

MEMORANDUM

To: Anna Dearman, AICP
Nashville Department of Transportation and Multimodal Infrastructure (NDOT)

From: Leo Espelet, P.E.
Alainie Sawtelle, E.I.

Date: June 22, 2023

RE: ***East Nashville Spokes Background Growth Process and Assumptions***

This memo identifies the methodology for estimating the potential background traffic growth rate (i.e., background growth) within the study area for the East Nashville Spokes Bikeway Project needed to complete the 2043 Horizon Year traffic analysis.

Introduction

Three sources were identified in the original scope of the study as references for estimating the anticipated background growth:

1. Greater Nashville Regional Council (GNRC) Travel Demand Model
2. Connect Downtown Planning Study
3. East Bank Mobility Study

Kimley-Horn communicated with GNRC and learned that their Travel Demand Model was last updated in 2017 and does not include any anticipated East Bank redevelopment traffic volumes. Therefore, it was determined that the use of the existing model would provide inadequate information for estimating the background growth.

Connect Downtown Planning study was also considered in the evaluation. It was determined that there was a minimal overlap between the East Nashville Spokes project study area and the study area used in the Connect Downtown Planning document. Furthermore, the Connect Downtown Planning study determined a 3% growth per year for the overlap intersection, and it was determined that the 3% was likely a very conservative assumption for estimating background growth, and additional research was needed.

The last available source was the East Bank Planning Mobility Study, which had more overlap and relevance to the East Nashville Spokes study network, and the therefore, determined to be a more accurate source for estimating background traffic growth.

East Bank Mobility Study Trip Generation

The East Bank Mobility Study developed estimated traffic generation based on four development areas (1. South of Shelby, 2. Central Waterfront, 3. North of Main, 4. River North) based on predicted development intensity and uses.

Table 1 presents the total trip generation in each of the study areas, as well as the trip generation used for the East Nashville Spokes project based on the percentages on each road.

Table 1: Trip Generation							
East Bank Area	Daily	AM Peak Hour			PM Peak Hour		
		Total	Enter	Exit	Total	Enter	Exit
South of Shelby	57,437	3,046	2,076	970	5,661	2,565	3,096
Central Waterfront	40,214	1,563	1,051	512	3,912	1,931	1,981
North of Main	53,846	2,532	1,765	767	5,224	2,408	2,816
River North	93,755	4,691	3,426	1,265	9,122	4,024	5,098
Pools of Trip Generation Relevant to Spokes							
Woodland Trips	9,311	447	312	135	909	418	491
Shelby Trips	5,882	283	198	85	574	264	311
Davidson Trips	5,882	283	198	85	574	264	311

East Bank Mobility Study Trip Distribution

The East Bank Mobility Study developed estimated traffic distributions based on four development areas (1. South of Shelby, 2. Central Waterfront, 3. North of Main, 4. River North) and surrounding transportation network and freeway access points.

Figure 1 shows the assumed general traffic distributions from the East Bank Mobility Study.

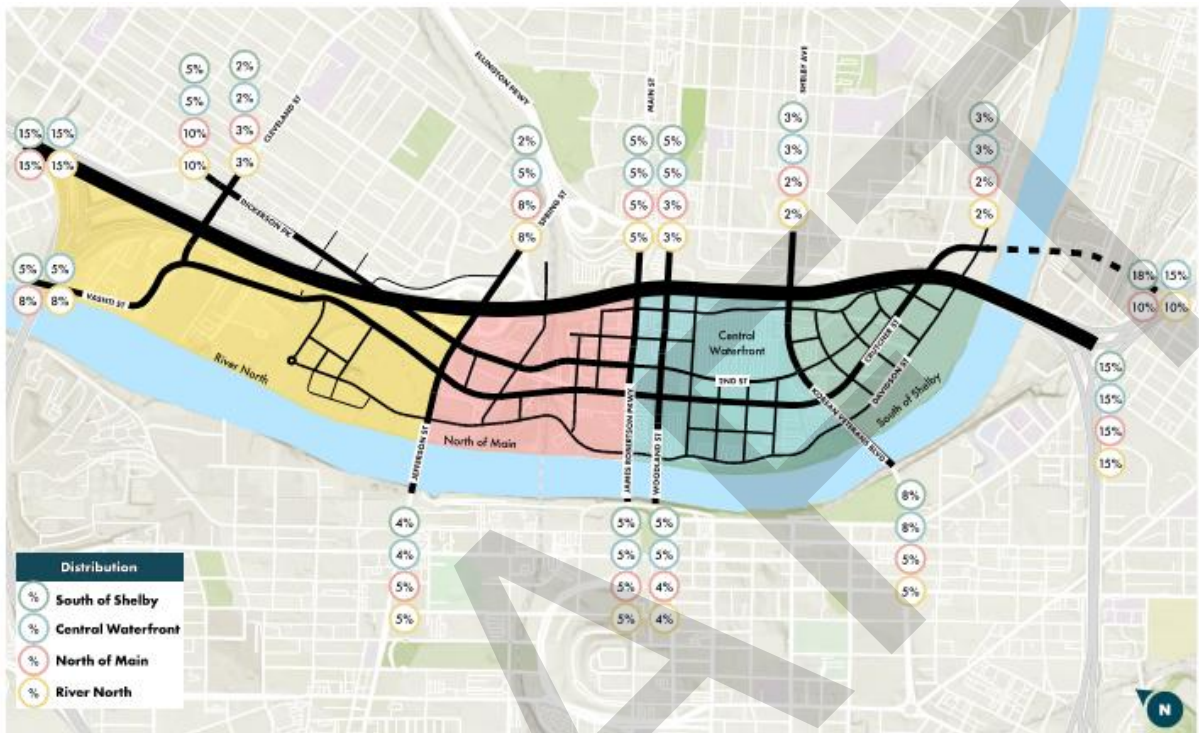
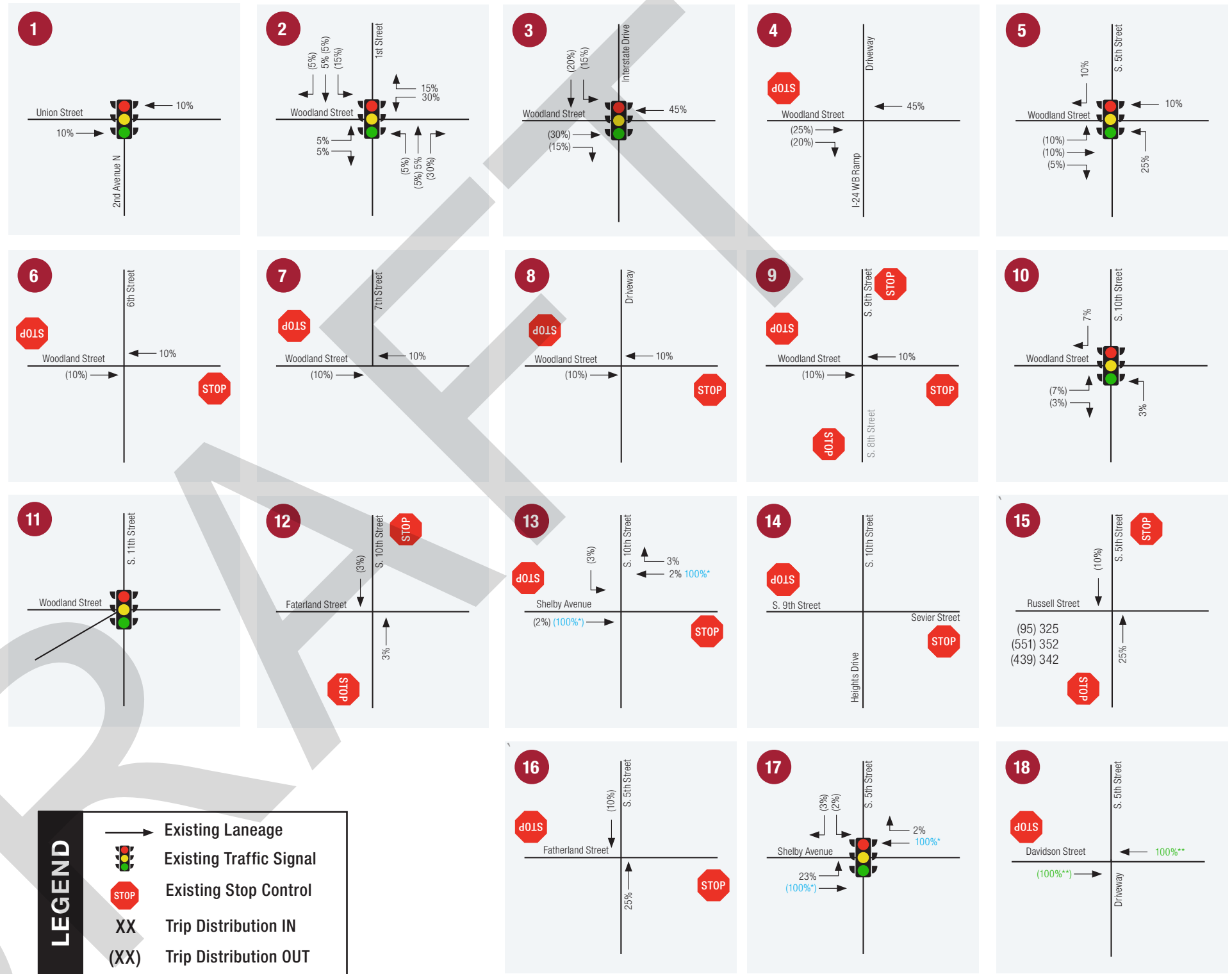
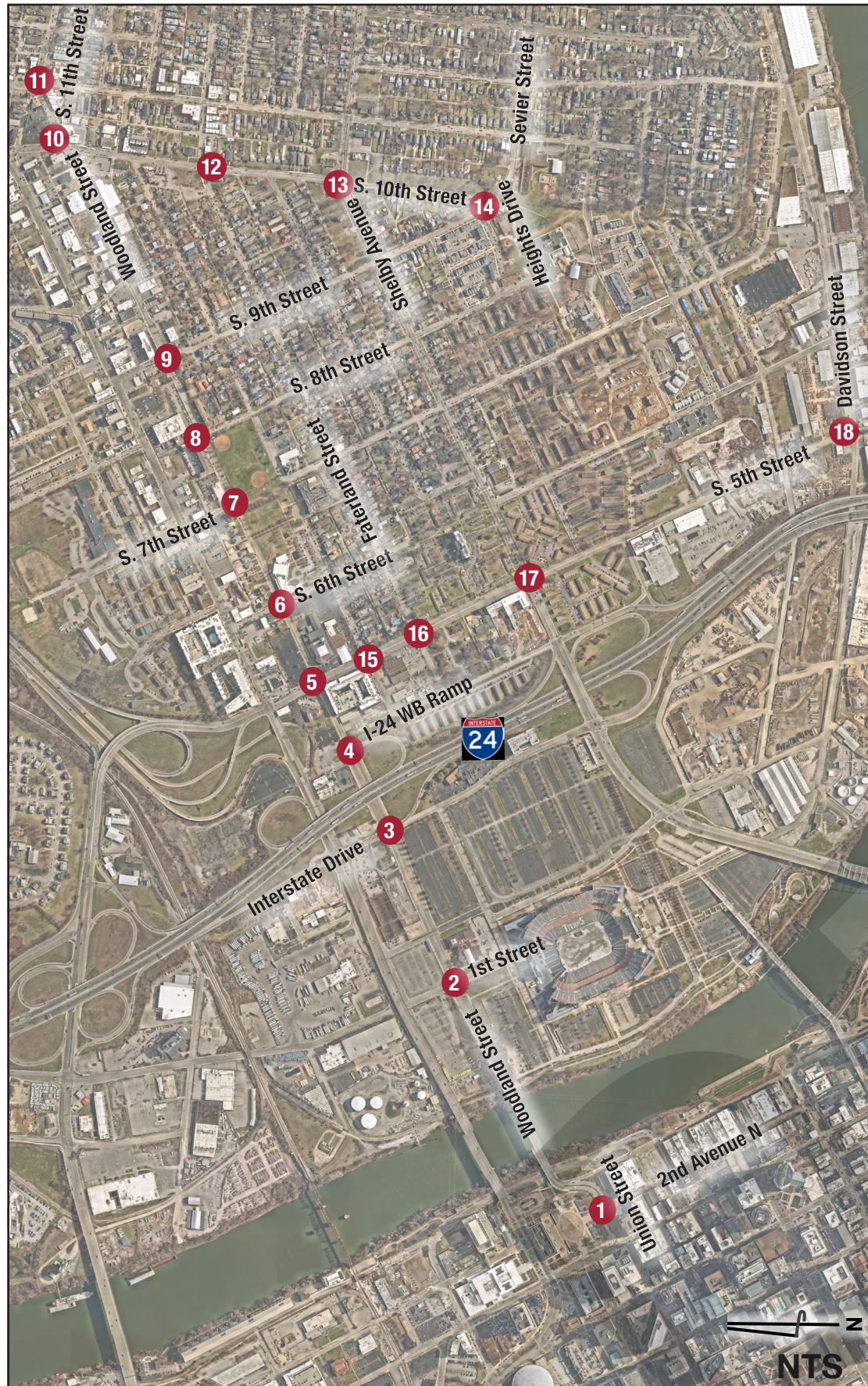


Figure 1: East Bank Mobility Study Trip Distributions

Using the same assumed distributions, the anticipated traffic that would travel within the East Nashville Spokes study area (Woodland Avenue, 5th Street and 10th Street) was determined. The generated trips from Table 1 were then distributed through the network using the distributions shown in **Figure 1**.

Figure 2 presents the trip distributions assumed through the network for the East Bank Mobility Study.



Note: *Shelby Ave Trips, **Davidson Street Trips, otherwise assume Woodland Street Trips

Background Growth Calculations

Once the East Bank Development trips were distributed through the network, a 20-year growth rate was calculated for each intersection movement as compared to existing traffic counts.

Table 2 presents the 20-year growth rate for each movement for AM and PM peak periods for each intersection.

Table 2: Growth by Movement and Time of Day (2023-2043)

Intersection Number	Peak Hour	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1	AM	-	1.16%	-	-	0.14%	-	0.00%	-	0.00%	-	-	-
	PM	-	0.55%	-	-	0.80%	-	0.00%	-	0.00%	-	-	-
2	AM	1.48%	0.00%	3.53%	16.10%	0.00%	3.70%	0.85%	1.32%	16.58%	2.18%	0.75%	0.17%
	PM	0.69%	0.00%	1.71%	18.97%	0.00%	3.65%	3.87%	1.00%	13.37%	2.81%	0.86%	0.72%
3	AM	-	1.83%	1.22%	0.00%	1.99%	-	-	-	-	5.03%	0.16%	0.00%
	PM	-	0.54%	0.35%	0.00%	5.11%	-	-	-	-	2.14%	0.16%	0.00%
4	AM	0.00%	1.93%	2.97%	0.00%	1.05%	0.00%	-	-	-	0.00%	0.00%	0.00%
	PM	0.00%	1.51%	2.25%	0.00%	3.64%	0.00%	-	-	-	0.00%	0.00%	0.00%
5	AM	2.18%	1.42%	2.92%	0.00%	0.46%	0.00%	4.94%	0.00%	0.00%	0.00%	0.00%	1.74%
	PM	1.42%	1.12%	4.14%	0.00%	1.49%	0.00%	8.10%	0.00%	0.00%	0.00%	0.00%	5.05%
6	AM	0.00%	0.46%	0.00%	0.00%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	PM	0.00%	0.64%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
7	AM	0.00%	0.45%	-	-	0.36%	0.00%	-	-	-	0.00%	-	0.00%
	PM	0.00%	0.60%	-	-	0.93%	0.00%	-	-	-	0.00%	-	0.00%
8	AM	0.00%	0.49%	0.00%	0.00%	0.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	PM	0.00%	0.61%	0.00%	0.00%	0.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
9	AM	0.00%	0.51%	0.00%	0.00%	0.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	PM	0.00%	0.68%	0.00%	0.00%	1.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10	AM	1.66%	0.00%	0.88%	0.00%	0.00%	0.00%	1.96%	0.00%	0.00%	0.00%	0.00%	1.51%
	PM	2.24%	0.00%	1.89%	0.00%	0.00%	0.00%	2.54%	0.00%	0.00%	0.00%	0.00%	2.24%
11	AM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	PM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
12	AM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.12%	0.00%
	PM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.23%	0.00%	0.00%	0.45%	0.00%
13	AM	0.00%	1.33%	0.00%	0.00%	1.26%	1.73%	0.00%	0.00%	0.00%	1.26%	0.00%	0.00%
	PM	0.00%	2.18%	0.00%	0.00%	2.36%	2.12%	0.00%	0.00%	0.00%	4.14%	0.00%	0.00%
14	AM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	PM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15	AM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.80%	0.00%	0.00%	0.13%	0.00%
	PM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.64%	0.00%	0.00%	0.39%	0.00%
16	AM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.87%	0.00%	0.00%	0.13%	0.00%
	PM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.00%	0.00%	0.41%	0.00%
17	AM	1.23%	0.72%	0.00%	0.00%	0.45%	0.39%	0.14%	0.00%	2.98%	0.00%	0.00%	0.00%
	PM	0.84%	1.52%	0.00%	0.00%	2.13%	0.37%	0.46%	0.00%	3.91%	0.00%	0.00%	0.00%
18	AM	0.00%	5.61%	-	-	2.57%	0.00%	-	-	-	0.00%	-	0.00%
	PM	0.00%	5.20%	-	-	5.84%	0.00%	-	-	-	0.00%	-	0.00%

The average growth rates for Woodland Street and Shelby Avenue were then calculated and presented in **Table 3**.

All Movements	0.65%
Shelby Avenue Through Movements	0.51%
Woodland Street Through Movements	0.88%

Since this represents average growth rates resulting only for the development of the East Bank Development, and since it is expected that additional growth would likely occur between now and the Year 2043, to account for this additional growth, the calculated averages were rounded up. As a result, it was determined a 1% growth rate for all movements on Woodland Street and 0.75% for all other movements.

CONCLUSIONS

Based on the above described methodology, a 1% yearly growth rate was determined as appropriate for estimating background growth on Woodland Street, with a 0.75% yearly growth rate for all other movements.

We hope this information is helpful. Please contact us at leo.espelet@kimley-horn.com or alainie.sawtelle@kimley-horn.com should you have any questions.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

Leo Espelet, P.E.
Alainie Sawtelle E.I