May 2023

Downtown Tyler Traffic Study

Tyler Area MPO and City of Tyler

Prepared by
Kimley»Horn
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Traffic Operations Analysis

Downtown Tyler Traffic Study
Tyler, Texas

PRELIMINARY			
Kimley»Horn			
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I. INTRODUCTION

The Tyler Area Metropolitan Planning Organization (MPO) has retained Kimley-Horn to evaluate a Traffic Study for Downtown Tyler. With planned growth and revitalization in the downtown area, future traffic volumes were developed by modeling several expected developments, including the relocation of the Smith County Courthouse, along with a conservative growth rate to develop future traffic volumes for the 2032 identified study year. The existing one-way street network was also evaluated for a possible conversion to a two-way street network. Along several of these one-way streets are nine signalized intersections that currently operate in red flashing mode. Traffic signal warrants were analyzed for these nine intersections along with an intersection control analysis. In addition, a road diet was evaluated along Broadway Avenue between Front Street and Gentry Parkway in which two options are presented. This analysis includes the rerouting of existing traffic throughout the street network to model the effects of a potential road diet on Broadway Avenue. Impacts to the surrounding roadways and intersections were analyzed and ultimate recommendations are given for the lane configuration and traffic control along Broadway Avenue. The purpose of this study is to evaluate the operations and feasibility of these changes to of Downtown Tyler, in hopes to promote revitalization and make the area a “Destination Downtown”.

II. EXISTING TRAFFIC CONDITIONS

A. Existing Roadway Network

The major study area includes the following existing intersections as part of this study:

1. Gentry Parkway at Palace Avenue
2. Gentry Parkway at Broadway Avenue
3. Gentry Parkway at Beckham Avenue
4. Front Street at Palace Avenue
5. Front Street Broadway Avenue
6. Front Street at Beckham Avenue

There are nine additional signalized intersections on the west side of the study area that currently operate on red flash. The red flash implementation began in November 2021 and has remained in place since then. These intersections were evaluated for traffic control analysis and are as described below:

1. Bonner Avenue at Ferguson Street
2. Bonner Avenue at Erwin Street
3. Bonner Avenue at Elm Street
4. Bois D’Arc Avenue at Ferguson Street
5. Bois D’Arc Avenue at Erwin Street
6. Bois D’Arc Avenue at Elm Street
7. College Avenue at Ferguson Street
8. College Avenue at Erwin Street
9. College Avenue at Elm Street

The major study area roadways are described below:

Broadway Avenue – is currently an undivided five-lane roadway that travels north-south through the center of Downtown Tyler. The speed limit along Broadway Avenue is 30 mph between Front Street and Line Street and increases to 35 mph between Line St at Gentry Parkway.

Front Street – is a five-lane undivided road that runs east-west south of Downtown Tyler. The speed limit along Front Street is 35 mph.

Palace Avenue – is a five-lane undivided road that runs north-south on the west side of Downtown Tyler. The speed limit along Palace Avenue is 35 mph.

Gentry Parkway – is an eight-lane undivided road that runs east-west north of Downtown Tyler. The speed limit along Gentry Parkway is 45 mph.

Beckham Avenue – is a five-lane undivided road that runs north-south on the east side of Downtown Tyler. The speed limit along Beckham Avenue is 35 mph.

There are five streets that currently serve one-way traffic in certain segments of the downtown grid. These streets are as described below:

- Locust Street, from Broadway Avenue to Center Avenue
- Ferguson Street, from Bonner Avenue to Center Avenue
- Erwin Street, from Bois D'Arc Avenue to Center Avenue
- College Avenue, from Locust Street to Elm Street
- Spring Avenue, from Line Street to Elm Street

Exhibit 1 illustrates a vicinity map of the study intersections including the major roadways. **Exhibit 2** displays the existing intersection geometry used for the traffic analysis.

B. Existing Traffic Volumes

Exhibit 3 shows the existing weekday AM and PM peak hour traffic volumes. For the study intersections along Front Avenue, traffic counts were taken on Tuesday, April 5, 2022. The remaining traffic counts were taken on Wednesday, October 5, 2022. 24-hour machine counts were collected near the site on several of the major roadways including Broadway Avenue, Palace Avenue, Gentry Parkway, Beckham Avenue, Locust Street, Spring Avenue, and Erwin Street. The raw count sheets, as well as a comparison between the 24-hour volumes collected and previous 24-hour counts, are provided in **Volume 2** of this report. No adjustments were made to the existing traffic counts.

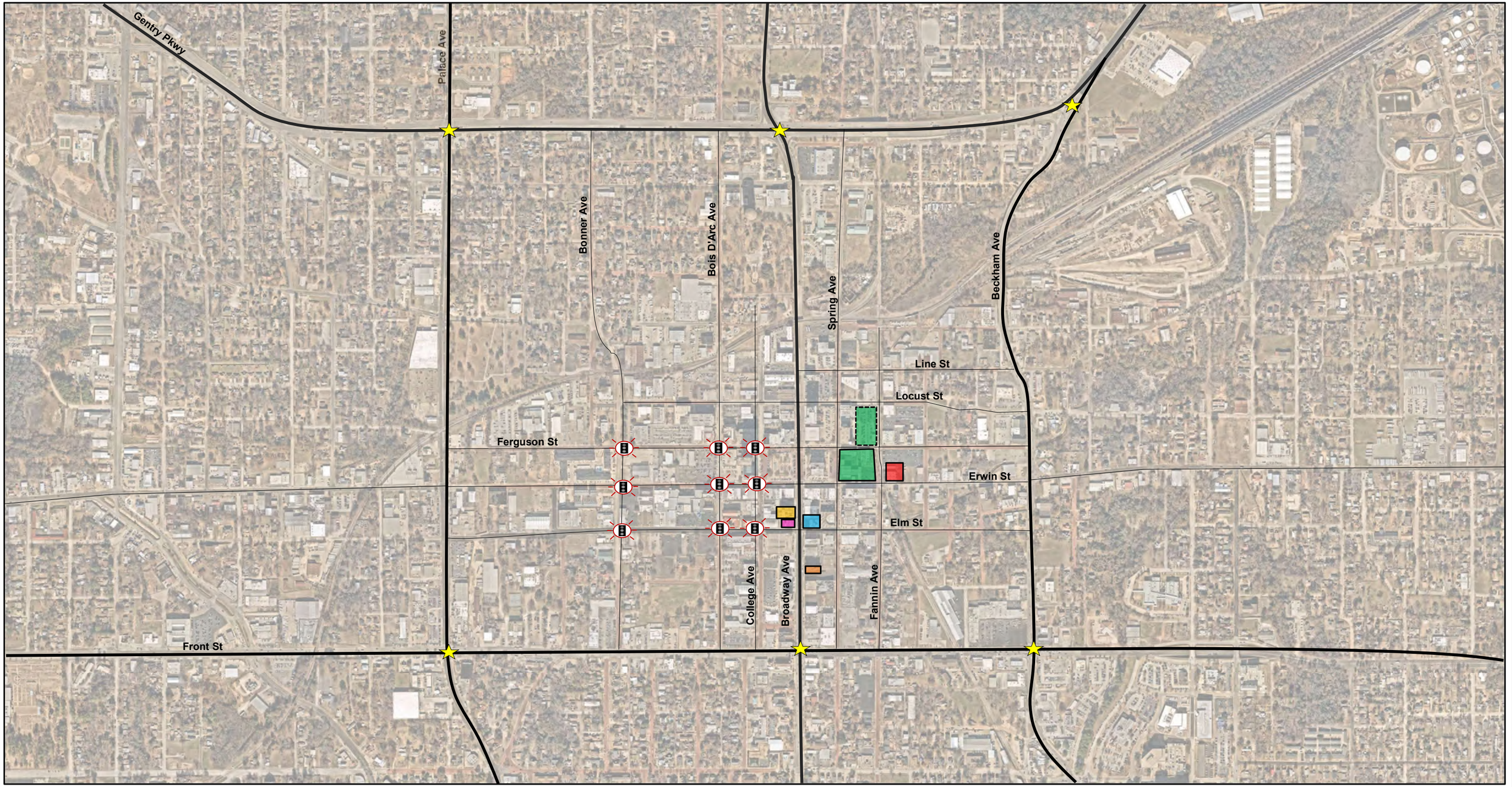


EXHIBIT 1

Vicinity Map

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:

- Prop. Courthouse
- Prop. Parking Garage
- Onyx + Misc. Apartments
- The Wilcox
- The Lindsey
- The Fair
- The Carlton
- Existing Signal on Flash Mode
- Study Intersection

North

Not To Scale

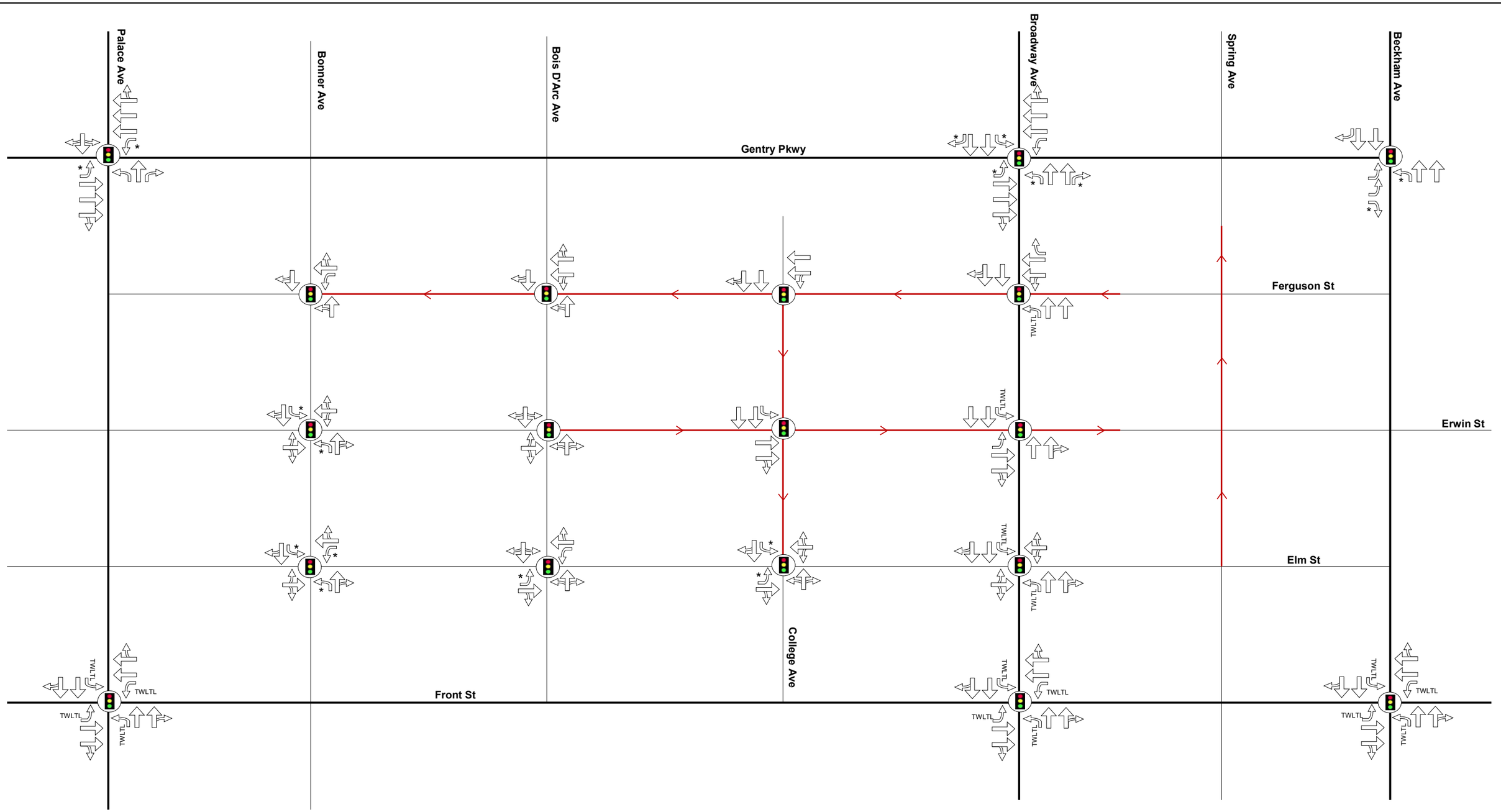


EXHIBIT 2

2022 Existing Lane Assignment and Intersection Control

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:

= Signalized Intersection
STOP = Stop-Controlled Approach
= Travel Lane
* = Turn Bay
= Driveway Lanes or Off-Site Improvements
TWLTL = Two-Way Left Turn Lane

North

Not To Scale

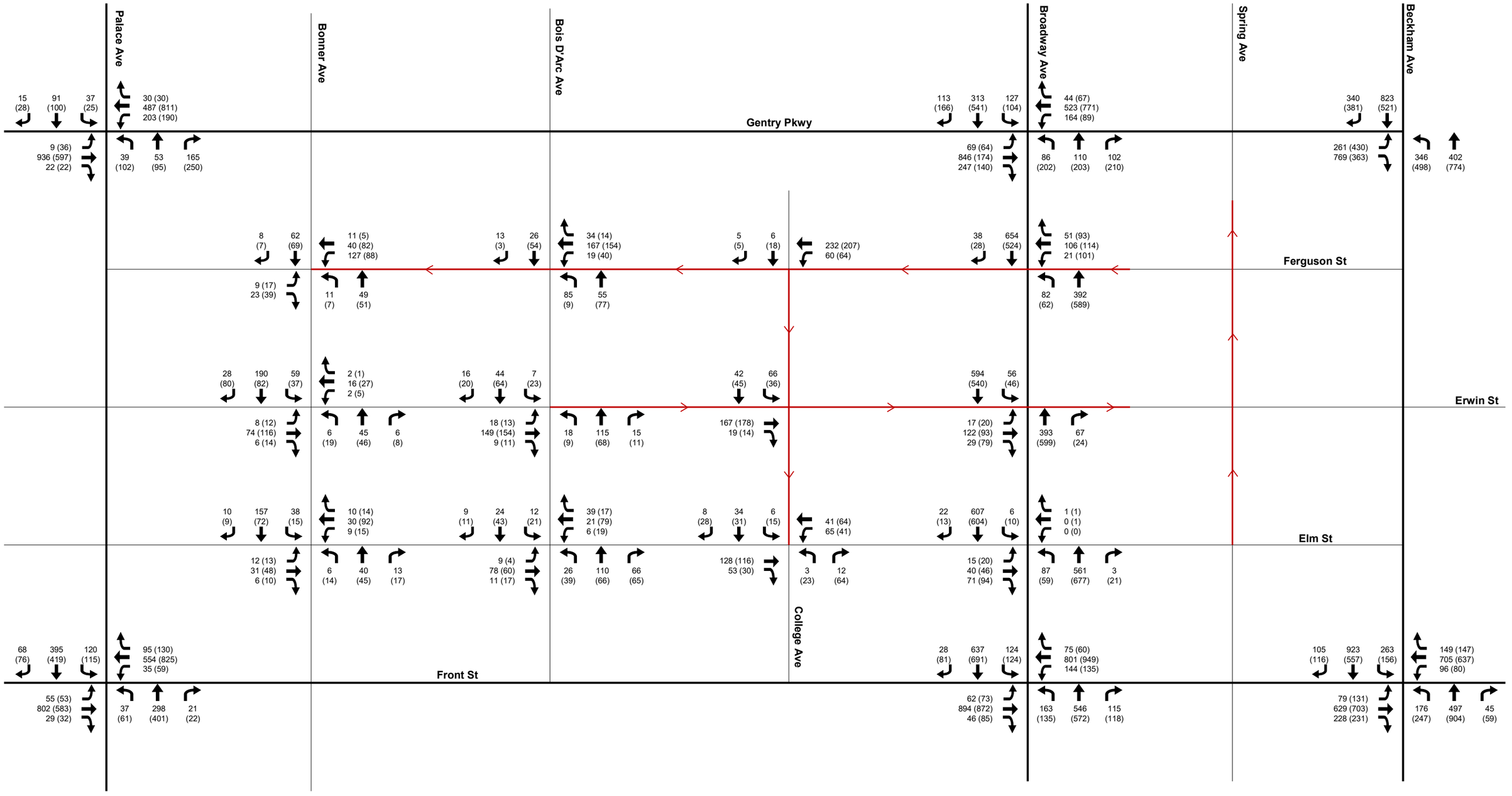


EXHIBIT 3

2022 Existing Traffic Volumes

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

III. FUTURE TRAFFIC CONDITIONS

A. Site-Generated Traffic

The following proposed developments were included in the analysis:

- The Fair Building, an office and commercial development
- The Carlton Building, a multifamily residential and commercial development
- Wilcox Tower, a multifamily residential development
- The Lindsey Building, a multifamily residential development
- Onyx Apartments, a multifamily residential development
- Proposed Courthouse, which includes the relocation and renovation of the existing Smith County Courthouse

These developments are located within Downtown Tyler and are expected to be complete by 2032. A Vicinity Map outlining the study area and proposed developments are shown in **Exhibit 1**.

Site-generated traffic estimates for these developments are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the 11th edition of Trip Generation Manual published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are one-way trips or trip ends, where one vehicle entering and exiting the site is counted as one inbound trip and one outbound trip.

No reductions were taken for pass-by trips, internal capture, or multimodal use.

Table 1 shows the resulting daily and weekday AM and PM peak hour trip generation for the proposed developments in downtown, showing new external trips.

Table 1 – Trip Generation (2032)

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Fair Building										
General Office Building	65,000	SF	820	798	102	14	116	20	96	116
Strip Retail Plaza (<40k)	26,000	SF	822	1,327	37	24	61	77	76	153
Carlton Building										
Multifamily Housing - High-Rise	102	Units	222	463	11	30	41	31	19	50
Strip Retail Plaza (<40k)	4,859	SF	822	265	7	4	11	24	23	47
Wilcox Tower										
Multifamily Housing - Mid-Rise	31	Units	221	101	0	2	2	7	5	12
Lindsey Building										
Multifamily Housing - Mid-Rise	50	Units	221	192	2	8	10	12	8	20
Onyx & Misc. Apartments										
Multifamily Housing - Mid-Rise	53	Units	221	206	3	9	12	13	8	21
Proposed Courthouse (Additional Trips*)										
Government Office Building	186,100	SF	730	4,204	467	155	622	80	238	318
Development Totals										
Total Net New External Vehicle Trips:				**7,556**	**629**	**246**	**875**	**264**	**473**	**737**

Trip Generation rates based on *ITE's Trip Generation Manual*, 11th Edition.

* Trips reflected under the Proposed Courthouse take into account the expected additional trips. The square footage is the difference between the

B. Trip Distribution and Assignment

The distribution of the site-generated traffic volumes in to and out of the downtown area was based on the area street system characteristics, existing traffic patterns, and relative land use density.

With the evaluation of the one-way streets potentially being converted to two-way streets, two distributions were created for each proposed site to portray both the one-way street and two-way street scenario. The corresponding inbound and outbound traffic assignment for each development, where the directional distribution is applied using the most probable paths to and from the site, can be found in **Volume 2**. The resulting site-generated weekday AM and weekday PM peak hour turning movements after multiplying the new external trip generation by the respective traffic assignment percentages is also shown in **Volume 2**.

C. Development of 2032 Traffic Volumes

To obtain 2032 background traffic, the existing traffic counts and historic counts near the site were compared to find expected growth trends within the study area. Since 2011, Downtown Tyler has seen a negative growth rate based on historical trends. However, for a conservative analysis, an annual growth rate of 1% was assumed for the background traffic through 2032. To calculate the 2032 background traffic, the existing 2022 traffic counts were grown by 1% annually for ten years. The expected traffic volumes from the proposed developments were also added to the network. **Exhibit 4** shows the resulting 2023 weekday AM and PM peak hour total traffic volumes. A summary of the historical volumes and growth rates in the study area can be found in **Volume 2**.

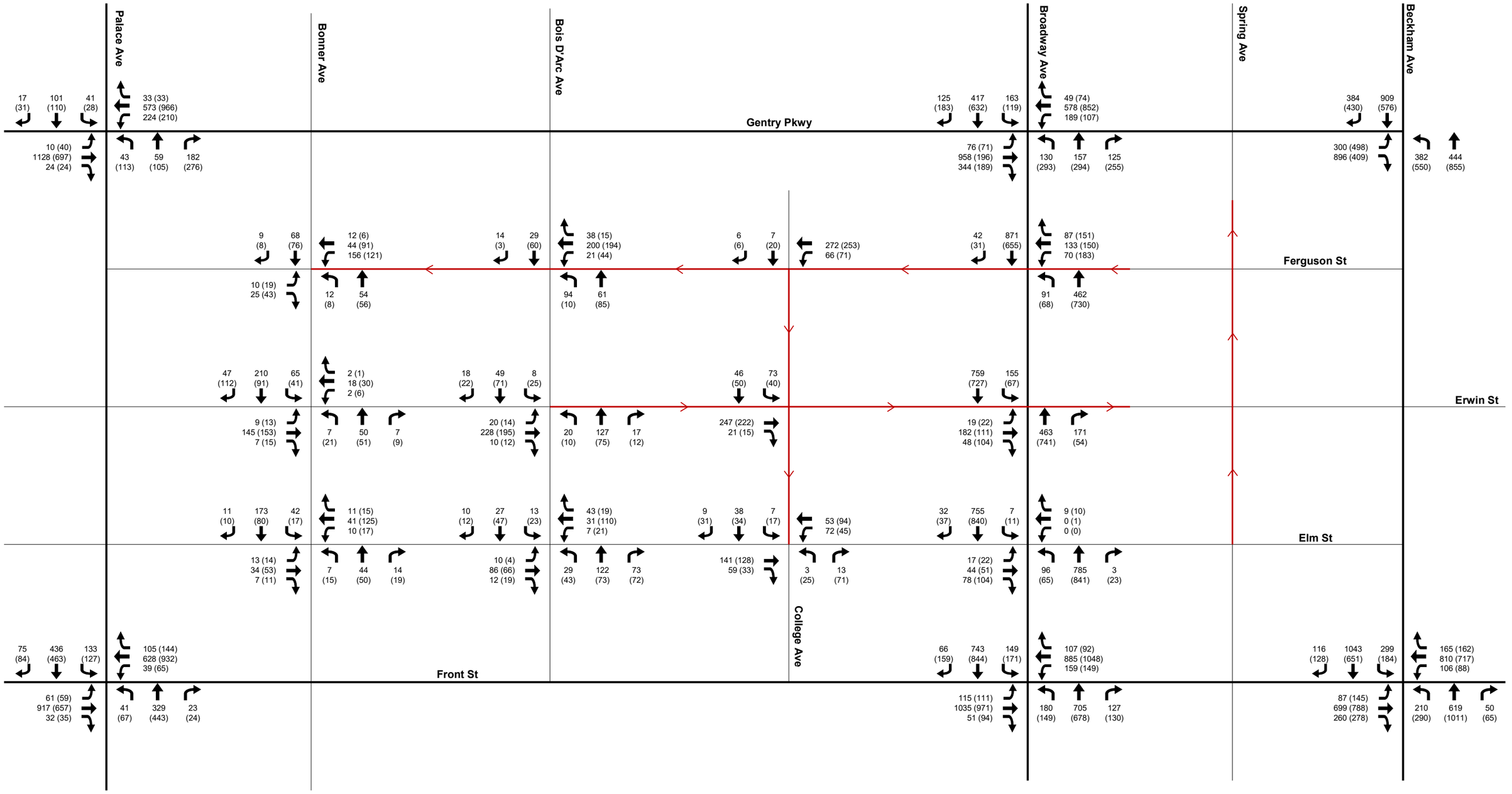


EXHIBIT 4

2032 Traffic Volumes (with No Mitigations)

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

IV. ONE-WAY TO TWO-WAY STREET EVALUATION

The one-way street network in Downtown Tyler was evaluated for the potential conversion of the one-way streets to two-way streets. Using StreetLight Data, which is a probe-based data platform, existing traffic patterns were evaluated for each of the one-way street segments in downtown. The data paired origins along a street segment with the destination in which a vehicle was traveling towards. For this analysis, the cardinal directions (north, south, east, west) served as the destination zones throughout downtown. Once these origin to destination patterns were determined, a percentage from each of the one-way streets was diverted to the adjacent one-way pair. For example, Ferguson Street, which currently serves westbound traffic, was paired with Erwin Street, which currently serves eastbound traffic. In this example, a calculated percentage of westbound trips on Ferguson Street were diverted to use Erwin Street based on the ultimate destination of the vehicle. This concept was applied for all segments of the one-way street network. The details of these changes are shown **Table 2** below.

Table 2 – One-Way to Two-Way Street Conversion

Roadway Segment	Origin Direction	North Destination	East Destination	South Destination	West Destination	Traffic to Divert to One-Way Pair	Traffic to be Removed
College Ave, Erwin to Elm	S	25%	10%	35%	30%	25%	13%
College Ave, Feguson to Erwin	S	25%	15%	45%	15%	50%	13%
College Ave, Locust to Ferguson	S	25%	20%	35%	20%	50%	13%
Erwin St, Bois D'Arc to College	E	35%	35%	20%	10%	64%	5%
Erwin St, Broadway to Spring	E	30%	45%	15%	10%	67%	5%
Erwin St, College to Broadway	E	40%	25%	25%	10%	62%	5%
Erwin St, Spring to Fannin	E	30%	45%	15%	10%	67%	5%
Ferguson St, Bois D'Arc to Bonner	W	30%	15%	20%	35%	40%	8%
Ferguson St, Broadway to College	W	30%	15%	20%	35%	40%	8%
Ferguson St, College to Bois D'Arc	W	25%	15%	20%	40%	44%	8%
Ferguson St, Fannin to Spring	W	35%	10%	20%	35%	36%	5%
Ferguson St, Spring to Broadway	W	35%	10%	25%	30%	42%	5%
Spring Ave, Elm to Erwin	N	40%	20%	20%	20%	75%	10%
Spring Ave, Ferguson to Erwin	N	45%	10%	25%	20%	50%	13%
Spring Ave, Ferguson to Locust	N	45%	20%	20%	15%	50%	10%

- College, south of Elm was not recorded as a destination so College Avenue south destinations were increased accordingly.

Exhibit 5 shows the resulting 2032 weekday AM and PM peak hour total traffic volumes after the one-way streets are converted to serve two-way traffic. The conversion of one-way to two-way streets can be a way to relieve confusion for vehicles that are new to the area and unfamiliar with the one-way street network, while also allowing vehicles easier access with more options to travel in and out of the downtown area. Section 3C below evaluates the traffic operation results at several intersections in downtown after the conversion of one-way to two-way streets. Overall, the two-way conversion does not have a negative impact on the street network and is recommended to be implemented in Downtown Tyler.

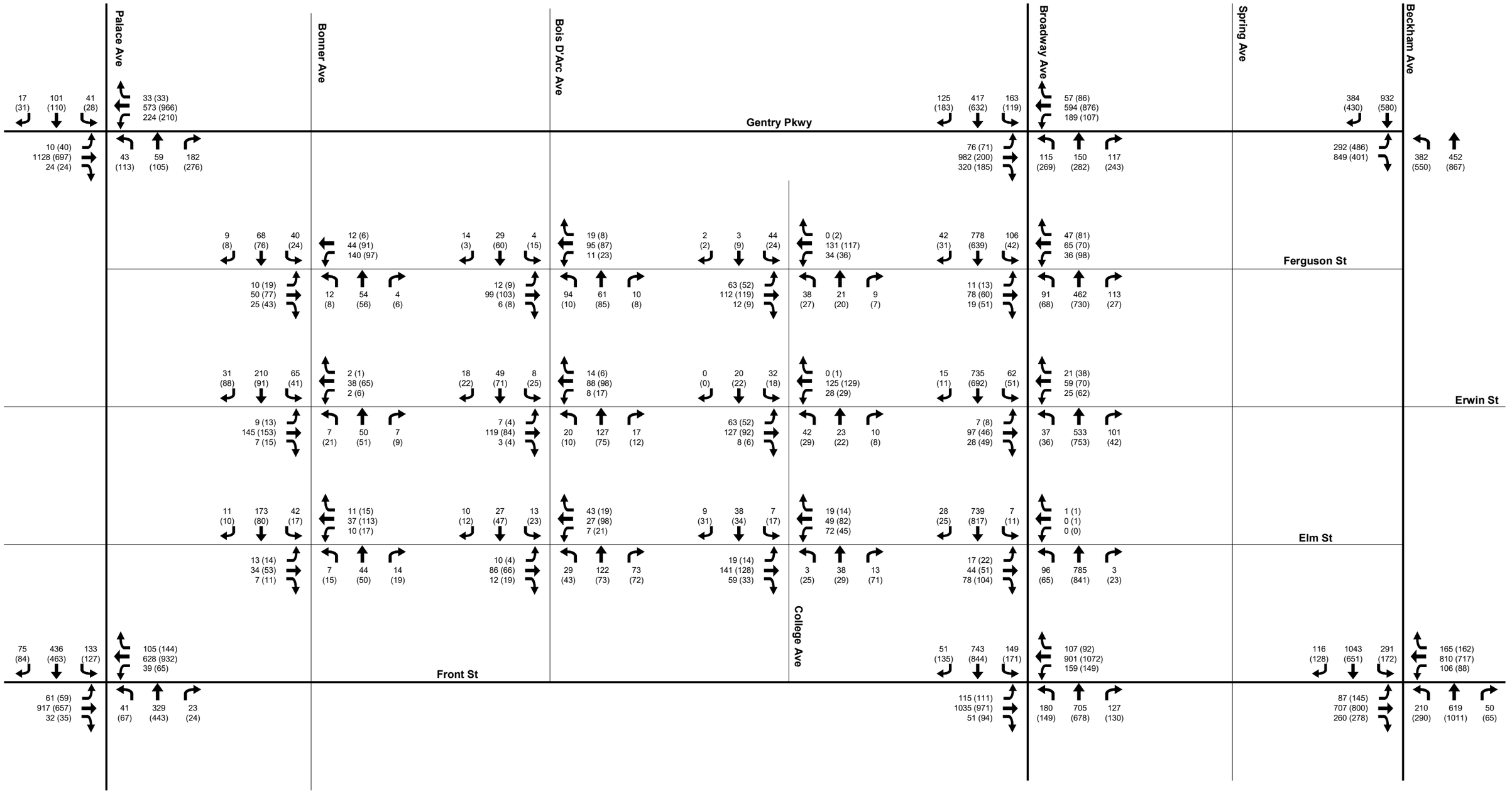


EXHIBIT 5

2032 Traffic Volumes (with One-Way to Two-Way Conversion)

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

V. INTERSECTION TRAFFIC CONTROL ANALYSIS

A traffic control analysis was performed at the nine signalized intersections on the west side of downtown that are currently operating in red flash mode. Traffic operations results were also analyzed for both the one-way and two-way street network scenarios.

A. Traffic Signal Warrant Analysis

Traffic signal warrant analyses (TSWA) were performed for the nine study intersections operating on red-flash mode using procedures outlined in the 2011 *Texas Manual on Uniform Traffic Control Devices* (TxMUTCD). The TxMUTCD identifies nine signal warrants as areas of analysis when investigating if a traffic signal would be justified at a location. For example, speed on the major road, population characteristics of the surrounding area, number of crashes, and distance to the nearest signal all impact the volumes needed to warrant a traffic signal. The satisfaction of a warrant is not a requirement that a signal be installed, but rather is a qualifier or an indication that a signal may be a net benefit to the community. Only the vehicle warrants (Warrants 1, 2, and 3) were evaluated for this analysis. The intersection scenarios were analyzed as shown below in **Table 3**.

Table 3 – TSWA Summary Results

Intersection	Signal Warrant Met? 2032 Traffic Volumes		Signalization Recommended?
	One-Way Street Network	Two-Way Street Network	
Bonner Ave @ Ferguson St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED
Bonner Ave @ Erwin St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED
Bonner Ave @ Elm St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED
Bois D'Arc Ave @ Ferguson St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED
Bois D'Arc Ave @ Erwin St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED
Bois D'Arc Ave @ Elm St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED
College Ave @ Ferguson St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED
College Ave @ Erwin St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED
College Ave @ Elm St	*Not Met*	*Not Met*	✕ NOT RECOMMENDED

The traffic signal warrant analysis worksheets are available in **Volume 2** of the memo. To warrant a signal, it is necessary to have 8 hours of volumes meeting the threshold for Warrant 1 and 4 hours for Warrant 2. As seen from the data above, none of the nine study intersections meet signal warrants in the 2032 scenario, including both scenarios with the one-way and two-way street network. Based on the results from the traffic signal warrant analysis, all nine intersections are recommended to be operated as stop controlled. Further recommendations for stop control are explained in the following section.

B. Analysis Methodology

The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual*. Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway

during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). **Table 4** shows the definition of level of service for signalized and unsignalized intersections.

Table 4 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Definitions provided from the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2010.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. For the unsignalized analysis, the level of service (LOS) for a two-way stop-controlled intersection is defined for each movement. Unlike signalized intersections which define LOS for each approach and for the intersection as a whole, LOS for two-way stop-controlled intersections is not defined as a whole. Calculations for the level of service at the key intersections identified for study are provided in **Volume 2** of this memo.

C. Stop Control Analysis

The nine study intersections were evaluated to determine the recommended traffic control of all-way stop control or two-way stop control. The proposed intersection control was determined based on traffic volumes, site distance, and expected pedestrian activity. A site visit was performed on February 2, 2023, to evaluate the existing site distance at each intersection approach. After evaluating the expected traffic volumes, none of the nine intersections meet All-Way Stop Control warrants based on traffic volumes along. However, due to site distance constraints and expected pedestrian activity, several of the intersections are recommended to be all-way stop controlled. **Exhibit 6** shows the future traffic control recommendations for each of the nine study intersections and identified constraints at each intersection. The All-Way Stop Control warrant worksheets can be found in **Volume 2**.

The following intersections are recommended to be two-way stop controlled:

- Bonner Ave at Ferguson St
- Bonner Ave at Erwin St

The following intersections are recommended to be all-way stop-controlled:

- Bonner Ave at Elm St
- Bois D'Arc Ave at Ferguson St
- Bois D'Arc Ave at Erwin St
- Bois D'Arc Ave at Elm St
- College Ave at Ferguson St
- College Ave at Erwin St
- College Ave at Elm St

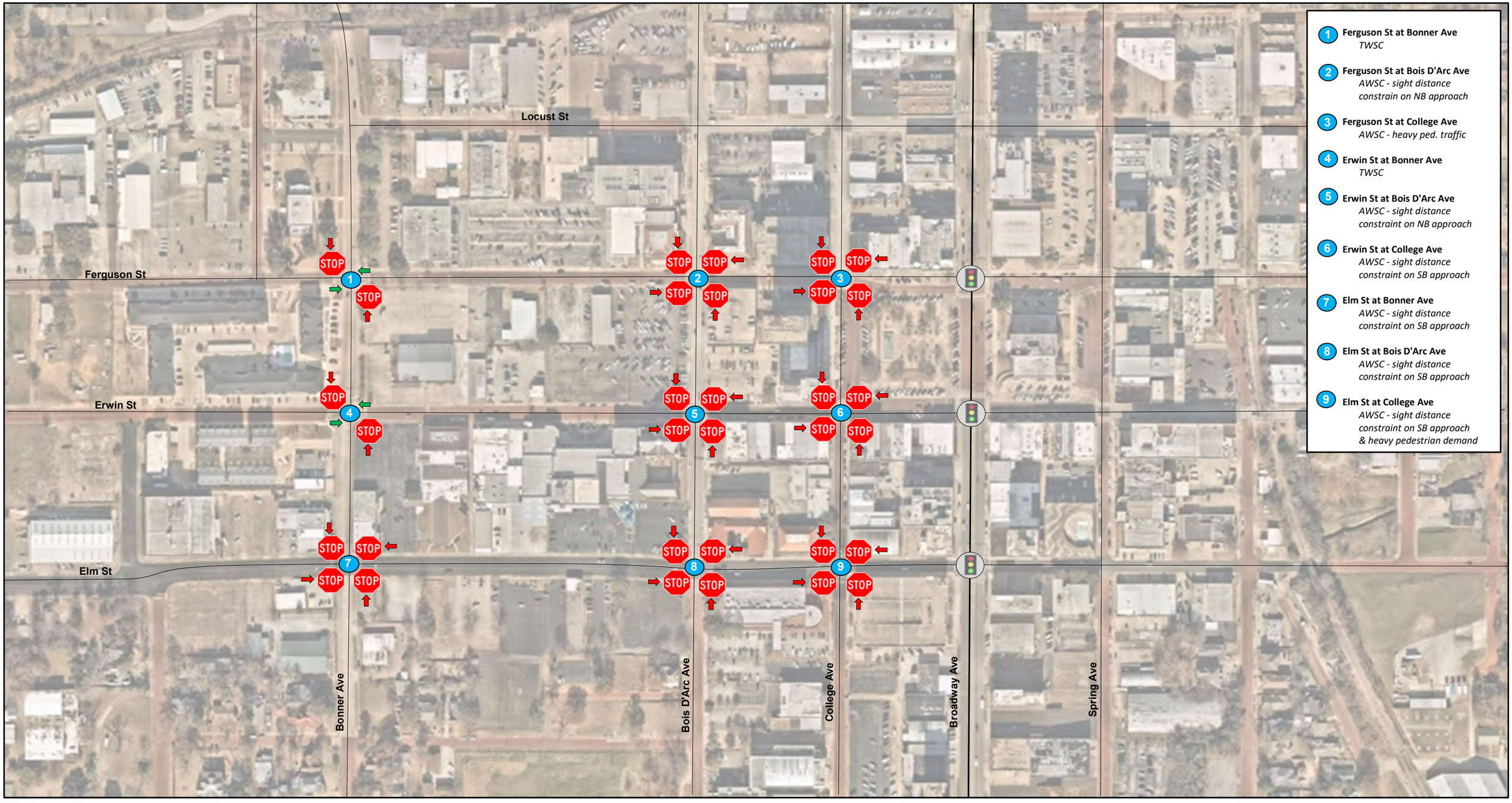


EXHIBIT 6

Proposed Traffic Control Recommendations (9 Intersections)

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:

Stop-Controlled Movement — STOP

Free Movement

Existing Signal

Study Intersection 1

North

Not To Scale

The traffic operation results were also compared for the existing one-way street configuration and the proposed two-way street configuration with the recommended traffic control at each intersection. **Table 5** displays the level of service results for these scenarios.

Table 5 – Level of Service Results – Nine Flashing Red Intersections

Roadway Segment	One-Way LOS Results with AWSC	Two-Way LOS Results		Configuration
		Total Average Delay	Worst Movement Delay	
Bonner Ave @ Ferguson St	B	A	C	TWSC
Bonner Ave @ Erwin St	B	A	C	TWSC
Bonner Ave @ Elm St	B	A	A	AWSC
Bois D'Arc Ave @ Ferguson St	A	A	A	AWSC
Bois D'Arc Ave @ Erwin St	B	A	A	AWSC
Bois D'Arc Ave @ Elm St	B	A	B	AWSC
College Ave @ Ferguson St	A	A	A	AWSC
College Ave @ Erwin St	A	A	A	AWSC
College Ave @ Elm St	A	B	B	AWSC

Note: Highest LOS C is equal to 18.1 seconds of delay in Two-Way Conversion Analysis

When compared to keeping the existing one-way street configuration, the nine intersections operate with similar delay or a minimal increase in delay when compared to the two-way street configuration. With favorable intersection results after the conversion, the one-way street network is recommended to be converted to a two-way street network.

VI. BROADWAY AVENUE ROAD DIET

A road diet is a term used to describe repurposing existing vehicular travel lanes to accommodate other street improvements, such as on-street parking, sidewalks, shared use paths, and landscaping. Road diets can be a way to repurpose underutilized space to rebalance the emphasis from an auto-dominated environment to accommodate a multi-modal network. With the goal of making Downtown Tyler a destination, Broadway Avenue was evaluated for a road diet between Gentry Parkway and Front Street.

A. Traffic Rerouting

With the potential to remove vehicular capacity along Broadway Avenue, a percentage of the existing vehicles that travel along Broadway Avenue will be forced to take alternate routes to get to their destinations. To determine the percentage of traffic that could be rerouted away from Broadway Avenue, StreetLight Data was used to evaluate existing traffic patterns for vehicles traveling along Broadway Avenue.

The Streetlight data showed that approximately 35% of the existing traffic on Broadway Avenue between Gentry Parkway and Front Street has an ultimate destination or origin within downtown. There is also a high percentage of traffic that utilizes Broadway Avenue as a cut-through route, traveling either northbound or southbound directly past Front Street and Gentry Parkway. The trips that are traveling to or from downtown as well as the trips that are considered direct cut-through trips, were not rerouted away from Broadway Avenue. Even with the implementation of a road diet, it is expected that these trips would continue to utilize Broadway Avenue.

Due to the layout of the street network, northbound and southbound traffic patterns were separated and assigned different rerouting percentages. Based on the data from the Streetlight Data platform, 26% of existing southbound traffic on Broadway Avenue could be rerouted to a different route. Of this 26%, approximately 16% of traffic traveling from the northwest and 10% of traffic traveling from the northeast would be rerouted. The rerouting traffic patterns for southbound traffic on Broadway Avenue is shown in **Exhibit 7**. Comparably, for the northbound traffic on Broadway Avenue, it was found that 40% of existing traffic could be rerouted to take a different route. Of this 40%, approximately 24% of the traffic is traveling to the northwest and 16% of this traffic is traveling to the northeast. **Exhibit 8** displays the rerouting traffic patterns for the northbound traffic on Broadway Avenue.

In addition to the regional rerouted trips, a small percentage of local trips were rerouted through the downtown area away from Broadway Avenue onto the local street network. Based on the data provided by Streetlight, 5% of traffic from Broadway Avenue was rerouted to parallel local streets including Erwin Street, Elm Street, and Ferguson Street.

Exhibit 9 shows the expected 2032 traffic volumes after the rerouting of traffic due to the road diet along Broadway Avenue along with the two-way street conversion in downtown.

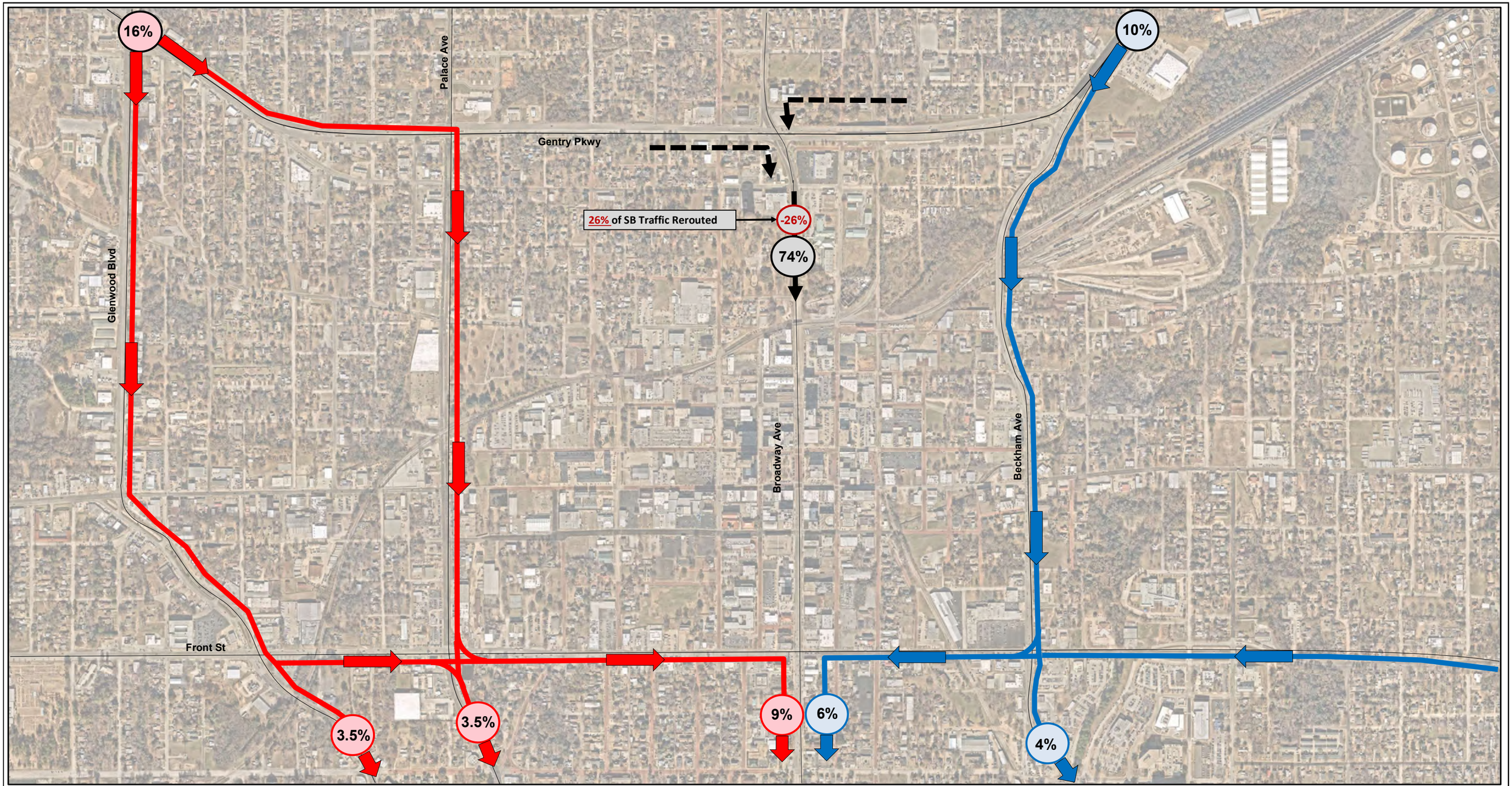


EXHIBIT 7

Rerouting of Southbound Regional Traffic for Broadway Ave Road Diet

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:

- Rerouted Traffic from the Northwest — XX%
- Rerouted Traffic from the Northeast — XX%
- Existing Movements effected by Reroute
- Traffic to Remain on Broadway — XX%

North

Not To Scale

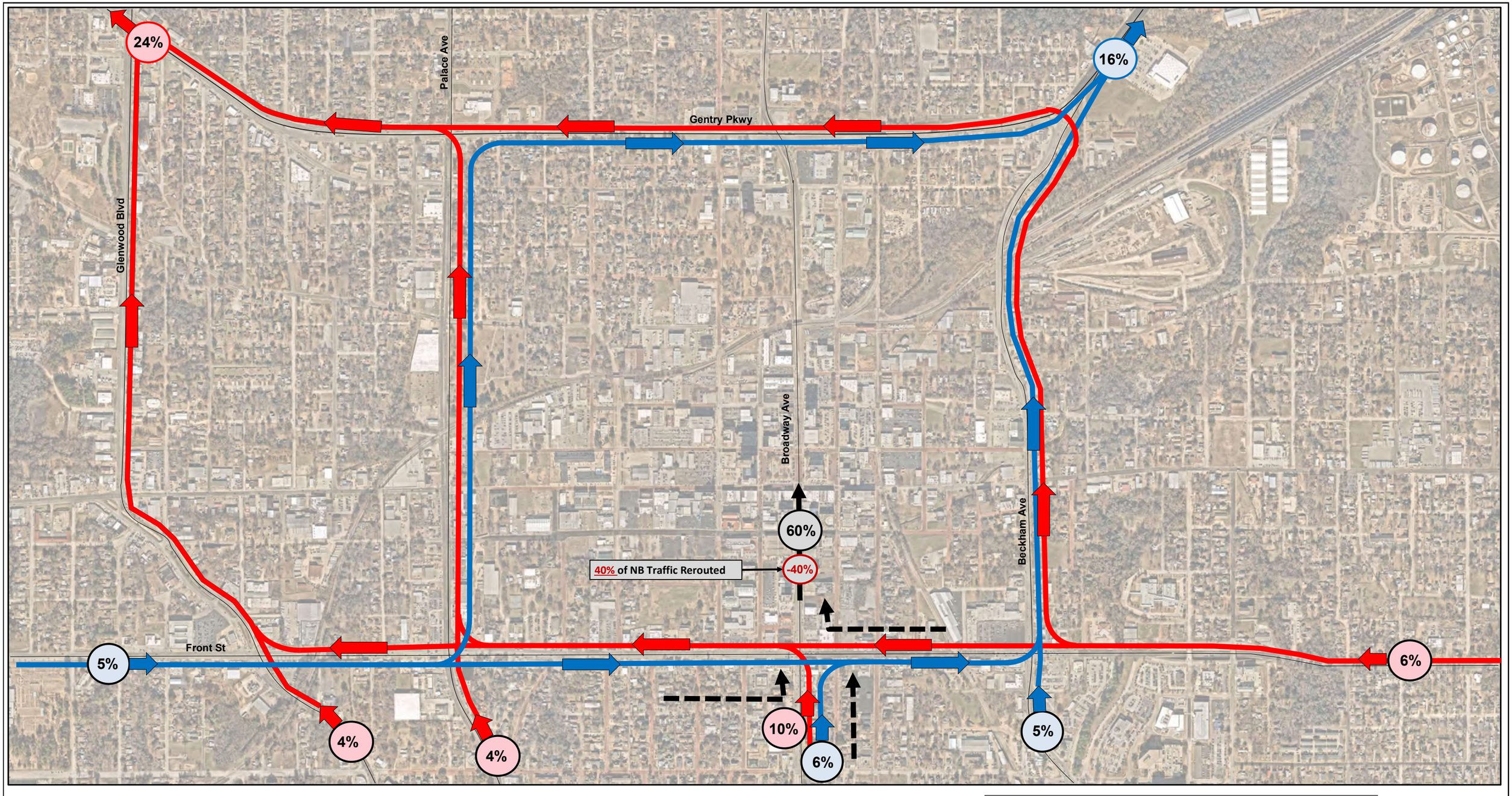


EXHIBIT 8

Rerouting of Northbound Regional Traffic for Broadway Ave Road Diet

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:

- Rerouted Traffic to the Northwest — XX%
- Rerouted Traffic to the Northeast — XX%
- Existing Movements effected by Reroute
- Traffic to Remain on Broadway — XX%

North

Not To Scale

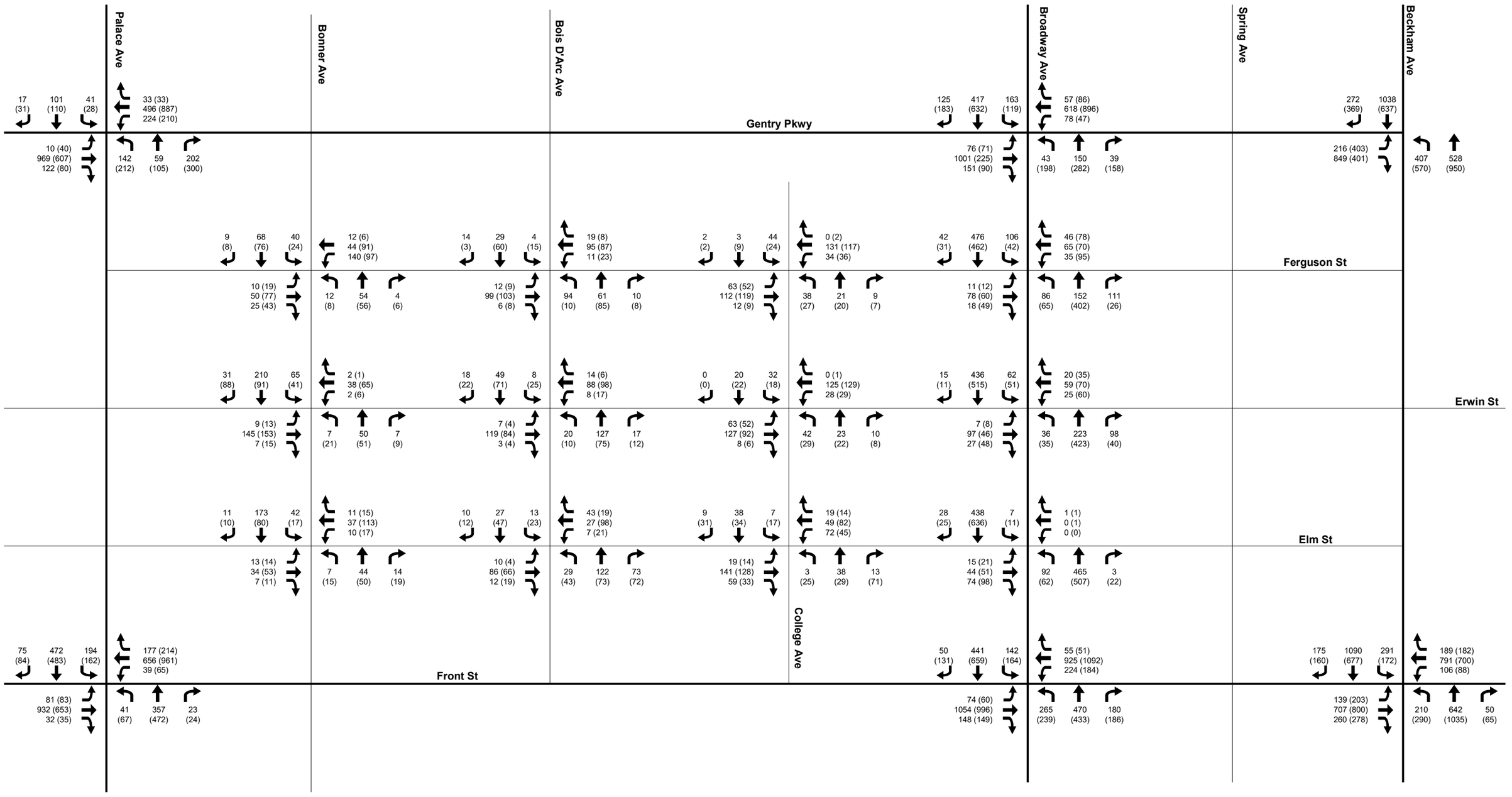


EXHIBIT 9

2032 Traffic Volumes (Broadway Ave Road Diet & Two-Way Street Conversion)

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

B. Regional Impact and Surrounding Network Link Analysis

The surrounding roadways were analyzed for potential capacity constraints brought on by the rerouting of traffic from Broadway Avenue. When comparing the 2032 traffic volumes without any mitigations, Palace Avenue, on the west side of downtown, sees an increase in traffic of 20% during the peak hour with the Broadway Avenue road diet. Similarly, both Front Street and Beckham Avenue see an increase in traffic ranging from 4% to 8%. Alternatively, Gentry Parkway sees a decrease in expected traffic with the road diet along Broadway Avenue, ranging from -7% to -9% of traffic during the peak hour. This decrease is due to the reroute of regional trips coming to and from the northeast and northwest to utilize either Palace Avenue or Beckham Street instead of Broadway Avenue. This regional impact on the surrounding street network can be seen in **Exhibit 10**.

A link analysis was also performed for the streets that expected an increase in traffic from the road diet, including Palace Avenue, Front Street, and Beckham Avenue. The link capacity analysis examines the operating conditions of roadway links rather than intersections, using the peak hour volumes passing a fixed point. The operating condition is defined by the ratio of link volume to link capacity, or V/C. The link capacity for each roadway is taken from the statewide accepted North Central Texas Council of Governments (NCTCOG) model capacity volumes. Palace Avenue, Front Street, and Beckham Avenue were all analyzed as five-lane undivided principal arterials. As an undivided principal arterial, these roads have a capacity of 875 vehicles per hour per lane (vphpl).

The link analysis was analyzed with 2022 existing volumes, 2032 traffic volumes with no mitigations, and 2032 traffic volumes with the Broadway Avenue road diet and one-way to two-way conversion. **Table 6** and **Table 7** show the peak hour link analysis results for each study corridor.

Table 6 – Regional Impact – Link Analysis Results (AM Peak Hour)

Roadway	Segment	Number of Lanes	Capacity	AM Peak Hour			
				Direction of Travel	Volume	V/C	LOS
2022 Existing Scenario							
Palace Ave	Between Front St and Erwin St	2	1,750	NB	448	0.26	A/B
		2	1,750	SB	583	0.33	A/B
Beckham Ave	Between Erwin St and Gentry Pkwy	2	1,750	NB	748	0.43	A/B
		2	1,750	SB	1,592	**0.91**	**E**
Front St	Between Palace Ave and Broadway Ave	2	1,750	EB	1,002	0.57	C
		2	1,750	WB	992	0.57	C
2032 No Mitigations							
Palace Ave	Between Front St and Erwin St	2	1,750	NB	495	0.28	A/B
		2	1,750	SB	644	0.37	A/B
Beckham Ave	Between Erwin St and Gentry Pkwy	2	1,750	NB	826	0.47	C
		2	1,750	SB	1,805	**1.03**	**F**
Front St	Between Palace Ave and Broadway Ave	2	1,750	EB	1,201	0.69	D
		2	1,750	WB	1,131	0.65	C
2032 Broadway Ave Road Diet + Two-Way Reroute							
Palace Ave	Between Front St and Erwin St	2	1,750	NB	615	0.35	A/B
		2	1,750	SB	741	0.42	A/B
Beckham Ave	Between Erwin St and Gentry Pkwy	2	1,750	NB	935	0.53	C
		2	1,750	SB	1,887	**1.08**	**F**
Front St	Between Palace Ave and Broadway Ave	2	1,750	EB	1,276	0.73	D
		2	1,750	WB	1,240	0.71	D

Table 7 – Regional Impact – Link Analysis Results (PM Peak Hour)

Roadway	Segment	Number of Lanes	Capacity	PM Peak Hour			
				Direction of Travel	Volume	V/C	LOS
2022 Existing Scenario							
Palace Ave	Between Front St and Erwin St	2	1,750	NB	619	0.35	A/B
		2	1,750	SB	479	0.27	A/B
Beckham Ave	Between Erwin St and Gentry Pkwy	2	1,750	NB	1,272	0.73	D
		2	1,750	SB	884	0.51	C
Front St	Between Palace Ave and Broadway Ave	2	1,750	EB	1,030	0.59	C
		2	1,750	WB	1,165	0.67	D
2032 No Mitigations							
Palace Ave	Between Front St and Erwin St	2	1,750	NB	646	0.37	A/B
		2	1,750	SB	674	0.39	A/B
Beckham Ave	Between Erwin St and Gentry Pkwy	2	1,750	NB	1,405	**0.80**	**E**
		2	1,750	SB	985	0.56	C
Front St	Between Palace Ave and Broadway Ave	2	1,750	EB	1,176	0.67	D
		2	1,750	WB	1,356	0.77	D
2032 Broadway Ave Road Diet + Two-Way Reroute							
Palace Ave	Between Front St and Erwin St	2	1,750	NB	769	0.44	A/B
		2	1,750	SB	729	0.42	A/B
Beckham Ave	Between Erwin St and Gentry Pkwy	2	1,750	NB	1,520	**0.87**	**E**
		2	1,750	SB	1,038	0.59	C
Front St	Between Palace Ave and Broadway Ave	2	1,750	EB	1,205	0.69	D
		2	1,750	WB	1,462	**0.84**	**E**

As shown in the above table, Palace Avenue operates at LOS A/B under the 2022 existing conditions. When the background growth and development traffic is added onto the network, Palace Avenue continues to operate at LOS A/B during both peak hours and also with the implementation of the Broadway Ave road diet and one-way conversion, with over half of its capacity still available.

Beckham Avenue sees a higher level of service under existing conditions with the southbound direction operating at LOS E during the AM peak hour and the northbound direction operating at LOS D during the PM peak hour. In the 2032 No Mitigations scenario, those same movements continue to increase in delay, with the southbound operating over capacity at LOS F and the northbound operating at LOS E in the respective peak hours. After the Broadway Avenue road diet and two-way conversion, these results increase nominally and maintain the same level of service. With these capacity constraints along Beckham Avenue, it is expected that vehicles will reroute to the path with the least resistance. Palace Avenue, which could serve as a parallel reliever route, has additional capacity to take on these vehicles, if needed.

Front Street operates at LOS C and LOS D under existing conditions and continues to do so through the 2032 No Mitigations scenario. With the Broadway Avenue road diet and two-way conversion, the westbound direction increases to LOS E during the PM peak hour with only a minor increase in delay.

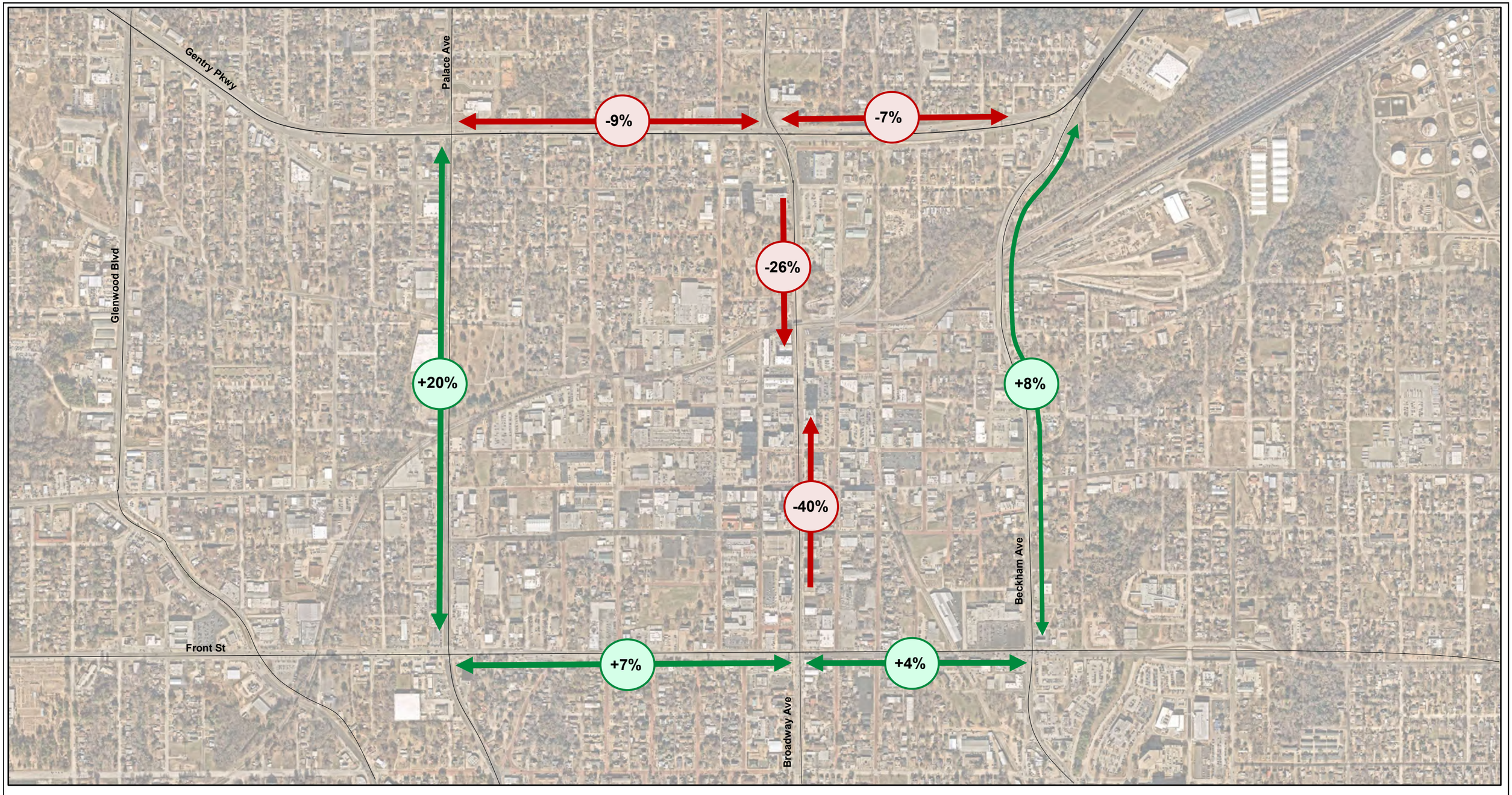


EXHIBIT 10

Regional Impact to Traffic Volumes from Broadway Ave Road Diet

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:

Percent Increase along Roadway — XX%

Percent Decrease along Roadway — XX%

North

Not To Scale

C. Broadway Avenue Road Diet – Options 1 and 2

Broadway Avenue is a five-lane undivided roadway that runs through the heart of Downtown Tyler. Two options were evaluated for a potential road diet along Broadway Avenue between Front Street and Gentry Parkway. The proposed lane configuration, intersection traffic control, and on-street parking details for each option is outlined below and can also be seen in **Exhibit 1** and **Exhibit 2** in the **Attachments**.

Option 1 – Full Road Diet

This option proposes a two-lane configuration along Broadway Avenue with one lane in each direction from Front Street to Goodman Drive. Traveling further north, a three-lane configuration is proposed with one lane in each direction and a two-way center left-turn lane from Goodman Drive to Gentry Parkway. On-Street back-in parking is proposed along Broadway Avenue between Front Street and Elm Street along with a Pedestrian Hybrid Beacon (PHB) or Rectangular Rapid Flashing Beacon (RRFB) pedestrian signal approximately 570' north of Front Street.

The following streets that intersect with Broadway Avenue are proposed to serve two-way traffic and are proposed as stop-controlled:

- Elm Street
- Erwin Street
- Ferguson Street
- Locust Street
- Line Street

Option 2 – Hybrid Tapered Road Diet

This option proposes a tapered hybrid lane approach with a four-lane configuration along Broadway Avenue from Front Street to Elm Street, a three-lane configuration from Elm Street to Erwin Street, and a two-lane configuration from Erwin Street to Goodman Drive. Similar to Option 1, a three-lane configuration is proposed with one lane in each direction and a two-way center left-turn lane from Goodman Drive to Gentry Parkway. On-street parking is proposed along Broadway Avenue between Front Street and Elm Street along with a PHB or RRFB pedestrian signal approximately 570' north of Front Street. The conceptual layout shown in **Exhibit 2** demonstrates that both front-in and parallel parking can be accommodated with this layout.

The following streets that intersect with Broadway Avenue are proposed to serve two-way traffic and to be signalized:

- Elm Street
- Locust Street
- Line Street

The following streets that intersect with Broadway Avenue are proposed to serve two-way traffic and to be controlled by one-lane mini-roundabouts:

- Erwin Street
- Ferguson Street

Mini-roundabouts have a traversable inner circle which allows easy access for heavy vehicles and emergency vehicles that travel through them. When compared to signalized or stop-controlled intersections, mini-roundabouts also allow for a steady flow of traffic, which can alleviate congestion during peak hours. In addition, with no equipment to continually replace, mini-roundabouts allow for a reduction in maintenance costs.

D. Broadway Avenue Link Analysis

A link analysis was performed for Broadway Avenue using the peak hour volumes. Under existing conditions, Broadway Avenue was analyzed as a five-lane undivided minor arterial with a capacity of 825 vehicles per hour per lane (vphpl). The roadway was also analyzed for the 2032 No Mitigations scenario and the 2032 road diet scenario for both Option 1 and Option 2. Link analyses results are shown in different sections along the roadway since several of the sections are proposed to have a different number of lanes. **Table 8** and **Table 9** display the link analysis results along Broadway Avenue for the AM and PM peak hours.

Table 8 – Broadway Avenue – Link Analysis Results (AM Peak Hour)

Segment along Broadway Ave	Number of Lanes	Capacity	AM Peak Hour				
			Direction of Travel	Volume	V/C	LOS	
2022 Existing Scenario							
Between Front St and Elm St	2	1,650	NB	646	0.39	A/B	
	2	1,650	SB	704	0.43	A/B	
Between Elm St and Erwin St	2	1,650	NB	493	0.30	A/B	
	2	1,650	SB	704	0.43	A/B	
Between Ferguson St and Locust St	2	1,650	NB	436	0.26	A/B	
	2	1,650	SB	707	0.43	A/B	
2032 No Mitigations							
Between Front St and Elm St	2	1,650	NB	927	0.56	C	
	2	1,650	SB	958	0.58	C	
Between Elm St and Erwin St	2	1,650	NB	811	0.49	C	
	2	1,650	SB	794	0.48	C	
Between Ferguson St and Locust St	2	1,650	NB	549	0.33	A/B	
	2	1,650	SB	913	0.55	C	
2032 Broadway Ave Road Diet + Two-Way Reroute							
Between Front St and Elm St	1	825	NB	599	0.73	D	**Option 1** Full Road Diet
	1	825	SB	633	0.77	D	
Between Elm St and Erwin St	1	825	NB	481	0.58	C	
	1	825	SB	473	0.57	C	
Between Ferguson St and Locust St	1	825	NB	209	0.25	A/B	
	1	825	SB	624	0.76	D	
Between Front St and Elm St	2	1,650	NB	599	0.36	A/B	**Option 2** Tapered Hybrid
	2	1,650	SB	633	0.38	A/B	
Between Elm St and Erwin St	1.1	908	NB	481	0.53	C	
	1.1	908	SB	473	0.52	C	
Between Ferguson St and Locust St	1	825	NB	209	0.25	A/B	
	1	825	SB	624	0.76	D	

Table 9 – Broadway Avenue – Link Analysis Results (PM Peak Hour)

Segment along Broadway Ave	Number of Lanes	Capacity	PM Peak Hour				
			Direction of Travel	Volume	V/C	LOS	
2022 Existing Scenario							
Between Front St and Elm St	2	1,650	NB	729	0.44	A/B	
	2	1,650	SB	736	0.45	A/B	
Between Elm St and Erwin St	2	1,650	NB	683	0.41	A/B	
	2	1,650	SB	635	0.38	A/B	
Between Ferguson St and Locust St	2	1,650	NB	693	0.42	A/B	
	2	1,650	SB	523	0.32	A/B	
2032 No Mitigations							
Between Front St and Elm St	2	1,650	NB	881	0.53	C	
	2	1,650	SB	1,174	0.71	D	
Between Elm St and Erwin St	2	1,650	NB	873	0.53	C	
	2	1,650	SB	888	0.54	C	
Between Ferguson St and Locust St	2	1,650	NB	881	0.53	C	
	2	1,650	SB	686	0.42	A/B	
2032 Broadway Ave Road Diet + Two-Way Reroute							
Between Front St and Elm St	1	825	NB	544	0.66	D	**Option 1**: Full Road Diet
	1	825	SB	954	**1.16**	**F**	
Between Elm St and Erwin St	1	825	NB	529	0.64	C	
	1	825	SB	672	**0.81**	**E**	
Between Ferguson St and Locust St	1	825	NB	492	0.60	C	
	1	825	SB	535	0.65	C	
Between Front St and Elm St	2	1,650	NB	544	0.33	A/B	**Option 2**: Tapered Hybrid
	2	1,650	SB	954	0.58	C	
Between Elm St and Erwin St	1.1	908	NB	529	0.58	C	
	1.1	908	SB	672	0.74	D	
Between Ferguson St and Locust St	1	825	NB	492	0.60	C	
	1	825	SB	535	0.65	C	

From Front Street to Locus Street, Broadway Avenue operates relatively favorably under the 2022 existing conditions as well as the 2032 No Mitigations scenario. When evaluating the link analyses for Option 1, the Full Road Diet, capacity constraints are seen on the southbound approach between Front Street and Elm Street during the PM peak hour. This link operates at LOS F for the southbound direction with a V/C of 16% over capacity. The southbound direction between Elm Street and Erwin Street operates at LOS E during the PM peak hour. The link analyses results for Option 2, the Hybrid Tapered Road Diet, are very similar to the results from the 2032 No Mitigations scenario. Both northbound and southbound approaches operate at LOS D or better along all segments and during both peak hours, which is favorable for this type of downtown environment.

Based on these results outlined in the above tables, when comparing Option 1 to Option 2, the hybrid tapered lane configuration approach shown in Option 2 is recommended for Broadway Avenue. This option offers a favorable vehicular level of service for a “Destination” downtown environment. It also offers balance in serving both vehicular traffic and multi-modal traffic and will allow additional room for growth after 2032 in Downtown Tyler.

E. Surrounding Network Traffic Operations Analysis

Traffic operations were evaluated for six signalized intersections in the surrounding network to determine the impact of a road diet along Broadway Avenue with the regional rerouted traffic. Operations were evaluated for 2022 existing conditions, the 2032 No Mitigation scenario, and the 2032 road diet scenario following recommendations outlined in Option 2. **Table 10** displays the traffic operation results for the six study intersections during the AM and PM peak hours. The level of service results are also shown in **Exhibit 11**.

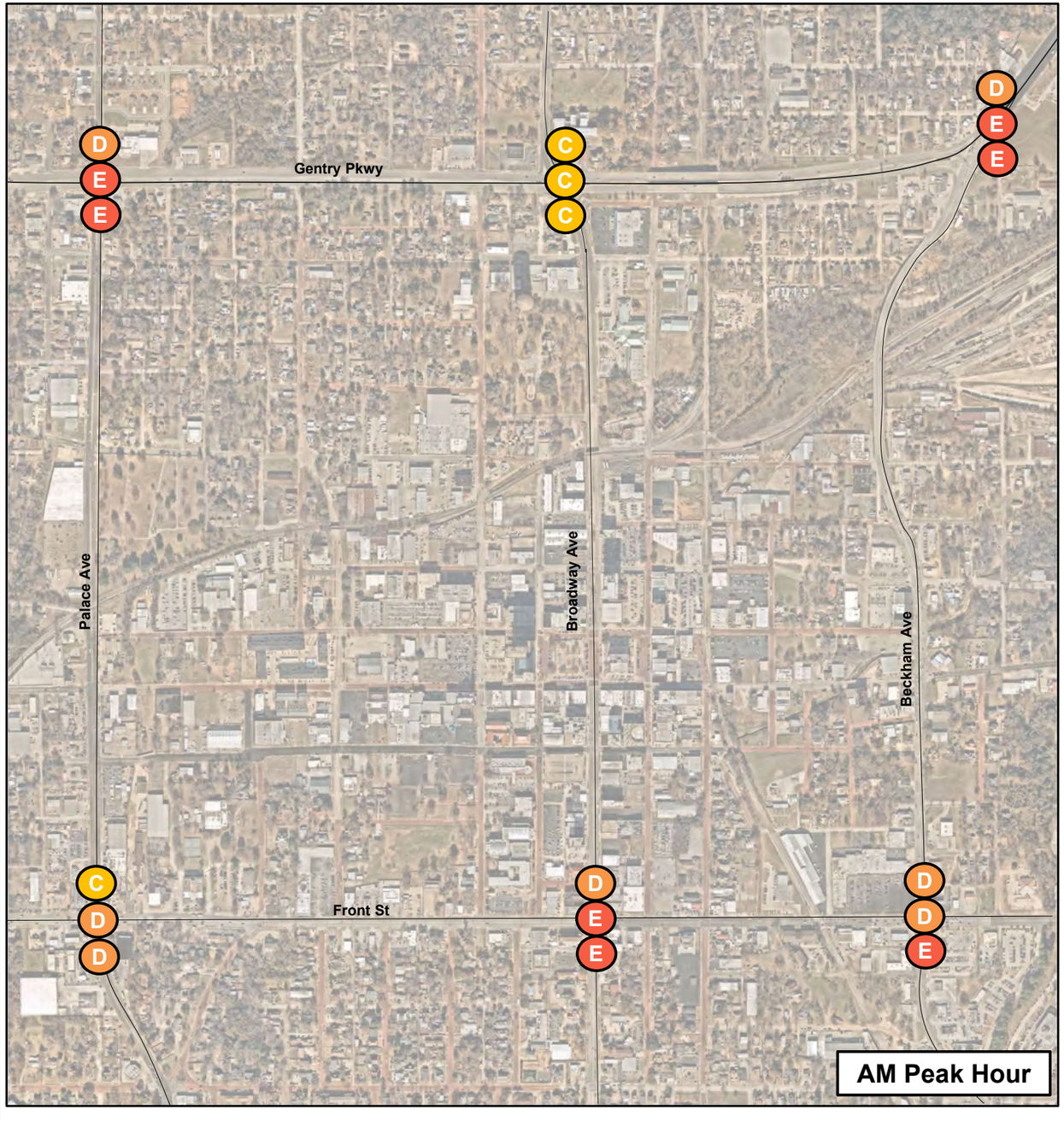
Table 10 – Surrounding Network – Traffic Operations Results

INTERSECTION	APPROACH	2022 Existing Traffic				2032 Traffic				2032 Traffic			
						No Mitigations		Broadway Road Diet + Two-Way Reroute*		No Mitigations		Broadway Road Diet + Two-Way Reroute*	
		AM Peak Hour		PM Peak Hour		AM Peak Hour				PM Peak Hour			
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Palace Avenue & Gentry Parkway	EB	37.9	D	34.4	C	42.1	D	40.3	D	36.0	D	34.8	C
	WB	63.5	E	36.2	D	94.5	F	100.1	F	41.4	D	39.7	D
	NB	17.4	B	18.9	B	17.4	B	23.1	C	19.2	B	22.8	C
	SB	48.8	D	42.2	D	49.6	D	49.5	D	43.3	D	43.3	D
	Overall	**45.0**	**D**	**32.7**	**C**	**57.6**	**E**	**56.7**	**E**	**35.8**	**D**	**34.7**	**C**
Gentry Parkway & Broadway Avenue	EB	29.4	C	19.9	B	32.3	C	31.7	C	20.7	C	20.8	C
	WB	26.6	C	34.2	C	28.4	C	29.0	C	37.0	D	36.9	D
	NB	16.2	B	17.6	B	19.1	B	21.7	C	26.8	C	23.9	C
	SB	24.3	C	33.3	C	30.3	C	21.1	C	51.9	D	41.4	D
	Overall	**26.2**	**C**	**28.2**	**C**	**29.3**	**C**	**27.7**	**C**	**36.3**	**D**	**33.5**	**C**
Beckham Avenue & Gentry Parkway	EB	93.8	F	43.3	D	158.3	F	145.1	F	43.7	D	41.0	D
	NB	16.6	B	9.1	A	22.0	C	29.3	C	15.6	B	16.9	B
	SB	32.4	C	17.4	B	34.7	C	40.6	D	19.0	B	19.9	B
	Overall	**49.9**	**D**	**20.8**	**C**	**76.1**	**E**	**71.0**	**E**	**24.3**	**C**	**23.6**	**C**
Beckham Avenue & Front Street	EB	58.1	E	56.3	E	60.0	E	69.2	E	57.1	E	67.9	E
	WB	58.8	E	59.9	E	60.7	E	59.9	E	60.2	E	59.4	E
	NB	38.2	D	35.5	D	51.5	D	51.3	D	51.1	D	53.1	D
	SB	30.8	C	20.8	C	43.0	D	53.5	D	31.2	C	32.2	C
	Overall	**45.6**	**D**	**43.3**	**D**	**53.0**	**D**	**58.3**	**E**	**50.4**	**D**	**54.0**	**D**
Broadway Avenue & Front Street	EB	49.5	D	54.6	D	63.8	E	81.9	F	71.4	E	91.3	F
	WB	47.2	D	57.7	E	59.4	E	79.2	E	105.2	F	81.5	F
	NB	47.9	D	45.3	D	61.7	E	51.3	D	54.4	D	58.7	E
	SB	53.9	D	48.5	D	70.8	E	51.3	D	70.0	E	53.4	D
	Overall	**49.4**	**D**	**52.1**	**D**	**63.7**	**E**	**69.3**	**E**	**77.0**	**E**	**73.5**	**E**
Palace Avenue & Front Street	EB	18.4	B	19.0	B	21.3	C	22.5	C	21.0	C	21.8	C
	WB	17.2	B	22.1	C	19.5	B	22.7	C	25.2	C	30.1	C
	NB	63.3	E	63.0	E	62.3	E	62.2	E	64.8	E	66.7	E
	SB	59.2	E	60.4	E	60.8	E	65.3	E	61.7	E	64.6	E
	Overall	**33.9**	**C**	**36.9**	**D**	**35.6**	**D**	**38.3**	**D**	**38.9**	**D**	**42.0**	**D**

* Results shown for Option 2: Hybrid Tapered Option

\- No movements in Time Period

\+ Movement Delay Exceeds 200 seconds



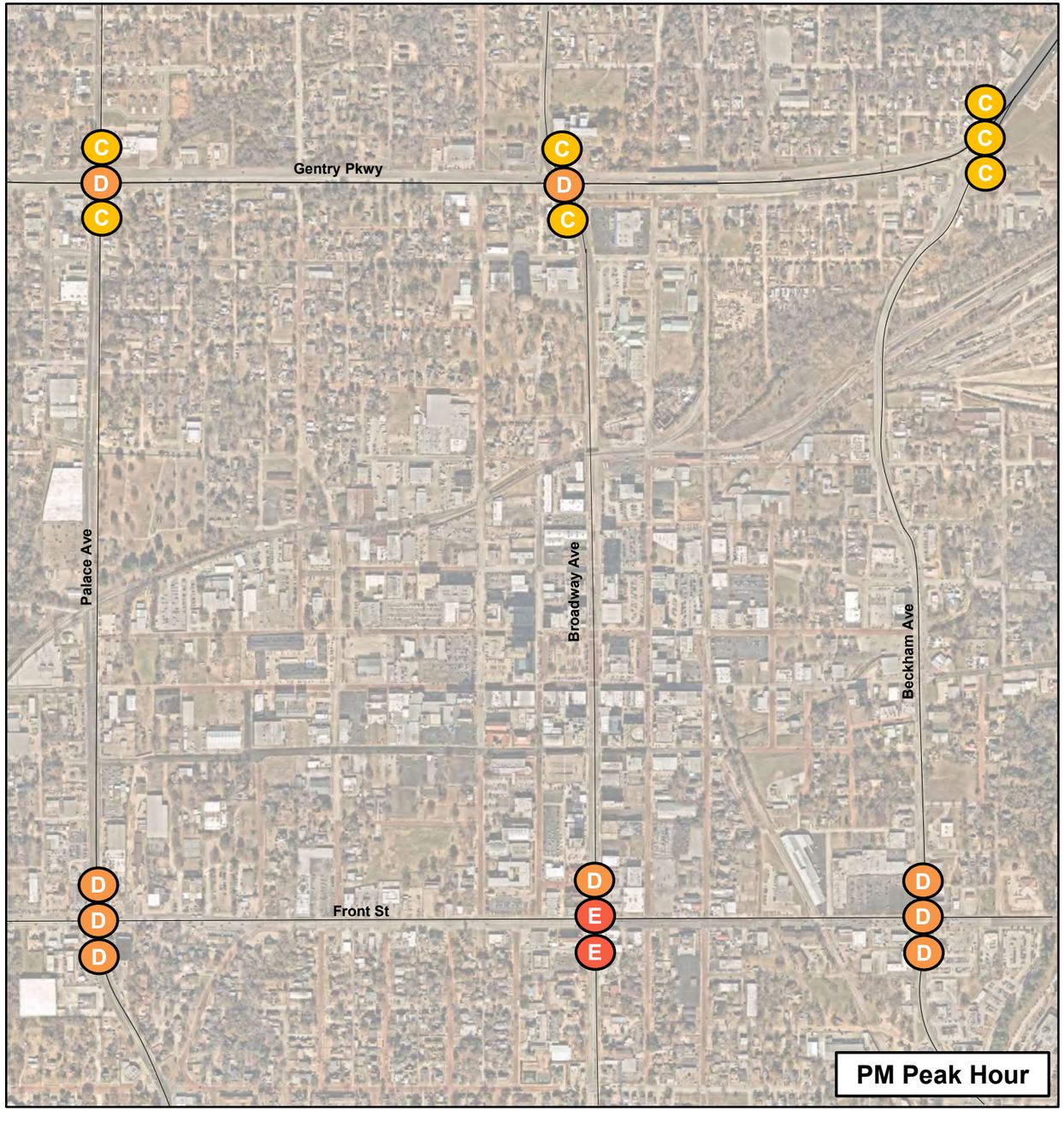


EXHIBIT 11

Surround Network - Intersection Level of Service Results

Downtown Tyler Traffic Study - Tyler, Texas

Kimley»Horn

LEGEND:

- X — 2022 Existing
- X — 2032 (No Mitigations)
- X — 2032 (Hybrid Tapered Option)

North

Not To Scale

2032 No Mitigations Scenario - Traffic Operations

When evaluating the 2032 traffic volumes with no mitigations, three of the six study intersections operate at LOS D or better. The intersections of Palace Ave at Gentry Pkwy, Beckham Ave at Gentry Pkwy, and Broadway Ave at Front Street all operate at LOS E overall during at least one of the peak hours. This level of delay is expected at major signalized intersections during the critical peak hours.

2032 Broadway Ave Road Diet and Two-Way Street Network Scenario - Traffic Operations

After the regional traffic has been rerouted from the road diet on Broadway Avenue and the local traffic has been rerouted for the two-way street conversion, the overall traffic operations results show a minimal difference when compared to the 2032 No Mitigations scenario. The three signalized intersections along Gentry Pkwy show a nominal change in delay when compared to the 2032 No Mitigation results, with the minor changes showing a slight decrease in overall delay. At Broadway Ave at Front St, the intersection changes from LOS D to LOS E during the AM peak hour but only accounts for a five-second increase in overall delay. All other intersections continue to operate at the same overall level of service when compared to the 2032 No Mitigation results.

The proposed road diet along Broadway Avenue does not have a negative effect on the overall operations of the adjacent signalized intersections in the surrounding network.

VII. CONCLUSION AND RECOMMENDATIONS

Based on the results presented in the Tyler Downtown Traffic Study, a road diet can be implemented along Broadway Avenue with the expected growth and development in downtown. With the implementation of the road diet, the 2032 traffic operations results in minimal change when compared to the 2032 scenario with no mitigations. The analysis results also show that a conversion of the one-way street network can also be implemented to a two-way street network. This modification can relieve confusion for vehicles that are new to the area and unfamiliar with the one-way street network, while also allowing vehicles easier access with more options to travel in and out of the downtown area. Based on the analysis, the recommendations for Downtown Tyler are as described below:

The following signalized intersections are recommended to become two-way stop controlled:

- Bonner Ave at Ferguson St
- Bonner Ave at Erwin St

The following signalized intersections are recommended to become all-way stop-controlled:

- Bonner Ave at Elm St
- Bois D'Arc Ave at Ferguson St
- Bois D'Arc Ave at Erwin St
- Bois D'Arc Ave at Elm St
- College Ave at Ferguson St
- College Ave at Erwin St
- College Ave at Elm St

The following one-way streets are recommended to become two-way streets:

- Ferguson St
- Erwin St
- College Ave
- Spring Ave
- Locust St

The following lane configuration, on-street parking, and intersection control, as shown in the Hybrid Tapered Road Diet (Option 2), are recommended to implement a road diet along Broadway Avenue:

Lane configuration:

- Four-lanes, with two lanes in each direction, from Front Street to Elm Street.
- Three-lanes, with one lane in each direction and a two-way center left-turn lane, from Elm Street to Erwin Street
- Two-lanes, with one lane in each direction, from Erwin Street to Goodman Drive.
- Three-lanes, with one lane in each direction and a two-way center left-turn lane, from Goodman Drive to Gentry Parkway.

On-Street Parking:

- A combination of front-in parking and parallel parking between Front Street and Elm Street.

Intersection Control:

- The following intersections are recommended to be controlled with a traffic signal:
  - Elm St at Broadway Ave
  - Locust St at Broadway Ave
  - Line St at Broadway Ave

- The following intersections are recommended to be controlled with a mini-roundabout:
    - Erwin St at Broadway Ave
    - Ferguson St at Broadway Ave
- A PHB or RRFB pedestrian signal is recommended approximately 570’ north of Front Street.

ATTACHMENTS

TYLER AREA METROPOLITAN PLANNING ORGANIZATION

BROADWAY AVENUE CORRIDOR IMPROVEMENTS

CITY OF TYLER SMITH COUNTY

OPTION 1 (TALLEMAS DET) LANE CONFIGURATION AND PEDESTRIAN/ BICYCLE PATHWAY RECOMMENDATIONS

LEGEND

- PROPOSED ROADWAY IMPROVEMENTS
- PROPOSED PEDESTRIAN/CYCLE IMPROVEMENTS
- DESIGNATED USE ZONES

PLANNING LEVEL EXHIBIT

THESE DRAWINGS ILLUSTRATE A PLANNING LEVEL EXHIBIT AND ARE NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES. THEY WERE PREPARED UNDER THE AUTHORITY OF MICHAEL STEWART, P.E. DATE MARCH 31, 2021. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE.

Kimley»Horn

BROADWAY AVENUE

ERWIN PARK

ERWIN PARK

CAMP FIRE BOYS & GIRLS

CITY PLAZA/ERWIN PARK

SHARED USE LOADING/ UNLOADING ZONE

CITY OF TYLER

CITY HALL

CITY PLAZA/ERWIN PARK

SHARED USE LOADING/ UNLOADING ZONE

CITY PLAZA/ERWIN PARK

SHARED USE LOADING/ UNLOADING ZONE

BROADWAY AVENUE

EXISTING BROADWAY AVENUE UNDERPASS

BROADWAY AVENUE

TYLER AREA METROPOLITAN PLANNING ORGANIZATION

BROADWAY AVENUE
CORRIDOR IMPROVEMENTS

CITY OF TYLER
SMITH COUNTY

OPTION 2: HYBRID TAPERED ROAD DIET

LANE CONFIGURATON AND PEDESTRIAN/
BICYCLE PATHWAY RECOMMENDATIONS

N

0' 20' 40'
HORIZONTAL GRAPHIC SCALE:
1"=40' (18" ROLL PLOT)

LEGEND

🟥 PROPOSED ROADWAY IMPROVEMENTS

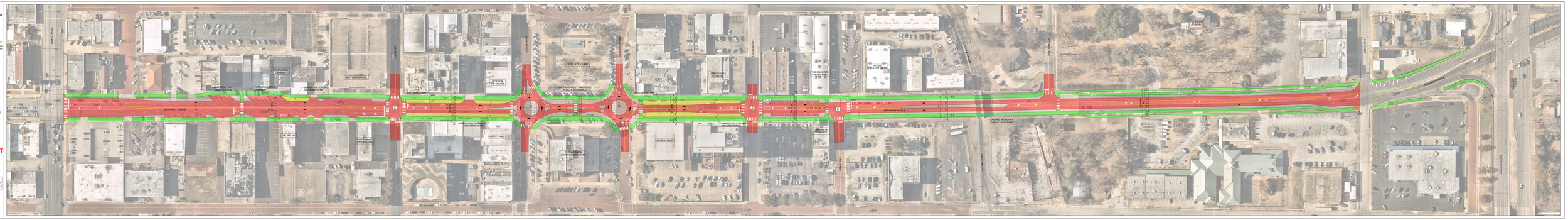
🟩 PROPOSED PEDESTRIAN/BICYCLE IMPROVEMENTS

🟨 DESIGNATED USE ZONES

PLANNING LEVEL EXHIBIT

THESE PRELIMINARY DOCUMENTS ARE TO BE
RELEASED FOR INFORMATIONAL PURPOSES
AND ARE NOT INTENDED FOR CONSTRUCTION.
THEY WERE PREPARED UNDER THE SUPERVISION OF:
HIRON M. FERNANDO, P.E. DATE: MARCH 20, 2023
TEXAS NUMBER: 123288

Kimley»Horn F-928



NOTES:
1. AERIAL IMAGE OBTAINED FROM NEARMAPS 2022.