



# Technical Planning Report for Interchange Improvements *Campbell Station Road at I-40/75*

February 2022

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

### **Executive Summary**

The Tennessee Department of Transportation (TDOT), in collaboration with the Knoxville Regional Transportation Planning Organization (TPO), initiated a study of interchange improvements of the Interstate 40/75 at Campbell Station Road interchange (Exit 373) in Knox County, Tennessee, as a result of the analysis performed on the I-40/81 Multimodal Corridor Study. The I-40/I-75 at Campbell Station Road interchange is located in western Knox County within the Town of Farragut town limits and as shown in Figure ES-1, is situated between Watt Road (Exit 369) and Lovell Road (SR 131) (Exit 374) interchanges. Two (2) truck weigh stations (one in each direction) are located between the Watt Road and Campbell Station Road interchanges.

The purpose of proposed interchange improvements is to accommodate future traffic demands, relieve existing and anticipated capacity deficiencies, and address geometric limitations of the subject interchange. The Campbell Station Road interchange serves as a major east-west and north-south transportation facility, connecting residents of the Town of Farragut to and from downtown Knoxville, as well as commuters to offices, residential communities, and commercial and industrial centers north and south along Campbell Station Road. Campbell Station Road directly connects to the Hardin Valley area, which is Knox County's fastest growing community. South of the interchange, Campbell Station Road connects to SR-1 (US-70/Kingston Pike) which is a major commercial corridor and a designated detour route for the Knox County area. As identified within the I-40/81 Multimodal Corridor Study, it is recommended to widen the interstate within the study limits from six (6) to eight (8) lanes total, or three (3) to four (4) lanes in each direction. This subject widening will further impact operations of the existing Campbell Station Road interchange.

Three (3) options were further evaluated in developing potential alternatives for the interchange: No-Build, Build Alternative 1 (maintain existing alignment of Campbell Station Road and raise the grade of I-40/75 mainlines to construct DDI concept), and Build Alternative 2 (shift alignment of Campbell Station Road to the west and invert the interchange to construct DDI concept). Interstate improvements were also evaluated as part of the subject interchange study, which included widening the interstate mainlines from the I-40/75 system interchange to Lovell Road (SR-131)<sup>1</sup> and adding an auxiliary in each direction from Campbell Station Road to Lovell Road (SR-131).

The estimated cost of Build Alternative 1 is approximately \$58,800,000, which includes right-of-way and utility expenditures. The estimated cost of Build Alternative 2 is approximately \$41,030,000 and also includes costs associated with right-of-way and utilities. The total estimated cost for interstate improvements, which includes adding a lane in each direction as well as an auxiliary lane in each

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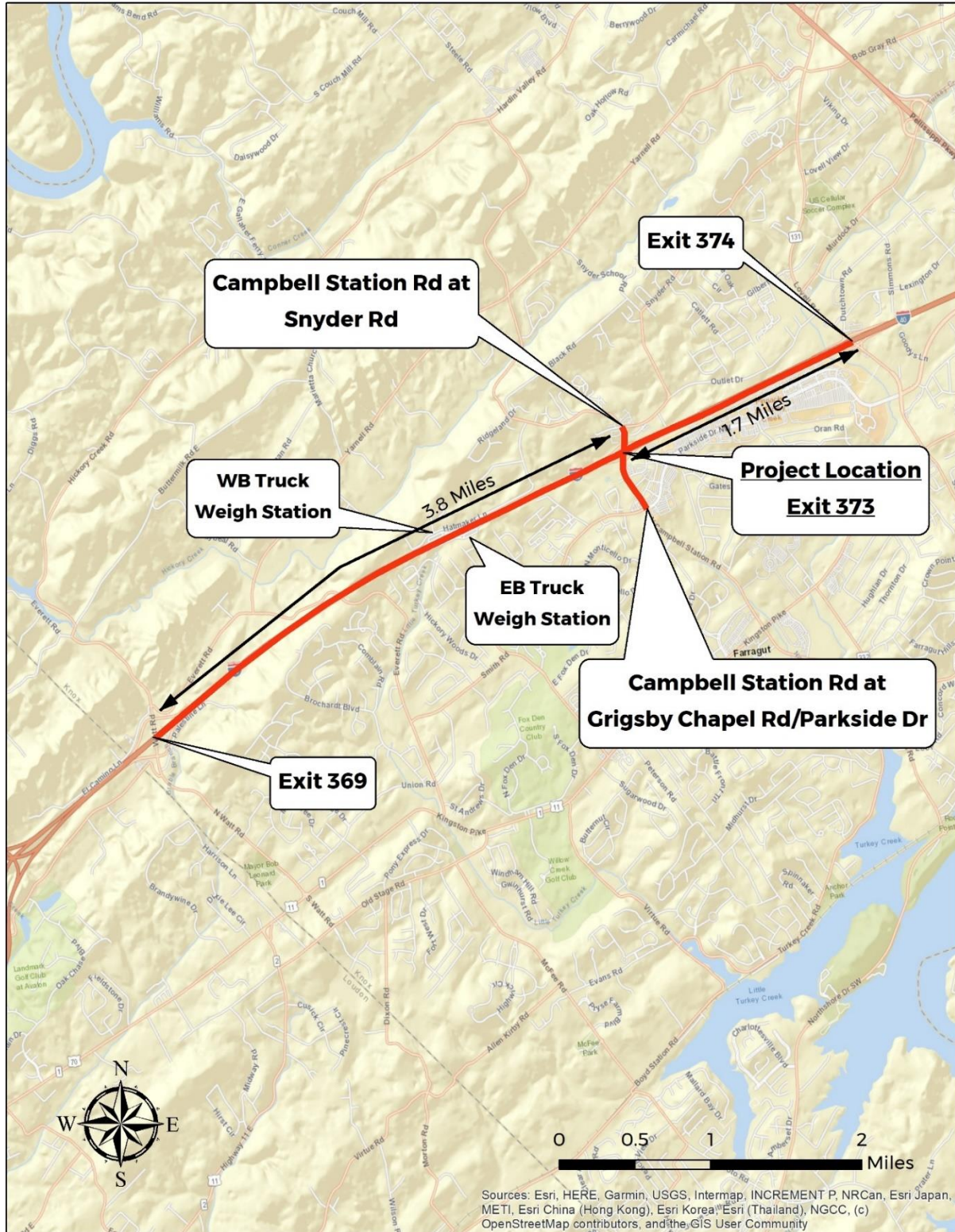
<sup>1</sup> Identified as a recommended improvement project within the I-40/81 Multimodal Corridor Study.

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

direction from Exit 373 to Exit 374 is \$79,000,000. Figures ES-2 and ES-3 (Build Alternative 1), ES-4 and ES-5 (Build Alternative 2), and ES-6 and ES-7 (Interstate Improvements) outline these total costs in 2021 dollars and are broken down into preliminary engineering, ROW, utilities, and construction phases. Additionally, inflated estimates for the opening and future years (i.e. 2025 and 2045) are provided which utilize a 5% inflation factor.

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure ES-1. Location Map



# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

## Build Alternative 1

Figure ES-2. Build Alternative 1 Interstate Improvements Total Cost and Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Widen	\$ 2,470,000	\$ -	\$ -	\$ 31,800,000	\$ 34,300,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 2,860,000	\$ -	\$ -	\$ 36,800,000	\$ 39,700,000	
23	2045	\$ 7,590,000	\$ -	\$ -	\$ 97,700,000	\$ 105,000,000	

Figure ES-3. Build Alternative 1 Campbell Station Road Improvements Total Cost and Inflated Costs

PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Modify Interchange	\$ 1,600,000	\$ 1,120,000	\$ 2,800,000	\$ 19,000,000	\$ 24,500,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 1,850,000	\$ 1,300,000	\$ 3,240,000	\$ 22,000,000	\$ 28,400,000	
23	2045	\$ 4,910,000	\$ 3,440,000	\$ 8,600,000	\$ 58,400,000	\$ 75,300,000	

## Build Alternative 2

Figure ES-4. Build Alternative 2 Improvements (from WB ramps to just south of Campbell Lakes Drive)  
Total Cost and Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Modify Interchange	\$ 2,510,000	\$ 551,000	\$ 1,540,000	\$ 33,400,000	\$ 38,000,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 2,910,000	\$ 638,000	\$ 1,780,000	\$ 38,700,000	\$ 44,000,000	
23	2045	\$ 7,710,000	\$ 1,690,000	\$ 4,730,000	\$ 103,000,000	\$ 117,000,000	

Figure ES-5. Build Alternative 2 Improvements (Campbell Station Road new alignment, north of WB ramps) Total Cost and Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Construction-New	\$ 251,000	\$ 273,000	\$ -	\$ 2,510,000	\$ 3,030,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 291,000	\$ 316,000	\$ -	\$ 2,910,000	\$ 3,510,000	
23	2045	\$ 771,000	\$ 839,000	\$ -	\$ 7,710,000	\$ 9,310,000	

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

## Interstate Improvements

Figure ES-6. 8 Lane Widening Total Cost & Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Widen	\$ 3,540,000	\$ -	\$ -	\$ 64,900,000	\$ 68,400,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 4,100,000	\$ -	\$ -	\$ 75,100,000	\$ 79,200,000	
23	2045	\$ 10,900,000	\$ -	\$ -	\$ 199,000,000	\$ 210,000,000	

Figure ES-7. Auxiliary Lanes Total Cost & Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Widen	\$ 960,000	\$ -	\$ -	\$ 9,600,000	\$ 10,600,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 1,110,000	\$ -	\$ -	\$ 11,100,000	\$ 12,300,000	
23	2045	\$ 2,950,000	\$ -	\$ -	\$ 29,500,000	\$ 32,600,000	

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Knox County**

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- Appendix B - Traffic Data
- Appendix C - Conceptual Layouts
- Appendix D - Cost Estimates

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

## 1.0 Introduction

The Tennessee Department of Transportation (TDOT), in collaboration with the Knoxville Regional Transportation Planning Organization (TPO), initiated a study of interchange improvements of the Interstate 40/75 at Campbell Station Road interchange (Exit 373) in Knox County, Tennessee, as a result of the analysis performed on the I-40/81 Multimodal Corridor Study. The purpose of proposed interchange improvements is to accommodate future traffic demands, relieve existing and anticipated capacity deficiencies, and address geometric limitations of the subject interchange. In addition to being noted as a potential interchange improvement project within the *Multimodal Solutions Technical Memorandum*<sup>2</sup>, the subject project is also listed in the region's long-range transportation plan with a 2030 horizon year (*Mobility Plan 2045, KRMP ID 09-629*).

### 1.1 Study Background

In 2004, an I-40/Campbell Station Road Interchange Study was prepared for the Town of Farragut. This study identified and evaluated six (6) alternative interchange options, which included the following:

- Three (3) varying loop options for the westbound off ramps
- Two (2) flyover design alternatives
- One (1) Single Point Urban Interchange (SPUI)

The study concluded that most of the six (6) identified options resulted in acceptable traffic operations; however, a more detailed study should be conducted. Therefore in 2009, TDOT prepared an Interchange Modification Study (IMS). This study further evaluated major improvements to the existing interchange (identified as Option 2B within the study), which included the following:

- Lengthen and widen the I-40 westbound off-ramp to provide two (2) exit lanes<sup>3</sup>.
- Widen the I-40 westbound off-ramp at the intersection with Campbell Station Road to provide three (3) left turn lanes.
- Replace the existing I-40 bridge with a new structure which will accommodate improvements to Campbell Station Road.
- Lower Campbell Station Road to provide 16.5 feet of clearance under the new bridge, as well as widen Campbell Station Road to include seven (7) travel lanes:
  - Three (3) southbound through lanes, two (2) northbound through lanes, and two (2) northbound left turn lanes.
- Signalize the intersection of Campbell Station Road with the I-40 eastbound ramps<sup>4</sup>.
- Widen Campbell Station Road north and south of I-40 to provide appropriate transitions between the interchange modifications and the existing cross-

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<sup>2</sup> <https://www.tn.gov/content/dam/tn/tdot/long-range-planning/studies/i-40-81-study/i-40-81-Multimodal-Solutions-Memo.pdf>

<sup>3</sup> Improvements in 2014 were implemented to provide additional ramp queue lengths in order to address safety concerns for vehicle queues backing onto the interstate mainline.

<sup>4</sup> This configuration is reflective of current conditions.

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

section on Campbell Station Road.

This study was initiated in 2021 as an extension of the ongoing efforts and work associated with the I-40/81 Multimodal Corridor Study, which identified the Campbell Station Road interchange as a potential interchange improvement candidate<sup>5</sup>. The study purpose is to re-evaluate potential improvement(s) based on current and future needs within the study area.

### 1.2 Project Location

As shown in Figure 1, the I-40/I-75 at Campbell Station Road interchange (Exit 373) is in western Knox County located within the Town of Farragut. As shown in Figure 2, the Campbell Station Road interchange is located between Watt Road (Exit 369) and Lovell Road (SR 131) (Exit 374) interchanges. Two (2) truck weigh stations (one in each direction) are located between the Watt Road interchange and Campbell Station Road interchange. Table 1 below lists the distances to adjacent interchanges/ramps. The study area also extends north and south along Campbell Station Road - north to the signalized intersection of Snyder Road and south to the signalized intersection of Grigsby Chapel Road/Parkside Drive.

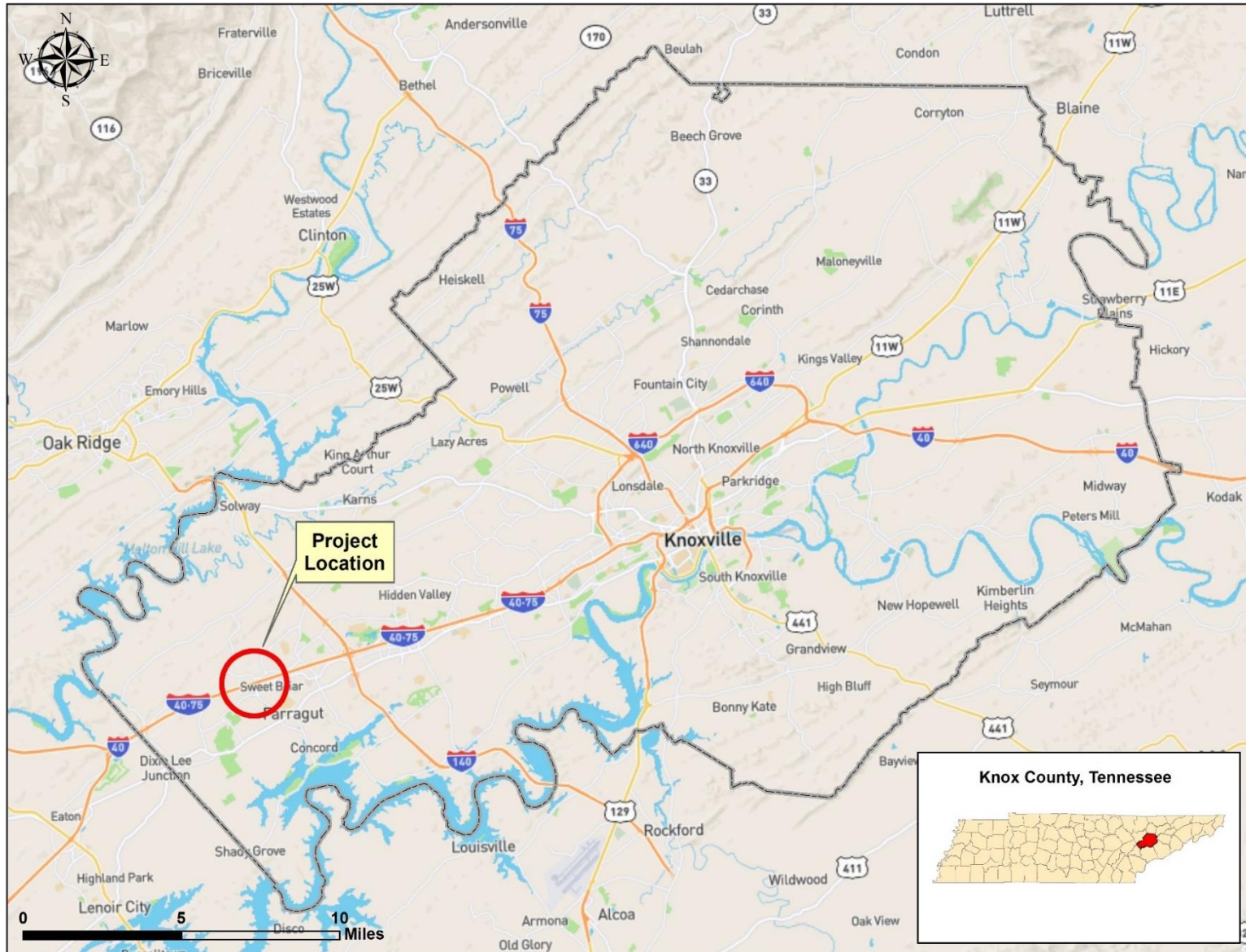
Table 1. Distance to Adjacent Interchanges

Interchange/Ramp	I-40/I-75 Exit Number or MM	Direction from Campbell Station Road	Distance from Campbell Station Road (Miles)
Watt Road	369	West	3.8
I-40/I-75 WB Weigh Station	371.4	West	2.3
I-40/I-75 EB Weigh Station	371.6	West	2.3
Campbell Station Road	373	N/A	0
Lovell Road (SR 131)	374	East	1.7

<sup>5</sup> Multimodal Solutions Technical Memorandum, p 10, <https://www.tn.gov/content/dam/tn/tdot/long-range-planning/studies/i-40-81-study/i-40-81-Multimodal-Solutions-Memo.pdf>

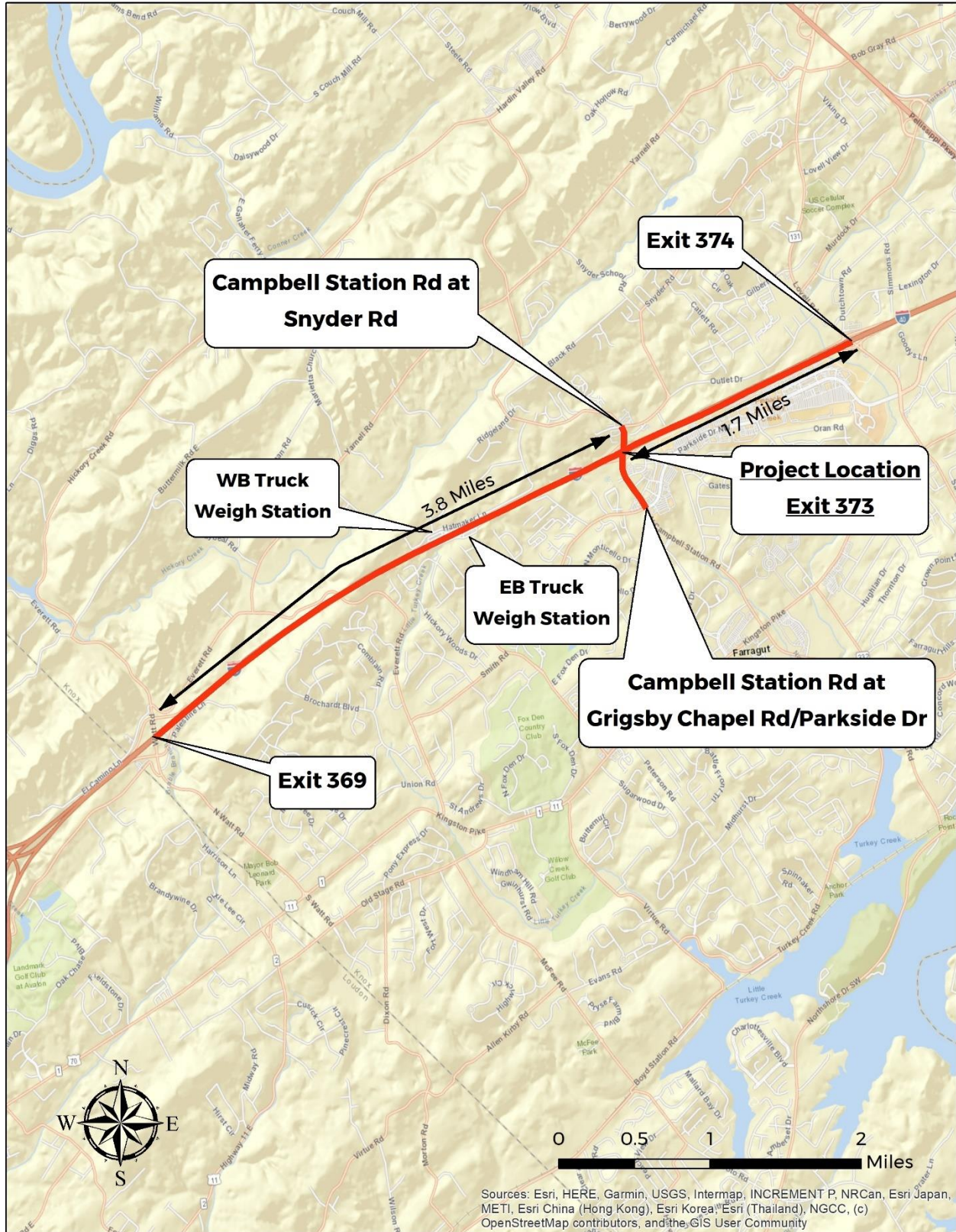
# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 1. Vicinity Map



# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 2. Study Area Map



## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

### 1.3 Purpose and Need

The primary purpose of the proposed interchange improvements is to improve traffic operations at the subject interchange and address the geometric limitations of the I-40 bridge over Campbell Station Road. The subject interchange serves as a major east-west and north-south transportation facility, connecting residents of the Town of Farragut to and from downtown Knoxville, as well as commuters to offices, residential communities, and commercial and industrial centers north and south along Campbell Station Road. Campbell Station Road directly connects to the Hardin Valley area (which is north of the interchange); this area is Knox County's fastest growing community. South of the interchange, Campbell Station Road connects to SR-1 (US-70/Kingston Pike) which is a major commercial corridor and a designated detour route for the Knox County area. As identified within the I-40/81 Multimodal Corridor Study, it is recommended to widen the interstate within the study limits from six (6) to eight (8) lanes total, or three (3) to four (4) lanes in each direction. This subject widening will further impact operations of the existing Campbell Station Road interchange. Identified needs to be addressed via improvements include geometric restrictions, operational deficiencies, and pedestrian connectivity.

The existing I-40 bridge over Campbell Station Road has a substandard vertical clearance height of 14' 0". Per TDOT Roadway Design Guidelines Chapter 2 Geometric Design Criteria, *the minimum vertical clearance for all structures on all systems shall not be less than 16 feet over the entire roadway width, with an added 6" of allowance to accommodate future resurfacing*<sup>6</sup>. Therefore, improvements to the interchange will correct the existing geometric limitation to meet the 16' 6" minimum requirement.

Incorporated in 1980, the Town of Farragut consists of 16.0 square miles within western Knox County. As of 2019, the Town of Farragut has a population of approximately 23,000<sup>7</sup>, which represents an approximately 15 percent increase since 2010. With the connectivity to the interstate system as well as the close proximity to nearby communities such as Oak Ridge, Knoxville, Maryville, Alcoa, and Loudon County, the Farragut area continues to be a growing community. Most recently, the Town was ranked #2 as the best place to live in Tennessee based on various criteria such as housing cost, median income, and school ratings<sup>8</sup>. Traffic volumes along Campbell Station Road (between the interstate system and Grigsby Chapel Road/Parkside Drive) have grown from 27,460 in 2011 to 35,580 in 2019. The Town also includes existing and planned regional commercial attractions. Topgolf is currently under construction at 11400 Outlet Drive which will be a two (2) story venue with 72 bays. Furthermore, growth is anticipated north of the study area within the Hardin Valley area, which was examined through the *Hardin Valley Mobility Study* (2019). This growth and increased activity within and around the study area will further impact operations and increase congestion at the subject interchange.

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<sup>6</sup> [https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/design\\_guidelines/DG-C2.pdf](https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/design_guidelines/DG-C2.pdf), pp 2-7

<sup>7</sup> Census Bureau, American Community Survey (ACS) 2019 Data Profile

<sup>8</sup> <https://www.townoffarragut.org/CivicAlerts.aspx?AID=1303>

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

The Town of Farragut has more than fifteen (15) miles of greenway trails, as well as four (4) parks and miles of sidewalk infrastructure within the Town. The current interchange configuration does not provide pedestrian infrastructure, therefore, inhibiting pedestrian movement north to south (and vice versa) of the interstate system. Improvements to the interchange will include the development of pedestrian amenities in order to meet the high demand of multimodal access needs within the area.

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

## 2.0 Existing Conditions

### 2.1 Land Use and Zoning

Existing land use types vary within the study area, as outlined within Figure 3. Commercial (CO) is the predominant land use type directly along Campbell Station Road within the study boundaries (i.e. from Snyder Road to Grigsby Chapel Rd). Commercial properties along Campbell Station Road include various hotel/motels, restaurants, service stations, and shopping centers. Similarly, along I-40 east of the interchange, the area is characterized by CO land use, including Topgolf (under construction north of the interstate) and commercial shopping centers south of the interstate system. Agriculture/Forestry/Vacant land (AgForVac) encompasses the area along I-40 west of the interchange.

The majority of existing zoning within the study area is Commercial (C-2), as shown in Figure 4. C-2 denotes regional commercial district and is intended to permit lands adjacent to the interstate highway and interchanges to be used for the provision of general commercial and business services to both interstate travelers and residents of the region<sup>9</sup>.

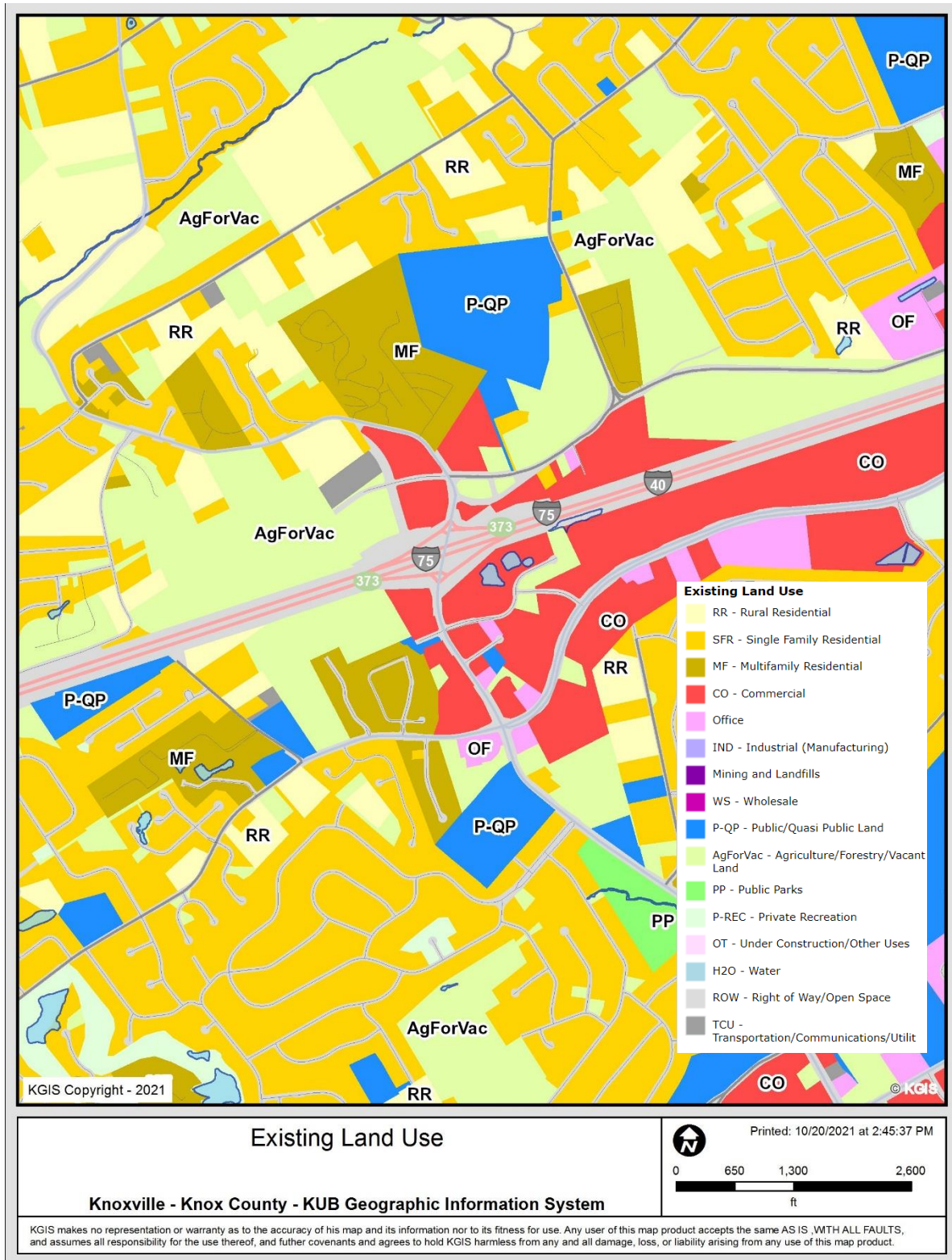
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<sup>9</sup> Town of Farragut Code of Ordinances, [https://library.municode.com/tn/farragut/codes/code\\_of\\_ordinances?nodeId=PTIICOOR\\_APXAZO\\_CH3SPDIRE\\_SXVRE\\_CODI](https://library.municode.com/tn/farragut/codes/code_of_ordinances?nodeId=PTIICOOR_APXAZO_CH3SPDIRE_SXVRE_CODI)



# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 3. Existing Land Use Surrounding Study Area





## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

### 2.2 Roadway Network

#### 2.2.1 Interstate 40/75

Within the study area (as shown in Figure 2), I-40/75 is a six (6)-lane, barrier divided interstate with three (3) lanes in each direction. (A center concrete median barrier separates the directions of travel.) I-40/75 travel lanes are twelve (12) feet wide. The inside (median) shoulders are ten (10) feet wide; the outside shoulders are sixteen (16) feet wide. The posted speed limit is 65 mph.

#### 2.2.2 Campbell Station Road

Within the study area (as shown in Figure 2), Campbell Station Road extends from Grigsby Chapel Road (to the south of the interchange), through the I-40/Campbell Station Road interchange and terminates at Snyder Road to the north.

Campbell Station Road is categorized as an urban minor arterial. South of the interstate, Campbell Station Road consists of a five (5) lane urban facility with two twelve (12) foot travel lanes in each direction, a twelve (12) foot two-way left turn lane (TWLTL), curb and gutter, and sidewalks on both sides of the roadway (for a majority of the route) – see Figure 5 below. North of the interstate, Campbell Station Road consists of a four (4) lane urban facility with two eleven (11) foot southbound travel lanes, a twelve (12) foot two-way left turn lane (TWLTL), and twelve (12) foot northbound travel lane – with curb and gutter and sidewalk on the west side of Campbell Station Road – see Figure 6 below.

*Figure 5. Campbell Station Road Looking North - Just South of Interchange*



## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 6. Campbell Station Road NB - Just North of Interchange



### 2.2.3 I-40/Campbell Station Road Interchange

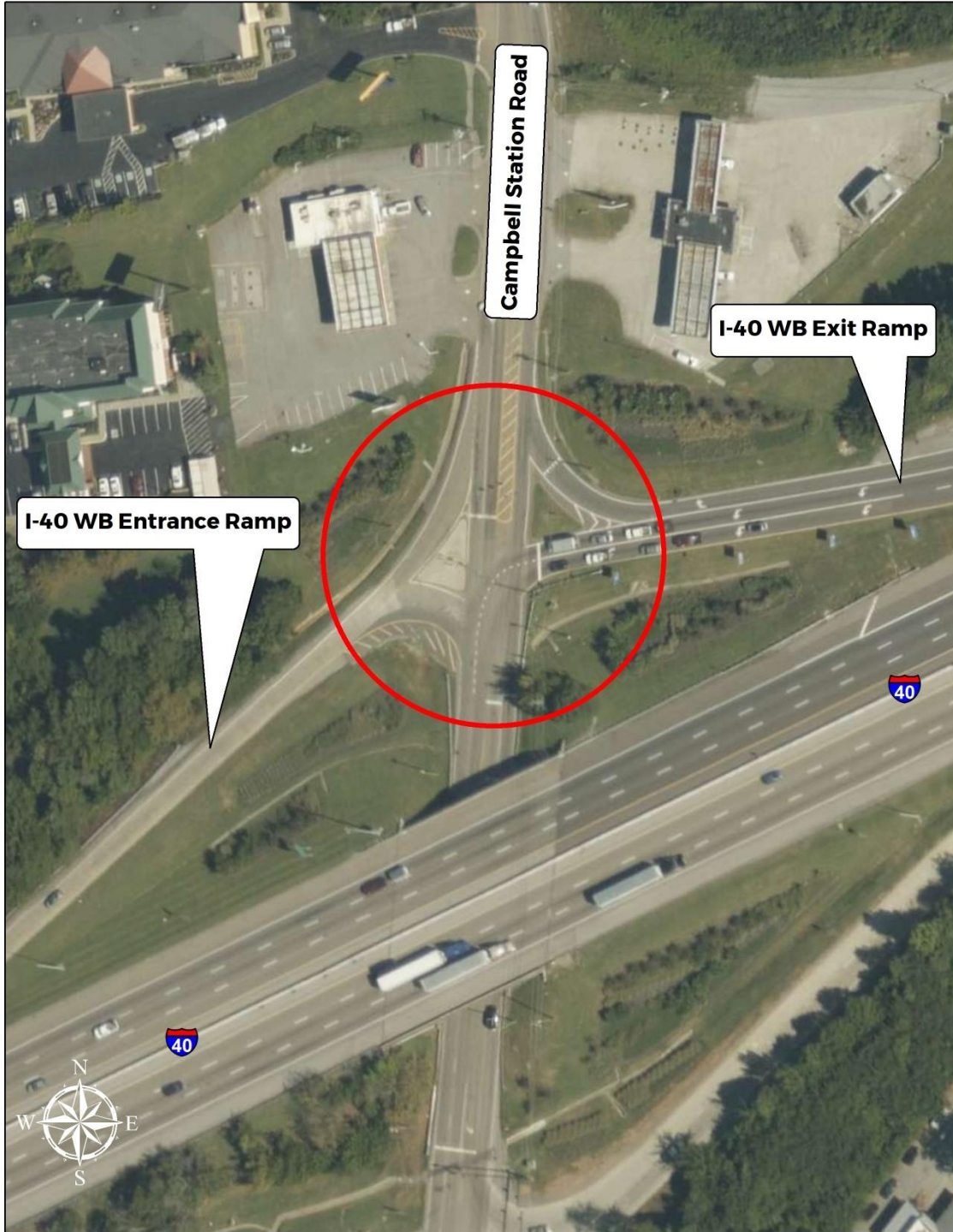
The I-40/Campbell Station Road interchange is classified as a tight diamond interchange (TDI). Both eastbound and westbound ramps are signalized at Campbell Station Road, with acceleration and deceleration lanes on I-40. All ramps are one (1) lane ramps, with the exception of the I-40 westbound off ramp which consists of two (2) lanes. There are no dedicated multimodal facilities within the interchange.

As shown in Figure 7, the intersection of the I-40 westbound ramps with Campbell Station Road creates a signalized, four (4)-leg intersection. The westbound entrance ramp is a sixteen (16) foot, single lane ramp. The westbound exit ramp has three (3), twelve (12) foot lanes. Two (2) lanes turn left to travel southbound on Campbell Station Road; the other lane turns right to travel northbound on Campbell Station Road. In the southbound direction travelling towards the signalized ramp, Campbell Station Road consists of two (2), eleven (11) foot lanes thru the intersection and a right-turn yield to access the westbound entrance ramp<sup>10</sup>. In the northbound direction, travelling towards the signalized ramp, Campbell Station Road consists of two (2), eleven (11) foot lanes. The outside lane is a thru lane; the inside lane is a left turn lane to access the westbound entrance ramp.

<sup>10</sup> The Town of Farragut recently implemented improvements to this intersection of Campbell Station Road and Snyder Road which included extending the southbound lane on Campbell Station Road between Snyder Road and the interstate which allows for a double left turn lane from westbound Snyder Road to South Campbell Station Road.

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 7. I-40 Westbound Ramps at Campbell Station Road



## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

As shown in Figure 8, the intersection of the I-40 eastbound ramps with Campbell Station Road creates a signalized, four (4)-leg intersection. The eastbound entrance ramp has two (2), twelve (12) foot lanes with a concrete island between and which merges to one (1) lane to enter the interstate mainlines. The eastbound exit ramp is a sixteen (16) foot single lane that widens near the signal to include an island and channelized right turn-lane onto southbound Campbell Station Road. In the southbound direction travelling towards the signalized ramp, Campbell Station Road is comprised of three (3), eleven (11) foot lanes. The inside lane is a left-turn lane to access the eastbound entrance ramp. The other two (2) lanes continue southbound through the intersection. In the northbound direction travelling towards the signalized ramp, Campbell Station Road is comprised of two (2), eleven (11) foot lanes. The outside lane is a dedicated right turn lane; the inside lane continues through the signalized intersection.

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 8. I-40 Eastbound Ramps at Campbell Station Road



## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

### 2.3 Existing Structure

The I-40/75 bridge over Campbell Station Road (bridge ID 47100400005) is a three (3) span concrete continuous bridge. It was built in 1968 and was most recently inspected on October 2, 2020. As noted in the most current inspection report and as outlined in Figure 9, the bridge received a sufficiency rating of 66.7. (Usually, bridges with a sufficiency rating of 50 or below are considered for replacements; whereas bridges with a sufficiency rating between 50 and 80 are considered for rehabilitation.) The report recommended a bridge rehabilitation project. Furthermore, a bridge maintenance project (PIN 130028.00) was let to construction on the subject bridge in the first quarter of 2021 to Twin K Construction, Inc. to repair the bridge on I-40/75 over Campbell Station Road (L.M. 3.98). Per TDOT's Interactive Tennessee Road Improvement Program (iTRIP) database<sup>11</sup>, the project had an estimated completion date of August 30, 2021.

In addition to the existing sufficiency rating, the report notes the substandard clearance for Campbell Station Road which is 14.01 feet. [This is also documented on TDOT's Oversize and Overweight Permit Office webpage as a Tennessee Vertical Clearance (Restrictions less than 14'-6") structure.<sup>12</sup>] Per TDOT Roadway Design Guidelines Chapter 2 Geometric Design Criteria, *the minimum vertical clearance for all structures on all systems shall not be less than 16 feet over the entire roadway width, with an added 6" of allowance to accommodate future resurfacing*<sup>13</sup>.

Lastly, Table 2 outlines the existing bridge condition. As outlined on TDOT's Structures Division webpage<sup>14</sup>, if the lowest rating is greater than or equal to 7 then the bridge is classified as Good (G). If it is rated 5 or 6, the bridge is classified as Fair (F). If it is less than or equal to 4, the classification is Poor (P). The most recent inspection did not result in any type of recommended improvements to the existing structure.

Table 2. Bridge Condition Ratings

Bridge Component	Rating
Deck	7
Superstructure	6
Substructure	6
Stream Channel & Channel Protection	N
Culvert Condition (if applicable)	N

<sup>11</sup> <https://www.arcgis.com/apps/dashboards/e14888bce2954050a10df5e949a1bc1d>

<sup>12</sup> <https://www.tn.gov/content/dam/tn/tdot/documents/CentralServices/TennClearanceReport.pdf>


<sup>13</sup> [https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/design\\_guidelines/DG-C2.pdf](https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/design_guidelines/DG-C2.pdf), pp 2-7

<sup>14</sup> <https://www.tn.gov/tdot/structures-/tennessee-bridge-facts.html>



# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 9. Bridge Inventory and Appraisal Report

NATIONAL BRIDGE INVENTORY TENNESSEE INVENTORY AND APPRAISAL REPORT		 TDOT DEPARTMENT OF TRANSPORTATION
BRIDGE ID NUMBER: 47100400005	COUNTY: KNOX	
BRIDGE OWNER: STATE OF TENNESSEE	ROUTE: 10040	
FIPS CODE: 00000	SPECIAL CASE: 0	
ROAD NAME: I-40	COUNTY SEQUENCE: 1	
CROSSING: CAMPBELL STATION RD	LOG MILE: 3.98	
LOCATION: IN FARRAGUT	SUFFICIENCY RATING: 66.7	
<b>IDENTIFICATION</b>		<b>CLASSIFICATION</b>
(16a,b) LATITUDE: N 35.89838 DEGREES	(112) MEETS NBIS BRIDGE LENGTH: YES	
(17a,b) LONGITUDE: W 84.17523 DEGREES	(104) NATIONAL HIGHWAY SYSTEM: NHS ROUTE	
(98a) BORDER BRIDGE STATE CODE: N/A	(26) FUNCTIONAL CLASS: URBAN INTERSTATE	
(98b) PERCENT SHARE: N/A	(101) PARALLEL BRIDGE: NO PARALLEL BRIDGE	
(99) BORDER BRIDGE NUMBER: NOT APPLICABLE	(102) TRAFFIC DIR: 2-WAY TRAFFIC	
	(103) TEMPORARY BRIDGE: NOT APPLICABLE	
	(110) NATIONAL TRUCK ROUTE: ON TRUCK NETWORK	
	(37) HISTORICAL CLASS: HISTORICAL SIGNIFICANCE HAS NOT BEEN DETERMINED	
<b>BRIDGE TYPE AND MATERIAL</b>		<b>CONDITION RATINGS</b>
(43a) MAIN SPAN MATERIAL: CONCRETE CONTINUOUS	(45) NUMBER OF MAIN SPANS: 3	(58) DECK: 7
(44a) APPR SPAN MATERIAL: NOT APPLICABLE	(46) NUMBER OF APPROACH SPANS: 0	(59) SUPERSTRUCTURE: 6
	(107) TYPE OF DECK: CONCRETE CAST-IN-PLACE	(60) SUBSTRUCTURE: 6
	(108) TYPE OF WEARING SURFACE AND DECK PROTECTION:	(61) STREAM CHANNEL AND CHANNEL PROTECTION: N
	A) TYPE OF SURFACE: MONOLITHIC CONCRETE	(62) CULVERT CONDITION (IF APPLICABLE): N
	B) TYPE MEMBRANE: NONE	
	C) TYPE PROTECTION: EPOXY COATED REINFORCING	
<b>AGE AND SERVICE</b>		<b>DESIGN LOAD AND WEIGHT POSTING</b>
(27) YEAR THE BRIDGE WAS BUILT: 1968	(49) TOTAL BRIDGE LENGTH: 142.1 FT	(31) DESIGN LOADING: HS-20-44
(106) YEAR THE BRIDGE WAS REHABILITATED: 1985	(50a) LEFT SIDEWALK WIDTH: 0.0 FT	WEIGHT POSTING (2 AXLE VEHICLES): ALL LEGAL LOADS
(42a) SERVICE ON BRIDGE: OVERPASS STRUCTURE	(50b) RIGHT SIDEWALK WIDTH: 0.0 FT	WEIGHT POSTING (3 OR MORE AXLES): ALL LEGAL LOADS
(42b) UNDER BRIDGE: HIGHWAY	(51) BRIDGE CURB TO CURB WIDTH: 128.6 FT	(70) BRIDGE POSTING CODE: 5
(28a) NUMBER OF LANES CARRIED BY BRIDGE: 6	(52) BRIDGE OUT TO OUT WIDTH: 130.6 FT	(41) WT POSTING STATUS: OPEN
(28b) NUMBER OF LANES UNDER THE BRIDGE: 3	(32) APPROACH ROADWAY (W/ SHLDS) WIDTH: 128.0 FT	
<b>GEOMETRIC DATA</b>		<b>APPRAISAL</b>
(48) MAXIMUM SPAN LENGTH: 60.0 FT	(33) BRIDGE MEDIAN: OPEN MEDIAN	(67) STRUCTURAL EVALUATION: 5
(49) TOTAL BRIDGE LENGTH: 142.1 FT	(34) BRIDGE SKEW: 30 DEGREES	(68) DECK GEOMETRY: 9
(50a) LEFT SIDEWALK WIDTH: 0.0 FT	(35) BRIDGE FLARE: NO FLARE	(69) UNDERCLEARANCE RATING: 3
(50b) RIGHT SIDEWALK WIDTH: 0.0 FT	(520) MIN VERTICAL CLEARANCE OVER RD: NO RESTRICTION	(71) WATERWAY ADEQUACY: N
(51) BRIDGE CURB TO CURB WIDTH: 128.6 FT	(47) MIN HORIZONTAL CLEARANCE ON ROADWAY: 64.0 FT	(72) APPROACH ROADWAY ALIGNMENT: 8
(52) BRIDGE OUT TO OUT WIDTH: 130.6 FT	(54a) VERT UNDERCLR: HIGHWAY BENEATH BRIDGE	(36) TRAFFIC SAFETY FEATURES: 1000
(32) APPROACH ROADWAY (W/ SHLDS) WIDTH: 128.0 FT	(54b) MIN VERTICAL UNDERCLEARANCE: 14.01 FT	(113) SCOUR CONDITION RATING: N
(33) BRIDGE MEDIAN: OPEN MEDIAN	(55a) HORZ UNDERCLR: HIGHWAY BENEATH BRIDGE	
(34) BRIDGE SKEW: 30 DEGREES	(55b) MIN HORZ UNDERCLR ON RIGHT: 1.97 FT	
(35) BRIDGE FLARE: NO FLARE	(56) MIN HORZ UNDERCLR ON LEFT: NOT APPLICABLE	
(520) MIN VERTICAL CLEARANCE OVER RD: NO RESTRICTION		
(47) MIN HORIZONTAL CLEARANCE ON ROADWAY: 64.0 FT	<b>RECOMMENDED IMPROVEMENTS</b>	
(54a) VERT UNDERCLR: HIGHWAY BENEATH BRIDGE	(75) TYPE OF WORK: BRIDGE REHABILITATION	
(54b) MIN VERTICAL UNDERCLEARANCE: 14.01 FT	(76) LENGTH OF BRIDGE IMPROVEMENT: 142.1 FT	
(55a) HORZ UNDERCLR: HIGHWAY BENEATH BRIDGE	(94) BRIDGE IMPROVEMENT COST: \$2,480,000.00	
(55b) MIN HORZ UNDERCLR ON RIGHT: 1.97 FT	(95) ROADWAY IMPROVEMENT COST: \$249,000.00	
(56) MIN HORZ UNDERCLR ON LEFT: NOT APPLICABLE	(96) TOTAL PROJECT COST: \$3,721,000.00	
	(97) YEAR OF IMPROVEMENT COST ESTIMATE: 2021	
<b>NAVIGATION DATA</b>		<b>INSPECTION DATES</b>
(38) NAV CONTROL: NOT APPLICABLE	(90) DATE OF LAST REGULAR INSPECTION: 10/2/2020	
(39) NAVIGATION VERTICAL CLEARANCE: N/A	(91) REGULAR INSPECTION FREQUENCY (MONTHS): 24	
(116) LIFT BRIDGE VERT CLEARANCE: N/A	(93b) DATE OF LAST UNDERWATER INSP (MO/YR): N/A	
(40) NAVIGATION HORZ CLEARANCE: N/A	(92b) UNDERWATER INSP FREQUENCY (MONTHS): N	
	(93c) DATE OF SPECIAL INSPECTION (MO/YR): N/A	
	(92c) SPECIAL INSP FREQUENCY (MONTHS): N	
<b>PUBLICATION DATE</b>	<b>PRODUCED PURSUANT TO PUBLIC RECORDS REQUEST</b> This document is covered by 23 USC §409 and its production pursuant to a public document records request does not waive the provisions of §409	
09-Mar-21		

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

### **2.4 Preliminary Environmental Constraints**

A preliminary desktop review of environmental constraints within the study area was conducted, using publicly available data sources. The findings discussed herein should be considered preliminary and are subject to change and/or clarification after additional studies (including ecological, hazardous, materials, air quality/noise, archaeological, and/or historical) are conducted.

National Ambient Air Quality Standards (NAAQS) are established for six (6) criteria pollutants: particulate matter, ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, and lead. Furthermore, the United States Environmental Protection Agency (EPA) regulates these pollutants by setting maximum limits on exposure levels - which are periodically reviewed. Geographic areas are classified as being in “attainment” or “non attainment.” A geographic area with air quality that meets NAAQS standards is referred to as an attainment area; whereas an area that does not meet NAAQS standards is classified as a non-attainment area. The Knoxville Region (which encompasses the study area) is designated as attainment with a maintenance plan for:

- 2008 8-hour Ozone Standard
- 2006 Particulate Matter 2.5 (PM2.5) Daily Standard

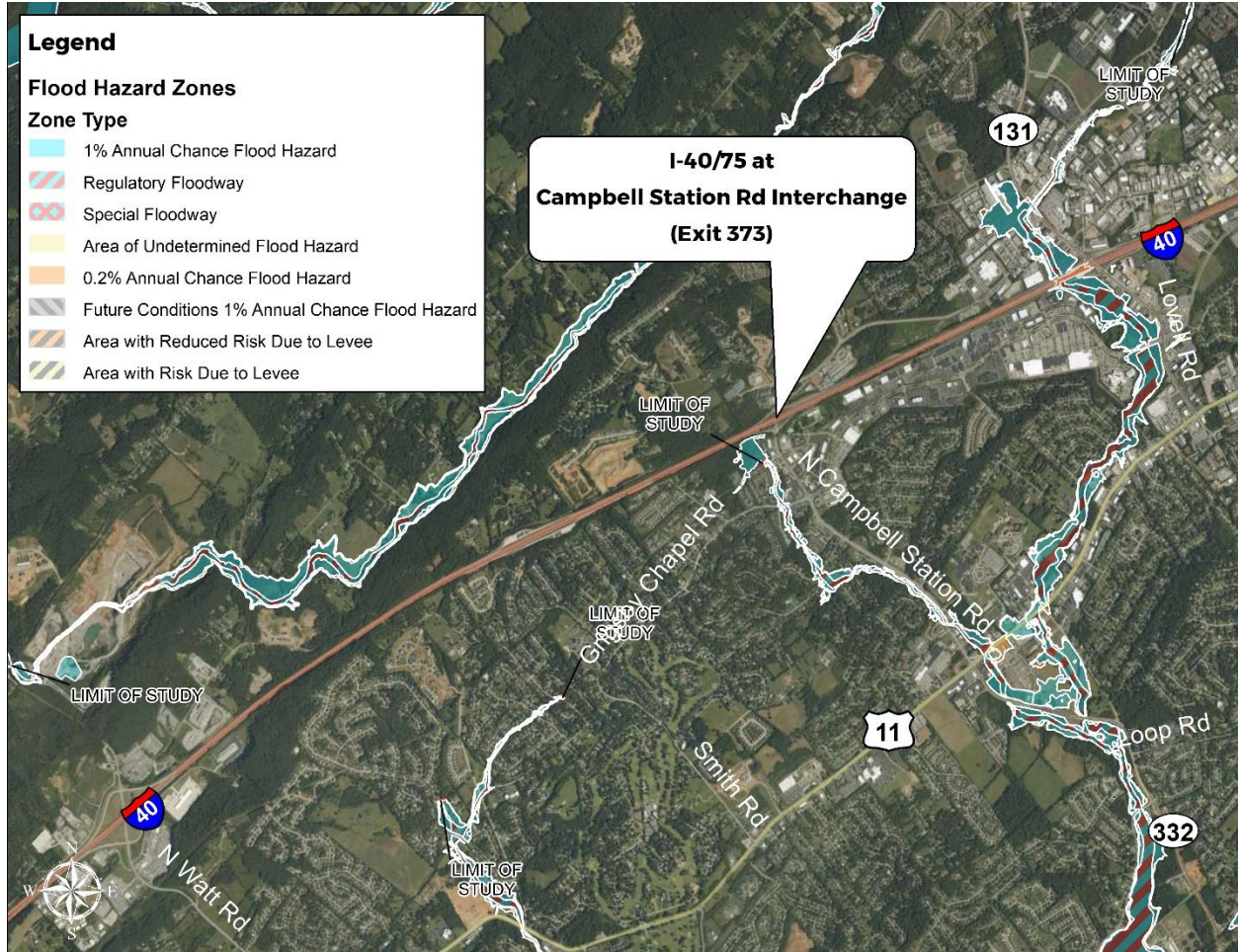
Three (3) named streams are present within the study area: Grable Branch, North Fork Turkey Creek, and Turkey Creek. None of the streams are identified as Exceptional Tennessee Waters (ETW) and all are classified as “not supporting” in the Tennessee Department of Environment and Conservation’s (TDEC) draft 2022 List of Impaired and Threatened Waters<sup>15</sup>. The Federal Emergency Management Agency (FEMA) flood map service center platform was utilized to identify flood zones within the study area. FEMA data indicates two (2) floodplains within the area and are depicted in Figure 10.

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<sup>15</sup> <https://tdeconline.tn.gov/dwr/>

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 10. FEMA Flood Data Map

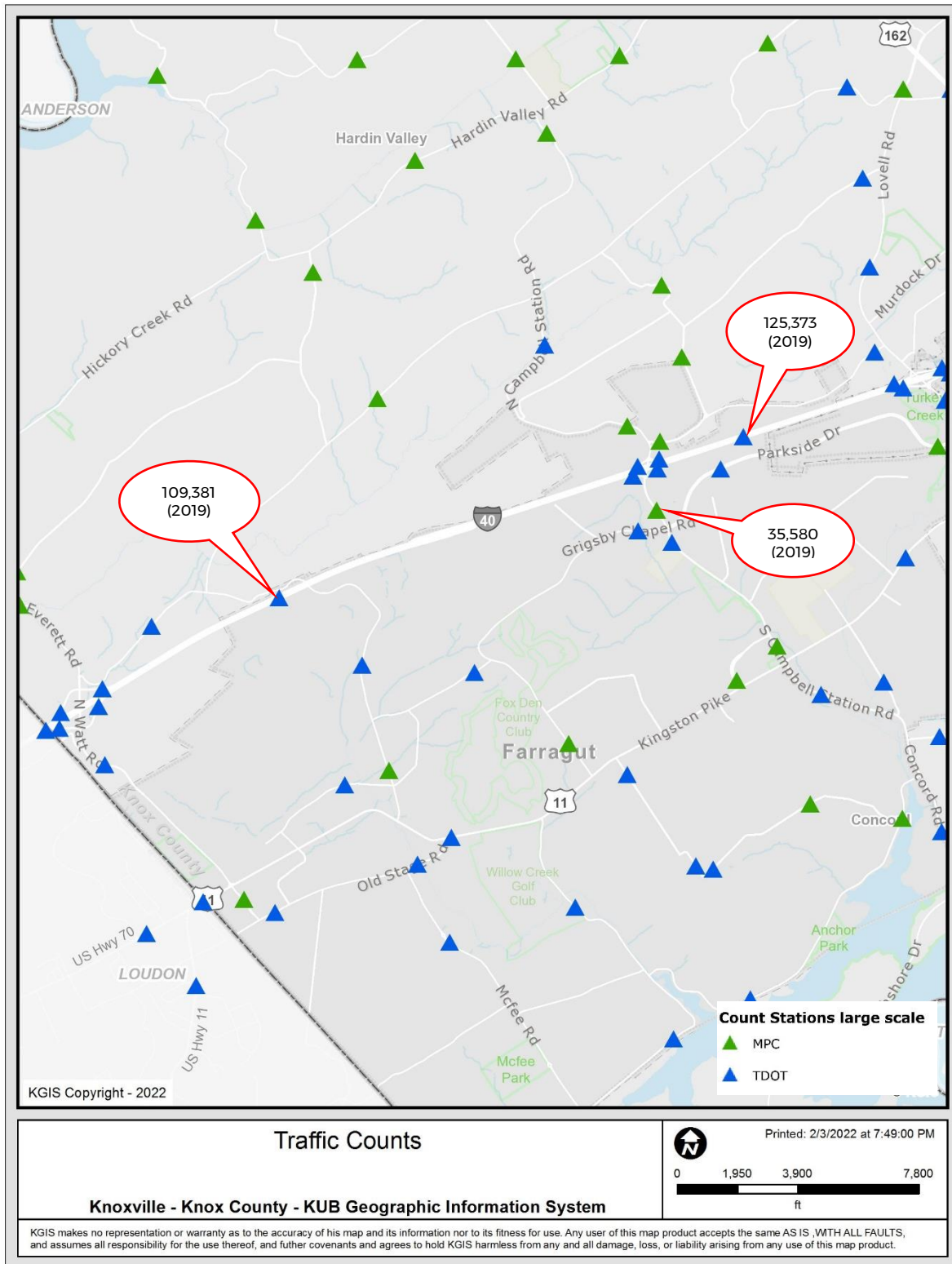


## 2.5 Existing Traffic

Figure 11 highlights 2019 annual average daily traffic (AADT) along I-40 and Campbell Station Road within the limits of the study area. As noted within the figure, data sources include both TDOT and the Knoxville-Knox County Planning Commission. (Although 2020 data is available, it was not reported on this figure due to irregular travel patterns in 2020 from the pandemic.)

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 11. Existing AADT



## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

### 2.6 Crash History

Crash history was reviewed for both Campbell Station Road and I-40 within the study area for the three (3)-year period of 2017, 2018, and 2019. As summarized in Table 3, 151 crashes occurred along Campbell Station Road between Snyder Road (to the north) and Parkside Drive/Grigsby Chapel Road (to the south). Most crashes were rear-end and angle crashes, indicating that congestion may be a contributing factor.

Table 3. Crash Statistics – Campbell Station Road (Exit 373)

Condition	2017-2019	
	Number of Crashes	Percentage of Total
<b>Lighting Conditions</b>		
Daylight	108	71%
Dark-Not Lighted	5	3%
Dark-Lighted	31	21%
Dark-Unknown Lighting	1	1%
Dusk/Dawn	3	2%
Other/Not Indicated/Unknown	3	2%
<b>Crash Severity</b>		
Property Damage	125	83%
Suspected Minor Injury	23	15%
Suspected Serious Injury	2	1%
Fatal	1	1%
<b>Manner of Collision</b>		
Rear-End	66	44%
Rear to Rear	0	0%
Rear to Side	1	1%
Angle	45	30%
Sideswipe (Same Direction)	25	16%
Sideswipe (Opposite Direction)	3	2%
Head On	2	1%
No Collision	4	3%
Other/Unknown/Unlisted	5	3%
<b>Weather Conditions</b>		
Clear	105	70%
Cloudy	22	14%
Rain	20	13%
Snow/Blowing Snow	0	0%
Fog	1	1%
Not Indicated /Unknown	3	2%

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

### 3.0 Future Conditions

#### 3.1 Planned Projects

Including the subject interchange, there are five (5) proposed roadway projects within the project’s study area, as outlined in Table 4. These projects are outlined in either the Knoxville Regional Transportation Planning Organization’s 2020-2023 Transportation Improvement Program (TIP) or the *Mobility Plan 2045*. (Project sheets from the TIP and *Mobility Plan 2045* are located in Appendix A.)

Table 4. TIP and LRTP Project Summary

ID	Project Description	Lead Agency	Year
LRTP 09-629	I-40/I-75/Campbell Station Road interchange - reconfigure existing interchange to improve capacity, safety, and operations.	Town of Farragut	2030
TIP # 20-2017-024	Upgrade closed loop signal system to centrally controlled signal system along Campbell Station Road (as well as additional routes).	Town of Farragut	2020
LRTP 13-603	I-40/75 widening from Campbell Station Road to Lovell Road (SR-131), add auxiliary lane in each direction	Town of Farragut	2030
LRTP 10-700	Widening and realignment of Campbell Station Road from I-40 to Hardin Valley Road	Knox County	2030
LRTP 09-691	I-40/75 widening from I-40/75 junction to Lovell Road (SR-131), from 6 to 8 lanes total	Town of Farragut	2035

Furthermore as noted in Knoxville-Knox County Planning/Knox County’s 2019 *Hardin Valley Mobility Study* and also noted in Table 4 (LRTP 10-700), improvements to North Campbell Station Road were identified as catalyst projects for the study area in order to enhance transportation safety, accessibility, and connectivity. Potential improvements to North Campbell Station Road are shown in Figure 12 and include various solution options ranging from shoulder widening (only) of the existing route to realignment improvements. Improvements begin at the subject interchange and continue north to Hardin Valley Road<sup>16</sup>.

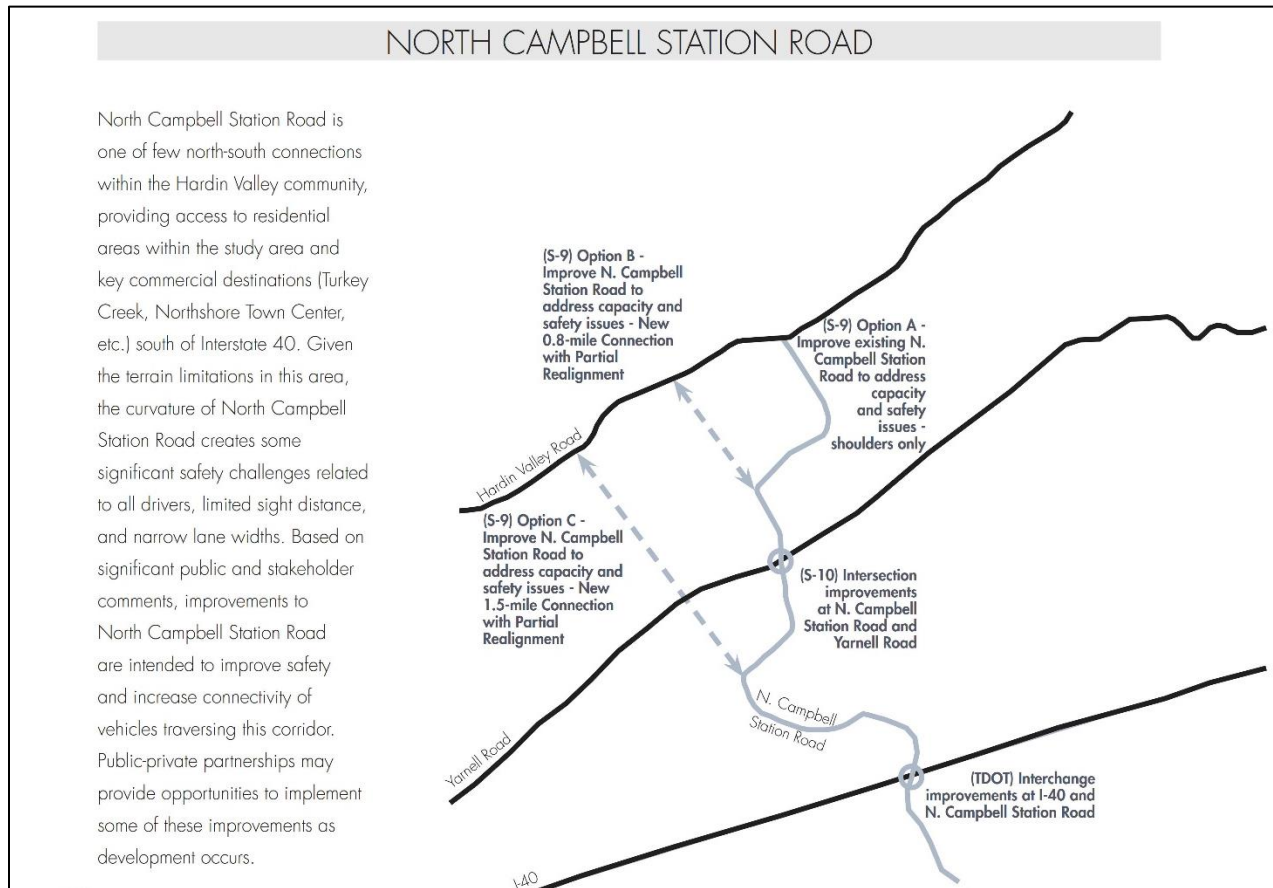
In addition, this same study (i.e. *Hardin Valley Mobility Study*) references the Knoxville-Knox County Park, Recreation, and Greenways Plan – completed in 2009 – which highlights Campbell Station Road (from Snyder Road to Hardin Valley Road) as a

<sup>16</sup> A study is currently underway to further evaluate and analyze improvements to Campbell Station Road from Snyder Road to Hardin Valley Road. This is also noted on the conceptual layouts in Appendix C. This study is scheduled to be complete in March 2022.

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

proposed greenway connector for future multimodal facilities<sup>17</sup>

Figure 12. N. Campbell Station Road Improvements<sup>18</sup>



### 3.2 Future Land Use

According to the *Comprehensive Land Use Plan: Farragut 2025*<sup>19</sup> and as outlined in Figure 13, future land use patterns within the study area are similar to existing land use patterns. However instead of the Commercial designation, much of the land is categorized as Regional Commercial which is intended to support and ensure on-going success of large auto-oriented commercial centers (i.e. hubs). Furthermore, the subject interchange is denoted as a gateway area – aiming to welcome and encourage visitors and prospective businesses and improve civic pride.

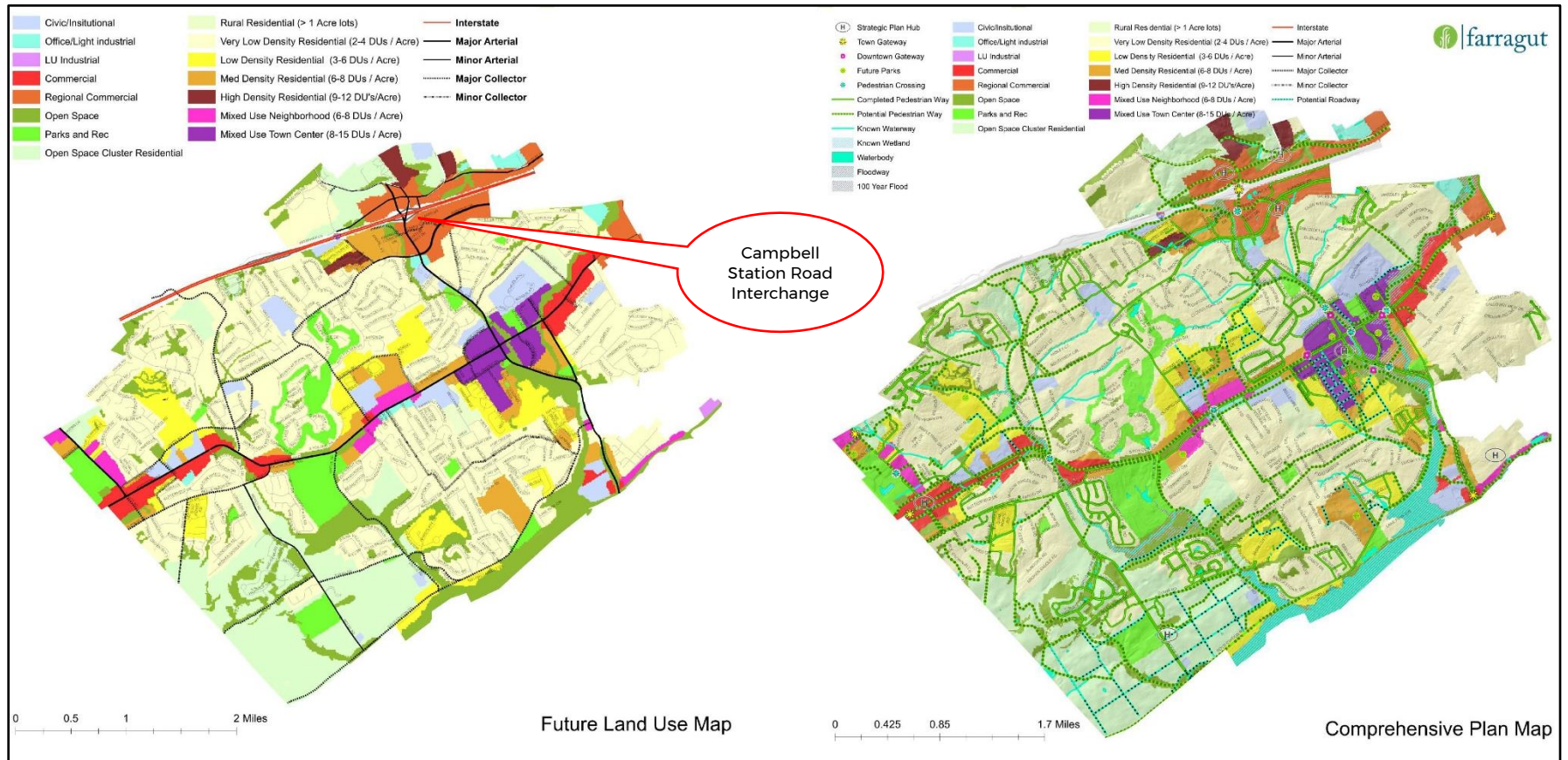
<sup>17</sup> *Hardin Valley Mobility Study*, p. 16, <https://knoxplanning.org/resources/hardin-valley/resources/final%20report/Hardin%20Valley%20Mobility%20Plan.pdf>

<sup>18</sup> *Hardin Valley Mobility Study*, p. 28, <https://knoxplanning.org/resources/hardin-valley/resources/final%20report/Hardin%20Valley%20Mobility%20Plan.pdf>

<sup>19</sup> <https://www.townoffarragut.org/DocumentCenter/View/5962/CLUP-Adopted-Plan-Updated-Through-Dec-2020>

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 13. Future Land Use and Comprehensive Plan Map



Source: Comprehensive Land Use Plan: Farragut 2025



## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

### **3.3 Future Traffic Volumes**

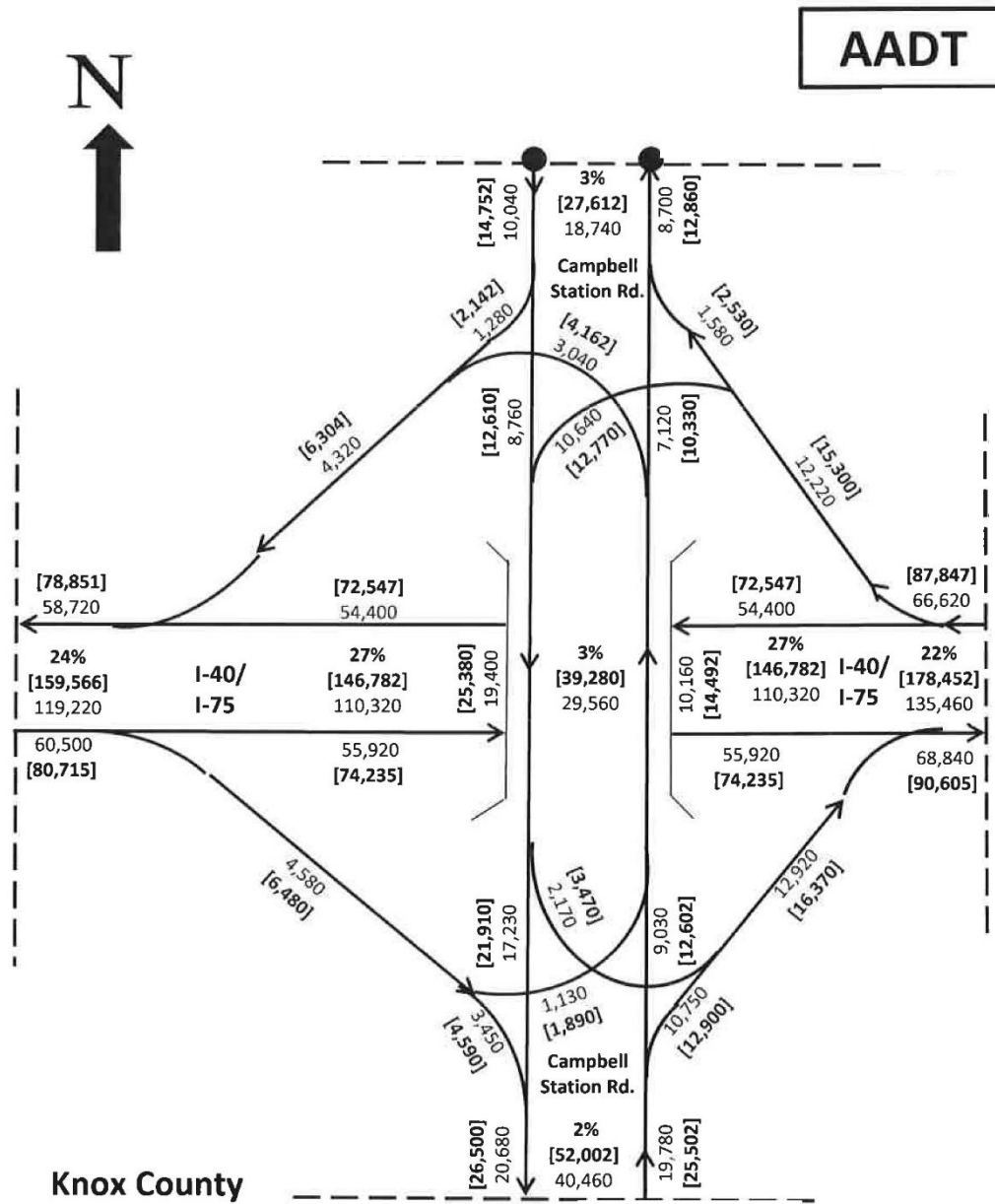
TDOT, in conjunction with the Knoxville Regional TPO, developed the base year (2025) and future year (2045) traffic volumes. Projected traffic volumes were based on a number of sources:

- Knoxville Regional TPO Travel Demand Model
- 2019 cycle and ramp counts
- Four (4) 2018, 8-hour turning movement counts
- Twelve (12) 2021, 8-hour turning movement counts

The 2025 and 2045 Average Annual Daily Traffic (AADT) volumes at the I-40/Campbell Station Road interchange are summarized in Figure 14. Appendix B includes additional AADT data and Design Hourly Volumes (DHVs) for the entire study area.

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 14. 2025 and 2045 AADT



## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

### 4.0 Conceptual Alternatives

TDOT's Highway System Access Manual (HSAM) – Intersection and Interchange Evaluation (IIE) tool was utilized as a baseline to develop conceptual alternatives. This tool utilizes project specific data to screen interchange options. Furthermore, previous and concurrent studies were referenced as a guide, while also taking into account various factors such as engineering, environmental limitations, constructability, and cost to develop the alternatives discussed below. For each alternative, two (2) years were evaluated: 2025 and 2045.

#### 4.1 Methodology and Initial Alternatives

TDOT's HSAM IIE process and corresponding spreadsheet tool was implemented in the early stages of the study in order to evaluate and develop various concepts, which led to the build alternatives noted below. As noted in HSAM Volume 2<sup>20</sup>, the benefits to the Department and the traveling public by utilizing IIE procedures include:

- Implementation of safer, more balanced, and more cost-effective options.
- Consistent documentation that improves the transparency of transportation decisions.
- Increased awareness of innovative intersection solutions and emphasis on objective performance metrics for consistent comparisons.
- Opportunity to consolidate and streamline existing intersection-related policies and procedures, including access or encroachment approvals, new traffic signal requests, and impact studies for development.

TDOT's HSAM IIE process is a two (2) stage approach to developing potential improvements:

1. Stage I – Scoping. This step results in a short list of all possible options that merit further consideration. This step requires input of various study-specific data, such as traffic data, opening and design years, functional classifications of roadways, land use context, multimodal activity, etc. In addition, the Stage 1 – Scoping requires CAP-X traffic analysis.
2. Stage II – Preferred Option Selection. This step results in the preferred option(s) based on more detailed evaluations conducted during preliminary engineering activities. This step requires further traffic analysis of potential options, as well as development of high-level cost estimates for each option.

The results of each stage are detailed within the following sections.

##### 4.1.1 Stage I – Scoping Results

For the subject study, the Stage I – Scoping phase resulted in three (3) options (in addition to the existing configuration) to carry forward to the Stage II – Preferred Option Section stage: **Diverging Diamond Interchange (DDI)**, **Single Point Urban Interchange (SPUI)**, and **Diamond Interchange with Loop**. The completed Stage 1 – Scoping

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<sup>20</sup> <https://www.tn.gov/content/dam/tn/tdot/traffic-engineering/hsam/TDOT%20HSAM%20Vol%202%20IIE%20012921.pdf>

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

spreadsheet (including data input) are depicted in Figure 15 and Figure 16. As outlined in Figure 15, the Crash History and Intersection Crash Data and Turning Movement Volumes sections were not completed since these sections apply to intersections – not interchanges. As shown in Figure 16, the Conflict Point Score column was populated using the tool’s Conflict Point Score tab/calculations, and the AM V/C Ratio and PM V/C Ratio columns were completed via CAP-X analysis. Options which resulted in “Yes” progressed forward.


# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 15. TDOT IIE Data Input

		<b>Intersection and Interchange Evaluation (IIE) Forms</b> TDOT IIE Form - Data Inputs <span style="float: right;">Version: 09142020</span>																																																																																	
Project Information																																																																																			
Project and Location Data		Turning Movement Volumes (TMV)																																																																																	
Project Name: I-40 & Campbell Station Road Interchange Improvements Major Road Name: I-40      Minor Road Name: Campbell Station Road PIN:                                      County: Date: 8/5/2021      Analyst/Firm: WSP Existing Control Type: Diamond      No. of Legs: - Major Road Direction: E-W      Opening Year: 2025      Design Year: 2045 Funct. Class of Major Road: Interstate      Land Use Context: Suburban Project Type of Work: Modify Interchange		<div style="border: 1px solid black; padding: 5px;">                     2025 = Opening Year Design Hourly Volumes (DHV)                 </div> <table border="1" style="width: 100%; text-align: center;"> <tr><td colspan="4">Campbell Station Road</td></tr> <tr><td>0</td><td></td><td></td><td></td></tr> <tr><td>(0)</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td>SB</td></tr> <tr><td>EB</td><td>PEDS</td><td>←</td><td>↓</td><td>→</td><td>PEDS</td><td>(0)</td><td>0</td></tr> <tr><td></td><td></td><td>↑</td><td colspan="2">Entering Hourly Volumes</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>→</td><td></td><td></td><td></td><td></td><td>OP-T</td></tr> <tr><td></td><td></td><td>↓</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>0</td><td>(0)</td><td>PEDS</td><td>←</td><td>↑</td><td>→</td><td>PEDS</td><td>WB</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td>(0)</td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <p>(AM) = AM Peak Hour Approach                      (PM) = PM Peak Hour Approach                      Blue = Pedestrian Volumes</p> 		Campbell Station Road				0				(0)							SB	EB	PEDS	←	↓	→	PEDS	(0)	0			↑	Entering Hourly Volumes							→					OP-T			↓						0	(0)	PEDS	←	↑	→	PEDS	WB							(0)								0									
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Crash History and Intersection Crash Rate																																																																																			
Crash Data Year(s):      No. of Years:      No. of Crashes:																																																																																			
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# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 16. TDOT IIE Stage I – Scoping

<b>Intersection Location:</b>		I-40 at Campbell Station Road in County							
<b>Number of Intersection Legs:</b>		-		<b>PIN:</b>		0.00	<b>Date:</b> 8/5/21		
<b>Existing Control Type:</b>		Diamond		<b>Analyst:</b>		WSP	<b>Version:</b> 09142020		
<b>Control Type</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Conflict Point Score (lower # is better) Is the option feasible and reasonable? Is the option likely to improve or maintain safety? Is the option likely to improve operations? Is the Option likely to improve or maintain multimodal access? AVM V/C Ratio (CAP-X) PM V/C Ratio (CAP-X) Should the Option proceed to Stage II?</p> </div> <div style="width: 35%; text-align: right;">  <p><b>TDOT IIE Stage I Form - Scoping</b></p> </div> </div>								
		Safety	Q1	Q2	Q3	Q4	Capacity	Decision	Screening Decision Justification
At-Grade Intersection									
Traffic Signal	48	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Two-Way Stop Control	48	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
All-Way Stop Control	48	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Continuous Green T	n/a	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Quadrant Roadway	40	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Partial Displaced Left Turn	44	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Displaced Left Turn	40	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Signalized RCUT	20	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
J-Turn (Unsignalized RCUT)	20	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Median U-Turn	20	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Partial Median U-Turn	28	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Bowtie	24	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Split Intersection	36	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Roundabout	8	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Other (provide description)									
Grade-Separated Intersection	Safety	Q1	Q2	Q3	Q4	CAP-X	Decision		Screening Decision Justification
Echelon	28	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Center Turn Overpass	32	No	-	-	-		No	No	Subject junction is an interchange, this option is not viable
Interchange	Safety	Q1	Q2	Q3	Q4	CAP-X	Decision		Screening Decision Justification
<b>Diamond</b>	28	Yes	Yes	No	Yes	1.36 1.73	Yes	Yes	Existing interchange type, included in Stage II
Partial Cloverleaf	20	Yes	Yes	Yes	Yes	0.61 0.58	No	No	Diamond with Loop preferred due to lesser foot print
Displaced Left Turn Interchange	28	Yes	Yes	No	Yes	1.06 1.20	No	No	Inadequate capacity
Contraflow Left Interchange	32	Yes	No	No	Yes	1.01 0.84	No	No	Inadequate capacity
DDI	20	Yes	Yes	Yes	Yes	0.64 0.75	Yes	Yes	Potential alternative, included in Stage II
Single Point	32	Yes	No	Yes	Yes	0.84 0.77	Yes	Yes	Potential alternative, included in Stage II
Single Point with Roundabout	12	No	-	-	-		No	No	Traffic volumes not desirable for roundabouts
<b>Other (Diamond with Loop)</b>	25	Yes	Yes	Yes	Yes	0.85 0.75	Yes	Yes	Potential alternative, included in Stage II

Descriptions of the three (3) interchange options which progressed forward are noted within the sections below.

### 4.1.1.1 DDI Overview<sup>21</sup>

A DDI, as depicted in Figure 17, is a variation of a conventional diamond interchange which uses directional crossover intersections to shift traffic to the opposite side between ramp terminals within the interchange area. Crossing the thru movements to the opposite side replaces left-turn conflicts with same direction merge/diverge traffic and also eliminates exclusive left-turn signal phases to and from the ramps. The DDI concept has several advantages compared to other interchange designs:

- Ability to accommodate varying traffic patterns due to the two-phase signal operations.
- Fewer vehicle-to-vehicle, vehicle-to-pedestrian, and vehicle-to-bike conflict points compared to a traditional diamond interchange.
- Left-turn capacity is higher.
- Ability to provide fewer and shorter signal phases for both motorized and

<sup>21</sup> AASHTO's "A Policy on Geometric Design of Highways and Streets," 7<sup>th</sup> Edition, pp. 10-53 through 10-57

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

nonmotorized movements.

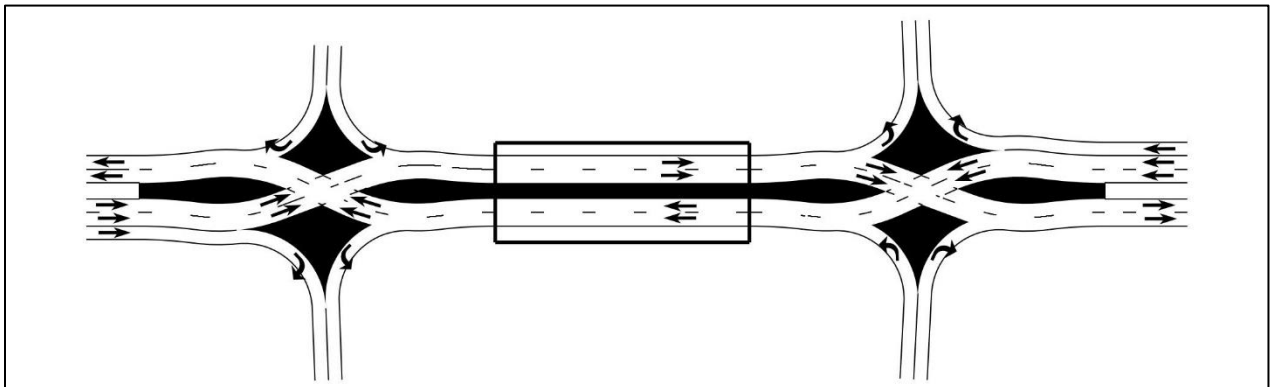
- Crossing distances for pedestrians are shorter and traditionally involve traffic approaching from only one (1) direction at a time.

For the DDI concept, several specific design factors must be considered:

- Proximity of the interchange to adjacent signalized intersections
- Design speed
- Crossover radii
- Lane widths
- Sight distance for crossover intersection and ramps

The primary disadvantage for the DDI concept is its limited ability to accommodate trucks, oversized vehicles, and transit vehicles.

Figure 17. DDI Example



Source: AASHTO's "A Policy on Geometric Design of Highways and Streets," 7<sup>th</sup> Edition

### 4.1.1.2 SPUI Overview<sup>22</sup>

A SPUI, as depicted in Figure 18, is an interchange design which features all four (4) turning movements controlled by a single traffic signal and opposing left turns operate to the left of each other. Traditionally, SPUIs are best suited for areas with tight ROW and provide greater capacity than tight diamond interchanges (TDI). The SPUI concept has several advantages compared to other interchange designs:

- Additional green time allows more vehicles to pass through the intersection allowing for improved travel time at the interchange signal as well as nearby, adjacent traffic signals (if applicable).
- Constructability within areas with limited/tight ROW parameters.
- Vehicles making opposing left turns pass to the left of each other (compared to the right) so their paths do not intersect.
- Right turn movements are traditionally free-flow or yield control only.

<sup>22</sup> AASHTO's "A Policy on Geometric Design of Highways and Streets," 7<sup>th</sup> Edition, pp. 10-48 through 10-52

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

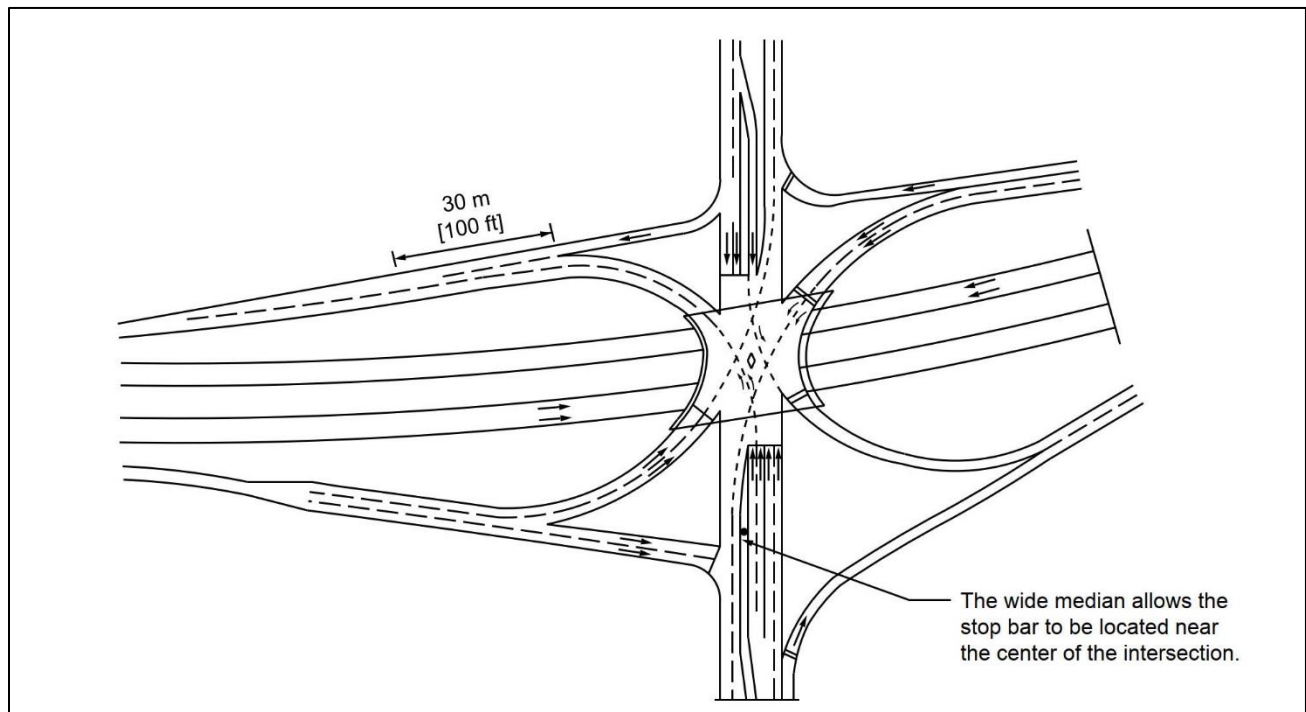
- Curve radii for left-turn movements is significantly flatter, therefore, the movement can occur at higher speeds.

For the SPUI concept, several specific design factors must be considered:

- Single radius left-turn curve
- Stopping sight distance for the left-turn movements

The primary disadvantage for the SPUI concept is the high construction cost of the bridge due to the large structure dimensions and irregular shape.

Figure 18. SPUI Example



Source: AASHTO's "A Policy on Geometric Design of Highways and Streets," 7<sup>th</sup> Edition

### 4.1.1.3 Diamond Interchange with Loop Overview<sup>23</sup>

A diamond interchange with loop is a modified version of a traditional diamond interchange which forms one-way diagonal ramp for all quadrants minus one which utilizes a loop. This option was evaluated due to the site conditions and the ability to accommodate heavy left-turns from I-40/75 westbound to Campbell Station Road southbound. The Diamond Interchange with Loop concept has several advantages compared to other interchange designs:

- Traffic can enter and leave the major route at relatively high speeds
- Traditionally limited ROW is needed

<sup>23</sup> AASHTO's "A Policy on Geometric Design of Highways and Streets," 7<sup>th</sup> Edition, pp. 10-40 through 10-47



## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

The primary disadvantage for the diamond interchange with loop concept is the potential for wrong way movements.


### ***4.1.2 Stage II – Preferred Option Selection Results***

The three (3) options from the Stage I – Scoping stage were further analyzed in the 2<sup>nd</sup> stage. The intent of the form/table is to summarize the results of the evaluation process. As outlined in Figure 19, input values include project cost (from a high-level perspective), traffic operations, and multimodal qualitative assessment. (It should be noted that the Life Cycle Cost and Predictive Crash Analysis sections are optional, therefore, were not included as part of the review.)

The results of the Stage II – Preferred Option Selection process were used to evaluate geometric features and constructability of options which ultimately lead to the development of Build Alternative 1 and Build Alternative 2, which are further detailed in subsequent sections below. The SPUI and diamond with loop options were not further evaluated past the Stage II – Preferred Option Selection process due to existing site restrictions of the area and the potential for wrong-way maneuvers (specifically for the diamond with loop configuration).

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 19. TDOT IIE Stage II - Preferred Option Selection

	<b>Intersection Location:</b>		I-40 at Campbell Station Road in County								
	<b>Number of Intersection Legs:</b>		-	<b>PIN:</b>	0.00				<b>Date:</b>	8/5/21	
	<b>TDOT IIE Stage II Form - Selection</b>				<b>Analyst:</b>	WSP				<b>Version:</b> 09142020	
<b>Existing Control</b>	<b>Option 1</b>		<b>Option 2</b>		<b>Option 3</b>		<b>Option 4</b>				
TDOT IIE Stage II Form - Selection	Diamond		DDI		Single Point		Other (Diamond w Loop)		None		
<b>Project Cost</b>											
Tool Used	Not Applicable		TDOT STID Tool		TDOT STID Tool		TDOT STID Tool		-		
Total Project Cost	Not Applicable		\$40,900,000		\$46,500,000		\$33,800,000		-		
<b>Life Cycle Cost</b>											
Tool Used	-		-		-		-		-		
Analysis Period	2025 to 2045		2025 to 2045		2025 to 2045		2025 to 2045		2025 to 2045		
Total Life Cycle NPV Cost	-		-		-		-		-		
<b>Traffic Operations</b>											
Traffic Analysis Software Used	Synchro		Synchro		Synchro		Synchro		-		
2025 Opening Year	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
LOS	D	E	B	C	C	C	B	B	-	-	
Delay (s/veh)	38.6	64.8	18.6	23.4	23	23.2	12.2	12.9			
v/c	1.03	1.05	0.71	0.81	0.87	0.89	0.84	0.83			
Queues Accommodated?	No	No	Yes	Yes	Yes	Yes	Yes	Yes	-	-	
2045 Design Year	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
LOS	F	F	D	D	D	D	D	C	-	-	
Delay (s/veh)	112.2	141.4	37.7	54	50.2	41.6	39.6	23.1			
v/c	1.42	1.41	0.83	1.04	1.1	1.05	1.01	1			
Queues Accommodated?	No	No	Yes	Yes	Yes	Yes	Yes	Yes	-	-	
<b>Predictive Crash Analysis</b>											
Tool Used	Not Applicable		Not Applicable		Not Applicable		Not Applicable		-		
Analysis Period	2025 to 2045		2025 to 2045		2025 to 2045		2025 to 2045		2025 to 2045		
Total Crashes											
Fatal & Injury Crashes											
<b>Multimodal</b>											
Are peds, bicyclists, and transit riders accommodated?	Not Accommodated		Adequately		Adequately		Adequately		-		

## 4.2 No Build Alternative

The No-Build Alternative assumes that the subject interchange would remain as-is (with the exception of routine maintenance improvements) and mirror the features laid out in Section 2.0 Existing Conditions.

## 4.3 Build Alternative 1 – Diverging Diamond Interchange (DDI) Existing Alignment

Build Alternative 1 maintains the existing alignment of Campbell Station Road with significant geometric improvements to I-40 in order to provide a Diverging Diamond Interchange (DDI). This alternative will require additional right-of-way (ROW) in all quadrants of the interchange along Campbell Station Road. A summary of improvements to the interchange include:

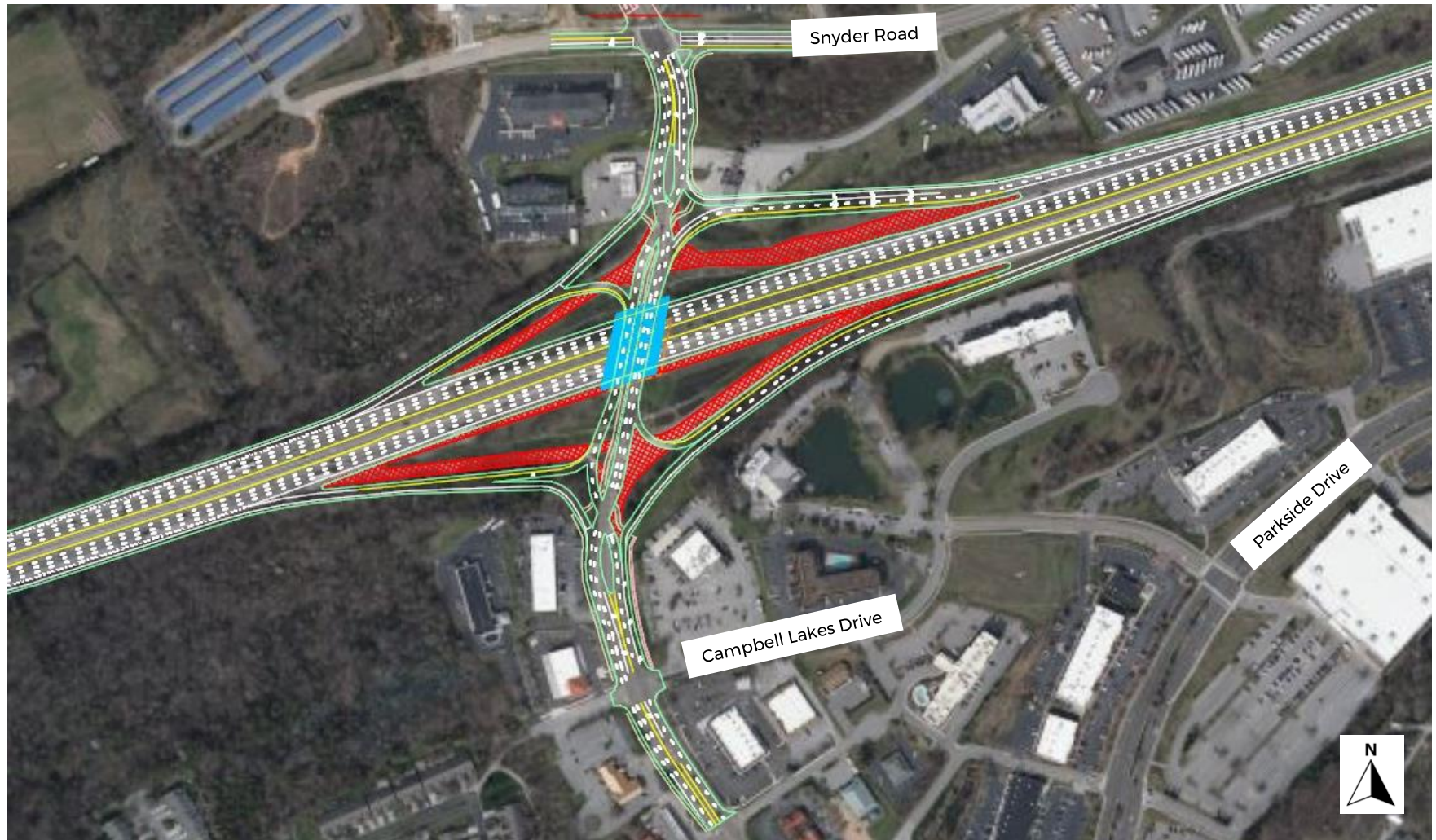
## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

- Maintain existing alignment of Campbell Station Road and raise the grade of I-40/75 to provide standard vertical clearance under the interstate mainlines.
- Add an additional lane in each direction (for a total of 8 lanes) along I-40/75.
  - Shift horizontal alignment of I-40/75 mainlines north for constructability of new structure and maintenance of traffic (MOT).
- Remove existing ramps and provide new ramps for DDI concept. New ramp configurations are as follows:
  - Eastbound off ramp to be a one (1) lane ramp which widens to provide one (1) left turn lane for northbound Campbell Station Road traffic and a single right turn lane for southbound Campbell Station Road traffic.
  - Westbound off ramp to be a two (2) lane ramp which widens to provide double left turn lanes for southbound Campbell Station Road traffic and a single right turn lane for northbound Campbell Station Road traffic.
  - Eastbound on ramp to be a two (2) lane ramp which tapers down to one (1) lane as it merges with I-40/75 eastbound lanes.
  - Westbound on ramp to be a single lane ramp that merges with I-40/75 westbound lanes.
- Add an additional northbound lane, near Campbell Lakes Drive, along Campbell Station Road – for a total of two (2) lanes through the interchange. (A retaining wall is likely needed for this lane addition – on the east side of Campbell Station Road between Campbell Lakes Drive and the eastbound on ramp.) This additional through lane continues through the intersection of Campbell Station Road and Snyder Road and is included and being evaluated as part of a separate study.
- Add an additional southbound lane, at the intersection of Campbell Station Road and Snyder Road, along Campbell Station Road – for a total of three (3) lanes through the interchange. This additional through lane is proposed to drop/merge just south of Campbell Lakes Drive.
- At the intersection of Campbell Station Road and Snyder Road, dual left turn lanes will provide improved operations at the subject signalized intersection.
- Add a ten (10) foot shared use path through the interchange concept to provide connectivity to existing multimodal facilities north and south of the interstate mainlines.

Figure 20 shows the layout for Build Alternative 1. A functional layout of this alternative can be found in Appendix C. Improvements to Campbell Station Road north of Snyder Road are currently being analyzed and evaluated as part of a separate study (as noted in the layout in Appendix C) and considered a separate project (if applicable) that should develop in conjunction with the subject interchange improvements.

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 20. Build Alternative 1 Overview



## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

### 4.4 Build Alternative 2 - Diverging Diamond Interchange (DDI) New Alignment

Build Alternative 2 shifts Campbell Station Road to the west – utilizing existing right-of-way (ROW) – to provide a Diverging Diamond Interchange (DDI). This alternative inverts the interchange to allow Campbell Station Road to go over I-40/75 mainlines while maintaining the existing geometric features of the interstate mainlines. This alternative will require additional right-of-way (ROW) at the northwest and southwest quadrants of the interchange. A summary of improvements to the interchange include:

- Shift existing alignment of Campbell Station Road to the west (approximately 330 feet from existing bridge centerline to proposed new structure centerline).
- Raise the grade of Campbell Station Road to allow the road to go over the interstate mainlines.
  - Tie into existing near Campbell Lakes Drive (to the south of the interchange) and Snyder Road (to the north).
- Remove existing ramps and provide new ramps for DDI concept. New ramp configurations are as follows:
  - Eastbound off ramp to be a one (1) lane ramp which widens to provide one (1) left turn lane for northbound Campbell Station Road traffic and a single right turn lane for southbound Campbell Station Road traffic.
  - Westbound off ramp to be a two (2) lane ramp which widens to provide double left turn lanes for southbound Campbell Station Road traffic and a single right turn lane for northbound Campbell Station Road traffic.
  - Eastbound on ramp to be a two (2) lane ramp which tapers down to one (1) lane as it merges with I-40/75 eastbound lanes.
  - Westbound on ramp to be a single lane ramp that merges with I-40/75 westbound lanes.
- Provide two (2) new northbound through lanes. (A retaining wall is likely needed for this lane addition – on the east side of Campbell Station Road between Campbell Lakes Drive and the eastbound on ramp.) These new lanes continue through the intersection of Campbell Station Road and Snyder Road and is included and being evaluated as part of a separate study.
- Provide three (3) southbound lanes. These new lanes start at the intersection of Campbell Station Road and Snyder Road and tie into existing just south of Campbell Lakes Drive.
- Add a ten (10) foot shared use path through the interchange concept to provide connectivity to existing multimodal facilities north and south of the interstate mainlines.
- Cul-de-sac existing Campbell Station Road north of the existing interchange.

Figure 21 shows the layout for Build Alternative 2. A functional layout of this alternative can be found in Appendix C. Improvements to Campbell Station Road north of Snyder Road are currently being analyzed and evaluated as part of a separate study (as noted in the layout in Appendix C) and considered a separate

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

project (if applicable) that should develop in conjunction with the subject interchange improvements.

# Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 21. Build Alternative 2 Overview



## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

### **4.5 Interstate Improvements**

As outlined in Table 4, there are multiple planned and proposed roadway projects within and near the study area. For purposes of the subject study and applicable study area, these alternatives are as follows:

- Widen I-40/75 from six (6) to eight (8) lanes from the I-40/75 junction to Lovell Road (SR-131).
- Add an auxiliary lane (in each direction) along I-40/75 from Campbell Station Road to Lovell Road (SR-131).

In addition, the existing truck weigh stations along I-40/75 within the study area are recommended to be removed/relocated, and the future analysis (i.e. 2045) reflects this recommendation.

Functional layouts of these improvements are included in Appendix C.



## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

### **5.0 Traffic Analysis**

Traffic analysis was performed for both the No Build and Build Alternatives. Furthermore, analysis was performed for both AM and PM peak hour conditions for years 2025 and 2045 for both the Build Alternatives. 2025 is considered the “opening year” and represents the year the project is expected to be open to traffic for use. 2045 is considered the “design year” or “future year” and represents the year for which the project is designed for.

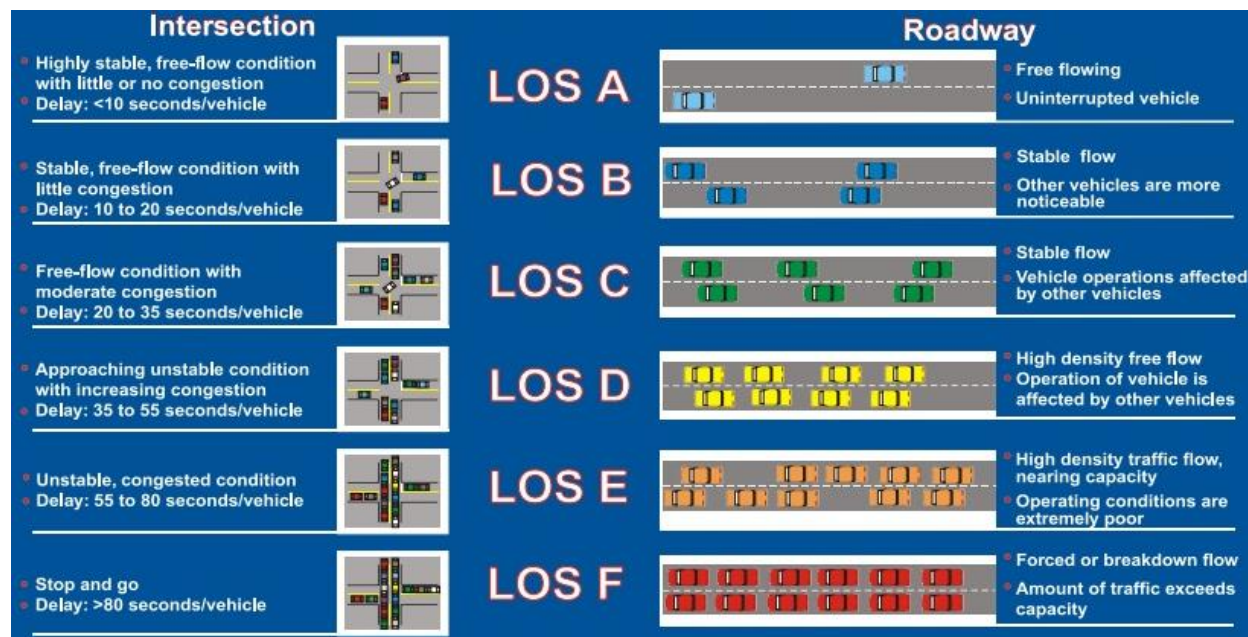
As outlined in Section 4.0 Conceptual Alternatives, there are two (2) build alternatives which both include the DDI concept. Build Alternative 1 maintains the existing alignment of Campbell Station Road; whereas, Build Alternative 2 shifts the interchange to the west to allow Campbell Station Road to go over I-40/75 mainlines. Both design options would function the same operationally; therefore, one (1) build analysis was performed for these two (2) alternatives.

#### **5.1 Level of Service (LOS) Concept**

Level of service (LOS) is a qualitative measure that characterizes the operational conditions within a traffic stream and the perception of traffic service by motorists and passengers. The Highway Capacity Manual (HCM), 6<sup>th</sup> Edition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The LOS takes qualitative values such as congestion and substandard geometry and transforms them into quantitative values such as operating speeds, flow densities, and vehicular delay. The HCM characterizes LOS A (best) to LOS F (worst) where level A represents ideal, low-volume traffic operations and level F represents over-saturated, high-volume traffic operations. Figure 22 provides a visual of LOS as it relates to intersections and freeway segments.

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 22. LOS Description<sup>24</sup>



LOS for freeway facilities is determined based on vehicular density of a freeway segment, merge/diverge area, or weaving section; whereas for intersections, it is determined based on average delay per vehicle. Table 5 provides a general description of the various LOS categories and delay ranges for freeways and signalized and unsignalized intersections. Six (6) levels are used, ranging from A to F.

Table 5. Level of Service Criteria<sup>25</sup>

LOS	Freeway (Density in pc/mi/in)			Intersection (Delay per Vehicle in seconds)	
	Basic Freeway	Weaving Area	Merge/Diverge Area	Signal Control	Stop-Control
A	0-11.0	0-10.0	0-10.0	0-10.0	0-10.0
B	>11.0-18.0	>10.0-20.0	>10.0-20.0	>10.0-20.0	>10.0-15.0
C	>18.0-26.0	>20.0-28.0	>20.0-28.0	>20.0-35.0	>15.0-25.0
D	>26.0-35.0	>28.0-35.0	>28.0-35.0	>35.0-55.0	>25.0-35.0
E	>35.0-45.0	>35.0-43.0	>35.0	>55.0-80.0	>35.0-50.0
F	>45.0 OR demand exceeds capacity	>43.0 OR demand exceeds capacity	Demand exceeds capacity	>80.0	>50.0

<sup>24</sup> MDOT Online Policy Manual, [https://policymanual.mdot.maryland.gov/mediawiki/index.php?title=Roadways:\\_Facility\\_Selection](https://policymanual.mdot.maryland.gov/mediawiki/index.php?title=Roadways:_Facility_Selection)

<sup>25</sup> Highway Capacity Manual, 6<sup>th</sup> Edition

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

All freeway analyses, such as ramp merges and diverges, were analyzed using the Highway Capacity Software (HCS7) Freeway Facilities module for AM and PM peak period results. Freeway Facilities integrates individual segment analyses into a corridor analysis to study potential multi-segment operational issues.

For intersections, the AM and PM peak period results are based on the LOS and delay procedures in the HCM and Synchro software was used to perform the analysis.

### ***5.1.1 Freeway Analysis Methodology***

The initial procedure for freeway analysis input into the HCS7 Freeway Facilities module involved the segmentation of existing and the proposed freeway facility. The corridor was segmented into the following categories – basic freeway segments, merge areas, diverge areas, and weaving sections.

For a basic freeway segments, the following inputs and typical values were used in the analysis:

- Peak hour traffic volumes and heavy percent were obtained from traffic forecasting/development by TDOT.
- Number of lanes were based on existing and proposed future geometry. The existing geometry was modeled based on the latest available aerial imagery.
- Terrain type was assumed to be “Rolling” for this area per the design criteria.
- Base free flow speed was assumed to be 5 mph greater than the posted speed limits.
- Lane width were set to 12 feet.
- Right shoulder lateral clearance was set to 10 feet.
- Segment lengths were determined by aerial photography or functional designs between upstream/downstream merge/diverge points.
- The analysis includes four 15-minute time periods for both the AM and PM peak hours with traffic demand adjusted using factors of 1.0, 1.12, 1.0, and 0.88 to replicate a peak hour factor (PHF) of 0.90.
- The traffic volumes at the truck weigh stations were estimated using the origin-destination data collected in 2019.

The freeway facilities inputs for merge, diverge and weaving segments involve the same inputs as a basic segment, but with some additional parameters including:

- Acceleration/deceleration lane lengths were determined from aerial photography.
- Free flow speeds on ramps were set 50 mph for diamond on/off ramps and 30 mph for loop ramps.

### ***5.1.2 Intersection Analysis Methodology***

The capacity for the signalized and unsignalized ramp terminal intersections in the study area is performed using Synchro, Version 10. The traffic analysis was completed in accordance with the Tennessee Department of Transportation (TDOT) Traffic Design Manual. The existing roadway network was modeled in Synchro to contain existing lane

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

configuration and traffic control. Existing signal timings and phasing were obtained from local entities.

The traffic volumes for the AM and PM peak hours were entered into Synchro for each analysis scenario. Synchro was used to obtain the optimized signal timings for the peak period traffic conditions in each scenario. The following additional details are included in the analysis:

- PHF was set to 0.90 for all intersections
- Cycle length ranges: 60 to 90 seconds for 2-phases, 70 to 120 seconds for 3-phases, 80-150 seconds for 4 or more phases. If the traffic signal is located within a coordinated traffic signal system, then the actual coordinated cycle length was used.
- Yellow and red times were set per existing signal plans for all scenarios.
- Yellow time, all-red time, and lost time adjustment will be set to 5.0, 2.0, and -2.0 seconds, respectively, when the lane configuration at an intersection is to be altered.
- Lost time adjustment was set to include a total lost time of 5.0 seconds per signal phase.

### **5.2 2025 No-Build Alternative**

#### Freeway Analysis

The 2025 AM and PM peak hour traffic volumes and existing lane geometrics were inputted into the HCS7 Freeway Facilities software module. Based on the freeway analysis, fourteen (14) of the fifteen (15) segments in the eastbound direction are projected to operate at LOS F in the AM peak hour. In the PM peak, three (3) of the fifteen (15) segments are projected to operate at LOS E. In the westbound direction, six (6) of the seventeen (17) segments are projected to operate at LOS E or LOS F in the AM peak hour. Sixteen (16) of the seventeen (17) segments are projected to operate at LOS F in the PM peak hour.

#### Intersection Capacity Analysis

The intersection of Campbell Station Road and Snyder Road is projected to operate at an overall LOS D in both the AM and PM peak hours. The eastbound and westbound Snyder Road approaches are projected to operate at LOS E and F, respectively, during both the AM and PM peak hours.

With the 2025 No Build Alternative, the I-40/75 westbound ramps and Campbell Station Road intersection is projected to operate at an overall LOS D in the AM peak and LOS E in the PM peak. The northbound Campbell Station Road approach is projected to operate at LOS F in the PM peak period.

The I-40/75 eastbound ramps and Campbell Station Road intersection is projected to operate at an overall LOS C in the AM peak and LOS D in the PM peak. The eastbound I-40/75 off ramp approach is projected to operate at LOS F in both the AM and PM peak

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

hours. The unsignalized Campbell Lakes Drive approach is projected to operate at LOS F in both the AM and PM peak hours.

### 5.3 2045 No-Build Alternative

#### Freeway Analysis

The 2045 AM and PM peak hour traffic volumes and existing lane geometrics were inputted into the HCS7 Freeway Facilities software module. Based on the freeway analysis, all fifteen (15) segments in the eastbound direction are projected to operate at either LOS E or F in the AM peak hour. Fourteen (14) of the fifteen (15) segments are projected to operate at LOS F in the PM peak hour. In the westbound direction, fifteen (15) of the seventeen (17) segments are projected to operate at LOS F in the AM peak hour. All seventeen (17) segments are projected to operate at LOS F in the PM peak hour.

#### Intersection Capacity Analysis

Under the 2045 No-Build conditions, all the signalized intersections along Campbell Station Road are projected to operate at an overall LOS F in both the AM and PM peak hours except for one (1): the Grigsby Chapel Road/Parkside Drive and Campbell Station Road intersection is projected to operate at LOS D in the AM peak and LOS E in the PM peak. The unsignalized Campbell Lakes Drive approach is projected to operate at LOS F in both the AM and PM peak hours.

Table 6 summarizes the LOS results for intersections within the study area for 2025 and 2045 No-Build Conditions.

*Table 6. No-Build Alternative Capacity Analysis Summary*

Intersection	2025 LOS AM/PM	2045 LOS AM/PM
<b>Snyder Road</b>		
Northbound Approach	B/C	F/F
Southbound Approach	B/B	D/C
Eastbound Approach	E/E	F/F
Westbound Approach	F/F	F/F
<u>Overall Intersection LOS</u>	<u>D/D</u>	<u>E/E</u>
<b>I-40/75 Westbound Ramps</b>		
Northbound Approach	B/F	E/F
Southbound Approach	D/D	F/F
Westbound Approach	D/D	F/F
<u>Overall Intersection LOS</u>	<u>D/E</u>	<u>F/E</u>
<b>I-40/75 Eastbound Ramps</b>		
Northbound Approach	C/D	F/F
Southbound Approach	C/B	F/F
Eastbound Approach	F/F	F/F
<u>Overall Intersection LOS</u>	<u>C/D</u>	<u>F/E</u>

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Intersection	2025 LOS AM/PM	2045 LOS AM/PM
<b>Campbell Lakes Drive</b>		
Worst Approach LOS	F/F	F/F
<b>Grigsby Chapel Road/Parkside Drive</b>		
Northbound Approach	D/E	D/E
Southbound Approach	C/E	D/E
Eastbound Approach	F/E	F/F
Westbound Approach	D/D	E/F
Overall Intersection LOS	D/E	E/E

Freeway segments and merge/diverge segments were analyzed along I-40/75 between the I-40/75 system interchange and Lovell Road (SR-131), which encompasses the existing truck weigh stations and Campbell Station Road ramps. Figure 23 outlines the resultant LOS and demand to capacity (d/c) ratios for the No-Build Alternative.

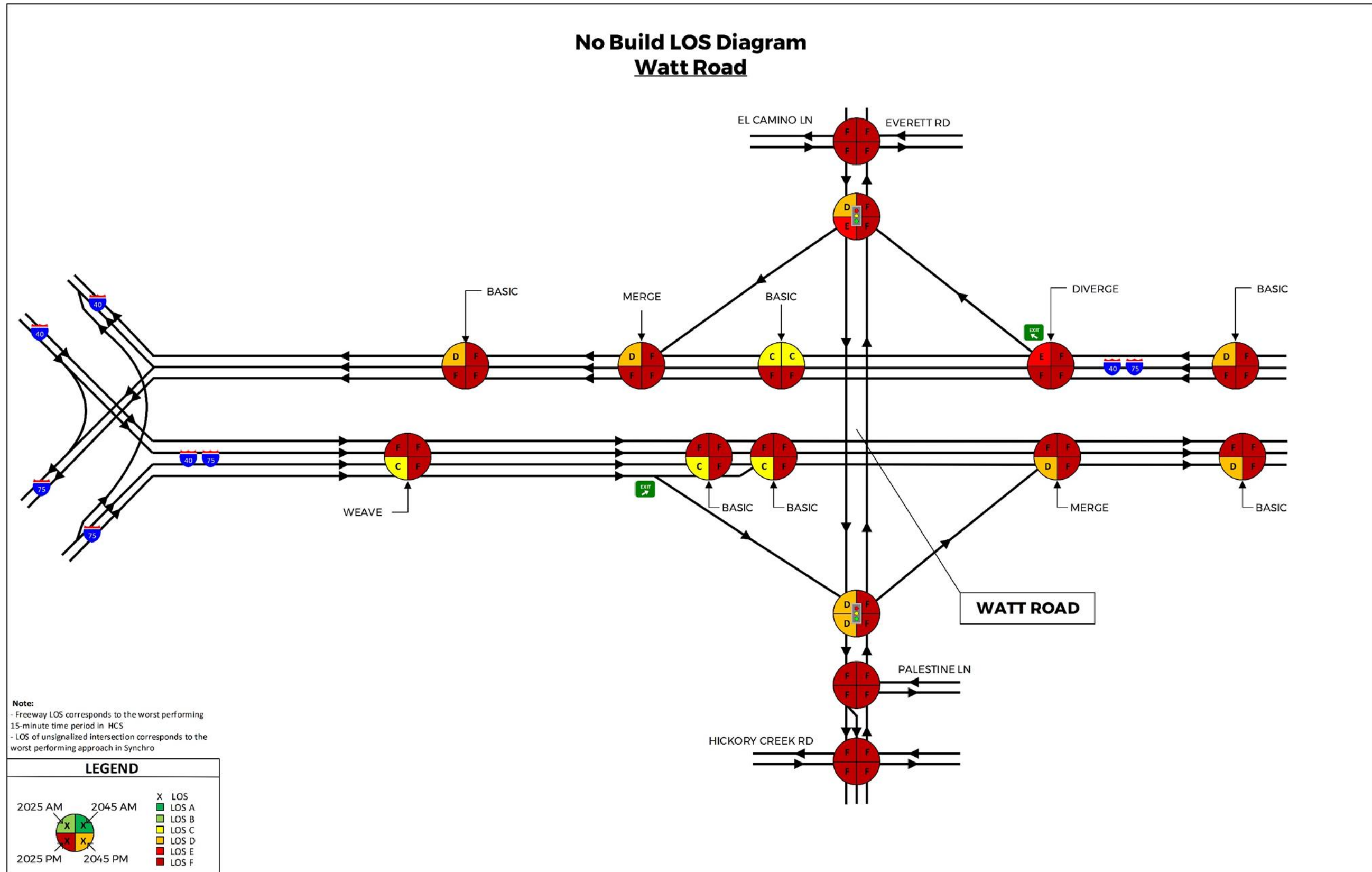
Figure 23. Segment LOS and Demand-Capacity Ratios for No-Build Alternative

		Basic		Diverge		Basic		Merge		Basic		Diverge		Basic		Merge		Basic	
2025	AM	d/c	0.52	0.78	0.84	0.78	0.74	0.81	0.87	0.81	0.83	0.80	0.89	0.80	0.84	0.91	103	101	0.96
		PM <td>LOS</td> <td>B</td> <td>E</td> <td>D</td> <td>D</td> <td>C</td> <td>E</td> <td>D</td> <td>D</td> <td>C</td> <td>D</td> <td>D</td> <td>D</td> <td>D</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td>	LOS	B	E	D	D	C	E	D	D	C	D	D	D	D	F	F	F
2045	AM	d/c	0.78	0.87	1.25	0.87	1.17	0.88	1.31	0.88	1.26	0.84	1.33	0.84	1.27	0.91	1.50	1.47	1.36
	PM <td>LOS</td> <td>C</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td>	LOS	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2025	AM	d/c	0.68	0.86	1.09	0.86	0.9	0.88	1.17	0.88	1.11	0.83	1.19	0.83	1.12	0.91	1.35	1.33	1.26
	PM <td>LOS</td> <td>C</td> <td>F</td> <td>F</td> <td>F</td> <td>C</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td>	LOS	C	F	F	F	C	F	F	F	F	F	F	F	F	F	F	F	F
2045	AM	d/c	1.01	0.98	1.62	0.98	1.45	0.96	1.75	0.96	1.69	0.88	1.77	0.88	1.69	0.91	1.97	1.92	1.79
	PM <td>LOS</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td>	LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
		Basic		Weave		Basic		Merge		Basic		Diverge		Basic		Merge		Basic	
2025	AM	d/c	0.76	1.43	1.06	1.25	1.23	1.21	1.19	1.26	1.25	1.23	1.19	1.35	1.47	0.91	1.32		
	PM <td>LOS</td> <td>D</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td>	LOS	D	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2045	AM	d/c	0.44	0.99	0.7	0.84	0.83	0.82	0.81	0.85	0.85	0.83	0.77	0.89	0.97	0.95	0.88		
	PM <td>LOS</td> <td>B</td> <td>C</td> <td>C</td> <td>D</td> <td>D</td> <td>D</td> <td>D</td> <td>C</td> <td>D</td> <td>D</td> <td>D</td> <td>D</td> <td>E</td> <td>E</td> <td>E</td> <td>E</td>	LOS	B	C	C	D	D	D	D	C	D	D	D	D	E	E	E	E	
2025	AM	d/c	0.97	1.81	1.15	1.43	1.41	1.39	1.36	1.45	1.43	1.41	1.34	1.52	1.67	0.91	1.47		
	PM <td>LOS</td> <td>E</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td>	LOS	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
2045	AM	d/c	0.71	1.27	0.88	0.83	1.14	1.12	1.1	1.16	1.16	1.14	1.04	1.19	1.3	0.91	1.17		
	PM <td>LOS</td> <td>C</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td> <td>F</td>	LOS	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	

Figure 24 and Figure 25 on the following pages summarize the No-Build LOS conditions for the study area - including freeway and intersection capacity analysis results.

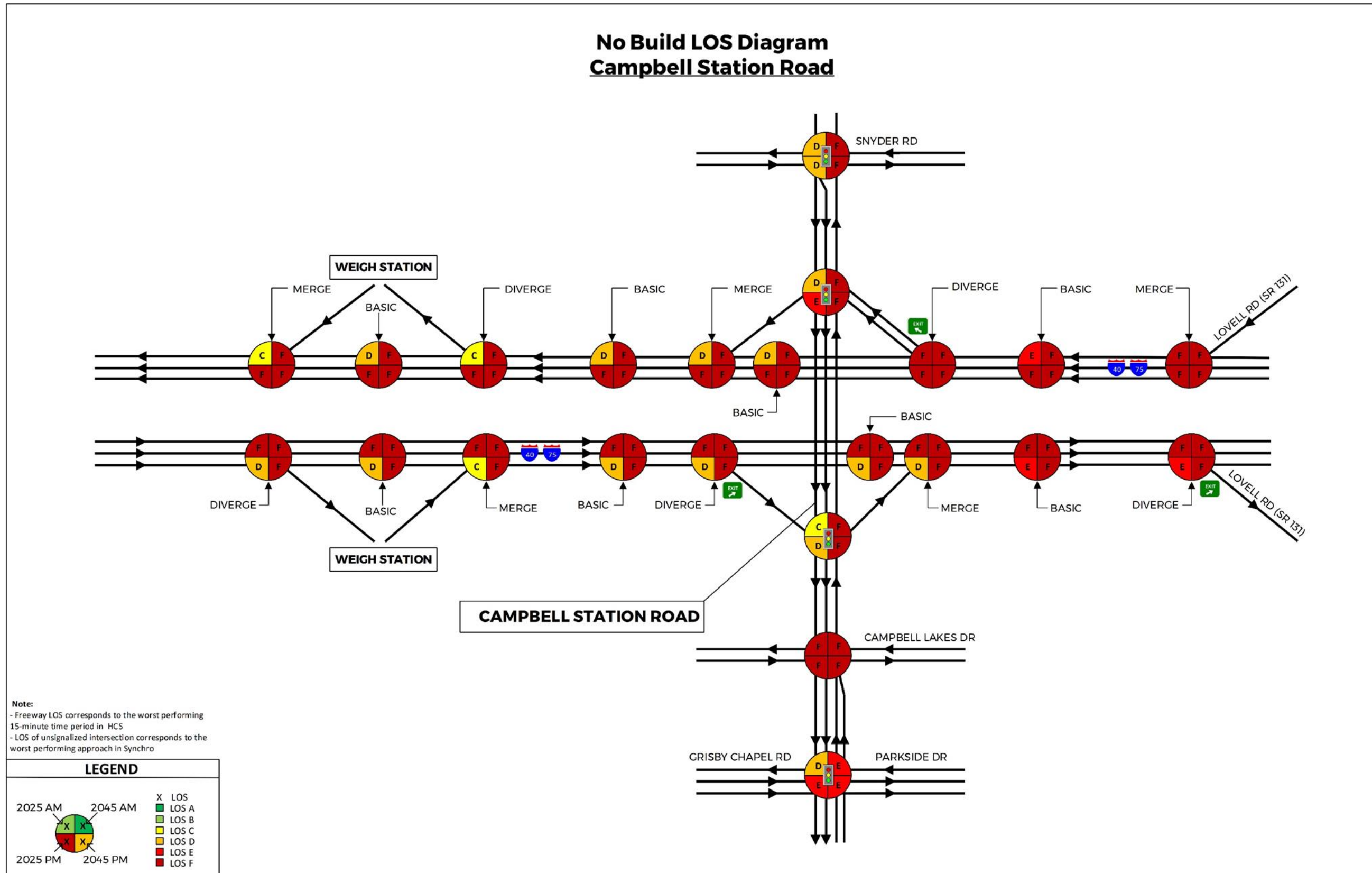
**Interchange Improvements at Campbell Station Road (Exit 373)  
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Figure 24. No-Build LOS Summary for Study Area



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Figure 25. No-Build LOS Summary for Study Area (cont.)





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### **5.4 2025 Build Alternatives 1 & 2**

The 2025 Build Alternative analysis was performed using the 2025 AM and PM peak hour volumes obtained from the traffic forecasting developed and provided by TDOT and assumes a DDI at the I-40/75 and Campbell Station Road interchange. Similar to the No Build Alternative, the build alternatives assume that the planned projects listed in Section 3.1 Planned Projects will be constructed. The following roadway improvements are assumed in the build alternatives:

- Widening of I-40/75 mainlines from six (6) to eight (8) lanes
- Addition of one (1) auxiliary lane in each direction on I-40/75 between Campbell Station Road and Lovell Road

#### Freeway Analysis

The 2025 AM and PM peak hour traffic volumes and future lane geometrics were inputted into the HCS7 Freeway Facilities software module. Based on the freeway analysis, eleven (11) of the seventeen (17) segments in the eastbound direction are projected to operate at either LOS E or F in the AM peak hour. All seventeen (17) segments are projected to operate at LOS C or better in the PM peak. In the westbound direction, all segments are projected to operate at LOS D or better in the AM peak hour. In the PM peak, eight (8) of the seventeen (17) segments are projected to operate at LOS E or F.

#### Intersection Capacity Analysis

All the signalized intersections along Campbell Station Road are projected to operate at LOS D or better in both the AM and PM peak hours. The unsignalized Campbell Lakes Drive approach is projected to operate at LOS F in both the AM and PM peak hours.

### **5.5 2045 Build Alternatives 1 & 2**

The 2045 Build Alternative analysis was performed using the 2045 AM and PM peak hour volumes obtained from the traffic forecasting developed and provided by TDOT and assumes a DDI at the I-40/75 and Campbell Station Road interchange. Similar to the No Build Alternative, the build alternatives assume that the planned projects listed Section 3.1 Planned Projects will be constructed. The following roadway improvements are assumed in the build alternatives:

- Widening of I-40/75 mainlines from six (6) to eight (8) lanes
- Addition of one (1) auxiliary lane in each direction on I-40/75 between Campbell Station Road and Lovell Road
- Relocation of the truck weigh station between the Watt Road and Campbell Station Road interchanges

#### Freeway Analysis

The 2045 AM and PM peak hour traffic volumes and future lane geometrics were inputted into the HCS7 Freeway Facilities software module. Based on the freeway analysis, all the fifteen (15) segments in the eastbound direction are projected to operate at either LOS E or F in the AM peak hour. Two (2) of the fifteen (15) segments is projected

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

to operate at LOS E in the PM peak. In the westbound direction, six (6) of the fifteen (15) segments are projected to operate at either LOS E or F in the AM peak hour. In the PM peak, all the fifteen (15) segments are projected to operate at LOS F.

### Intersection Capacity Analysis

All the signalized intersections along Campbell Station Road are projected to operate at an overall LOS D or better in both the AM and PM peak hours except for one. The Grigsby Chapel Road/Parkside Drive and Campbell Station Road intersection is projected to operate at LOS D in the AM peak and LOS E in the PM peak. The unsignalized Campbell Lakes Drive approach is projected to operate at LOS F in both the AM and PM peak hours.

Table 7 summarizes the LOS results for intersections within the study area across the 2025 and 2045 Build Conditions. Furthermore, Figure 26 depicts these results in relation to the freeway analysis results near the subject interchange.

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Table 7. Build Alternative Capacity Analysis Summary

Intersection	2025 LOS AM/PM	2025 Delay AM/PM	2025 95th Percentile Queue* (feet) AM/PM	2045 LOS AM/PM	2045 Delay AM/PM	2045 95th Percentile Queue* (feet) AM/PM
<b>Snyder Road</b>						
Northbound Approach	A/A	5.9/6.7	363/87	B/B	11.0/14.7	#532/347
Southbound Approach	B/B	11.8/10.2	187/150	C/B	20.4/19.2	361/313
Eastbound Approach	D/D	39.9/39.3	27/18	D/D	41.8/49.8	36/22
Westbound Approach	C/C	32.6/32.7	169/196	C/D	28.3/37.9	273/391
<u>Overall Intersection LOS</u>	<u>B/B</u>	<u>15.1/15.6</u>	-	<u>B/C</u>	<u>18.9/23.0</u>	-
<b>I-40/75 Westbound Ramps</b>						
Northbound Approach	A/B	3.2/19.5	36/241	B/A	10.8/4.1	101/47
Southbound Approach	C/C	23.6/23.5	169/137	C/C	24.0/31.1	265/326
Westbound Approach	B/B	13.8/12.7	247/302	C/C	20.6/21.6	337/531
<u>Overall Intersection LOS (Crossover)</u>	<u>B/C</u>	<u>15.4/21.6</u>	-	<u>B/B</u>	<u>18.7/18.1</u>	-
<u>Overall Intersection LOS (Left Turn)</u>	<u>A/A</u>	<u>6.7/7.6</u>	-	<u>A/B</u>	<u>9.0/11.9</u>	-
<b>I-40/75 Eastbound Ramps</b>						
Northbound Approach	C/C	30.6/31.4	241/345	C/E	30.7/67.4	351/#711
Southbound Approach	B/B	13.3/14.3	270/345	C/D	20.4/45.6	384/#820
Eastbound Approach	B/B	10.2/12.0	77/73	B/B	13.8/15.6	132/136
<u>Overall Intersection LOS (Crossover)</u>	<u>B/B</u>	<u>18.8/20.0</u>	-	<u>C/D</u>	<u>23.9/53.2</u>	-
<u>Overall Intersection LOS (Left Turn)</u>	<u>A/A</u>	<u>1.8/1.6</u>	-	<u>A/A</u>	<u>2.8/3.9</u>	-
<b>Campbell Lakes Drive</b>						

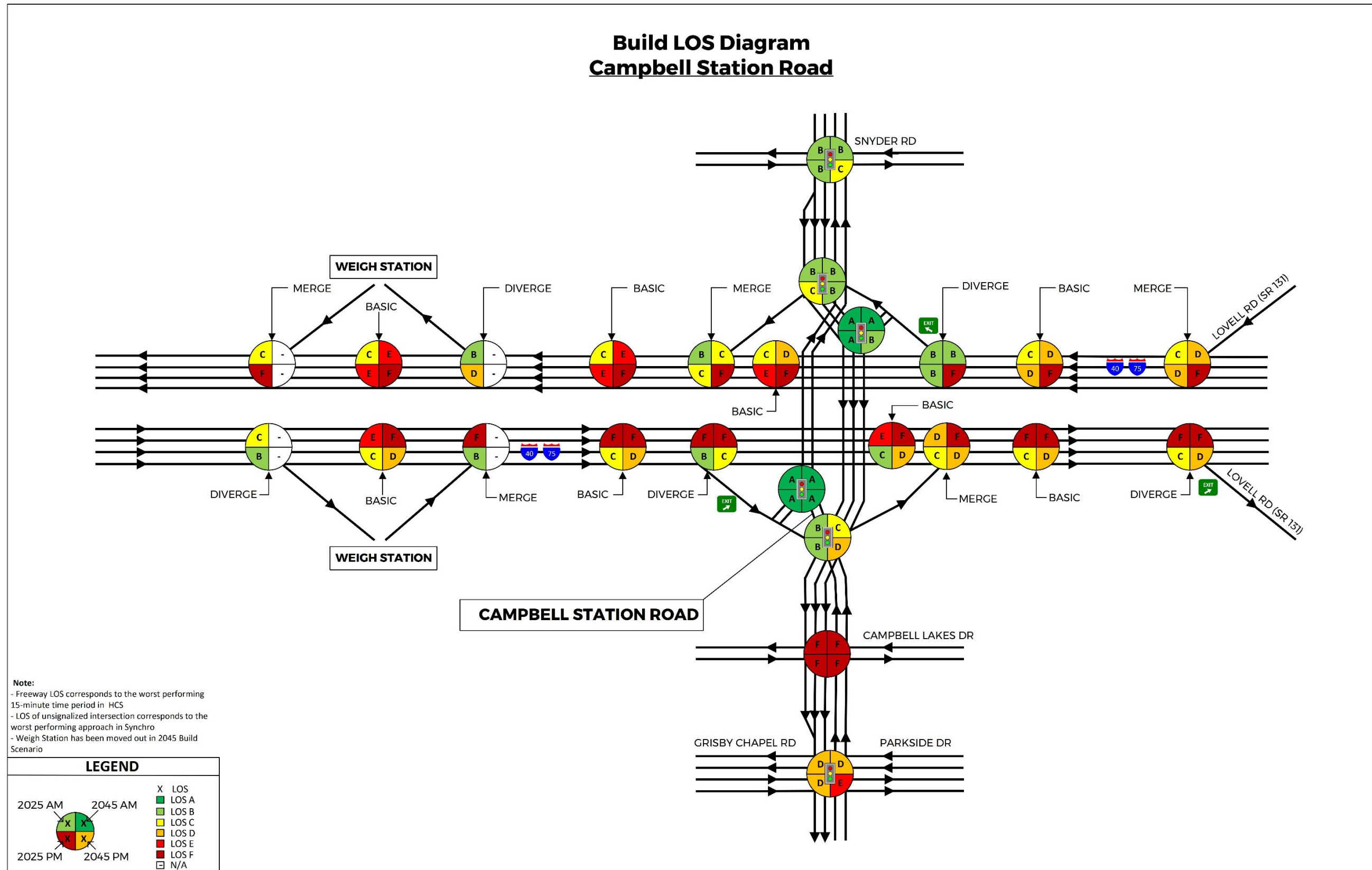
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Intersection	2025 LOS AM/PM	2025 Delay AM/PM	2025 95th Percentile Queue* (feet) AM/PM	2045 LOS AM/PM	2045 Delay AM/PM	2045 95th Percentile Queue* (feet) AM/PM
<u>Overall Intersection LOS</u>	F/F	\$2167.7/\$3712.2	55/75	F/F	\$3449.5/\$10694.1	92.5/130
<b>Grigsby Chapel Road/Parkside Drive</b>						
Northbound Approach	D/D	40.4/46.9	484/595	D/E	53.7/66.8	#757/#856
Southbound Approach	D/D	35.5/45.5	374/706	D/E	43.7/69.8	534/#1024
Eastbound Approach	D/E	41.6/66.6	437/#375	E/F	62.0/80.7	#695/#527
Westbound Approach	D/E	46.4/57.4	81/#422	D/E	54.7/70.2	108/#576
<u>Overall Intersection LOS</u>	<u>D/D</u>	<u>39.5/51.8</u>	-	<u>D/E</u>	<u>52.8/70.7</u>	-

\*Longest 95th Percentile Queues for the approach are reported  
 m - Volume for 95th Percentile queue is metered by upstream signal  
 # - 95th percentile volume exceeds capacity, queue may be longer  
 \$ - Delay exceeds 300 s

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Figure 26. Build Alternative 1 & 2 LOS Summary for Study Area



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Figure 27 outlines freeway segment LOS along I-40/75 from the I-40/75 system interchange to Lovell Road (SR-131) for both 2025 and 2045 under Build Alternative 1 and Build Alternative 2 conditions.

Figure 27. Segment LOS and Demand-Capacity Ratios for Build Alternatives\*

WB																				
		Basic		Diverge		Basic		Merge		Basic		Diverge		Basic		Merge		Basic		
2025	AM	d/c	0.52	0.62	0.63	0.62	0.56	0.64	0.66	0.70	0.62	0.65	0.66	0.65	0.63	0.60	0.62	0.61	0.72	
		LOS	C	C	C	B	C	B	C	C	C	B	C	B	C	B	C	C	D	
		v/c	0.78	0.91	0.94	0.91	0.88	0.96	0.98	0.96	0.95	0.96	1.00	0.96	0.95	0.86	0.90	0.86	1.02	
	PM	LOS	D	F	E	C	D	D	E	F	E	D	E	C	E	B	D	D	F	
		v/c	0.68	0.81	0.82	0.81	0.67	0.88	0.89	-	0.89	-	0.89	0.88	0.84	0.88	0.79	0.81	0.79	0.94
		LOS	F	F	F	F	F	F	F	-	F	-	F	F	F	F	F	F	F	
2045	AM	v/c	1.01	0.92	1.22	0.92	1.08	0.96	1.33	-	1.33	-	1.33	0.96	1.26	0.83	1.18	0.83	1.34	
		LOS	C	F	D	C	C	F	E	-	E	-	E	C	D	B	D	D	E	
		LOS	F	F	F	F	F	F	F	-	F	-	F	F	F	F	F	F	F	F
	PM	v/c	1.01	0.92	1.22	0.92	1.08	0.96	1.33	-	1.33	-	1.33	0.96	1.26	0.83	1.18	0.83	1.34	
		LOS	F	F	F	F	F	F	F	-	F	-	F	F	F	F	F	F	F	F
		LOS	F	F	F	F	F	F	F	-	F	-	F	F	F	F	F	F	F	F
EB																				
EB		Basic		Merge		Basic		Diverge		Basic		Merge		Basic		Diverge		Basic		
		d/c	0.76	0.82	0.93	0.82	0.89	0.92	1.01	0.92	0.98	0.93	1.03	0.93	0.99	0.86	0.95	0.93	1.08	
2025	AM	LOS	D	F	D	C	D	F	F	C	E	F	F	F	E	D	F	F	F	
		d/c	0.44	0.54	0.61	0.60	0.53	0.63	0.62	0.62	0.61	0.64	0.63	0.62	0.57	0.53	0.58	0.57	0.66	
		LOS	B	C	C	B	C	B	C	B	C	B	C	B	C	C	C	C	C	C
	PM	d/c	0.97	0.87	1.05	0.87	0.95	0.91	1.14	-	1.14	-	1.14	1.14	1.09	0.98	1.09	1.07	1.22	
		LOS	E	F	F	F	F	F	F	-	F	-	F	F	F	F	F	F	F	F
		LOS	F	F	F	F	F	F	F	-	F	-	F	F	F	F	F	F	F	F
2045	PM	d/c	0.71	0.76	0.86	0.76	0.70	0.84	0.90	-	0.90	-	0.90	0.84	0.83	0.76	0.81	0.76	0.92	
		LOS	C	E	D	C	C	D	D	-	D	-	D	C	D	D	D	D	E	
		LOS	C	E	D	C	C	D	D	-	D	-	D	C	D	D	D	D	E	

\*Freeway analysis is the same for the two build alternatives.

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### 6.0 Constructability & Cost Estimates

A multi-phase construction is proposed for both alternatives in order to maintain functionality of I-40/75 and Campbell Station Road during the construction phase. The following options lay out potential means of constructing each alternative. In addition, preliminary estimated construction costs for each alternative are outlined below. TDOT's most current Strategic Transportation Investments Division (STID) tool was utilized to develop these costs. See Appendix D for detailed cost calculations.

#### 6.1 Build Alternative 1

Build Alternative 1 requires raising the grade of the interstate mainlines in order to provide standard vertical clearance under I-40/75. This major geometric modification would require interstate improvements first and/or in tandem with the DDI concept implementation. The following general phases could be implemented for building out Build Alternative 1:

##### Phase 1

- Shift I-40/75 eastbound and westbound traffic south to allow construction of the north side (i.e. westbound lanes) of new structure to be built on I-40/75.
  - Structure to be built to accommodate potential further widening of interstate mainlines (i.e. 10 lanes total).
- Construct additional westbound lane on I-40/75.

##### Phase 2

- Once Phase 1 is complete, shift all traffic to new structure to allow construction of southside of I-40/75 bridge (i.e. eastbound lanes).
- Construct additional eastbound lane on I-40/75.

##### Phase 3

- Construct majority of all four (4) proposed interstate ramps to Campbell Station Road.
- Construct new Campbell Station Road northbound lanes at interchange.
- Construct new lane addition(s) south of interchange - including shared use path.
- Construct retaining wall(s).

##### Phase 4

- Potentially shift traffic to new northbound lanes at interchange to improve existing Campbell Station Road which will be retrofitted to 3 southbound lanes.
- Construct new lane addition(s) north of interchange - including shared use path.
- Finalize ramp ties and improvements.
- Scarify and abandon old, existing pavement.
- Final surface pavement and striping.

The total projected cost for Build Alternative 1 is \$58,800,000. Table 8 further breaks down this overall cost into specific construction components.

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Table 8. Build Alternative #1 Projected Cost Estimate

Improvements Description	Build Alternative #1
Remove existing bridge and replace with bridge to accommodate future interstate widening (i.e. 10 lanes total) and DDI concept on Campbell Station Road. Raise the grade of I-40/75 to provide standard vertical clearance and add additional lane in each direction within limits of interchange (for a total of 8 lanes) – including applicable deceleration and acceleration lanes.	\$34,300,000
Widening improvements to Campbell Station Road from Snyder Road to just south of Campbell Lakes Drive to accommodate DDI concept, construction of a retaining wall in the southeast quadrant, signalization associated with DDI, construction of new ramps and removal of old, right-of-way, and utilities.	\$24,500,000
<b>Total Projected Cost (2021)</b>	<b>\$58,800,000</b>

Figure 28<sup>26</sup> and Figure 29 outline the total cost for these improvements, broken down into preliminary engineering, ROW, utilities, and construction phases, as well as inflated estimates for the opening and future years – utilizing a 5% inflation factor.

Figure 28. Build Alternative 1 Interstate Improvements Total Cost and Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Widen	\$ 2,470,000	\$ -	\$ -	\$ 31,800,000	\$ 34,300,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 2,860,000	\$ -	\$ -	\$ 36,800,000	\$ 39,700,000	
23	2045	\$ 7,590,000	\$ -	\$ -	\$ 97,700,000	\$ 105,000,000	

Figure 29. Build Alternative 1 Campbell Station Road Improvements Total Cost and Inflated Costs

PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Modify Interchange	\$ 1,600,000	\$ 1,120,000	\$ 2,800,000	\$ 19,000,000	\$ 24,500,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 1,850,000	\$ 1,300,000	\$ 3,240,000	\$ 22,000,000	\$ 28,400,000	
23	2045	\$ 4,910,000	\$ 3,440,000	\$ 8,600,000	\$ 58,400,000	\$ 75,300,000	

<sup>26</sup> Referenced directly from the TDOT STID tool – “Inflated Cost” tab.



## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

### 6.2 Build Alternative 2

Build Alternative 2 maintains the existing geometric features of the interstate mainlines as part of the proposed DDI concept. The following general phases could be implemented for building out Build Alternative 2:

#### Phase 1

- Construct proposed Campbell Station Road bridge over I-40/75.
- Construct relocated/realigned Campbell Station Road north of the interstate and majority of new alignment south of interchange – including shared use path.
- Construct majority of all four (4) proposed interstate ramps to Campbell Station Road.
  - Full or partial closure of westbound off and on ramps could expedite construction process during this phase.

#### Phase 2

- Place traffic on new bridge.
- Construct adjoining intersection improvements.
- Potentially close eastbound off and on ramp in order to expedite construction process during this phase.

#### Phase 3

- Finalize ramp ties and improvements.
- Scarify and abandon old, existing pavement.
- Final surface pavement and striping.

The total projected cost for Build Alternative 2 is \$41,030,000. Table 9 further breaks down this overall cost into specific construction components.

Table 9. Build Alternative #2 Projected Cost Estimate

Improvements Description	Build Alternative #2
Construct new bridge over I-40/75 mainlines for DDI concept, construct new ramps and remove old, widening improvements to Campbell Station Road from I-40/75 WB ramps to just south of Campbell Lakes Drive to accommodate DDI concept, construction of a retaining wall in the southeast quadrant, signalization associated with DDI, right-of-way, and utilities.	\$38,000,000
Campbell Station Road new alignment, north of interstate system from the I-40/75 WB ramps to Snyder Road.	\$3,030,000
<b>Total Projected Cost (2021)</b>	<b>\$41,030,000</b>

Figure 30 and Figure 31 outline the total cost for these improvements, broken down into preliminary engineering, ROW, utilities, and construction phases, as well as inflated estimates for the opening and future years – utilizing a 5% inflation factor.

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 30. Build Alternative 2 Improvements (from WB ramps to just south of Campbell Lakes Drive) Total Cost and Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Modify Interchange	\$ 2,510,000	\$ 551,000	\$ 1,540,000	\$ 33,400,000	\$ 38,000,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 2,910,000	\$ 638,000	\$ 1,780,000	\$ 38,700,000	\$ 44,000,000	
23	2045	\$ 7,710,000	\$ 1,690,000	\$ 4,730,000	\$ 103,000,000	\$ 117,000,000	

Figure 31. Build Alternative 2 Improvements (Campbell Station Road new alignment, north of WB ramps) Total Cost and Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Construction-New	\$ 251,000	\$ 273,000	\$ -	\$ 2,510,000	\$ 3,030,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 291,000	\$ 316,000	\$ -	\$ 2,910,000	\$ 3,510,000	
23	2045	\$ 771,000	\$ 839,000	\$ -	\$ 7,710,000	\$ 9,310,000	

### 6.3 Interstate Improvements

Interstate improvements within the study area include widening the interstate from six (6) to eight (8) lanes total from the I-40/75 system junction to Lovell Road (SR-131). In addition, it is proposed to add an auxiliary lane in direction between Campbell Station Road and Lovell Road (SR-131). The total projected cost for these improvements is \$79,000,000. Table 10 further breaks down this overall cost into specific construction components.

Table 10. Interstate Improvements Projected Cost Estimate

Improvements Description	Interstate Improvements
Widen approximately 6.14 miles of I-40/75 mainlines from the I-40/75 system interchange to Lovell Road (SR-131) from six (6) lanes to eight (8) lanes. This includes bridge improvements to the following bridges to accommodate widening improvements: Everett Road, Turkey Creek, and Lovell Road (SR-131).	\$68,400,000
Widen approximately 1.14 miles of I-40/75 from Campbell Station Road to Lovell Road (SR-131) to add an auxiliary lane in each direction.	\$10,600,000
<b>Total Projected Cost (2021)</b>	<b>\$79,000,000</b>

## Interchange Improvements at Campbell Station Road (Exit 373) Knox County

Figure 32 and Figure 33 outline the total cost for these improvements, broken down into preliminary engineering and construction phases, as well as inflated estimates for the opening and future years – utilizing a 5% inflation factor.

Figure 32. 8 Lane Widening Total Cost & Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Widen	\$ 3,540,000	\$ -	\$ -	\$ 64,900,000	\$ 68,400,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 4,100,000	\$ -	\$ -	\$ 75,100,000	\$	79,200,000
23	2045	\$ 10,900,000	\$ -	\$ -	\$ 199,000,000	\$	210,000,000

Figure 33. Auxiliary Lanes Total Cost & Inflated Costs

COST ESTIMATE SUMMARY (2021)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2021):
N/A	Widen	\$ 960,000	\$ -	\$ -	\$ 9,600,000	\$ 10,600,000

INFLATED COST ESTIMATE SUMMARY						Report Type:	Technical Report
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost	
3	2025	\$ 1,110,000	\$ -	\$ -	\$ 11,100,000	\$	12,300,000
23	2045	\$ 2,950,000	\$ -	\$ -	\$ 29,500,000	\$	32,600,000

## **Interchange Improvements at Campbell Station Road (Exit 373) Knox County**

### **7.0 Summary**

Based on the geometric limitations of the existing structure, operational deficiencies, and anticipated growth within the study area (including Knox County and Town of Farragut), both Build Alternative 1 and Build Alternative 2 provide operational improvements to the future network compared to the No Build Alternative. Both alternatives improve level of service along Campbell Station Road and provide pedestrian connectivity to the growing areas north and south of the interstate system. Both alternatives require right-of-way (ROW) acquisition as part of the ultimate buildout.

Build Alternative 1 maintains existing Campbell Station Road alignment while raising the grade to provide standard vertical clearance under the bridge. Build Alternative 2 inverts the interchange such that Campbell Station Road goes over the interstate mainlines. Build Alternative 1 has a total cost estimate of \$58,800,000. Build Alternative 2 has a total cost estimate of \$41,030,000.

In addition to interchange improvements, it is proposed to widen the interstate from six (6) lanes total to eight (8) lanes, as well as add an auxiliary lane in each direction along the interstate mainlines from Campbell Station Road to Lovell Road (SR-131). These interstate improvements have a total cost estimate of \$79,000,000.

Interchange Improvements at Campbell Station Road (Exit 373)  
Knox County

## Appendix A - TIP and Mobility Plan 2045 Project Sheets

### Contents

TIP Sheet

L RTP Sheets

## Knoxville Regional Transportation Planning Organization TRANSPORTATION IMPROVEMENT PROGRAM FY 2020-2023

TIP No.	20-2017-024	Revision No.	0	Mobility Plan No.	13-813	
TDOT PIN	125462.00	STIP No.				
Project Name	Town of Farragut Advanced Traffic Management System Phase 1					
Lead Agency	Town of Farragut					
Total Project Cost	\$7,020,000					

**Project Description** Upgrade Farragut's closed loop signal system to a centrally controlled signal system. The limits of the project includes all 26 signals in Farragut's signal system on Kingston Pike, Campbell Station Road, Concord Road, and Parkside Drive. The upgrades include new central traffic signal control software, new signal series controllers, ethernet communication upgrades, bringing pedestrian infrastructure up to current PROWAG standards, cabinet upgrades, detection upgrades, and replacing span wire signals at five intersections with mast arms. Phase 2 elements included with this project of the ATMS project will build upon Phase 1 to include the remaining cabinet, detection, signal head modification, and mast arm upgrades that were not originally included due to budget constraints. Additionally, DSRC equipment will be added to each intersection, and CCTV cameras will be installed at up to 5 intersections.

Termini/Intersection	Various				
Counties	Knox				
City/Agency	Town of Farragut				
Length		(miles)	Conformity Status	Exempt	

**Additional Details**

**Programmed Funds**

FY	Phase	Funding Type	Total Funds	Federal	State	Local	Other
2020	CON	CMAQ	\$6,580,000	\$6,505,000	\$0	\$75,000	\$0
<b>Total</b>			<b>\$6,580,000</b>	<b>\$6,505,000</b>	<b>\$0</b>	<b>\$75,000</b>	<b>\$0</b>

Revision Date	
Revision Details	
Previous TIP No.	17-2017-024



Table G-4. Fiscally Constrained Projects in Knox County

KRMP ID	PROJECT NAME	AGENCY	FACILITY NAME	FROM	TO	LENGTH (MILES)	DESCRIPTION	HORIZON YEAR	HORIZON YEAR COST	PROPOSED FUNDING SOURCE	PM IMPACT
EAST TENNESSEE HUMAN RESOURCE AGENCY (ETHRA)											
21-1002	ETHRA Transit Vehicle Replacement Project	ETHRA	-	-	-	N/A	Purchase of demand response transit vehicles for fleet replacement	2026	\$1,348,650	L-STBG	4
TOWN OF FARRAGUT											
09-629	I-40/I-75/Campbell Station Road Interchange	Farragut	Interchange of I-40/75 at Campbell Station Rd			-	Reconfigure existing interchange to improve capacity, safety and operations.	2030	\$54,546,881	NHPP	1,3
09-630	Virtue Road Reconstruction	Farragut	Virtue Rd	Boyd Station Rd	2200' S of Broadwood Dr	0.95	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities	2026	\$7,716,121	L-STBG	1,2
09-668	Kingston Pike (SR 1) Widening	Farragut	Kingston Pk	Smith Rd	Campbell Station Rd	1.40	Widen from 4 to 6 lanes with addition of bicycle/pedestrian facilities	2040	\$28,812,844	NHPP	1,2,3
09-669	Everett Road Improvements	Farragut	Everett Rd	Watt Rd	Split Rail Lane	2.50	Reconstruct 2-lane road with addition of continuous center turn lane and bicycle/pedestrian facilities	2045	\$41,173,191	L-STBG	1,2
09-691	I-40/75 Widening	Farragut	I-40/75	I-40/75 Interchange	Campbell Station Rd Interchange	5.30	Widen from 6 to 8 lanes	2035	\$54,503,516	NHPP	3
13-601	Union Road /N Hobbs Road Reconstruction	Farragut	Union Rd/N. Hobbs Rd	Everett Rd	Kingston Pike (SR 1)	1.00	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities	2026	\$4,546,000	L-STBG	1,2
13-603	I-40/75 Auxiliary Lanes	Farragut	I-40/75	Campbell Station Rd Interchange	Lovell Rd Interchange	1.40	Construct eastbound and westbound auxiliary lanes between interchanges	2030	\$12,412,500	NHPP	3
13-813	Farragut Advanced Traffic Management System - Ph 1	Farragut				N/A	Advanced Traffic Management Systems (ATMS) are a component of Intelligent Transportation Systems (ITS) that integrate various technologies specifically related to the traffic signal system to improve overall operations. This project includes the Town's entire signal system.	2026	\$7,738,167	CMAQ	3
19-703	Jamestowne Boulevard Study	Farragut	Jamestowne Boulevard	SR 1 (Kingston Pike)	Campbell Station Road	N/A	Feasibility and planning study to determine needed improvements to Jamestowne Boulevard in Farragut to provide additional route for motorists and pedestrians to bypass intersection of Kingston Pike at Campbell Station Road.	2026	\$88,184	L-STBG	-

KRMP ID	PROJECT NAME	AGENCY	FACILITY NAME	FROM	TO	LENGTH (MILES)	DESCRIPTION	HORIZON YEAR	HORIZON YEAR COST	PROPOSED FUNDING SOURCE	PM IMPACT
<b>KNOXVILLE AREA TRANSIT (KAT)</b>											
21-1003	Purchase KAT Vehicles - Fixed Route Buses	KAT	-	-	-	N/A	Purchase of fixed-route buses for fleet replacement or minor expansion	2026	\$25,480,360	L-STBG/CMAQ	4
21-1004	KAT Bus Engine Overhauls	KAT	-	-	-	N/A	Mid-life engine overhauls on 46 transit buses. An engine "overhaul" is a mid-life action on a major component that enables an asset to achieve its useful life and is an FTA-eligible activity under Circular 5010.1E	2026	\$5,248,971	L-STBG	4
<b>KNOX COUNTY</b>											
09-625	Schaad Road Widening	Knox County	Schaad Rd	Oak Ridge Hwy (SR 62)	Pleasant Ridge Rd	1.50	Widen from 2 to 4 lanes with addition of sidewalks	2026	\$12,676,484	Local	1,2,3
09-637	Lovell Road Widening (SR 131)	Knox County	Lovell Rd (SR 131)	Cedardale Ln	Middlebrook Pk	1.70	Widen 2-lane to 4-lane, including pedestrian and bicycle facilities.	2030	\$25,490,954	L-STBG	1,2,3
09-644	Gov John Sevier Highway (SR 168)	Knox County	Gov John Sevier Hwy (SR 168)	Alcoa Hwy (SR 115/US 129)	Chapman Hwy (US 441/SR 71)	6.50	Widen from 3 to 4-lane divided roadway	2035	\$105,690,856	S-STBG	1,2,3
09-645	Northshore Drive (SR 332)	Knox County	Northshore Dr (SR 332)	Morrell Rd	Ebenezer Rd	3.50	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities	2035	\$31,875,020	S-STBG	1,2,3
09-646	Northshore Drive (SR 332)	Knox County	Northshore Dr (SR 332)	Pellissippi Pkwy (SR 162)	Concord Rd (SR 332)	4.50	Reconstruct 2-lane road with addition of turn lanes and bicycle/pedestrian facilities	2040	\$47,359,784	S-STBG	1,2,3
09-647	Pellissippi Parkway (SR 162)	Knox County	Pellissippi Pkwy (SR 162)	Edgemoor Rd (SR 170)	Dutchtown Rd	6.00	Corridor safety and capacity improvements to include access control, interchange reconstruction, frontage roads, additional/auxiliary lanes and provision for a shared use path	2030	\$101,976,781	NHPP	1,2,3
09-651	I-40/I-75/Watt Road Interchange	Knox County	I-40 at Watt Rd Interchange	Interchange at Watt Rd		-	Reconfigure existing interchange to improve capacity, safety and operations.	2026	\$24,250,665	NHPP	1,3
09-673	Oak Ridge Highway (SR 62)	Knox County	Oak Ridge Hwy (SR 62)	Byington Beaver Ridge Rd (SR 131)	Pellissippi Pkwy (SR 162)	4.20	Widen from 2 to 4 lanes	2035	\$62,743,460	NHPP	2,3
10-700	Campbell Station Road Improvements	Knox County	Campbell Station Road	I-40	Hardin Valley Road	3.30	Widening and realignment of Campbell Station Rd from I-40 to Hardin Valley Rd	2030	\$27,487,702	L-STBG	1,2



Interchange Improvements at Campbell Station Road (Exit 373)  
Knox County

## Appendix B - Traffic Data

### Contents

TDOT Projected Traffic

**TENNESSEE DEPARTMENT OF TRANSPORTATION  
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION**

PROJECT NO.: \_\_\_\_\_ ROUTE: 1-40/75  
 COUNTY: KNOX CITY: KNOXVILLE  
 PROJECT PIN NUMBER: \_\_\_\_\_  
 PROJECT DESCRIPTION: FROM S.R. 73 INTERCHANGES TO I-140/S.R. 162 INTERCHANGE.  
INCLUDES S.R. 73, WATT RD., CAMPBELL STATION RD., S.R. 131 & I-140.

**DIVISION REQUESTING:**

MAINTENANCE	<input type="checkbox"/>	PAVEMENT DESIGN	<input type="checkbox"/>
S.T.I.D.	<input checked="" type="checkbox"/>	STRUCTURES	<input type="checkbox"/>
PROG. DEVELOPMENT & ADM.	<input type="checkbox"/>	SURVEY & ROADWAY DESIGN	<input type="checkbox"/>
PUBLIC TRANS. & AERO.	<input type="checkbox"/>	TRAFFIC SIGNAL DESIGN	<input type="checkbox"/>
YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: _____		OTHER <u>WSP USA</u>	<input checked="" type="checkbox"/>
PROJECTED LETTING DATE: _____			

**TRAFFIC ASSIGNMENT:**

BASE YEAR		ISEE ATTACHMENTS I					DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS	
AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
	2025				2045					

REQUESTED BY: NAME PAIGE HARRIS DATE 6/28/21  
 DIVISION WSP USA  
 ADDRESS 2100 WEST END AVE. SUITE 630  
NASHVILLE TN 37203

REVIEWED BY: RANDY BOGUSKIE Randy Boguskie DATE 7/19/2021  
 TRANSPORTATION MANAGER 1  
 SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: TONY ARMSTRONG Tony Armstrong DATE 7/19/2021  
 TRANSPORTATION MANAGER 2  
 SUITE 1000, JAMES K. POLK BUILDING

**COMMENTS:**

THIS TRAFFIC IS BASED ON 2019 CYCLE AND RAMPS COUNTS, [4] 8-HOUR TURNING MOVEMENT COUNTS [OCT. 2018] AND [12] 8-HOUR TURNING MOVEMENT COUNTS [APRIL 2021]. THE DESIGN YEAR TRAFFIC IS BASED ON GROWTH RATES FROM THE KNOXVILLE [LRTP] TPO COMPUTER ASSIGNMENT MODEL PLUS TRIP GENERATION FOR THE DEVELOPMENT PROPOSED AT THE WATT ROAD INTERCHANGE. AADT's, AND BOTH YEAR DHV's ARE INCLUDED.

Cc: SHAUN ARMSTRONG, S.T.I.D.

**DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT.**

**NOTE:** FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR ADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS  
 SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.



**Knox County**

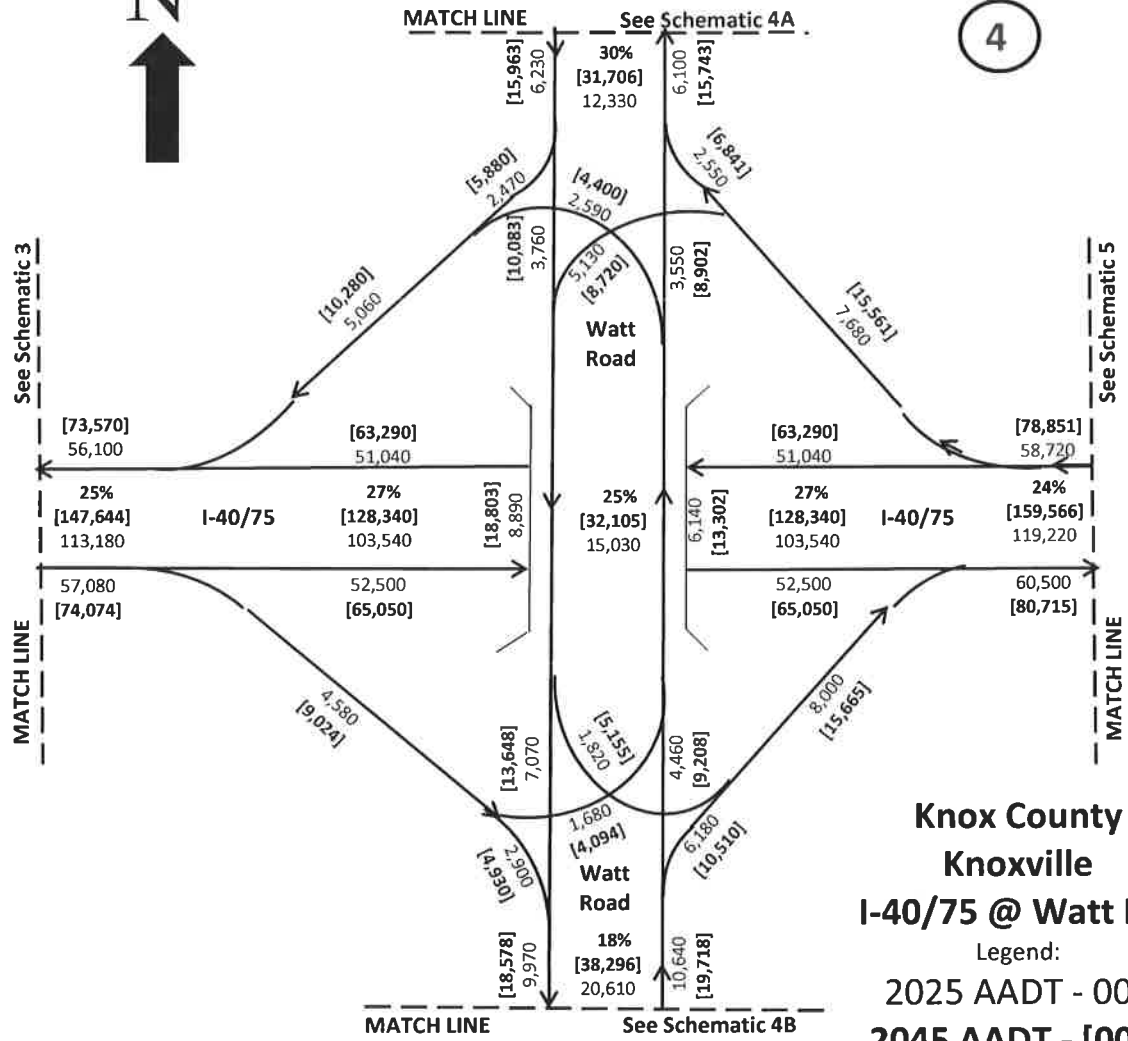
**Knoxville**

**I-40/75**



**AA DT**

4



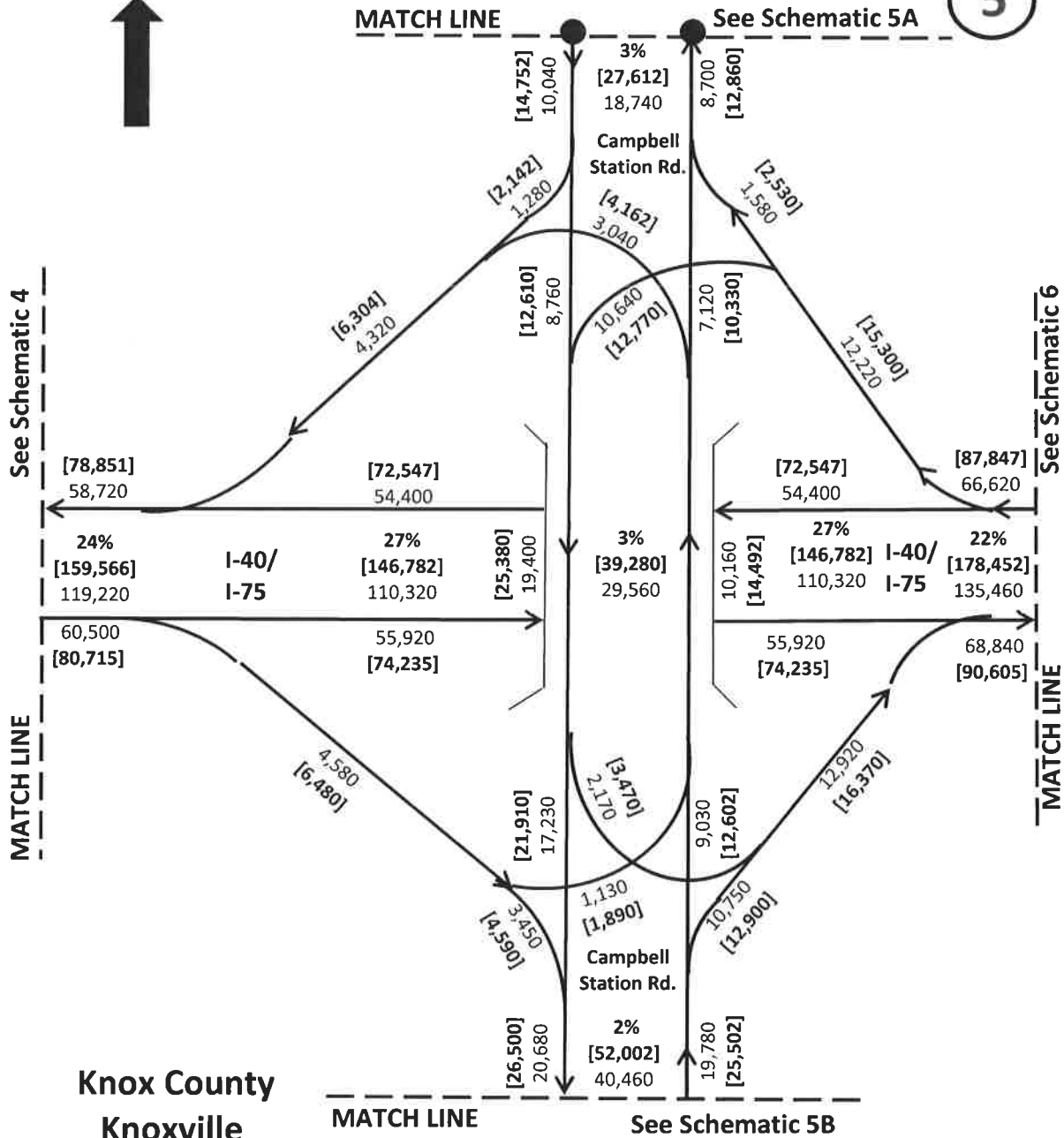
**Knox County  
Knoxville  
I-40/75 @ Watt Rd.**

Legend:  
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AADT Truck % - 0%  
Rev. Date: July 19, 2021  
TA



**AAADT**

**5**

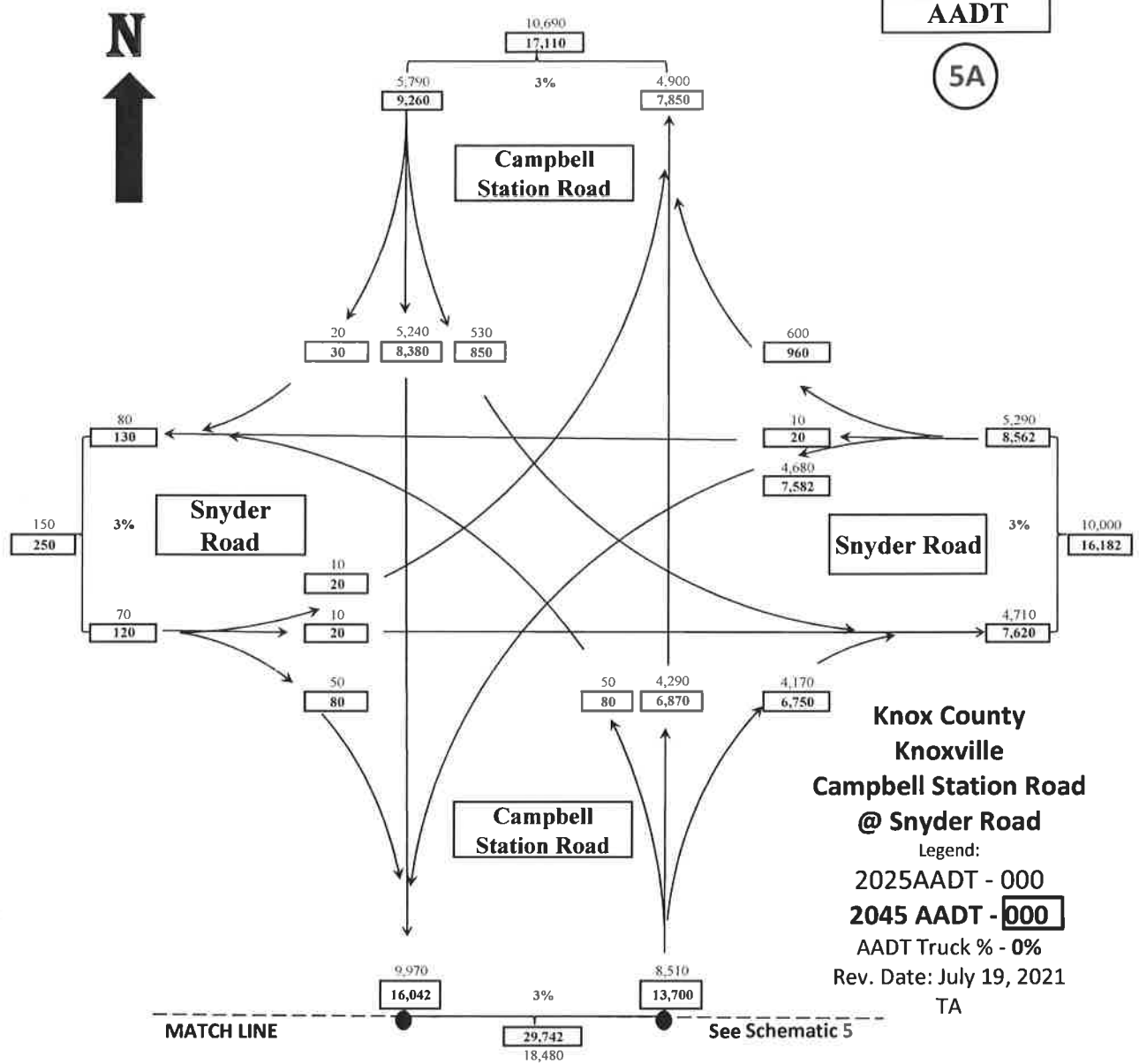


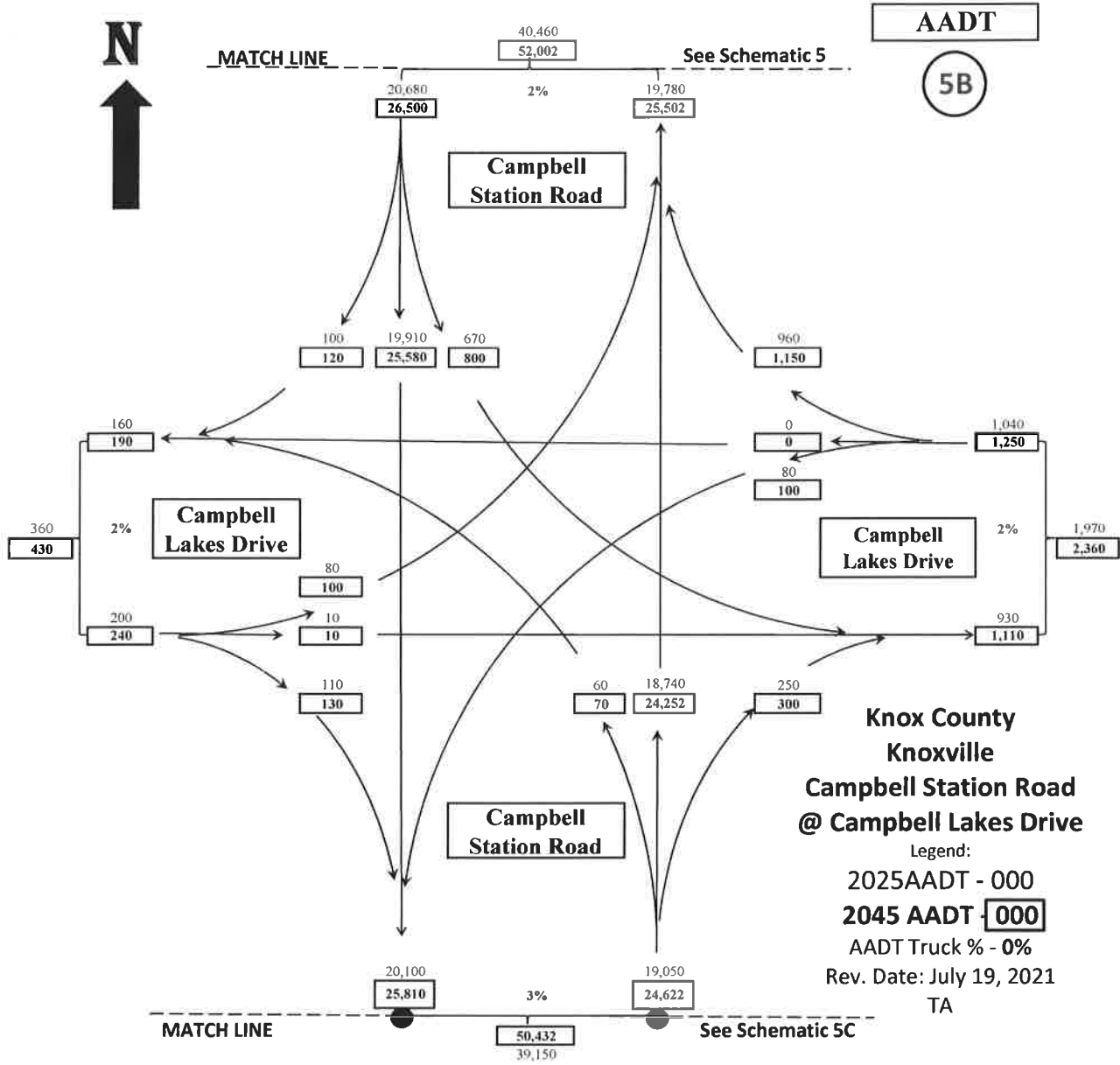
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 Knoxville  
 I-40/75 @ Campbell  
 Station Road**

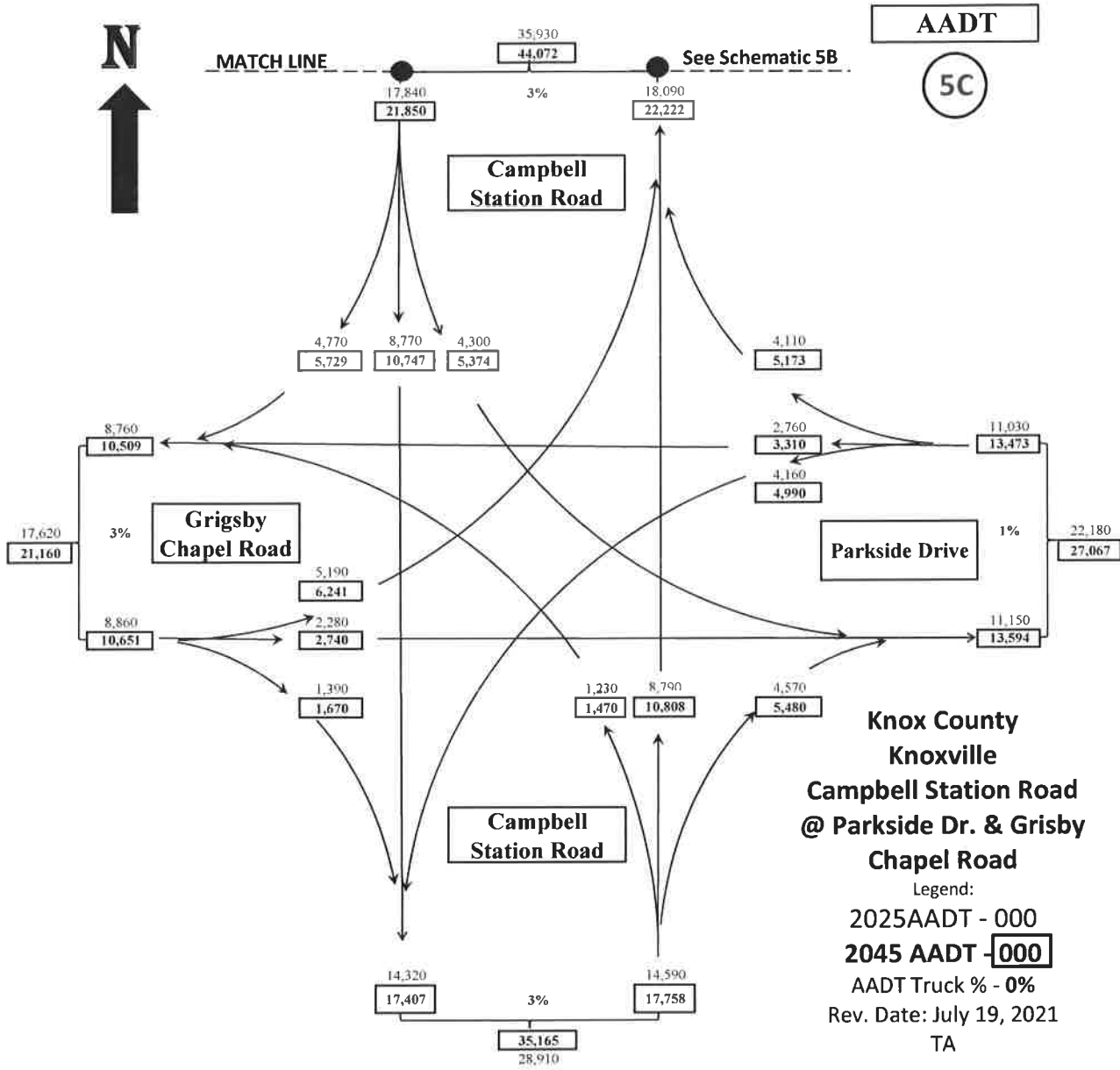
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 Rev. Date: July 19, 2021  
 TA



AADT  
5A





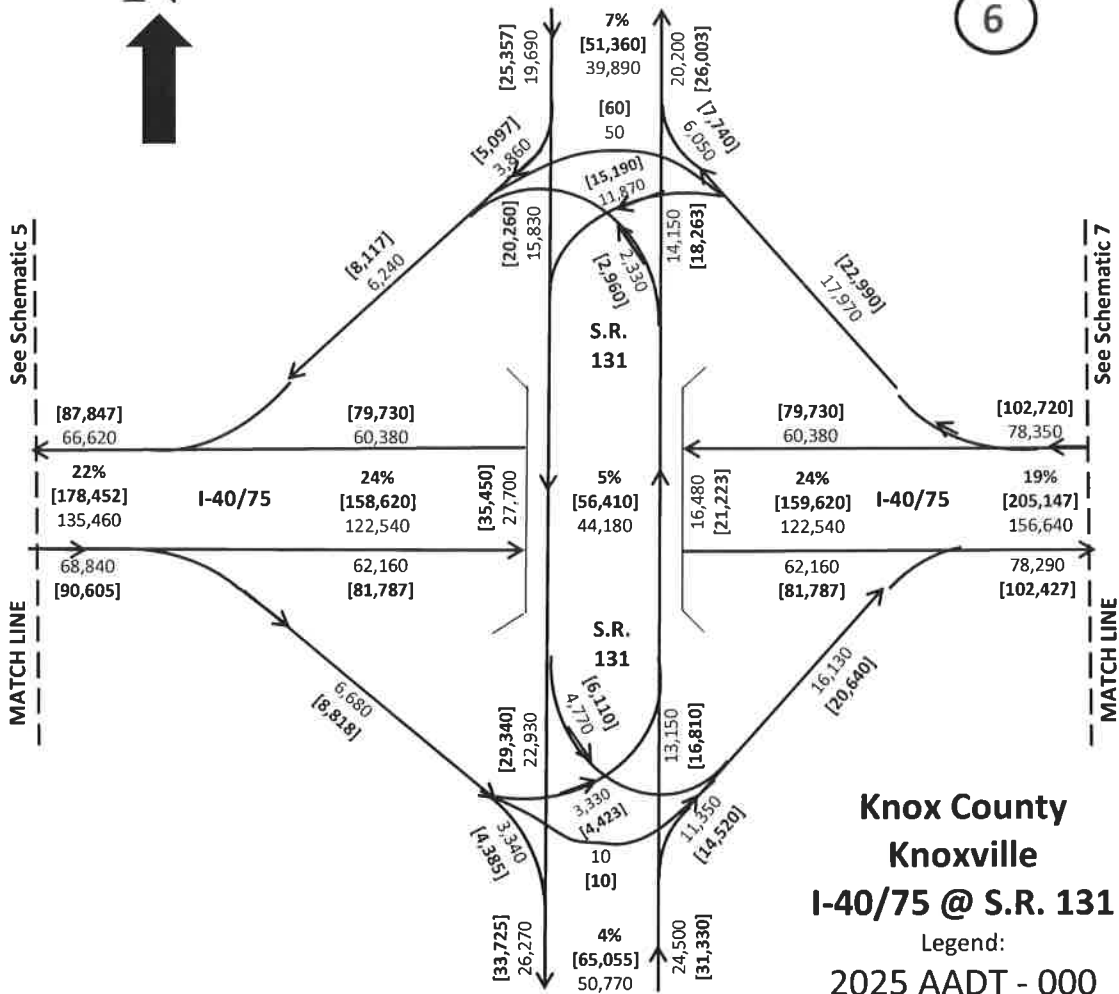






**AADT**

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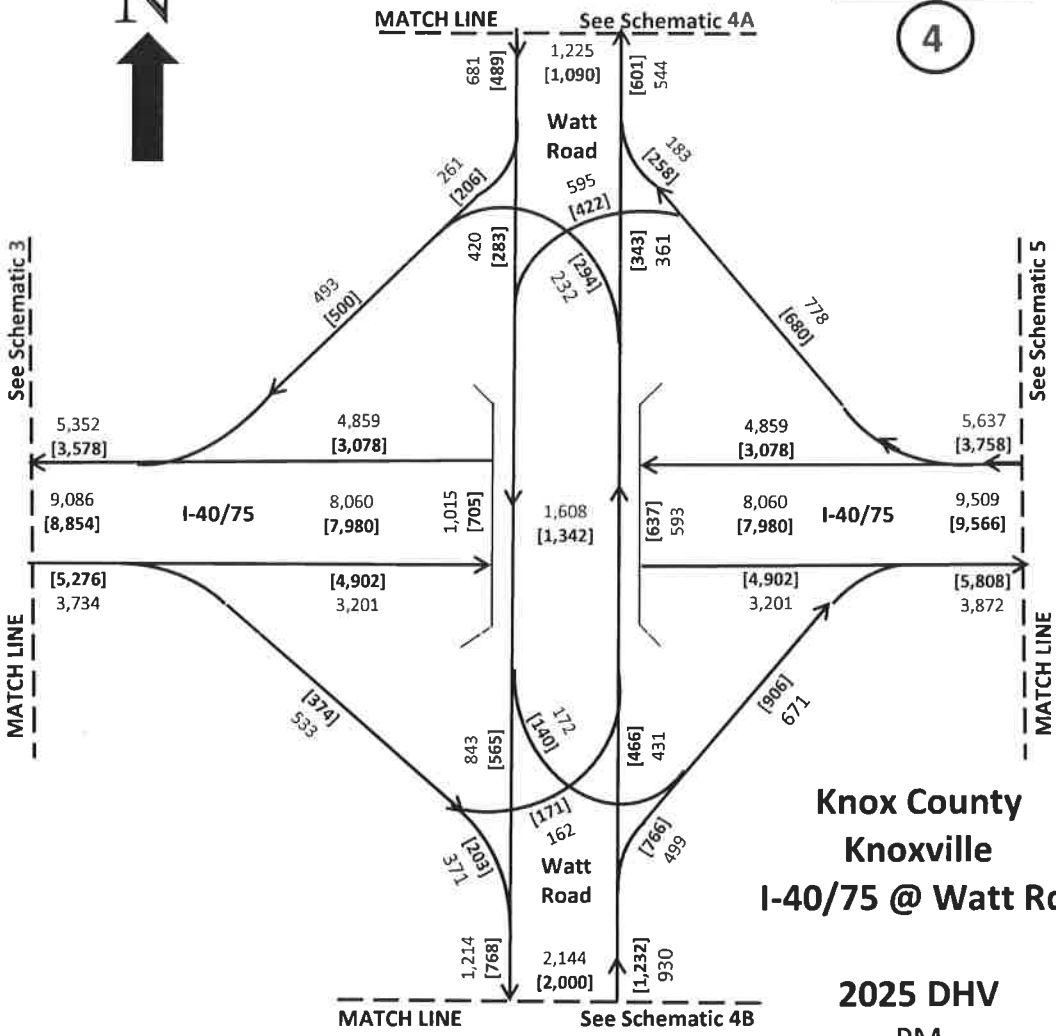
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Knoxville  
I-40/75 @ S.R. 131**

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 TA



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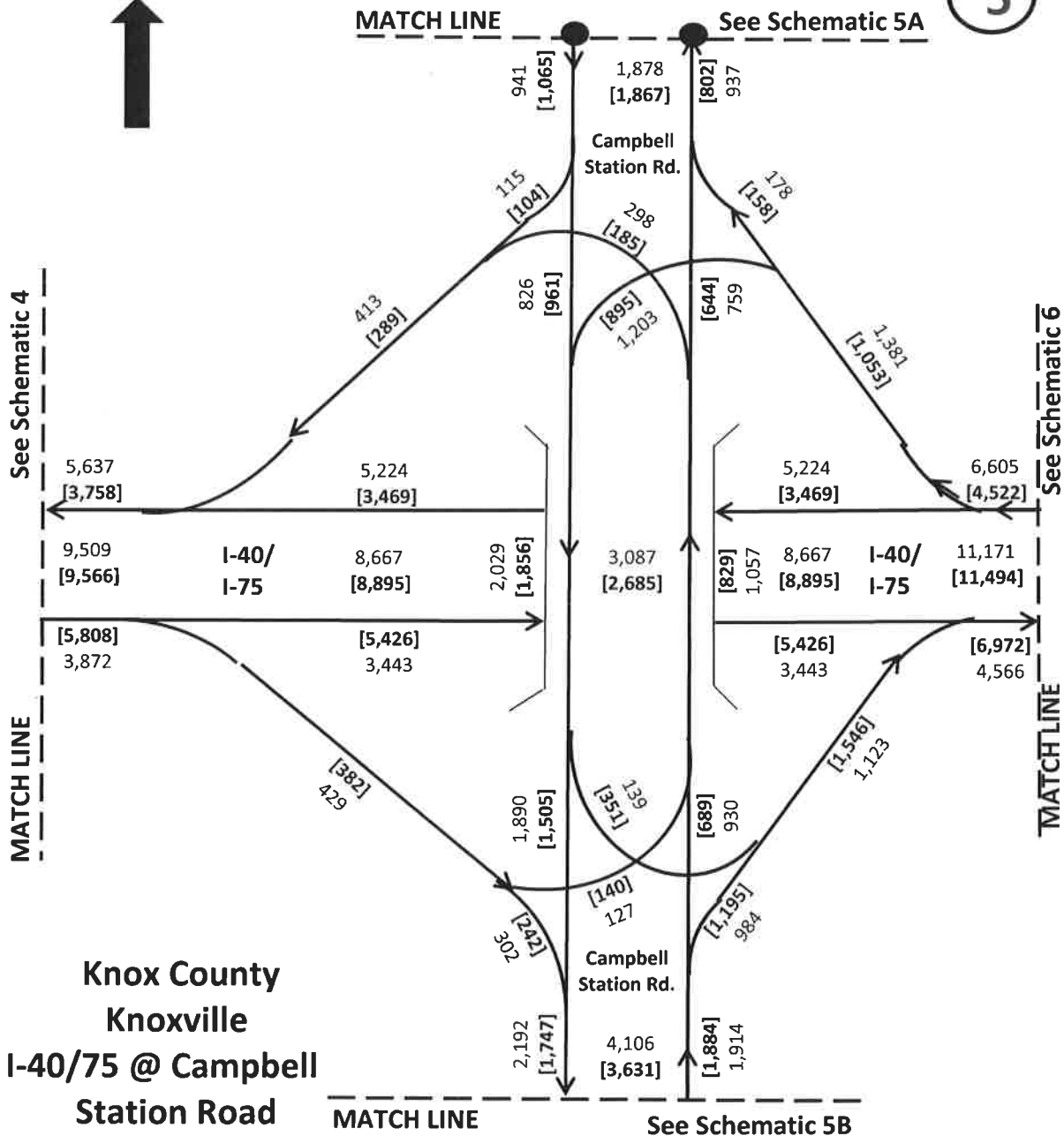
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**Knox County  
Knoxville  
I-40/75 @ Watt Rd.**

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PM  
[AM]**

Date: May 5, 2021  
TA

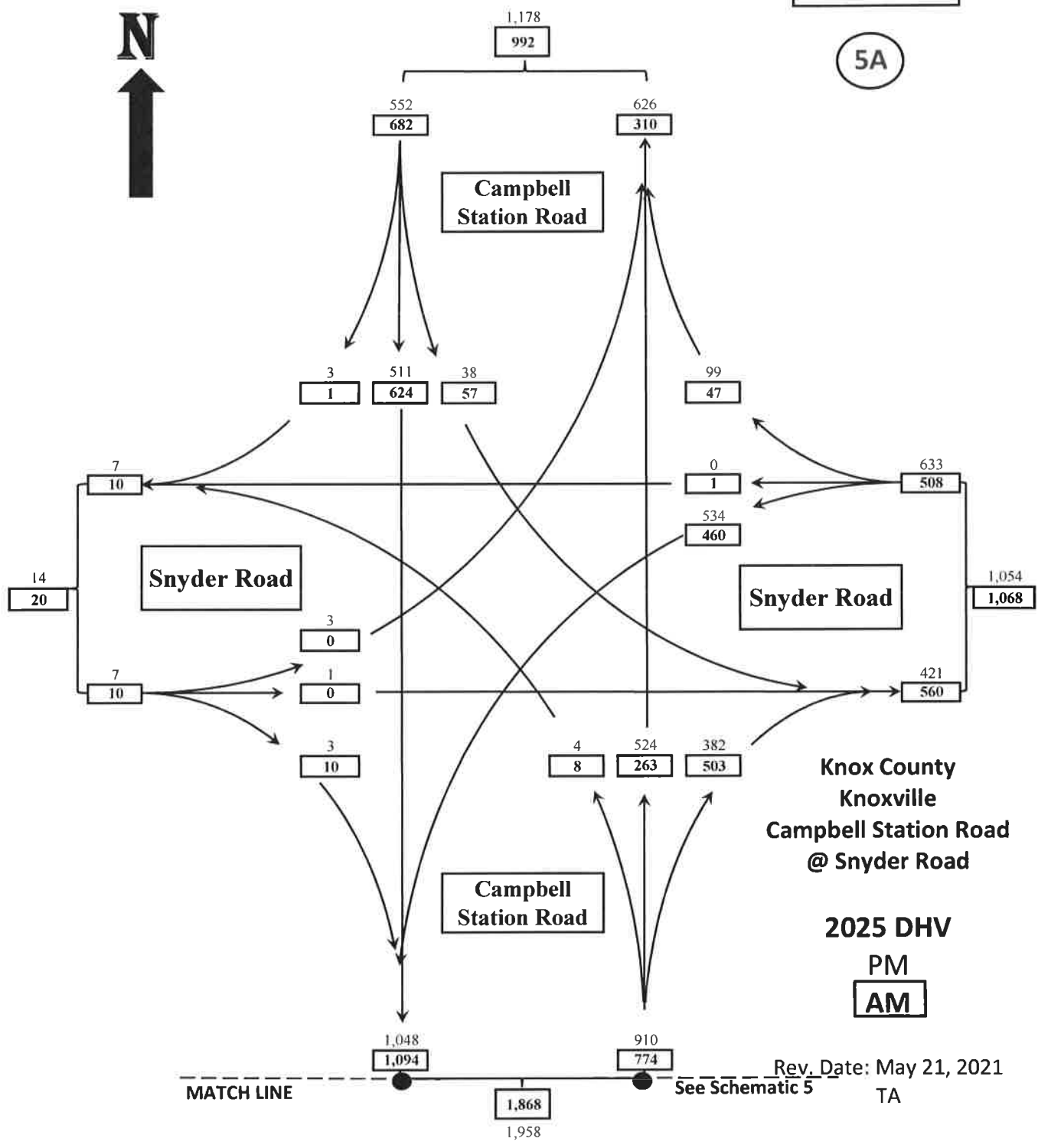


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[AM]

Rev. Date: May 21, 2021  
TA

2025 DHV

5A



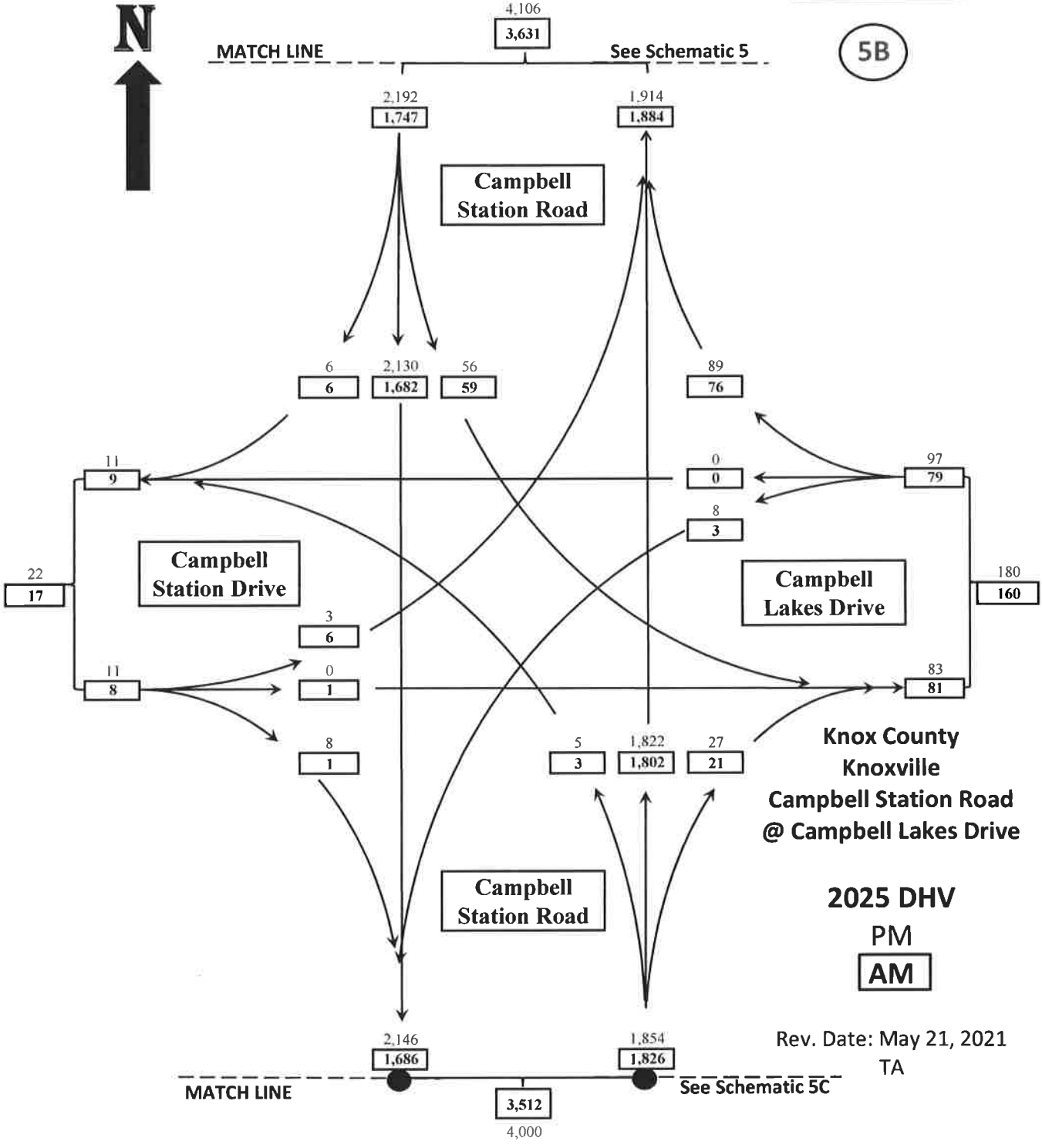
2025 DHV

5B



MATCH LINE

See Schematic 5



MATCH LINE

See Schematic 5C

4,000

**2025 DHV**

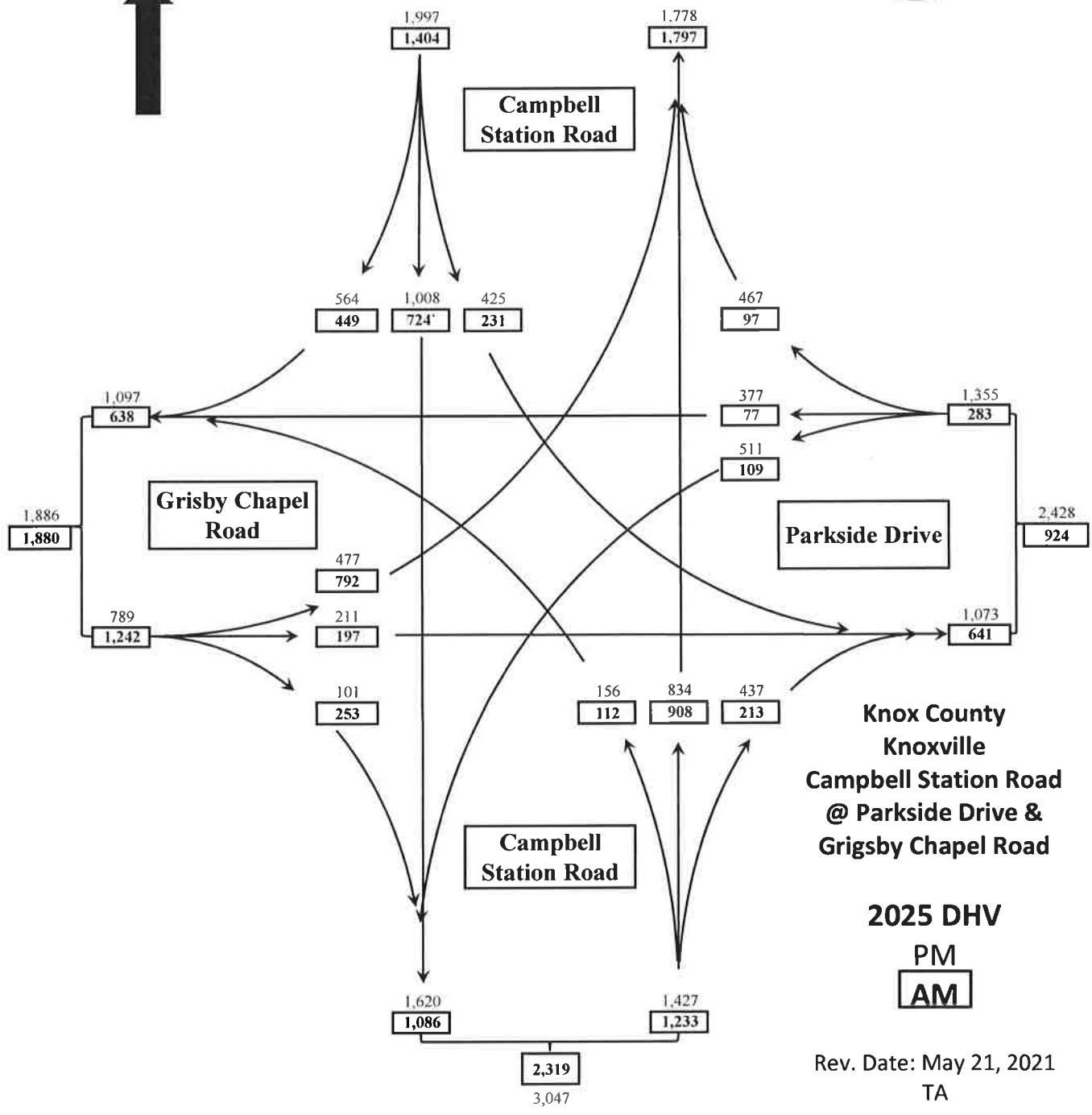


MATCH LINE

3,775  
3,201

See Schematic 5B

5C



**Knox County  
Knoxville  
Campbell Station Road  
@ Parkside Drive &  
Grigsby Chapel Road**

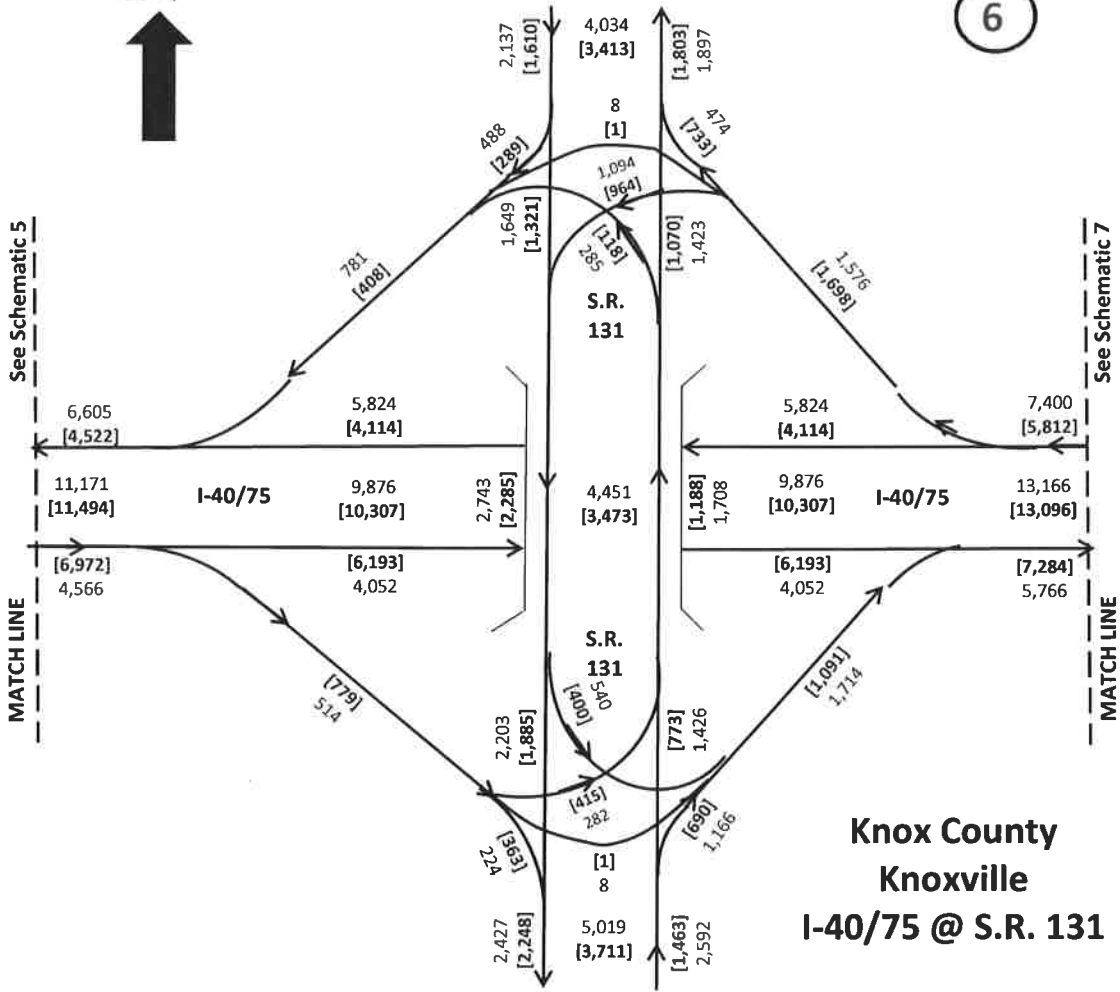
**2025 DHV  
PM  
AM**

Rev. Date: May 21, 2021  
TA



2025 DHV

6



**Knox County  
Knoxville  
I-40/75 @ S.R. 131**

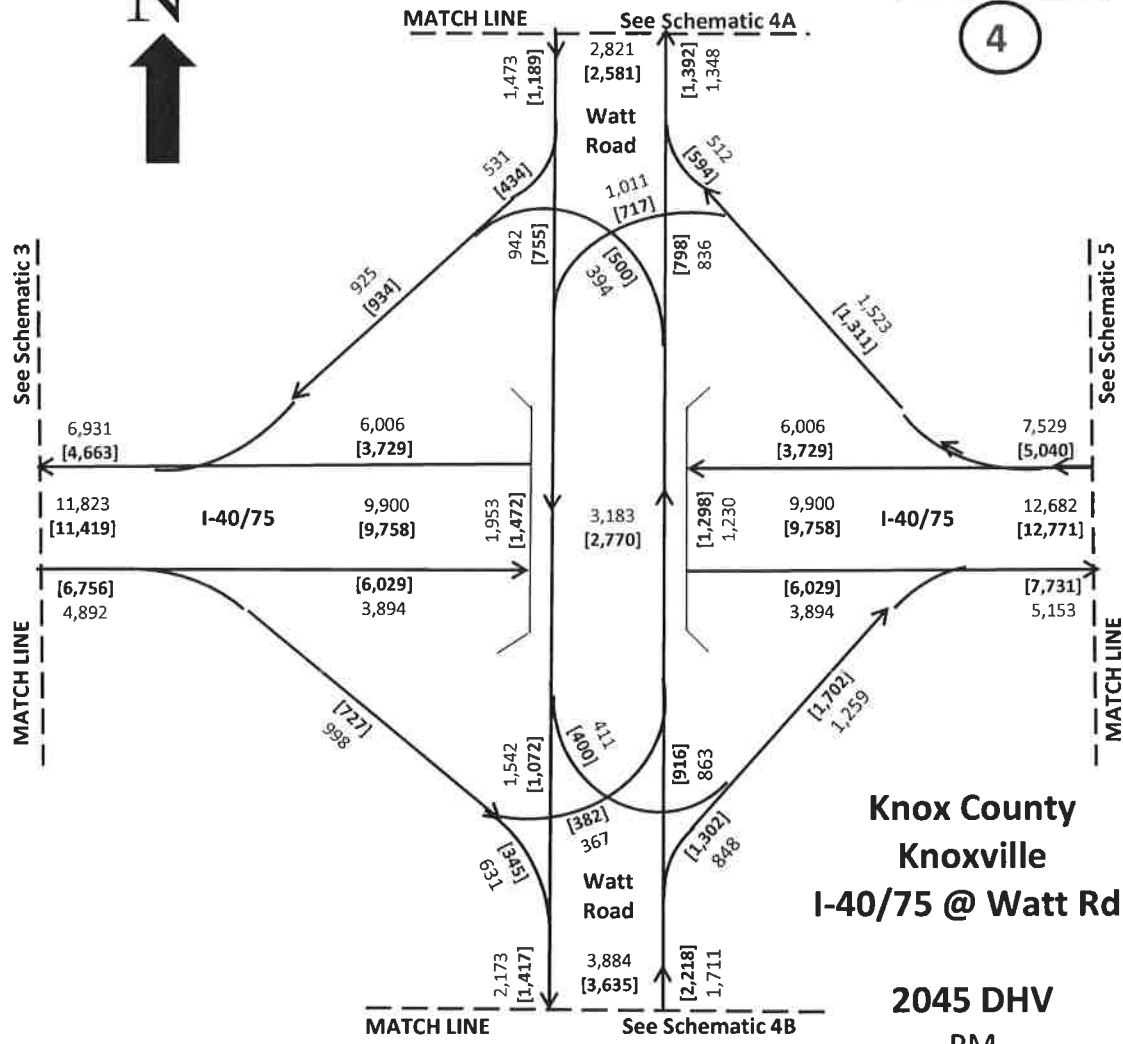
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[AM]**

Rev. Date: May 21, 2021  
TA



2045 DHV

4



### Knox County Knoxville I-40/75 @ Watt Rd.

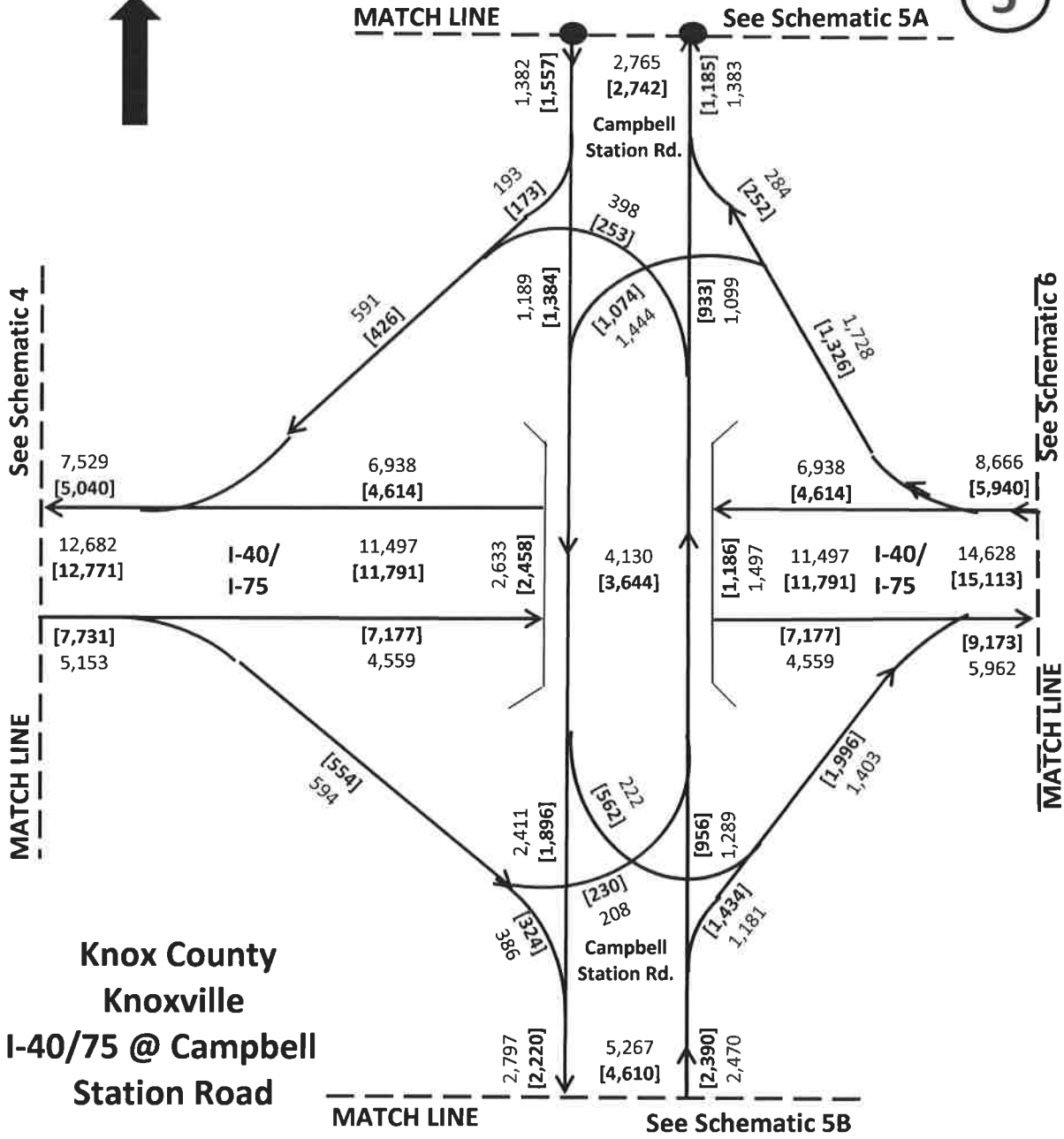
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[AM]

Rev. Date: July 19, 2021  
TA



2045 DHV

5



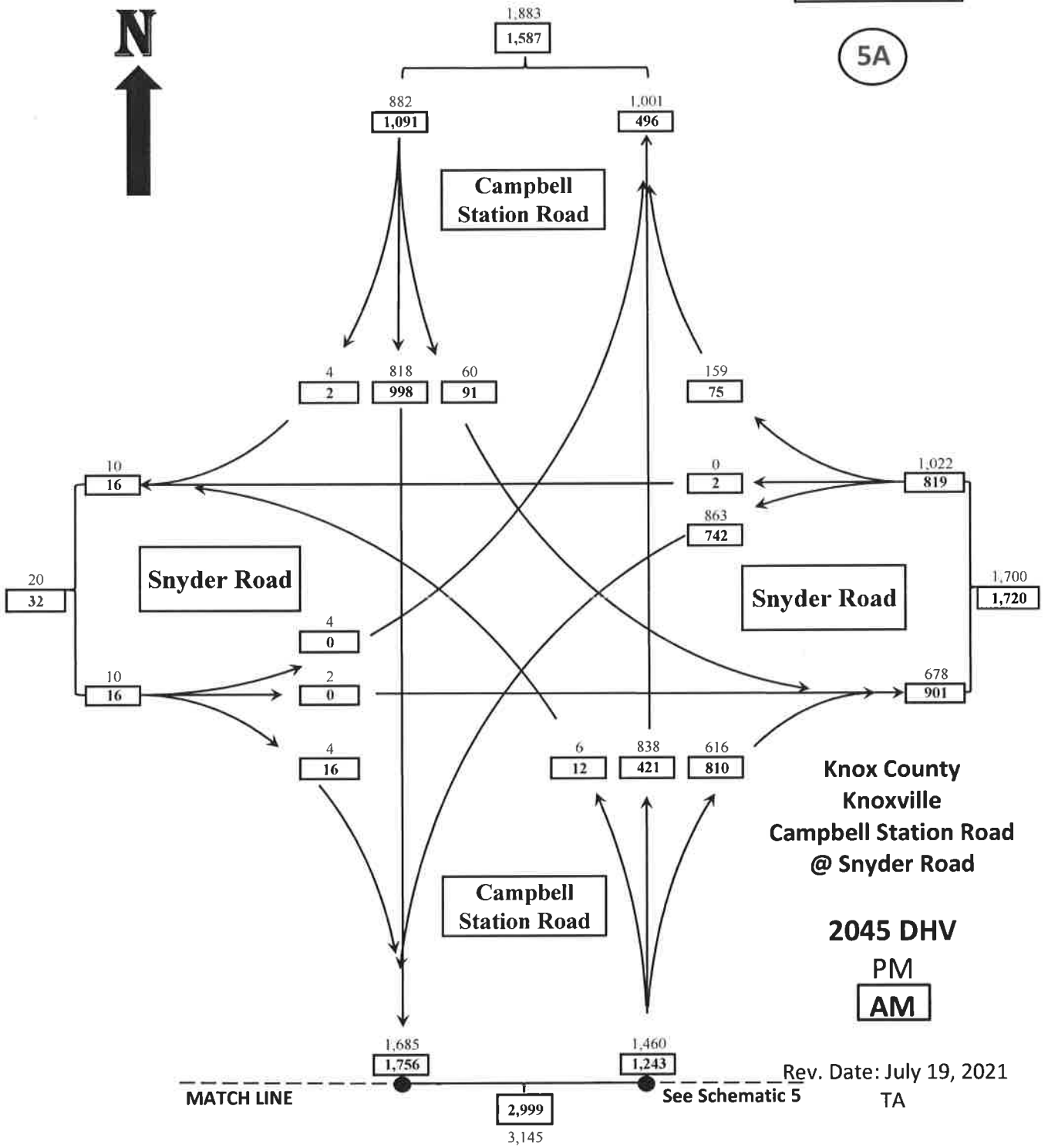
**Knox County  
Knoxville  
I-40/75 @ Campbell  
Station Road**

**2045 DHV  
PM  
[AM]**

Rev. Date: July 19, 2021  
TA

2045 DHV

5A



2045 DHV

5B



MATCH LINE

See Schematic 5

5,267  
4,610

2,797  
2,220

2,470  
2,390

Campbell  
Station Road

7  
7

2,723  
2,142

67  
71

107  
91

13  
11

0  
0

117  
95

Campbell  
Station Drive

Campbell  
Lakes Drive

216  
192

25  
20

3  
7

10  
4

12  
9

0  
1

99  
97

Knox County  
Knoxville  
Campbell Station Road  
@ Campbell Lakes Drive

Campbell  
Station Road

2045 DHV  
PM  
AM

6  
4

2,360  
2,292

32  
25

2,742  
2,147

2,398  
2,321

MATCH LINE

See Schematic 5C

4,468  
5,140

Rev. Date: July 19, 2021  
TA

2045 DHV



MATCH LINE

4,596

3,905

See Schematic 5B

5C

2,421

1,718

2,175

2,187

Campbell Station Road

677

539

1,222

888

522

291

582

129

1,316

767

452

93

1,647

353

Grisby Chapel Road

Parkside Drive

2,262

2,258

2,947

1,137

572

950

253

237

1,300

784

121

304

187

135

1,021

1,108

525

256

Campbell Station Road

Knox County  
Knoxville  
Campbell Station Road  
@ Parkside Drive &  
Grigsby Chapel Road

2045 DHV

PM

AM

1,956

1,323

1,733

1,499

2,822

3,689

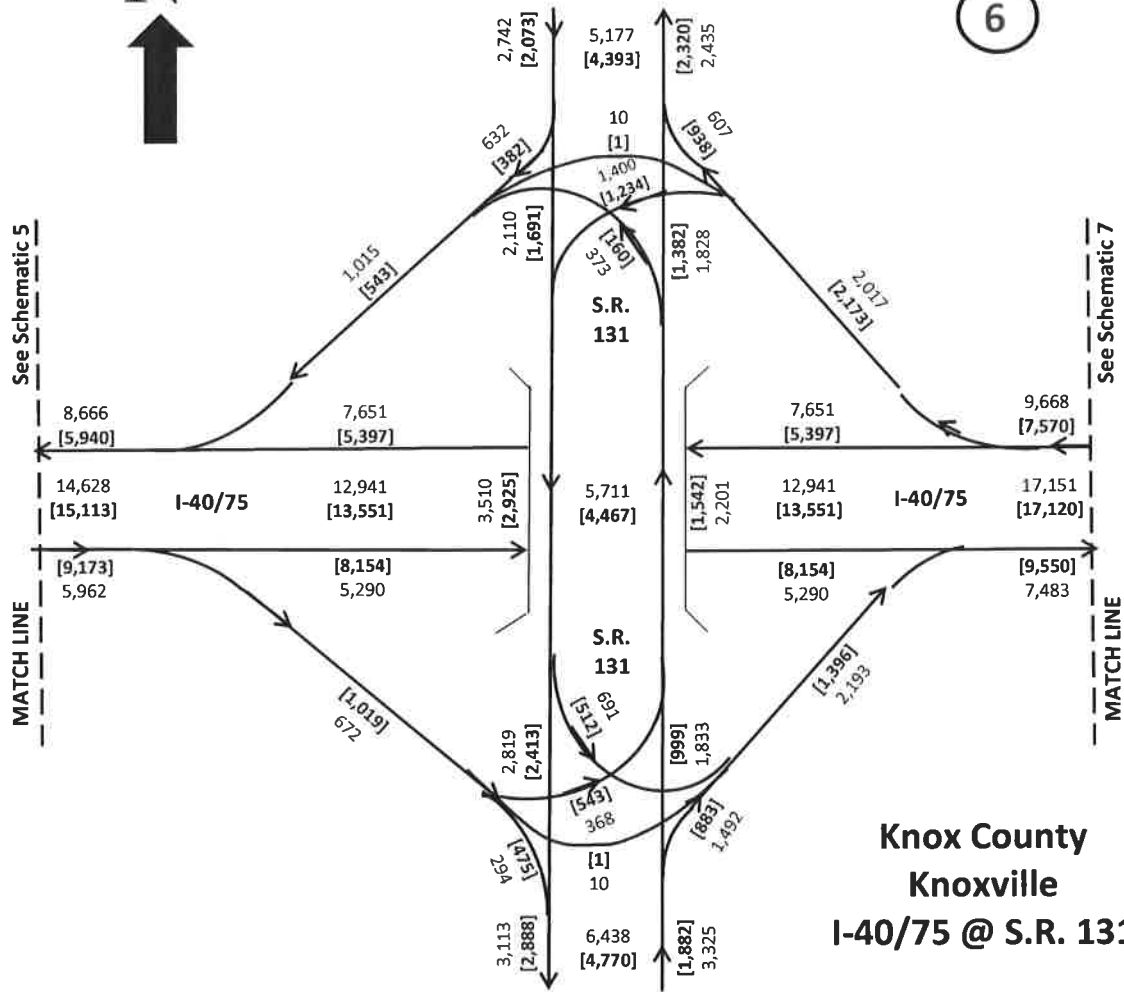
Rev. Date: July 19, 2021

TA



2045 DHV

6



Knox County  
Knoxville  
I-40/75 @ S.R. 131

2045 DHV  
PM  
[AM]

Rev. Date: July 19, 2021  
TA

Interchange Improvements at Campbell Station Road (Exit 373)  
Knox County

## Appendix C - Conceptual Layouts

### Contents

Build Alternative #1 Conceptual Layout

Build Alternative #2 Conceptual Layout

Interstate Improvements Conceptual Layouts



TYPE	YEAR	COUNTY	FIGURE NO.
	2021	KNOX	2



# TECHNICAL PLANNING REPORT

I-40 EXIT 373  
 CAMPBELL STATION ROAD  
 KNOX COUNTY

STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 S.T.I.D.

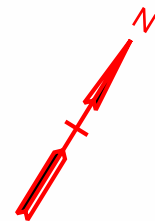
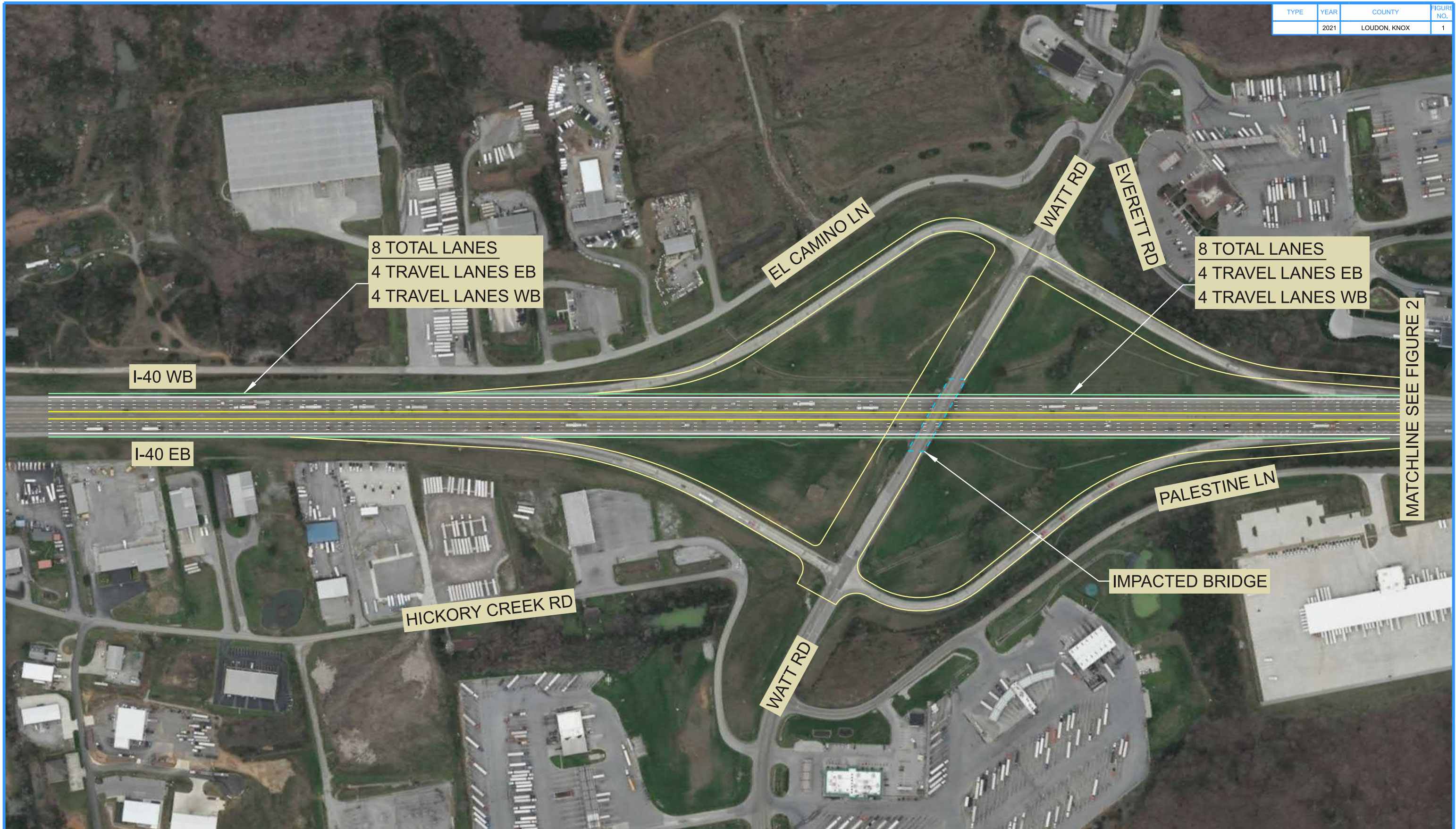
FIGURE 2  
 BUILD ALTERNATIVE #2  
 DIVERGING DIAMOND  
 INTERCHANGE ON  
 NEW ALIGNMENT

1/3/2022 9:41:16 AM C:\PROGRAMDATA\BENTLEY\OPENROADS DESIGNER CE\CONFIGURATION\WORKSPACES\DOT\_STANDARDS\WORKSETS\KNOX\INTERCHANGE\CUTSHEETS\KNOX\INTERCHANGE\CUTSHEETS\KNOX\CAMPBELL STATION RD\193646-STTD-PROPOSED.DGN





TYPE	YEAR	COUNTY	FIGURE NO.
	2021	LOUDON, KNOX	1



# TECHNICAL PLANNING REPORT

I-40 WIDENING  
FROM I-75 TO LOVELL ROAD  
LOUDON AND KNOX COUNTIES

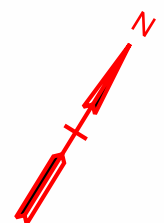
STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
S.T.I.D.

FIGURE 1

TYPE	YEAR	COUNTY	FIGURE NO.
	2021	KNOX	2



1/28/2022 3:15:40 PM C:\USERS\WILLIAMSC\DESKTOP\CAMB STATION\193646-STID-MAINLINE I-40PROPOSED.DGN



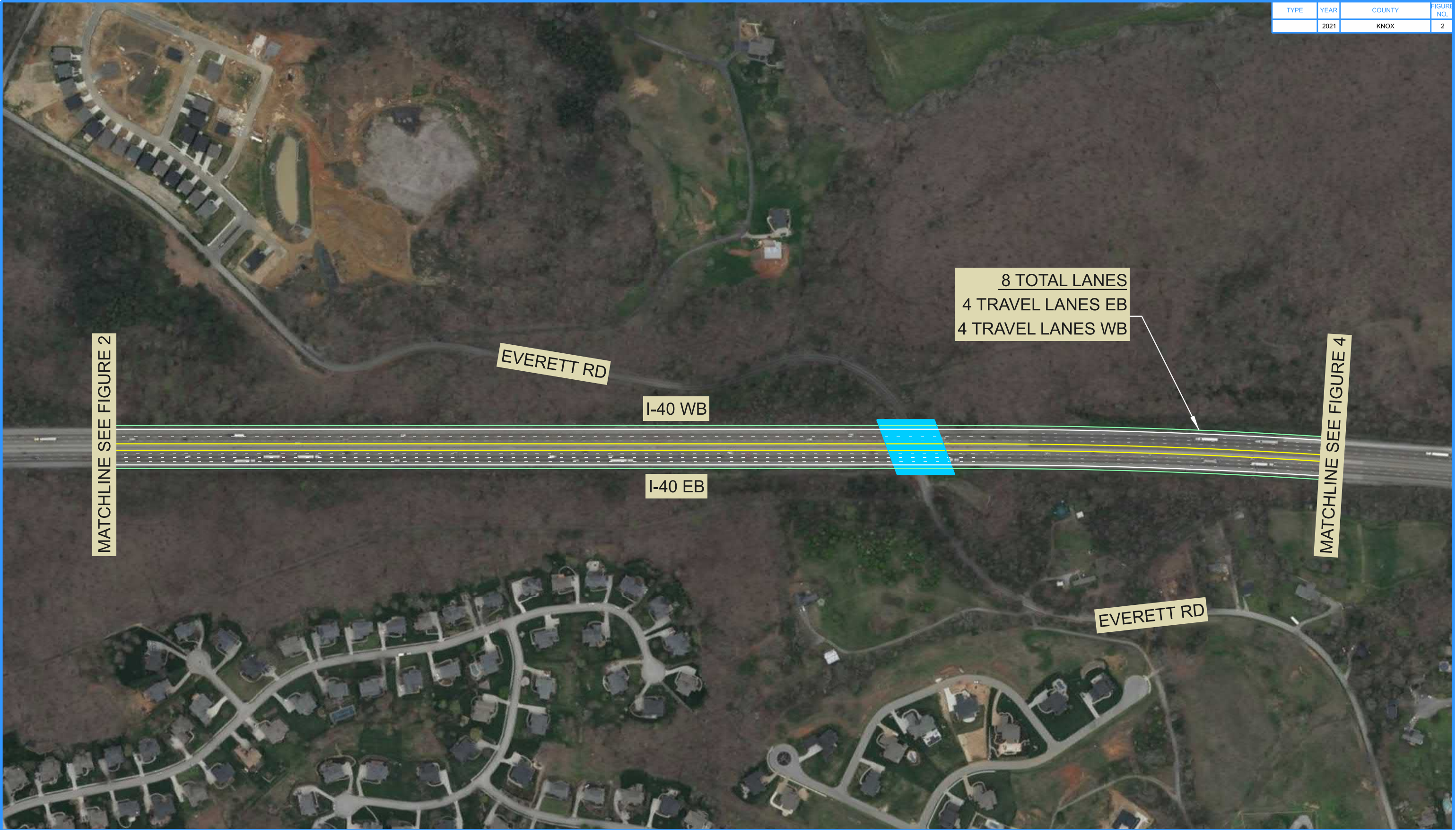
# TECHNICAL PLANNING REPORT

I-40 WIDENING  
FROM I-75 TO LOVELL ROAD  
KNOX COUNTY

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
S.T.I.D.

FIGURE 2

TYPE	YEAR	COUNTY	FIGURE NO.
	2021	KNOX	2



MATCHLINE SEE FIGURE 2

MATCHLINE SEE FIGURE 4

8 TOTAL LANES  
4 TRAVEL LANES EB  
4 TRAVEL LANES WB

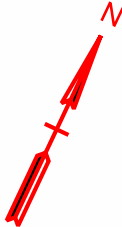
EVERETT RD

I-40 WB

I-40 EB

EVERETT RD

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# TECHNICAL PLANNING REPORT

I-40 WIDENING  
FROM I-75 TO LOVELL ROAD  
KNOX COUNTY

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
S.T.I.D.

FIGURE 3



TYPE	YEAR	COUNTY	FIGURE NO.
	2021	KNOX	4



# TECHNICAL PLANNING REPORT

I-40 WIDENING  
FROM I-75 TO LOVELL ROAD  
KNOX COUNTY

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
S.T.I.D.

FIGURE 4

1/28/2022 3:16:48 PM C:\USERS\WILLIAMSC\DESKTOP\CAMB STATION\193646-STID-MAINLINE I-40PROPOSED.DGN

TYPE	YEAR	COUNTY	FIGURE NO.
	2021	KNOX	5



MATCHLINE SEE FIGURE 4

MATCHLINE SEE FIGURE 6

8 TOTAL LANES  
4 TRAVEL LANES EB  
4 TRAVEL LANES WB

HATMAKER LN

I-40 WB

I-40 EB

FRETZ RD



# TECHNICAL PLANNING REPORT

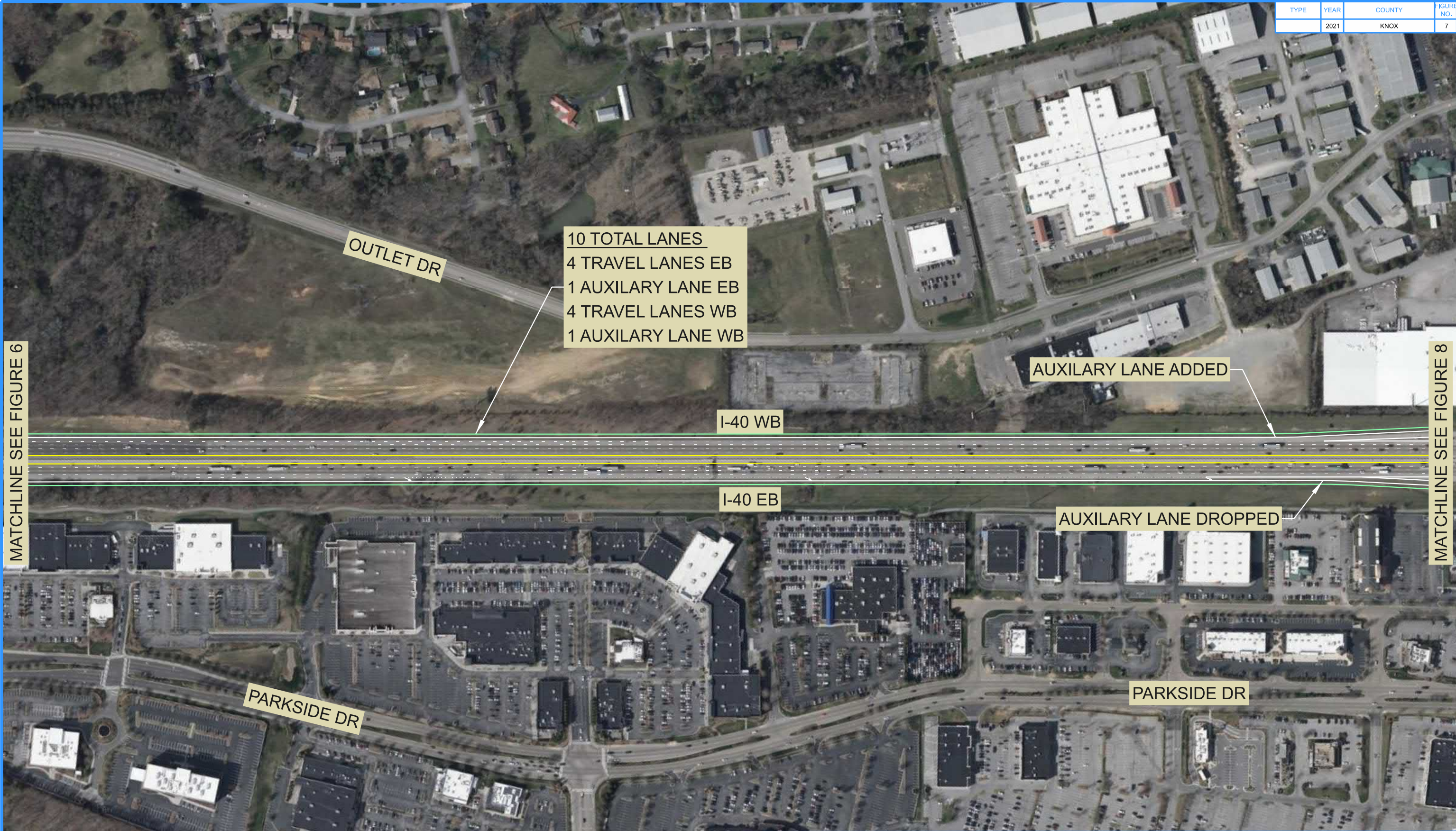
I-40 WIDENING  
FROM I-75 TO LOVELL ROAD  
KNOX COUNTY

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
S.T.I.D.

FIGURE 5



TYPE	YEAR	COUNTY	FIGURE NO.
	2021	KNOX	7



MATCHLINE SEE FIGURE 6

MATCHLINE SEE FIGURE 8



# TECHNICAL PLANNING REPORT

I-40 WIDENING  
FROM I-75 TO LOVELL ROAD  
KNOX COUNTY

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
S.T.I.D.

FIGURE 7





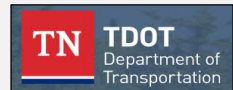
Interchange Improvements at Campbell Station Road (Exit 373)  
Knox County

## Appendix D - Cost Estimates

### Contents

Build Alternative #1 Cost Estimate  
Build Alternative #2 Cost Estimate  
Interstate Widening Cost Estimates


# COST ESTIMATE SUMMARY



Route:	Build Alternative #1 - Interstate Only
Termini:	
Scope of Work:	Widen I-40/75 to 8 lanes total and raise grade to meet standard clearance requirements (also remove existing bridge)
Project Type of Work:	Widen
County:	Knox
Length:	1.87 Miles
Date:	February 4, 2022
Estimate Type:	Concept

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
<b>Construction Items</b>				
Removal Items	\$0	\$0	\$0	\$382,000
Asphalt Paving	\$0	\$0	\$0	\$6,400,000
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$339,000
Appurtenances	\$0	\$0	\$0	\$0
Structures	\$0	\$0	\$0	\$5,770,000
Fencing	\$0	\$0	\$0	\$0
Signalization & Lighting	\$0	\$0	\$0	\$0
Railroad Crossing	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$0	\$4,890,000
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$84,600
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$31,900
Guardrail	\$0	\$0	\$0	\$203,000
Signing	\$0	\$0	\$0	\$18,100
Pavement Markings	\$0	\$0	\$0	\$32,400
Maintenance of Traffic	\$0	\$0	\$0	\$217,000
Mobilization 5%	\$0	\$0	\$0	\$918,000
Other Items and Annual Inflation 10%	\$0	\$0	\$0	\$1,930,000
Const. Contingency (Structures Not Included) 50%	\$0	\$0	\$0	\$7,720,000
Const. Eng. & Inspec. 10%	\$0	\$0	\$0	\$2,890,000
Construction Estimate	\$0	\$0	\$0	\$31,800,000
<b>Interchanges &amp; Unique Intersections</b>				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
<b>Right-of-Way &amp; Utilities</b>				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
Right-of-Way	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$0	\$0
<b>Preliminary Engineering</b>				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
Prelim. Eng. 7.8%	\$0	\$0	\$0	\$2,470,000
<b>Total Project Cost (2021)</b>	\$ -	\$ -	\$ -	\$ 34,300,000

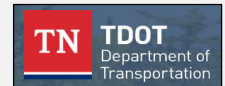
# COST ESTIMATE SUMMARY

<b>Route:</b>	<b>Build Alternative #1 - Campbell Station Road Improvements</b>	
<b>Termini:</b>	<b>Snyder Road to just south of Campbell Lakes Drive</b>	
<b>Scope of Work:</b>		
<b>Project Type of Work:</b>	<b>Modify Interchange</b>	
<b>County:</b>	<b>Knox</b>	
<b>Length:</b>	<b>1.73 Miles</b>	
<b>Date:</b>	<b>January 6, 2022</b>	
<b>Estimate Type:</b>	<b>Concept</b>	

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
<b>Construction Items</b>				
Removal Items	\$0	\$0	\$0	\$196,000
Asphalt Paving	\$0	\$0	\$0	\$1,790,000
Concrete Pavement	\$0	\$0	\$0	\$3,890,000
Drainage	\$0	\$0	\$0	\$633,000
Appurtenances	\$0	\$0	\$0	\$456,000
Structures	\$0	\$0	\$0	\$408,000
Fencing	\$0	\$0	\$0	\$0
Signalization & Lighting	\$0	\$0	\$0	\$750,000
Railroad Crossing	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$0	\$2,370,000
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$37,700
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$0
Guardrail	\$0	\$0	\$0	\$68,300
Signing	\$0	\$0	\$0	\$10,600
Pavement Markings	\$0	\$0	\$0	\$26,200
Maintenance of Traffic	\$0	\$0	\$0	\$157,000
Mobilization	5% \$0	\$0	\$0	\$540,000
Other Items and Annual Inflation	10% \$0	\$0	\$0	\$1,130,000
Const. Contingency (Structures Not Included)	40% \$0	\$0	\$0	\$4,820,000
Const. Eng. & Inspec.	10% \$0	\$0	\$0	\$1,730,000
<b>Construction Estimate</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$19,000,000</b>
<b>Interchanges &amp; Unique Intersections</b>				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
<b>Right-of-Way &amp; Utilities</b>	<b>LOCAL</b>	<b>STATE</b>	<b>FEDERAL</b>	<b>TOTAL</b>
	0%	0%	0%	
Right-of-Way	\$0	\$0	\$0	\$1,120,000
Utilities	\$0	\$0	\$0	\$2,800,000
<b>Preliminary Engineering</b>	<b>LOCAL</b>	<b>STATE</b>	<b>FEDERAL</b>	<b>TOTAL</b>
	0%	0%	0%	
Prelim. Eng.	8.4% \$0	\$0	\$0	\$1,600,000
<b>Total Project Cost (2021)</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 24,500,000</b>

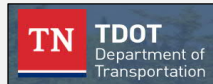
# COST ESTIMATE SUMMARY

<b>Route:</b>	Build Alternative #2 - DDI Concept
<b>Termini:</b>	I-40/75 WB Ramps to just south of Campbell Lakes Drive
<b>Scope of Work:</b>	
<b>Project Type of Work:</b>	Modify Interchange
<b>County:</b>	Knox
<b>Length:</b>	1.80 Miles
<b>Date:</b>	January 6, 2022
<b>Estimate Type:</b>	Concept



DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
<b>Construction Items</b>				
Removal Items	\$0	\$0	\$0	\$62,100
Asphalt Paving	\$0	\$0	\$0	\$2,040,000
Concrete Pavement	\$0	\$0	\$0	\$3,760,000
Drainage	\$0	\$0	\$0	\$546,000
Appurtenances	\$0	\$0	\$0	\$309,000
Structures	\$0	\$0	\$0	\$5,000,000
Fencing	\$0	\$0	\$0	\$0
Signalization & Lighting	\$0	\$0	\$0	\$750,000
Railroad Crossing	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$0	\$6,840,000
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$69,600
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$31,900
Guardrail	\$0	\$0	\$0	\$315,000
Signing	\$0	\$0	\$0	\$19,700
Pavement Markings	\$0	\$0	\$0	\$23,400
Maintenance of Traffic	\$0	\$0	\$0	\$229,000
Mobilization 5%	\$0	\$0	\$0	\$1,000,000
Other Items and Annual Inflation 10%	\$0	\$0	\$0	\$2,100,000
Const. Contingency (Structures Not Included) 40%	\$0	\$0	\$0	\$7,240,000
Const. Eng. & Inspec. 10%	\$0	\$0	\$0	\$3,030,000
<b>Construction Estimate</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$33,400,000</b>
<b>Interchanges &amp; Unique Intersections</b>				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
<b>Right-of-Way &amp; Utilities</b>	<b>LOCAL</b>	<b>STATE</b>	<b>FEDERAL</b>	<b>TOTAL</b>
	0%	0%	0%	
Right-of-Way	\$0	\$0	\$0	\$551,000
Utilities	\$0	\$0	\$0	\$1,540,000
<b>Preliminary Engineering</b>	<b>LOCAL</b>	<b>STATE</b>	<b>FEDERAL</b>	<b>TOTAL</b>
	0%	0%	0%	
Prelim. Eng. 7.5%	\$0	\$0	\$0	\$2,510,000
<b>Total Project Cost (2021)</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 38,000,000</b>

# COST ESTIMATE SUMMARY

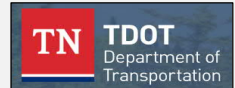


**Route:** Build Alternative #2 - Campbell Station Road Improvements north of I-40/75 WB Ramps  
**Termini:** I-40/75 WB Ramps to Snyder Rd  
**Scope of Work:**  
**Project Type of Work:** Construction-New  
**County:** Knox  
**Length:** 0.10 Miles  
**Date:** January 6, 2022  
**Estimate Type:** Concept

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
<b>Construction Items</b>				
Removal Items	\$0	\$0	\$0	\$0
Asphalt Paving	\$0	\$0	\$0	\$414,000
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$94,700
Appurtenances	\$0	\$0	\$0	\$111,000
Structures	\$0	\$0	\$0	\$0
Fencing	\$0	\$0	\$0	\$0
Signalization & Lighting	\$0	\$0	\$0	\$250,000
Railroad Crossing	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$0	\$560,000
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$2,000
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$0
Guardrail	\$0	\$0	\$0	\$10,800
Signing	\$0	\$0	\$0	\$1,400
Pavement Markings	\$0	\$0	\$0	\$3,000
Maintenance of Traffic	\$0	\$0	\$0	\$72,200
Mobilization 5%	\$0	\$0	\$0	\$76,000
Other Items and Annual Inflation 10%	\$0	\$0	\$0	\$160,000
Const. Contingency (Structures Not Included) 30%	\$0	\$0	\$0	\$527,000
Const. Eng. & Inspec. 10%	\$0	\$0	\$0	\$228,000
<b>Construction Estimate</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$2,510,000</b>
<b>Interchanges &amp; Unique Intersections</b>				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
<b>Right-of-Way &amp; Utilities</b>				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
Right-of-Way	\$0	\$0	\$0	\$273,000
Utilities	\$0	\$0	\$0	\$0
<b>Preliminary Engineering</b>				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
Prelim. Eng. 10.0%	\$0	\$0	\$0	\$251,000
<b>Total Project Cost (2021)</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 3,030,000</b>

# COST ESTIMATE SUMMARY

Route:	I-40/75
Termini:	From I-40/75 system interchange to Lovell Road (SR-131)
Scope of Work:	Widen from 6 lanes total to 8 lanes total
Project Type of Work:	Widen
County:	Knox
Length:	6.14 Miles
Date:	January 31, 2022
Estimate Type:	Concept



DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
<b>Construction Items</b>				
Removal Items	\$0	\$0	\$0	\$853,000
Asphalt Paving	\$0	\$0	\$0	\$18,800,000
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$1,600,000
Appurtenances	\$0	\$0	\$0	\$0
Structures	\$0	\$0	\$0	\$12,600,000
Fencing	\$0	\$0	\$0	\$0
Signalization & Lighting	\$0	\$0	\$0	\$0
Railroad Crossing	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$0	\$6,710,000
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$163,000
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$95,700
Guardrail	\$0	\$0	\$0	\$295,000
Signing	\$0	\$0	\$0	\$41,100
Pavement Markings	\$0	\$0	\$0	\$256,000
Maintenance of Traffic	\$0	\$0	\$0	\$432,000
Mobilization	5%	\$0	\$0	\$2,090,000
Other Items and Annual Inflation	10%	\$0	\$0	\$4,390,000
Const. Contingency (Structures Not Included)	30%	\$0	\$0	\$10,700,000
Const. Eng. & Inspec.	10%	\$0	\$0	\$5,900,000
<b>Construction Estimate</b>		\$0	\$0	\$64,900,000
<b>Interchanges &amp; Unique Intersections</b>				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
<b>Right-of-Way &amp; Utilities</b>	<b>LOCAL</b>	<b>STATE</b>	<b>FEDERAL</b>	<b>TOTAL</b>
	0%	0%	0%	
Right-of-Way	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$0	\$0
<b>Preliminary Engineering</b>	<b>LOCAL</b>	<b>STATE</b>	<b>FEDERAL</b>	<b>TOTAL</b>
	0%	0%	0%	
Prelim. Eng.	5.5%	\$0	\$0	\$3,540,000
<b>Total Project Cost (2021)</b>	\$ -	\$ -	\$ -	\$ 68,400,000

# COST ESTIMATE SUMMARY



Route:	I-40/75
Termini:	Auxiliary lane in each direction from Campbell Station Road to Lovell Road (SR-131)
Scope of Work:	
Project Type of Work:	Widen
County:	Knox
Length:	1.14 Miles
Date:	January 6, 2022
Estimate Type:	Concept

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
<b>Construction Items</b>				
Removal Items	\$0	\$0	\$0	\$200,000
Asphalt Paving	\$0	\$0	\$0	\$3,670,000
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$321,000
Appurtenances	\$0	\$0	\$0	\$0
Structures	\$0	\$0	\$0	\$0
Fencing	\$0	\$0	\$0	\$0
Signalization & Lighting	\$0	\$0	\$0	\$0
Railroad Crossing	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$0	\$1,370,000
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$30,200
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$0
Guardrail	\$0	\$0	\$0	\$45,200
Signing	\$0	\$0	\$0	\$5,600
Pavement Markings	\$0	\$0	\$0	\$56,600
Maintenance of Traffic	\$0	\$0	\$0	\$114,000
Mobilization 5%	\$0	\$0	\$0	\$291,000
Other Items and Annual Inflation 10%	\$0	\$0	\$0	\$610,000
Const. Contingency (Structures Not Included) 30%	\$0	\$0	\$0	\$2,010,000
Const. Eng. & Inspec. 10%	\$0	\$0	\$0	\$872,000
Construction Estimate	\$0	\$0	\$0	\$9,600,000
<b>Interchanges &amp; Unique Intersections</b>				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
<b>Right-of-Way &amp; Utilities</b>				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
Right-of-Way	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$0	\$0
<b>Preliminary Engineering</b>				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	0%	
Prelim. Eng. 10.0%	\$0	\$0	\$0	\$960,000
<b>Total Project Cost (2021)</b>	\$ -	\$ -	\$ -	\$ 10,600,000