 Exit to Freeman Avenue NB I-75 North of Ezzard SB I-75 North of Ezzard SB I-75 North of Ezzard NB I-75 Exit to Western Avenue NB I-75 Exit to WHV SB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street SB I-75 Exit to Hopple Street NB C-D South of Martin Luther King Drive SB I-75 Exit to WHV NB I-75 Exit to WHV NB I-75 Exit to WHV NB I-75 Exit to WHV SB I-75 Exit to WHV NB I-75 Exit to WHV NB I-75 Exit to WHV NB I-75 Exit to WHV SB I-75 Entrance from WHV NB I-75 Exit to WHV SB I-75 Entrance from Buttermilk Pike WB US-50 SB I-71 NB I-71 EB US-50 9th NB Entrance to BSB Local US 50 WB US 50 EB US-50 to KY KY to US-50 3rd Entrance to I-75 3rd to I-71 NB Exit to Ezzard Charles NB Entrance from 9th	2508 198 198 587 1041 190 208 336 553 6305 7364 952 834 484 1196 301 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 583 279 359	2744 240 755 1247 257 210 331 581 7351 8431 1050 853 516 1207 305 8129 8730 1027 391 943 801 802 845 585 959 2516 2444 3301 2512 1580 1234 13937 723 583 301 434 377	832 415 269 739 287 336 342 7648 5026 1000 821 646 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 235 3513 1046 285 800 715 867 999 909 715 867 999 909 909 909 909 909 909 909 909 90	911 504 346 346 348 1000 290 331 359 8916 5755 1103 840 688 8996 7347 391 1227 3293 3849 2597 3601 1129 3008 2408 841 7151 936 1200 2777	11973 4582 4561 4809 4389 1894 2352 6032 77621 16868 10546 5468 17325 7148 85608 84111 5859 9252 10499 9252 10499 10499 10585 30612 33857 28765 8705 19687 2384 19687 2384 19687 2384 19687 2384 19687 2384 19687 2384 19687 2384 2384 2485 2590 33439	13100 5557 5859 5761 1911 2315 6336 1907 88868 18612 10787 5826 17481 7225 98736 95467 6481 10015 10714 6937 11472 14181 32884 37370 37329 29487 9389 20746 5529 9904 4895 5792	145 480 610 1300 305 550 5395 6495 665 600 8600 230 5810 6505 735 880 520 745 750 1815 1775 2415 1995 1155 995 3155 995 3155 640 640 290 235	50 395 395 305 220 175 505 400 305 340 6350 4365 520 655 800 800 620 6430 5475 280 180 885 635 995 310 720 960 2375 2795 1900 2860 825 2425 2425 1905 745 785 900 650 180	750 6250 3700 4100 3100 3300 2900 2350 6600 72900 74150 9650 9250 13700 6000 80450 81100 3350 11800 7150 10950 6500 6150 12200 31750 27400 31950 7550 18400 21900 7200 8300 5850 5900 4550	165 2155 229 587 866 219 290 336 553 6305 7364 952 834 600 1196 357 7048 7691 929 372 933 740 786 790 552 858 2342 2215 2999 2450 1465 1171 3737 687 640 290 410 357 271	2358 240 755 1037 300 346 581 7351 8431 1050 853 610 1207 367 8129 8730 1027 391 943 801 802 2516 2444 3301 2512 1580 1234 3397 723 650 301 434 377	110 832 415 269 299 739 341 336 342 7648 5026 1000 821 800 1113 812 7800 6473 354 285 938 904 1049 340 1394 1098 3065 3387 2285 800 785 900 993 262 790	911   504   346   346   358   1000   351   346   359   8916   5755   1103   840   810   1123   822   8996   7347   391   299   948   978   1071   364   1477   1227   3293   3849   2597   3601   1129   3008   841   795   936   1200   277   896   896	1496 11973 4582 4561 4809 4389 2900 2352 6600 79820 77621 16868 10546 7450 17325 7148 85608 84111 5859 4815 11800 9252 10950 10825 12685 31750 33857 33907 31950 8705 19687 23884 7200 8300 5850 8197 3311	1652 13100 5557 5859 5761 5938 2950 Western Ramp 2402 6650 93057 88868 18612 10787 7500 17481 7225 98736 95467 6481 5064 11850 10015 11000 6937 11472 14181 32884 37370 37329 32000 9388 20746 25165 7393 8350 5900 9904 3498 5792	1800 230 590 880 240 210 280 590 6560 7560 780 720 640 1140 350 7120 7740 930 370 930 730 780 810 580 860 2330 2210 3040 2480 1470 1120 3650 720 660 310 470 330 280	1 19 2 2 2 2 2 2 2 2 2 6 6 7 6 8 8 8 8 7 7 6 6 11 11 3 3 8 1 10 0 3 9 9 9 9 9 9 9 9 9 9 9 9 7 7 7 7 8 8 9 9 9 9	770	840	940 1: 490 4 320 4 330 4 330 333 330 33410 1 410 1410 1410 1410 1410 1410 1410	1500 12650 4550 5600 4400 5650 4400 5650 4800 6400 2300 2350 1900 2050 6600 6850 9800 93300 7900 89450 4850 16250 9950 10200 6800 6900 5550 9850 5050 96500 5800 6450 4800 11850 9250 10050 6800 7200 0550 1100 0550 11050 2700 14200 2200 33550 1100 31450 0250 10750 9500 10750 9500 10750 9500 10750 9500 10750 9500 10750 9500 20550 1100 31450 0250 10750 9500 20550 1100 31450 0250 10750 9500 20550 1100 31450 0250 10750 9500 10750 9500 10750 9500 10750 9500 11550 3250 6300

## ALT I-W

		Adjuster Sp	eadsheet Target	Existing 2019	Volumes	Adjusted For	ecast Targets					Balanced F	orecasts		
Adjuster Spreadsheet	Turn	AM29 AM49 PM29	PM49 DY29	DY49 AM19 PM19		.,	PM49 DY	29 DY49	Notes on minimum overrides	AM29 A				DY29	DY49
Misc Ramps Alternative W.xlsm	SB BSB Local	1875 2176 29	6 3465 32348	8 37542	29815	1875 2176 2986	3465	32348 37	37542	2280	2530	3520	4130	34550	40500
Misc Ramps Alternative W.xlsm	SB BSB I-71/75	3945 4579 46	1 5375 54449	9 63192	50185	3945 4579 4631	5375	54449 63	33192	3580	4230	4120	4710	52300	60250
Misc Ramps Alternative W.xlsm	US-50 to I-71	2067 2128 15	3 1588 14660	15094 1775 133	25 13850	2067 2128 1543	1588	14660 15	5094	2090	2150	1690	1750	15100	15650
Misc Ramps Alternative W.xlsm	US-50 to 2nd	254 258	5 76 1156	6 1172 220 (	65 1100	208 218 75	85	1156 1	1206	210	220	80	90	1200	1250
Misc Ramps Alternative W.xlsm	SB I-75 to EB I-71	615 644 12	9 1339 17661	1 18495 565 11	75 17850	883 893 1279	1339	17850 18	8495	850	860	1390	1460	17000	17700
Misc Ramps Alternative W.xlsm	SB I-75 to 2nd Street	2267 2502 7	1 851 10940	0 12075 970 33	30 5150	1641 1811 771	851	10940 12	.2075 use .15 max	1590	1750	760	850	10300	11400
Misc Ramps Alternative W.xlsm	SB Exit to 7th St	3143 3638 2	7 344 14158	8 16388 1360 1	05 5500	2124 2458 708	718	14158 16	.6388 use .15 max	2070	2360	710	730	13250	15450
Misc Ramps Alternative W.xlsm	EB WHV to NB I-75	778 790 4	5 492 9011	1 9149 530 33	30 6750	778 790 485	495	9011 9	9149	790	800	560	570	9500	9550
Misc Ramps Alternative W.xlsm		1011 1040 16	6 1653 13607	7 14002		1011 1040 1606	1653	13607 14	4002	1040	1090	1690	1760	13800	14100
Misc Ramps Alternative W.xlsm		1651 1830 17	5 1978 19541	1 21659		1651 1830 1785	1978	19541 21	1659	1630	1810	1900	2100	19600	21450
AltI-W_VolumeAdjuster_9th at Bullock.xlsm		30 30	0 40 90	90		16 26 16	26	90	140	20	30	20	30	200	250
AltI-W_VolumeAdjuster_9th at Bullock.xlsm		20 20	0 10 380	370		20 30 19	29	380	430	20	30	20	30	450	500
AltI-W_VolumeAdjuster_9th at Bullock.xlsm		80 80 2	0 260 1540	1540		80 90 260	270	1540 1	1590	90	100	290	300	1650	
AltI-W_VolumeAdjuster_9th at Bullock.xlsm		450 450 12	0 1220 10210	0 10210		511 521 1220	1230	10210 10	.0260	600	630	1120	1170	11050	11450
AltI-W_VolumeAdjuster_9th at Bullock.xlsm		20 20 1	0 160 920	920		46 56 160	170	920	970	60	70	200	210	1150	1200
AltI-W_VolumeAdjuster_9th at Bullock.xlsm		40 40	0 50 120	120		22 32 22	32	120	170	20	30	30	40	150	200
AltI-W_VolumeAdjuster_9th at Bullock.xlsm		90 90	0 30 370	370		67 77 30	40	370	420	40	50	30	40	350	
AltI-W_VolumeAdjuster_9th at Jillians.xlsm		0 0	0 0 0	0 0		20 20 30	30	200	250	20	30	40	50	150	200
AltI-W_VolumeAdjuster_9th at Jillians.xlsm		50 50 1	0 190 1290	1290		65 75 190	200	1290 1	1340	60	70	180	190	1200	1250
AltI-W_VolumeAdjuster_9th at Jillians.xlsm		770 780 1	0 160 4000	4010		720 730 200	210	4000 4	4050	450	470	180	200	2650	2800
AltI-W_VolumeAdjuster_9th at Jillians.xlsm		50 50	0 60 540	540		50 60 60	70	540	590	50	60	50	70	450	500
AltI-W_VolumeAdjuster_9th at Jillians.xlsm		10 10	0 10 30	30		5 15 5	15	30	80	10	20	10	10	50	100
AltI-W_VolumeAdjuster_9th at Jillians.xlsm		1590 1590 8	0 840 12220	12230		1590 1600 840	850	12220 12	.2270	1140	1150	760	780	9050	9400
AltI-W_VolumeAdjuster_9th at Jillians.xlsm		80 80	0 70 1100	1100		80 90 70	80	1100 1	1150	60	70	60	70	950	1000
AltI-W_VolumeAdjuster_WHV at I-75 NB.xlsm		1130 1130 5	0 580 11300	11300		1130 1140 580	590	11300 11	1350	790	800	560	570	9500	9550
AltI-W_VolumeAdjuster_WHV at I-75 NB.xlsm		190 190 1	0 140 1810	1810		190 200 140	150	1810 1	1860	110	120	110	110	1300	1400
AltI-W_VolumeAdjuster_WHV at I-75 NB.xlsm		700 700 12	0 1200 11820	11820		700 710 1200	1210	11820 11	1870	680	710	1270	1330	12100	12400
AltI-W_VolumeAdjuster_WHV at I-75 NB.xlsm		340 340 4	0 400 6170	6170		340 350 400	410	6170 6	6220	350	360	520	530	6800	7050

## No-Build

		Adjustor Spr	eadsheet Target	•	Existing 2019 Volumes	Adjusted Forecast Targets Notes on minimum overrides	Balanced Forecasts
Adjuster Spreadsheet	Turn AM29 AM49		PM49 DY2			Adjusted Porecast rargets Notes on minimum overrides  AM49 PM29 PM49 DY29 DY49	AM29 AM49 PM29 PM49 DY29 DY49
NoBuild VolumeAdjuster 12th at I-75 NB.xlsm	EBL 130 1	_	_	280 310	115 15 450 50		60 70 20 30 450 500
NoBuild VolumeAdjuster 12th at I-75 NB.xIsm	EBT 490 5.			5200 5390	395 295 4950 490		540 580 450 460 5300 5400
NoBuild VolumeAdjuster 12th at I-75 NB.xlsm	WBR 390 3			4190 4300	355 320 4300 390		430 440 360 380 4450 4500
NoBuild VolumeAdjuster 12th at I-75 NB.xlsm	WBT 330 3:			5070 5030	260 370 4300 330		330 340 510 520 5050 5100
NoBuild VolumeAdjuster 12th at I-75 NB.xlsm	NBL 30			100 100	20 15 100 18		10 20 20 30 100 150
NoBuild VolumeAdjuster 12th at I-75 NB.xlsm	NBT 230 1	_		3000 2990	90 160 1650 230		180 180 220 220 2700 2800
NoBuild VolumeAdjuster 12th at I-75 NB.xlsm		30 430		4180 3930	140 320 3900 200		190 200 390 400 3800 3950
NoBuild VolumeAdjuster 12th at I-75 SB.xlsm	EBT 290 3			1580 1760	245 90 1750 284		260 300 110 120 1750 1800
NoBuild VolumeAdjuster 12th at I-75 SB.xlsm		20 20		380 310	15 10 200 30		30 40 20 30 350 400
NoBuild VolumeAdjuster 12th at I-75 SB.xlsm		10 20	20	90 100	5 20 100 10		10 20 20 30 100 150
NoBuild VolumeAdjuster 12th at I-75 SB.xlsm	SBT 110 1:	20 290	330	2440 2740	80 240 1800 122		30 90 310 340 2500 2750
NoBuild VolumeAdjuster 12th at I-75 SB.xlsm	SBL 330 3.	10 320	300	3890 3960	265 220 3650 330	0 340 320 330 3890 3960	340 350 360 370 4000 4100
NoBuild VolumeAdjuster 12th at I-75 SB.xlsm	WBT 40	10 40	40	250 240	30 35 250 40	0 50 40 50 250 300	40 50 50 60 250 300
NoBuild VolumeAdjuster 12th at I-75 SB.xlsm	WBL 310 3.	10 510	480	4940 4890	250 350 4150 310	0 320 510 520 4940 4990	300 310 480 490 4900 4950
NoBuild VolumeAdjuster 2nd at CWB Bridge.xlsm	SBT 350 3.	50 1420	1550	8390 8990	275 1145 7450 420	0 430 1420 1550 8390 8990	390 410 1260 1350 8100 8650
NoBuild_VolumeAdjuster_2nd at CWB Bridge.xlsm	SBL 210 2	10 210	200	1590 1560	180 165 1700 210	0 220 210 220 1700 1750	230 240 360 370 2000 2050
NoBuild_VolumeAdjuster_2nd at CWB Bridge.xlsm	NBT 880 11-	10 850	790	9160 9600	500 405 4800 880	0 1140 850 860 9160 9600	840 1050 810 840 8750 9150
NoBuild_VolumeAdjuster_2nd at CWB Bridge.xlsm	NBR 900 11	30 490	480	7780 8350	435 165 3300 900	0 1130 490 500 7780 8350	1000 1270 470 480 8150 8750
NoBuild_VolumeAdjuster_2nd at Elm.xlsm	EBL 370 4	30 280	280	2700 3140	180 165 1700 370	0 480 280 290 2700 3140	340 410 260 280 2750 3100
NoBuild_VolumeAdjuster_2nd at Elm.xlsm	EBT 2790 33-	1110	1140	18400 20970	1550 760 12000 2790	0 3340 1110 1140 18400 20970	2500 2940 1250 1360 17900 20150
NoBuild_VolumeAdjuster_2nd at Elm.xlsm	EBR 300 3	50 160	200	2070 2430	220 105 1250 300	0 350 160 200 2070 2430	270 310 180 230 2000 2350
NoBuild_VolumeAdjuster_2nd at Elm.xlsm	NBT 190 19	90 190	220	1580 1740	145 165 1400 190	0 200 190 220 1580 1740	190 200 260 280 1800 2000
NoBuild_VolumeAdjuster_2nd at Elm.xlsm	11511	90		660 670	15 60 400 33		30 40 90 100 650 700
NoBuild_VolumeAdjuster_3rd at Central.xlsm	EBL 480 6		530	6010 6390	180 185 1950 480		440 600 540 560 5600 5950
NoBuild_VolumeAdjuster_3rd at Central.xlsm	2511 30	90 40	50	480 470	70 35 400 86	5 50 10 50 100 550	100 120 50 60 550 600
NoBuild_VolumeAdjuster_3rd at Central.xlsm	35.1	10 210		1240 1300	65 180 1350 65		70 80 180 190 1350 1400
NoBuild_VolumeAdjuster_3rd at Central.xlsm	SBT 110 1	_		610 630	100 75 700 110		100 110 120 150 750 850
NoBuild_VolumeAdjuster_3rd at Central.xlsm	WBR 290 3.			4570 4960	160 315 2700 290		240 250 500 540 3850 4100
NoBuild_VolumeAdjuster_3rd at Central.xlsm	WBT 210 1:			3570 3970	105 430 2400 210		210 230 460 500 3400 3750
NoBuild_VolumeAdjuster_3rd at Central.xlsm	WBL 250 2	_		1160 1170	230 85 1200 209		210 230 120 130 1250 1300
NoBuild_VolumeAdjuster_3rd at Central.xlsm		20 90		420 450	15 85 450 21		20 30 100 120 450 550
NoBuild_VolumeAdjuster_3rd at Central.xlsm	NBT 110 1			2610 2760	65 300 1500 131		160 180 580 590 3200 3450
NoBuild_VolumeAdjuster_3rd at Elm.xlsm	WBR 200 2	_		1700 1790	210 200 2050 210		280 310 290 330 3150 3450
NoBuild_VolumeAdjuster_3rd at Elm.xlsm	WBT 630 6			9670 9820	585 1220 10200 630		760 810 1640 1870 12950 14650
NoBuild_VolumeAdjuster_3rd at Elm.xlsm	NBL 170 10 NBT 290 2:			1930 1780	110 215 1400 170 215 115 1700 290		180 200 260 280 1850 2000 250 410 260 280 2700 2100
NoBuild_VolumeAdjuster_3rd at Elm.xlsm  NoBuild VolumeAdjuster 3rd at Plum.xlsm	NBT 290 2: SBR 80	30 160 70 40		2050 1960 830 930	215 115 1700 290 35 45 600 80		350 410 260 280 2700 3100 80 90 90 110 900 1050
NoBuild VolumeAdjuster_3rd at Plum.xlsm	WBT 640 6		50	8210 8860	460 785 5700 640	5 55 55 555	580 620 990 1060 7600 8100
NoBuild VolumeAdjuster 3rd at Plum.xisin	SBR 280 2	_		3810 4340	125 330 2500 280		260 270 570 630 3400 3800
NoBuild VolumeAdjuster 3rd at Race.xlsm	SBT 210 2	_		4650 6950	135 580 3350 23		230 250 780 1030 4650 6950
NoBuild VolumeAdjuster 3rd at Race.xlsm		50 1650		14570 17090	670 1090 9750 870		780 850 1360 1570 12700 14300
NoBuild VolumeAdjuster 3rd at Race.xlsm	WBL 180 1			1230 1240	140 110 1100 180		180 190 130 140 1250 1300
NoBuild VolumeAdjuster 3rd at US-42.xlsm	EBT 60	50 100	100	810 790	35 80 600 60	0 70 100 110 810 860	80 100 130 140 1050 1150
NoBuild VolumeAdjuster 3rd at US-42.xlsm	EBR 390 4	_		5990 6140	340 660 6050 390		410 420 980 1030 6250 6450
NoBuild VolumeAdjuster 3rd at US-42.xlsm	WBT 90	90 50	60	1220 1250	70 45 1100 90	<del>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 </del>	90 110 100 120 1350 1450
NoBuild_VolumeAdjuster_3rd at US-42.xlsm	WBL 160 1	50 840	930	3990 4410	115 650 3100 200	0 210 718 794 3990 4410	210 230 640 690 3850 4250
NoBuild_VolumeAdjuster_3rd at US-42.xlsm	NBL 370 4	330	320	3500 3580	285 265 3050 370	0 430 330 340 3500 3580	380 430 350 360 3650 3750
NoBuild_VolumeAdjuster_3rd at US-42.xlsm	NBR 520 7	20 520	470	5660 6020	215 140 1750 520	0 720 520 530 5660 6020	460 620 460 480 5100 5400
NoBuild_VolumeAdjuster_4th at Central.xlsm	SBT 110 1	10 230	240	1360 1410	130 210 1550 130	0 140 230 240 1550 1600	130 140 210 230 1550 1600
NoBuild_VolumeAdjuster_4th at Central.xlsm	WBR 120 1:	20 390	390	3360 3530	60 95 950 168	8 178 390 400 3360 3530	160 170 350 360 3250 3450
NoBuild_VolumeAdjuster_4th at Central.xlsm	WBT 240 3.	_	890	5490 6480	105 440 2700 275		300 310 890 1000 6050 7300
NoBuild_VolumeAdjuster_4th at Central.xlsm	***************************************	10 60	60	490 520	35 45 500 40	5 50 50 70 500 550	40 50 90 110 550 650
NoBuild_VolumeAdjuster_4th at Central.xlsm		90 880		6440 7010	185 460 3150 420		360         450         810         850         5350         5850
NoBuild_VolumeAdjuster_4th at Central.xlsm	NBT 440 5	_		6460 6760	220 340 3000 440		480 580 810 840 7300 7650
NoBuild_VolumeAdjuster_4th at Elm.xlsm		50 20		380 490	55 85 850 60		60 70 70 80 850 900
NoBuild_VolumeAdjuster_4th at Elm.xlsm	WBT 300 3	_		8500 9860	105 430 2900 425		400 410 1070 1170 8000 9250
NoBuild_VolumeAdjuster_4th at Elm.xlsm		50 120		840 840	80 130 1150 80		60 70 110 120 850 900
NoBuild_VolumeAdjuster_4th at Elm.xlsm		50 520		6720 7660	345 185 2600 670		570 650 440 490 5000 5650
NoBuild_VolumeAdjuster_4th at Plum.xlsm		150 150 150		1080 1340	20 40 300 54 30 25 400 60		50 60 160 190 1050 1300 70 80 80 100 850 1000
NoBuild_VolumeAdjuster_4th at Plum.xlsm	77.			760 910 8860 10050	30 25 400 60 180 540 3850 443		70 00 00 100 000 1000
NoBuild_VolumeAdjuster_4th at Plum.xlsm  NoBuild VolumeAdjuster 4th at Plum.xlsm	WBT 380 4 WBL 10			8860 10050 230 250	5 20 200 12		450 470 1170 1280 8800 10100 10 10 10 10 50 50
NoBuild_VolumeAdjuster_4th at Plum.xism  NoBuild VolumeAdjuster 5th and Crescent Entrance.xlsm		30 90		580 570	25 85 600 30		50 80 110 130 550 650
NoBuild VolumeAdjuster_5th and Crescent Entrance.xism	SBL 240 2	50		2510 2550	190 125 2000 240	5 15 50 200 000	280 290 210 220 2750 2800
NoBuild VolumeAdjuster 5th and Crescent Entrance.xism		00 580		7480 7300	260 365 5050 470		400 410 550 560 6750 6800
NoBuild VolumeAdjuster 5th and Crescent Entrance.xism		10 70		390 380	5 60 400 20		20 30 60 70 350 400
NoBuild VolumeAdjuster 5th and Crescent Entrance.xism		10 40		430 420	40 40 450 50		60 70 40 50 500 550
NoBuild VolumeAdjuster 5th and Crescent Entrance.xism		20 50		350 330	15 40 350 20		20 40 60 70 400 450
NoBuild VolumeAdjuster 5th at Central.xlsm	EBL 130 1			1420 1530	210 80 1300 210		250 260 230 260 1400 1550
NoBuild VolumeAdjuster 5th at Central.xlsm	EBT 800 8			5630 6530	1505 535 10100 1013		1260 1330 510 530 10550 11000
NoBuild_VolumeAdjuster_5th at Central.xlsm		10 10		150 150	35 10 150 27		30 40 10 20 150 200
NoBuild_VolumeAdjuster_5th at Central.xlsm	SBT 110 1			1430 1480	95 200 1400 110		100 100 200 210 1400 1400
NoBuild_VolumeAdjuster_5th at Central.xlsm	SBL 220 2.			1600 1660	180 150 1500 220		210 220 200 210 1600 1700
NoBuild_VolumeAdjuster_5th at Central.xlsm	NBT 420 4			8120 8590	165 315 2500 420		480 570 990 1020 8700 9200
NoBuild_VolumeAdjuster_5th at Central.xlsm	NBR 140 1			1660 1640	115 120 1450 140		160 180 170 180 1850 1900
NoBuild_VolumeAdjuster_6th at Central.xlsm	SBR 10	10 20	20	110 120	10 15 100 10		10 20 20 30 100 150
NoBuild_VolumeAdjuster_6th at Central.xlsm	SBT 130 1	30 60	60	640 660	105 50 600 115	5 125 60 70 640 690	110 110 60 70 600 600
NoBuild_VolumeAdjuster_6th at Central.xlsm	WBR 110 1	180	180	1260 1320	100 120 1050 110	0 120 180 190 1260 1320	140 160 170 180 1300 1400

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Add at a Considerate	T	44420		ljuster Spread		IDV40 AAAA	Existing 2019			Adjusted Forecas		Invan	Notes on minimum overrides	AA420	44440 In	Balanced Fore		o Invao
Adjuster Spreadsheet	Turn WBT		AM49 PI 550	M29 PM	1280 DY29 698	DY49 AM1 0 8490		950 4650	AM29 AM49 430 550	PM29 PM4	49 DY29 1280 6980	DY49 8490		AM29 400	AM49 P	M29 PM4 1160	1290 DY2	9 DY49 6200 7700
NoBuild_VolumeAdjuster_6th at Central.xlsm  NoBuild VolumeAdjuster 6th at Central.xlsm	WBI		200	360	370 243			300 2300	190 200		370 2430			200	210	340	350	2400 2500
NoBuild VolumeAdjuster 6th at Central.xlsm	NBL		80	620	610 480			170 950	240 250		630 4800			230	250	620	660	4500 4650
NoBuild VolumeAdjuster 6th at Central.xlsm	NBT	280	330	600	630 488		340	225 2850	340 350	600	630 4880			500	580	600	620	5600 6100
NoBuild_VolumeAdjuster_6th at Linn EB.xlsm	SBT	180	190	440	470 310	0 3230	160	370 2900	180 190	440	470 3100	3230		200	220	420	450	3250 3250
NoBuild_VolumeAdjuster_6th at Linn EB.xlsm	SBI	110	120	370	420 268	0 3150	105	325 2700	134 144	370	420 2700	3150	)	140	150	340	370	2700 2900
NoBuild_VolumeAdjuster_6th at Linn EB.xlsm	NBT		180	240	240 217			200 2000	170 180		250 2170		<u> </u>	170	190	240	250	2200 2250
NoBuild_VolumeAdjuster_6th at Linn EB.xlsm	NBR		30	80	80 61		25	80 650	31 41	L 80	90 650			30	40	80	90	650 700
NoBuild_VolumeAdjuster_6th at Linn WB.xlsm  NoBuild VolumeAdjuster 6th at Linn WB.xlsm	EBI EBR		10 120	20 370	40 21 370 215		110	5 100 320 2200	11 21 120 130	20	40 210 380 2200		<u> </u>	10 110	20 120	380	400 400	200 350 2200 2250
NoBuild VolumeAdjuster_6th at Linn WB.xlsm	SBR	+	120	10	10 16		10	10 150	10 130		20 160			110	30	10	20	150 250
NoBuild VolumeAdjuster 6th at Linn WB.xlsm	SBT		170	350	370 294			340 3150	160 170		370 3150		<u> </u>	220	230	340	370	3500 3600
NoBuild VolumeAdjuster 6th at Linn WB.xlsm	WBR		250	190	190 258		110	85 1300	240 250		200 2580		<u> </u>	220	230	180	190	2400 2450
NoBuild_VolumeAdjuster_6th at Linn WB.xlsm	WBT	380	420	140	160 321	0 3650	105	45 1000	380 420	161	171 3210	3650		330	370	160	170	3000 3350
NoBuild_VolumeAdjuster_6th at Linn WB.xlsm	WBL		10	40	50 23		10	35 250	12 22		50 250		<u> </u>	10	20	40	50	250 300
NoBuild_VolumeAdjuster_6th at Linn WB.xlsm	NBL		80	70	70 69		60	65 700	80 90		80 700			80	90	70	80	700 750
NoBuild_VolumeAdjuster_6th at Linn WB.xlsm	NBT		110	170	170 148			135 1300	90 110		180 1480			90	100	170	170	1500 1500
NoBuild_VolumeAdjuster_7th at Central.xlsm  NoBuild VolumeAdjuster 7th at Central.xlsm	EBL EBT		410 2280	120 430	130 318 500 1056		190 1415	65 2150 265 7300	360 410 1901 2218		169 3180 538 10560		<u> </u>	360 1650	410 1900	170 560	180 580	3200 3600 10050 11650
NoBuild VolumeAdjuster 7th at Central.xism	EBR		130	80	80 70		115	65 700	126 136		90 700			120	1300	80	100	700 750
NoBuild_VolumeAdjuster_7th at Central.xism	NBT		600	500	510 512			245 2250	530 600		510 5120		<u> </u>	470	550	540	560	5300 5850
NoBuild_VolumeAdjuster_7th at Central.xlsm	NBR		100	250	250 120			100 1650	216 226		226 1650		<u> </u>	170	190	230	240	1600 1650
NoBuild_VolumeAdjuster_9th at Central.xlsm	SBR		10	90	100 9		30	65 550	16 26		26 550		<u> </u>	30	40	30	40	500 550
NoBuild_VolumeAdjuster_9th at Central.xlsm	WBR		70	50	70 59		40	30 350	60 70		70 590			60	70	50	70	600 700
NoBuild_VolumeAdjuster_9th at Central.xlsm	WBT		770	1440	1720 1249			080 8650	690 770		1720 12490			640	720	1520		11550 14150
NoBuild_VolumeAdjuster_9th at Central.xlsm	NBI NBT		110 970	260 430	280 224 480 696			160 1700 150 2700	112 122 850 970		280 2240 480 6960	+		100 730	110 850	270 440	280 460	1950 2150 6550 7300
NoBuild_VolumeAdjuster_9th at Central.xlsm  NoBuild VolumeAdjuster Brighton at Central Avenue.xlsm	EBI	+	970 80	60	480 696 60 108		320 55	150 2700 40 800	850 970 90 100		480 6960 70 1080	+		730	100	50	70	6550 7300 1050 1150
NoBuild VolumeAdjuster_Brighton at Central Avenue.xism	EBT		40	80	60 80		20	35 400	50 60	<b> </b>	90 800			50	60	70	80	750 800
NoBuild_VolumeAdjuster_Brighton at Central Avenue.xlsm	SBR		20	60	60 58		35	70 850	35 45	5 70	80 850	+		40	50	80	100	850 900
NoBuild_VolumeAdjuster_Brighton at Central Avenue.xlsm	SBL	10	10	10	10 9	0 90	30	40 400	16 26	16	26 400	450		20	30	20	30	450 500
NoBuild_VolumeAdjuster_Brighton at Central Avenue.xlsm	WBR		10	40	40 31		5	25 200	16 26		50 310		<u> </u>	20	30	40	50	300 350
NoBuild_VolumeAdjuster_Brighton at Central Avenue.xlsm	WBT		10	10	10 13		10	35 500	10 20		33 500			20	30	20	30	550 600
NoBuild_VolumeAdjuster_Brighton at Central Parkway.xlsm	EBT		810	400	420 596 20 21		525	410 6000	810 820	38	420 6000 48 450		<u> </u>	740 20	760	440	460	6500 6900 400 450
NoBuild_VolumeAdjuster_Brighton at Central Parkway.xlsm  NoBuild VolumeAdjuster Brighton at Central Parkway.xlsm	EBR WBT	+	250	20 410	20 21 400 228		190	40 450 560 5700	25 35 220 250	, , ,	48 450			320	350	690	710	400 450 6400 6650
NoBuild VolumeAdjuster_Brighton at Central Parkway.xism	WBI		20	50	50 47		40	70 800	40 50		80 800	+		40	50	70	90	900 950
NoBuild VolumeAdjuster Brighton at Central Parkway.xlsm	NBL		10	20	20 19		5	15 150	10 20	20	30 190			10		20	30	150 200
NoBuild_VolumeAdjuster_Brighton at Central Parkway.xlsm	NBR	90	80	80	80 119	0 1180	55	50 850	90 100	80	90 1190	1240		90	110	70	90	1200 1300
NoBuild_VolumeAdjuster_Central at WHV.xlsm	EBL		60	190	180 61			85 1050	110 120		120 1050			110	120	110	120	1050 1100
NoBuild_VolumeAdjuster_Central at WHV.xlsm	EBT		300	200	200 359			225 3450	320 330		235 3590			320	330	230	230	3600 3650
NoBuild_VolumeAdjuster_Central at WHV.xlsm	EBR SBR		370 40	230 10	230 371 10 3			190 3100 145 1150	370 380 5 1 <sup>s</sup>		240 3710 15 1150		<u> </u>	400 60	420 70	220 60	240 70	3650 3950 1150 1200
NoBuild_VolumeAdjuster_Central at WHV.xlsm  NoBuild VolumeAdjuster Central at WHV.xlsm	SBT		330	210	220 244		.5	145 1150 255 3300	330 340	, ,	265 3300			360	370	250	260	1150 1200 3250 3400
NoBuild VolumeAdjuster Central at WHV.xlsm	WBR		10	30	30 20	+ + + + + + + + + + + + + + + + + + + +	10	25 200	10 20	1	40 200			10	20	30	40	200 250
NoBuild_VolumeAdjuster_Central at WHV.xlsm	WBT		110	400	400 293		95	300 3100	147 157	7 400	410 3100		<u> </u>	160	170	400	410	3100 3150
NoBuild_VolumeAdjuster_Central at WHV.xlsm	NBL	170	170	310	310 299	0 3120	75	215 2950	170 180	310	320 2990	3120		160	170	300	310	3300 3400
NoBuild_VolumeAdjuster_Central at WHV.xlsm	NBT		160	400	410 279		110	335 2700	140 160		410 2790	2900	<u> </u>	160	180	390	400	3050 3200
NoBuild_VolumeAdjuster_Central at WHV.xlsm	NBR		20	10	10 10		10	25 200	10 20		28 200			10	20	20	30	200 250
NoBuild_VolumeAdjuster_Colerain at Central.xlsm	EBL	-	10	10	10 13		5	10 150	20 30	, ==0	20 150			20	140	10	20	150 200
NoBuild_VolumeAdjuster_Colerain at Central.xlsm  NoBuild VolumeAdjuster Colerain at Central.xlsm	EBT EBR		140	120 10	120 181 10 10		65 5	65 1100 5 100	150 160 10 20		130 1810 20 100	+		120 10		110	130 20	1700 1800 100 150
NoBuild VolumeAdjuster Colerain at Central.xism	SBR		20	10	10 15		10	5 150	20 30		20 150	+		20		10	20	150 200
NoBuild_VolumeAdjuster_Colerain at Central.xlsm	SBT		10	20	20 15		5	15 150	10 20		30 150			10		20	30	150 200
NoBuild_VolumeAdjuster_Colerain at Central.xlsm	SBL		10	10	10 10		10	10 100	10 20	10	20 100			10		10	20	100 150
NoBuild_VolumeAdjuster_Colerain at Central.xlsm	WBR		10	10	10 3		5	15 100		-	15 100			10		10	20	100 150
NoBuild_VolumeAdjuster_Colerain at Central.xlsm	WBT		20	50	50 50		30	70 1000			80 1000		<u> </u>	40		70	80	1050 1050
NoBuild_VolumeAdjuster_Colerain at Central.xlsm	WBL SBT		10 260	20	20 25 210 249		10 200	20 250			30 250			10 280	20 290	20 210	30 220	250 300 2750 2800
NoBuild_VolumeAdjuster_Crescent at 4th.xlsm  NoBuild VolumeAdjuster Crescent at 4th.xlsm	SBI		370	200 340	330 249 330 417			150 2100 145 1900	250 260 430 440		210 2490 350 4170		<u> </u>	360	380	300	310	2750 2800 4000 4050
NoBuild VolumeAdjuster_Crescent at 4th.xism	WBR	+	160	280	280 275			135 1200	190 200		290 2750	+		270	280	330	340	3000 3100
NoBuild_VolumeAdjuster_Crescent at 4th.xlsm	WBI		20	80	80 55			60 500	28 38		90 550			50	80	110	130	550 650
NoBuild_VolumeAdjuster_Crescent at 4th.xlsm	NBT		410	600	590 758			390 5350	500 510		610 7580		<u> </u>	450		570		7100 7150
NoBuild_VolumeAdjuster_Crescent at 4th.xlsm	NBR		10	20	20 16		10	15 150	10 20		30 160			10	20	20	30	150 200
NoBuild_VolumeAdjuster_Dalton at Findlay.xlsm	EBL		20	50	50 38		15	40 350	20 30	, 50	60 380			20		50	60	400 450
NoBuild_VolumeAdjuster_Dalton at Findlay.xlsm	EBT		10	30	30 17		5	30 200			40 200			10		40	50	250 300
NoBuild_VolumeAdjuster_Dalton at Findlay.xlsm  NoBuild VolumeAdjuster Dalton at Findlay.xlsm	EBR SBR		10 20	10 10	10 6 10 23		5 15	5 100 10 200	10 20 20 30		20 100			10 20		10	20	100 150 250 300
NoBuild VolumeAdjuster Dalton at Findlay.xism  NoBuild VolumeAdjuster Dalton at Findlay.xism	SBT		280	300	320 296			345 3850			355 3850			310		350		3850 3900
NoBuild VolumeAdjuster Dalton at Findlay.xism	SBI		120	180	180 155			155 1500	120 130		190 1550			190		250		1800 1850
NoBuild_VolumeAdjuster_Dalton at Findlay.xism	WBR		100	100	100 138		85	75 1250	100 110		110 1380		<u> </u>	110		110	120	1450 1500
NoBuild_VolumeAdjuster_Dalton at Findlay.xlsm	WBT		70	110	110 61	0 630	65	100 650	70 80	110	120 650	700		80	80	130	130	700 750
NoBuild_VolumeAdjuster_Dalton at Findlay.xlsm	WBL		40	40	50 54			60 850			70 850		<u> </u>	60		60	70	900 950
NoBuild_VolumeAdjuster_Dalton at Findlay.xlsm	NBL		10	10	10 10		10	5 150	10 20		20 150			10		10	20	150 200
NoBuild_VolumeAdjuster_Dalton at Findlay.xlsm	NBT NBR		120 20	220	230 241		135	245 3150 30 400	135 145 25 35		255 3150 40 400			160 40	170 50	250	260 50	3150 3200 450 500
NoBuild_VolumeAdjuster_Dalton at Findlay.xlsm  NoBuild VolumeAdjuster Dixie Hwy at I-75 NB.xlsm	EBI NBK		20	20 20	20 24		20	20 350	20 30	50	40 400 30 350	+		20		20	30	450 500 350 400
NoBuild VolumeAdjuster Dixie Hwy at I-75 NB.xlsm	EBT		580	1400	1590 1147			080 10000	620 630		1590 11470	+		610		1370		10950 11450
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Adimeter Consodele act	Tura	AM29		ster Spreads		DY49 AM1	Existing 201		AM29 AM49	Adjusted Forecas		IDV40	Notes on minimum overrides	AM29	AM49 P	Balanced Fored		DY49
Adjuster Spreadsheet	Turn WBR		630 PM2	660 PM4	650 7930			470 6450	710 72	PM29 PM4	49 DY29 670 7930	DY49 7980		770	790	M29 PM4		250 8300
NoBuild_VolumeAdjuster_Dixie Hwy at I-75 NB.xlsm  NoBuild VolumeAdjuster Dixie Hwy at I-75 NB.xlsm	WBT	880	950	600	620 6570			645 8350	930 95		655 8350			930		640		350 8400
NoBuild VolumeAdjuster Dixie Hwy at I-75 NB.xlsm	NBL	280	860	160	160 2190			150 2150	280 63		170 2190	3550		250	460	160		100 3200
NoBuild VolumeAdjuster Dixie Hwy at I-75 NB.xlsm	NBR		90	210	220 2520			155 1650	180 19		220 2520	2570		170	180	210		400 2450
NoBuild_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	EBT	380	380	710	730 5720		330	600 5700	380 39	710	730 5720			380	390	730	780 59	950 6150
NoBuild_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	EBR	230	230	330	330 3130	3180	210	300 3050	230 24	330	340 3130	3180		220	230	310	320 31	150 3150
NoBuild_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	SBR	60	70	60	10 700	560	50	45 550	60 7	60	70 700	750		60	70	60	70 6	650 700
NoBuild_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	SBL		210	640	730 5380			500 4650	269 27		730 5380			250	260	660		350 5700
NoBuild_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	WBT	1110	1710	640	640 7580			680 9100	1120 162		690 9100	9150		1090	1400	680		050 10050
NoBuild_VolumeAdjuster_Dixie Hwy at I-75 SB.xlsm	WBL	50	60	130	140 1130			115 1400	85 9	150	140 1400			90	100	120		400 1550
NoBuild_VolumeAdjuster_Gest at 6th.xlsm	SBT	250	230	130	130 1820			130 2150	250 26	+ + + + + + + + + + + + + + + + + + + +	140 2150	2200		260	300	200	230 27	
NoBuild_VolumeAdjuster_Gest at 6th.xlsm  NoBuild VolumeAdjuster Gest at 6th.xlsm	WBR WBL	140 180	190 180	30 90	40 830 100 1230		375 150	165 2950 60 1000	149 18 180 19		159 2950 100 1230			180 170	220 180	130		700 2850 200 1250
NoBuild VolumeAdjuster Gest at 6th.xlsm	NBT	200	230	240	240 2870			175 2400	200 23		250 2870	2950		240	280	230		700 3150
NoBuild VolumeAdjuster Gest at Freeman.xlsm	EBL	20	30	140	170 1750			115 1550	95 10		170 1750	1920		90	100	140		850 2050
NoBuild VolumeAdjuster Gest at Freeman.xlsm	EBT	220	240	110	120 1390		110	90 1150	220 24	110	120 1390	1730		160	170	100	100 12	200 1350
NoBuild_VolumeAdjuster_Gest at Freeman.xlsm	EBR	140	130	90	80 950	890	45	90 1050	140 15	90	100 1050	1100		110	120	90	100 10	050 1150
NoBuild_VolumeAdjuster_Gest at Freeman.xlsm	SBR	30	40	10	10 230	310	35	5 400	35 4	5 12	22 400	450		40	50	20	30	400 450
NoBuild_VolumeAdjuster_Gest at Freeman.xlsm	SBT		600	210	230 5190		380	285 4850	570 60	285	295 5190			510	510	260	260 50	050 5150
NoBuild_VolumeAdjuster_Gest at Freeman.xlsm	SBL	30	30	10	10 330		135	50 1350	59 6	30	60 1350	1400		60	70	60		100 1150
NoBuild_VolumeAdjuster_Gest at Freeman.xlsm	WBR		140	160	150 1690			130 1700	140 15		170 1700			130		160		850 1900
NoBuild_VolumeAdjuster_Gest at Freeman.xlsm	WBT	60	70 20	20	20 440		190	35 1050	79 8		45 1050	1100		70	80	30		150 1200
NoBuild_VolumeAdjuster_Gest at Freeman.xlsm  NoBuild VolumeAdjuster Gest at Freeman.xlsm	WBL NBL	10	20	30 20	30 320 20 40		10	10 200 15 250	16 2	5 30	40 320 17 250			20 10	30 20	10		350 400 250 350
NoBuild VolumeAdjuster_Gest at Freeman.xism  NoBuild VolumeAdjuster Gest at Freeman.xism	NBT NBT	440	460	460	470 5360	, .,,	450	410 6000	450 46	7 7 7	470 6000			480	490	440		100 6250
NoBuild VolumeAdjuster Gest at Freeman.xlsm	NBR		20	20	20 250		15	15 250	20 3		30 250			20	30	20		200 250
NoBuild_VolumeAdjuster_Kyles at I-75 NB.xlsm	EBL	50	20	90	100 970		110	80 1000	110 12		100 1000			120	130	100		050 1100
NoBuild_VolumeAdjuster_Kyles at I-75 NB.xlsm	EBT	870	900	1270	1160 10780			950 10000	870 90		1280 10780	10980		880	900		1290 106	
NoBuild_VolumeAdjuster_Kyles at I-75 NB.xlsm	WBR	820	950	440	460 6000	6760	725	465 5900	820 95	465	475 6000	6760		850	980	510	540 64	400 6550
NoBuild_VolumeAdjuster_Kyles at I-75 NB.xlsm	WBT	610	670	750	800 7120	7360	450	655 6900	610 67	750	800 7120	7360		620	760	770	820 72	250 7550
NoBuild_VolumeAdjuster_Kyles at I-75 NB.xlsm	NBL		580	430	410 4110	4900		195 2150	260 58		440 4110	4900		210	390	400		850 4650
NoBuild_VolumeAdjuster_Kyles at I-75 NB.xlsm	NBR		240	270	280 2910			265 2850	210 24		280 2910	2990		180	190	250		700 2800
NoBuild_VolumeAdjuster_Kyles at I-75 SB.xlsm	EBT		430	600	640 5470			500 5550	480 49		640 5550	5630		490	510	610		650 5750
NoBuild_VolumeAdjuster_Kyles at I-75 SB.xlsm	EBR SBR		180 140	280 150	300 2830 200 1760			215 2500 150 1800	200 21 160 17		300 2830 200 1800	2950 1980		200 170	210 170	270 150		850 2950 750 1850
NoBuild_VolumeAdjuster_Kyles at I-75 SB.xlsm  NoBuild VolumeAdjuster Kyles at I-75 SB.xlsm	SBR		460	730	620 6150	1		530 5450	480 49		740 6150			510	520	730		000 6050
NoBuild VolumeAdjuster Kyles at I-75 SB.xlsm	WBT	650	1070	950	940 8920			605 6700	650 107		960 8920	10010		620	930	910		600 9650
NoBuild VolumeAdjuster Kyles at I-75 SB.xlsm	WBL	220	190	280	300 2510			245 2350	220 23		300 2510	2560		210	220	260		500 2550
NoBuild_VolumeAdjuster_Kyles at US-25.xlsm	SBT	410	410	920	930 5260	5300	360	800 5250	410 42	920	930 5260	5310		410	420	920	930 52	250 5300
NoBuild_VolumeAdjuster_Kyles at US-25.xlsm	SBL	470	460	650	690 5900	6120	445	515 5650	470 48	650	690 5900	6120		460	480	650	690 60	000 6150
NoBuild_VolumeAdjuster_Kyles at US-25.xlsm	WBR		1070	810	780 8000			530 6000	660 107	810	820 8000			650		800		850 8800
NoBuild_VolumeAdjuster_Kyles at US-25.xlsm	WBL	140	150	260	320 2480			225 2500	140 15		320 2500			140	150	260		500 2700
NoBuild_VolumeAdjuster_Kyles at US-25.xlsm	NBT NBR	520 230	1200	390	390 3470 250 2460			465 5050	610 90 230 24		475 5050	5100		610	910 240	470		050 5100
NoBuild_VolumeAdjuster_Kyles at US-25.xlsm  NoBuild VolumeAdjuster Linn at 8th.xlsm	NBR EBL		200 150	230	210 2300	+		200 2400 145 2100	230 24 150 16		250 2460 210 2300	2510 2420		230 140	150	230 190		500 2550 400 2500
NoBuild VolumeAdjuster Linn at 8th.xlsm	EBT		260	220	220 3060			170 2900	260 27		230 3060			300	310	210		200 3300
NoBuild VolumeAdjuster Linn at 8th.xlsm	EBR		140	120	130 1570		45	80 850	150 16		130 1570	1620		120	130	120		450 1550
NoBuild_VolumeAdjuster_Linn at 8th.xlsm	SBR	50	50	160	150 1550	1630	65	175 2050	78 8	3 175	185 2050	2100		100	110	180	190 19	950 2000
NoBuild_VolumeAdjuster_Linn at 8th.xlsm	SBT	30	30	180	200 890	950	90	215 1950	90 10	160	171 1950	2000		90	100	170	180 17	700 1750
NoBuild_VolumeAdjuster_Linn at 8th.xlsm	SBL	30	30	50	50 540	560	50	65 1100	50 6	65	75 1100	1150	)	60	70	70	80 11	100 1150
NoBuild_VolumeAdjuster_Linn at 8th.xlsm	WBR		20	20	20 450		20	20 450			33 450			20		20		500 550
NoBuild_VolumeAdjuster_Linn at 8th.xlsm	WBT	130	140	150	170 1910			190 2450			200 2450			140		190		500 2600
NoBuild_VolumeAdjuster_Linn at 8th.xlsm  NoBuild VolumeAdjuster Linn at 8th.xlsm	WBL NBL		20 140	60 120	60 460 110 1420		20 110	55 500 90 1300		3 60 120	70 500 130 1420			20 130		60 120		500 550 400 1500
NoBuild VolumeAdjuster_Linn at 8th.xlsm	NBT		200	210	200 2350			110 1200			220 2350			180		220		500 2550
NoBuild VolumeAdjuster Linn at 8th.xlsm	NBR		200	30	30 190		10	25 200			40 200			100		30		200 250
NoBuild_VolumeAdjuster_Linn at Bank.xlsm	EBL		30	60	60 780		25	60 750			70 780			40		60		800 850
NoBuild_VolumeAdjuster_Linn at Bank.xlsm	EBR		30	70	70 710	710	25	55 700	36 4	5 70	80 710			40	50	70	80 7	700 750
NoBuild_VolumeAdjuster_Linn at Bank.xlsm	SBR		100	130	130 2340			100 2200			140 2340			120		140		450 2500
NoBuild_VolumeAdjuster_Linn at Bank.xlsm	SBT		90	170	160 1480			200 2050			210 2050			130		200		150 2350
NoBuild_VolumeAdjuster_Linn at Bank.xlsm	NBL		40	150	150 1260			130 1250			160 1260			60	70	150		250 1300
NoBuild_VolumeAdjuster_Linn at Bank.xlsm	NBT		190	190	170 2740			225 2750			235 2750			170		240		850 3050
NoBuild_VolumeAdjuster_Linn at Central.xlsm  NoBuild VolumeAdjuster Linn at Central.xlsm	SEBL SEBT	10 720	10 740	10 400	10 70 430 5810		10 430	5 100 315 4550	10 2 720 74		20 100 430 5810			10 700	710	390		100 150 550 5900
NoBuild VolumeAdjuster Linn at Central.xism	SEBR		80	400	30 830			135 2150	135 14		145 2150			110		100		000 2050
NoBuild VolumeAdjuster Linn at Central.xism	SBR		50	10	10 110		30	55 700			30 700			30		30		600 650
NoBuild_VolumeAdjuster_Linn at Central.xlsm	SBT		60	170	190 1930		40	90 1250	97 10		190 1930			90		160		850 1950
NoBuild_VolumeAdjuster_Linn at Central.xlsm	SBL		10	10	20 190		5	5 100			20 190			10		10		200 250
NoBuild_VolumeAdjuster_Linn at Central.xlsm	NWBR		10	10	10 150		5	10 150	10 2	10	20 150			10		10		150 200
NoBuild_VolumeAdjuster_Linn at Central.xlsm	NWBT	240	290	770	800 6230			410 4000			800 6230			260		600		200 5400
NoBuild_VolumeAdjuster_Linn at Central.xlsm	NWBL	30	30	70	70 720		25	45 550			80 720			40		70		700 750
NoBuild_VolumeAdjuster_Linn at Central.xlsm	NEBL	70	70	100	80 1250			165 1800			175 1800			70		130		500 1550
NoBuild_VolumeAdjuster_Linn at Central.xlsm	NEBT		120	90	100 1610		30	60 1000			100 1610			90		90		450 1550
NoBuild_VolumeAdjuster_Linn at Central.xlsm  NoBuild VolumeAdjuster Linn at Court.xlsm	NEBR EBL		10 10	60 10	60 590 10 50		15 10	45 550 10 50	9 1		70 590 19 50	640		30 10		60 10	70 €	600 650 50 100
NoBuild_VolumeAdjuster_Linn at Court.xlsm  NoBuild VolumeAdjuster Linn at Court.xlsm	EBL		10	10	10 50		10	5 50	3 1	, ,	19 50			10	20	10	20	50 100
NoBuild VolumeAdjuster Linn at Court.xlsm	EBR		10	10	10 50		5	5 50			19 50			10		10		50 100
NoBuild VolumeAdjuster Linn at Court.xism	SBR		10	10	10 60		5	5 50			20 60			10		10		50 100
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Address Consodelines	7	44420		uster Spreads			Existing 2019			Adjusted Forecas		Invan	Notes on minimum overrides	44420		Balanced Fore		Invan
Adjuster Spreadsheet	Turn SBT		AM49 PM 120	129 PM4 370	9 DY29 370 3490	DY49 AM19 3550	PM19 145 3	_	AM29 AM49 175 18	PM29 PM4	49 DY29 380 3850	DY49 3900		AM29 210	220 P	M29 PM4 360		DY49 4100 4150
NoBuild_VolumeAdjuster_Linn at Court.xlsm  NoBuild VolumeAdjuster Linn at Court.xlsm	SBL		40	40	40 430		25	35 400		n 40	50 430			40	50	40		450 500
NoBuild VolumeAdjuster Linn at Court.xlsm	WBR	20	20	40	40 330		15	30 350	20 30	0 40	50 350			20	30	40		350 400
NoBuild VolumeAdjuster Linn at Court.xlsm	WBT		10	10	10 50	60	5	5 50	9 19	9 9	19 50	100		10	20	10	20	50 100
NoBuild_VolumeAdjuster_Linn at Court.xlsm	WBL	10	10	40	50 310	360	15	65 550	16 26	6 56	66 550	600		30	40	50	60	600 650
NoBuild_VolumeAdjuster_Linn at Court.xlsm	NBL	20	20	10	10 50	60	15	5 50	9 19	9 9	19 50	100		10	20	10	20	50 100
NoBuild_VolumeAdjuster_Linn at Court.xlsm	NBT			330	330 3880		230 3				355 4500			260	270	370		4300 4400
NoBuild_VolumeAdjuster_Linn at Court.xlsm	NBR		40	20	30 380		125	50 1100		30	60 1100			70	80	50		1050 1100
NoBuild_VolumeAdjuster_Linn at Ezzard Charles.xlsm  NoBuild VolumeAdjuster Linn at Ezzard Charles.xlsm	EBL FBT		30 640	20 180	20 300		30 1	25 400 20 2050	30 40 630 640		35 400 200 3780			30 660	40 690	220		400 450 3750 4200
NoBuild VolumeAdjuster Linn at Ezzard Charles.xism	EBR			150	160 1340		50				160 1340			140	150	170		1350 1400
NoBuild VolumeAdjuster Linn at Ezzard Charles.xism	SBR		30	60	60 580			50 550	30 40		70 580			30	40	60		600 650
NoBuild_VolumeAdjuster_Linn at Ezzard Charles.xlsm	SBT	250	240	450	450 3260	3350	225 4	05 3500	250 260	0 450	460 3500	3550		250	260	450	460 3	3500 3550
NoBuild_VolumeAdjuster_Linn at Ezzard Charles.xlsm	SBL	50	50	40	50 450		30	30 350	50 60	0 40	50 450	500		50	60	40	50	450 500
NoBuild_VolumeAdjuster_Linn at Ezzard Charles.xlsm	WBR		30	40	40 350		20	30 300	30 40	70	50 350			30	40	40		350 400
NoBuild_VolumeAdjuster_Linn at Ezzard Charles.xlsm	WBT		80	190	190 2090 30 430		70 1	_	105 115		200 2090			120	130	200		2150 2350
NoBuild_VolumeAdjuster_Linn at Ezzard Charles.xlsm  NoBuild VolumeAdjuster Linn at Ezzard Charles.xlsm	WBL NBL		10 60	20 110	30 430 120 1130		30	40 550 80 950	30 40 60 70	- '0	50 550 120 1130			30 60	40 70	110		550 600 1150 1250
NoBuild VolumeAdjuster Linn at Ezzard Charles.xism	NBT		280	310	310 1890		250 3				330 3550			280	290	320		3550 3600
NoBuild VolumeAdjuster Linn at Ezzard Charles.xlsm	NBR		70	50	40 640		60	40 650	70 80		60 650	700		70	80	50		650 700
NoBuild_VolumeAdjuster_Main at 4th.xlsm	SBR		180	600	640 3960		155 5		198 208	8 600	640 3960			190	200	530		3750 3800
NoBuild_VolumeAdjuster_Main at 4th.xlsm	SBT		170	820	910 4430		120 6		222 232		878 4430			200	210	730		4350 4850
NoBuild_VolumeAdjuster_Main at 4th.xlsm	WBR		1550	980	910 12170		530 3		1200 1550		990 12170	12890		1240	1590	930		2150 12850
NoBuild_VolumeAdjuster_Main at 4th.xlsm	WBT		670	940	1000 8270		635 9		630 670	940 8 190	1000 8270		ramp removed	540 80	610 90	880 190		7900 8300
NoBuild_VolumeAdjuster_Main at 4th.xlsm  NoBuild VolumeAdjuster Main at 4th.xlsm	WBL NBL		190	190 180	200 1560 180 1950	1	25 1 170 1		190 200	130	200 1560 190 1950	1700	ramp removed	170	180	190		1550 1700 1850 1900
NoBuild VolumeAdjuster Main at 4th.xlsm	NBT		720	360	360 4770		405 2		580 720		370 4770	5060		600	730	350		4750 5050
NoBuild_VolumeAdjuster_Main at 5th.xlsm	EBL		150	110	100 2000		100	55 1250	150 160		120 2000	2050		130	140	100		1850 1900
NoBuild_VolumeAdjuster_Main at 5th.xlsm	EBT	1040	1110	680	640 9700	9940	590 3	95 6000	1040 1110	0 680	690 9700	9940		920	950	640	660 8	8900 9250
NoBuild_VolumeAdjuster_Main at 5th.xlsm	EBR		20	130	130 820		30	70 800	41 5:	1 130	140 820			40	50	120		750 850
NoBuild_VolumeAdjuster_Main at 5th.xlsm	SBT			730	780 3100		65 5		155 165		605 3100	3360		140	150	570		3100 3400
NoBuild_VolumeAdjuster_Main at 5th.xlsm	SBL NBT		120	340 440	400 2800 440 4720		80 2 475 2		140 150 640 770		400 2800 450 4720	3120		140	150	350 430		2800 3150 4750 5050
NoBuild_VolumeAdjuster_Main at 5th.xlsm  NoBuild VolumeAdjuster Main at 5th.xlsm	NBR		770 100	140	440 4720 140 1280		60	90 3450 75 750	80 100		450 4720 150 1280	5030 1330		640 80	770 100	140		4750 5050 1300 1350
NoBuild VolumeAdjuster Mound at 9th.xlsm	SBHR		20	80	80 300		20	65 300	20 30	0 54	64 300			20	30	60		300 350
NoBuild_VolumeAdjuster_Mound at 9th.xlsm	SBBR	20	20	60	60 350		15	55 350	20 30	0 60	70 350			20	30	60		350 400
NoBuild_VolumeAdjuster_Mound at 9th.xlsm	WBR	20	20	20	20 300	300	15	15 300	20 30	0 20	30 300	350		20	30	20	30	300 350
NoBuild_VolumeAdjuster_Mound at 9th.xlsm	WBBR			730	790 5350		200 5		300 370		790 5350			340	400	790		5500 6500
NoBuild_VolumeAdjuster_Mound at 9th.xlsm	WBBL	370	390	1020	1290 7750		250 7	_	388 398		1290 7750			410	440			8200 10000
NoBuild_VolumeAdjuster_Patterson at Harrison.xlsm  NoBuild VolumeAdjuster Patterson at Harrison.xlsm	EBT EBR		120	120 10	120 1750 10 100		70	75 1250 10 100	130 140	-	130 1750 20 100			140 10	170 20	120		1850 2000 100 150
NoBuild VolumeAdjuster_Patterson at Harrison.xlsm	WBT		30	80	70 950		30	70 1050	48 58		90 1050			50	50	70		1100 1100
NoBuild VolumeAdjuster Patterson at Harrison.xlsm	WBL			10	10 100		10	5 100		0 10	20 100			10	20	10		100 150
NoBuild_VolumeAdjuster_Patterson at Harrison.xlsm	NBL	10	10	10	10 50	50	5	5 50	9 19	9 9	19 50	100		10	20	10	20	50 100
NoBuild_VolumeAdjuster_Patterson at Harrison.xlsm	NBR		10	10	10 100		5	5 100			20 100			10	20	10		100 150
NoBuild_VolumeAdjuster_Philadelphia at 4th.xlsm	SBR		40	40	40 390		540 4		40 50		50 390		ramp removed	30	40	40		350 400
NoBuild_VolumeAdjuster_Philadelphia at 4th.xlsm	SBT	140 130	150 130	130	100 1860		70 100 1	75 1000	140 150 130 140		140 1860 170 2450	1910 2500		150 150	170	140 170		2050 2100 2550 2650
NoBuild_VolumeAdjuster_Philadelphia at 4th.xlsm  NoBuild VolumeAdjuster Philadelphia at 4th.xlsm	WBR WBT		790	160 1480	150 2450 1550 9920		795 14		780 790		1550 9920		ramp removed	650	160 710	1330		9650 10000
NoBuild VolumeAdjuster Philadelphia at 4th.xlsm	WBL		90	80	90 1110		65	60 950	90 100		90 1110			100	120	90		1300 1350
NoBuild_VolumeAdjuster_Philadelphia at 4th.xlsm	NBL	50	20	50	50 480	440	185 1	.35 1650	50 60	50	60 480	530	ramp removed	40	50	40	50	500 550
NoBuild_VolumeAdjuster_Philadelphia at 4th.xlsm	NBT		20	20	20 450		115	95 2400		1 81	91 2400	2450	·	130	140	120		2700 2750
NoBuild_VolumeAdjuster_Philadelphia at 5th.xlsm	EBL		30	50	40 890		180 1				110 2700			110	120	100		2000 2050
NoBuild_VolumeAdjuster_Philadelphia at 5th.xlsm	EBT			730	700 9860		610 4				740 9860			870	890	640		8550 8950
NoBuild_VolumeAdjuster_Philadelphia at 5th.xlsm  NoBuild VolumeAdjuster Philadelphia at 5th.xlsm	EBR SBT			30 60	40 490 50 770		60 35	60 750 45 550			70 750 70 770			50 50	60 70	50 50		700 750
NoBuild VolumeAdjuster Philadelphia at 5th.xism	SBL			180	170 2740			90 1400			190 2740			200	220	180		2650 2700
NoBuild_VolumeAdjuster_Philadelphia at 5th.xism	NBT			10	10 210		120 1				48 1350			60	70	60		1200 1250
NoBuild_VolumeAdjuster_Philadelphia at 5th.xlsm	NBR			40	40 270		10	25 200	20 30	0 40	50 270			20	30	40	50	300 350
NoBuild_VolumeAdjuster_Philadelphia at 9th.xlsm	EBT			40	40 280		25	35 350			50 350			30	90	40		350 500
NoBuild_VolumeAdjuster_Philadelphia at 9th.xlsm	SBR			30	40 200		10	30 200			40 200			10	20	30		200 250
NoBuild_VolumeAdjuster_Philadelphia at 9th.xlsm	SBL WBT		30 20	60 10	60 430 10 100		30 25	45 400 20 250			70 430 28 250			40 20	50 30	60		450 500 250 300
NoBuild_VolumeAdjuster_Philadelphia at 9th.xlsm  NoBuild VolumeAdjuster Pike at I-75 NB.xlsm	EBL			130	120 3930		465 1				28 250 207 3930			630	1070	210	50	4200 5900
NoBuild VolumeAdjuster Pike at I-75 NB.xlsm	EBT			340	320 4940		630 2	_			350 4940			750	830	350		4950 5200
NoBuild_VolumeAdjuster_Pike at I-75 NB.xlsm	WBR		90	120	120 1040		120 1				130 1040			190	200	140		1100 1150
NoBuild_VolumeAdjuster_Pike at I-75 NB.xlsm	WBT		200	650	710 5060	5500	120 4			3 650	710 5060	5500		270	300	530	580 4	4750 5050
NoBuild_VolumeAdjuster_Pike at I-75 NB.xlsm	NBL			160	150 1660		105 1				170 1750			80	90	120		1600 1700
NoBuild_VolumeAdjuster_Pike at I-75 NB.xlsm	NBT			260	270 3030		305 2				270 3150			280	280	260		3300 3300
NoBuild_VolumeAdjuster_Pike at I-75 NB.xlsm	NBR EBT			220	220 2730 310 7730		150 1				230 2730 397 7730			310 1300	320 1810	220 400		2700 2800 7900 9800
NoBuild_VolumeAdjuster_Pike at I-75 SB.xlsm  NoBuild VolumeAdjuster Pike at I-75 SB.xlsm	EBR		2290 80	350 30	310 //30		70	25 550			397 7730 40 590			70	1810	30		7900 9800 600 650
NoBuild VolumeAdjuster_Pike at I-75 SB.xIsm	SBR			190	200 1090		100 4				206 390			200	210	230		3950 4000
NoBuild_VolumeAdjuster_Pike at I-75 SB.xlsm	SBT			290	280 3230		215 2	_			300 3230			160	170	290		3200 3200
NoBuild_VolumeAdjuster_Pike at I-75 SB.xlsm	SBL		60	140	130 1050		80 1		80 90		150 1250			80	90	160		1250 1300
NoBuild_VolumeAdjuster_Pike at I-75 SB.xlsm	WBT		50	310	330 1130		160 3		160 170		223 3250			200	200	280		3550 3600
NoBuild_VolumeAdjuster_Pike at I-75 SB.xlsm	WBL			310	350 2590		65 2		130 140		350 2590			150	190	370		2800 3150
NoBuild_VolumeAdjuster_Pike at Main.xlsm	EBL	530	540	340	320 3890	3880	455 2	65 3600	530 540	340	350 3890	3940	<u> </u>	530	560	350	360 3	3850 3950

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Adimeter Consodelens	Tues	AM29		djuster Spreads M29 PM4		DY49 AM1	Existing 2019 V 9 PM19		AM29 AM49	Adjusted Forecas		DY49	Notes on minimum overrides	AM29		Balanced Fore M29 PM4		DY49
Adjuster Spreadsheet  NoBuild VolumeAdjuster Pike at Main.xlsm	Turn EBT	_		210	210 384		325 14		530 56		220 3840			530	590	220		800 4050
NoBuild VolumeAdjuster_Pike at Main.xism	SBR			520	530 417		135 34		470 48		530 4170			360	370	450		150 4200
NoBuild VolumeAdjuster Pike at Main.xlsm	SBL		10	10	10 6		5	5 50	10 20	0 10	20 60	110		10	20	10	20	50 100
NoBuild VolumeAdjuster Pike at Main.xlsm	WBR	30	30	20	20 30	310	20 2	0 300	30 4	0 20	30 300	350		30	40	20	30 3	300 350
NoBuild_VolumeAdjuster_Pike at Main.xlsm	WBT	120	110	250	290 170	1940	105 23	0 1650	120 130	0 250	290 1700	1940		100	130	220	260 17	700 2000
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	EBI	40	30	20	10 34	290	15 1	0 250	40 50	0 20	30 340	390		40	50	20	30 3	350 400
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	EBT			70	70 115		20 4	0 730	58 68		80 1150			60	70	70		150 1200
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	EBR			60	60 112		25 1 15 1	5 350	60 70		70 1120			60	70	60		100 1150
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	SBR SBT			20 530	20 32 530 479		385 45	5 300 0 4900	20 30 460 470		30 320 540 4900	370 4950		20 440	30 440	500		300 350 950 5000
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm  NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	SBI			40	40 52		55 8	5 1100	55 6		95 1100	1150		60	70	500	90 11	
NoBuild VolumeAdjuster Spring Grove at Bank.xism	WBR			150	150 163		90 20		90 10		210 2150			100	110	180	30 11	950 2000
NoBuild VolumeAdjuster Spring Grove at Bank.xlsm	WBT			90	80 29		25 4	0 150	50 6	+	62 290	1		40	40	50		300 300
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	WBL	. 30	40	90	100 54	590	15 4	5 300	30 4	0 90	100 540	590		30	40	80	90 5	500 550
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	NBL			50	50 132		35 1	5 550	100 110		76 1320	1370		100	110	70		300 1350
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	NBT			330	330 290		160 27		170 180		340 3100	3150		160	170	320	330 30	
NoBuild_VolumeAdjuster_Spring Grove at Bank.xlsm	NBR EBL			100	110 118 20 5		40 7	0 1100 5 50	60 7	200	110 1180 19 50	1280		70 10	80 20	100		150 1250 50 100
NoBuild_VolumeAdjuster_Spring Grove at Harrison.xlsm  NoBuild VolumeAdjuster Spring Grove at Harrison.xlsm	EBI			20 10	10 5		5 1	5 50	9 1	-	19 50			10	20	10		50 100
NoBuild VolumeAdjuster Spring Grove at Harrison.xlsm	EBR		10	30	30 25		5 2	5 250	13 2	J	40 250			10	20	30	20	250 300
NoBuild_VolumeAdjuster_Spring Grove at Harrison.xlsm	SBR			70	70 15		20	5 150	20 3	50	37 150			20	30	30		150 200
NoBuild_VolumeAdjuster_Spring Grove at Harrison.xlsm	SBT			560	560 559		445 52		470 48	0 560	570 5900			490	490	560		950 5950
NoBuild_VolumeAdjuster_Spring Grove at Harrison.xlsm	SBL			30	20 142		60 6	000	90 10		81 1420			100	110	90		400 1450
NoBuild_VolumeAdjuster_Spring Grove at Harrison.xlsm	WBR			130	110 111		20 8	5 900	56 6	6 130	140 1110	1160		70	80	140		300 1400
NoBuild_VolumeAdjuster_Spring Grove at Harrison.xlsm	WBT		40 10	20	20 20 10 15		35 1	5 200	36 4 20 3	6 20 0 10	30 200 20 150			70 20	90	30		200 350 150 250
NoBuild_VolumeAdjuster_Spring Grove at Harrison.xlsm  NoBuild VolumeAdjuster Spring Grove at Harrison.xlsm	WBL NBL			10 10	10 15		5 15 1	5 150 0 200	20 3	0 10	20 150			20	30 30	10		150 250 200 250
NoBuild VolumeAdjuster_Spring Grove at Harrison.xism  NoBuild VolumeAdjuster Spring Grove at Harrison.xism	NBT			470	470 427		245 46		245 25		480 5100			270	280	500		950 5000
NoBuild_VolumeAdjuster_Spring Grove at Harrison.xlsm	NBR			10	10 20		5 1	0 200	10 20	+	20 200			10	20	10		200 250
NoBuild_VolumeAdjuster_Spring Grove at WHV.xlsm	EBL	. 80	90	120	130 117	1220	135 16	0 1800	135 14	5 160	170 1800	1850		140	150	160	170 18	800 1850
NoBuild_VolumeAdjuster_Spring Grove at WHV.xlsm	EBR			130	120 180		100 8	5 1200	180 19		140 1800			180	190	130	140 18	
NoBuild_VolumeAdjuster_Spring Grove at WHV.xlsm	SBR		70	220	220 154		75 20		80 9		230 1800	1850		90	100	220		800 1850
NoBuild_VolumeAdjuster_Spring Grove at WHV.xlsm	SBT			540	540 525		425 50		425 43		550 5700	5750		430	440	550	560 57 270 20	
NoBuild_VolumeAdjuster_Spring Grove at WHV.xlsm  NoBuild VolumeAdjuster Spring Grove at WHV.xlsm	NBI NBT			260 370	240 192 370 353		70 19 200 37		96 100 200 240		270 1950 380 4100	2000		100 250	110 270	260 390	270 20 410 42	
NoBuild VolumeAdjuster Western at Ezzard CharlesEB.xlsm	EBT		30	30	30 10		25 3	0 4100	18 28	8 18	28 100			20	30	20		100 150
NoBuild VolumeAdjuster Western at Ezzard CharlesEB.xlsm	EBR		10	0	0 5		5	5 50	9 1	9 5	15 50	100		10	20	10		50 100
NoBuild_VolumeAdjuster_Western at Ezzard CharlesEB.xlsm	SBT	550	550	550	550 329	3300	590 70	0 5200	590 60	0 592	602 5200	5250		510	560	570	630 51	100 5200
NoBuild_VolumeAdjuster_Western at Ezzard CharlesEB.xlsm	SBL		670	230	260 478		260 16	0 2500	650 670	0 239	260 4780			700	710	310	340 45	550 5050
NoBuild_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm	SBR			10	10 11		10	5 100	10 20		20 110	160		10	20	10		100 150
NoBuild_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm	SBT WBT			930 10	970 839 10 10		810 82	0 7000 0 100	1220 1230		970 8390 20 100	1		1170 10	1210 10	840		950 9500 100 100
NoBuild_VolumeAdjuster_Western at Ezzard CharlesWB.xlsm NoBuild VolumeAdjuster Western at Ezzard CharlesWB.xlsm	WBI			30	30 59		40 4	0 700	40 6		50 700			40	60	40		700 750
NoBuild VolumeAdjuster Western at Findlay.xlsm	EBT		30	50	50 61		25 5	0 650	31 4		60 650			20	50	50		600 650
NoBuild_VolumeAdjuster_Western at Findlay.xlsm	EBR	160	150	270	260 222		105 16	5 1450	160 170	0 270	280 2220	2270		220	230	280	290 19	900 2000
NoBuild_VolumeAdjuster_Western at Findlay.xlsm	SBR	210	200	240	240 244	2550	150 18	0 1850	210 220	0 240	250 2440	2550		190	200	240	250 21	150 2250
NoBuild_VolumeAdjuster_Western at Findlay.xlsm	SBT			530	530 422		310 37		480 530		540 4220			360	390	430		900 4150
NoBuild_VolumeAdjuster_Western at Findlay.xlsm	SBL		60	160	160 115 60 100		140 25		140 150		217 2600	2650		150	160	240		500 2550
NoBuild_VolumeAdjuster_Western at Findlay.xlsm  NoBuild VolumeAdjuster Western at Findlay.xlsm	WBT WBI		70 10	60 20	60 100 20 26		20 4	5 900 0 550	70 8	00	70 1000 50 550	1050		60 30	70 40	50		900 950 550 600
NoBuild VolumeAdjuster Western at Gest.xlsm	EBT			240	270 323		125 20				270 3230			220	240	240		200 3600
NoBuild_VolumeAdjuster_Western at Gest.xism	SBR			240	240 147		180 21		210 22		250 1470			160	190	210		400 1450
NoBuild_VolumeAdjuster_Western at Gest.xlsm	SBL			90	90 83		125 9	5 950	140 15		105 950	1000		140	150	90		900 950
NoBuild_VolumeAdjuster_Western at Gest.xlsm	WBT			30	40 73		235 5	5 1700	131 14		65 1700			120	150	60		800 2000
NoBuild_VolumeAdjuster_Western at Liberty.xlsm	EBT			170	180 216		70 9	0 1300	110 120		180 2160			110	120	160		200 2300
NoBuild_VolumeAdjuster_Western at Liberty.xlsm	EBR SBR			70	80 61 20 15		55 8 10 1	5 850 5 150	55 65 10 20		95 850 30 150			90 10	100 20	100 30		850 900 150 200
NoBuild_VolumeAdjuster_Western at Liberty.xlsm  NoBuild VolumeAdjuster Western at Liberty.xlsm	SBR			20 450	20 15 440 219		245 36				404 2190			10 250	260	320		200 2250
NoBuild VolumeAdjuster_Western at Liberty.xism  NoBuild VolumeAdjuster Western at Liberty.xism	SBI			320	330 397		180 19		290 320		330 3970			350	380	410		000 4300
NoBuild VolumeAdjuster Western at Liberty.xlsm	WBT			160	160 233		90 11		170 180		170 2330			130	140	160		200 2300
NoBuild_VolumeAdjuster_Western at Liberty.xlsm	WBL			50	50 52	510	90 12	5 1550	90 10	0 94	104 1550	1600		130	140	110	120 15	500 1550
NoBuild_VolumeAdjuster_Winchell at Bank.xlsm	EBI			110	110 179		70 6	5 1300	130 14	0 110	120 1790			110	120	110	120 17	
NoBuild_VolumeAdjuster_Winchell at Bank.xlsm	EBT			150	150 170		45 13		85 99		160 1700			80	100	140		700 1800
NoBuild_VolumeAdjuster_Winchell at Bank.xlsm	WBR			90	90 169		150 16		150 16		170 2450			150	160	160		350 2400
NoBuild_VolumeAdjuster_Winchell at Bank.xlsm  NoBuild VolumeAdjuster Winchell at Bank.xlsm	WBT NBI			150 110	150 116 120 122		40 13 90 15		58 68 100 110	200	160 1200 160 1400			70 100	80 110	160 150		300 1350 450 1500
NoBuild VolumeAdjuster Winchell at Bank.xism	NBT			440	410 513		140 28	_	257 26		450 5130	1		270	300	410		300 4600
NoBuild_VolumeAdjuster_Winchell at Bank.xlsm	NBR			80	80 70		50 6	5 700			90 700			60	70	70		650 700
NoBuild_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	EBL			0	0	0	25 3	0 250			10 250			20	30	20		300 400
NoBuild_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	EBT			280	320 465		260 16		660 68		320 4650			700	710	310	340 43	
NoBuild_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	NBT			230	220 302		285 23				245 3600			350	360	260		600 3800
NoBuild_VolumeAdjuster_Winchell at Ezzard CharlesEB.xlsm	NBR			60	60 52		130 8	0 800	94 10		90 800			130	170	110		150 1250
NoBuild_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm	WBR WBT			330 40	360 335 40 55		115 26 25 3	0 2950 0 550	168 173 30 4		360 3350 50 550			170 40	190 50	330		350 3700 550 550
NoBuild_VolumeAdjuster_Winchell at Ezzard CharlesWB.xlsm  NoBuild VolumeAdjuster Winchell at Ezzard CharlesWB.xlsm	NBI			10	10 55		20 2	0 250	5 1	5 5	15 250			10	20	10		250 300
NoBuild VolumeAdjuster Winchell at Ezzard CharlesWB.xlsm	NBT			250	250 378		290 24		350 36	0 250	260 3780			360	370	270		650 3900
NoBuild_VolumeAdjuster_Winchell at Findlay.xlsm	EBL			130	130 60		50 11				118 600			40	70	110		600 650
NoBuild_VolumeAdjuster_Winchell at Findlay.xlsm	EBT	100	100	160	150 196	1750	115 19	0 2650	115 12	5 190	200 2650	2700		130	140	180	190 25	500 2550
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Adimeter Corned de cot	Tues	AM29	AM49	Adjuster Spread		DY49 AM:	Existing 201		AM29 AM49	Adjusted Forecast Tai		DV40	Notes on minimum overrides	AM29		Balanced Fore		
Adjuster Spreadsheet  NoBuild VolumeAdjuster Winchell at Findlay.xlsm	Turn			PM29 PM	49 0729		19 PM19	35 550		PM29 PM49 50	DY29 60 660	DY49 710		40	50 F	M29 PM4		750
NoBuild VolumeAdjuster Winchell at Findlay.xlsm	WBT			30	30 42		20	50 650		50	60 650	700		30	40	60		700
NoBuild VolumeAdjuster Winchell at Findlay.xlsm	NBI			50	50 80		55	45 800		50	60 800	850		60	70	50		850
NoBuild VolumeAdjuster Winchell at Findlay.xlsm	NBT	Г 320	330	440	440 523	5330	215	355 4550	320 330	440 4	450 5230	5330		350	360	470		5400
NoBuild_VolumeAdjuster_Winchell at Findlay.xlsm	NBF	10	10	10	10 4	30	5	5 50	7 17	7	17 50	100		10	20	10	20 50	100
NoBuild_VolumeAdjuster_Winchell at Harrison.xlsm	EBT	Г 110	100	120	110 156	1440	70	75 1100	110 120	120 1	130 1560	1610	)	120	150	110	140 1650	1800
NoBuild_VolumeAdjuster_Winchell at Harrison.xlsm	WBT				70 99		35	75 1100			90 1100	1150		60	70	80		1200
NoBuild_VolumeAdjuster_Winchell at Harrison.xlsm	NBI		80		80 80		25	30 150			100 800	850		100	130	100		800
NoBuild_VolumeAdjuster_Winchell at Harrison.xlsm	NBF				20 24		5 15	10 250		20	30 250 50 250	300	<u> </u>	30	40	20		350
NoBuild_VolumeAdjuster_Winchell at Liberty.xlsm  NoBuild VolumeAdjuster Winchell at Liberty.xlsm	EBI				40 <u>25</u> 510 602		13	30 250 255 3900		70	50 250 510 6020	300 6440		20 440	460	520	230	300 6300
NoBuild VolumeAdjuster Winchell at Liberty.xism	WBF				290 305			235 2750			300 3050	3170		170	180	320		3400
NoBuild VolumeAdjuster Winchell at Liberty.xlsm	WBI				180 206			210 2500			220 2500	2550	<u> </u>	170	180	220		2750
NoBuild VolumeAdjuster Winchell at Liberty.xlsm	NBI		80		50 99		55	30 750	80 90	50	60 990	1040		90	100	50		1100
NoBuild_VolumeAdjuster_Winchell at Liberty.xlsm	NBT	Г 190	180	140	140 246	2270	170	140 2400	190 200	140 1	150 2460	2510		230	230	160	160 2400	2650
NoBuild_VolumeAdjuster_Winchell at Liberty.xlsm	NBF	₹ 90	90	120	120 122	1230	70	90 1100	90 100	120 1	130 1220	1270	D .	90	100	120	130 1250	1300
Misc Ramps Alternative NoBuild.xlsm	NB I-75 South of Buttermilk Pike	5349			6552 7636			850 72550	5349 6241	5615 65		89102		5810	6800	5810		88100
Misc Ramps Alternative NoBuild.xlsm	SB I-75 South of Buttermilk Pike	5208			8556 8329			79600	5208 6111		556 83296	97736	<u> </u>	5460	6470	7550		96850
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Exit to Buttermilk Pike	925			891 1178		000	775 12400			12400	12960		930	1020	810		13000
Misc Ramps Alternative NoBuild.xlsm Misc Ramps Alternative NoBuild.xlsm	SB I-75 Entrance from Buttermilk Pike NB I-75 Entrance from WB Buttermilk Pike	832 429			1184 1230 448 374			960 12200 405 3750	832 925 429 439		184 12307 455 3750	13683 3800		830 380	930 390	1070 420		13650 3850
Misc Ramps Alternative NoBuild.xism	NB I-75 Entrance from EB Buttermilk Pike	119			171 597			140 5250	299 309		309 5971	6021	<u> </u>	300	310	300		6100
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance from Buttermilk Pike	586			648 988			545 9000	586 596		668 9886	9936		680	700	720		9950
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to Buttermilk Pike	617	623	801	809 870	8791	570	740 8850	617 627	801 8	811 8850	8900		620	630	800	810 8900	9000
Misc Ramps Alternative NoBuild.xlsm	NB I-75 North of Buttermilk Pike	5433			6367 7433			620 69150	5433 6275	5513 63		85851	<u> </u>	5560	6480	5720		85050
Misc Ramps Alternative NoBuild.xlsm	SB I-75 North of Buttermilk Pike	5311			8256 7966			76250	5311 6183	7092 82		92740		5250	6170	7280		92200
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Exit to Dixie Highway	450			493 478			305 3800	450 525		493 4785	5584		420	640	370		5650
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Entrance from Dixie Highway	315 755			446 431 621 784			415 4450 490 6800	315 325 755 765	l	453 4450	4500 7895		310 790	330	430		4700 8700
Misc Ramps Alternative NoBuild.xlsm Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance from Dixie Highway  SB I-75 Exit to Dixie Highway	288			695 567			545 5200			632 7845 695 5678	6024		310	820 330	700 720		6400
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Exit to Kyle's Lane	366			734 664			460 5000	366 399		734 6649	7250		390	580	650		7450
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Entrance from Kyle's Lane	394			552 518			460 4850	394 404		552 5187	5294		410	430	530		5500
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance from Kyle's Lane	880	969	575	633 661	7282	835	545 6900	880 969	575 6	6900	7282		970	1110	610	650 7450	7650
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to Kyle's Lane	714	729	783	800 758	7 7750	620	680 7250	714 729	783 8	800 7587	7750	)	680	690	880	910 7750	7900
Misc Ramps Alternative NoBuild.xlsm	NB I-75 North of Kyle's Lane	5844			6394 7752			890 74050	5844 6636		394 77522	88022	2	6510	7190	6010		88300
Misc Ramps Alternative NoBuild.xlsm	SB I-75 North of Kyle's Lane	5311	6132		8665 8378			79400	5311 6132		665 83789	96741		5520	6430	7920		96300
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Exit to 12th Street	327			619 671			495 5650	336 346 446 456		657 6712 792 7222	6762	<u> </u>	380	400	630		6900
Misc Ramps Alternative NoBuild.xlsm Misc Ramps Alternative NoBuild.xlsm	SB I-75 Entrance from 12th Street  NB I-75 Exit to 5th Street	446 529			792 722 423 566			600 6150 400 6000	529 539		792 7222 425 6000	7382 6050		360 590	440 600	810 440		8100 6850
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Entrance from Bullock Street	388			1049 644			930 6850	388 423		049 6850	7022		420	460	1070		7450
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance from Pike Street	1219			710 940			465 7550	1219 1358		710 9404	10475		1350	1810	790		12350
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to Bullock Street	357	370	693	717 649	6723	330	640 6600	357 370	693 7	717 6600	6723	3	340	350	640	670 6450	6500
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to 5th Street	462	444	490	472 734	7069	400	425 7000	462 472	490 5	7342	7392	2	560	580	690	720 8700	8800
Misc Ramps Alternative NoBuild.xlsm	WB Exit from 4th to Bullock Street	268			991 542		200	965 6350	285 295		991 6350	6400		400	440	970		7200
Misc Ramps Alternative NoBuild.xlsm	EB Exit from Crescent Ave to Bullock Street	325			325 390			160 2050	325 335		346 3909	3959		370	400	320		4250
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to WB 5th St	382 114			593 713 82 119		265 135	425 5450	382 392 135 145		95 7134 95 1550	7184 1600	<u> </u>	420 140	440 140	610		7200
Misc Ramps Alternative NoBuild.xlsm Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to EB 5th St WB US-50 Exit to Linn Street	520			82 119 427 535			0 1550 165 2550	135 145 520 582		95 1550 427 5356	5994		560	620	380		1600 6100
Misc Ramps Alternative NoBuild.xlsm	EB US-50 Entrance from Linn Street	127			441 297			405 3350	149 159		441 3350	3400	<u> </u>	170	190	420		3600
Misc Ramps Alternative NoBuild.xlsm	WB US-50	1241			3189 2086		995 2	425 18400	1241 1308		189 20860	21997		1170	1220	2910		20700
Misc Ramps Alternative NoBuild.xlsm	EB US-50	3894		2382	2518 2488	26313	3115 1	.905 21900	3894 4117	2382 25	518 24889	26313	3	3630	3860	2310	2390 24450 2	25600
Misc Ramps Alternative NoBuild.xlsm	WB US-50 Exit to Gest Street	290			138 198			225 3950			235 3950	4000		350	400	220		4100
Misc Ramps Alternative NoBuild.xlsm	WB Entrance from 6th Street to US-50	395			1409 578			560 2900			194 5784	6633		460	570	1190		8100
Misc Ramps Alternative NoBuild.xlsm	NB I-71 to WB US 50	933			1525 1255			470 13700			525 13700	13750		980	1010	1520		14150
Misc Ramps Alternative NoBuild xlsm	NB I-75 to US 50 EB US 50 to KY	555 717			723 654 850 733			785 8300 745 7200			795 8300 850 7336	8350 7470		640 760	660 780	800 870		8650 7850
Misc Ramps Alternative NoBuild.xlsm Misc Ramps Alternative NoBuild.xlsm	US-50 to EB I-71	1929			1478 1368			.325 13850			478 13850	14048	<u> </u>	2060	2150	1490		7850 14800
Misc Ramps Alternative NoBuild.xism	US 50 to 2nd Street	326			115 148		220	65 1100			115 1484	1773	<u> </u>	330	400	90		1950
Misc Ramps Alternative NoBuild.xlsm	EB US-50 Exit to 5th Street	884			294 408			175 3100			294 4085	4732	<u> </u>	650	720	280		4600
Misc Ramps Alternative NoBuild.xlsm	EB 8th Street Exit to Gest Street	10			10 14	1 141	20	20 300	20 30	20	30 300	350		20	30	20	30 250	300
Misc Ramps Alternative NoBuild.xlsm	EB 8th Street Entrance from Gest Street	200			171 181		75	50 750			171 1814	2335	<u> </u>	200	250	140	160 2050	2500
Misc Ramps Alternative NoBuild.xlsm	WB US-50	2025			2837 2646			375 27750				28328	<u> </u>	2060	2240	2710		29500
Misc Ramps Alternative NoBuild.xlsm	SB I-71	2134			3752 3262			795 31750	2134 2382			36425		2180	2460	3430		38000
Misc Ramps Alternative NoBuild vlem	SB I-71 to BSB	1748			3191 2997			365 28700	1748 1930			33100	<u> </u>	1740	1940	2880		32700
Misc Ramps Alternative NoBuild.xlsm Misc Ramps Alternative NoBuild.xlsm	NB I-71 from BSB NB I-71	2546 2855			2349 2906 2538 3228			.660 27650 .900 31950	2546 2930 2855 3226			33447 36475		2400 2840	2800 3230	1980 2280		31000 35350
Misc Ramps Alternative NoBuild.xlsm	EB US-50	2066			3109 2425			860 27400	2066 2169			27450		2060	2180	3010		27600
Misc Ramps Alternative NoBuild.xlsm	NB BSB	6858			6599 7372			285 80000			599 80000	85377		6890	8000	5730		86900
Misc Ramps Alternative NoBuild.xlsm	SB BSB	5623			8418 8385			0000 80000			418 83854	95930	<u> </u>	5640	6460	7370	8450 83850 9	96050
Misc Ramps Alternative NoBuild.xlsm	SB Exit to 2nd Street	1349			523 650		970	330 5150	1172 1335		523 6509	7415	<u> </u>	1320	1490	420		7450
Misc Ramps Alternative NoBuild.xlsm	NB Exit to 2nd Street	185			506 428			305 3700			506 4285	5583		230	260	350		5400
Misc Ramps Alternative NoBuild.xlsm	3rd to KY	321			1097 732			650 5900				9055		360	390	910		8550
Misc Ramps Alternative NoBuild vlem	NB 4th Street Entrance	619			2172 1135			900 5850				12832	<u> </u>	660	760	1700		13150
Misc Ramps Alternative NoBuild.xlsm Misc Ramps Alternative NoBuild.xlsm	NB Exit to 5th Street SB Exit to 5th Street	440 546			234 341 217 327			220 4100 230 4350	480 510 589 623		234 4100 240 4350	4150 4400		390 500	400 510	230		4000 4150
Misc Ramps Alternative NoBuild.xlsm	SB I-75 to EB I-71	2493			3526 3070			100 31700		3303 35		32775		2500	2610	3310		31950
Misc Ramps Alternative NoBuild.xlsm	SB Exit to 7th St	1674			185 754			105 5500			387 7542	8824		1580	1820	380		9100
Misc Ramps Alternative NoBuild.xlsm	9th Street Exit to SB I-75	206			1039 474			505 3300			039 4744	6170		250	270	800		6700
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			Д	Adjuster Spr	eadsheet Targ	et		Existi	ing 2019 Volu	umes			Adjusted Fo	recast Tar	gets		Notes on minimum overrides			Bal	lanced Fored	casts		
Adjuster Spreadsheet	Turn	AM29 AM	/149 I	PM29	PM49 D'	/29 D	Y49 A	M19	PM19 A	AADT19	AM29	AM49	PM29	PM49	DY29	DY49	)	AM29	AM49	PM29	.9 PM4	9 D'	Y29 [	DY49
Misc Ramps Alternative NoBuild.xlsm	Entrance from 6th to Winchell	126	156	688	853	3046	3774	105	575	2800	152	162	548	6	79 3	046	3774	18	0 1	190	610	700	3650	4400
Misc Ramps Alternative NoBuild.xlsm	9th to Winchell	282	325	820	946	5300	6115	220	640	4550	282	325	820	9	46 5	300	6115	36	0 4	430	850	940	5800	6850
Misc Ramps Alternative NoBuild.xlsm	NB C-D to NB I-75	1998	2333	3701	4320	30126	35168	1420	2630	23550	1998	2333	3701	43	20 30	126	35168	213	0 24	460	3840	4390	30600	36150
Misc Ramps Alternative NoBuild.xlsm	Western Avenue Exit to SB I-75	187	189	258	261	1698	1717	290	400	2900	290	300	306	3	16 2	900	2950	22	0 2	240	280	290	2850	2900
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance from Winchell	245	284	848	982	5118	5930	185	640	4250	256	284	848	9	82 5	118	5930	27	0 3	300	830	930	5300	6300
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to Freeman Avenue	362	384	224	238	3946	4193	550	340	6600	550	560	340	3	50 6	600	6650	61	0 6	630	340	360	6550	6750
Misc Ramps Alternative NoBuild.xlsm	NB Freeman Avenue Entrance to NB I-75	518	546	544	573	6990	7368	495	520	7350	518	546	544	5	73 7	350	7400	54	0 5	570	600	630	7550	7750
Misc Ramps Alternative NoBuild.xlsm	NB I-75 North of Ezzard	6120	7072	7290	8424	77511	89563	5125	6105	71400	6120	7072	7290	84	24 77	511	89563	617	0 72	210	7640	8790	77400	88050
Misc Ramps Alternative NoBuild.xlsm	SB I-75 North of Ezzard	6401	7361	4416	5078	69704	80155	5965	4115	71450	6401	7361	4416	50	78 71	450	80155	676	0 77	750	4830	5550	72000	81950
Misc Ramps Alternative NoBuild.xlsm	NB Entrance from Winchell (N of Ezz)	118	133	263	297	2247	2536	110	245	2300	118	133	263	3 2	97 2	300	2536	12	0 1	130	270	300	2300	2550
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to Western Avenue (N of Ezz)	804	876	467	509	4587	4998	430	250	2700	804	876	467	7 5	09 4	587	4998	71	0 7	730	320	370	4500	4950
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to Western Avenue (N of Findlay)	706	725	942	967	7974	8187	600	800	7450	706	725	942	9	67 7	974	8187	70	0 7	750	910	960	8550	8950
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance from Bank	362	352	516	502	6938	6743	330	470	6950	362	372	516	5 5	26 6	950	7000	40	0 4	410	560	570	7550	7650
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Entrance from WHV	613	636	264	274	5035	5216	720	310	6500	720	730	310	3	20 6	500	6550	72	0 7	740	330	340	6600	6650
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Exit to WHV	434	460	1095	1163	8506	9033	285	720	6150	434	460	1095	11	63 8	506	9033	43	0 4	440	1070	1150	8500	8750
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance from WHV	830	853	517	531	9615	9875	530	330	6750	830	853	517	5	31 9	615	9875	86	0 8	870	540	550	9650	10000
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance North of WHV	1153	1160	1073	1079	16700	16793	860	800	13700	1153	1163	1073	10	83 16	700	16793	126	0 12	280	1100	1120	17200	17650
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to WHV	331	333	892	898	7849	7903	230	620	6000	392	402	892	9	02 7	849	7903	39	0 4	400	900	920	7700	7850
Misc Ramps Alternative NoBuild.xlsm	NB I-75 North of WHV	7129	8129	7889	8996	87447	99716	5810	6430	81250	7129	8129	7889	89	96 87	447	99716	712	0 81	180	7940	9060	88400	99500
Misc Ramps Alternative NoBuild.xlsm	SB I-75 North of WHV	7850	8863	6607	7459	85843	96926	6505	5475	81100	7850	8863	6607	74.	59 85	843	96926	784	0 88	890	6630	7460	86150	97050
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Entrance from EB Hopple Street	1113	1262	424	481	7021	7962	735	280	5100	1113	1262	424	4	81 7	021	7962	111	0 12	260	430	490	7000	7950
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Exit to Hopple Street	837	875	1022	1069	10459	10943	520	635	7150	837	875	1022	10	69 10	459	10943	86	0 9	900	1040	1090	10650	11050
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Entrance from WB Hopple Street	278	304	213	233	3597	3945	235	180	3350	278	304	213	3 2	33 3	597	3945	28	0 3	310	220	240	3650	4000
Misc Ramps Alternative NoBuild.xlsm	NB I-75 Entrance from Hopple	808	853	1079	1139	10794	11396	745	995	10950	808	853	1079	11	39 10	950	11396	82	0 8	860	1090	1150	11000	11400
Misc Ramps Alternative NoBuild.xlsm	SB I-75 Exit to Hopple Street	841	866	846	871	10258	10561	880	885	11800	880	890	885	8	95 11	800	11850	88	0 8	890	890	900	11800	11850
Misc Ramps Alternative NoBuild.xlsm	NB I-75 North of Hopple	6033	6963	6608	7628	76817	88667	5290	5795	74100	6033	6963	6608	76	28 76	817	88667	626	0 72	280	6900	7970	77750	88450
Misc Ramps Alternative NoBuild.xlsm	SB I-75 North of Hopple	7082	7921	6513	7285	84752	94795	6415	5900	84450	7082	7921	6513	72	85 84	752	94795	733	0 82	210	6870	7630	87300	96950
Misc Ramps Alternative NoBuild.xlsm	Pike Street Turnaround	226	208	161	148	1787	1643				226	236	161	1	71 1	787	1837	25	0 2	260	180	190	1950	2000

# **Appendix F: IMS Addendum Traffic Operations Analysis**



BRENT SPENCE BRIDGE CORRIDOR PROJECT

# IMS ADDENDUM: TRAFFIC OPERATIONS ANALYSIS

DECEMBER 8, 2023



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## **APPENDICES**

Appendix A: TransModeler Calibration Report

Appendix B: No Build – Level of Service

Appendix C: Selected Alternative I – Level of Service

Appendix D: Refined Alternative I (Concept I-W) – Level of Service



#### 1. INTRODUCTION

The purpose of this *Interchange Modification Study (IMS) Addendum Traffic Operations Analysis* is to update the original *Access Point Request (August 2011)*<sup>1</sup> for the Brent Spence Bridge (BSB) Corridor Project. The original document presented various design and performance criteria for the preferred alternative at that time (named Alternative I) to substantiate that the proposed changes in access to the interstate system would not degrade the operation or safety when compared to the existing conditions and was approved by the Federal Highway Administration (FHWA) on November 3, 2011. This design was approved in the 2012 Environmental Assessment/ Finding of No Significant Impact (EA/FONSI) and is referred to as the Selected Alternative I.

This report provides information relative to design and traffic analysis performed since 2012, which led to the identification of several value engineering refinements to Selected Alternative I. Throughout this document, these collective refinements incorporated into Selected Alternative I are referred to as Refined Alternative I (Concept I-W). This addendum will assist the Kentucky Transportation Cabinet (KYTC), the Ohio Department of Transportation (ODOT), and FHWA in assessing the differences in impacts on traffic operations between the No Build and Refined Alternative I (Concept I-W) and between Selected Alternative I (from the 2012 EA/FONSI) and Refined Alternative I (Concept I-W). The analysis will provide the justification and documentation necessary to substantiate that the refinements incorporated into Refined Alternative I (Concept I-W) will result in acceptable traffic operations and will not degrade traffic operations compared to the existing interstate system.

#### 2. TRAFFIC OPERATIONS STUDY AREA

The BSB Project Area is shown in **Figure 1**. The study area incorporates the highway corridors shown in blue and labeled as the Project Corridor - interstate I-71 and I-75 corridors, including geospatial data for the bridge crossing, and a portion of US 50 West and US 50 East (along I-71, east of I-75). The southern limit of the project corridor is approximately 5,000 feet south of the Dixie Highway interchange on I-71/I-75 in Fort Mitchell at Kentucky milepost 188.0. The northern boundary of the project corridor is about 1,500 feet north of the Western Hills Viaduct (WHV) Interchange on I-75 in Cincinnati at Ohio milepost 2.5. The eastern and western limits of the project corridor follow the existing alignment of I-75, a major throughway for local and regional mobility within the Greater Cincinnati/Northern Kentucky region. Locally, I-75 connects to I-71, I-74, I-275, and US Route 50. The BSB provides an interstate connection carrying I-71 and I-75 over the Ohio River, providing a critical link along the national I-75 corridor stretching from Florida to Michigan.

<sup>&</sup>lt;sup>1</sup> AccessPointRequest-Aug.2011.pdf (brentspencebridgecorridor.com)



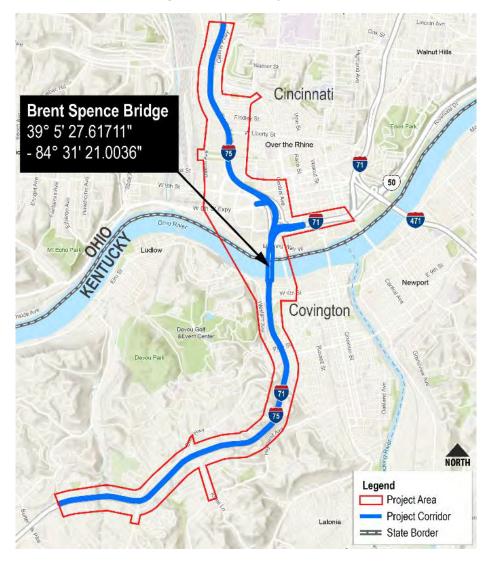


Figure 1: BSB Project Area

The limits of the TransModeler analysis are shown in **Figure 2**, which extends further along the I-71/ I-75 corridor than the BSB project corridor to include the I-275 Interchange on the south and the I-74/I-75 Interchange on the north. The model consists of mainline, ramps, and ramp terminal intersections. The traffic operations analysis study area does not use the full TransModeler limits but instead includes the first adjacent interchange beyond the BSB project corridor to include Buttermilk Pike to the south of the US 25/Dixie Highway interchange and Hopple Street to the north of the WHV interchange.





Figure 2: TransModeler Project Limits



#### 3. PROJECT BACKGROUND

On October 14, 2004, KYTC and ODOT recognized the need to improve the BSB corridor. They formally agreed to jointly develop and deliver a project to replace the existing BSB over the Ohio River. Key characteristics of the BSB corridor are described below:

- The corridor comprises 7.8 miles of I-71 and I-75, located within portions of Ohio and Kentucky.
- The BSB carries both I-71 and I-75 over the Ohio River.
- The BSB opened in 1963 and was initially designed to carry 80,000 vehicles per day (VPD) with current traffic volumes of 160,000 VPD.

#### 3.1 Existing Conditions

The BSB was not designed to accommodate the current or future daily traffic volume. The design of the I-71 and I-75 facilities does not meet current design standards for numerous features, including lane widths, shoulder widths, horizontal and vertical clearances, left-hand entrances and exits, and horizontal and vertical geometry. For these reasons, the BSB project corridor experiences design deficiency and congestion-related crashes.

#### 3.2 Purpose and Need

The BSB Project will improve the operational characteristics within the I-75 corridor for both local and through traffic. In the Greater Cincinnati/Northern Kentucky region, the I-75 corridor suffers from congestion and safety–related issues due to inadequate capacity to accommodate current traffic demand.

The purpose of the BSB Corridor Project is unchanged from what was presented in the approved 2012 EA/FONSI:

- Improve traffic flow and level of service;
- Improve safety;
- Correct geometric deficiencies; and
- Maintain connections to critical regional and national transportation corridors.

# 3.3 Traffic Operations Analysis in the 2011 Study

The Access Point Request (August 2011) contains a section that compares the capacity of freeway segments in the No Build and Build scenarios. The OKI travel demand model and current traffic count data were used to develop traffic projections for the No Build alternative and the Selected Alternative I in the 2035 design year. The traffic analyses used certified traffic, and capacity analyses were performed using Highway Capacity Software (HCS+) version 5.4. It should be noted that the roadway system for the No Build and build conditions are uniquely different, with the build condition having C-D roadways, no mainline left-hand exits, no drop lanes,



fewer weaves, and lane balance throughout the project. There are left-hand exits to local streets from the C-D roads, most notably the left-hand exit from the SB C-D on the BSB to Fifth St. in Kentucky in Refined Alternative I (Concept I-W). As a result, it may be challenging to compare the no-build and build conditions at every location directly. However, in summary, the analysis from the 2011 study showed a significant improvement in the level of service (LOS) for Selected Alternative I compared to the No Build. Most of the LOS segments that remained for Selected Alternative I are at the external points of the network, where the improvements tie into the existing roadway. The freeway analysis presented in the 2011 IMS is summarized in Section 3.3.1 and Section 3.3.2. LOS thresholds are defined by the Highway Capacity Manual (HCM)). KYTC and ODOT recognize LOS D or better as the goal for urban freeway mainlines. LOS E and LOS F indicate higher freeway densities and traffic delays.

#### 3.3.1 Kentucky

Eighteen freeway segments were analyzed along the No Build alternative in Kentucky. During the AM peak period, six freeway segments operated at LOS E, while two segments operated at LOS F. During the PM peak period, 11 freeway segments operated at LOS E, while three operated at LOS F.

#### Kentucky LOS F Segments in the AM Peak

- I-71/I-75 NB between Buttermilk Pike merge & Dixie Highway diverge
- I-71/I-75 NB between Pike St. merge & KY 4th St. Merge

#### Kentucky LOS F Segments in the PM Peak

- I-71/I-75 SB between BSB & KY 5th diverge
- I-71/I-75 SB between KY 12th St. merge & Kyles Lane diverge
- I-71/I-75 NB between Buttermilk Pike merge & Dixie Highway diverge

Twenty-one freeway segments were analyzed along the Selected Alternative I in Kentucky. During the AM peak period, three freeway segments operated at LOS E, while two segments operated at LOS F. During the PM peak period, five freeway segments operated at LOS E, while four operated at LOS F.

#### Kentucky LOS F Segments in the AM Peak

- I-71/I-75 SB between Buttermilk Pike merge & Kyles-Dixie CD diverge
- I-71/I-75 NB between Kyles-Dixie CD diverge & Kyles-Dixie CD diverge

#### Kentucky LOS F Segments in the PM Peak

- I-71/I-75 SB between Kyles-Dixie CD diverge & Kyles-Dixie CD merge
- I-71/I-75 SB between Buttermilk Pike diverge & Buttermilk Pike merge
- I-71/I-75 SB between Buttermilk Pike merge & Kyles-Dixie CD diverge
- I-71/I-75 NB between Kyles-Dixie CD diverge & Kyles-Dixie CD diverge

#### 3.3.2 Ohio

Sixty-nine freeway segments were analyzed along the No Build alternative in Ohio. During the AM peak period, six freeway segments operated at LOS E, while five segments operated at LOS F. During the PM peak period, seven freeway segments operated at LOS E, while seven operated at LOS F.



#### Ohio LOS F Segments in the AM Peak

- I-75 SB between Hopple St. merge & Western Hills Viaduct (WHV) diverge
- I-71 NB between US 50 diverge & OH 2nd St. merge
- I-71 NB between I-471 merge & Gilbert Ave. merge
- I-75 SB between I-74 merge & Hopple St. diverge
- I-75 SB between Hopple St. diverge, and Hopple St. merge

#### Ohio LOS F Segments in the PM Peak

- I-75 SB between OH 6th St. merge & I-71 SB merge
- I-71 SB between Reading Rd./Dorchester Ave. merge & I-471 diverge
- I-71 SB between OH 3rd St. diverge & US 50 merge
- I-71 SB between OH 3rd St. merge & I-75 SB merge
- I-71/I-75 SB between I-75 SB merge & OH 5th St. diverge
- I-75 NB between Winchell Ave./Ezzard Charles Dr. merge & WHV diverge
- I-75 NB between WHV merge & Hopple St. diverge

Fifty-five freeway segments were analyzed along the Selected Alternative I in Ohio. During the AM peak period, six freeway segments operated at LOS E, while two segments operated at LOS F. During the PM peak period, one of the freeway segments operated at LOS E, while two segments operated at LOS F.

#### Ohio LOS F Segments in the AM Peak

- I-71 NB between US 50 diverge & OH 2nd St. merge
- I-71 NB between I-471 merge & Gilbert Ave. merge

#### Ohio LOS F Segments in the PM Peak

- I-71 SB between Reading Rd./Dorchester Ave. merge & I-471 diverge
- I-71 SB between OH 3rd St. diverge & US 50 merge

#### 3.3.3 Summary

Projects that add capacity to an Interstate System typically have less than desirable LOS at the project limits, where the expanded number of lanes within the proposed project is reduced to connect to the existing number of lanes. Such areas are in the Selected Alternative I at the following locations:

- I-71/I-75 south of US 25/Dixie Highway (Kentucky)
- I-71 east of the I-75/I-71 Interchange (Ohio)

For both states, the existing freeway system experiences periods of congestion in various locations due to inadequate capacity for existing traffic volumes. The proposed project adds additional freeway lanes, collector-distributor (C-D) roadways, and service roads to gather, distribute, and move traffic that would otherwise be forced to use exclusively high-speed mainline freeway lanes. Additional roadways and freeway lanes should eliminate congestion and reduce crashes. Where congestion existed on the existing freeway system, it was caused by the lack of freeway lanes, not by the lack of capacity within the local street network to receive exiting traffic from the freeway. With the addition of C-D lanes and additional freeway lanes, the freeway system will



be vastly improved over the No Build alternative in the design year, and the local street network will still be able to receive all exiting traffic from the freeway without being overcapacity as concluded from the HCS analysis.

#### 4. TRAFFIC ANALYSIS METHODOLOGY

The traffic operations analysis for this IMS addendum is evaluated using TransModeler traffic microsimulation modeling. The TransModeler models were developed following guidelines from the *ODOT Analysis and Traffic Simulation Manual: Traffic Simulation with TransModeler*<sup>2</sup>, *KYTC Microsimulation Guidelines*<sup>3</sup>, FHWA Traffic Analysis Toolbox Volume III: Guidelines for Applying Microsimulation Modeling Software (2019 update)<sup>4</sup>, and agreed upon calibration methodologies outlined in the BSB Traffic Methods and Assumption Memorandum. The Existing 2019 model was calibrated for 6-10 AM and 2-7 PM periods. The model duration and calibration parameters were maintained for the future year modeling. The future 2049 modeling is completed for a No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). The methodology for each of these models is described in the sections below.

#### 4.1 Existing (2019) Calibration

The Existing 2019 model development procedures are outlined below. The TransModeler Calibration report includes the full details of the process and results, which are included in **Appendix A**.

#### 2019 Existing Calibration Approach

- 1) Existing Model Network Development:
  - a. Started with the Existing 2019 model prepared for the BSB value engineering study in 2022. This model was modified from a model developed by Caliper in 2020 for the Connected Autonomous Vehicle (CAV) analysis. During the development of the value engineering model, the link grades were reviewed and updated to be consistent with the criteria outlined in the OATS manual.
  - b. The TransModeler network was adjusted to match the IMS limits.
  - c. Minor calibration adjustments were included from the value engineering model with changes to the local headway buffers.
  - d. Models are developed with TransModeler 6.1.
- 2) Cluster Analysis
  - a. A cluster analysis was completed using methodologies agreed upon by all stakeholders to determine a primary cluster for each peak period with a corresponding representative day.
  - b. Data inputs include:
    - i. I-71/I-75 Travel times collected by INRIX and available through the National Performance Management Research Data Set (NPMRDS)

<sup>&</sup>lt;sup>4</sup> https://ops.fhwa.dot.gov/publications/fhwahop18036/fhwahop18036.pdf



<sup>&</sup>lt;sup>2</sup> https://www.transportation.ohio.gov/working/engineering/roadway/studies-access-management/oats

<sup>&</sup>lt;sup>3</sup> https://transportation.ky.gov/Planning/Documents/KYTC%20Microsimulation%20Guidelines.pdf

- ii. Volume throughput on BSB
- iii. Precipitation
- iv. Crashes
- c. Analysis timeframe is May 28, 2019, to October 25, 2019
- 3) Volume Development
  - a. As part of the value engineering study completed in 2022, the following steps were completed:
    - i. Traffic counts from 2017 2021 were reviewed for the project corridor, and count target volume values were selected.
    - ii. The selected traffic volumes were inputs in an origin-destination (O-D) matrix estimation.
    - iii. Model periods were defined as 6:00-10:00 AM and 2:00-7:00 PM on a weekday to capture the full extent of peak period travel delays. Each model also includes a 30-minute warmup.
    - iv. Existing O-D matrices were developed for three vehicle classes in 15-minute bins.
      - 1. Autos
      - 2. Single Unit Trucks
      - 3. Articulated Trucks
    - v. Project-specific vehicle fleet information was developed for the project using traffic counts and recommendations from ODOT and KYTC manuals.
  - b. For the IMS calibration update, the BSB throughput volume was established using the representative day identified in the cluster analysis. The O-D matrices were modified from the models created in 2022 to achieve travel time and volume throughput calibration targets.
  - c. The volumes used for the Existing 2019 TransModeler calibration were also used to establish balanced peak hour volumes used within the certified traffic process to forecast opening year and design year traffic volumes.
- 4) Existing Model Calibration
  - a. Cluster analysis was used to identify a representative day.
  - b. The calibration methodology agreed upon by all stakeholders uses two measures of effectiveness (MOEs):
    - i. I-71/I-75 travel time
    - ii. BSB vehicle throughput



#### 4.2 Alternative Evaluation

#### 4.2.1 Model Overview

The year 2049 models were developed for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) using TransModeler. These models have the same model limits, calibration parameters, and periods as the 2019 Existing calibrated model. The LOS for signalized intersections and freeway mainline segments are reported for the peak hour for each site and summarized in **Appendix B** (No Build), **Appendix C** (Selected Alternative I), and **Appendix D** (Refined Alternative I (Concept I-W)). Intersection LOS is based on travel delay, while the mainline LOS is based on roadway densities measured in passenger car equivalents per mile per lane. The LOS scale defined by the Highway Capacity Manual 6<sup>th</sup> Edition for intersections and mainlines is summarized in the tables below. The target LOS for this project is LOS D or better for freeways, D or better for intersections, and E or better for intersection approaches.

**Table 1: Intersection Level of Service Scale** 

LOS	Signalized I	ntersections	Unsignalized	Intersections
	Low Delay (s)	High Delay (s)	Low Delay (s)	High Delay (s)
LOS A	0	10	0	10
LOS B	10	20	10	15
LOSC	20	35	15	25
LOS D	35	55	25	35
LOS E	55	80	35	50
LOS F	80	-	50	

**Table 2: Freeway Level of Service Scale** 

		reeway nents		Diverge Segments	Weave Freeway Segments				
LOS	Low Density	High Density	Low Density	High Density	Low Density	High Density			
LOS A	0	11	0	10	0	10			
LOS B	12	18	11	20	11	20			
LOS C	19	26	21	28	21	28			
LOS D	27	35	29	35	29	35			
LOS E	36	45	36	45	36	43			
LOS F	46	-	46	-	44	-			

Travel time metrics are reported for the I-71/I-75 corridor following guidelines from the FHWA TAT III alternative analysis guidelines. Each model's number of run requirements is checked to ensure the 95% confidence interval is achieved. **Section 4.3** provides additional details of this process.

The models are developed to consider roadway grades and design exceptions where applicable. The traffic signal timings are optimized to accommodate traffic demand within the project limits. Most arterial roadways have coordinated signals, with many of the signals in Cincinnati and Covington using pre-timed signals. The TransModeler assumes actuated traffic signals for some arterial intersections and many ramp terminal intersections outside downtown Cincinnati and Covington. Final traffic control recommendations will be evaluated in the final design. Turn lane storage recommendations are developed using ODOT's storage length calculations and 2049 certified traffic forecasts.

A KYTC project for the I-71/I-75/I-275 Interchange<sup>5</sup> is currently in development. This project covers the southern extent of the BSB TransModeler limits. It is anticipated to be a significant bottleneck for the BSB corridor if the project still needs to be completed in 2049. A preliminary TransModeler analysis was conducted with the build alternatives and the existing condition between Buttermilk Pike and I-275. The study indicated significant queuing in the PM peak for SB I-71/I-75. In the AM peak, the queueing develops NB and prevents the full traffic demand from reaching the study limits. To account for the impacts of this project, the BSB model includes the current recommended configuration for I-71/I-75 between I-275 and Buttermilk Pike Interchange, including interchange reconfiguration of Buttermilk Pike Interchange. This improvement alleviates the southern traffic bottleneck, allowing the full forecasted traffic demand to reach the study area facilities. Results in this report reflect the removal of this bottleneck; external delays south of Dixie Hwy are expected if the I-71/I-75/I-275 project is not implemented. Additional analysis details for the southern terminus are included in **Section 5.3.3**. The assumed geometric modifications for the I-71/I-75 corridor at the southern terminus of the project

<sup>&</sup>lt;sup>5</sup> I-71/I-75 and I-275 Interchange Project Website: <a href="https://www.75275interchange.org/">https://www.75275interchange.org/</a>



Traffic Operations Analysis

are summarized in **Figure 3**. The BSB corridor design tapers the mainline lanes between Dixie Hwy and Kyles Lane to match existing conditions.

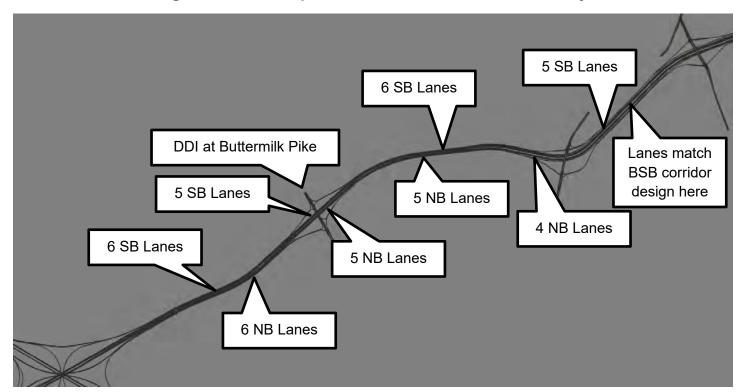


Figure 3: I-71/I-75 Improvements between I-275 and Dixie Hwy

#### 4.2.2 Traffic Demand

Certified Traffic forecasts were developed for 2049 AM and PM design hour volumes. The Existing calibrated TransModeler model represents 6-10 AM and 2-7 PM peak periods. To ensure the models are consistent with the certified design hour volumes and the calibrated 2019 model, the project team created proportioning factors to convert the certified traffic into 15-minute bins that blend data from the calibrated 2019 models and the certified traffic forecasts. This procedure results in 15-minute origin-destination matrices in three vehicle classifications used as inputs for the TransModeler analysis. The process follows these three steps to derive O-D matrices for each of the 2049 model scenarios:

- 1) Origin-Destination Matrix Estimation (ODME) was completed for the 1-hour AM and PM design hour traffic. The ODME uses the OKI travel demand model as a pattern O-D matrix. The outcome of this step is a 1-hour O-D matrix (auto and truck classifications) for the AM peak and one for the PM peak that replicates the forecasted traffic volumes at the roadway link and turn movements. The peak hours are 7:30-8:30 AM and 4:30-5:30 PM.
- 2) The 1-hour matrices are then proportioned into 15-minute loading matrices based on the traffic loading proportions from the Existing calibrated TransModeler models. The 15-minute proportions are shown in **Figure 4** (AM) and **Figure 5** (PM).



3) The truck matrices are then divided into single-unit (SU) and multi-unit (MU) classes using origin and destination proportions from the Existing calibrated TransModeler network. The final SU and MU truck matrices are derived using Fratar Factoring.

The result of the ODME is TransModeler traffic inputs consistent with the certified traffic volumes, OKI travel demand model, and temporal distributions from the Existing calibrated TransModeler model.

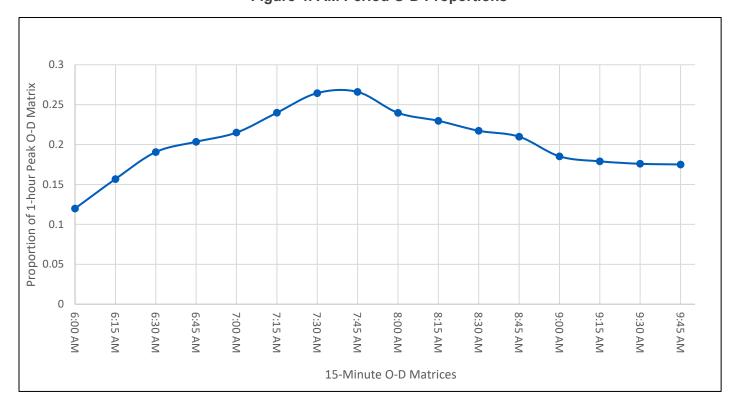


Figure 4: AM Period O-D Proportions

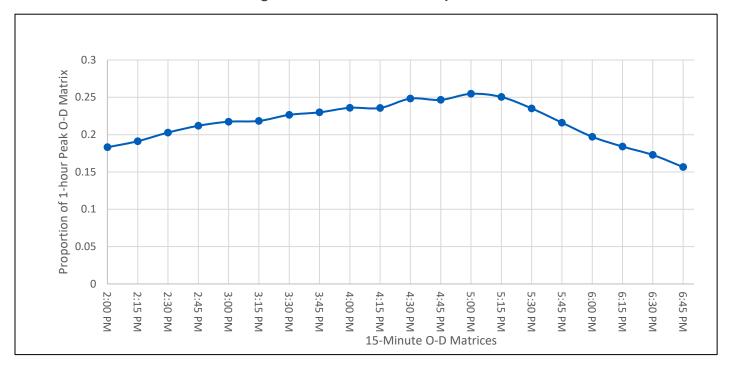


Figure 5: PM Period O-D Proportions

#### 4.3 Required Number of Model Runs

The ODOT and KYTC microsimulation guidelines recommend the use of ten model runs. FHWA TAT III 2019 provides guidelines for calculating the number of model runs based on field and model data. The agreed-upon approach for this project is to use an initial set of ten runs and then confirm that ten runs achieve a 95% confidence interval. The following steps are applied for each peak period model scenario.

The minimum number of model runs is calculated using this formula:

$$N_{min} = (\frac{t_{n-1,95\%}s}{e\bar{x}})^2$$

 $N_{min}$ : Required number of model runs

*n* : Number of initial model runs (10 runs)

 $\bar{x}$ , s : Mean and standard deviation of the initial runs

 $t_{n-1.95\%}$ : t statistic for n-1 degrees of freedom and 95% confidence level

e : Tolerance error



The initial model replications (runs) are performed with random number seeds to prepare an initial output Measures of Effectiveness (MOEs) set. TAT III guidelines recommend performing four initial model runs, but ten initial runs were chosen to be consistent with state guidelines.

Tolerance error, e, is calculated for each MOE using the two (non-adjacent) critical periods,  $t_1$  and  $t_2$ , for that measure. The maximum of the two calculated values is set as the tolerance error. The following formula is used to calculate the tolerance error:

$$e = \frac{t_{n-1,95\%}(\frac{s}{\sqrt{n}})}{\bar{x}}$$

e : Tolerance error

*n* : Number of field observations (days of the primary cluster)  $\bar{x}$ , s : Mean and standard deviation of the critical time for the MOE.  $t_{n-1,95\%}$  : t statistic for n-1 degrees of freedom and 95% confidence level

PM

The minimum number of required model runs is calculated using the  $N_{\text{min}}$  formula, for all measures of interest. The minimum number of model runs (replications) is the maximum of the calculated  $N_{\text{min}}$  for all MOEs. **Table 3** presents the minimum number of required model runs for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W), considering each measure of interest separately. The measure of interest includes the BSB volume throughput (NB and SB) and I-71/I-75 travel time (NB and SB). These four metrics are used for the existing model calibration.

Measure of Interest **Alternative Peak BSB Volume BSB Volume** I-71/I-75 TT I-71/I-75 TT Northbound Southbound Northbound Southbound AM 1.2 0.5 0.6 < 0.1 No Build PΜ 0.6 0.7 4.0 15.3 AM 1.2 0.2 < 0.1 < 0.1 Selected Alternative I PM 0.7 0.6 <0.1 < 0.1 AM 0.2 0.5 <0.1 <0.1 Refined Alternative I

**Table 3: Minimum Number of Runs** 

The results presented above show that the ten initial model runs are sufficient to meet the minimum number of run requirements (the required number of runs in Table 3 is less than the ten initial runs), and no additional model replications are needed for Selected Alternative I, Refined Alternative I (Concept (I-W)), and No Build (AM only). The No Build minimum number of run calculations indicates that 16 runs are needed for the PM peak. The results presented in this report use the average of ten model runs for all scenarios except for the No Build PM period, which uses 16 runs.

0.7

0.6

< 0.1



(Concept I-W)

< 0.1

### 4.4 Test Differences in Alternative Analysis: Statistical Hypothesis Testing

One of the main objectives of this IMS addendum is to demonstrate that the Refined Alternative I (Concept I-W) has acceptable operations and does not show poorer operations than the No Build and Selected Alternative I. This objective is evaluated using a statistical hypothesis testing that assesses the I-71/I-75 travel times for the alternatives. The average performance measures for the two alternatives,  $x_1$  and  $x_2$ , are calculated to reflect the frequency of each travel condition using the weighted average formula shown below:

$$\bar{x}_j = \frac{\sum_{i=1}^C (x_i * n_i)}{\sum n_i}$$

Where:

 $\bar{x}_j$ : Weighted average of measure for alternative j

i: Cluster ID

C: Total number of clusters

 $x_i$ : Average performance measure estimate across all random number runs (i.e.,  $N_{\min}$ ) for Cluster i

 $n_i$ : Number of days in Cluster i

$$s_j^2 = \frac{\sum_{i=1}^{C} (x_i * \bar{x}_j)^2}{C}$$

 $s_i^2$  = Variance of measure for alternative j

Pooled variance:

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{(n_1 + n_2 - 2)}$$

$$t_{calculated} = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{s_p^2(\frac{1}{n_1} + \frac{1}{n_2})}}$$

Hypothesis test:

Null hypothesis,  $H_0$ :  $\mu_1 \ge \mu_2$ 

Alternative hypothesis,  $H_1$ :  $\mu_1 < \mu_2$ 

if  $t_{calculated} \le t_{n_1+n_2-2,95\%}$ , reject H<sub>0</sub> and accept H<sub>A</sub>. Otherwise, we do not have enough evidence to reject H<sub>0</sub>.



Four hypothesis tests will be completed in **Section 5.4.3** to compare the peak direction travel times for Refined Alternative I (Concept I-W) compared to Selected Alternative I and Refined Alternative I (Concept I-W) to No Build. The peak travel directions are NB I-71/I-75 in the AM peak period and SB I-71/I-75 in the PM peak period.

#### 5. TRAFFIC OPERATIONS ANALYSIS

The traffic operational comparison for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) is based on traffic simulation analyses performed using Caliper's TransModeler platform. Travel time and LOS metrics are reported for intersections and the freeway mainline segments. The analysis focuses on AM and PM peak period operations for the 2049 design year. The corridor-wide operational results for the No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) are discussed in this section. LOS Schematics for total intersection LOS and freeway segments are summarized in **Appendix B**, **Appendix C**, and **Appendix D**. The report includes tabular summaries of intersection LOS for all scenarios and approach LOS for Refined Alternative I (Concept I-W).

The traffic operations analysis aims to demonstrate acceptable traffic operations for Refined Alternative I (Concept I-W). The No Build and previous preferred Alternative (Selected Alternative I) are evaluated for comparison purposes. The No Build and Selected Alternative I are not modified geometrically based on operational needs. However, signal timing adjustments are applied where appropriate.

#### 5.1 No Build Operational Results

The No Build model is a no-BSB Project scenario. It does have one difference compared to the Existing 2019 model with implementing the Pike Street turnaround project that removes the NB 4<sup>th</sup> Street Entrance ramp in Covington. The No Build includes the I-275 Interchange improvements assumed for Selected Alternative I and Refined Alternative I (Concept I-W).

#### 5.1.1 AM Peak Period

Inbound Cincinnati traffic is the primary source of traffic delays in the AM Period, with significant traffic delays for NB I-71/75 in Kentucky and SB I-75 north of the BSB. Screen captures from the No Build TransModeler capture the extent of these traffic delays at 8:00 AM.



NB traffic delays impacting SB frontage road

Figure 6: No Build AM Peak – Kentucky

SB I-75 traffic queues upstream of BSB

Figure 7: No Build AM Peak - Ohio

As shown by the model screen captures, the No Build experiences excessive traffic delays and queues, which cause gridlock conditions for most of the corridor model.

#### 5.1.2 PM Peak Period

Outbound Cincinnati traffic in the PM peak is the primary source of delays in the 2019 condition. For 2049 No Build, the traffic delays occurred for both directions of freeway traffic, with significant queues impacting the local roadways as shown in the screen captures from No Build TransModeler taken at 5:00 PM.



Traffic delays for both travel directions

Figure 8: No Build PM Peak – Kentucky



SB I-75 traffic queues upstream of BSB

Figure 9: No Build PM Peak - Ohio

Like the AM condition, the PM experiences excessive traffic delays in the PM period with gridlock conditions for both freeway mainline and ramp terminal intersections.

#### 5.1.3 No Build Summary

The 2049 No Build has severe traffic congestion throughout the project study area. The capacity constraint at the Brent Spence Bridge is the main factor for unacceptable traffic delays in Kentucky and Ohio. The level of service schematics is provided in **Appendix B**. Due to these existing capacity constraints, the total forecasted traffic demand cannot be served in the No Build condition.

#### 5.2 Selected Alternative I Operational Results

Selected Alternative I increases the number of travel lanes on the I-71 and I-75 mainlines and adds a C-D road system to reduce the number of ramp conflict points on the main freeway facility. These improvements significantly reduce peak-period traffic delays. Selected Alternative I has lane recommendations optimized based on forecasts developed for the 2011 IMS. The forecasts have changed since the previous IMS, and the lane recommendations are no longer optimal for all movements. Therefore, some local facilities experience poor LOS due to the disconnect between geometric recommendations and traffic forecasts. However, the modeling still provides a valuable comparison for Refined Alternative I (Concept I-W), especially for the freeway system.

#### 5.2.1 AM Peak Period

For the existing condition, inbound Cincinnati traffic is the primary source of traffic delays in the AM Period, with significant traffic delays for NB I-71/75 in Kentucky and SB I-75 north of the BSB. The proposed freeway capacity improvements reduce these traffic delays for Selected Alternative I. TransModeler screen captures of the AM peak are shown below. One problem area observed with Selected Alternative I is the traffic delays associated with the 4<sup>th</sup> Street traffic trying to access the entrance ramp in Kentucky, as shown in **Figure 10**. The traffic demand for this movement is reduced in Refined Alternative I (Concept I-W) due to access modifications, which reduce the traffic congestion on 4<sup>th</sup> Street. Note that the model links at the network's edge are artificially extended beyond adjacent intersections to capture the extent of traffic queueing.



Figure 10: Selected Alternative I AM Peak – Kentucky

Another area of poor operations is US-50 entering the study limits. This movement has traffic delays for No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). The Refined Alternative I (Concept I-W) section covers additional discussion on these operations.

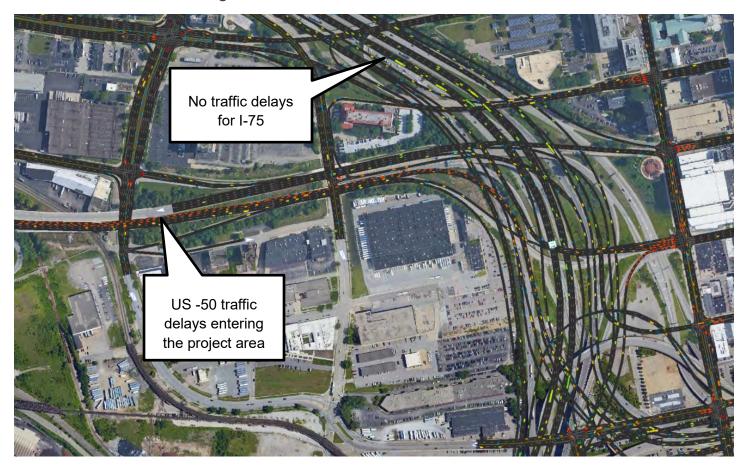


Figure 11: Selected Alternative I AM Peak - Ohio

#### 5.2.2 PM Peak Period

For the existing condition, outbound Cincinnati traffic is the primary source of delays in the PM period, with significant traffic delays for SB I-71/75 in Kentucky and Ohio. These traffic delays are removed for Selected Alternative I with the proposed freeway capacity improvements. TransModeler screen captures for the PM peak are shown below. Some operational issues still exist, including 4<sup>th</sup> Street in Kentucky (like the AM peak) and the intersection at Freeman Avenue and Gest Street, which was impacted by access modifications. Freeman Avenue and Gest Street intersection are anticipated to operate acceptably with Refined Alternative I (Concept I-W) due to lower forecast traffic demand related to freeway access differences.

Figure 12: Selected Alternative I PM Peak – Kentucky



Figure 13: Selected Alternative I PM Peak - Ohio





#### 5.2.3 Selected Alternative I Summary

Selected Alternative I alleviates traffic delays on the I-71/I-75 freeway, which are present in the existing conditions and significantly increased in the No Build. Some remaining operational concerns exist on the arterial roadways and external freeway segments outside the project's scope. The project team did not evaluate improvements to the arterial locations beyond traffic timing adjustments. The Selected Alternative I geometry was recommended based on traffic forecasts approved for the 2011 IMS. The updated traffic forecasts for Selected Alternative I indicate that design changes could be investigated. However, reevaluating the Selected Alternative I geometry does not align with the IMS addendum's purpose.

#### 5.3 Refined Alternative I (Concept I-W) Operational Results

#### 5.3.1 AM Peak Period

For the existing condition, inbound Cincinnati traffic is the primary source of traffic delays in the AM Period, with significant traffic delays for NB I-71/75 in Kentucky and SB I-75 north of the BSB. Like Selected Alternative I, these traffic delays are reduced for Refined Alternative I (Concept I-W) with the proposed freeway capacity improvements. TransModeler screen captures of the AM peak are shown below in **Figure 14** and **Figure 15**.

The US-50 EB traffic experiences travel delays like Selected Alternative I, with insufficient roadway capacity for the one lane ramp of US-50 EB to I-71. The I-71 eastern project limits are constrained and limit the expansion of this ramp to two-lanes. It is recommended that the design-build team evaluate the feasibility of design modifications that would reduce the US 50 queueing and minimize travel delays for this movement as part of the final design. If design modifications are not feasible, advanced queue warning signs can be implemented to encourage alternative paths and reduce the risk of rear-end crashes in the horizon year. The operations of US-50 EB are consistent with the No Build and Selected Alternative I and does not present a degradation of the existing freeway system.

The other noteworthy change with Refined Alternative I (Concept I-W) is the ramp modifications in downtown Cincinnati. These changes include the removal of the SB I-75 exit ramp to 5<sup>th</sup> Street. With this ramp removed, additional traffic utilizes the 7<sup>th</sup> Street and 2<sup>nd</sup> Street ramps, with the highest traffic demand in the AM peak period. As modeled in TransModeler, these ramps and ramp terminal intersections operate with an acceptable level of service.



No traffic delays on I-71/I-75

Figure 14: Refined Alternative I (Concept I-W) AM Peak – Kentucky



No traffic delays for I-75

US -50 traffic delays entering the project area

Figure 15: Refined Alternative I (Concept I-W) AM Peak - Ohio

# 5.3.2 PM Peak Period

For the existing condition, outbound Cincinnati traffic is the primary source of delays in the PM period, with significant traffic delays for SB I-71/75 in Kentucky and Ohio. Like Selected Alternative I, these traffic delays are removed with the proposed freeway improvements for Refined Alternative I (Concept I-W). TransModeler screen captures for the PM peak are shown in **Figure 16** and **Figure 17**. One of the notable differences between Selected Alternative I and Refined Alternative I (Concept I-W) is the removal of the 4<sup>th</sup> Street entrance ramp in Ohio and the proposed 3<sup>rd</sup> Street (east of Central) entrance ramp. This change in access impacts how traffic accesses NB I-75 from downtown Cincinnati. The modeling indicates that 3rd Street and Central Avenue intersections maintain acceptable traffic operations with traffic pattern changes.

An additional operation condition in all scenarios is the 5% grade on I-71/I-75 between 12<sup>th</sup> Street and Kyles Lanes. As shown in the TransModeler image in **Figure 16**, vehicles climbing the hill have reduced speeds. Still, these reduced speeds are isolated and do not impact the overall operations of the freeway system.



Speeds are reduced on segment with 5% grade, but acceptable operations are maintained

Figure 16: Refined Alternative I (Concept I-W) PM Peak – Kentucky

Downtown Intersections with acceptable operations

No traffic delays for I-75

Figure 17: Refined Alternative I (Concept I-W) PM Peak - Ohio

## 5.3.3 I-71/I-75 Southern Terminus

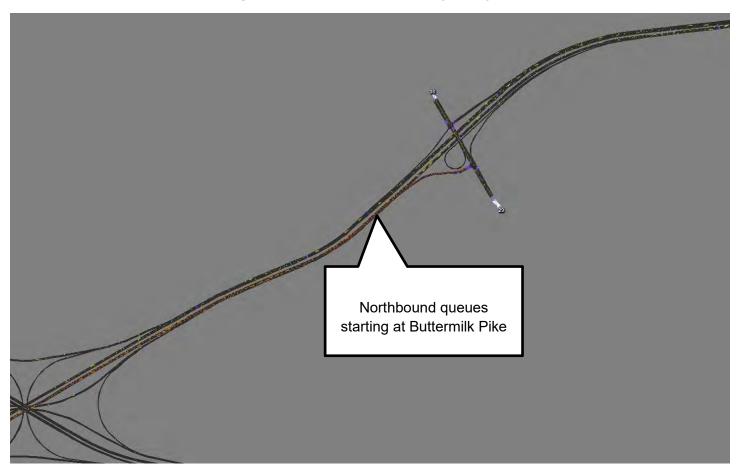
The 2049 operations analysis assumes the completion of the I-275 project. An additional sensitivity analysis was completed to evaluate the impact of an incomplete I-275 project on the I-71/I-75 corridor. The I-275 project is anticipated to be built between 2027 and 2035, pending funding authorization by the KY General Assembly. A BSB opening day analysis using the AM and PM 2029 certified traffic volumes was evaluated with TransModeler using existing roadway geometry on I-71/-75 at the southern project terminus. Overall, the operations are acceptable for I-71/I-75 during the opening year, except for minor queuing during the PM peak at Buttermilk Pike, as shown in **Figure 18**.

Minor travel delays

Figure 18: PM 2029 Opening Year Analysis

The same design scenario was also tested using 2049 volumes; this is a worst-case scenario as the I-275 project is anticipated to be completed before 2049. With 2049 traffic, there is more significant queueing, as shown in **Figure 19** (AM Peak) and **Figure 20** (PM Peak). The PM peak is the most significant for the BSB corridor, with traffic slowdowns between Buttermilk Pike and 12<sup>th</sup> Street in Kentucky. The AM Northbound queues extend beyond the I-275 Interchange.

Figure 19: AM 2049 – Sensitivity Analysis



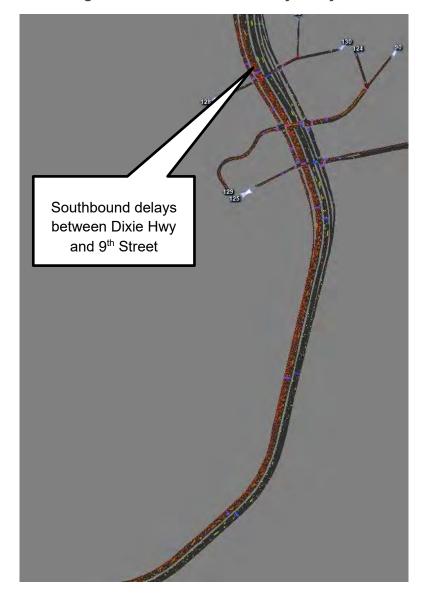


Figure 20: PM 2049 - Sensitivity Analysis

# 5.3.4 Refined Alternative I (Concept I-W) Summary

Like Selected Alternative I, Refined Alternative I (Concept I-W) alleviates traffic delays on the I-71/I-75 freeway, which are present in the existing conditions. The ramp terminal intersections have acceptable traffic operations. External constraints still exist for Refined Alternative I (Concept I-W), including traffic delays for US 50, I-71 east of the limits, and I-71/I-75 south of Dixie Hwy (modeling assumes this project is completed). Overall, the TransModeler analysis indicates that Refined Alternative I (Concept I-W) achieves the purpose and need statement of improved traffic operations and passes the evaluation criteria that it does not degrade the operations compared to Selected Alternative I.



# **5.4 Alternative Comparison**

**Section 5.3** presented a visual review of the TransModeler models, demonstrating the operational characteristics of the No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). This section summarizes the I-71/I-75 travel time, BSB throughput, intersection LOS, and freeway LOS for the model scenarios and includes a reference to results from the 2019 Existing calibrated model. A null hypothesis test was completed to evaluate the travel time improvements for Refined Alternative I (Concept I-W) compared to the No Build and Refined Alternative I (Concept I-W) compared to the Selected Alternative I.

### 5.4.1 I-71/I75 Travel Time

The I-71/I-75 travel times are measured for northbound and southbound directions between the I-275 and I-74 interchanges. This roadway segment is approximately 10.5 miles. In the AM peak period, the NB direction is the peak for existing conditions, which experiences a peak travel time of 25 minutes. For the 2049 No Build conditions, this travel time increases to 43 minutes and does not recover during the peak period. Both Selected Alternative I and Refined Alternative I (Concept I-W) have free flow travel times of about 12 minutes throughout the peak period.

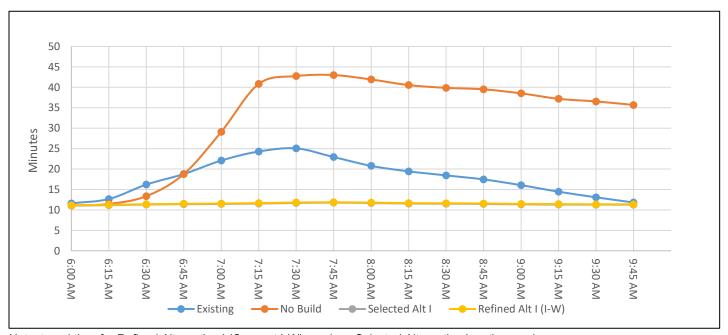


Figure 21: NB I-71/I-75 Travel Time – AM Period

Note: travel time for Refined Alternative I (Concept I-W) overlaps Selected Alternative I on the graph

SB I-71/75 is the off-peak direction during the AM peak hour. The existing model shows free flow travel times in 2019 and maintains the free flow condition for Selected Alternative I and Refined Alternative I (Concept I-W). This differs from the 2049 No Build, which experiences peak travel times of over 35 minutes.



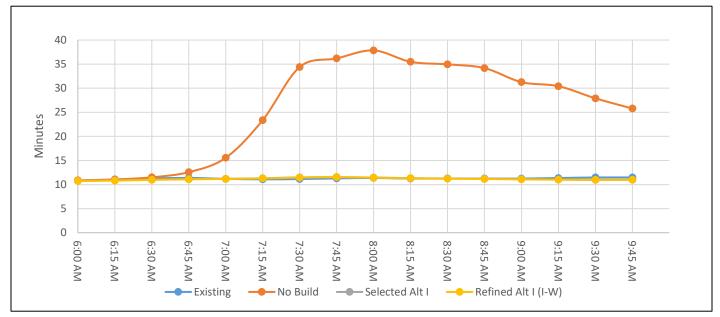


Figure 22: SB I-71/I-75 Travel Time - AM Period

Note: travel time for Refined Alternative I (Concept I-W) overlaps Selected Alternative I and Existing on the graph

In the PM peak, NB I-71/75 is the off-peak direction with free flow travel times for Existing 2019, which are maintained for 2049 Selected Alternative I and Refined Alternative I (Concept I-W). In contrast, 2049 No Build has travel times greater than 25 minutes through most of the peak period.

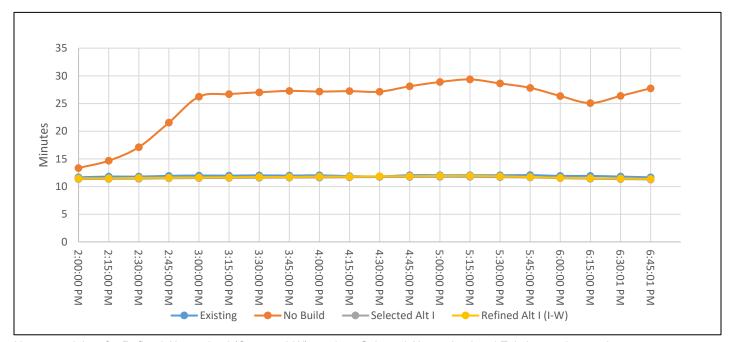


Figure 23: NB I-71/I-75 Travel Time - PM Period

Note: travel time for Refined Alternative I (Concept I-W) overlaps Selected Alternative I and Existing on the graph



SB I-71/I-75 is the peak direction for the PM peak period. The existing 2019 model shows travel times are greater than 20 minutes for multiple hours in the period. This traffic congestion increases with the No Build condition and has travel times greater than 50 minutes for most of the peak period. Selected Alternative I and Refined Alternative I (Concept I-W) maintain free flow conditions for the peak period.



Figure 24: SB I-71/I-75 Travel Time - PM Period

Note: travel time for Refined Alternative I (Concept I-W) overlaps Selected Alternative I on the graph

# 5.4.2 Brent Spence Bridge and Companion Bridge Throughput

The BSB is an I-71/I-75 corridor traffic bottleneck for the existing condition. A comparison of the traffic throughput (BSB and Companion Bridge) for 2019 Existing, 2049 No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) is summarized in the following figures. As is shown in these figures, the BSB throughput for Selected Alternative I and Refined Alternative I (Concept I-W) are very similar, with no observed capacity constraint. Some of the minor differences in volume are related to access differences that affect the BSB traffic forecasts. In contrast, the existing condition experiences capacity constraints in the peak directions due to severe queuing. It only serves part of the BSB traffic demand for AM and PM peak travel directions.

Figure 25: Northbound BSB Traffic Throughput – AM Period

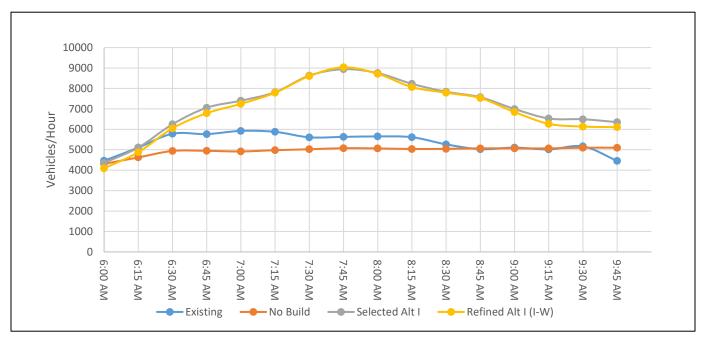


Figure 26: Southbound BSB Traffic Throughput – AM Period

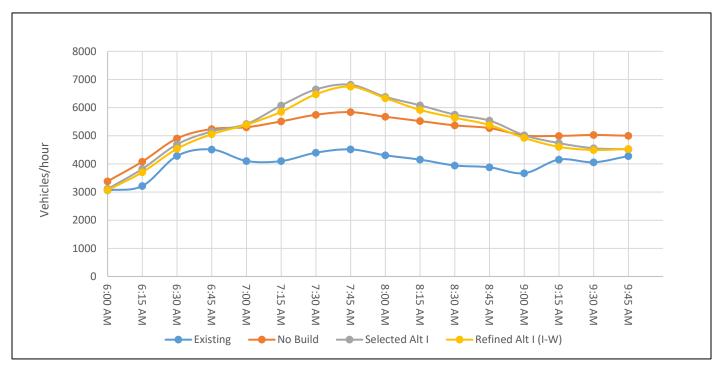


Figure 27: Southbound BSB Traffic Throughput - PM Period

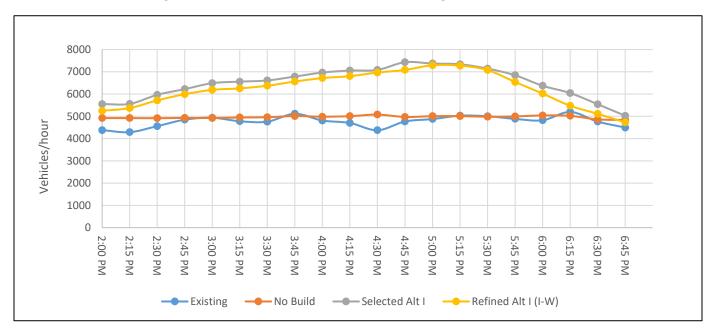
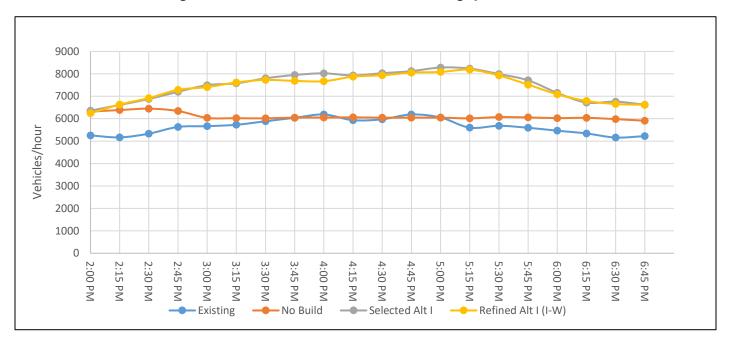


Figure 28: Southbound BSB Traffic Throughput - PM Period



# 5.4.3 Hypothesis Testing for I-71/I-75 Travel Time

**Section 4.4** describes the hypothesis testing and compares the critical measures of interest for the design alternatives. These critical measures are travel time in the NB direction for the AM peak and travel time in the SB direction for the PM peak. The results comparing Refined Alternative I (Concept I-W) to Selected Alternative I are presented in **Table 4** (AM) and **Table 5** (PM).

Table 4: Alternative Analysis for Travel Time NB in AM Peak (Refined Alt I (I-W) - Selected Alt I)

	Refined Alternative I (Concept I-W)	Selected Alternative I				
Number of Runs	10	10				
Travel Time Mean	11.5357	11.4380				
Travel Time Variance	0.0001	0.0001				
Pooled Variance	0.0001					
t <sub>(n1 + n2 - 2),</sub> 95%	2.1009					
t <sub>calculated</sub>	19.5808					
Hypothesis	H <sub>0</sub> : µ <sub>1</sub> ≤ µ <sub>2</sub> , H <sub>A</sub> : µ <sub>1</sub> > µ <sub>2</sub>					
Conclusion	We reject H₀					

Table 5: Alternative Analysis for Travel Time SB in PM Peak (Refined Alt I (I-W) – Selected Alt I)

	Refined Alternative I (Concept I-W)	Selected Alternative I			
Number of Runs	10	10			
Travel Time Mean	11.4087	11.5097			
Travel Time Variance	0.0004	0.0001			
Pooled Variance	0.0003				
t <sub>(n1 + n2 - 2),</sub> 95%	2.1009				
t calculated	-14.0565				
Hypothesis	$H_0$ : $\mu_1 \le \mu_2$ , $H_A$ : $\mu_1 > \mu_2$				
Conclusion	We do not have sufficient evidence to reject H <sub>0</sub>				

The conclusion of the hypothesis test for the AM model shows that we reject the null hypothesis that the travel time for Refined Alternative I (Concept I-W) is lower than or equal to the travel time for Selected Alternative I.



Therefore, the travel time for Refined Alternative I (Concept I-W) is higher than Selected Alternative I for the AM peak direction.

As for the PM model, the hypothesis test indicates we do not have sufficient evidence to reject the null hypothesis that the travel time for Refined Alternative I (Concept I-W) is lower than or equal to the travel time for Selected Alternative I. Therefore, we conclude that the travel time for Refined Alternative I (Concept I-W) is lower than Selected Alternative I for the PM peak direction.

The findings of the alternatives analysis led to the conclusion that Refined Alternative I (Concept I-W) and Selected Alternative I provide comparable freeway travel conditions, with each alternative offering a slightly lower travel time for one peak direction. It is to be noted that the differences between the average travel time in Refined Alternative I (Concept I-W) and Selected Alternative I for AM and PM peak directions are six and five seconds, respectively.

Refined Alternative I (Concept I-W) is compared to the No Build. **Table 6** and **Table 7** below present the analysis results comparing Refined Alternative I (Concept I-W) to the No Build.

Table 6: Alternative Analysis for Travel Time NB in AM Peak (Refined Alt I (I-W) vs. No Build)

	Refined Alternative I (Concept I-W)	No Build			
Number of Runs	10	10			
Travel Time mean	11.5357	32.5110			
Travel Time Variance	0.0001	0.0198			
Pooled Variance	0.0100				
t <sub>(n1 + n2 - 2),</sub> 95%	2.1009				
t calculated	-469.7430				
Hypothesis	H <sub>0</sub> : µ <sub>1</sub> ≤ µ <sub>2</sub> , H <sub>A</sub> : µ <sub>1</sub> > µ <sub>2</sub>				
Conclusion	We do not have sufficient evidence to reject H				

Table 7: Alternative Analysis for Travel Time SB in PM Peak (Refined Alt I (I-W) vs. No Build)

	Refined Alternative I (Concept I-W)	No Build			
Number of Runs	10	16			
Travel Time mean	11.4087	48.6457			
Travel Time Variance	0.0004	7.5928			
Pooled Variance	4.7456				
t (n1 + n2 - 2), 95%	2.0639				
t calculated	-42.4035				
Hypothesis	$H_0$ : $\mu_1 \le \mu_2$ , $H_A$ : $\mu_1 > \mu_2$				
Conclusion	We do not have sufficient evidence to reject I				

The conclusion of hypothesis tests shows that we do not have sufficient evidence to reject the null hypothesis that the travel time for Refined Alternative I (Concept I-W) is lower than or equal to the travel time for the No Build. Therefore, we conclude that the travel time for Refined Alternative I (Concept I-W) is lower than the No Build.

# 5.4.4 Freeway Level of Service

TransModeler was used to measure the freeway level of service for the I-71, I-75, US 50, and C-D roads. The project study area was divided into HCS-defined segments, including diverges, merges, weaves, and basic segments. These segments and the resultant LOS for each scenario are summarized in the appendices. A high-level summary of the segments that fall within each LOS grade is outlined in **Table 8**.

Table 8: Freeway Segments by LOS Grade

Peak Period	LOS	2049 No Build	2049 Selected Alternative I	2049 Refined Alternative I (Concept I-W)
	C or better	35	61	62
AM	D	11	22	27
AIVI	E	2	4	1
	F	31	3	1
	C or better	19	62	57
PM -	D	10	18	25
F IVI	E	4	7	6
	F	46	3	3



The LOS results are like the travel time comparison with many segments in the No Build registering a LOS F. Selected Alternative I and Refined Alternative I (Concept I-W) have only a few segments in the LOS F and LOS E categories. The one AM and three PM LOS F segments for Refined Alternative I (Concept I-W) occur at external points of the project area, including US 50 to the west of I-71/I-75 and I-71 on the eastern project limits. All Refined Alternative I (Concept I-W) segments within the project area have LOS E or better.

### 5.4.5 Intersection Level of Service

The operations analysis for the IMS addendum includes 62 intersections. The operational goal is to have the intersections operate at LOS D or better. The results for each intersection are summarized in **Table 9** (Kentucky) and **Table 10** (Ohio). As shown in the tables, Refined Alternative I (Concept I-W) achieves the intersection LOS target for all intersections, except Philadelphia Street & 9<sup>th</sup> Street (LOS F), Bullock Street & 12<sup>th</sup> Street (LOS E), and Bullock Street & 12<sup>th</sup> Street (LOS E). These intersections are constrained to existing geometry due to right-of-way constraints. Philadelphia Street and 9<sup>th</sup> Street is a stop-controlled intersection adjacent to the ramp terminal intersection at 9<sup>th</sup> Street and Simon Kenton Street. This intersection is currently an all-way stop controlled. The TransModeler analysis assumed a one-way stop controlled on Philadelphia Street to prevent queueing between Philadelphia Street and Simon Kenton Street. The 12<sup>th</sup> and Bullock Street intersection is an all-way stop-controlled intersection in the existing conditions and is analyzed as a signalized intersection for the build alternatives. The 12<sup>th</sup> Street and Bullock Street intersection has a traffic signal for both the existing and future year conditions.

The No Build intersections experience poor operations, primarily due to the impact of freeway mainline congestion, which backs up into the ramp terminal intersections. However, some intersections in the No Build have better operations than the Build, resulting from traffic metering. Selected Alternative I has four intersections with LOS F, including the 4<sup>th</sup> Street intersections in Kentucky and the Freeman Avenue & Gest Street intersection.



Table 9: Intersection Level of Service - Kentucky

No Build	the state of the s		No Build	Selected Alt I	Refined Alt I (I-W)
	AM Perio	d		PM Period	
Α	В	С	Α	В	Α
С	С	С	В	В	В
Α	Α	С	В	В	С
С	В	В	С	С	С
С	В	С	С	С	С
Α	В	С	Α	В	В
D	С	С	С	С	В
С	F	В	С	F	В
F	D	С	Α	С	С
Α	Α	F	Α	Α	Α
Е	D	D	С	С	С
N/A	Α	D	N/A	В	В
В	С	D	В	F	С
С	F	С	С	E	С
F	С	D	Α	В	E
F	С	E	С	С	В
N/A	А	Α	N/A	Α	А
Α	Α	Α	Α	В	Α
Α	Α	Α	В	Α	Α
	Build  A C A C C A D C F A E N/A B C F N/A A	Build         Alt I           AM Period           A         B           C         C           A         A           C         B           C         B           A         B           D         C           F         D           A         A           E         D           N/A         A           B         C           C         F           F         C           N/A         A           A         A	Build         Alt I         Alt I (I-W)           AM Period         A         B         C           C         C         C         C           A         A         C         C           A         A         C         C           C         B         B         C           A         B         C         C           C         F         B         C           C         F         B         F           D         C         C         C           A         A         A         F           E         D         D         D           N/A         A         A         D           F         C         D         C           F         C         E         N/A           A         A         A         A	Build         Alt I (I-W)         No Build           AM Period           A         B         C         A           C         C         C         B           A         A         C         B           C         B         B         C           C         B         B         C           C         B         C         C           A         B         C         C           C         F         B         C           F         D         C         A           A         A         F         A           E         D         D         C           N/A         A         D         N/A           B         C         D         B           C         F         C         C           F         C         E         C           N/A         A         A         A	Build         Alt I           AM Period         PM Period           A         B         C         A         B           C         C         C         B         B           C         C         C         B         B           C         B         B         C         C           C         B         B         C         C           C         B         C         C         C           C         B         C         C         C           A         B         C         C         C         C           C         F         B         C         F         F           F         D         C         C         C         C           C         F         B         C         C         C           N/A         A         A         D         N/A         B         F           C         F         C         C         C         E         E         C         C         C           N/A         A         A         A         A         A         A         A

Table 10: Intersection Level of Service - Ohio

Intersection	No Build	Selected Alt I	Refined Alt I (I-W)	No Build	Selected Alt I	Refined Alt I (I-W)
		AM Period			PM Period	
Central Ave & 3rd St	D	С	D	F	Е	D
Central Ave & 4th St	В	С	В	D	D	В
Central Ave & 4th St	В	C	С	D	E	В
Central Ave & 6th St	В	C	A	D	D	С
Central Ave & 7th St	В	B	В	F	<u>В</u>	B
Central Ave & 7th St	В	В	В	F	В	С
Mound St & 9th St	A	A	A	A	A	A
US-42 & 3rd St	В	C	C	C	D	C
Gest St & 6th St	С	A	A	B	A	A
Elm St & 2nd St	В	В	В	A	A	В
Race St & 3rd St	A	A	В	D	B	С
Elm St & 3rd St	В	A	В	С	В	В
Elm St & 4th St	В	A	В	C	С	В
Plum St & 3rd St	F	<u></u> В	A	F	C	В
	В			E	С	A
Plum St & 4th St	С	A	A			
Linn St & 6th St		В	В	D	<u>В</u> В	В
Linn St & 8th St	В	В	В	В		В
Linn St & Court St	A	A	A	A	D	A
Linn St & Ezzard Charles Dr	D	C	С	C	C	С
Winchell Ave & Ezzard Charles	В	A	В	A	A	В
Freeman Ave & Gest St	С	D	С	В	F	В
Western Ave & Gest St	D	D	A	В	D	A
Western Ave & Ezzard Charles	A	A	A	A	A	A
Winchell Ave & Liberty St	В	Α	Α	В	В	В
Winchell Ave & Findlay St	В	В	В	В	В	В
Western Ave & Liberty St	В	В	В	В	В	В
Western Ave & Findlay St	В	В	В	В	В	В
Dalton Ave & Findlay St	В	С	В	С	С	С
Linn St & Bank St	Α	Α	Α	Α	Α	Α
Linn St & Central Pkwy	В	В	С	В	В	С
Brighton PI & Central Ave	Α	Α	Α	Α	Α	Α
Brighton PI & Central Pkwy	D	В	D	D	В	С
McMillian Ave & Central Pkwy	В	В	D	В	В	С
Colerain Ave & Harrison St	С	Α	Α	В	Α	Α
Patterson St & Harrison St	Е	Α	Α	Α	Α	Α
Winchell Ave & Bank St	С	С	С	С	С	С
Winchell Ave & Harrison St	Е	Α	Α	С	Α	Α
NB I-75 & WHV	N/A	В	В	N/A	В	В
Spring Grove Ave & Bank St	В	Α	Α	В	В	А
Spring Grove Ave & Harrison	В	Α	В	В	Α	В
SB I-75 & WHV	N/A	Α	В	N/A	Α	В
WHV Ramp & Harrison Street	N/A	Α	Α	N/A	Α	Α
NB I-75 & 5 <sup>th</sup> Street	N/A	N/A	В	N/A	N/A	В



With the focus of the IMS addendum to show the operational acceptability of Refined Alternative I (Concept I-W), additional details on the intersection operations are provided in **Table 11** and **Table 12**. These tables show the LOS by intersection approach. OATS manual states that the operation target for intersection approaches is LOS E or better. Most of the intersections achieve this target with a couple of exceptions. The exceptions include 12<sup>th</sup> Street & Bullock Street, Philadelphia Street & 9<sup>th</sup> Street, and Bullock Street & Pike Street. The ROW constraints limit the opportunity for future expansion. By design year 2049, some traffic is anticipated to seek alternative paths to minimize travel delays, which is true for the three intersection approaches with LOS F. The west approach of 12<sup>th</sup> Street serves a densely populated neighborhood with a narrow 2-lane street. 12<sup>th</sup> Street is a cut-through road to I-75 from US-25 (Pike Street), with freeway access north of 12<sup>th</sup> Street. With higher delays for the west approach at 12<sup>th</sup> Street in the PM peak, traffic is anticipated to stay on Pike Street to I-71/I-75. The travel conditions are reversed in the AM peak with Pike Street incurring higher traffic delays than 12<sup>th</sup> Street. Traffic balancing between these two approaches is anticipated to minimize the traffic delays at the two intersections.

Table 11: Kentucky Intersection Approach LOS – Refined Alternative I (Concept I-W)

Intersection		AM P	eriod			PM P	eriod	
	WB	EB	NB	SB	WB	EB	NB	SB
NB I-71/I-75 & Dixie Hwy	-	D	D	В	-	C	Α	Α
NB I-71/I-75 & Kyles Lane	-	O	D	В	•	C	Α	В
SB I-71/I-75 & Dixie Hwy	С	•	С	С	C	-	O	O
SB I-71/I-75 & Kyles Lane	С	•	В	В	C	-	В	O
Dixie Hwy & Kyles Lane	В	C	С	-	С	В	C	-
Main St & Pike St	С	C	-	Α	С	С	-	Α
5th St & Main St	-	C	В	С	-	C	D	Α
4th St & Main St	В	•	Α	D	В	-	С	В
Simon Kenton & 12th St	С	В	С	-	D	В	С	-
Philadelphia St & 9th St	F	Α	-	D	Α	Α	-	Α
Simon Kenton & Pike St	С	В	Е	-	С	В	В	-
Simon Kenton & 9th St	D	C	Е	-	С	D	В	-
Philadelphia & 5th St	-	D	В	С	-	C	C	В
Philadelphia & 4th St	D	-	С	С	В	-	Е	D
Bullock & 12th St	Α	C	-	Е	Α	F	-	D
Bullock & Pike St	Α	F	-	С	В	С	-	С
Bullock & 9th St	С	В	-	Α	С	С	-	Α
Crescent & 5th St	Α	-	Α	Α	С	-	Α	Α
Crescent & 4th St	Α	-	Α	Α	С	-	С	Α

Table 12: Ohio Intersection Approach LOS – Refined Alternative I (Concept I-W)

	AM Period				PM Period			
Intersection	WB	EB	NB	SB	WB	EB	NB	SB
Central Ave & 3rd St	D	С	С	D	D	D	D	D
Central Ave & 4th St	Α	-	Α	В	В	-	В	Α
Central Ave & 5th St	-	В	D	В	-	В	С	В
Central Ave & 6th St	В	-	Α	В	С	-	С	С
Central Ave & 7th St	-	В	В	-	-	В	Α	
Central Ave & 9th St	В	-	В	В	С	-	С	В
Mound St & 9th St	Α	-	-	Α	Α	-	-	В
US-42 & 3rd St	С	В	С	D	D	С	D	D
Gest St & 6th St	Α	-	Α	Α	Α	-	Α	Α
Elm St & 2nd St	-	Α	С	-	-	В	С	-
Race St & 3rd St	Α	-	-	С	С	-	-	С
Elm St & 3rd St	В	-	В	-	Α	-	D	-
Elm St & 4th St	Α	-	В	-	Α	-	В	-
Plum St & 3rd St	Α	-	-	С	Α	-	-	С
Plum St & 4th St	Α	-	-	Α	Α	-	-	Α
Linn St & 6th St	С	Α	С	С	В	Α	С	С
Linn St & 8th St	В	В	С	В	В	В	С	В
Linn St & Court St	Α	В	Α	Α	С	С	Α	Α
Linn St & Ezzard Charles Dr	С	С	С	С	С	С	С	D
Winchell Ave & Ezzard Charles	В	В	В	-	В	В	В	-
Freeman Ave & Gest St	В	С	С	С	В	В	В	С
Western Ave & Gest St	Α	Α	-	В	Α	Α	-	В
Western Ave & Ezzard Charles	В	Α	-	Α	В	Α	-	Α
Winchell Ave & Liberty St	Α	Α	В	-	В	Α	В	
Winchell Ave & Findlay St	Α	С	В	-	Α	С	В	-
Western Ave & Liberty St	В	Α	-	Α	В	В	-	В
Western Ave & Findlay St	Α	В	-	В	Α	В	-	В
Dalton Ave & Findlay St	В	C	В	В	C	C	C	C
Linn St & Bank St	-	Α	Α	Α	•	D	Α	Α
Linn St & Central Pkwy	Е	В	C	В	C	Α	C	В
Brighton PI & Central Ave	Α	Α	-	Α	Α	Α	-	Α
Brighton PI & Central Pkwy	Α	Е	Α	•	Α	D	Α	•
McMillian Ave & Central Pkwy	С	D	В	С	С	С	В	С
Colerain Ave & Harrison St	Α	Α	-	Α	Α	Α	-	Α
Patterson St & Harrison St	Α	Α	Α	•	Α	Α	Α	
Winchell Ave & Bank St	В	В	С	-	В	С	С	-
Winchell Ave & Harrison St	Α	Α	Α	-	Α	Α	Α	-
NB I-75 & WHV	-	В	В	-	-	С	Α	-
Spring Grove Ave & Bank St	Α	В	Α	Α	Α	В	В	Α
Spring Grove Ave & Harrison	В	В	Α	В	Α	В	С	В
SB I-75 & WHV	В	-	-	Α	Α	-	-	В
WHV Ramp & Harrison Street	Α	Α	-	Α	Α	Α	-	Α
NB I-75 & 5th Street	_	В	В	-	-	В	В	-

# 6. CONCLUSION

The purpose of this BSB IMS addendum traffic operations analysis is to show that the Refined Alternative I (Concept I-W) has acceptable traffic operations for the I-71 & I-75 freeway and adjacent ramp terminal intersections as compared to the No Build and Selected Alternative I. This conclusion can be made based on the TransModeler analysis. The Brent Spence Bridge capacity constraint is removed for both Selected Alternative I and Refined Alternative I (Concept I-W), which leads to free flow traffic conditions on the freeway mainline throughout the project area, a significant operational improvement compared to the No Build. Additionally, the design modification for Refined Alternative I (Concept I-W) results in acceptable traffic operations for the C-D roadway, ramp terminal intersections, and adjacent arterial streets. Some traffic delays occur at external network points, including US 50, I-71, and I-71/I-75; however, these delays are similar to those in the Selected Alternative I and No Build conditions. Overall, the Refined Alternative I (Concept I-W) achieves the operational goals of the project's purpose and need.

# **Appendix A: BSB TransModeler Calibration Report**



BRENT SPENCE BRIDGE CORRIDOR PROJECT

# TRANSMODELER CALIBRATION IMS ADDENDUM

APRIL 19, 2023





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# 1. INTRODUCTION

The Brent Spence Bridge Corridor consists of 7.8 total miles of I-71 and I-75 located within portions of Ohio and Kentucky. This Corridor is located within the Greater Cincinnati/Northern Kentucky region and is a major route for local and regional mobility. Locally, it connects to I-74, I-275 and US 50. The Brent Spence Bridge provides an interstate connection over the Ohio River and carries both I-71 and I-75 traffic. This Corridor is also one of the busiest trucking routes in the US, connecting Michigan to Florida via I-75.

Since 2013, there have been multiple traffic evaluation completed as part of the Brent Spence Bridge Corridor Study (BSBC) from 2013-2022 and the Brent Spence Strategic Corridor Study (Strategic Corridor) in 2017. A summary of these traffic evaluations is listed below:

- 2013-2015 (BSBC): Traffic Forecasting, Travel Demand Modeling, and Traffic operations analysis using HCS and VISSIM. The study focussed on the traffic impacts of tolling the BSB.
- 2017 (Strategic Corridor): Traffic count collection, Travel Demand Modeling, and Traffic Operations analysis with TransModeler. The study included the development and evaluation of the Brent Spence Bridge bypass concepts, including the Cincinnati Eastern Bypass.
- 2019-2020 (BSBC): TransModeler analysis of value engineering concepts; Concept I-W and Concept I-M were part of this study. The planning level evaluation was based on forecasted 2040 toll free traffic volumes developed for Alternative I in 2015. A detailed alternative analysis using the OKI travel demand model was not completed for this study.
- 2021-2022 (BSBC): Refined Alternative Level forecasts and TransModeler analysis was completed for Concept I-W and Alternative I. The TransModeler models were calibrated to standards outlined in the OATS manual. The findings of this study indicated Concept I-W had similar traffic operations to Alternative I and was moved forward as the preferred alternative.

Since the completion of the value engineering analysis in 2022, the project team has been coordinating with FHWA on the traffic analysis for the Interchange Modification Study (IMS) addendum. This addendum compares Alternative I to Alternative I-W. The traffic analysis includes certified traffic forecasts for 2029 and 2049, a safety analysis, and TransModeler operations analysis. Through coordination with FHWA, ODOT, and KYTC; it was determined the project should update the TransModeler calibration to achieve agreed upon calibration standards as outlined in the BSB Methods and Assumptions Memorandum. As part of the updated calibration the project team completed a cluster analysis and developed calibration targets for travel time and vehicle throughputs on the BSB. This updated calibration report outlines the cluster analysis, calibration targets for travel time and throughput, and the calibration parameters used in TransModeler and explanation of how they will be carried to the future models. The TransModeler calibration for the value engineering study has additional details on model development and can be referenced at BSB Traffic Operations Report Final.pdf (brentspencebridgecorridor.com). The TransModeler project limits are shown in Figure 1.



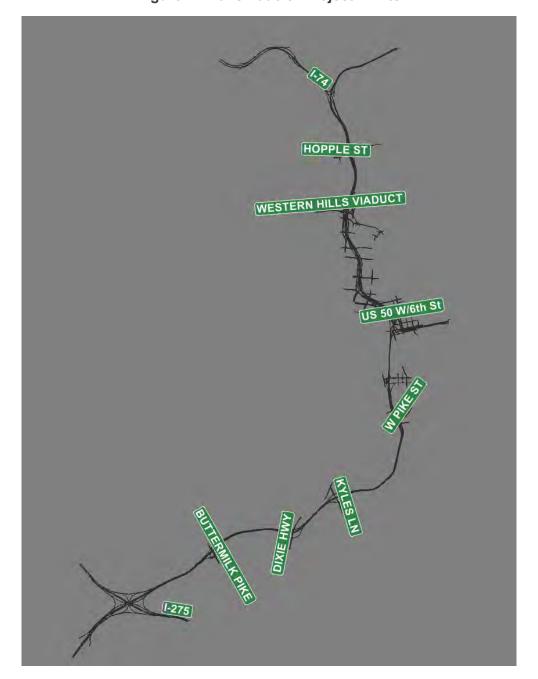


Figure 1: TransModeler Project Limits

# 2. METHODOLOGY

The TransModeler models were developed following guidelines from the *ODOT Analysis and Traffic Simulation Manual: Traffic Simulation with TransModeler*, KYTC TransModeler guidance, and agreed upon calibration methodologies outlined in the BSB Traffic Methods and Assumption Memorandum. The model development procedures are outlined below.

- 1) Existing Model Network Development:
  - a. Started with Existing 2019 model prepared for the BSB value engineering study in 2022. This model was modified from a model developed by Caliper in 2020, for the Connected Autonomous Vehicle (CAV) analysis. During the development of the value engineering model, the link grades were reviewed and updated to be consistent with criteria outlined in the OATS manual.
  - b. The TransModeler network was adjusted to match the IMS limits.
  - c. Minor calibration adjustments from value engineering model with additional applications of local headway buffers.
- 2) Cluster Analysis
  - a. A cluster analysis was completed using methodologies agreed upon by all stakeholders to determine a representative day.
  - b. Data inputs include:
    - I-71/75 Travel times collected by INRIX and available through the National Performance Management Research Data Set (NPMRDS)
    - ii. Volume throughput on BSB
    - iii. Precipitation
    - iv. Crashes
  - c. Analysis timeframe is May 28, 2019 to October 25, 2019
- 3) Volume Development
  - a. As part of the value engineering study completed in 2022 the following steps were completed:
    - i. Traffic counts from 2017 2021 were reviewed for the project corridor and count target volume values selected.
    - ii. The selected traffic volumes are used as inputs in an origin-destination (O-D) matrix estimation
    - iii. Model periods were defined as 6:00-10:00 AM and 2:00-7:00 PM to capture the full extent of peak period travel delays. Each model also includes a 30-minute warmup.
    - iv. Existing O-D matrices were developed for three vehicles classes in 15-minute bins.
      - 1. Autos
      - 2. Single Unit Trucks
      - 3. Articulated Trucks
    - v. Project specific vehicle fleet information was developed for the project using traffic counts and recommendations from ODOT and KYTC manuals.



- b. For the IMS calibration update, the BSB volume throughput volume was established using the representative day identified in the cluster analysis. The O-D matrices were modified from the models created in 2022 to achieve travel time and volume throughput calibration targets.
- c. The volumes used for the Existing 2019 TransModeler calibration were also used to establish balanced peak hour volumes that are used within the certified traffic process to forecast opening year and design year traffic volumes.
- 4) Existing Model Calibration
  - a. Cluster analysis used to identify a representative day
  - b. The calibration methodology agreed upon by all stakeholders uses two measures of effectiveness (MOE's):
    - i. I-71/75 travel time
    - ii. BSB vehicle throughput

# 3. CLUSTER ANALYSIS

Cluster analysis (or clustering) of daily traffic data is grouping a set of days into distinct groups with similar traffic characteristics. Clustering is commonly used in transportation network analysis to detect data patterns and trends. Cluster analysis is a form of unsupervised learning which can be performed using different algorithms. The k-means technique is one of the most common approaches for cluster analysis. The k-means algorithm aims to group n observations into k clusters, in a way that each observation is allocated to the cluster with the closest mean. The allocation is done by minimizing the sum of squared distances between the data points and the cluster centroids.

This study employed the k-means technique to perform a cluster analysis for day-to-day traffic data of the Brent Spence Bridge. The study examined the traffic attributes of the duration between May 28 and October 25, 2019. The study excluded the data of days June 3 - 8 and August 31 due to incomplete volume data. Two models were developed for the AM and the PM peak periods. The AM peak period was defined as the period from 6:00 to 10:00 AM. While the PM peak period was defined as the duration from 2:00 to 7:00 PM. The cluster analysis process followed the most recent guidelines provided by the U.S. Department of Transportation, as presented in Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software (April 2019).

The clustering process was performed as in the following steps.

# **Step 1: Attributes Identification:**

The first step of the analysis aimed to identify the key attributes impacting travel conditions. The analysis included key traffic attributes, which significantly defined the travel condition on Brent Spence Bridge corridor. The examined attributes included precipitation, number of crashes, average travel time and traffic volumes, for northbound (NB) and southbound (SB) directions, separately.



Precipitation data was collected from the Automated Surface Observing System (ASOS) program. The modeling included precipitation data from Cincinnati/Lunken (LUK) weather station of Ohio ASOS Network. The precipitation variable in the modeling was considered as the accumulative precipitation levels in inches during the peak period (whether it is AM or PM), on a given day.

Crashes are defined by the number of total crashes observed on each freeway direction during the period of analysis. The average travel time variable represents the directional travel time on the corridor in the study limits, averaged across the peak period. The traffic volume was considered as the cumulative directional traffic volumes during the peak period.

In summary, seven attributes were considered for the analysis, and they are defined as follows:

Precipitation, Crash Counts NB, Crash Counts SB, Travel Time NB, Travel Time SB, Traffic Volumes NB, and Traffic Volumes SB.

# Step 2: Data Processing:

All attributes considered in the analysis were quantitative variables, with no need for further transformation. The analysis was proceeded to the next step with data normalization.

# **Step 3: Data Normalization:**

The third step of the process is to normalize the examined data. The data normalization is a critical step to ensure validity of the process. The normalization is performed by converting the data to a common scale among all attributes. The normalization equation is presented as follows:

$$x' = a + \frac{(x - x_{min})(b - a)}{x_{max} - x_{min}}$$

where:

x': normalized value of data x

 $x_{min}$ : minimum value for the attribute

 $x_{max}$ : maximum value for the attribute

a: minimum value of common scale

b: maximum value of common scale

All attributes were normalized to a 0 to 1 common scale, except for traffic volume and travel time for the peak direction which were normalized to a 0 to 2 scale. The peak direction of the AM period was NB, while it was SB



for the PM period. The different scale for traffic volume and travel time for the peak direction is to adjust for a higher weight for these attributes. The higher weights reflect the significance of these characteristics in traffic conditions.

# **Step 4: Attributes Down Selection:**

This step aimed to filter out the redundant variables that have no impact on the key measure of interest (travel time), or that are highly correlated with other attributes. The variables were tested to multicollinearity and the correlation matrix was developed. The correlation matrix presented that the examined attributes were not highly correlated, and all correlation factors were less than 0.8.

Additionally, a variance inflation factor (VIF) test was performed to check for multicollinearity. The VIF evaluates the variance inflation of a regression coefficient, due to multicollinearity in the model. The VIF values were all far below 5, which indicates that multicollinearity is not an issue. Therefore, the cluster analysis performed with the full set of examined attributes.

# **Step 5: Cluster Performing:**

The cluster analysis was performed using the k-means technique. The k-means algorithm requires defining the number of clusters (k) for the analysis. The initial number of clusters was specified as 3. This technique aims to minimize the sum of squared distances (Euclidean distance) between the normalized data points and the cluster centroids. The following formula calculates the Euclidean distance for each data point and the cluster centroid:

$$xdis_y = \sqrt{(x_1 - ymean_1)^2 + (x_2 - ymean_2)^2 + (x_3 - ymean_3)^2 + \cdots}$$

where:

xdis<sub>v</sub>: distance of data x to mean of cluster y

 $x_1$ : value corresponding to attribute 1 for data x

ymean<sub>a</sub>: mean value for attribute a for cluster y

The data points examined in the analysis included the seven traffic attributes, described in step 1. The cluster analysis was performed using R statistical software, particularly by the "kmeans" function.

## **Step 6: Stopping Criterion Identification:**

The initial cluster size was set as k = 3, while the maximum cluster size was calculated as:

$$k = 2 * \sqrt{n/2}$$



Where n is the number of days. The maximum cluster size was calculated as 18.

The R package "NbClust" was utilized to determine the optimal number of clusters for the model. This package follows a set of 30 unique indices to optimize the number of clusters. The "NbClust" tallies the results and promotes k with the most votes as the optimal number of clusters.

# **Results: AM Peak**

The clustering results revealed that k=4 was the optimal number of clusters for the AM peak period. Cluster 3 was found to be the typical day cluster, as it included 71 days. The representative day was selected based on a combined evaluation that included travel time and traffic volumes. The representative day of the AM period was selected as June 26, 2019.

The number of days for each cluster was identified as follows:

**Table 1: Number of Days for each Cluster (AM Peak)** 

Cluster Number	Number of Days
1	21
2	10
3	71
4	42

As for the traffic volumes of the AM peak period, the NB volumes ranged from 6,272 to 22,494; with an average of 17,353 vehicles. While for the SB, the traffic volumes ranged from 5,809 to 18,198 with an average of 14,098 vehicles. The representative day volumes were 20,627 for NB and 16,330 for SB. Figure 2 and Figure 3 illustrate the AM peak period traffic volumes for NB and SB.

As for the travel time of the AM peak period, the NB travel times ranged from 10.7 to 45.6, with an average of 16.8 minutes. While for the SB, the travel times ranged from 10.6 to 21.9 with an average of 11.6 minutes. The representative day travel times were 17.8 and 11.4 minutes for NB and SB, respectively. Figure 4 and Figure 5 represent the daily AM peak travel times for NB and SB.



The following section discusses the traffic attributes of each cluster, with the distinctive characteristics highlighted in the header:

Cluster 1 (Lower travel times on NB and all days had crashes on SB)

Cluster 1 is including weekdays data points with the following characteristics:

- NB: Average to high traffic volumes, relatively lower travel times, a considerable number of days experienced crashes.
- SB: Mixed traffic volumes, mixed travel times, all days had crashes.
- Most days didn't experience precipitation.

Cluster 2 (High travel times and crashes on NB)

Cluster 2 is including weekdays data points with the following characteristics:

- NB: relatively lower traffic volumes, higher travel times, almost all days experienced crashes.
- SB: relatively lower traffic volumes, lower travel times, most days didn't experience crashes.
- Half of data points in this cluster experienced precipitation.

Cluster 3 (High volumes and no crashes on SB)

Cluster 3 is the representative cluster and including weekdays data points with the following characteristics:

- NB: relatively higher traffic volumes, relatively lower travel times, a considerable number of days experienced crashes.
- SB: higher traffic volumes, relatively lower travel times, no crashes.
- Most days in this cluster didn't experience precipitation.

# Cluster 4 (weekends)

Cluster 4 is including data points of the weekends with the following characteristics:

- NB: The lowest traffic volumes, the lowest travel times, almost all data points had no crashes.
- SB: The lowest traffic volumes, the majority had the lowest travel times, almost all data points had no crashes.
- A considerable number of days had precipitation.



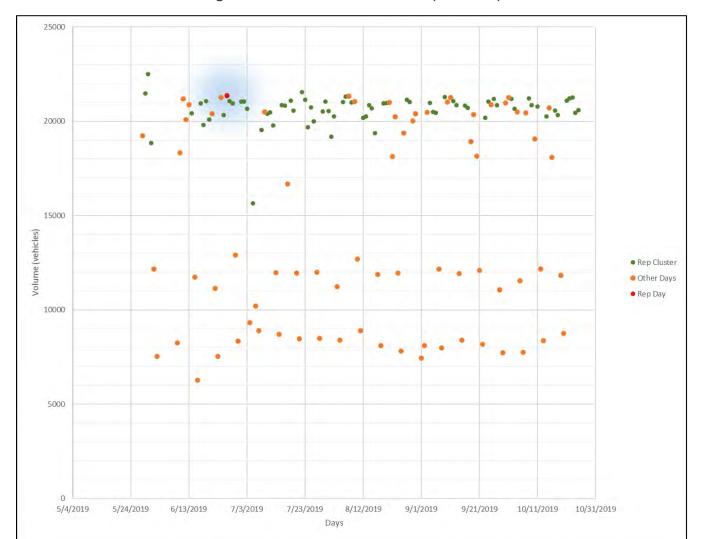


Figure 2: Traffic Volumes for NB (AM Peak)



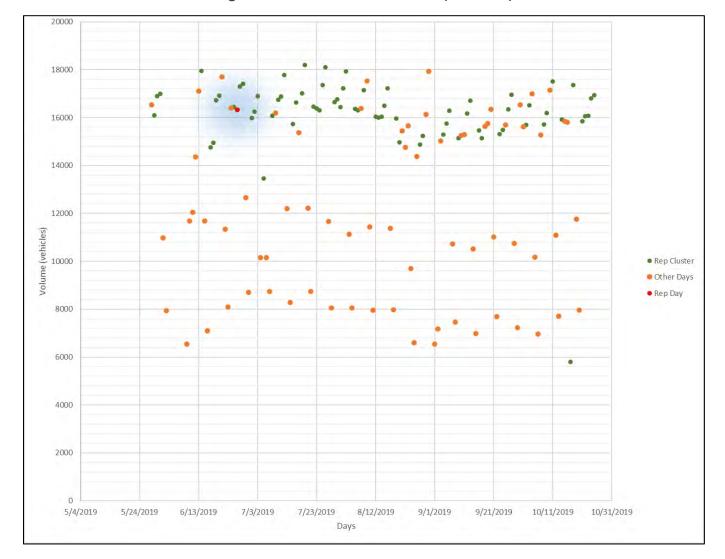


Figure 3: Traffic Volumes for SB (AM Peak)



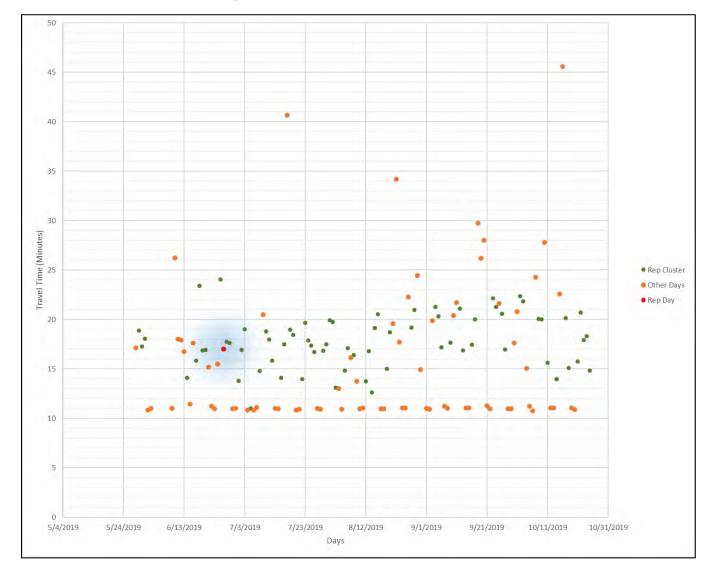


Figure 4: Travel Times for NB (AM Peak)





Figure 5: Travel Times for SB (AM Peak)



## **Results: PM Peak**

The optimal number of clusters of the PM peak period was identified as three, and cluster 2 was found to be the most common cluster with 85 days. The representative day for the PM period based on the combined evaluation of volume and travel time was selected as August 15, 2019. This day has volume and travel time conditions closest to the mean of the days in cluster 2.

The number of days for each cluster was identified as follows:

**Table 2: Number of Days for each Cluster (PM Peak)** 

Cluster Number	Number of Days		
1	41		
2	85		
3	18		

As for the traffic volumes for the PM peak period, the NB volumes ranged from 17,912 to 25,717; with an average of 23,318 vehicles. While for the SB, the traffic volumes ranged from 17,440 to 28,868 with an average of 25,599 vehicles. The traffic volume for the representative day were 23,647 for NB and 27,547 for SB. Figure 6 and Figure 7 illustrate the daily PM peak traffic volumes for NB and SB.

As for the travel time of the PM peak period, the NB travel times ranged from 11.1 to 29.2, with an average of 16.4 minutes. While for the SB, the travel times ranged from 10.9 to 44.3 with an average of 20 minutes. The travel times for the representative day were 16.3 and 22.2 minutes for NB and SB, respectively. Figure 8 and Figure 9 represent the daily PM peak travel times for NB and SB.

The following section discusses the traffic attributes of each cluster, with the distinctive characteristics highlighted in the header:

## Cluster 1 (weekends)

Cluster 1 is including data points of weekends with the following characteristics:

- NB: High traffic volumes, relatively low travel times, a considerable number of days experienced crashes.
- SB: Average traffic volumes, the lowest travel times, a noticeable number of days experienced crashes.
- Most days didn't experience precipitation.

Cluster 2 (High traffic volumes and considerable crash counts on both directions)

Cluster 2 is the representative cluster and including weekdays data points with the following characteristics:

- NB: relatively high traffic volumes, relatively low travel times, a considerable number of days experienced crashes.
- SB: High traffic volumes, average travel times, half of the days experienced crashes.



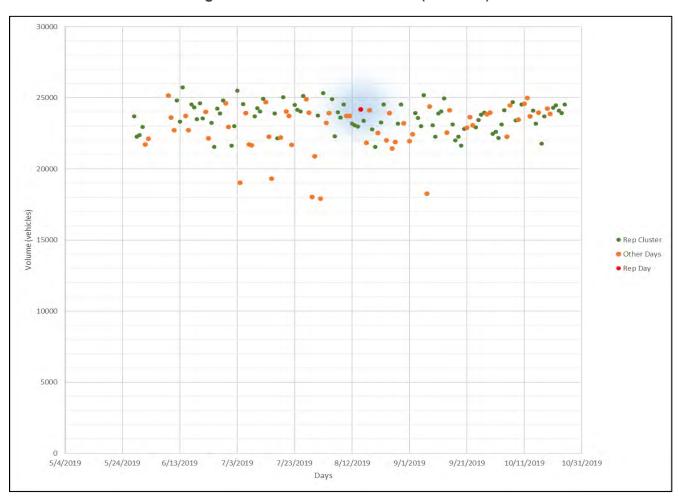
A noticeable number of days experienced precipitation.

## Cluster 3 (High crash counts on both directions)

Cluster 3 is the representative cluster and including weekdays data points with the following characteristics:

- NB: Mixed traffic volumes, mixed travel times, most days experienced crashes.
- SB: Mixed traffic volumes, higher travel times, almost all days experienced crashes.
- Half the data points experienced precipitation.

Figure 6: Traffic Volumes for NB (PM Peak)





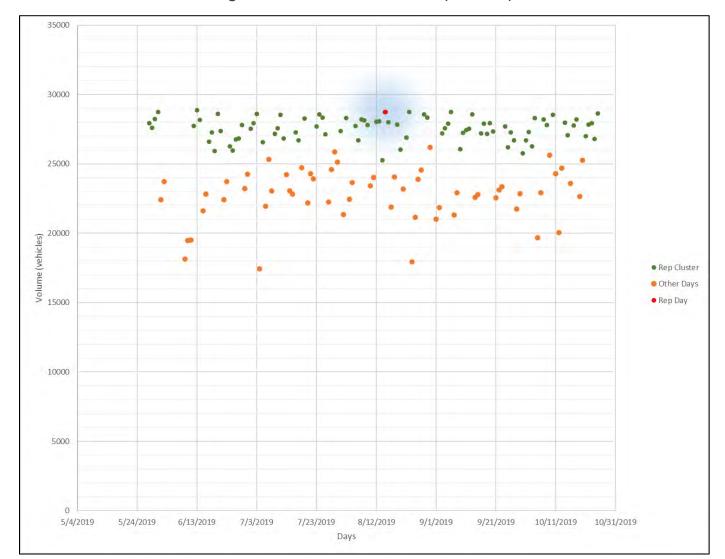


Figure 7: Traffic Volumes for SB (PM Peak)



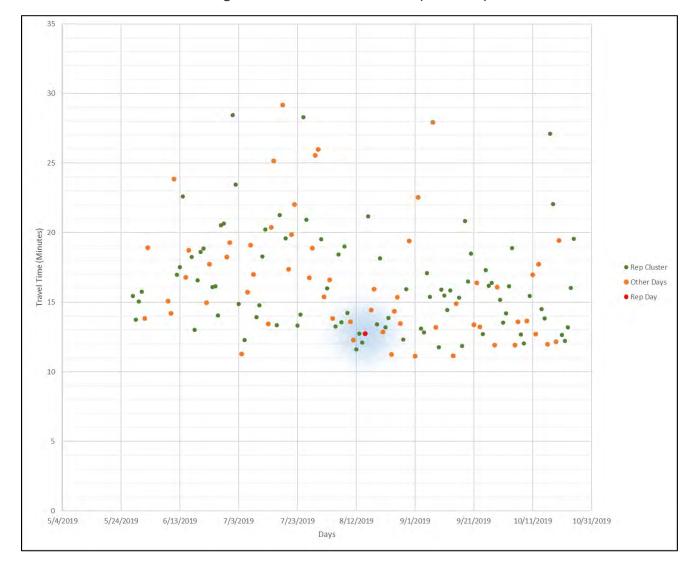


Figure 8: Travel Times for NB (PM Peak)



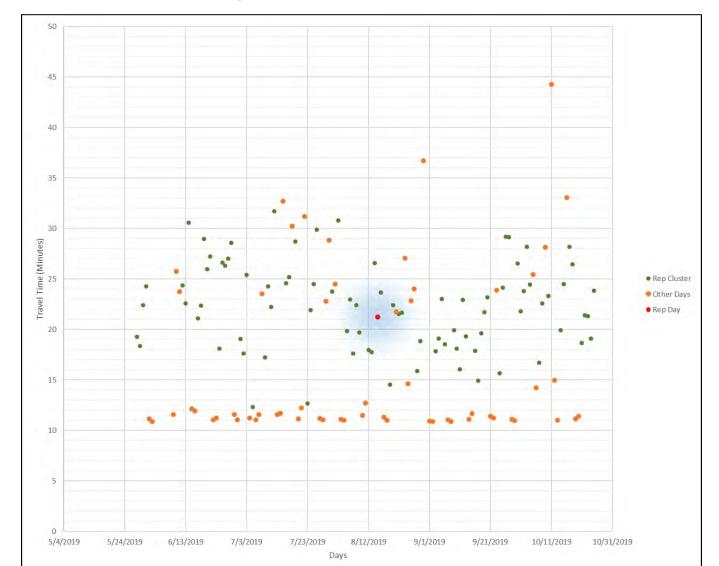


Figure 9: Travel Times for SB (PM Peak)

## 4. VOLUME DEVELOPMENT

## 4.1 Overview

As part of the 2022 value engineering study, the Existing 2019 TransModeler traffic inputs for the AM and PM peak periods were developed based on AM and PM peak period pattern O-D matrices from the OKI travel demand model, and all available traffic counts between 2017 and 2022. BSB counts for the typical day were inserted in this process instead of the averaged count data used in the value engineering study. An overview of the O-D development process is described in the flow chart shown in Figure 10. The Origin-Destination Matrix Estimation (ODME) is an iterative process with a feedback loop between TransModeler simulation runs and O-D trip table adjustments as show in the O-D development flow chart. The O-D matrices were adjusted through the iterative process to achieve the IMS calibration targets for the throughput on the Brent Spence Bridge and corridor travel time on I-71/75.

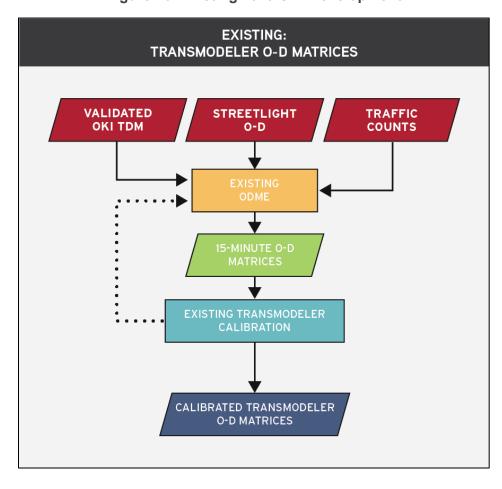


Figure 10: Existing 2019 O-D Development

# 4.2 ODME Methodology

The existing TransModeler O-D matrices are developed using an ODME approach, implemented by HNTB with the R scripting language, that applies an entropy maximization technique through iterative matrix factoring. The goal of the ODME is to derive 15-minute O-D matrices by vehicle classifications that best fit the count data (link and turning movements), and the anticipated trip pattern distributions at the interchanges and freeway ramp-to-ramp movements. The TransModeler network structure allows for a practical application of all-or-nothing traffic assignment, as there is one clear shortest path between every O-D pair. This condition is optimal for the proposed ODME process, which assigns a skim matrix for each traffic count location. A skim matrix defines the O-D trips that traverse a particular point in the network. The assigned skim matrices are the basis of the ODME factoring algorithm which iteratively factors the pattern matrices by O-D pairs using the skims and the traffic count targets. An O-D pattern fitting procedure follows each round of count factoring to preserve the underlying trip distributions. The final estimated matrices are derived using the method of successive averages which combines the results of each factoring iteration. An override factor is applied to the Brent Spence Bridge traffic counts to prioritize these counts as they represent the typical day from the cluster analysis.

A key input for the ODME is a pattern O-D matrix. The project team reviewed Streetlight and extracted O-D matrices from the OKI model. Both data sets are suitable as pattern O-D matrices, however, it was agreed during the value engineering study that the OKI model is a better choice in this situation as the growth rates are developed using the OKI travel demand model. The Streetlight O-D was used for validating the OKI data and for the initial 15-minute matrix distributions within the ODME process. The ODME steps are listed below.

#### Step 1: Estimate Period O-D Matrices

Total vehicle O-D matrices are estimated for 6-10 AM and 2–7 PM. The ODME uses directional link and turning movement traffic counts as targets. O-D period pattern matrices are extracted from the OKI travel demand model. Streetlight for the AM and PM periods is also reviewed and serves as a secondary source of O-D data. The Streetlight query details for these matrices include:

Hours: 6-10 AM; 2-7 PM (separate queries)

Year: 2019 (12-months)

The resultant of this first step is AM and PM period matrices for total trips. These matrices represent a best fit of the available link and turn count data while also maintaining pattern and overall trip distribution targets.

## Step 2: Develop Temporal Distribution of Trip tables

15-minute trips tables are developed from the total peak trip tables. This procedure develops proportioning tables that best match the static assignment of each of the target link counts. The initial proportions are identified by O-D pairs using Streetlight data and then factored to best match available count data temporal distributions.



## Step 3: Develop Classification Trips Tables

The 15-minute O-D matrices are divided into three classifications: autos, single unit trucks, and articulated trucks. The matrices are proportioned by O-D cell into the three classifications. The proportioning procedures uses an iterative factoring algorithm that seeks the best fit to the count classification data. The initial estimate of the proportional matrices is based on the classification O-D matrices from the OKI model.

## Step 4: Feedback Loop with TransModeler Assignment and Table Adjustments

TransModeler is simulated with the initial matrices from Step 3. The convergence on count targets and operation metrics are evaluated. The proportioning tables from Step 3 were revisited and the temporal distributions of trips were iteratively refined to meet calibration targets. The Existing trip table temporal distributions are used for the 2049 TransModeler O-D development.

# 4.3 Comparison to Value Engineering Study

The O-D matrices for Existing 2019 do not deviate significantly from the ones used in the Value Engineering study. A scatter plot comparing the O-D pair volumes at the period level before and after the calibration adjustments are shown in Figure 11 (AM) and Figure 12 (PM). The volume adjustments were an iterative process with changes to network calibration parameters to achieve the calibration targets. As is shown in the figures the changes to period volume from the previous TransModeler analysis are minimal. The two outliers to point out in the PM scatter plot are internal trips on 4<sup>th</sup> Street in Kentucky, which were reduced to offset increases in traffic to other destinations on I-71/75. These volume reductions will not impact the forecasted volumes used for the Alternative I and Alternative I-W alternative analysis.



Figure 11: O-D Pair Comparison - AM Period

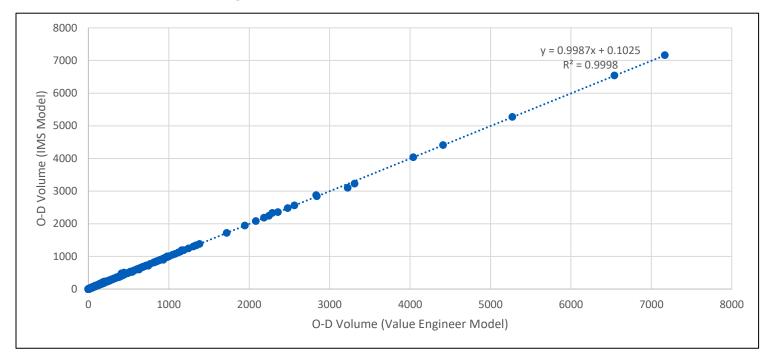
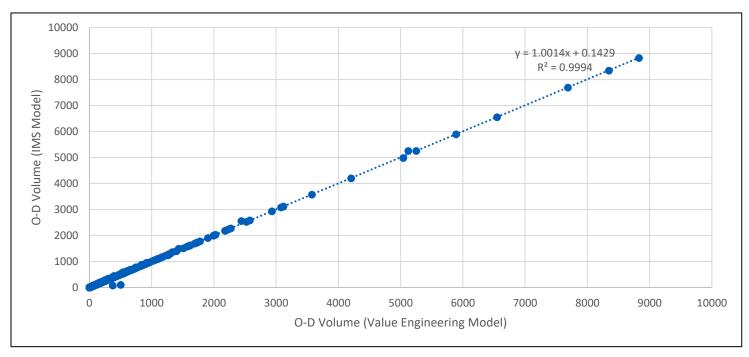


Figure 12: O-D Pair Comparison – PM Period



# 5. EXISTING MODEL CALIBRATION

## 5.1 Model Characteristics

Software: TransModeler 6.1

#### **Model Durations:**

- AM Period 6:00 – 10:00 AM with 30-minute warmup

- PM Period: 2:00 – 7:00 PM with 30-minute warmup

Car Following Model: Modified General Motors

Traffic Demand Inputs: O-D Matrices in 15-minute bins by auto, SU trucks, and articulated trucks

**Link Grades:** Per ODOT standards, freeway links with grades of 2% or greater are included, other freeway links are set to 0%. Arterial roads with 3% or greater are included in the model with all other links set to 0%.

#### **Calibration Considerations**

- Temporal Distribution of Traffic Demand
- Vehicle Fleet Distributions
- Normal Acceleration
- Car Following Model
- Local Headway Buffers

# **5.2 Calibration Targets**

The primary calibration target is the I-71/75 travel times between I-275 Interchange on the southern extent and I-74 Interchange on the northern extent. The secondary calibration target is the volume throughput on the Brent Spence Bridge. The calibration criterion agreed upon by all stakeholders is listed below. The calibration results for the AM and PM periods were achieved for both the travel time and volume throughput on the BSB.

## **Criterion I: Control for Time-Variant Outliers**

Ninety-five percent of simulated outputs fall within the approximate 2 Sigma Band.

#### **Criterion II: Control for Time-Variant Inliers**

 Two-thirds of the simulated results (and both critical time intervals) fall within the 1 Sigma Band for this travel condition.

## **Criterion III: Bounded Dynamic Absolute Error (BDAE)**

• The average absolute difference between the simulation and the representative day is less than the BDAE.



$$\frac{\sum_{t} |c_{r}(t) - \tilde{c}_{i}(t)|}{N_{T}} \leq \text{BDAE Threshold}$$

$$\text{BDAE Threshold} = \frac{\sum_{i \neq r} \sum_{t} \frac{|c_{r}(t) - c_{i}(t)|}{N_{T}}}{N_{cluster} - 1}$$

$$\frac{c_{r}(t)}{c_{i}(t)} \quad \text{Observed value of representative day during time interval } t$$

$$\frac{c_{r}(t)}{c_{r}(t)} \quad \text{Observed value of non-representative day within the cluster during time interval } t$$

$$\frac{c_{r}(t)}{c_{r}(t)} \quad \text{Simulated performance measure during time interval } t$$

$$N_{T} \quad \text{Number of time intervals}$$

$$N_{cluster} \quad \text{Number of days in the cluster representing this travel condition}$$

# **Criterion IV: Bounded Dynamic Systematic Error**

One third BDAE

• The average difference between the simulation and the representative day is less than one third of the BDAE.

## 5.3 AM Period Travel Time

Criteria IV

The AM period travel time calibration is summarized in Table 3, Figure 13, and Figure 14. All four criteria are achieved for the AM period travel time.

**AM Model Description Test** Criteria Criteria **NB BSB SB BSB Criteria Met?** Met? 95% within 2 Criteria L 95% 100% 100% Yes Yes Sigma Two thirds Criteria II 66.66% 94% Yes 94% Yes within 1 Sigma Criteria III **BDAE** 3.0/0.4 0.2 1.6 Yes Yes

8.0

0.1

Yes

Yes

1.0/0.1

**Table 3: AM Travel Time Calibration** 

Figure 13: AM Travel Time NB I-71/75

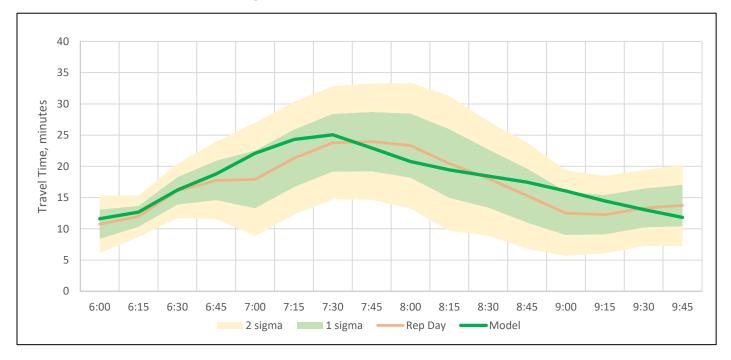
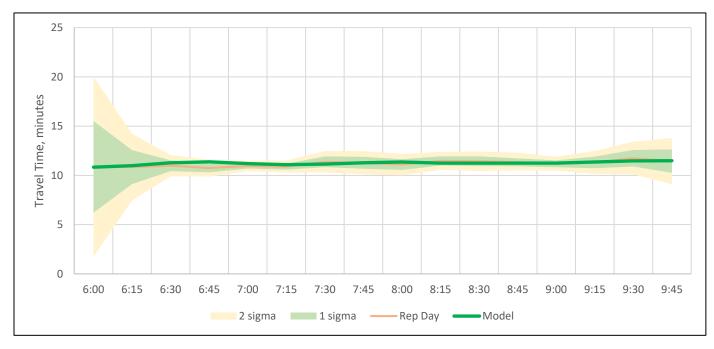


Figure 14: AM Travel Time SB I-71/75



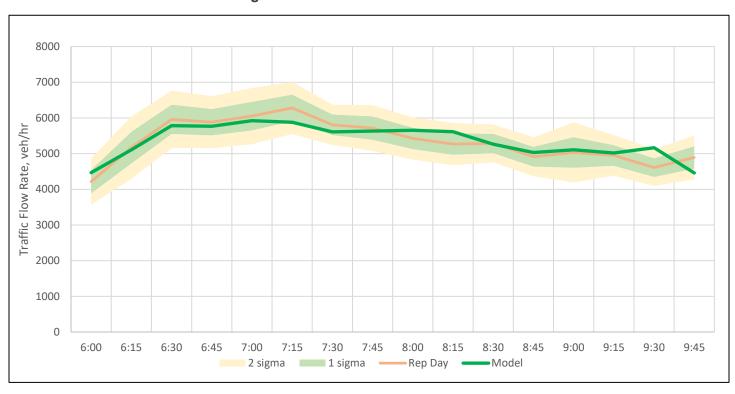
## 5.4 AM Period Volume

The modeled volume throughput on the BSB was checked against the representative day. The volume calibration was achieved for all four criteria as shown in Table 4, Figure 15, and Figure 16.

**Table 4: AM BSB Volume Throughput Calibration** 

	Description	Criteria	AM Model			
Test			NB BSB	Criteria Met?	SB BSB	Criteria Met?
Criteria I	95% within 2	95%	Yes	100%	Yes	
Sign	Sigma	(or missing one target)	<i>9</i> 470	163	100%	163
Criteria II	Criteria II	66.66%	75%	Yes	100%	Yes
V	within 1 Sigma					
Criteria III	BDAE	97/84	51	Yes	47	Yes
		{15-min volume}				
Criteria IV	One third BDAE	32/28	0	Yes	11	Yes
		{15-min volume}				

Figure 15: AM NB BSB Traffic Volume



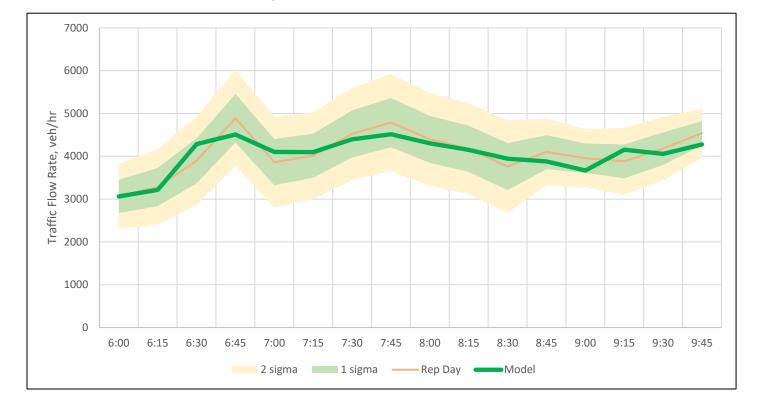


Figure 16: AM SB BSB Traffic Volume

## 5.5 PM Period Travel Time

The I-71/75 travel time between the I-74 Interchange and the I-275 interchanges was evaluated as the primary calibration target for the PM period model. The model achieves all four criteria as shown in Table 5, Figure 17, and Figure 18.

**PM Model Test** Description Criteria Criteria **NB I-71/75** SB I-71/75 **Criteria Met?** Met? 95% within 2 Criteria I 95% 100% Yes 100% Yes Sigma Two thirds Criteria II 66.66% 100% Yes 100% Yes within 1 Sigma Criteria III **BDAE** 4.2/5.0 0.9 Yes 2.4 Yes Criteria IV One third BDAE 1.4/1.7 8.0 Yes 0.1 Yes

**Table 5: PM Travel Time Calibration** 

Figure 17: PM BSB NB Travel Time

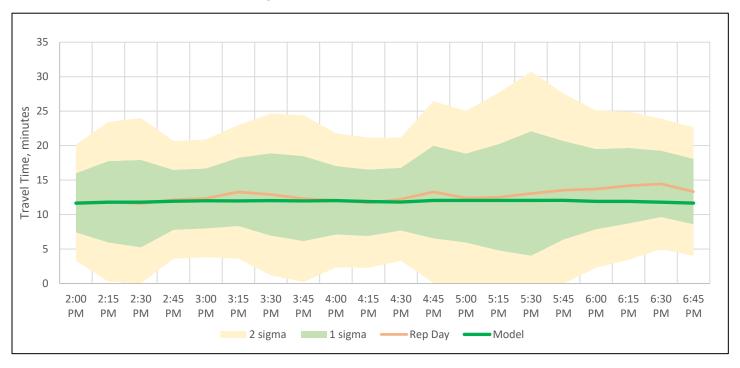
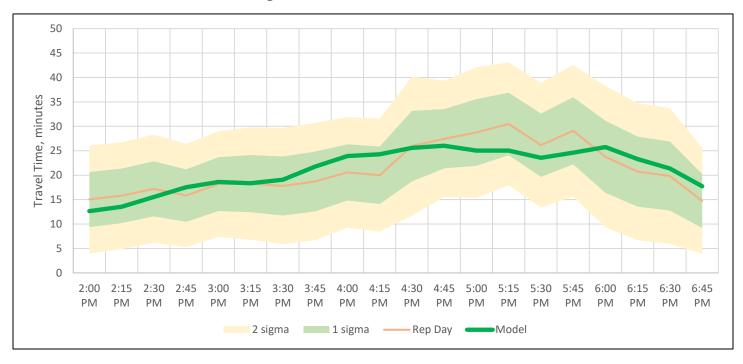


Figure 18: PM BSB SB Travel Time



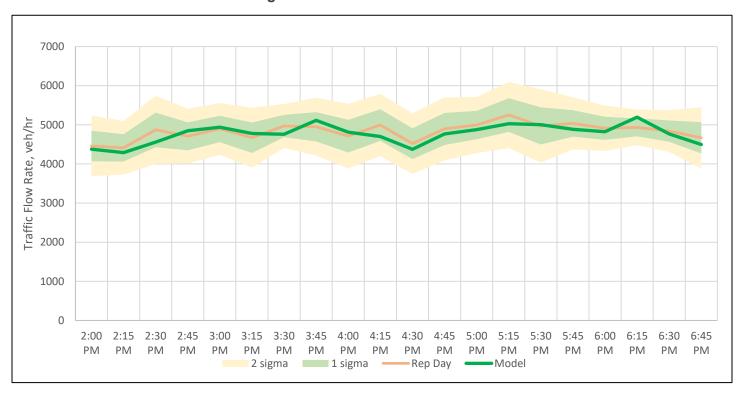
## 5.6 PM Period Volume

The modeled volume throughput on the BSB was checked against the representative day. The volume calibration was achieved for all four criteria as shown in Table 6, Figure 19, and Figure 20.

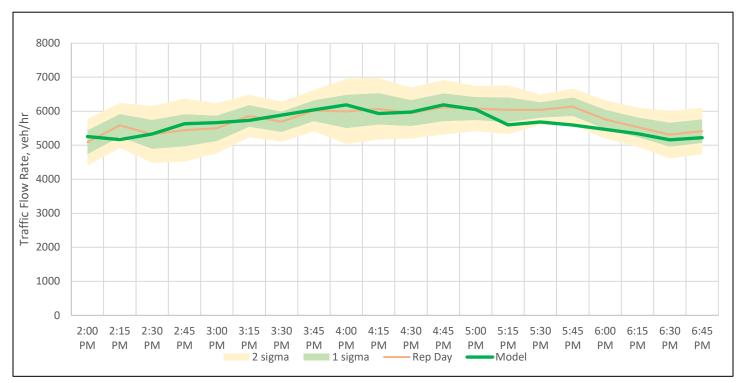
**Table 6: PM BSB Volume Throughput Calibration** 

	Description	Criteria	PM Model			
Test			NB I-71/75	Criteria Met?	SB I-71/75	Criteria Met?
Critoria	95% within 2	95%	100%	Yes	94%	Yes
Criteria I	Sigma	(or missing one target)				
Criteria II	Critoria II Two thirds	66.66%	94%	Yes	75%	Yes
Criteria ii	within 1 Sigma					
Criteria III	BDAE	73/81	37	Yes	48	Yes
		{15-min volume}				
Criteria IV	One third BDAE	24/27	12	Yes	10	Yes
		{15-min volume}				

Figure 19: NB BSB Traffic Volume







## 6. DEVIATIONS FROM DEFAULT VALUES

The calibration workflow used for the value engineering models prioritized traffic demand adjustments to meet calibration targets. These adjustments included changes to the trip temporal distributions and refinements to the vehicle fleet inputs. Once the options for traffic adjustments were exhausted, the calibration was refined by modifying the normal acceleration, car following model, and headway buffers. As part of the TransModeler calibration for the IMS addendum, the traffic demand was adjusted as discussed in the Volume Development section. Additionally, calibration parameters were modified for NB and SB I-71/75 between Dixie Highway and BSB. All the calibration parameters modified from default model parameters are discussed in the section below, this includes both parameters identified during the Value Engineering study and with the IMS addendum model updates.

### 6.1 Vehicle Fleet

The O-D matrices are divided into three classifications: Autos, SU Trucks, and Articulated Trucks. The characteristics of SU Trucks and Articulated Trucks are based on default TransModeler definition. The Autos are more specifically defined based on vehicle fleet distributions. ODOT and KYTC have different default recommendations. These recommendations as well as the fleet used in the BSB model are detailed in Table 7. The BSB model fleet distribution uses project counts to determine the motorcycle, pickups/vans/SUV, and bus percentages. There are 125 project count locations with detailed vehicle classification data. These counts cover sites on the freeway mainline, freeway ramps, and arterial locations in Kentucky and Ohio. A summation of this count data is used to define the auto proportions. The remaining automobile distribution is divided between high, middle, and low performance vehicles. These characteristics are not part of the traffic count data, so the ODOT and KYTC relative proportions were averaged to allocate the remaining auto distributions. A comparison of the auto vehicle fleet information is summarized in Table 7.

**Auto Vehicles Class BSB Model ODOT Default KYTC Default** Motorcycles 0.3% 0.0% 0.0% **High Performance** 14.6% 20.0% 5.5% Middle Performance 39.6% 40.0% 21.9% Low Performance 30.0% 30.0% 16.8% Pickups/Vans/SUVs 14.9% 10.0% 55.3% 0.7% 0.0% **Buses** 0.5%

**Table 7: Auto Vehicle Fleet** 

# 6.2 Normal Acceleration

The KYTC TransModeler manual recommends modifications to the normal acceleration Beta parameter. The change in distribution for the Beta parameter results in slower accelerations for a portion of the modeled traffic. The TransModeler defaults and the parameters in the BSB model are shown in Table 8.



**Table 8: Normal Acceleration** 

TransModeler Default		BSB Model (KYTC Recommendation)		
Percentage of Vehicles	Beta	Percentage of Vehicles	Beta	
20	1.10	10	1.10	
60	1.00	30	1.00	
20	0.95	20	0.90	
		20	0.88	
		20	0.75	

# 6.3 Car Following Model

The car following model is the Modified GM. The model coefficients are default except for the Alpha+ coefficient. The default is 1.81 and the calibrated model uses 2.31. This value is within the acceptable range outlined in the KYTC TransModeler manual, which states to calibrate the car following model by using Alpha values between 1.81 and 2.81. Increasing the alpha coefficient from 1.81 to 2.31 decreases roadway capacity. A range of values were tested during calibration of the Value Engineering models, 2.31 was chosen based on the volume throughput for SB I-71/75 at the BSB. The NB direction warranted further reduction in the capacity, which is accounted for with the use of a local headway buffer parameter.

# 6.4 Headway Buffer

The headway buffer is identified in the OATS manual as a parameter to consider for adjustment during model calibration. This parameter can be applied locally or globally in the network. The headway buffer specifies the additional time that a driver prefers between themselves and another vehicle. Increasing the buffer time decreases the roadway capacity. During the calibration workflow, the headway buffer was tested after modification to the normal acceleration and car following model. In the Value Engineering model the headway buffer was applied only to NB I-71/75 between Buttermilk Parkway and the Ohio side of the Brent Spence Bridge. With the IMS addendum calibration update, a headway buffer is added to SB I-71/75 between 12<sup>th</sup> Street and Kyles Lane. The NB I-71/75 headway buffers are also adjusted to decrease the roadway capacity. The application of the parameters improves the convergence of the model for speeds, travel time, and volume throughput on the Brent Spence Bridge. A comparison of the default and proposed local headway buffers are summarized in Table 9.



**Table 9: Headway Buffers** 

	On Freeways (Sec)			
Percentage of Drivers	Default	NB I-71/75 (Buttermilk to BSB)	SB I-71/75 (12th Street to Kyles Lane)	
10	0.00	0.04	0.05	
10	0.02	0.08	0.10	
10	0.03	0.17	0.18	
10	0.04	0.22	0.24	
10	0.05	0.28	0.30	
10	0.06	0.33	0.36	
10	0.07	0.39	0.42	
10	0.07	0.44	0.48	
10	0.09	0.50	0.54	
10	0.10	0.55	0.60	

## 6.5 Lane Restrictions

SB I-71/75 in Kentucky between the BSB and Kyles Lane is signed with truck restrictions for the two left lanes. The value engineering models used these truck restrictions with a default compliance rate of 100%. This input was reviewed with the calibration update by reviewing traffic count data for two count sites on I-71/I-75 (059072 & 059P93), which are within the lane restricted area. The count data indicates there is an 85% compliance rate for truck classes 6 to 13 during the PM peak period. During off peak periods the truck compliance is slightly better with observed compliance near 90%. The model compliance rate for the truck restricted lanes is set to 85% and is a deviation from TransModeler default of 100% compliance.

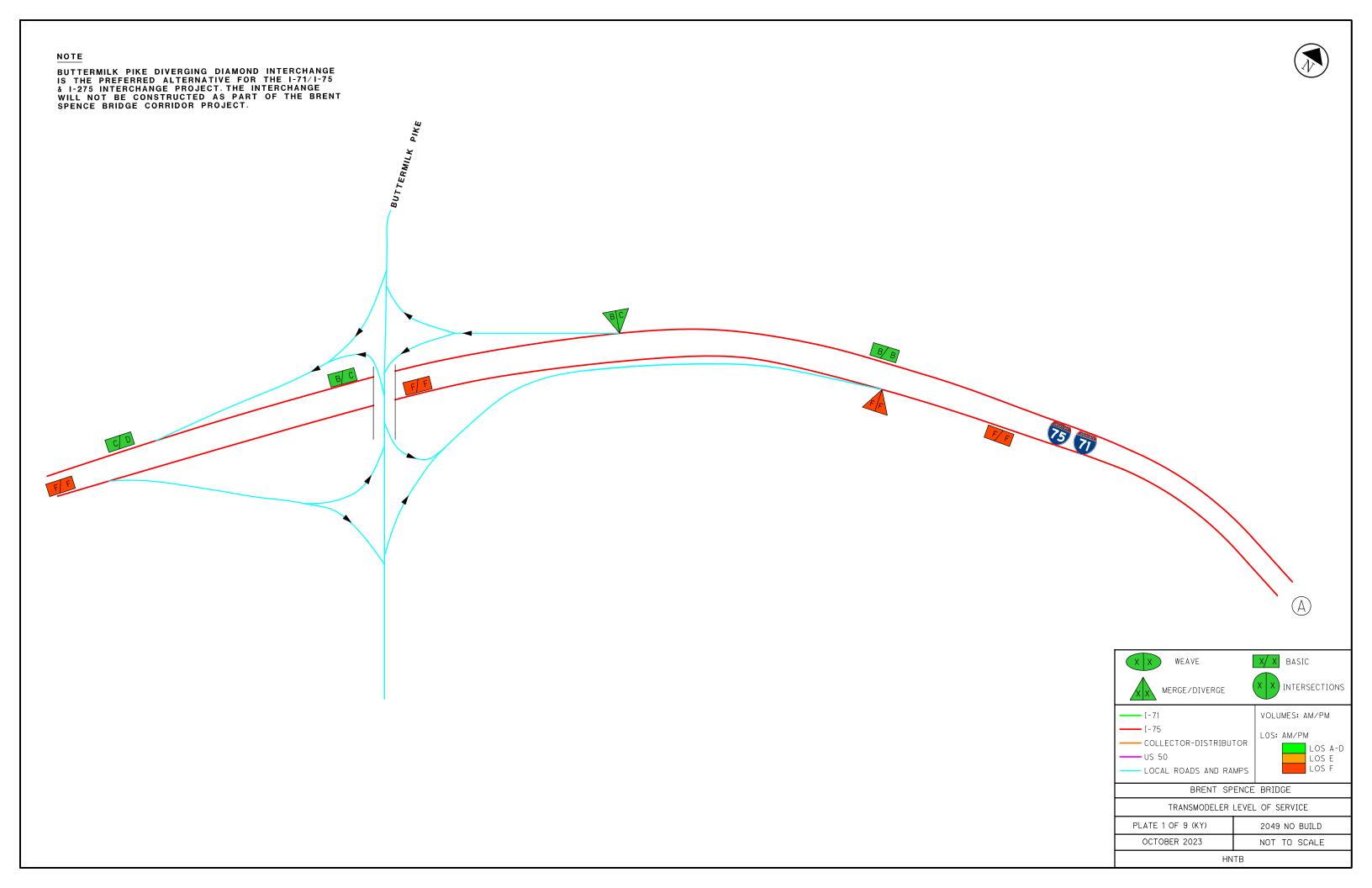
## 7. CONCLUSION

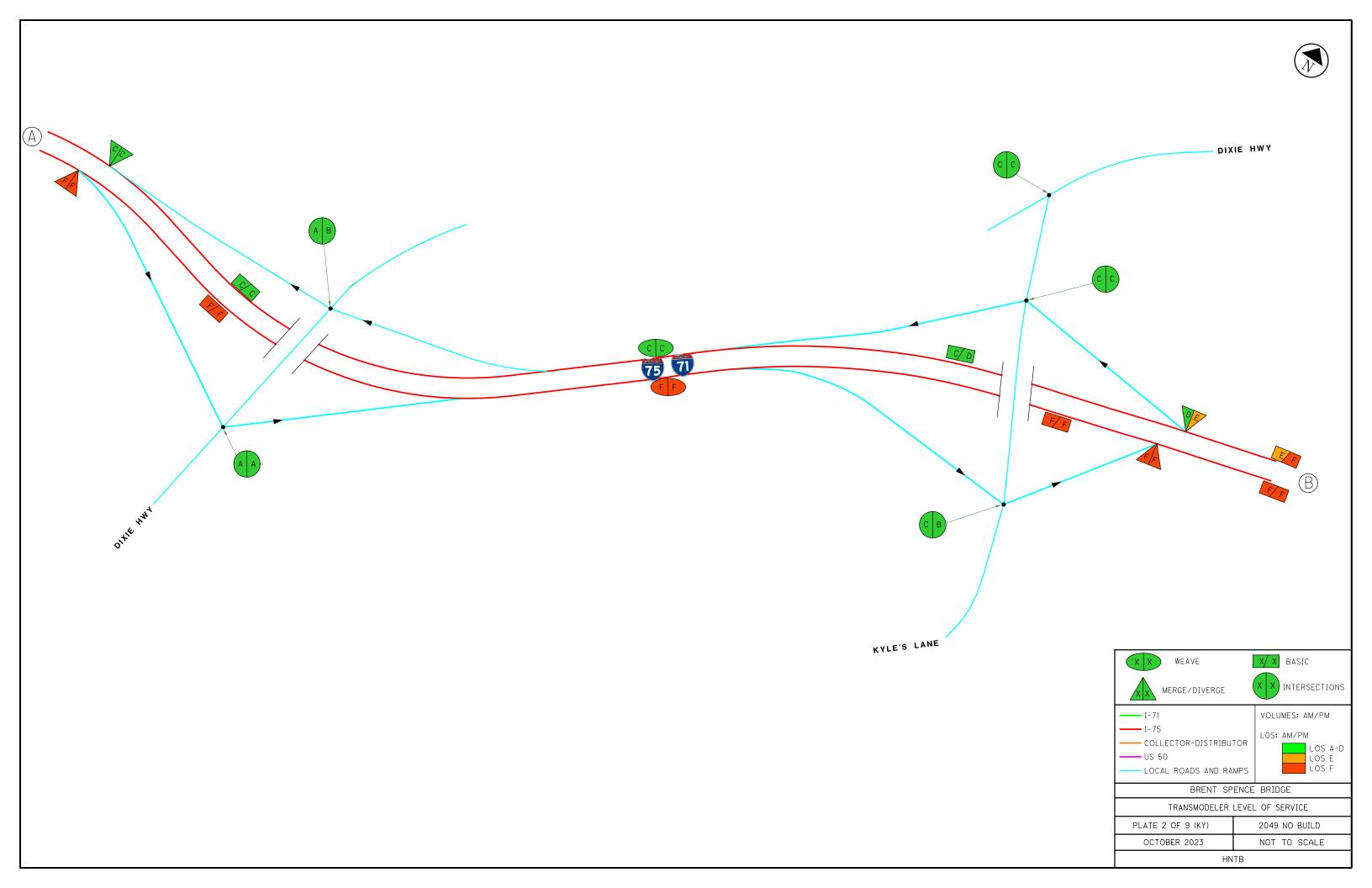
The Existing 2019 TransModeler models for the AM and PM period are modified from the Value Engineering study in 2022 to achieve updated calibration methodology agreed upon by all stakeholders. The calibration parameters outlined in this report will be carried to the 2049 Build Alternative I and Alternative I-W models. These future models will maintain the 4-hour AM and 5-hour PM periods, with the three vehicle classifications used for the Existing models.

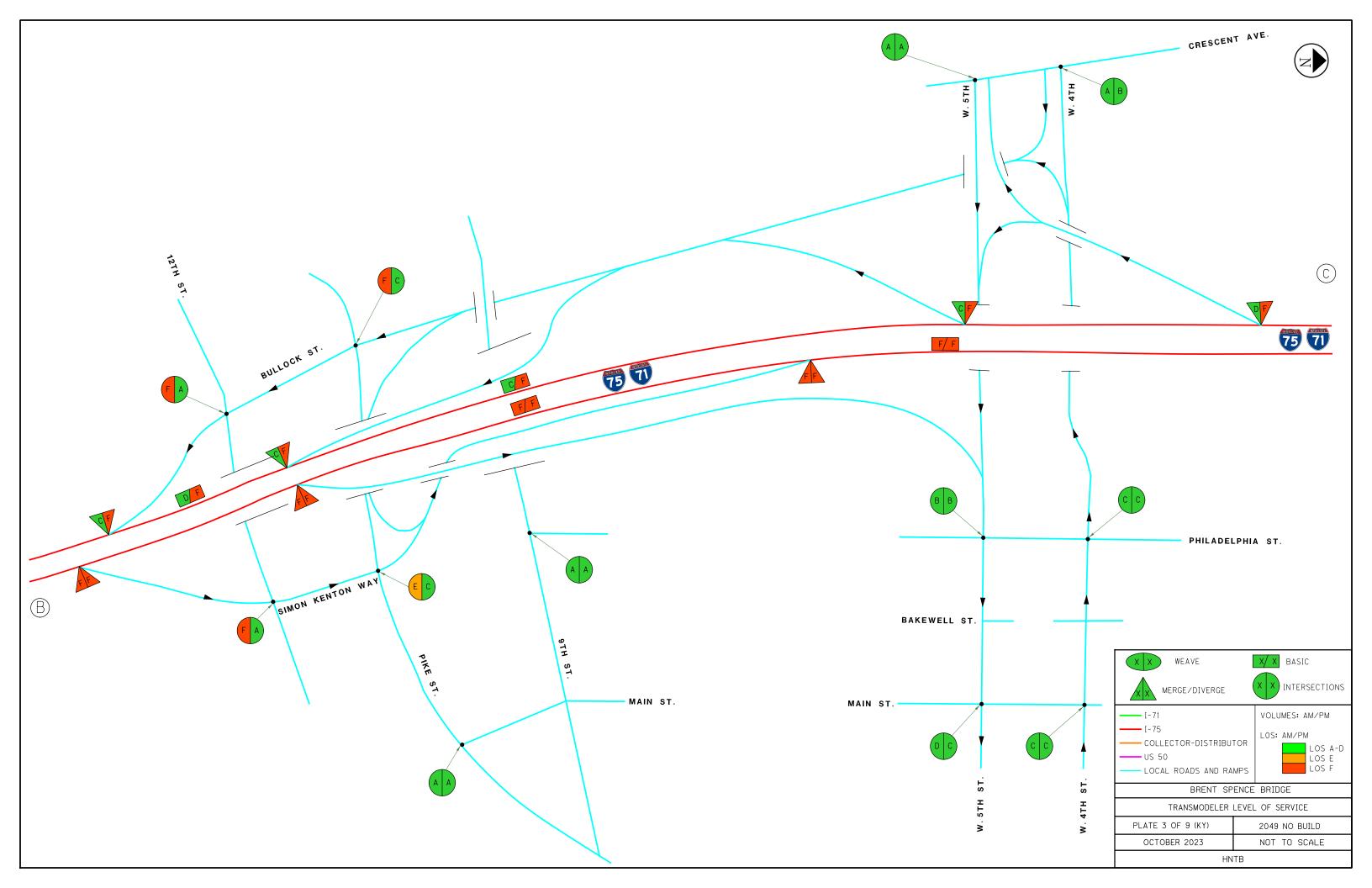


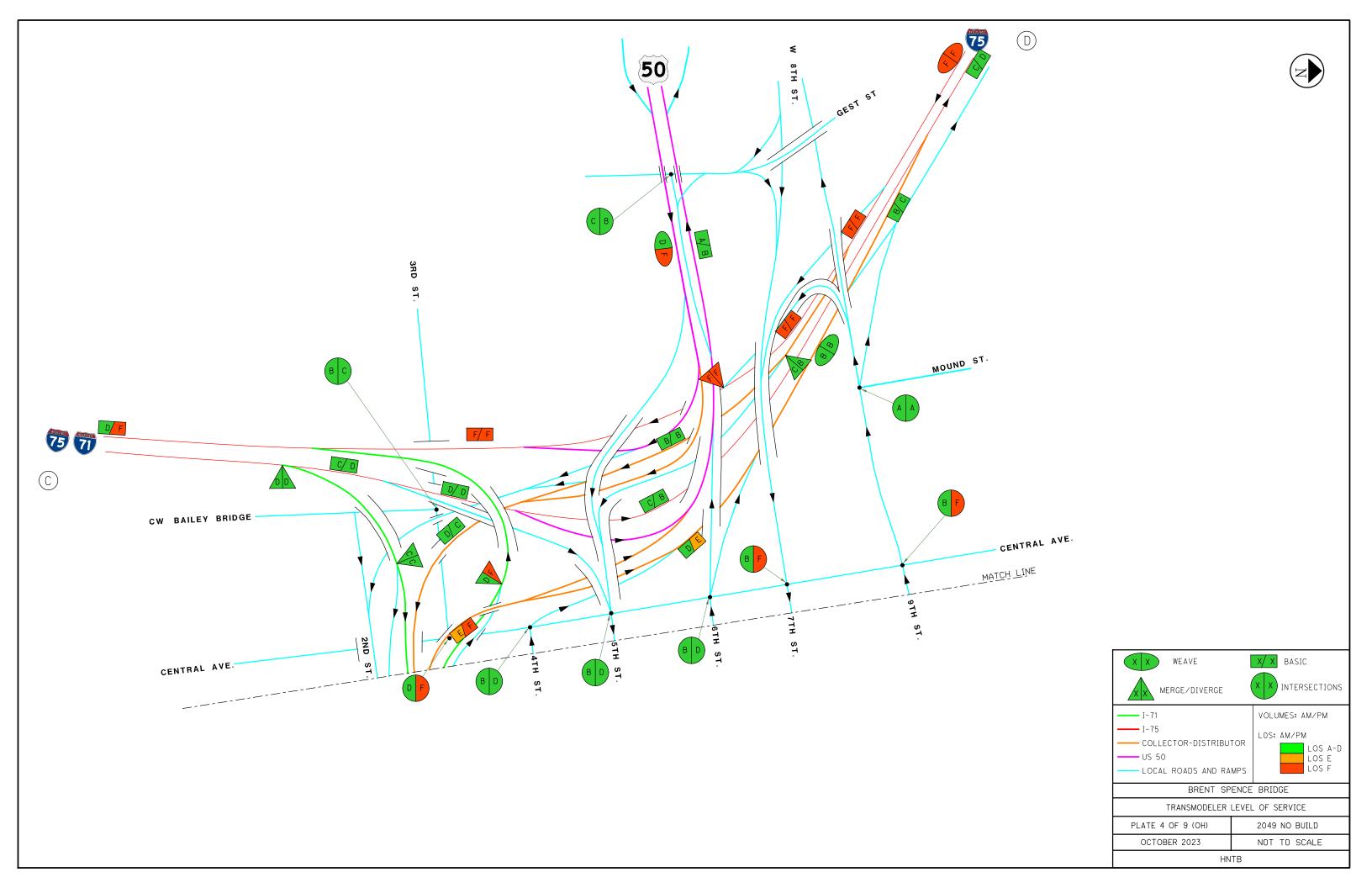
# **Appendix B:**2049 No Build Level of Service

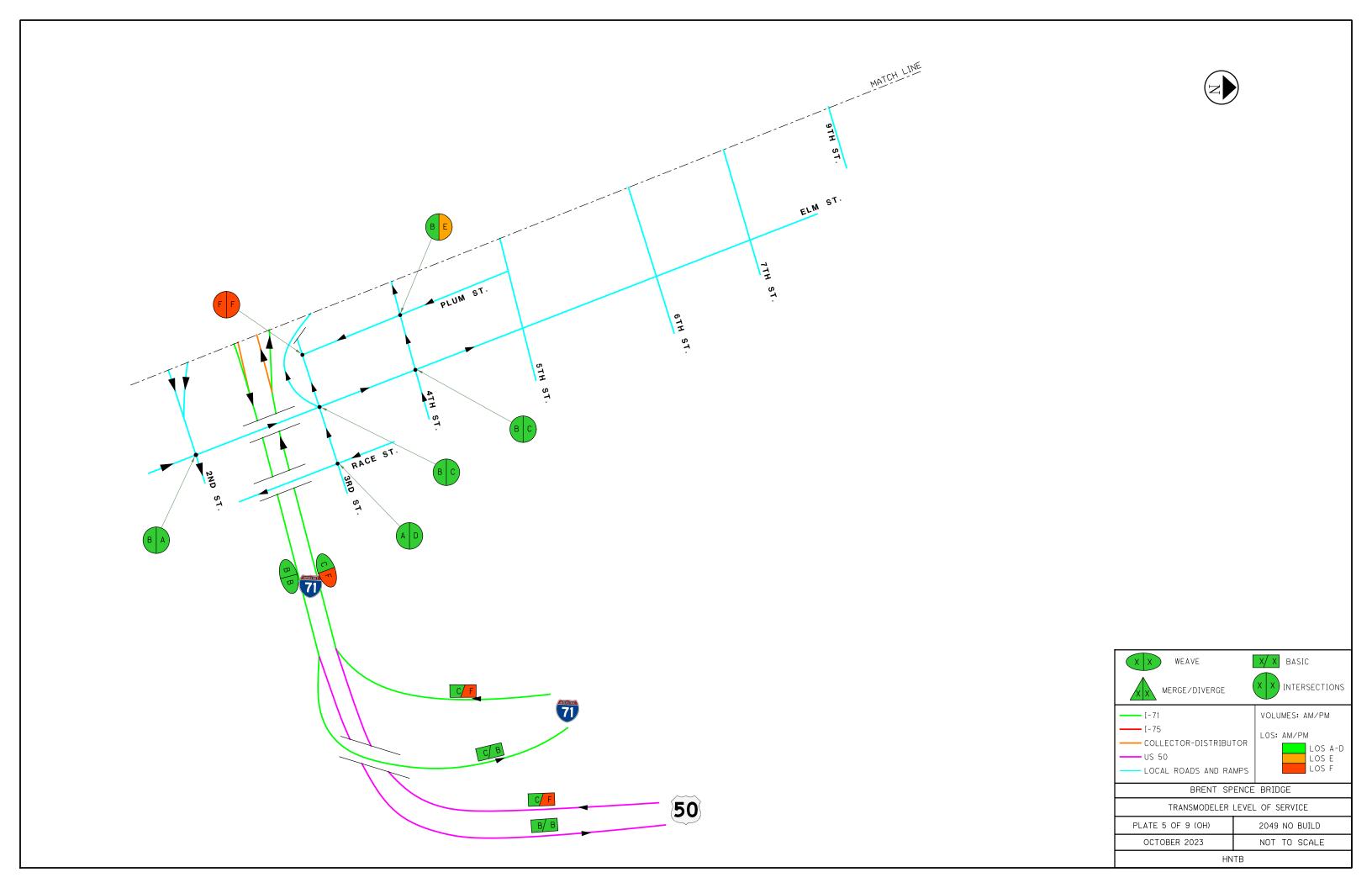


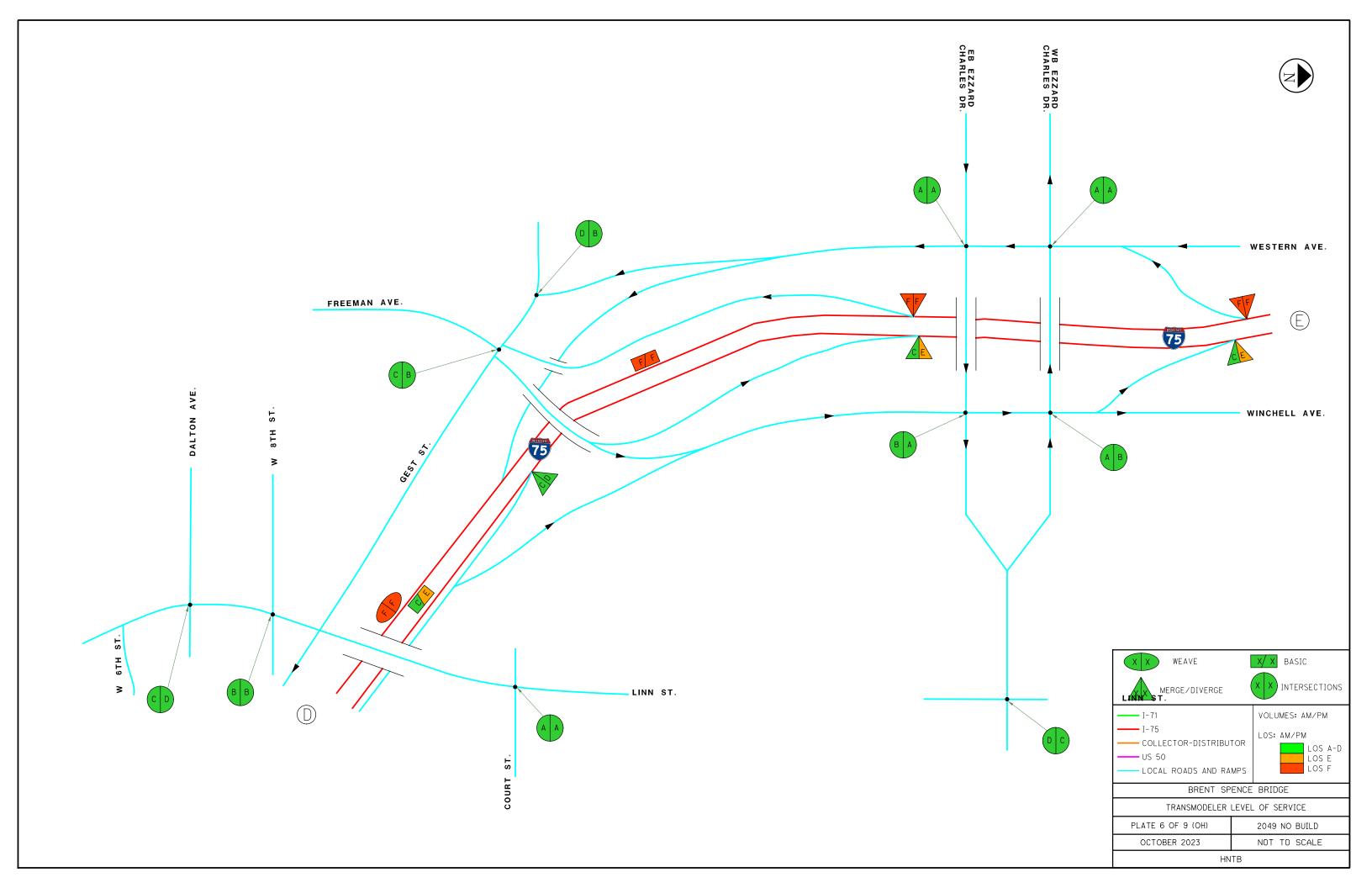


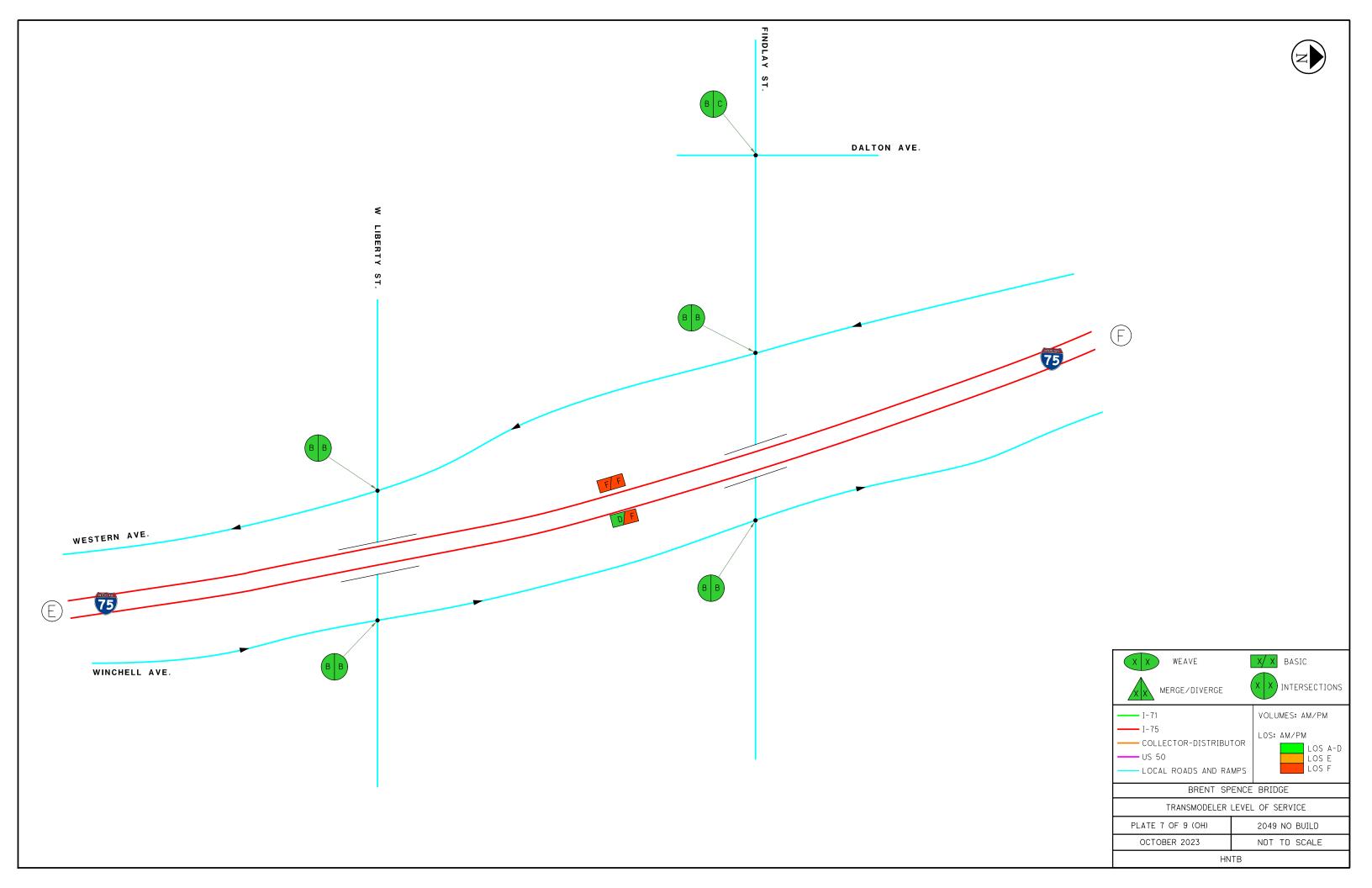


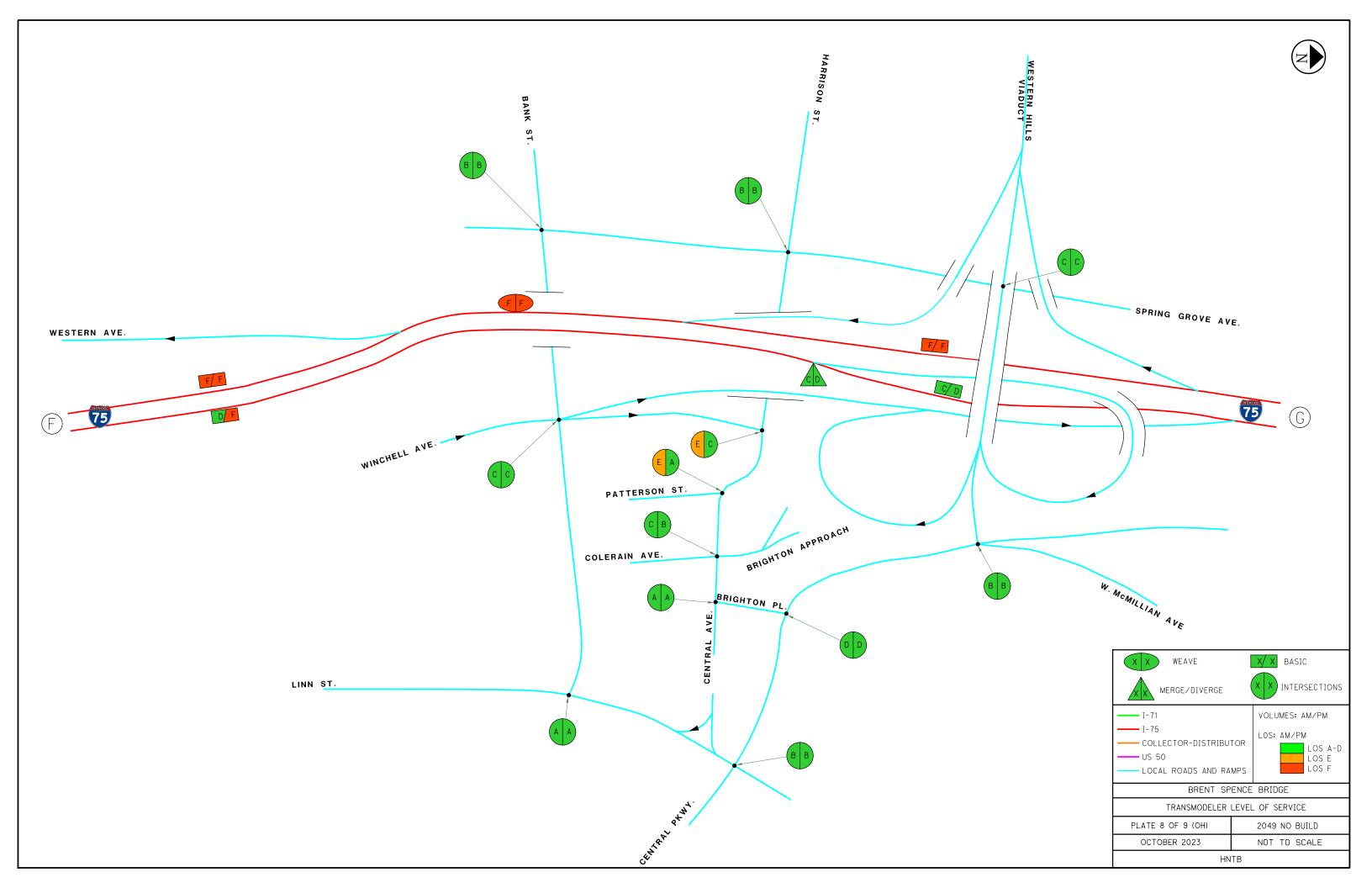


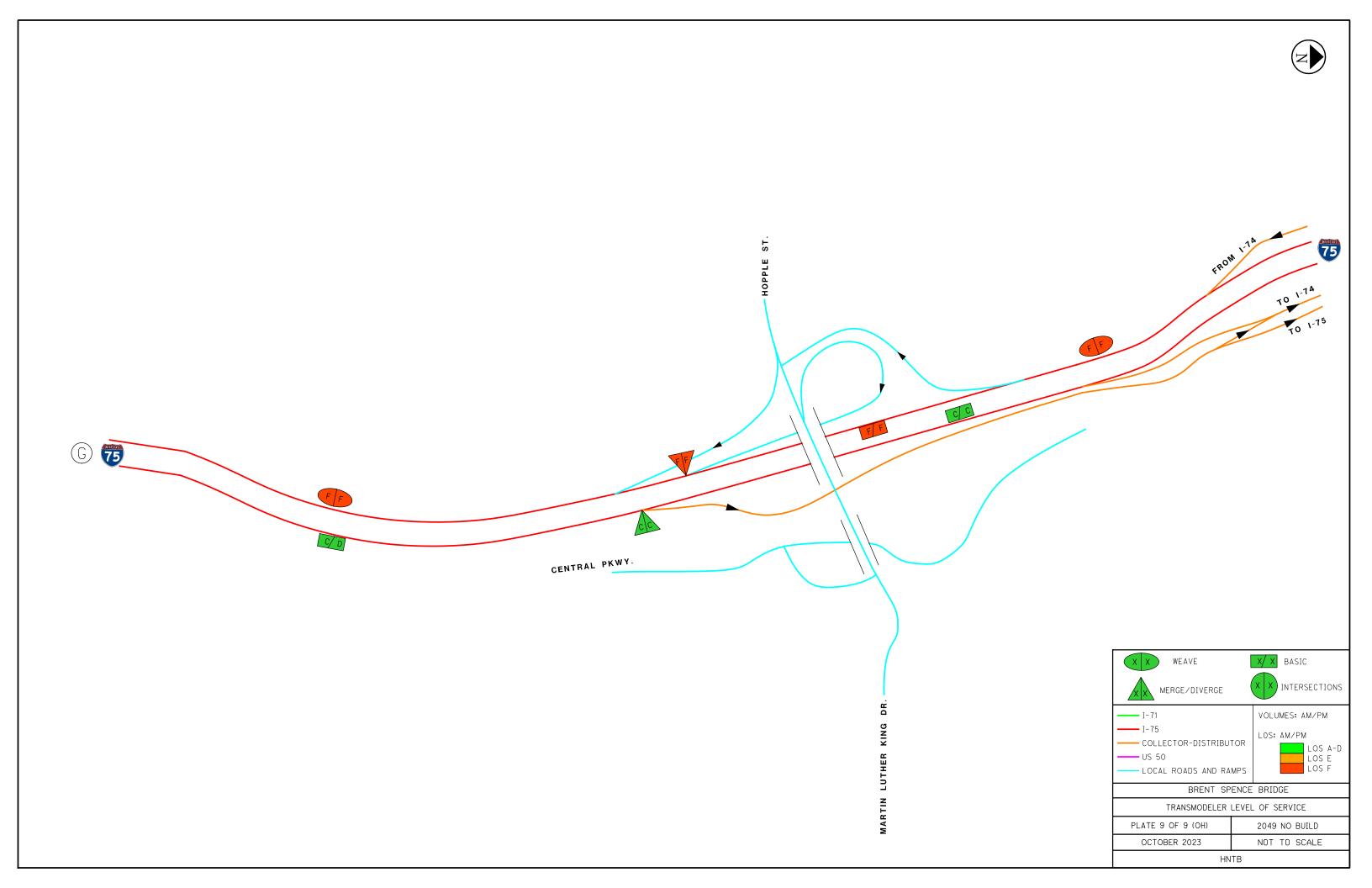






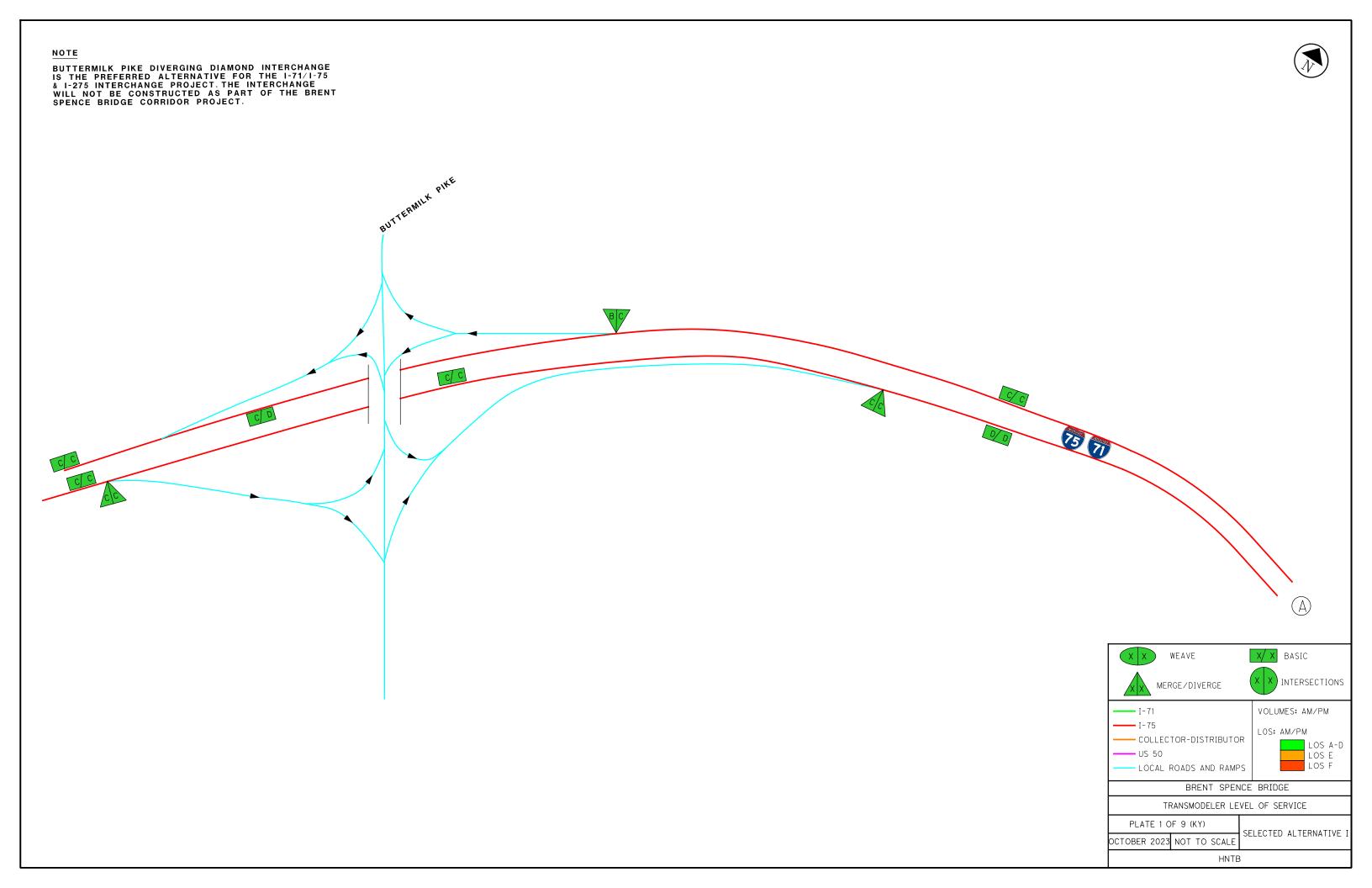


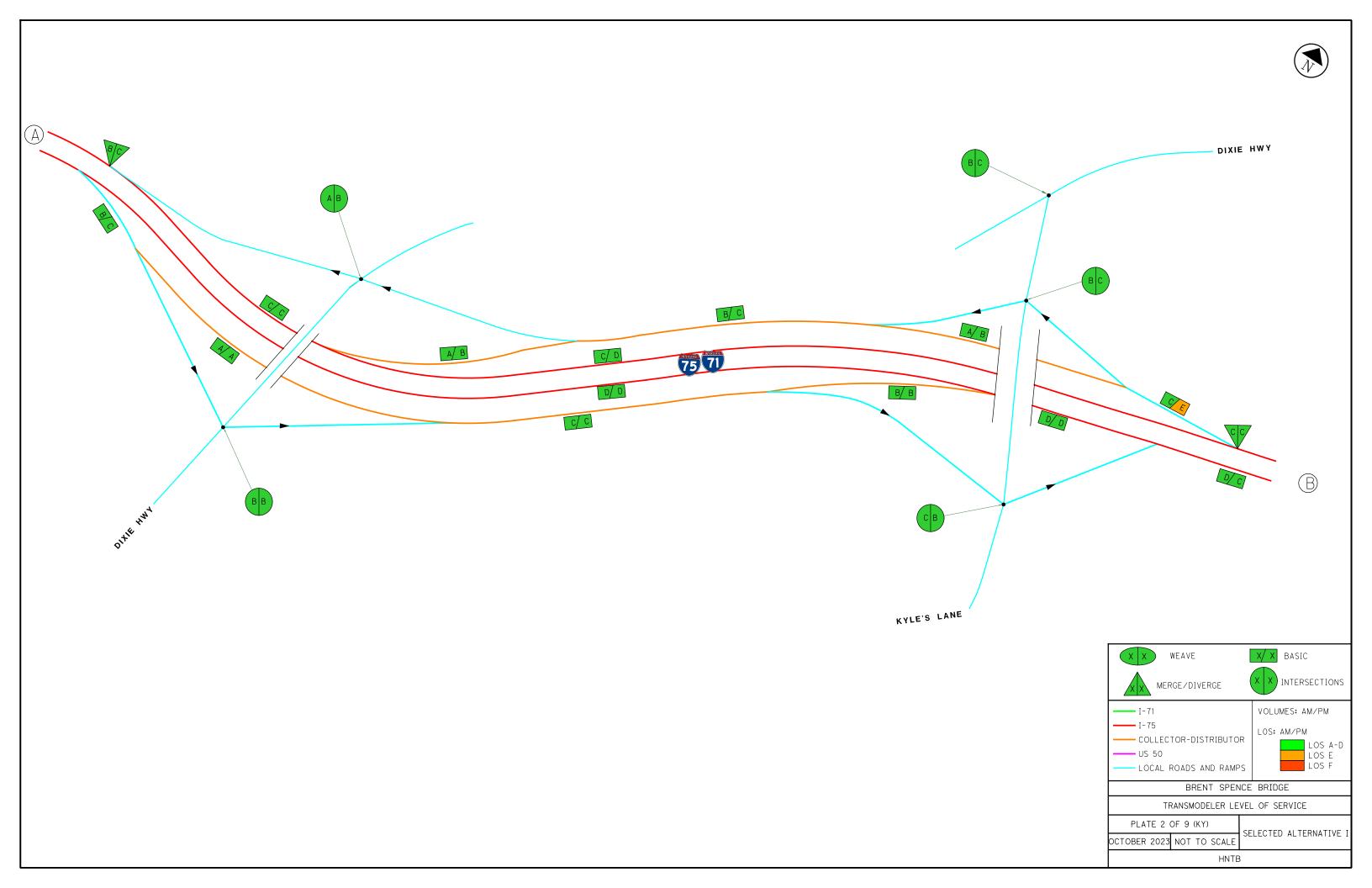


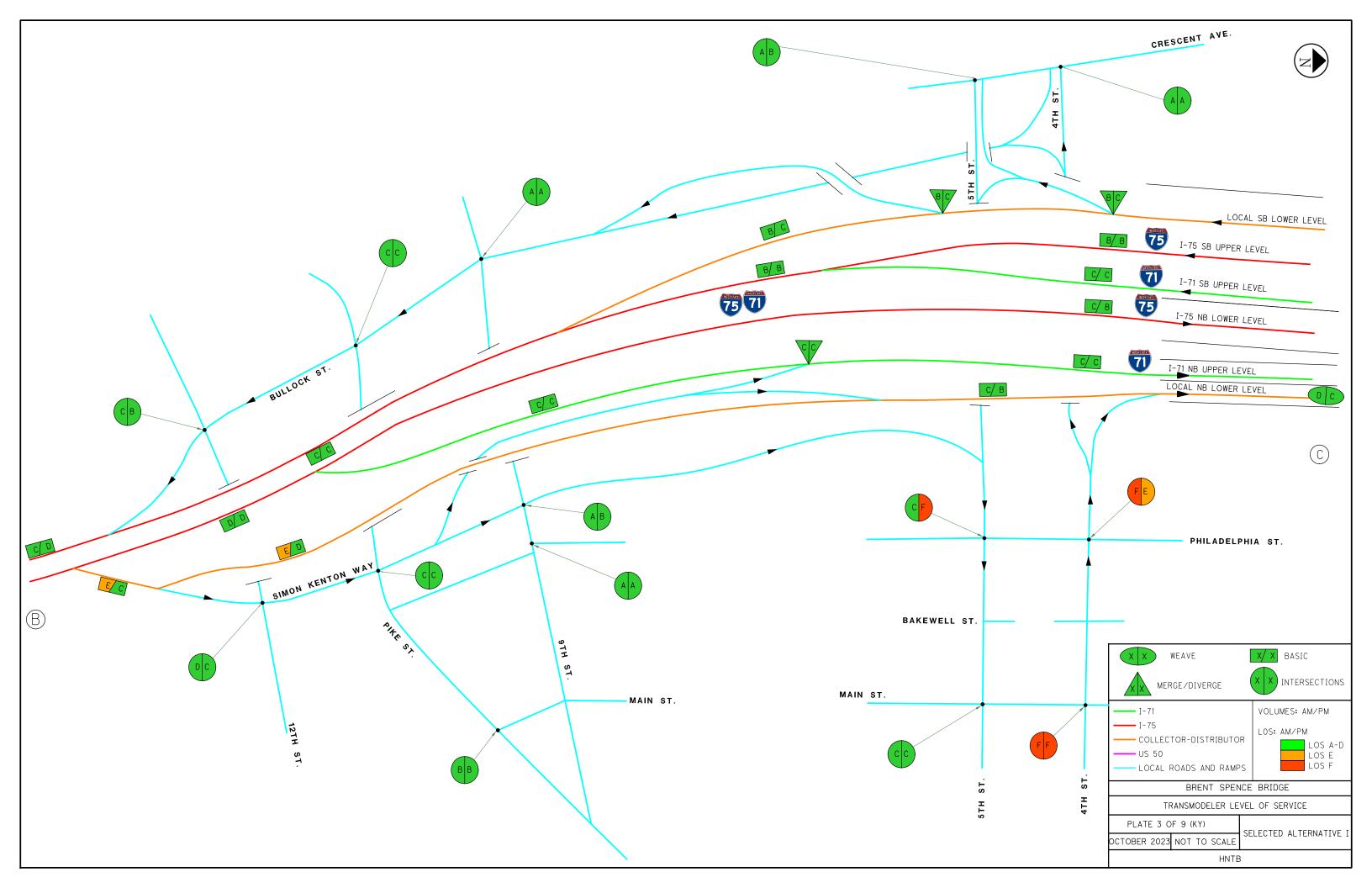


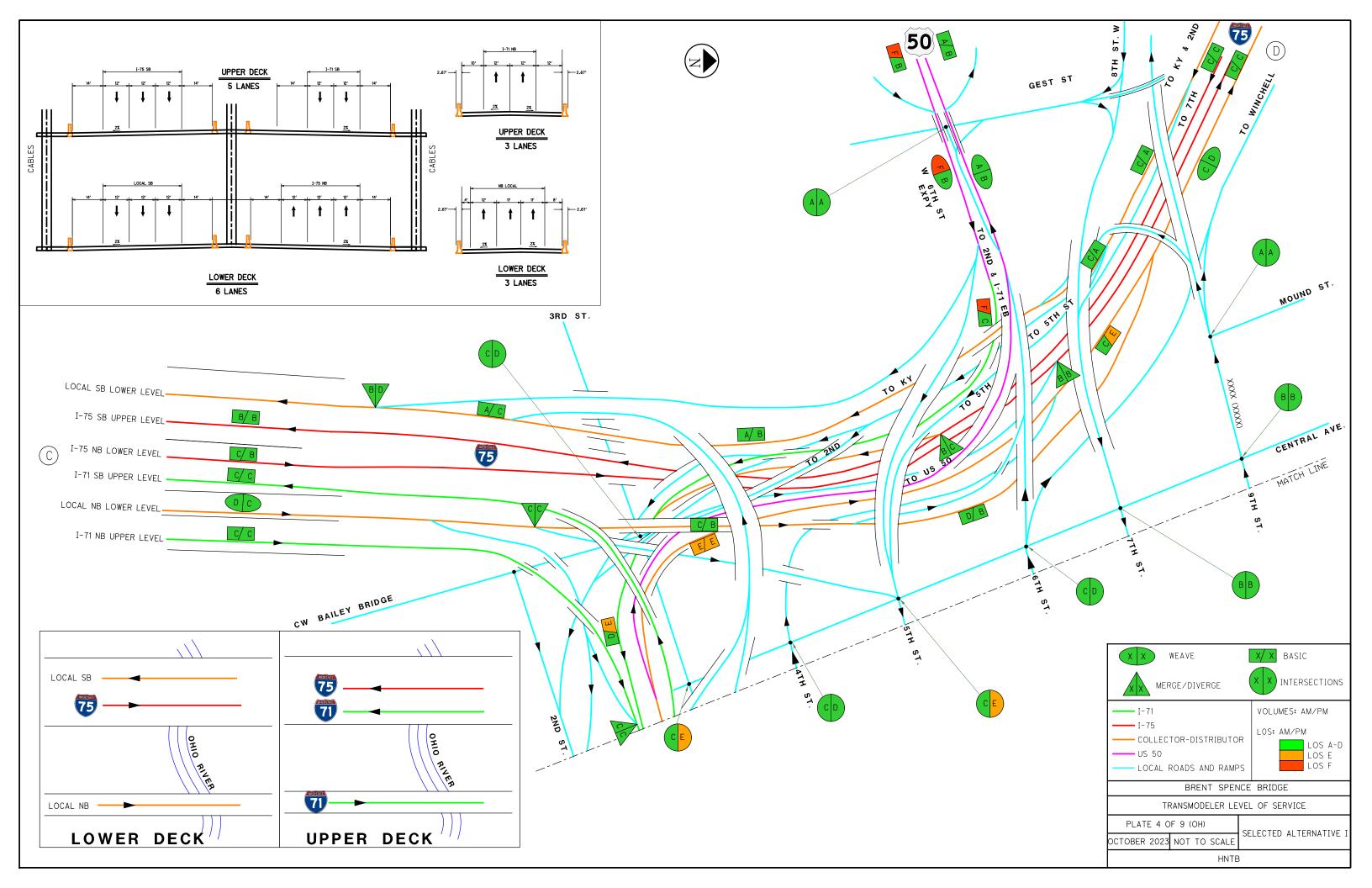
# **Appendix C: 2049 Selected Alternative I Level of Service**

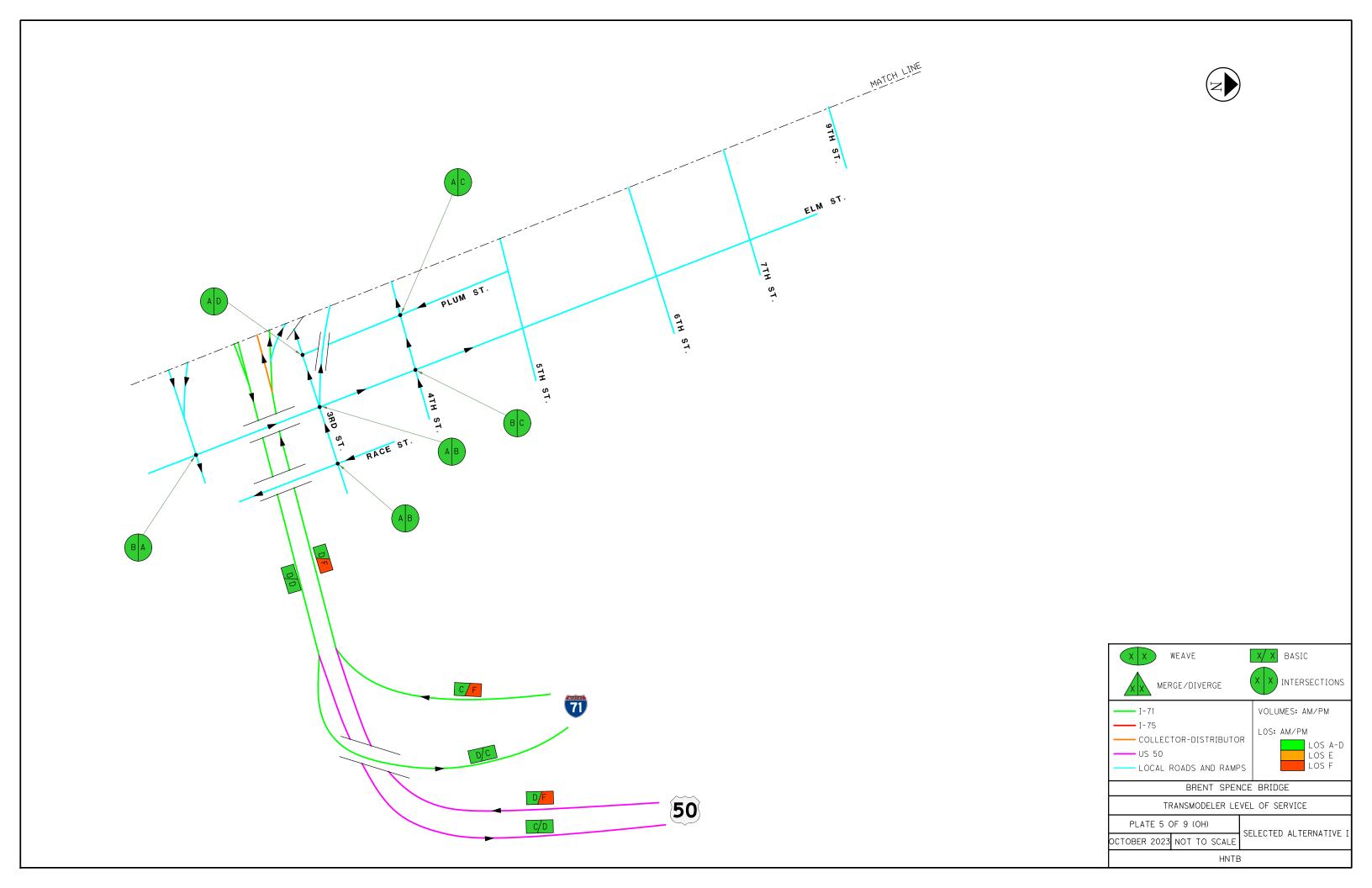


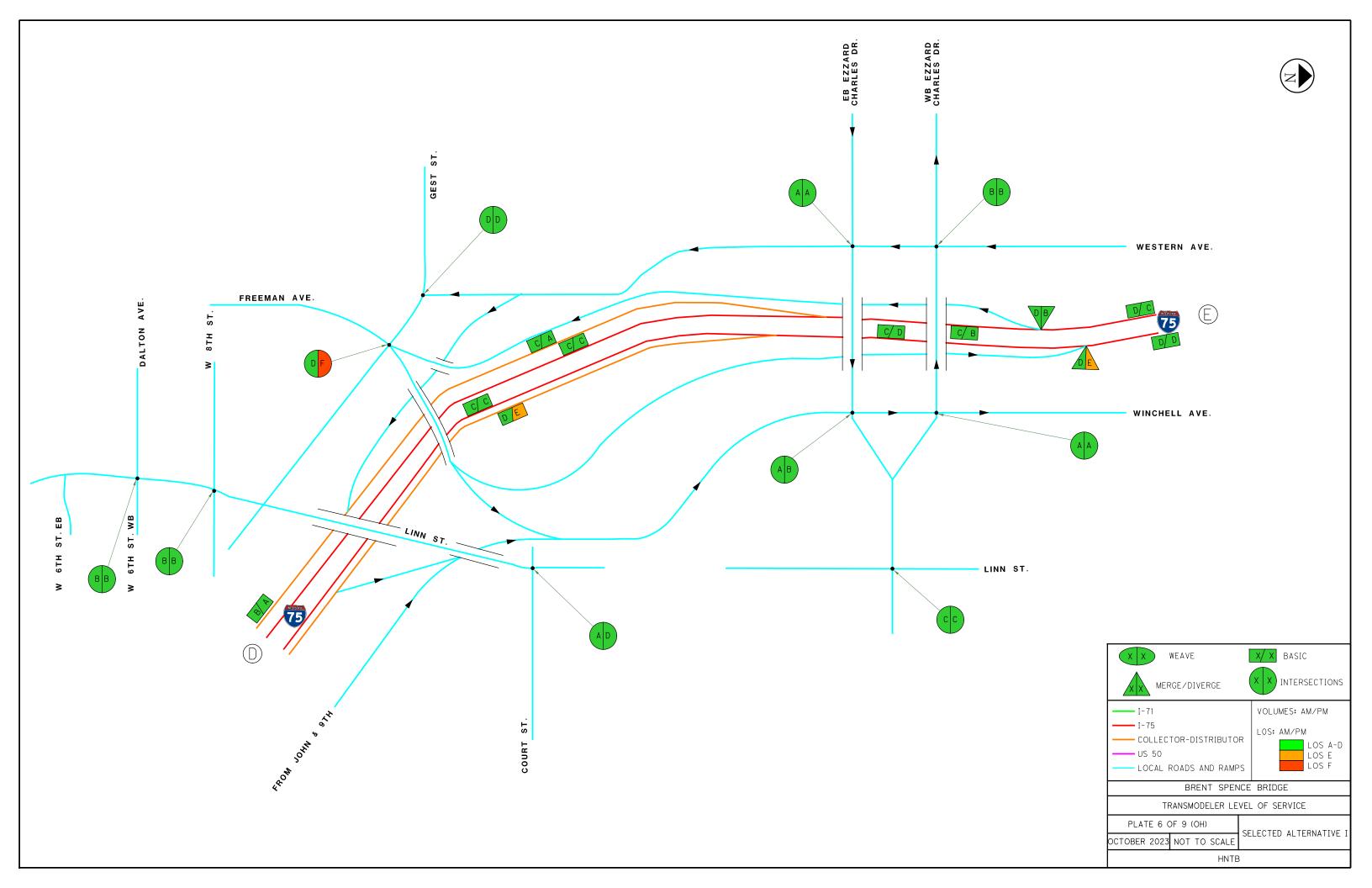


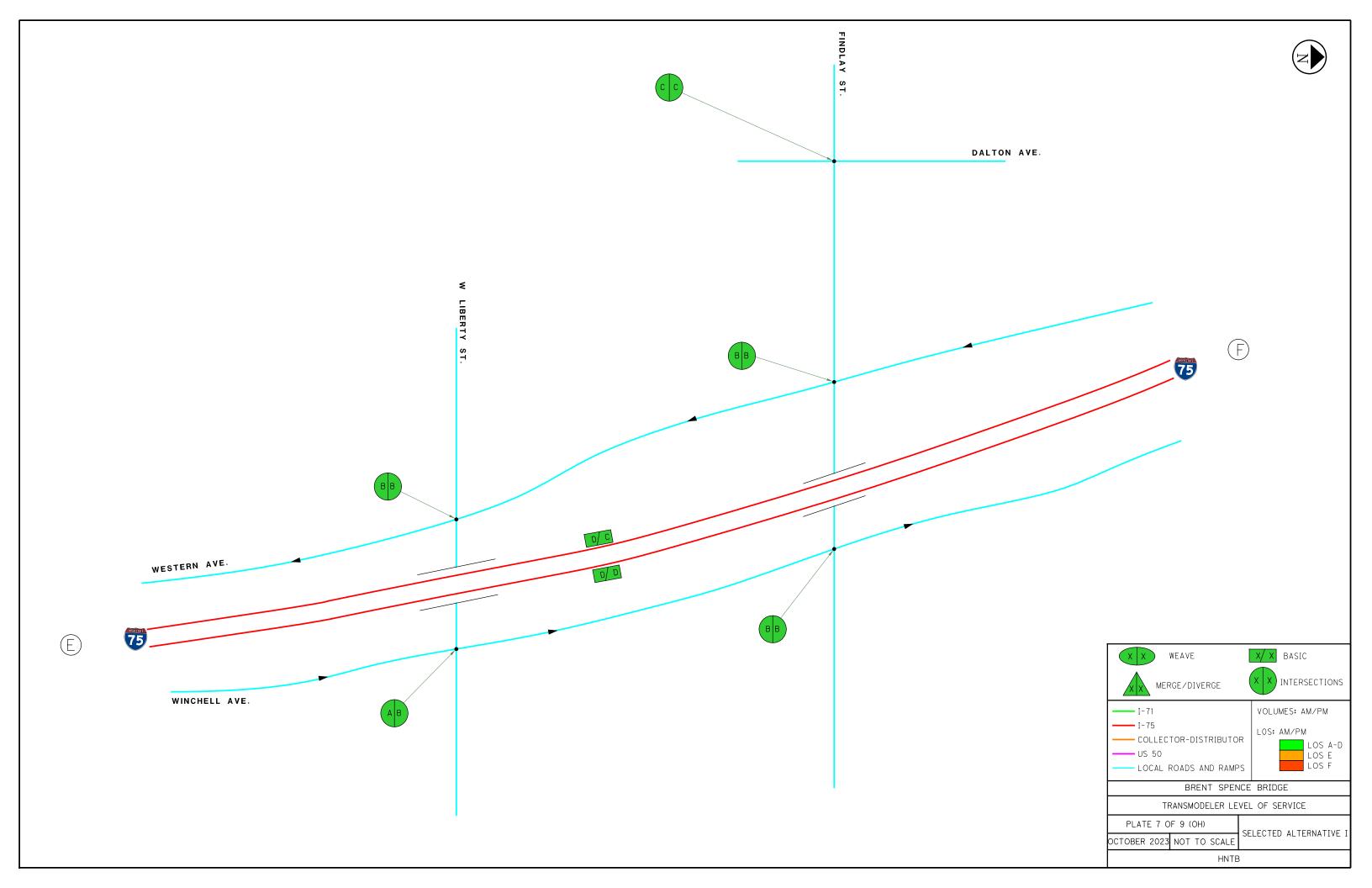


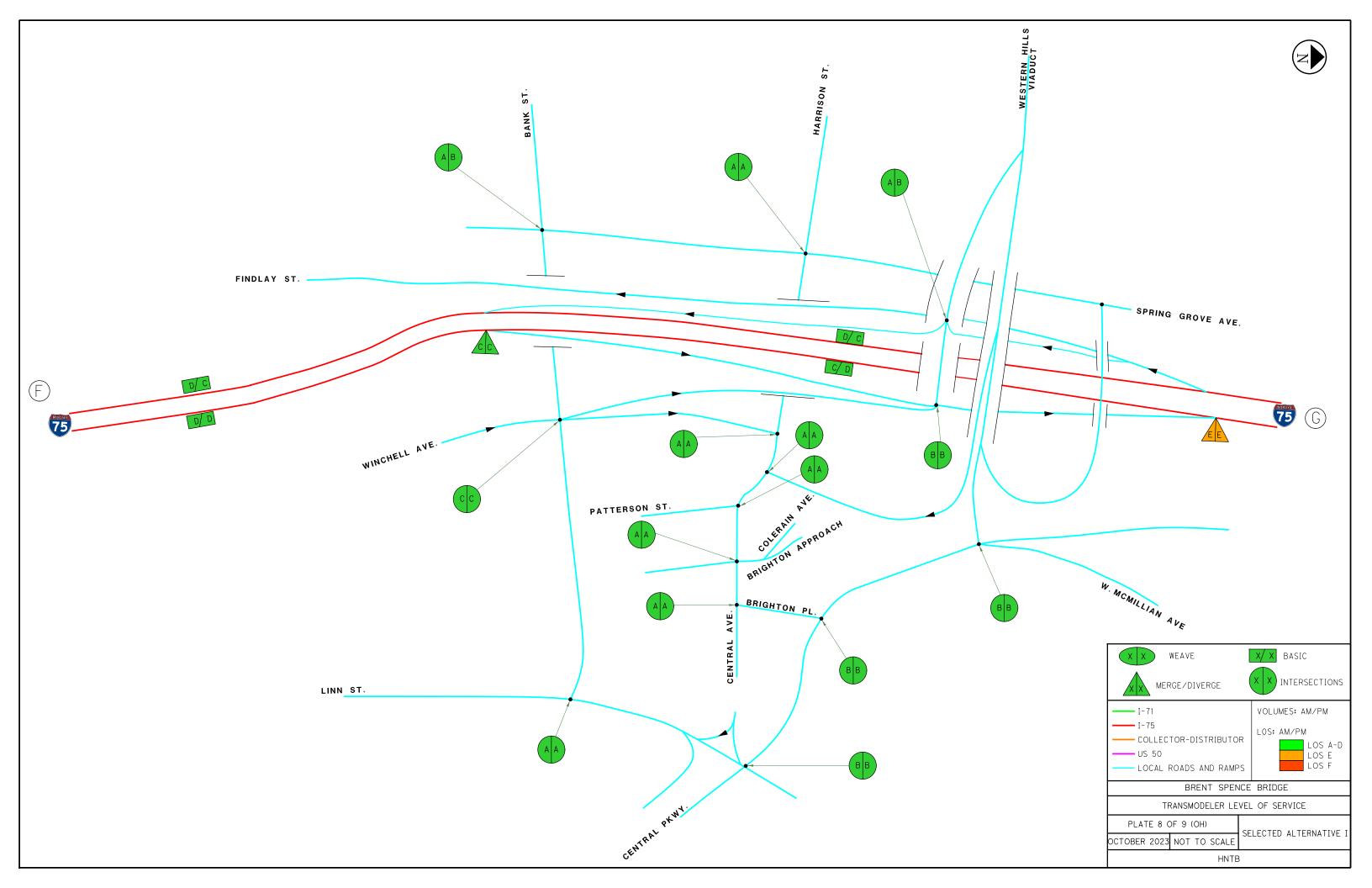


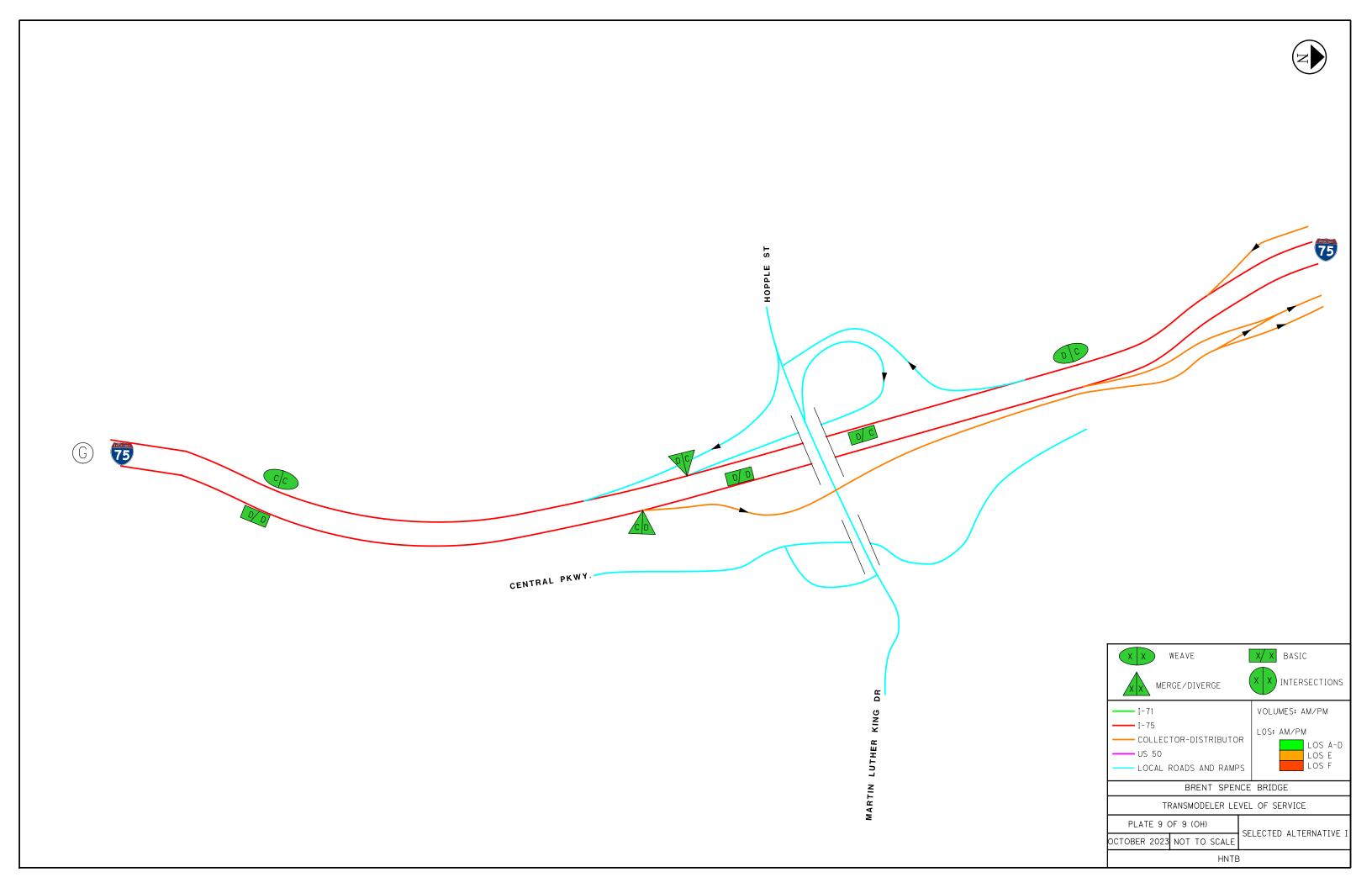




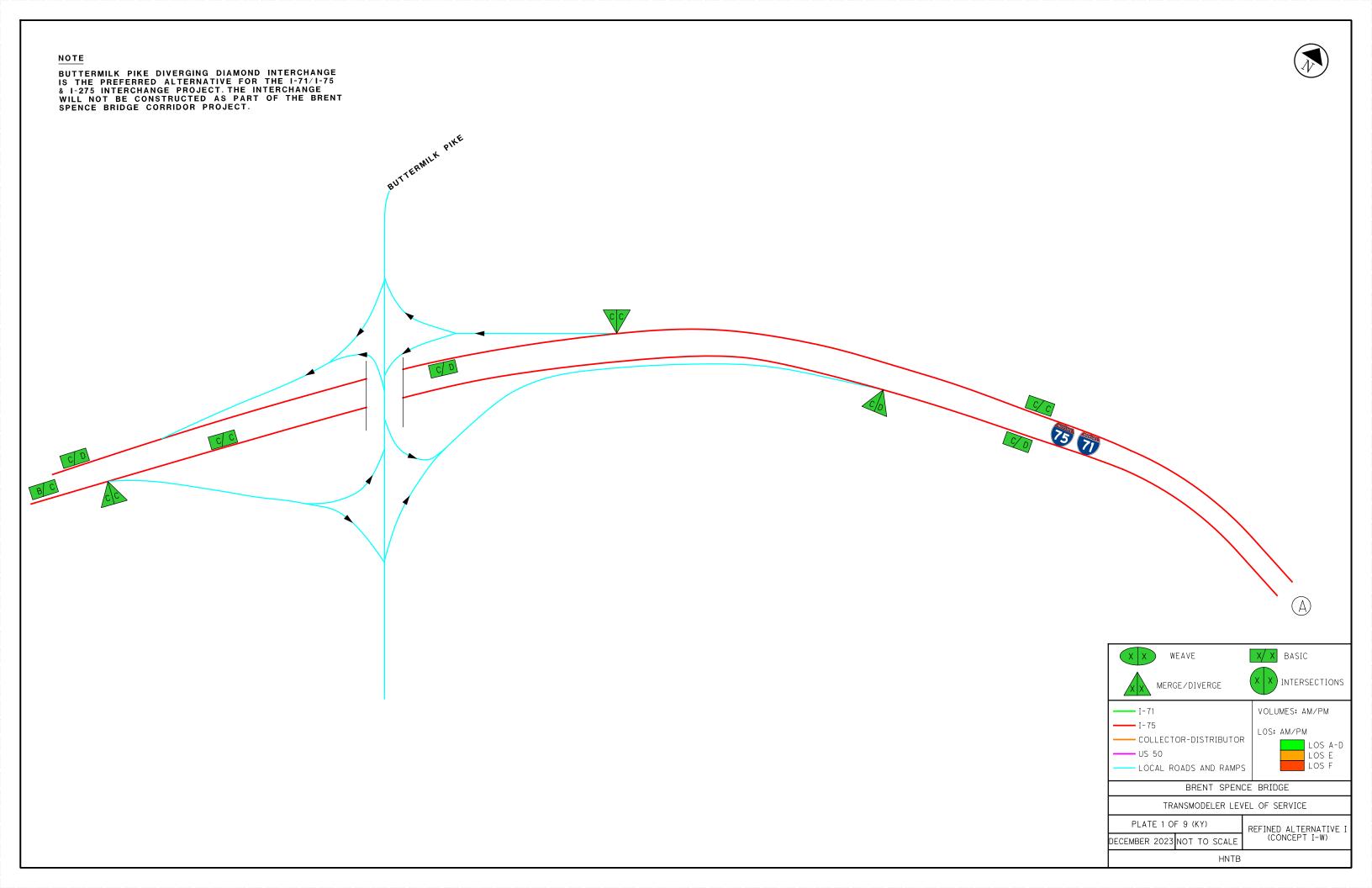


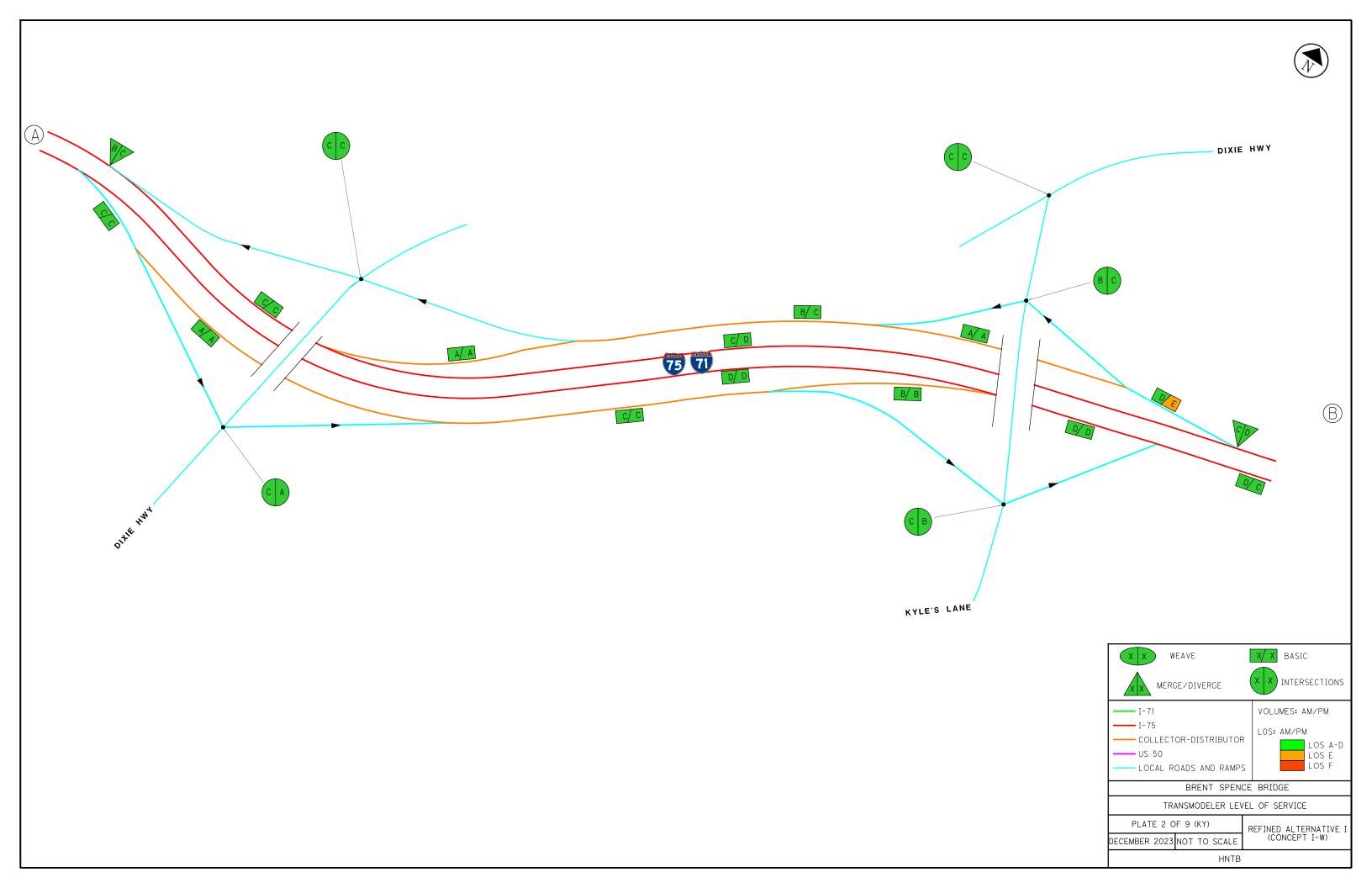


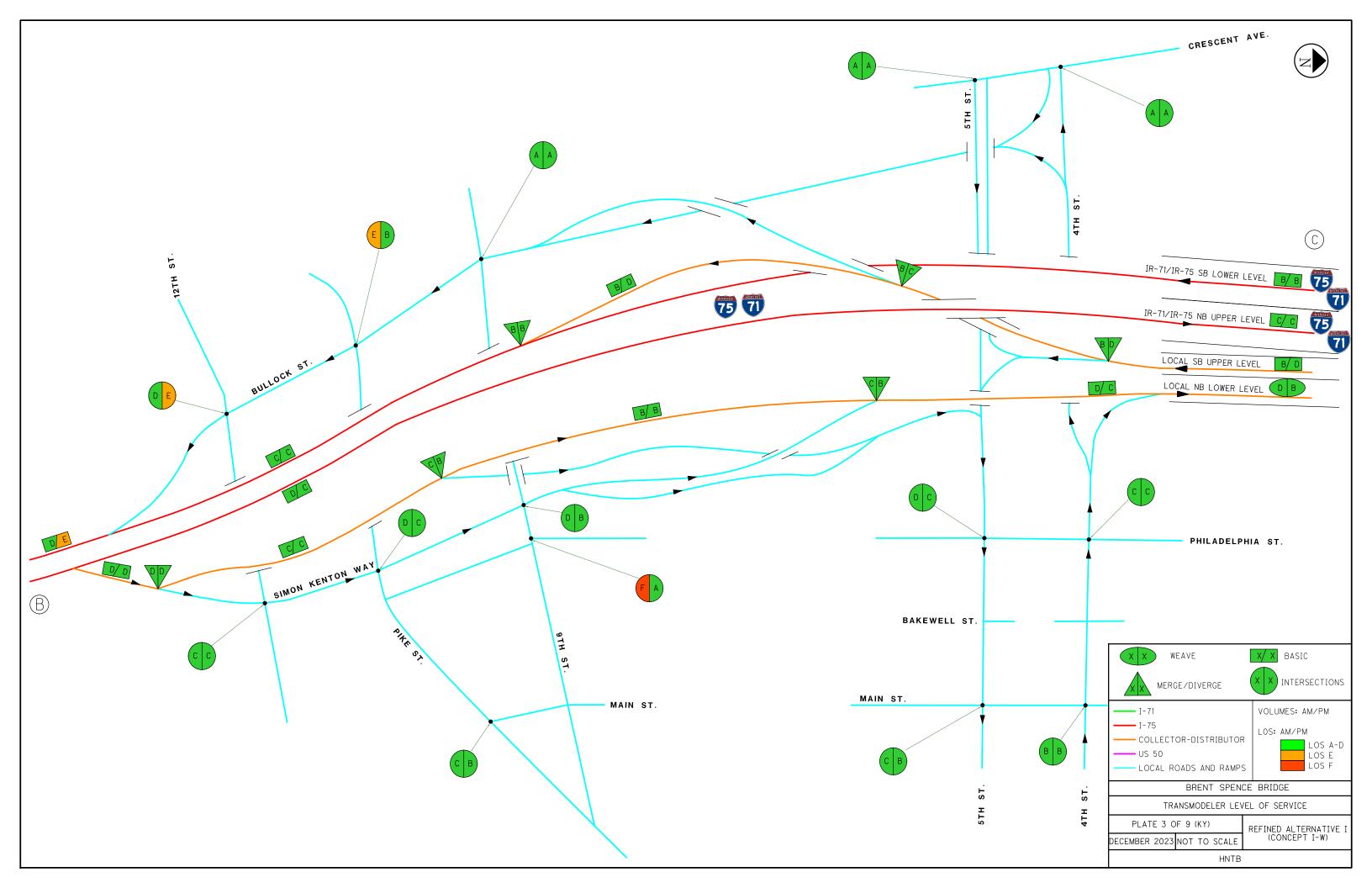


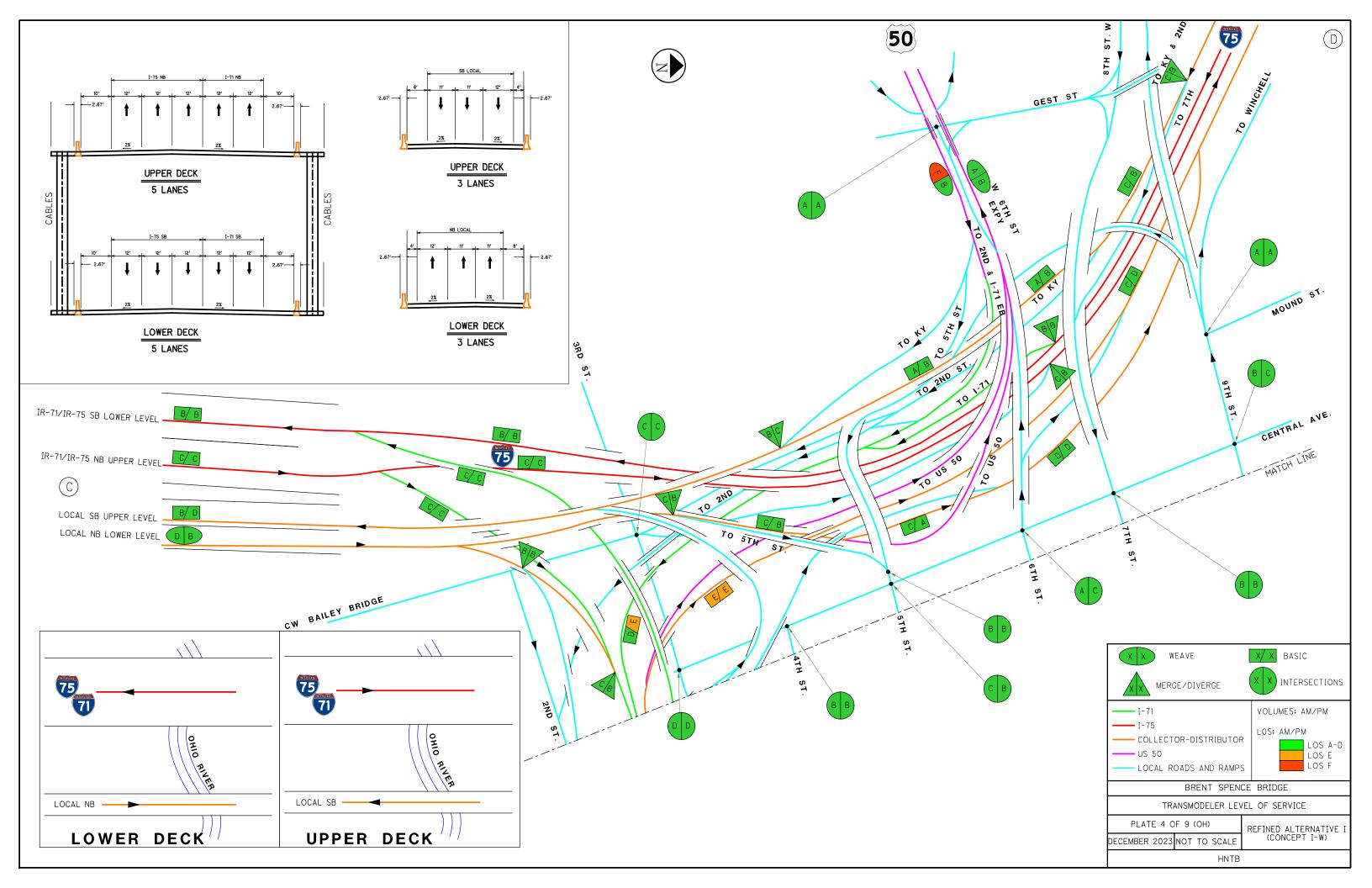


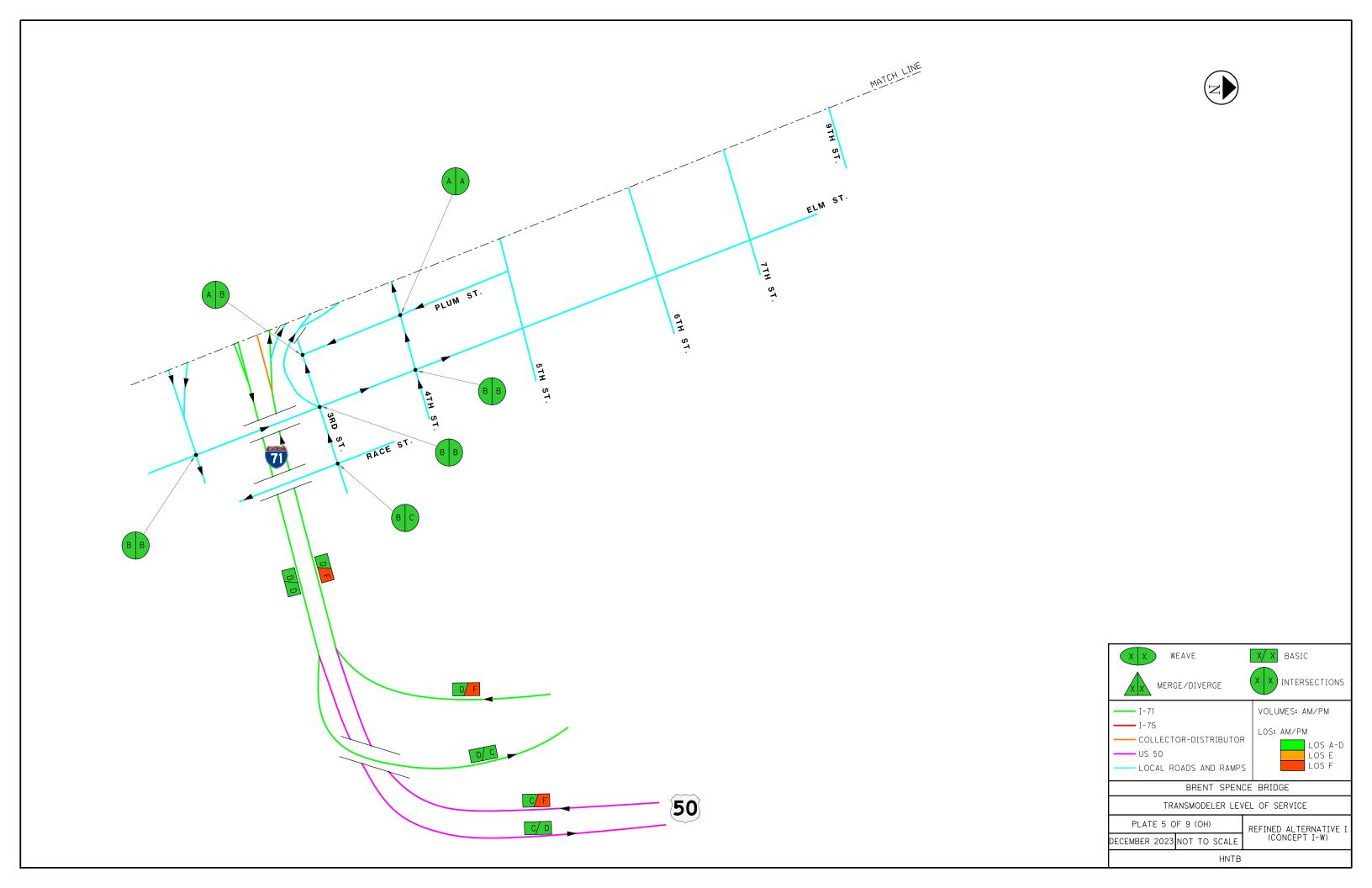
# Appendix D: 2049 Refined Alternative I (Concept I-W) Level of Service

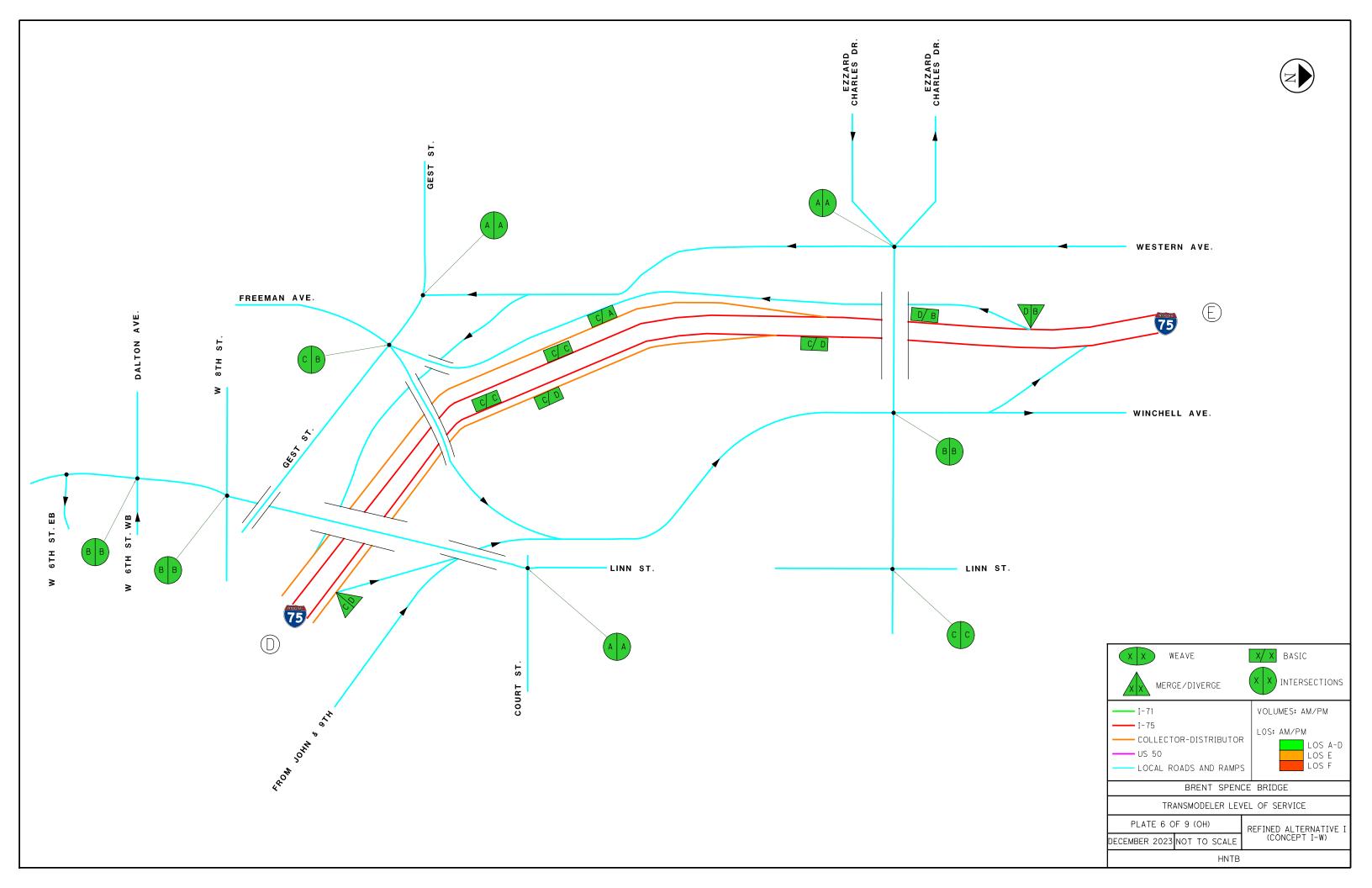


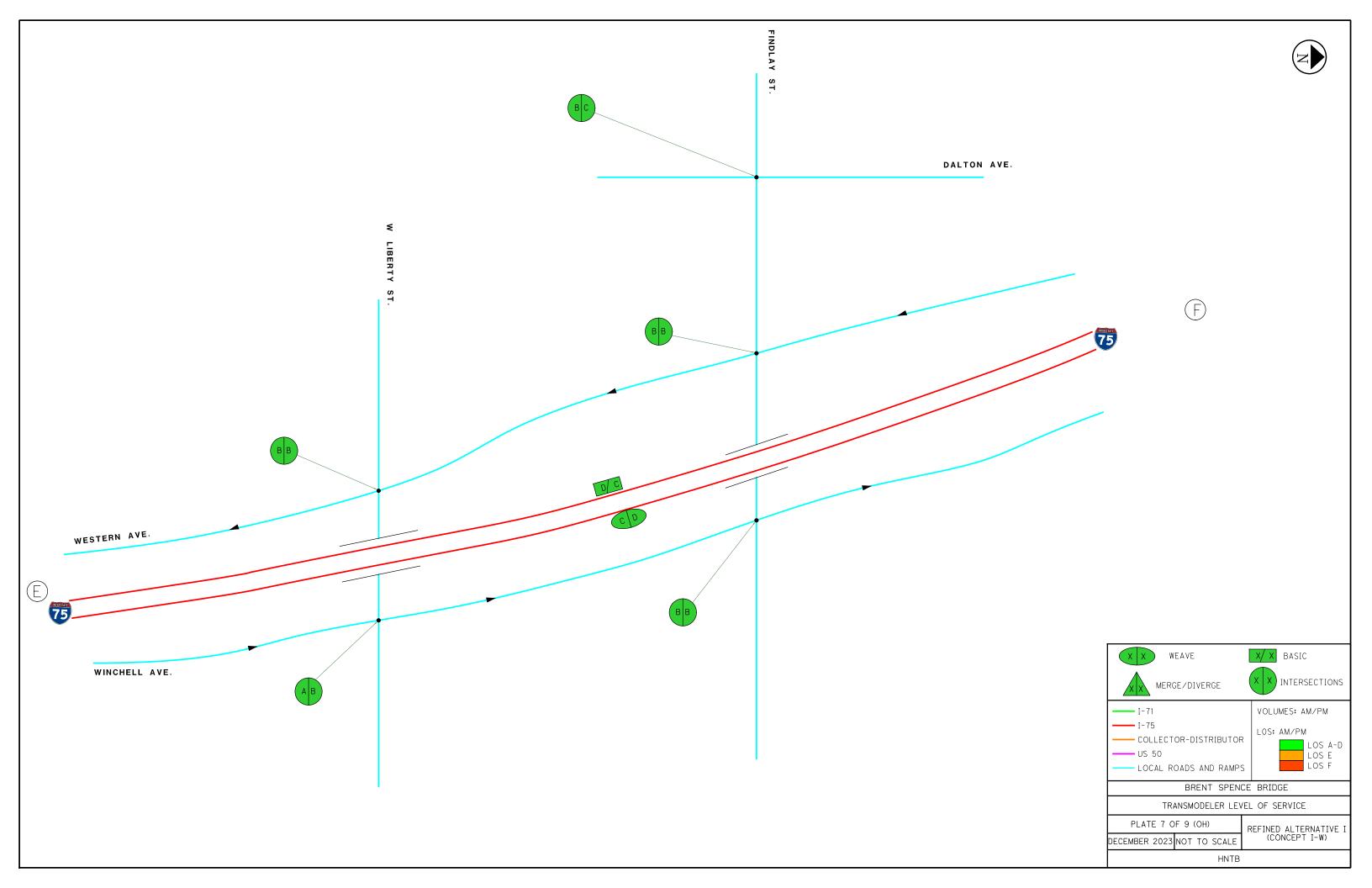


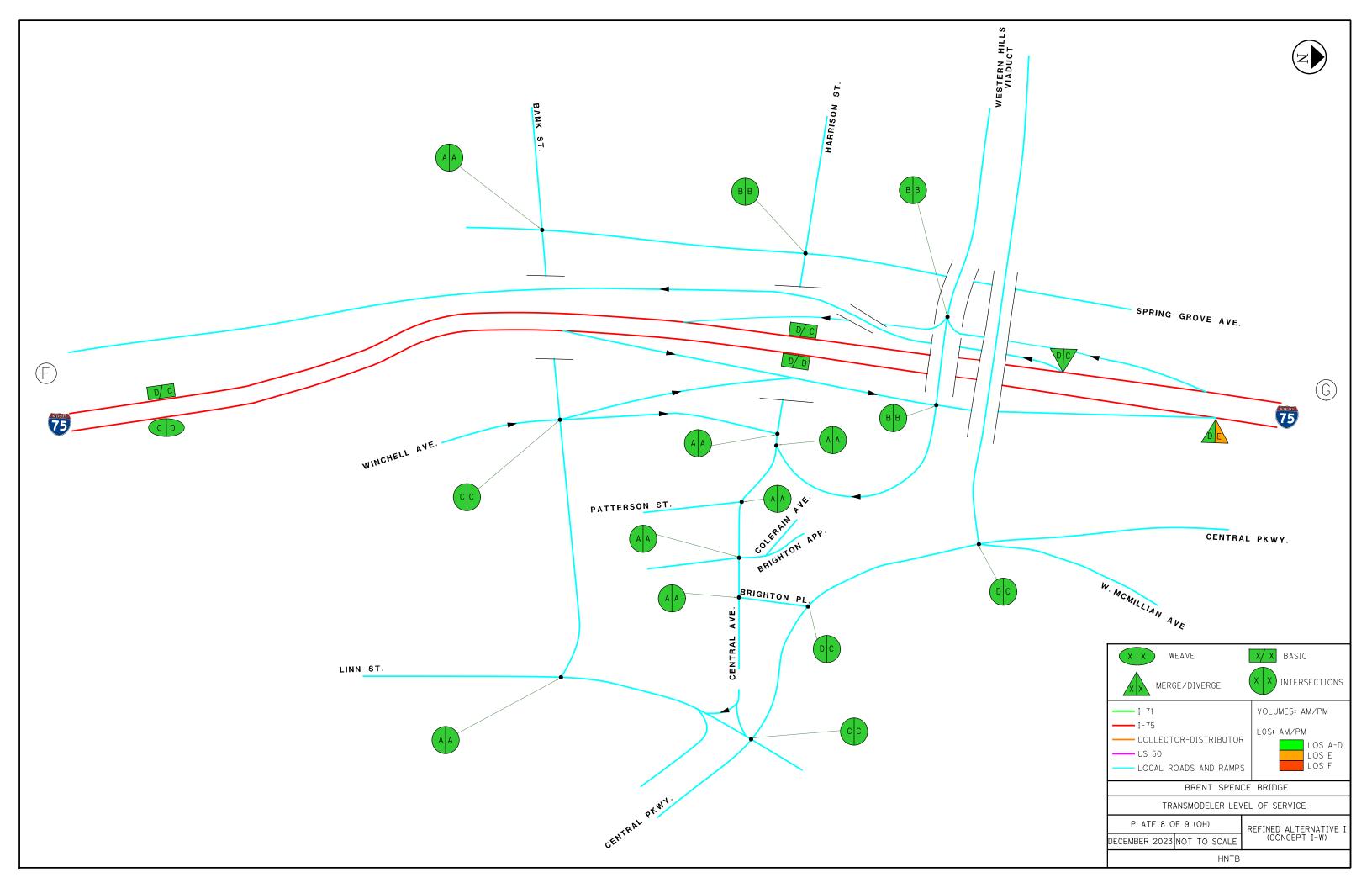


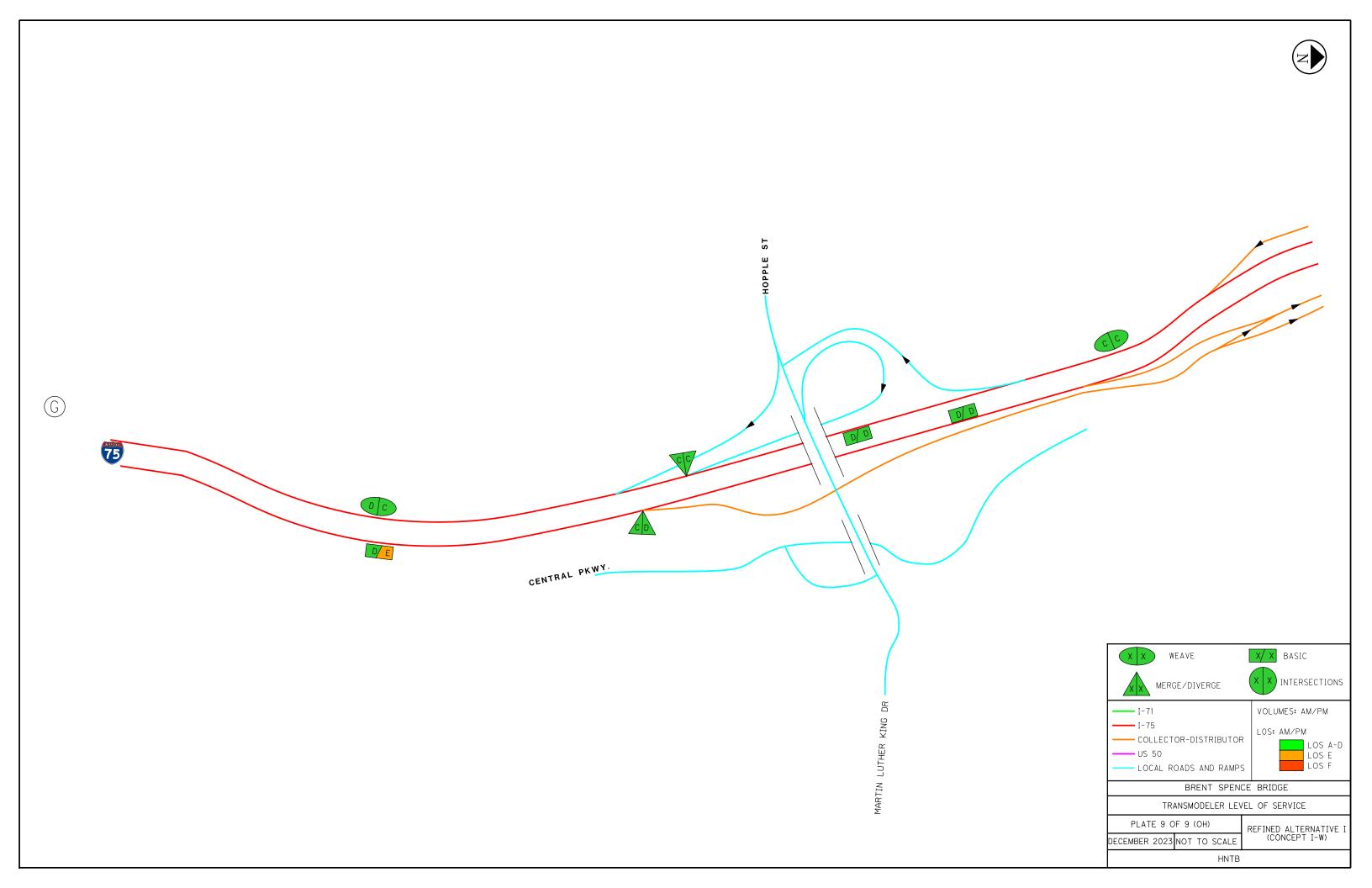












# **Appendix G: IMS Addendum Safety Analysis**



BRENT SPENCE BRIDGE CORRIDOR PROJECT

# **IMS ADDENDUM SAFETY ANALYSIS**

ODOT PID 89068 | KYTC PROJECT ITEM NO. 6-17 OCTOBER 26, 2023





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## 1. INTRODUCTION

The purpose of this *Interchange Modification Study (IMS) Addendum Safety Analysis* is to update the original *Access Point Request (August 2011)*<sup>1</sup> for the Brent Spence Bridge (BSB) Corridor Project. The original document presented various design and performance criteria for the preferred alternative at that time (named Alternative I) to substantiate that the proposed changes in access to the interstate system would not degrade the operation or safety when compared to the existing conditions and was approved by the Federal Highway Administration (FHWA) on November 3, 2011. This design was approved in the 2012 Environmental Analysis/Finding of No Significant Impacts (IA/FONSI) and is referred to as the Selected Alternative I.

This Safety Analysis provides information relative to design and traffic analysis performed since 2012, which led to the identification of several value engineering refinements to Selected Alternative I. Throughout this document, these collective refinements incorporated into Selected Alternative I are referred to as Refined Alternative I (Concept I-W). The addendum will assist the Kentucky Transportation Cabinet (KYTC), the Ohio Department of Transportation (ODOT), and FHWA in assessing the differences in impacts to safety between the No Build and Refined Alternative I (Concept I-W) and between Selected Alternative I (from the 2012 EA/FONSI) and Refined Alternative I (Concept I-W). The analysis will provide the justification and documentation necessary to substantiate that the refinements incorporated into Refined Alternative I (Concept I-W) will improve safety compared to the existing interstate system.

#### 2. SAFETY ANALYSIS STUDY AREA

The BSB Project Area is shown in **Figure 1.** This incorporates the highway corridors in blue labeled as the Project Corridor, including interstate I-71 and I-75 corridors, the BSB bridge crossing, a portion of US 50 West, and US 50 East (along I-71, east of I-75). The southern limit of the project corridor is approximately 5,000 feet south of the Dixie Highway interchange on I-71/I-75 in Fort Mitchell at Kentucky milepost 188.0. The northern limit of the project corridor is approximately 1,500 feet north of the Western Hills Viaduct (WHV) Interchange on I-75 in Cincinnati at Ohio milepost 2.5. The eastern and western limits of the project corridor generally follow the existing alignment of I-75, a major throughway for local and regional mobility within the Greater Cincinnati/Northern Kentucky region. Locally, I-75 connects to I-71, I-74, I-275, and US Route 50. The BSB provides an interstate connection carrying I-71 and I-75 over the Ohio River, providing a critical link along the national I-75 corridor stretching from Florida to Michigan.

The Safety Analysis Study Area matches the BSB project corridor shown in blue, focusing on the safety of the freeway mainline and system interchange ramps within the overall project area.

<sup>&</sup>lt;sup>1</sup> AccessPointRequest-Aug.2011.pdf (brentspencebridgecorridor.com)



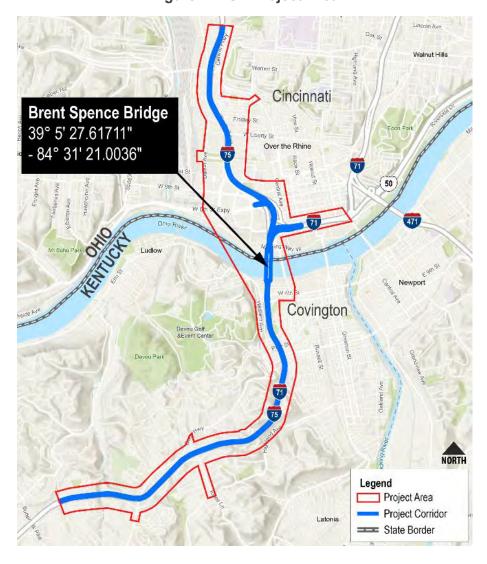


Figure 1: BSB Project Area

## 3. PROJECT BACKGROUND

On October 14, 2004, KYTC and ODOT recognized the need to improve the BSB corridor. They formally agreed to jointly develop and deliver a project to replace the existing BSB over the Ohio River. Key characteristics of the BSB corridor are described below:

- The corridor consists of 7.8 miles of I-71 and I-75, located within portions of Ohio and Kentucky.
- The BSB carries both I-71 and I-75 over the Ohio River.
- The BSB opened in 1963 and was initially designed to carry 80,000 vehicles per day (VPD) with current traffic volumes of 160,000 VPD.



#### 3.1 Existing Conditions

The design of the I-71 and I-75 facilities at many locations within the project corridor do not meet current design standards for numerous features, including lane widths, shoulder widths, horizontal and vertical clearances, left-hand entrances and exits, and horizontal and vertical geometry. The operational design of the BSB, with its reduced travel lane and shoulder widths, is the most frequently noted substandard feature. The BSB was opened in 1963 as a double-deck truss structure designed to carry three 12-foot travel lanes in both directions over the Ohio River. In 1985, increased traffic volumes resulted in the bridge needing to accommodate an additional travel lane in each direction to add capacity. To accomplish this, the original safety curb on the bridge was retrofitted to New Jersey Barrier style barrier, and the existing travel lanes were reduced in width to accommodate four 11-foot lanes with one-foot shoulders.

In summary, the bridge was not designed to accommodate the current or future daily traffic volume. In addition to the design deficiencies on the bridge, the approaches on either side are also characterized by design deficiencies, such as narrow travel lanes and reduced shoulder widths. For these reasons, the BSB corridor experiences design deficiency and congestion-related crashes.

#### 3.2 Purpose and Need

The purpose of the BSB Corridor Project is unchanged from what was presented in the approved 2012 EA/FONSI:

- Improve traffic flow and level of service;
- · Improve safety;
- · Correct geometric deficiencies; and
- Maintain connections to critical regional and national transportation corridors.

#### 3.3 Crash History

The Access Point Request (August 2011) contains a discussion of crash rates and safety issues for the years 2001 to 2003, as detailed in the Planning Study Report (April 2006) and the Purpose and Need Statement (May 2006). These studies found that most crashes in the BSB corridor were rear-end and sideswipe types, and the crash rates exceeded the Kentucky and Ohio statewide averages at that time. These types and rates of crashes were seen as typical for congested traffic conditions with deficient and substandard roadway geometry. The following crash statistics were presented:

In Kentucky along I-71/I-75:

- Of the 676 crashes, 51.6 percent were rear-end, and 32.4 percent were sideswipes.
- Approximately 67.3 percent of the crashes occurred during daylight, and about 74.3 percent occurred on dry pavement.



• Approximately 56.4 percent of crashes occurred in the northbound lanes and 43.6 percent in the southbound lanes.

#### In Ohio along I-75:

- Of the 1,049 crashes, 48 percent were rear-end, and 25.3 percent were sideswipes.
- Approximately 67.8 percent of the crashes occurred during daylight, and about 69.4 percent occurred on dry pavement.
- Approximately 44 percent of crashes occurred in the northbound lanes, and 56 percent occurred in the southbound lanes.

#### In Ohio along I-71:

- Of the 150 total crashes, 37.3 percent were rear-end, 16.7 percent were sideswipe, and 14.7 percent were fixed object crashes.
- Approximately 54.7 percent of crashes occurred during daylight, and about 58 percent occurred on dry pavement.

Specific areas with a high concentration of crashes were also listed in the *Access Point Request* for the BSB corridor.

#### 4. SAFETY ANALYSIS METHODOLOGY

ODOT and KYTC have guidance for data-driven safety analysis that evaluates the safety benefit of a project. The two states have a similar process for the evaluation of safety on roadway projects, and both follow these general steps:

- 1) Identify locations with existing safety deficiencies
  - a. ODOT uses the Safety Integrated Project Mapping with locations assigned a safety priority ranking.
  - b. KYTC uses the Level of Service of Safety (LOSS) measurements to identify roadway segments with safety deficiencies and focuses its analysis on segments with LOSS 3 or 4 rankings.
- 2) Evaluate historical crashes
  - Both states maintain a crash database that can be summarized to determine existing crash trends for individual roadway segments.
- 3) Predictive crash analysis to evaluate mitigation strategies
  - a. ODOT uses the Economical Crash Analysis Tool (ECAT) for predictive crash analysis based on HSM procedures
  - b. KYTC uses the HSM procedure and utilizes all available tools, including HSM spreadsheets, ISATe, and IHSDM.

The BSB project follows these general steps and includes a qualitative safety evaluation to compare the safety differences between the No Build, Selected Alternative I, and Refined Alternative I (Concept I-W). The safety



analysis report includes a summary of ODOT and KYTC safety priority locations, a summary of historical crashes, and the use of select predictive crash analysis to evaluate mitigation strategies. A detailed step-by-step comparison of the BSB analysis approach as it relates to the ODOT and KYTC processes is provided in the following sections.

## 4.1 BSB Project Application of KYTC Safety Process

KYTC has three safety analysis approaches based on the type of project and the severity of the existing crash trends. The categories include:

- Safety Analysis 1 (SA1)
  - Safety is not included in the purpose and need
  - o Does not include multiple alternatives or multiple improvement options
- Safety Analysis 2 (SA2)
  - o Includes Alternative analysis
  - Has multiple improvement options
- Safety Analysis 3 (SA3)
  - Any project with a high number of excessive crashes and will find a significant use for a cost/benefit analysis

KYTC includes a flow chart for determining the safety analysis approach best suited for the project shown in **Figure 2.** The BSB project is identified as a project with safety in the initial purpose and need and has segments with LOSS 3 and 4. The project will not include a 20-year cost/benefit analysis of safety performance. Therefore, the BSB project is categorized as an SA2, as highlighted with the hatched arrows in **Figure 2**. As prescribed by the SA2, the BSB project uses predictive safety analysis to evaluate the benefits of mitigation strategies. The KYTC road segments with LOSS 3 and 4 are discussed in **Section 6.2**.



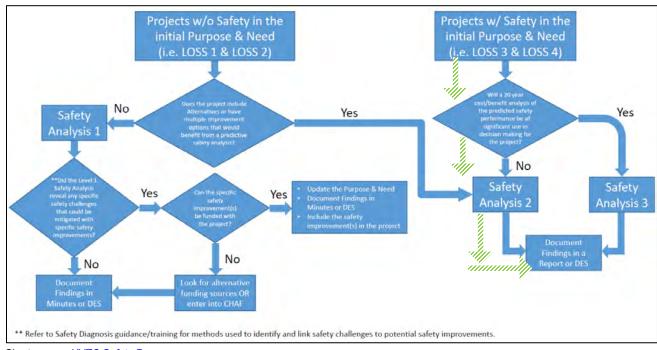


Figure 2: KYTC Safety Process

Chart source: KYTC Safety Process

#### 4.2 BSB Project Application of ODOT Safety Process

ODOT uses a data-driven safety analysis process and has methodologies based on the type of project and severity of existing crash trends. ODOT has three project categories:

- 1) Non-Complex Projects (No Alternative Analysis)
- 2) Complex Projects Assessment with Alternative Analysis without "Safety" in the Purpose and Need Statement
- 3) Complex Projects Assessment with Alternative Analysis and Safety Component

The BSB project is identified under the third category: "Complex Projects Assessment with Alternative Analysis and Safety Component." This category is for projects with "Safety" considerations in the purpose and need., and for projects with intended safety funding requests. The safety methodology flow chart is shown in **Figure 3.** The BSB project follows the green hatched arrows through the flow chart. The one deviation from the process is the omission of the expected crash calculations. The BSB safety study estimated predicted crashes instead of expected crashes along the project corridor. This is due to the significant geometric and operational modifications in design alternatives compared to the existing design, which impacts the relevancy of crash history in predictive crash calculations. Figures showing the safety priority locations for ODOT in the project corridor are displayed in **Section 6.3**.



Complex Projects Assessment with Alternative Analysis and Safety Component For projects with "Safety" considerations in the purpose and need. AND / OR For projects with intended safety funding requests. 1gaaaanii 1

**Figure 3: ODOT Safety Process** 

Chart Source: ODOT Data Driven Safety Analysis Process Diagram



#### 5. CRASH ANALYSIS

Crash data for the five years from 2017 to 2021 was collected from Ohio and Kentucky within the study area to confirm crash patterns and trends. Kentucky crash data were obtained using Kentucky's Crash Data Queries tool through Kentucky's State Police Collision Analysis for the Public website. Ohio crash data were obtained using ODOT's GIS Crash Analysis Tool (GCAT) within the Transportation Information Mapping System (TIMS).

## 5.1 Kentucky Crash Trends

Kentucky's crash data from 2017 through 2021 indicated that 3,374 crashes occurred within the project area. Crashes in Kentucky are reported in three levels of severity – Fatal, Injury, Property Damage Only (PDO)/No Injury. These three crash levels differ from the ODOT summaries that include five severity levels, which are explained more in **Section 5.2**. The highest number by crash type was rear-end with a total of 1,788 crashes (53 percent), followed by sideswipe-same direction (called sideswipe passing in Ohio) with a total of 1,020 crashes (30.2 percent) and single vehicle (includes fixed object) with a total of 434 crashes (12.9 percent). These crash trends are consistent with the observations made from earlier safety studies in the corridor and crashes typical for congested urban freeway systems.

Table 1, Table 2, and Table 3 summarize the Kentucky crashes.

**Grand Total** 

Year **Number of Crashes** Percent 2017 713 21.13% 761 22.55% 2018 2019 817 24.21% 2020 580 17.19% 2021 503 14.91%

Table 1: Total Crashes by Year - Kentucky

Table 2: Total Crashes by Severity – Kentucky

3,374

100.00%

Crash Severity	Number of Crashes	Percent
(1) Fatal	5	0.15%
(2) Injury	409	12.12%
(3) PDO/No Injury	2960	87.73%
Grand Total	3,374	100.00%



Table 3: Total Crashes by Crash Type – Kentucky

Crash Type	Number of Crashes	Percent	Fatal	Injury
REAR END	1788	52.99%	3	223
SIDESWIPE-SAME DIRECTION	1020	30.23%	0	65
SINGLE VEHICLE	434	12.86%	1	88
OTHER	132	3.91%	1	33
Grand Total	3,374	100.00%	5	409

#### 5.2 Ohio Crash Trends

Ohio's crash data from 2017 through 2021 show that 2,263 crashes occurred within the BSB project area. Crashes in Ohio are reported in five levels of severity on the OH-1 crash reports – Fatal, Serious Injury Suspected, Minor Injury Suspected, Injury Possible, and PDO. The highest number by crash type is sideswipe-passing with a total of 886 crashes (39.2 percent), followed by rear-end with a total of 734 crashes (32.4 percent) and fixed object with a total of 403 crashes (17.8 percent). These crash types are typical of an urban freeway system with many ramp interactions, weaving, and congestion.

Table 4, Table 5, Table 6 summarize the total Ohio crashes in more detail.

Table 4: Total Crashes by Year - Ohio

Year	Number of Crashes	Percent
2017	533	23.55%
2018	436	19.27%
2019	487	21.52%
2020	367	16.22%
2021	440	19.44%
Grand Total	2,263	100.00%

Table 5: Total Crashes by Severity - Ohio

Crash Severity	Number of Crashes	Percent
(1) Fatal	3	0.13%
(2) Serious Injury Suspected	25	1.10%
(3) Minor Injury Suspected	216	9.54%
(4) Injury Possible	215	9.50%
(5) PDO/No Injury	1,804	79.72%
Grand Total	2,263	100.00%

Table 6: Total Crashes by Crash Type - Ohio

Crash Type	Number of Crashes	Percent	Fatal	Injury
Sideswipe - Passing	886	39.15%	0	61
Rear-End	734	32.43%	1	70
Fixed Object	403	17.81%	0	70
Other	240	10.62	2	40
Grand Total	2,263	100.00%	3	241

## **5.3 Predictive Safety Methodology**

FHWA's Interactive Highway Safety Design Model (IHSDM) provides a quantitative evaluation of the safety effects of geometric designs of highways by calculating a predicted crash frequency. The No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) are compared for representative freeway segments within the safety priority locations identified by ODOT and KYTC. Where direct quantitative measures cannot be provided, a qualitative discussion of the roadway safety of Refined Alternative I (Concept I-W) compared to the No Build and Selected Alternative I is provided.

The IHSDM modeling considers many geometric and traffic-related inputs for their predictive model, including:

- Lane width
- Shoulder width (outside and inside)
- Number of Lanes
- Facility Type
- AADT
- High hour volume proportion
- Horizontal Curves

The predictive crash rates for the alternatives are derived using these variables. There is a discussion within the following sections related to the impact of individual geometric features. The crash modification factors presented are built into the IHSDM models. The formulations for these CMFs are described in the following section. The predictive crash rates shared in this report are based on a 20-year analysis using opening year 2029 and design year 2049 traffic volumes.

# 5.4 Freeway Cross-Section Safety Relationships

This section describes the relationship between freeway cross-section attributes and crash frequency. This topic is discussed by reviewing the critical cross-section attributes' Crash Modification Factors (CMFs). A CMF is used to identify the effect of roadway, traffic, and environmental characteristics on traffic safety. The CMFs reviewed in this section are the most critical design elements for the BSB alternatives.

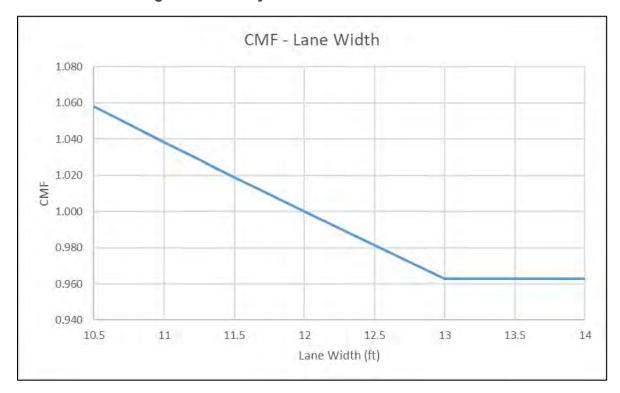


#### Lane Width

The following equation represents the lane width CMF for Fatal/Injury (FI) crashes, with an average lane width across all through lanes. **Figure 4** presents the freeway lane width CMF for FI crashes. The figure illustrates that crash frequency steadily increases when the lane width decreases from a maximum width of 13 ft. Lane widths of 11 and 12 feet are present in the existing conditions and are considered for the build alternatives.

$$CMF_{lw} = \begin{bmatrix} e^{-0.0376(W_l - 12)} & : If \ W_l < 13 \ ft \\ 0.963 & : If \ W_l \ge 13 \ ft \end{bmatrix}$$

Figure 4: Freeway Lane width CMF for FI crashes



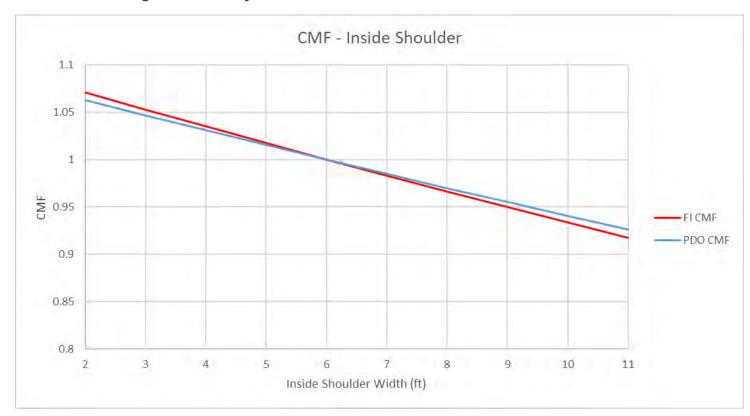
#### Inside Shoulder Width

The CMF of inside shoulder width is described using the following formula, considering the shoulder width as the average of both travel directions. **Equation 1** and **Equation 2** represent the freeway inside shoulder-width CMF for FI and PDO crashes, respectively. **Figure 5** illustrates the base condition for this crash modification factor (CMF=1) at shoulder width = 6 ft. The CMFs for FI and PDO crashes are gradually increasing for shoulders under 6 ft, which increases crash risk.

$$CMF_{isw} = e^{-0.0172(W_{is}-6)}$$
 Equation 1

$$CMF_{isw} = e^{-0.0153(W_{is}-6)}$$
 Equation 2

Figure 5: Freeway Inside Shoulder Width CMFs for FI and PDO crashes



#### Outside Shoulder Width

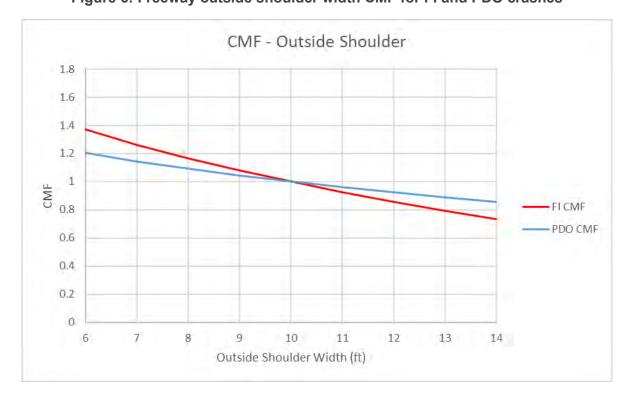
The outside shoulder width CMF is presented in the following formula, considering the shoulder width as the average for both travel directions. This CMF is relevant to single-vehicle crashes since the correlation between outside shoulder width and multi-vehicle crashes was insignificant. The variable  $P_{c,i}$  is the ratio of the length of curve i on the segment to the length of the segment.

**Equation 3** and **Equation 4** represent the freeway outside shoulder width CMF for FI and PDO crashes, respectively. For demonstration purposes, the chart considers half the segments are within a horizontal curve.

**Figure 6** shows the rapidly increasing CMF for shoulder width of less than 10 ft and improved safety for outside shoulder width of more than 10 ft.

$$\begin{aligned} \textit{CMF}_{sv,osw|agg} &= \left( \mathbf{1.0} - \sum P_{c,i} \right) e^{-0.0647(W_s - 10)} + \left( \sum P_{c,i} \right) e^{-0.0897(W_s - 10)} \\ \textit{CMF}_{sv,osw|agg} &= \left( \mathbf{1.0} - \sum P_{c,i} \right) \mathbf{1.0} + \left( \sum P_{c,i} \right) e^{-0.0840(W_s - 10)} \end{aligned}$$
 Equation 6





## 6. SAFETY EVALUATION OF ALTERNATIVES

## **6.1 KYTC Safety Priority Locations**

Level of Service of Safety (LOSS) is used to identify existing roadway segments with low safety performance that can be prioritized for improvement. Segments ranked from LOSS 1 to 4, as 1 indicates a substantially better safety performance and a low potential for crash reduction. While LOSS 4 shows a substantially worse-than-expected safety performance and a high potential for crash reduction. KABCO crash severity scale is used in the following figures to present segment LOSS ranking. **Figure 7** shows the segment LOSS ranking for KAB (fatal, serious injury, minor injury) crashes, and **Figure 8** illustrates the segment LOSS ranking for CO (possible injury or property damage only) crashes. Segments with LOSS 3 or 4 are highlighted in red. These figures indicate that most of the I-71/I-75 corridor between the southern project extent and the Brent Spence Bridge is flagged for safety concerns involving injury and property damage crashes.

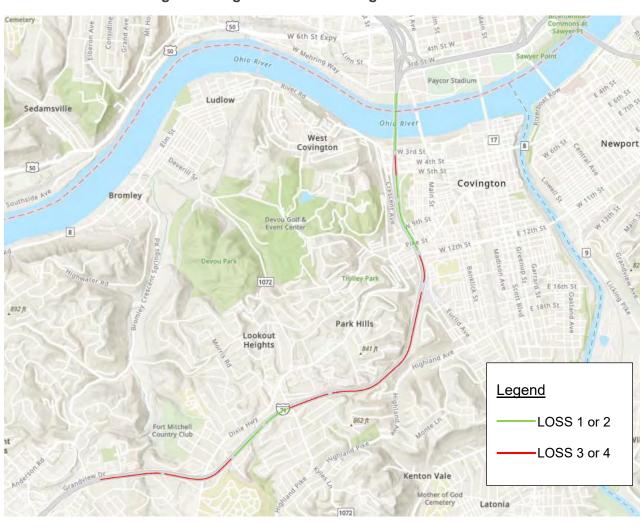


Figure 7: Segment LOSS ranking for KAB crashes

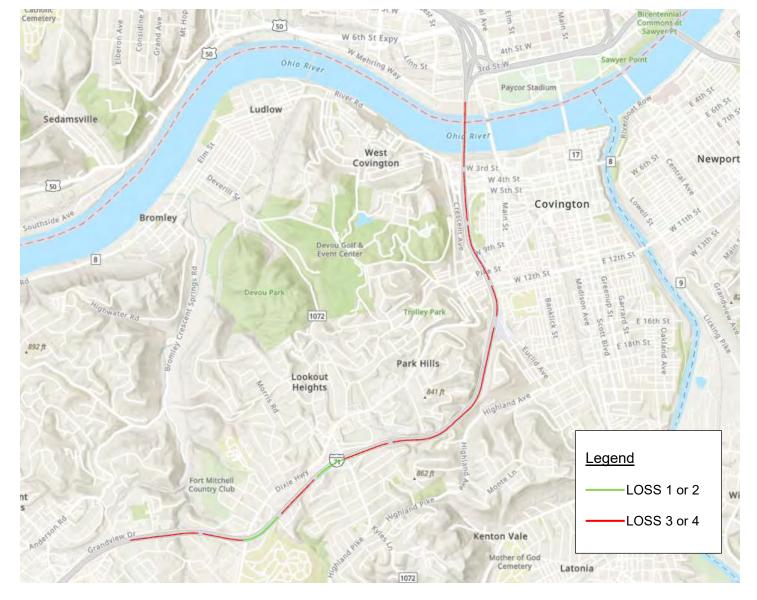


Figure 8: Segment LOSS ranking for CO Crashes

The following sections will further discuss the factors increasing safety risks in these segments and propose modifications and countermeasures to improve traffic safety.

# 6.2 ODOT Highway Safety Improvement Program (HSIP) Priority Segments

Highway Safety Improvement Program (HSIP) is a federal aid program that aims to reduce traffic fatalities and injuries on all public roadways. The HSIP follows a data-driven strategic approach to improve highway safety. **Figure 9** presents a map of locations identified as priority segments according to ODOT's HSIP. These segments cover most of the I-75 project limits, the Brent Spence Bridge, and I-71 to the eastern project extents.

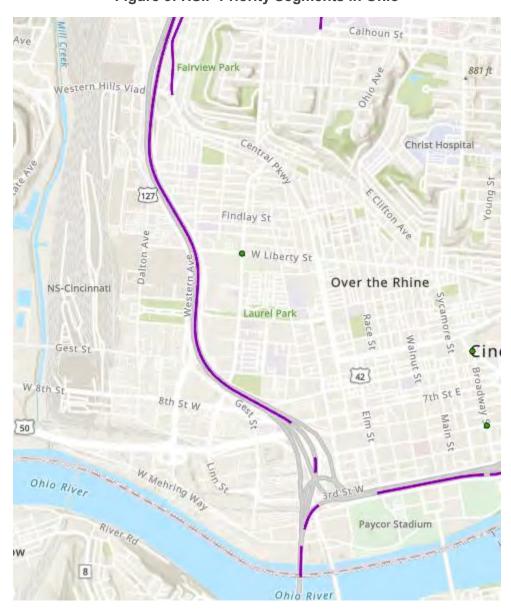


Figure 9: HSIP Priority Segments in Ohio

## 6.3 Brent Spence Bridge (ODOT/KYTC Safety Priority Location)

During the five years between 2017 and 2021, Brent Spence Bridge experienced 662 crashes. Most were sideswipes (47.6%), rear-end crashes (40.2%), and smaller proportions of single-vehicle and other crash types. As for crash injury severity, the bridge experienced no fatal crashes and nine serious injury crashes representing less than 2% of total crash records. Minor injury crashes represented a considerable proportion (7.3%), while possible injury and PDO crashes represented the majority of crash counts (91.4%) on the bridge.

The AM peak period (6:00 to 10:00 AM) experienced 117 crashes in that 5-year duration. Sixty-seven of them were sideswipes, and 38 were rear-end crashes. Eight crashes were identified as minor or severe injury crashes. Two hundred forty crashes were recorded during the PM period (2:00 to 7:00 PM) in the same 5-year duration. One hundred twenty-five of which were rear-end, and 100 were sideswipe crashes. Fourteen minor and severe injury crashes were recorded during that period. It is noted that the PM peak duration experienced more crashes than the AM peak due to higher vehicle miles traveled represented by higher traffic volumes and longer duration of the peak. The more congested traffic is the primary cause of a significant proportion of rear-end crashes during the PM peak.

Most crashes on the BSB bridge are rear-end and sideswipe crashes due to traffic congestion and substandard lane and shoulder widths. The existing cross-section of the Brent Spence Bridge has four 11-foot lanes with 1-foot shoulders in each direction. Both the Selected Alternative I and Refined Alternative I (Concept I-W) expand the total number of lanes across the Ohio River from 8 to 16, providing improved lane and shoulder width on the existing bridge. **Figure 10**, **Figure 11**, and **Figure 12** show the cross sections of the Brent Spence Bridge (existing + companion bridge span) for each alternative.

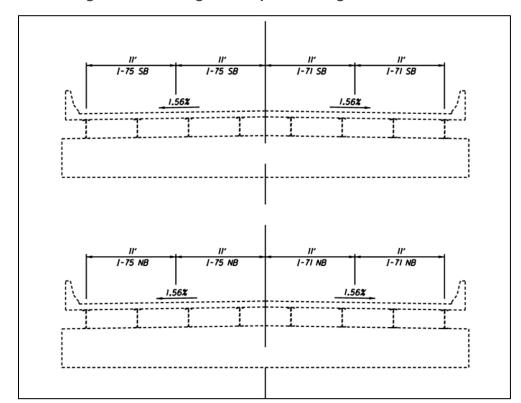


Figure 10: Existing Brent Spence Bridge Cross Section

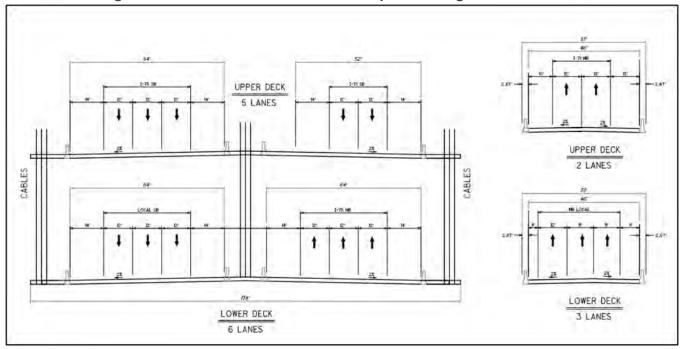
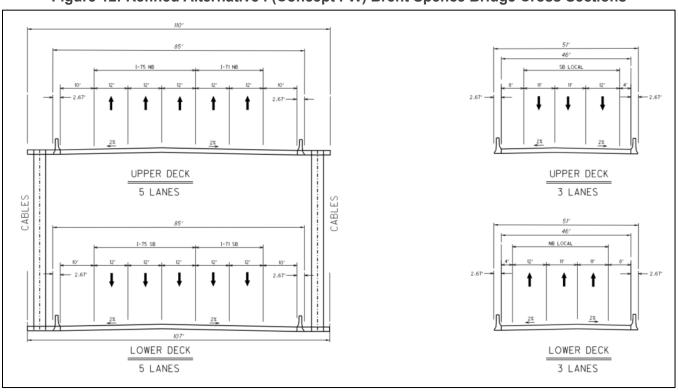


Figure 11: Selected Alternative I Brent Spence Bridge Cross Sections

Figure 12: Refined Alternative I (Concept I-W) Brent Spence Bridge Cross Sections



The predicted crash rate for the BSB spans is summarized in **Figure 13** and **Table 7**. As shown in these summaries, the Refined Alternative I (Concept I-W) has a lower crash rate on the companion bridge and existing bridge span than the No Build but has an increased crash rate compared to Selected Alternative I. Compared to Selected Alternative I, the increase is the proposed reduction of shoulder widths from 14' to 10', which was recommended as part of the value engineering process. KYTC and ODOT have adopted 10' inside and outside shoulders as the design standard applicable on the Brent Spence Bridge.

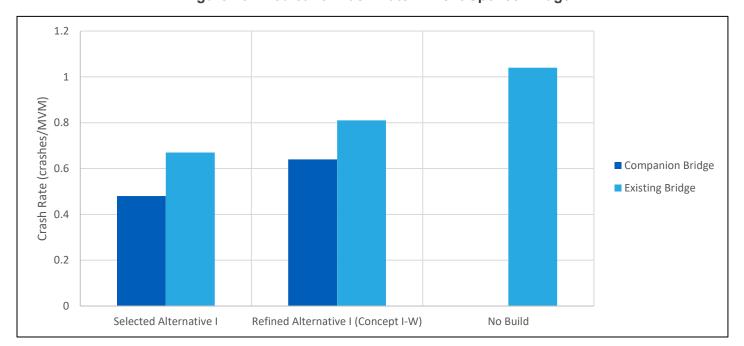


Figure 13: Predictive Crash Rate - Brent Spence Bridge

Table 7: Predictive Safety Analysis - Brent Spence Bridge

Alternative	Crash Rates	Brent Spence Bridge (Companion Bridge)	Brent Spence Bridge (Existing Span)		
Coloctod	Crash Rate (crashes/MVM)	0.48	0.67		
Selected Alternative I	FI Crash Rate (crashes/MVM)	0.15	0.2		
Aitemative	PDO Crash Rate (crashes/MVM)	0.34	0.46		
Refined	Crash Rate (crashes/MVM)	0.64	0.81		
Alternative I	FI Crash Rate (crashes/MVM)	0.19	0.26		
(Concept I-W)	PDO Crash Rate (crashes/MVM)	0.45	0.55		
	Crash Rate (crashes/MVM)	-	1.04		
No Build	FI Crash Rate (crashes/MVM)	-	0.31		
	PDO Crash Rate (crashes/MVM)	-	0.72		



A summary of the cross-section features of the BSB and how it impacts the predicted crash rates is summarized in **Table 8**. The crash modification factors (CMF) are used in the IHSDM predictive model to adjust the base predictive model for freeway segments. Lower CMFs indicate a lower crash rate. The CMFs summarized in the table are for FI and PDO crashes. The summary shows that the Refined Alternative I (Concept I-W) improves the safety of the existing bridge span compared to the No Build condition by reducing the number of lanes and increasing the shoulder and lane widths. The companion bridge safety is similar between the Refined Alternative I (Concept I-W) and Selected Alternative I, with the main difference occurring due to the reduction of shoulder widths from 14 ft to 10 ft with the Refined Alternative I (Concept I-W). The design decision for the shoulder widths balances the many project needs, including safety, right-of-way constraints, and project costs. The 10 ft shoulders achieve nominal safety objectives by achieving design standards for shoulder widths on the companion bridge.

**Table 8: BSB Cross-Section Evaluation** 

			Outside Shoulder		Inside Shoulder			Lanes		
Bridge	Scenario	# of Lanes	Width (ft)	CMF (FI)	CMF (PDO)	Width (ft)	CMF (FI)	CMF (PDO)	Width (ft)	CMF (FI)
	No Build	8	1	2.02	1.56	1	1.09	1.08	11.0	1.04
Existing BSB	Selected Alt I	5	10	1.00	1.00	7	0.98	0.98	11.6	1.02
	Refined Alt I (I-W)	6	8	1.17	1.09	4	1.03	1.03	11.3	1.03
	No Build	-	-	-	-	-	-	-	-	-
Companion Bridge	Selected Alt I	11	14	0.74	0.86	14	0.92	0.93	12.0	1.00
	Refined Alt I (I-W)	10	10	1.00	1.00	10	0.93	0.94	12.0	1.00

## 6.4 Kentucky I-71/I-75 Mainline

From 2017 to 2021, Kentucky I-71/I-75 mainline experienced 2,828 crashes. Rear-end was the most recorded crash type representing 55.1% of crashes, followed by sideswipe crashes (27.2%). As for crash injury severity, the mainline experienced five fatal crashes, while injury and PDO crashes represented 12.8% and 87% of total crash records, respectively.

Five hundred sixty-nine crashes occurred during the AM peak period (6:00 to 10:00 AM) in the 5-year duration. Three hundred forty-eight of which were rear-end, and 137 were sideswipe crashes. The AM peak experienced one fatal crash and 59 injury crashes. One thousand-seven crashes were recorded during the PM period (2:00 to 7:00 PM) in the 5-year duration. Six hundred seventy-one records were rear-end, and 251 were sideswipe crashes. The PM peak experienced two fatal and 111 injury crashes. Higher crash counts during the PM peak can be related to higher traffic volumes during the PM peak and the longer peak period.

KYTC has identified most of the I-71/I-75 mainline in the project limits to have a LOSS 3 or 4 ranking, indicating significant potential for safety mitigation. The I-71/I-75 corridor has reoccurring traffic congestion and tightly spaced ramps, influencing the high existing crash rates. The proposed improvements for Refined Alternative I (Concept I-W) address the current conditions by implementing a C-D road system between Dixie Hwy and Kyles Lane and between 12th Street and the BSB and companion bridge. These system improvements and basic cross-section enhancements are expected to reduce the crash rate for the Kentucky I-71/I-75 mainline. A summary of the mainline cross-section for two representative segments on I-71/I-75 in Kentucky is summarized in Table 9. The CMFs summarized in the table are for FI and PDO crashes. A predicted crash rate comparison for these two segments is summarized in Figure 14 and Table 10. Overall, a crash rate reduction for I-71/I-75 mainline segments in Kentucky for Refined Alternative I (Concept I-W) compared to No Build and similar crash predictions to Selected Alternative I. Refined Alternative I (Concept I-W) uses a consistent 10 ft inside and outside shoulder width from the southern project terminus to the Companion Bridge. The No Build has a section of 12 ft inside shoulder in the roadway sections between Dixie Hwy and 12<sup>th</sup> Street. This cross-sectional element is decreased to 10 ft with Refined Alternative I (Concept I-W) to allow for other roadway improvements, including the C-D road system between Dixie Hwy and Kyles Lane. Widening the shoulders beyond the design standards would expand the roadway footprint and negatively impact adjacent properties. The predictive analysis shown in the tables focuses only on the crosssectional differences. Therefore, Refined Alternative I (Concept I-W) for the one comparative segment (Dixie Hwy to Kyles Ln) shows a slight increase in crashes compared to the No Build. However, this minor increase becomes insignificant when viewed next to the safety improvements at the other comparative segment of I-71/I-75 at 5th Street. Furthermore, the safety improvements associated with the C-D road system are anticipated to alleviate the existing safety concerns caused by peak period traffic congestion that is not captured as part of the predictive safety analysis.



Table 9: Kentucky I-71/I-75 Mainline Cross Section Evaluation

		Outside Shoulder			Ins	ide Shoul	Lanes		
Location	Scenario	Width (ft)	CMF (FI)	CMF (PDO)	Width (ft)	CMF (FI)	CMF (PDO)	Width (ft)	CMF
1.74/1.75	No Build	10	1.0	1.0	12	0.92	0.93	12	1.0
I-71/I-75: Dixie Hwy to Kyles Lane	Selected Alt I	14	0.74	0.86	14	0.92	0.93	12	1.0
	Refined Alt I (I-W)	10	1.0	1.0	10	0.93	0.94	12	1.0
I-71/I-75: Pike Street to 4 <sup>th</sup> Street	No Build	12\6	0.86\1.36	0.92\1.2	6.5	0.99	0.99	12	1.0
	Selected Alt I	14\12	0.74\0.86	0.86\0.92	14	0.92	0.93	12	1.0
	Refined Alt I (I-W)	10	1.0	1	10	0.93	0.94	12	1.0

Figure 14: Predicted Crash Rate for Kentucky I-71/I-75 Mainline

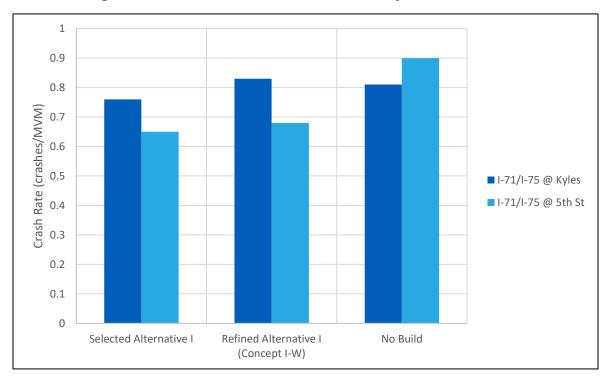


Table 10: Predictive Safety Analysis – Kentucky I-71/I-75 Mainline

Alternative	Crash Rates	KY IR-71/75 (between Dixie and Kyles)	KY IR-71/75 @ 5 <sup>th</sup> Street
	Crash Rate (crashes/MVM)	0.81	0.90
No Build	FI Crash Rate (crashes/MVM)	0.23	0.25
	PDO Crash Rate (crashes/MVM)	0.58	0.65
Calaatad	Crash Rate (crashes/MVM)	0.76	0.65
Selected Alternative I	FI Crash Rate (crashes/MVM)	0.20	0.18
Aitemative	PDO Crash Rate (crashes/MVM)	0.56	0.46
Refined Alternative I (Concept I-W)	Crash Rate (crashes/MVM)	0.83	0.68
	FI Crash Rate (crashes/MVM)	0.24	0.21
	PDO Crash Rate (crashes/MVM)	0.60	0.47

#### 6.5 Ohio I-75 Mainline

Ohio I-75 mainline (North of Linn Street) experienced 1,031 crashes between 2017 and 2021. Most recorded crashes were sideswipe (43.3%) and rear-end (33.3%). Three fatal crashes were recorded on the mainline, while injury crashes represented 11.6% of total crash counts. Property-Damage-Only crashes accounted for 88% of crash records on the I-75 mainline.

One hundred seventy-five crashes were recorded during the AM peak period (6:00 to 10:00 AM) from 2017 to 2021. Seventy-two of these crashes were sideswipes, and 44 were rear-end crashes. Seventeen minor and severe injury crashes were recorded during that peak period. As for the PM period (2:00 to 7:00 PM), 406 crashes were recorded in the 5-year study duration. One hundred sixty-eight crashes were sideswipe, and 186 were rear-end collisions. Thirty-eight records during that peak period were minor or severe injury crashes. Increasing crashes were recorded in the PM peak duration compared to the AM peak due to higher traffic volumes and longer period of the PM peak. The more congested traffic during the PM peak is the primary cause of a more significant proportion of rear-end crashes.

ODOT identifies the I-75 mainline between WHV and I-71/I-75 Interchange as safety priority segments. This area experiences many crashes due to reoccurring congestion and interactions between the freeway mainline, service ramps, and system interchange ramps. This area is improved with Refined Alternative I (Concept I-W) with the consolidation of ramps and introduction of the C-D road through the I-71/I-75 interchange. These improvements are expected to improve traffic safety on Ohio I-75 mainline. A summary of the mainline cross-section for two representative segments on I-75 in Ohio is summarized in **Table 11**. The CMFs summarized in the table are for FI and PDO crashes. The basic cross-section on this roadway is also improved with wider inside and outside shoulder widths. The predicted crash rate results from IHSDM are summarized in



#### Figure 15 and Table 12.

Table 11: Ohio I-75 Mainline Cross-Section Evaluation

		Outside Shoulder			Ins	side Should	Lanes		
Location	Scenario	Width (ft)	CMF (FI)	CMF (PDO)	Width (ft)	CMF (FI)	CMF (PDO)	Width (ft)	CMF
I-75: Linn	No Build	10	1.0	1.0	6.5	0.99	0.99	12	1.0
Street to Ezzard Charles Drive	Selected Alt I	12	0.86	0.92	13.5	0.92	0.93	12	1.0
	Refined Alt I (I-W)	10	1.0	1.0	10	0.93	0.94	12	1.0
I-75 Liberty Street to Findlay Street	No Build	10	1.0	1.0	8	0.97	0.97	12	1.0
	Selected Alt I	12	0.86	0.92	13.5	0.92	0.93	12	1.0
	Refined Alt I (I-W)	10	1.0	1.0	10	0.93	0.94	12	1.0

As discussed in the previous sections, the Selected Alternative I proposed 12 ft inside and outside shoulders for I-75. The Refined Alternative I (Concept I-W) reduce the shoulder widths to 10 ft to match current freeway design standards. The proposed 10 ft shoulder widths achieve nominal safety objectives and balance the corridor's operational, safety, right-of-way, and project cost considerations.

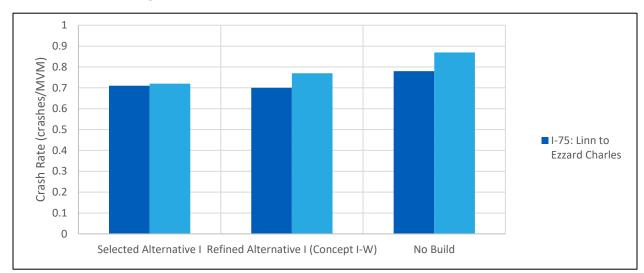


Figure 15: Predicted Crash Rates for Ohio I-75 Mainline

Table 12: Predicted Crashes Rate for Ohio I-75 Mainline

Alternative	Crash Rates	I-75: Linn to Ezzard Charles	I-75 Liberty to Findlay
	Crash Rate (crashes/MVM)	0.78	0.87
No Build	FI Crash Rate (crashes/MVM)	0.23	0.24
	PDO Crash Rate (crashes/MVM)	0.55	0.63
Calaatad	Crash Rate (crashes/MVM)	0.71	0.72
Selected Alternative I	FI Crash Rate (crashes/MVM)	0.20	0.20
Aitemative	PDO Crash Rate (crashes/MVM)	0.51	0.52
Refined	Crash Rate (crashes/MVM)	0.70	0.77
Alternative I	FI Crash Rate (crashes/MVM)	0.21	0.22
(Concept I-W)	PDO Crash Rate (crashes/MVM)	0.49	0.55

Overall, the predicted crashes for the Refined Alternative I (Concept I-W) are lower than the No Build.

# 7. ALTERNATIVE COMPARISON AT LOCATIONS WITH NOTABLE CHANGES

The previous section focused on the freeway safety priority locations for ODOT and KYTC that experience high crash rates in the existing conditions. This section assesses the qualitative differences in impacts on safety between the No Build, Selected Alternative I, and Refined Alternative I (Concept I-W) for project areas with notable differences not covered in the previous section.

## 7.1 New Interchange Configuration at I-75 & WHV

The City of Cincinnati and Hamilton County have collaborated with ODOT to design the WHV replacement and integrate the new facility with the I-75 improvement project. This resulted in a new design for the I-75/WHV Interchange in the Refined Alternative I (Concept I-W) in 2023. The Selected Alternative I from 2012 provided a plan for a new interchange, including a connection to the existing WHV, since its design had yet to progress.

Figure 16 shows the Existing, Selected Alternative I, and Refined Alternative I (Concept I-W) designs for the I-75/WHV interchange.

Existing Conditions

Selected Alternative I

Refined Alternative I (Concept LW)

Internative I (Concept LW)

Inter

Figure 16: I-75 Interchange with Western Hills Viaduct

The I-75/WHV interchange experiences crashes related to its current design, mainly due to the northbound I-75 left exit and loop ramp to the upper deck of the WHV. Existing crash types in this area of I-75 include 36% sideswipe, 30% rear-end, and 11% fixed object. The new interchange will remove the left exit (with slow vehicles in the left lane of I-75) and associated weaving, reducing sideswipe and rear-end crashes. Removal of loop ramps will mitigate wet weather, fixed object crashes, and rear-end collisions due to poor sight distance. The 2012 and 2023 interchange designs are similar to a tight diamond and share these crash-reduction features. The 2023 design improves upon the 2012 design by better incorporating the local connectivity to Spring Grove Avenue (running parallel to I-75 on the west) by eliminating the local street loop connections, which required tunneling under I-75 and a steep grade to access the upper deck of the WHV.

In summary, the latest design of the interchange will significantly improve the safety for interstate and local drivers using current design standards and more intuitive right-side ramp placement.

## 7.2 Change in Location of Northbound Entrance Ramp from Freeman Avenue

The existing section of I-75 between Linn Street and Liberty Street includes partial interchanges with ramps to and from Freeman Avenue and ramps to and from Ezzard Charles to/from the north on I-75 within a relatively short distance. In the existing condition, northbound ramps from downtown streets and I-71 S converge with mainline I-75 just south of Ezzard Charles. Southbound in this area of I-75, drivers must select the appropriate lane to continue onto I-75 S or I-71 N/US 50E, use the right exit to Seventh Street, or use the left exit to Fifth Street or Second Street downtown. Given the left and right exit ramps and the associated need for driver decisions for lane selection, the highest crash types are sideswipe and rear-end due to weaving and stopped traffic.

The Selected Alternative I and Refined Alternative I (Concept I-W) are similar in using a C-D system for northbound and southbound I-75 to separate mainline traffic from traffic using the downtown and the design of right-side I-71/US-50 connections. These C-Ds diverge and merge with the mainline south of Ezzard Charles. In the Selected Alternative I, the ramps to and from Freeman remain similar to existing conditions, but the Ezzard Charles ramps are removed. In Refined Alternative I (Concept I-W), the southbound conditions are the same as Selected Alternative I, with only the exit ramp to Freeman. However, in coordination with the City of Cincinnati, a change was made to the northbound entrance ramp to I-75 from Freeman Avenue from south of Ezzard Charles Drive to north of Ezzard Charles Drive at Winchell Avenue, similar to the existing condition. This change requires drivers from Freeman to use the arterial street to travel north through the intersection with Ezzard Charles before using the entrance ramp. This allows for better connectivity of the local roads to I-75 N while also adding more distance between the merge of the NB C-D and mainline I-75 N with this Ezzard Charles entrance ramp. However, this relocation moves the on-ramp closer to the WHV off-ramp. Refined Alternative I (Concept I-W) incorporates an auxiliary lane between the Freeman Avenue entrance ramp and exit ramp to WHV. These designs for Selected Alternative I and Refined Alternative I (Concept I-W) are shown in **Figure 17**.

In summary, the relocation of the Freeman ramp is within design standards for ramp spacing. Creating NB and SB C-Ds will separate local access from mainline traffic, removing many closely spaced entrance and exit ramps and eliminating left exits from the No Build condition. This change will reduce weaving and associated sideswipe and rear-end crashes.



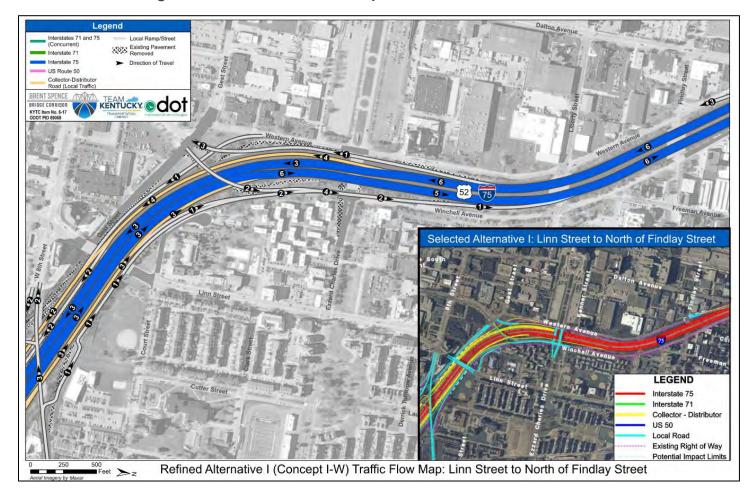


Figure 17: I-75 NB Entrance Ramp Modification at Freeman Avenue

## 7.3 Cincinnati Ramp Modifications

The existing ramps and local street connections for I-75, I-71, and US 50 just west of the downtown provide reasonable access today for all users and destinations. Existing crashes are generally sideswipe and rear-end due to the curves, weaving, and stopped traffic during peak hours. The Selected Alternative I separated mainline and local traffic with C-D roads while maintaining various access points for local connectivity. This design met current standards of roadway design while still reducing the facility footprint.

The notable difference between the Selected Alternative I and Refined Alternative I (Concept I-W) in this area comes from the separation of C-D and mainline uses on the BSB and companion bridge, respectively. This plan required modification to the travel location for ramps and local connections from Selected Alternative I. In addition, the City of Cincinnati requested additional changes for various I-75 ramps between the Ohio River and Linn Street, which are incorporated into Refined Alternative I (Concept I-W). These include the relocation of the northbound entrance ramp in Ohio to I-75 from Fourth Street to Third Street, and the removal of the southbound exit ramp in Ohio from I-75 to Fifth Street, to provide improved geometrics and free additional land



for potential redevelopment. As part of these ramp changes, a new intersection with the northbound C-D ramp was created at Fifth Street; lanes were reduced on the Fifth Street approach to Central Avenue; and the connection from Sixth Street was changed from Winchell Avenue to the northbound C-D directly to I-75. These changes also impact traffic to adjacent ramps, resulting in design modifications to two-lane off-ramps from SB I-75 to Seventh Street and Second Street. A comparison of the ramp changes is shown in **Figure 18.** The SB exit to Seventh Street and NB exit to fifth Street uses lower speed design criteria to ensure drivers are entering the city streets close to the posted speed limit, which will result in enhanced safety for pedestrians and vehicles. To prepare drivers for the lower speeds, advanced signing will be provided prior to the horizontal curves.

In summary, the design of the Cincinnati ramps will be significantly different from a No Build condition due to the reconfiguration of lane use on the BSB and integration with a companion bridge. Refined Alternative I (Concept I-W) will separate mainline traffic from the C-D and local connections and meet new standards for curves and shoulders, reducing weaving and potential for rear-end, sideswipe, and fixed object crashes.

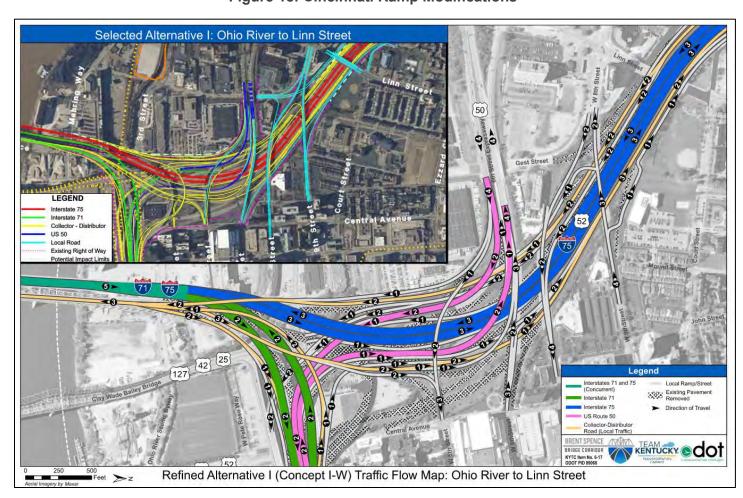


Figure 18: Cincinnati Ramp Modifications

## 7.4 Kentucky Collector-Distributor Modifications in Covington

The existing local street connections from the BSB to the local street grid in Kentucky include ramps that do not meet current design standards, leading to a short southbound off-ramp to a T intersection at 5th Street. The parallel local arterials are designed as high-speed roadways near the BSB, meeting signalized arterials to the south towards 12th Street. Various crash types relative to interstate, local roads, signalized intersections, and stop-control intersections occur due to the need for more consistency in the design along the routes, which are also not friendly to bikes and pedestrians.

Selected Alternative I separates mainline and local traffic with C-D roads while maintaining various access points for local connectivity. This design met current standards for the ramps. It provided a consistent design for the C-D system for southbound and northbound access and included a new connection under the interstate for 9th Street.

The notable difference between Selected Alternative I and Refined Alternative I (Concept I-W) in this area comes from the separation of C-D and mainline uses on the BSB and companion bridge, respectively. This plan required modification to the travel location for ramps and local connections from Selected Alternative I. Most notable is the southbound exit ramp from the C-D (existing BSB) to 5th Street in Covington, designed as a left-hand exit to meet vertical clearance and curve standards. This is a change from the 2012 design which uses a right-side exit from the companion bridge. The two configurations for this ramp are depicted in

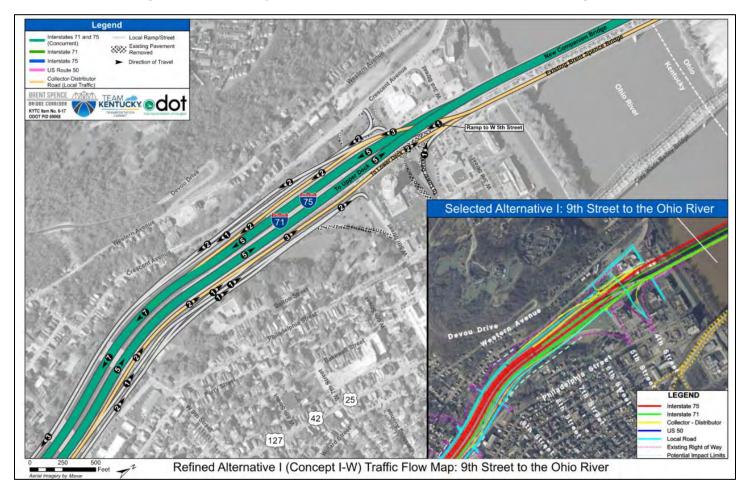
**Figure** 19. Revisions to the frontage road system south of 9th Street include the modification of Bullock Street (southbound frontage road) between 9th Street and 12th Street to minimize right-of-way impacts, and an extension of Simon Kenton Way (northbound frontage road) parallel to the I-71/I-75 northbound ramp to 5th Street in Covington. There are also fewer lanes on both frontage roads from the Selected Aternative I design based on traffic modeling.

The new NB and SB C-D/frontage roads in Kentucky will provide an added connection to 9th Street, offering better connectivity for the Covington local street network. New intersection design with turn lanes and traffic signal timing will improve vehicular safety. Sidewalks, multiuse paths, crosswalks, and new signing will improve route options and safety for pedestrians and cyclists.

Reduced traffic on the existing BSB will allow the NB on the ramp from 4th Street to enter the bridge as an add-lane and not require a merge. This will reduce rear-end and sideswipe crashes.

In summary, the design of the Kentucky C-D/frontage road system will provide improved access to local destinations throughout Covington while addressing needed pedestrian and bicycle connectivity and safety. The left exit from the SB C-D to 5th Street is less desirable than the right exit in Selected Alternative I, but allows for a highly desired connection to 5th Street into the C-D and local street network and meets design standards.

Figure 19: Kentucky Collector-Distributor Modifications in Covington



## 7.5 I-71/I-75 Southern Project Limits

The southern project limits of the BSB project are I-71/I-75 between Dixie Hwy and Buttermilk Pike. This limit matches the I-275 Interchange study, which is currently in the project planning stage. In the interim, before the I-275 Interchange project is completed, the I-71/I-75 lanes taper to existing conditions. With the capacity improvements between Dixie Hwy and BSB, this limit is anticipated to be a traffic capacity constraint, where traffic queueing may present a safety concern, especially for SB I-71/I-75. This is a common problem with any capacity improvement project, and the condition is present in both Selected Alternative I and Refined Alternative I (Concept I-W). The safety concern can be mitigated using an advanced queue warning system for SB I-71/I-75 between 12<sup>th</sup> Street and Dixie Hwy if operational problems are present upon the completion of the BSB corridor project.



Figure 20: I-71/I-75 South of Dixie Highway: Refined Alternative I (Concept I-W)

#### 8. SAFETY COUNTERMEASURES

The existing I-71 and I-75 facilities at many locations within the study area do not meet current design standards for numerous features, including lane widths, shoulder widths, horizontal and vertical clearances, left-hand entrances and exits, and horizontal and vertical geometry. The most frequently noted substandard feature of the corridor is the design of the BSB, with its narrow travel lanes and shoulder widths on the bridge and approaches. The existing BSB was also not designed to accommodate the current or future daily traffic volume. For these reasons, the BSB corridor experiences design deficiency and congestion-related crashes.

Selected Alternative I from the 2012 FONSI provides an improved corridor meeting current design standards. The new companion bridge will allow traffic distribution onto two bridges, and the proposed reconfiguration of the existing BSB will reestablish adequate shoulders and lane widths, reducing crash potential. Added capacity at the Ohio and Kentucky approaches and the bridges will further improve safety by lowering congestion-related crashes. In addition, separating interstate traffic from local traffic on the bridges and C-D system will enhance safety by reducing weaving and merging for all travelers.

Refined Alternative I (Concept I-W) shares many of the same design features for improved safety in the I-71/I-75 corridor as Selected Alternative I but provides additional design benefits by providing all interstate traffic on the companion bridge and all local or C-D traffic on the existing bridge. This eliminates the need for center barriers as on the Selected Alternative I companion bridge, which was used to separate opposing directions of traffic on the lower deck and the southbound I-71 and I-75 traffic on the upper deck. Other modifications in Refined Alternative I (Concept I-W) allow for better spacing of C-D connections to local streets and improved bike and pedestrian connectivity in the local arterial network.

The BSB project supports the <u>National Roadway Safety Strategy</u> (NRSS) <u>Safe System Approach</u> (SSA), a comprehensive approach to reducing serious injuries and deaths on the nation's roadways. Kentucky and Ohio will collaborate to design and operate a system that provides safe mobility for all users. The Project will incorporate the five SSA Safety System Elements:

- Safer People through real-time user information and messaging and improved driver expectation and decision-making features.
- Safer Roads through countermeasures on bridges, highway approaches, and adjacent frontage and C-D roadways, including pedestrian and bicycle improvements.
- Safer Vehicles and Safer Speeds through design speeds, speed limits, and intelligent transportation system (ITS) facilities that support connected/automated vehicle systems and speed management.
- Post-Crash Care through emergency vehicle access to the scene (using shoulders if needed), routing, and incident messaging.

The entire corridor will be rebuilt and proactively incorporate Proven Safety Countermeasures identified by the FHWA into the highway, C-D, and local street network. Examples of these countermeasures include:



#### Roadway/Highway

- Wider edge lines
- Enhanced delineation for horizontal curves
- Longitudinal rumble strips
- Median barriers
- Roadway lighting
- Appropriate speed limits or variable speed limits

#### **Local Streets**

- Corridor access management for frontage roads
- Dedicated left and right turn lanes at intersections
- Appropriate yellow change and all-red intervals
- Backplates with reflective borders for traffic signals
- Walkways and pedestrian refuge areas
- Bike lanes and side paths

There are locations where design exceptions are proposed if current standards cannot be met, generally for shoulder and lane width, horizontal and vertical curve issues, and grades. The Refined Alternative I (Concept I-W) plan will improve upon existing conditions overall, and the areas of design exceptions could be made safer with the use of enhanced warning signing, speed advisory plaques, and enhanced delineation. Redundancy in design elements will also create layers of protection to reduce the likelihood of driver error, prevent crashes from occurring, and mitigate harm when they do occur, such as roadway lighting and guardrail. As the design-build project progresses, the currently identified locations of design exceptions can be reviewed to determine any design changes or specific countermeasures to improve safety in those areas.

A new guide and destination signing will be installed, and ITS technology will be designed for the corridor, including changeable message signs, sensors, and cameras with fiber connectivity. This will allow real-time driver information, incident management, and event traffic management to reduce confusion and provide clear guidance. Future uses can be considered for connected and automated vehicle technologies.

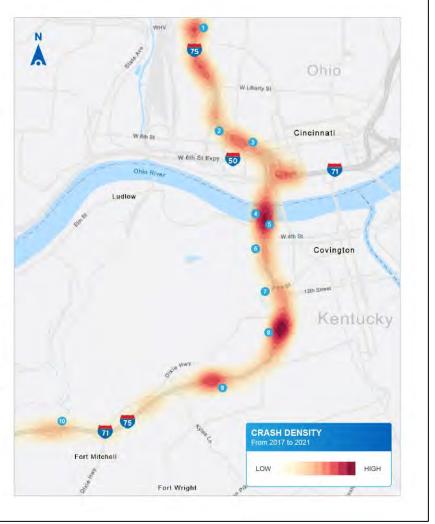
In summary of the crash mitigation strategies, **Figure 21** identifies high crash locations within the project corridor and highlights safety-related improvements to be implemented to improve future safety conditions.



Figure 21: BSB Project Safety Improvements

#### **Safety Countermeasures**

- New interchange with Western Hills Viaduct (WHV) will remove NB left lane, reducing sideswipe and rear-end crashes. Removal of the loop ramps will reduce wet weather and fixed object crashes as well as rear-end crashes due to poor sight distance.
- The construction of a NB and SB C-D system from Ezzard Charles in OH to 12th in KY will separate local access from mainline interstate traffic, removing closely spaced entrance and exit ramps and eliminating left exits. This change will reduce weaving and the presence of exiting vehicles in the left lane, reducing sideswipe and rear-end crashes.
- Newly constructed ramps at I-71/I-75 interchange will meet updated seismic criteria and provide edge and median barriers meeting the current standards. This will reduce the severity of fixed object crashes.
- The companion bridge will be built to add capacity to the Ohio River crossing with standard lane widths, shoulder widths, edge and median barrier designs to reduce sideswipe, rear-end and fixed object crashes. The shoulders will provide emergency vehicles access and storage for stalled vehicles, reducing secondary crashes.
- Existing BSB decks will be reconfigured from four lanes with no shoulder to three lanes with inside and outside shoulders. This provides more space for stalled vehicles and maneuvering at emergencies, reducing rear-end, sideswipe and single vehicle crashes.
- Reduced traffic on the existing BSB will allow for the NB I-71/75 4th St on-ramp to enter the bridge as an add-lane without merging. This will reduce rear-end and sideswipe crashes.
- The new NB and SB C-D/frontage roads in KY will provide an added connection to 9th St, offering better connectivity for the Covington street network. New intersection design with turn lanes and traffic signal timing will improve vehicular safety. Sidewalks, multi use paths, crosswalks and new signing will improve mobility and safety for pedestrians and cyclists.
- The new C-D road and increasing the number of lanes will provide safer maneuvering and reduce rear-end and sideswipe crash frequency. Maintaining sufficient friction levels will mitigate the effect of downhill grade (NB) and frequent wet road conditions.
- Reconfiguration of the lanes will reduce the frequency of sideswipe and rear-end crashes due to merging and diverging on this section.
- New C-D lanes in both directions between Dixie Highway and Kyles Lane will reduce rear-end and sideswipe crashes.





# 9. CONCLUSION

An Interchange Modification Study requires documentation that the recommended preferred alternative will not degrade the interstate system concerning operations or safety compared to the existing conditions. The purpose of the BSB IMS Addendum is to confirm that the value engineering refinements incorporated into Refined Alternative I (Concept I-W) will not degrade operation or safety when compared to the previously approved IMS design, Selected Alternative I (from the 2012 EA/FONSI), and when compared to a No Build condition.

This Safety Analysis is part of the overall IMS documentation of the historical, existing, and predicted safety conditions in the BSB corridor. The analysis evaluates predicted safety based on a No Build design, the Selected Alternative I (from the 2012 EA/FONSI) design, and the Refined Alternative I (Concept I-W) design from 2023. A comparison of the existing crash data and predicted crash data with the various designs includes an evaluation of geometric factors such as vertical and horizontal curves, shoulder width, and traffic volumes.

The current I-71 and I-75 facilities at many locations within the study area need to meet current design standards for numerous features, including lane widths, shoulder widths, horizontal and vertical clearances, left-hand entrances and exits, and horizontal and vertical geometry. The existing BSB was not designed to handle the current or future daily traffic volume, resulting in design deficiency and congestion-related crashes.

The designs of the Selected Alternative I and Refined Alternative I (Concept I-W) followed the project Purpose and Need to improve traffic flow and level of service and correct geometric deficiencies, which leads to improved safety and maintains connections to critical regional and national transportation corridors. The analysis verified the existing crash data and recognized that the three highest crash types in the BSB corridor are typical for interstates – rear-end, sideswipe, and fixed object. While the percentage of each may differ in segments throughout the corridor, the capacity constraints and design deficiencies of these segments contribute to the specific crash condition.

The analysis shows that the Selected Alternative I (from the 2012 EA/FONSI) design and the Refined Alternative I (Concept I-W) design from 2023 provide improved conditions for travelers from the No Build design. This is due to increased capacity and improved traffic flow; designs that meet current standards for curves and shoulders; reduced weaving by separating mainline and local traffic, and the elimination of left exits. These improvements to safety over the No Build are similar between the Selected Alternative I (from the 2012 EA/FONSI) design and the Refined Alternative I (Concept I-W) design. The analysis indicates that safety will be slightly worse in some isolated areas of Refined Alternative I (Concept I-W) compared to Selected Alternative I, due to the use of 10 ft shoulders in the Refined Alternative I (Concept I-W). The proposed 10 ft shoulder widths achieve nominal safety objectives and balance the corridor's operational, safety, right-of-way, and project cost considerations. Furthermore, the safety improvements associated with the C-D road system are anticipated to alleviate the existing safety concerns caused by peak period traffic congestion that are not captured as part of the predictive safety analysis.

