Board 0

Maple Avenue Transportation Corridor Study Public Meeting

Welcome!

Use a red pin to indicate where you live, use a blue pin to indicate where you work

Mockingbird Ln
Maple Ave
Inwood Rd
Denton Drive Cutoff
Cedar Springs Rd
Dallas North Tollway
Wycliff Ave
Harry Hines Blvd
Southwestern Medical District
I-35E
Medical District Dr
Maple Ave
Wycliff Ave
Harry Hines Blvd
Oak Lawn Ave

Live Outside this Area

Work Outside this Area

LEGEND

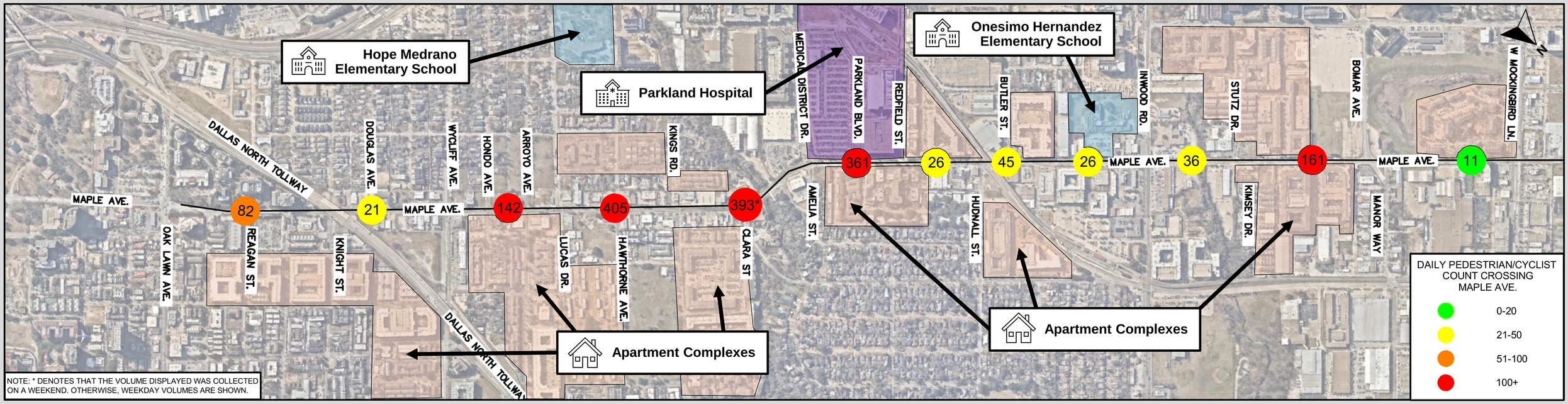
- Major Roadway
- Study Corridor
- Medical District

Board 1

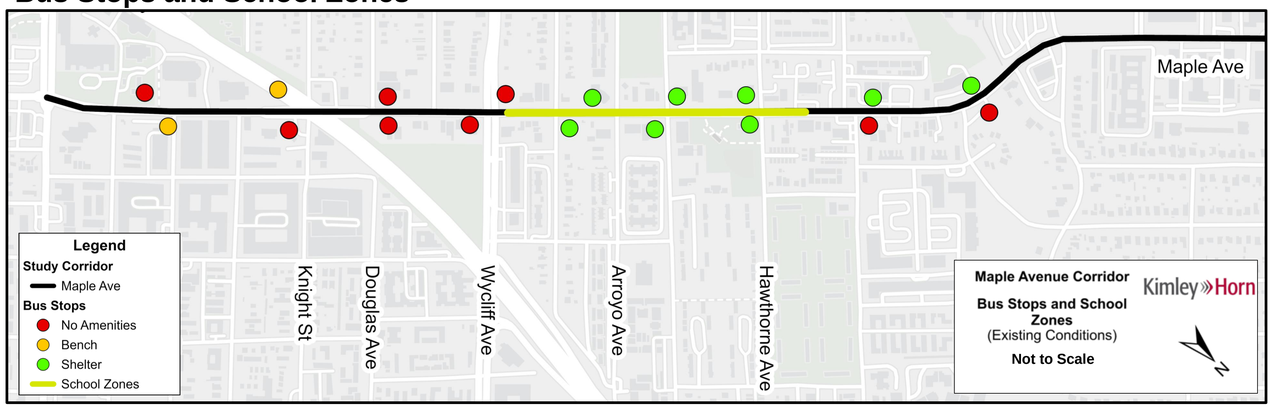
Maple Avenue Transportation Corridor Study Public Meeting

Existing Conditions

Pedestrian & Cyclist Volumes Crossing Maple Ave at Unprotected Locations



Bus Stops and School Zones



Bus Stops Between Oak Lawn Avenue and Clara Street

There are currently **18 bus stops** between Oak Lawn Avenue and Clara Street. This **high density** of bus stops generates pedestrian crossings as passengers are constantly loading and unloading. While some bus stops are near signalized intersections, allowing for safe crossings of pedestrians, **others have no protected crossings near them**, leading to **unsafe conditions**. The ridership of each bus stop varies, with the stops near **Wycliff Avenue** and **Douglas Avenue** showing the **lowest number of riders**, and those near **Hawthorn Avenue** and **Lucas Drive** having the **highest number of riders.** The school zone from Wycliff Avenue to just past Hawthorne Avenue also proved to be an additional point of interest.

Where is the most critical need for pedestrian crossings?

Traffic counts shows **high pedestrian volumes crossing Maple Avenue** throughout the corridor at unprotected locations. Many of these crossings are concentrated at specific locations, such as at the Hawthorne and Arroyo Avenue intersections. This is due to the **numerous pedestrian generators in those areas**, such as bus stops and nearby apartment complexes. **Parkland Hospital** is also a large pedestrian generator, with many pedestrians crossing at the Medical District Drive and Parkland Boulevard intersections. One of the primary goals of these improvements is to improve **walkability and pedestrian safety** throughout the corridor, and providing **safe crossings** at **high volume, unprotected locations** plays a crucial role in achieving that goal.

2.43 mi
Total Length

~18,000
Daily Vehicles

20
Bus Stops

38 mph
85th Percentile Speed

30 mph
Speed Limit

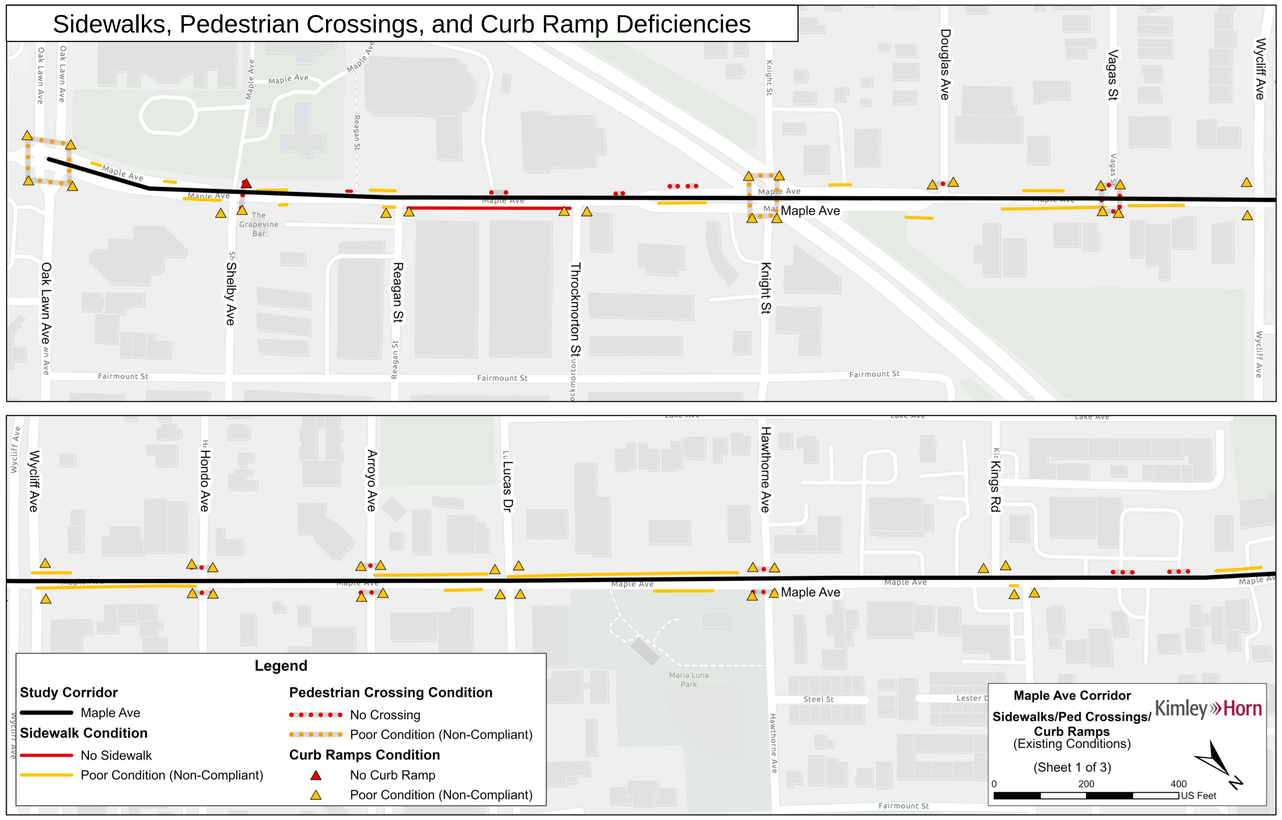
General Information

Board 2

Maple Avenue Transportation Corridor Study Public Meeting

Existing Conditions

Sidewalks, Pedestrian Crossings, and Curb Ramp Deficiencies



Sidewalk and Ramp Deficiencies

An analysis of the existing sidewalks, ramps, and crossings was conducted along the length of the corridor. Each feature was assigned a category of either normal or poor condition based on general functionality and compliance with the Americans with Disabilities Act (ADA). The analysis showed most features to be in poor condition, with several intersections missing ramps and crossings entirely.

Example of an area with no curb ramp (Northwest corner of Denton & Maple).

Example of a sidewalk in poor condition (Northeast leg of Inwood & Maple). Large amounts of cracking along the sidewalk creates an uneven surface.

Example of a ramp in poor condition (South corner of Inwood & Maple). Several sections of the curb have broken off and the ramp is not ADA compliant.

Existing Cyclist Facilities and Planned Improvements

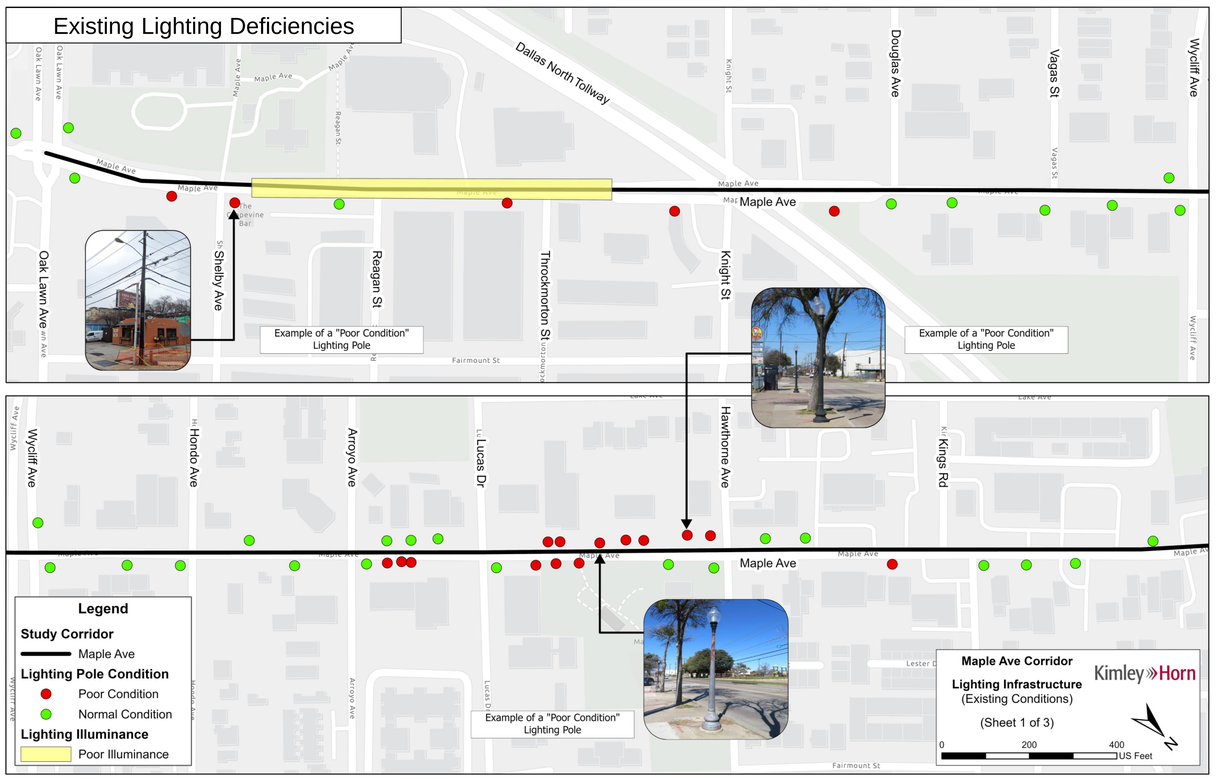
Currently, Maple Avenue is four lanes undivided with no dedicated bike lanes or shared use paths. The corridor is listed as a **priority corridor** for bike lanes in the draft **2023 Dallas Bike Plan Update** and is listed as a proposed corridor for **"Visually Separated"** bike facilities.

There are several cyclist generators throughout, such as the Parkland Hospital, elementary school, retail, restaurants, and apartments.

Existing Lighting Infrastructure and Deficiencies

The existing lighting infrastructure along the corridor was examined and **all lighting fixtures categized and mapped**. Several areas were identified as having **poor illuminance**, such as the section from Shelby Avenue to Throckmorton Street marked on the right. These lower light areas can **increase risk and safety concerns** to both drivers and pedestrians/cyclists.

Existing Lighting Deficiencies



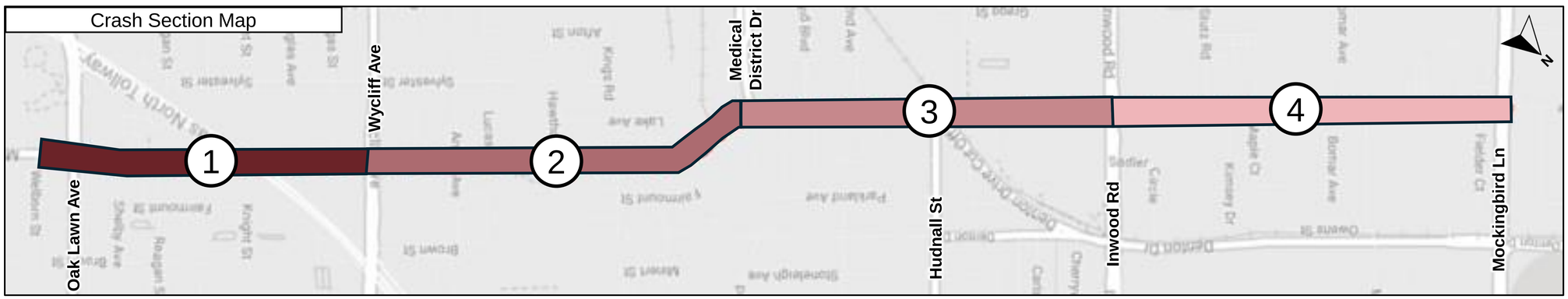
Board 3

Maple Avenue Transportation Corridor Study Public Meeting

Crash Data

Total Crashes Heat Map

Crash Section Map



General Information

463
Total Crashes

16
Pedestrian/Cyclist Crashes

85
Average Crashes per Year

Crash Density by Section

Section Name	Count of Crashes	Sum of Lane Miles	Crashes per Lane Mile
Section 1: Oak Lawn to Wycliff	144	2.08	69.10
Section 2: Wycliff to Medical District Drive	136	2.67	50.90
Section 3: Medical District Drive to Inwood	105	2.40	43.68
Section 4: Inwood to Mockingbird	78	2.42	32.23

Top 5 Crash Factors

Primary Crash Factor	Count of Crashes
Failed To Yield Right Of Way - Turning Left	98
Failed To Control Speed	73
Disregard Stop And Go Signal	65
Failed To Yield Right Of Way - Private Drive	26
Other (Explain In Narrative)	26

Crash Data along Maple Corridor

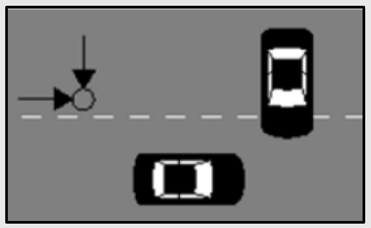
From January 2018 to June 2023, there were a total of **463 recorded crashes** along the corridor. Of these, over half resulted in property damage only, 150 resulted in minor or possible injuries, **8 resulted in severe injury, and 2 resulted in fatalities**. The primary contributing factors to crashes along the corridor were 1) **failure to yield of way while turning left**, 2) failure to control speed, and 3) disregarding traffic signals and signage. The majority of crashes were **right angle or left turn crashes**, with rear end crashes and sideswipe crashes being the two next most common. The densest area of crashes occurred along section one, from **Oak Lawn Ave to Wycliff Ave**. Undivided roadways like Maple Avenue can lead to an increased amount of left turn and rear end crashes as drivers are stopping and turning rapidly. Additionally, **sight distance and lighting issues** can increase the chance of a collision.

Crash Types by Section

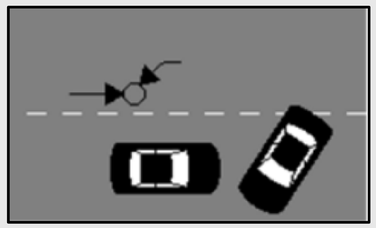
Crash Type	1	2	3	4	Total
Right Angle	32	39	19	36	126
Left Turn	48	22	26	17	113
Rear End	24	28	24	6	82
Sideswipe	22	15	14	7	58
Single Vehicle	8	9	7	8	32
Right Turn	4	7	7	2	20
Non-Occupant Involved	2	10	4	1	17
Head On	2	5	3		10
Other	1	1		1	3
Right And Left Turn	1		1		2
Total	**144**	**136**	**105**	**78**	**463**

Top 5 Crash Types:

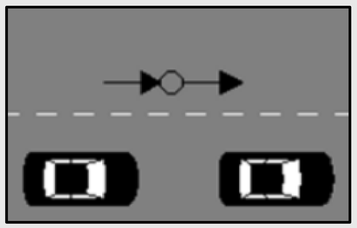
1. Right Angle: 27%



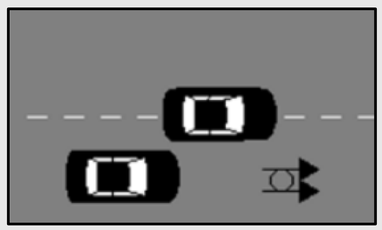
2. Left Turn: 24%



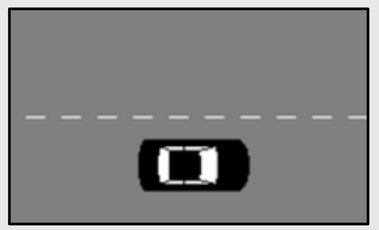
3. Rear End: 18%



4. Sideswipe: 13%



5. Single Vehicle – 7%



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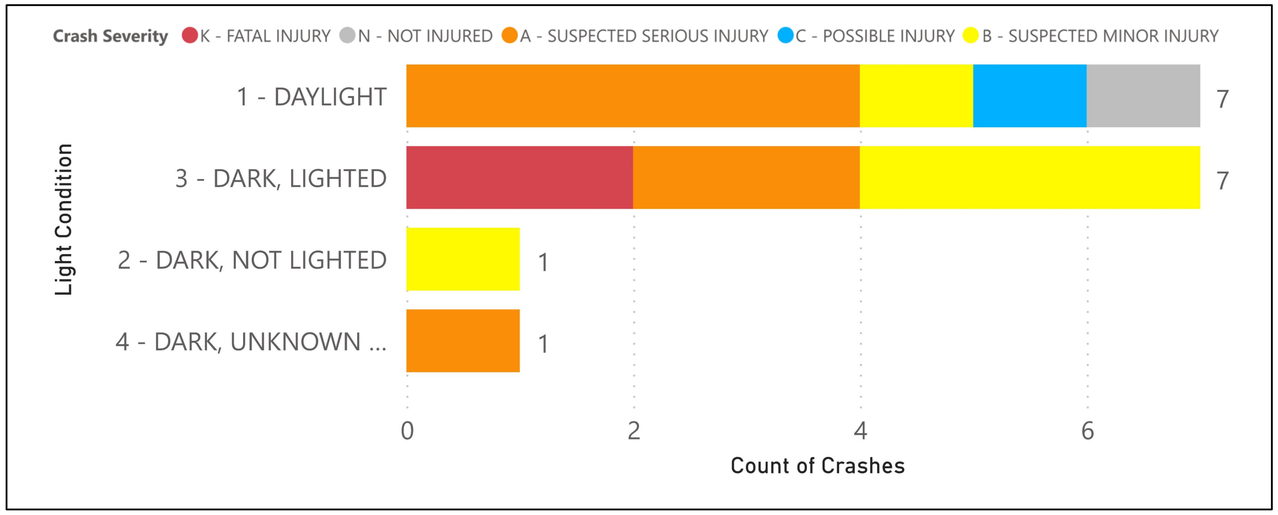
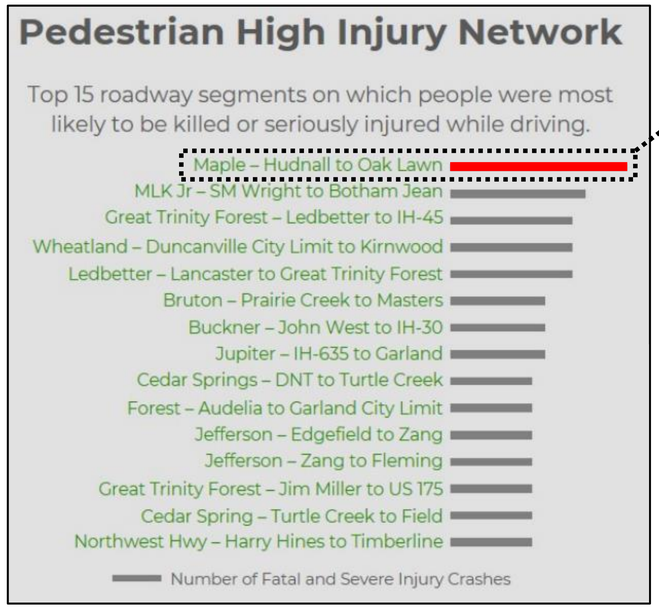
Board 4

Maple Avenue Transportation Corridor Study Public Meeting

Crash Data

Pedestrian/Cyclist Crashes based on Light Condition



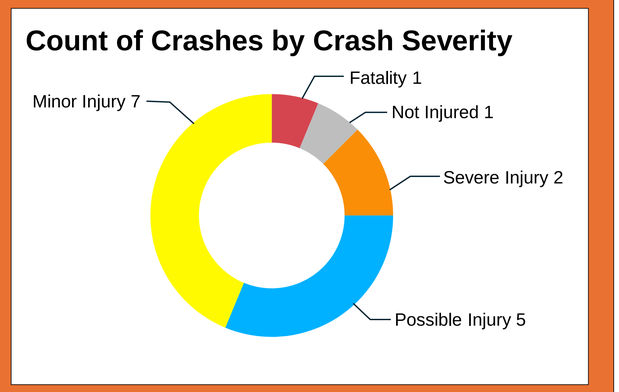


Maple from Hudnall to Oak Lawn: #1 on the City's Top 15 Pedestrian High Injury Network Segments (2022)

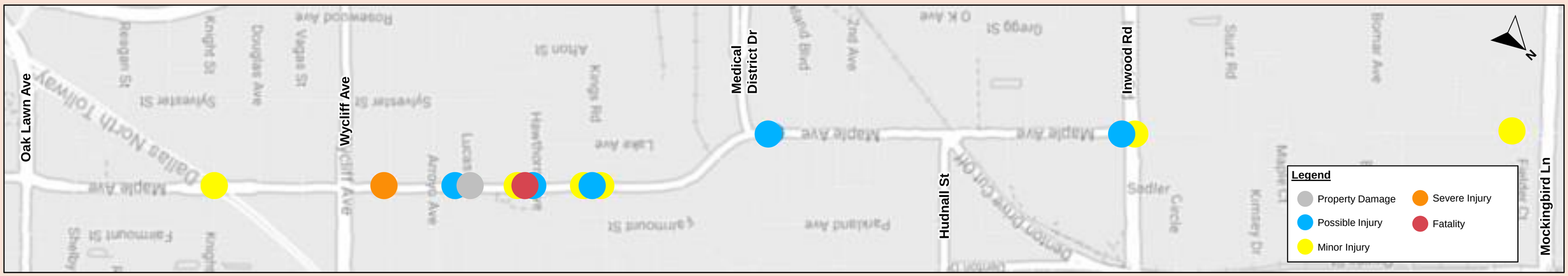
Based on the 2022 Vision Zero Action Plan, the majority of the Maple study corridor, from Oak Lawn Ave to Hudnall St, was at the top of the list of roads in which pedestrians were most likely to be killed or injured from traffic crashes.

Pedestrian and Cyclist Crash Data

All pedestrian and cyclist related crashes from January 2018 to June 2023 were analyzed along the corridor using data from TxDOT and the City. There were a total of **13 pedestrian crashes** and **3 cyclist crashes**. Of these, **one pedestrian crash** at the intersection of Hawthorne and Maple was **fatal** and two other crashes caused severe injuries. The **majority of the crashes occurred in dark conditions**. The highest density of pedestrian/cyclist crashes occurred between **Wycliff Ave and Medical District Dr.** This area has a high volume of pedestrian traffic and not many protected crossings, leading to a larger number of crashes. The **high density of bus stops** along this segment also **significantly contributes to pedestrian crashes**, making this area a high priority for crossing improvements.



Pedestrian & Cyclist Crashes Along Maple Ave.



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Board 5

Maple Avenue Transportation Corridor Study Public Meeting

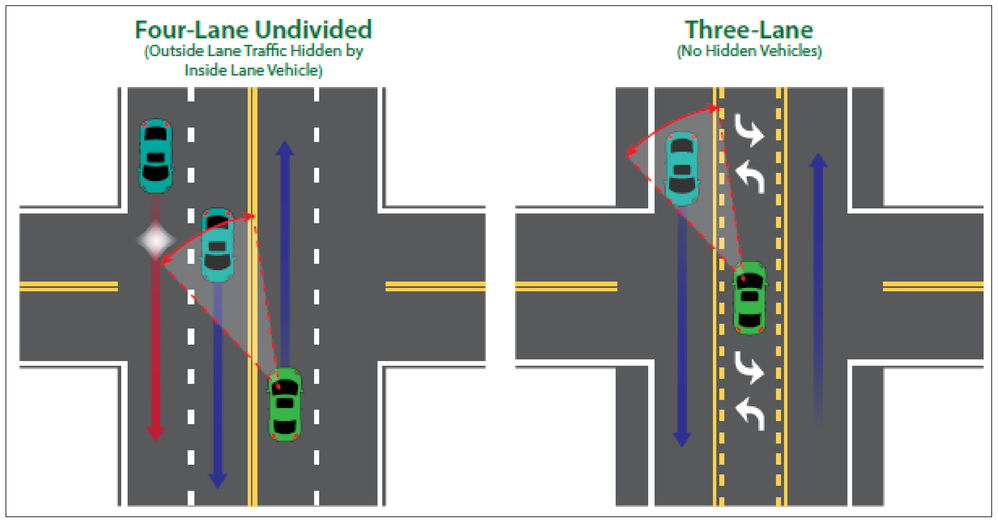
Potential Solutions

Road Diet, Bike Lanes, Sidewalk and Curb Improvements, and Improved Pedestrian Crossings

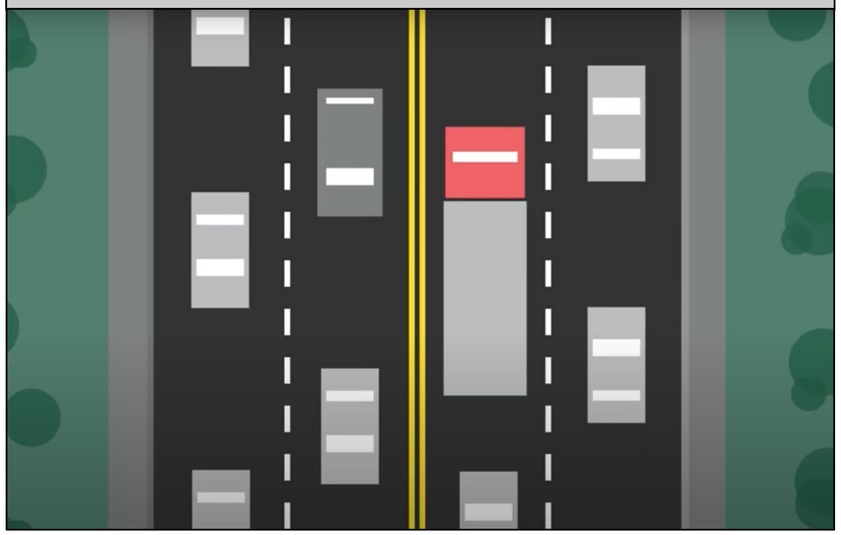
One solution to reduce crashes along the corridor is a **road diet**. A **road diet reduces the number of lanes** from four lanes to three lanes with a center two-way left turn lane. Having fewer lanes **slows down traffic** and provides space for **bike lanes**. This **reduces the chance of pedestrian, cyclist, and vehicle crashes** by providing and additional buffer for pedestrians, removing cyclists from vehicular traffic, and adding a turn lane for vehicles. The addition of **PHBs and RRFBs at key pedestrian crossings can also improve the safety of the corridor**. Other solutions to some of the problems along Maple Ave are general sidewalk, curb, and ramp improvements, additional lighting in darker areas, the addition of pedestrian refuge islands, and the **removal of under-utilized bus stops.**

Example of a Pedestrian Refuge Island

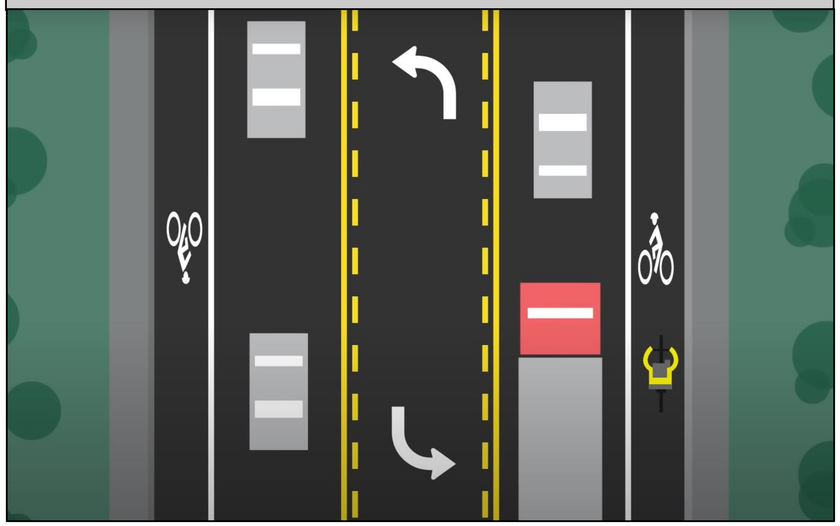
Example of a "Visually Separated" Bike Lane



Before



After



Benefits of a Road Diet

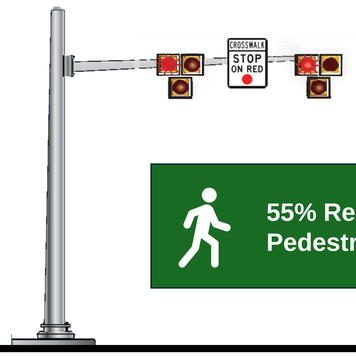
Road diets provide **many benefits**, such as traffic calming, additional room for bike lanes, **safer left turns**, and easier side-street traffic crossings for both pedestrians and drivers**. A road diet reclaims space for pedestrians and cyclists** and increases walkability along the corridor. However, the reduction in lanes also **reduces the vehicular capacity of Maple Ave**, causing increased congestion and leading some drivers to reroute.

What is a Rectangular Rapid Flashing Beacon? (RRFB)

A **Rectangular Rapid Flashing Beacon (RRFB)** is a traffic warning device which alerts drivers to pedestrians. When activated, yellow flashing lights turn on, prompting drivers to yield to pedestrians. They are used to increase pedestrian safety at a crossing, while minimizing the disruption to traffic flow.

What is a Pedestrian Hybrid Beacon? (PHB)

A **Pedestrian Hybrid Beacon (PHB)** is a traffic control device that provides a protected crossing for pedestrians. The beacon remains dark until activated by a pedestrian, after which it will light up and direct drivers to stop and yield to pedestrians. PHB's are less expensive and less disruptive to traffic than a full traffic signal, while still providing a fully protected crossing to pedestrians.



55% Reduction of Pedestrian Crashes*

*Source: NCHRP Research Report 841

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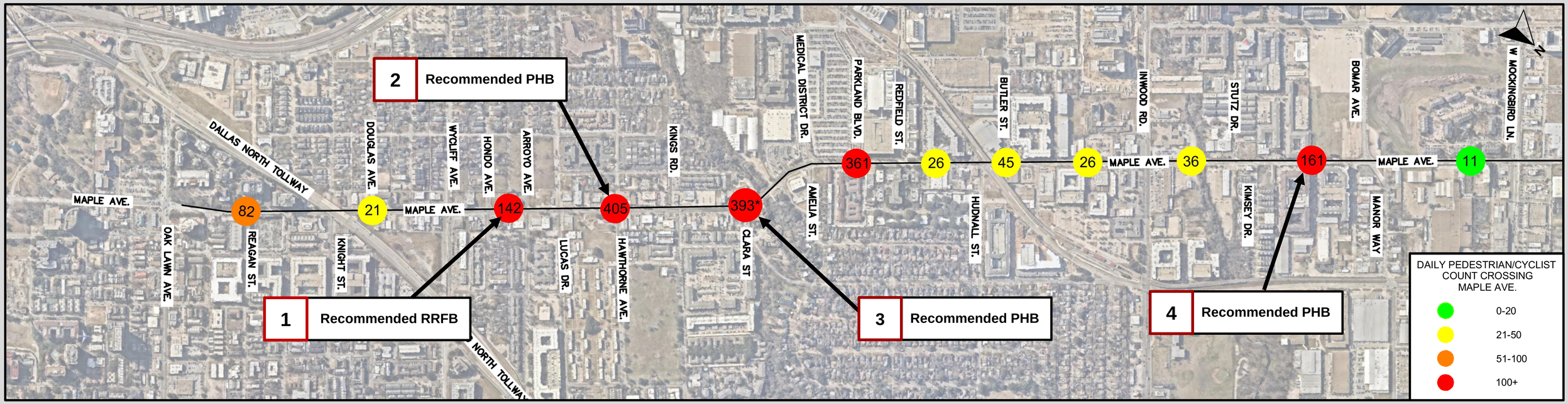
Maple Avenue Transportation Corridor Study Public Meeting

Crossing Treatment Summary

Map of Recommended PHBs and RRFB

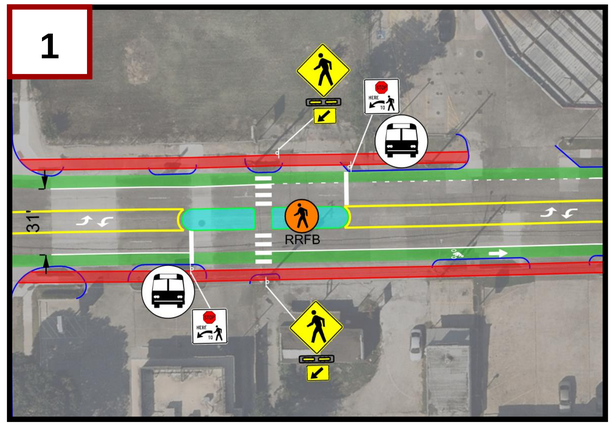


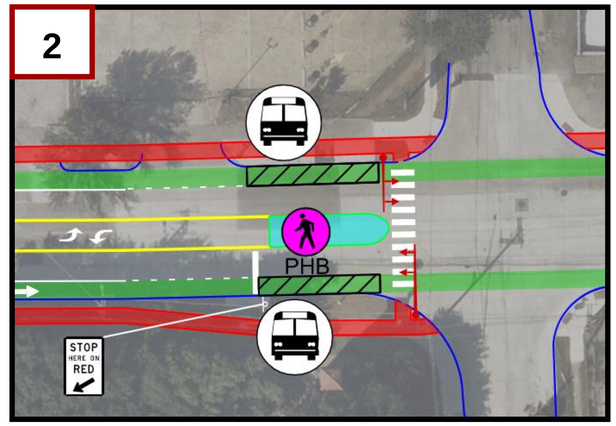
Summary of Proposed Crossing Improvements

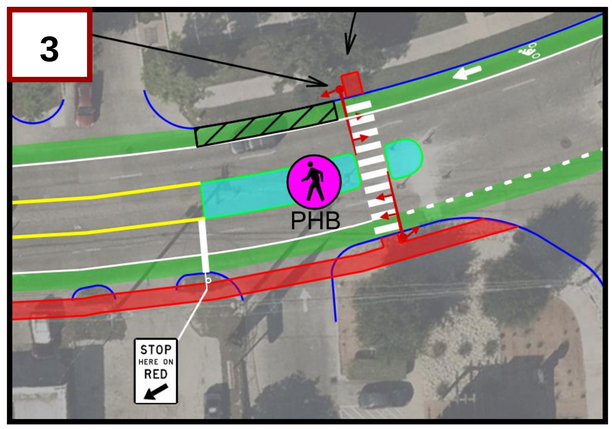
Five different locations along the corridor were assessed as potential locations for installing Pedestrian Hybrid Beacons (PHBs) or Rectangular Rapid Flashing Beacons (RRFBs). It was determined that two of these locations, **Maple Avenue at Hawthorne Street** and **Maple Avenue at Alma Apartments Driveway**, **warranted PHBs** based on pedestrian volumes alone. An **RRFB is already planned for construction at Maple & Hawthorne Street** later this year, but due to the location meeting a PHB warrant we recommend this later be upgraded to a PHB. Due to the presence of bus stops and the amount of pedestrian crashes, a **PHB is also recommended at Maple Avenue & Clara Street** and an **RRFB is recommended crossing Maple Avenue between Arroyo Avenue & Hondo Avenue.** Additionally, several existing crosswalks throughout the corridor are recommended to be restriped, and several ramps and sidewalks are recommended to be reconstructed.

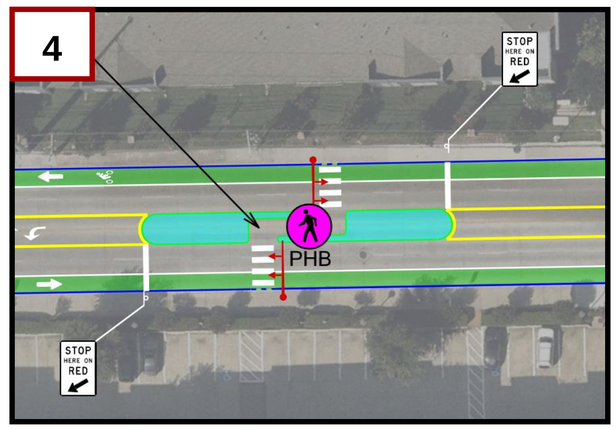
Intersection	Scenario	Warrant Met Based on Volumes	Recommendation
Maple Ave & Reagan St	2023 Existing	No	No
Maple Ave between Arroyo Ave & Hondo Ave	2023 Existing	No	RRFB*
Maple Ave & Hawthorne Ave	2023 Existing	Yes	PHB
Maple Ave & Clara St	2023 Existing	No	PHB*
Maple Ave & Alma on Maple Driveway	2023 Existing	Yes	PHB

*RRFB/PHB Recommended to Accommodate Bus Stops and Mitigate Pedestrian Crashes









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Board 7

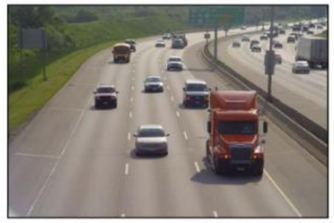
Maple Avenue Transportation Corridor Study Public Meeting

Road Diet (Lane Reduction) Traffic Analysis

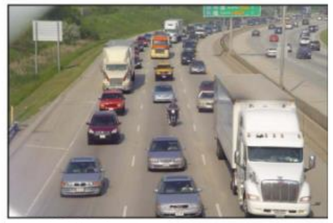
Levels of Service (LOS)

Level of Service A

Level of Service D



Level of Service B



Level of Service E

Level of Service C

Level of Service F

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

What is Level of Service (LOS)?

Level of Service (LOS) is a letter grade that assesses the congestion at an intersection or along a roadway. For intersections, it is typically assigned based on the **Average Total Delay** in **seconds per vehicle**. For roadways, it is usually assigned based on the **volume over capacity ratio (V/C).** An A or B grade indicates very little delay or congestion, while a E or F grade indicates heavy congestion.

Projected Traffic Volumes

Existing traffic counts were collected at several intersections along the corridor. Using these counts and historic volumes from TxDOT, **an annual growth rate of 1%** was determined from **2023 to 2030**, and an annual growth rate of **0.5% from 2030 to 2045**. This growth rate was used to **increase the existing traffic volumes to both 2030 and 2045 traffic volumes,** which were then used in the analysis.

1% Annual Growth

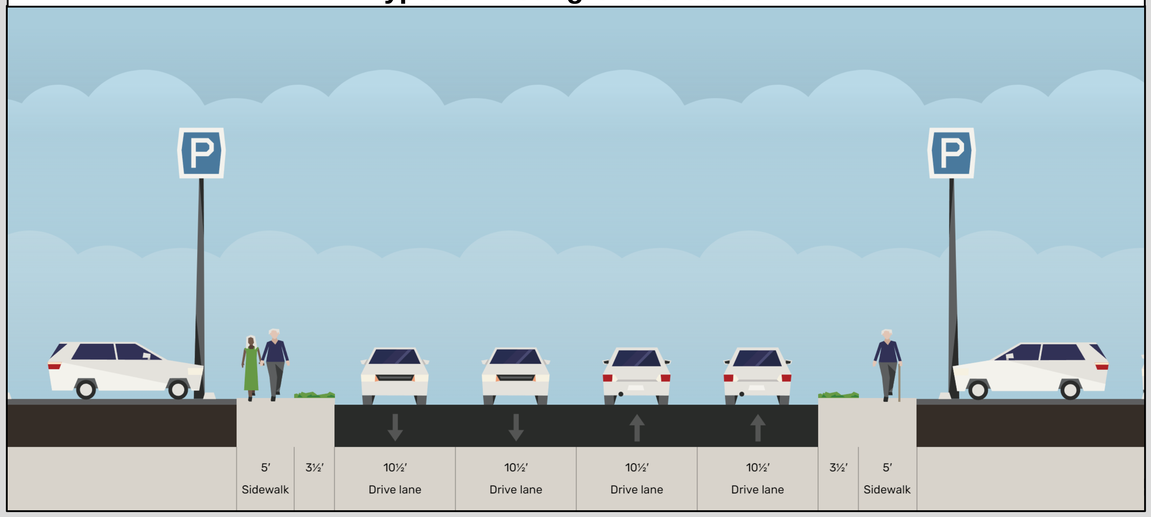
0.5% Annual Growth

2023 Existing Volumes → **2030 Future Volumes** → **2045 Future Volumes**

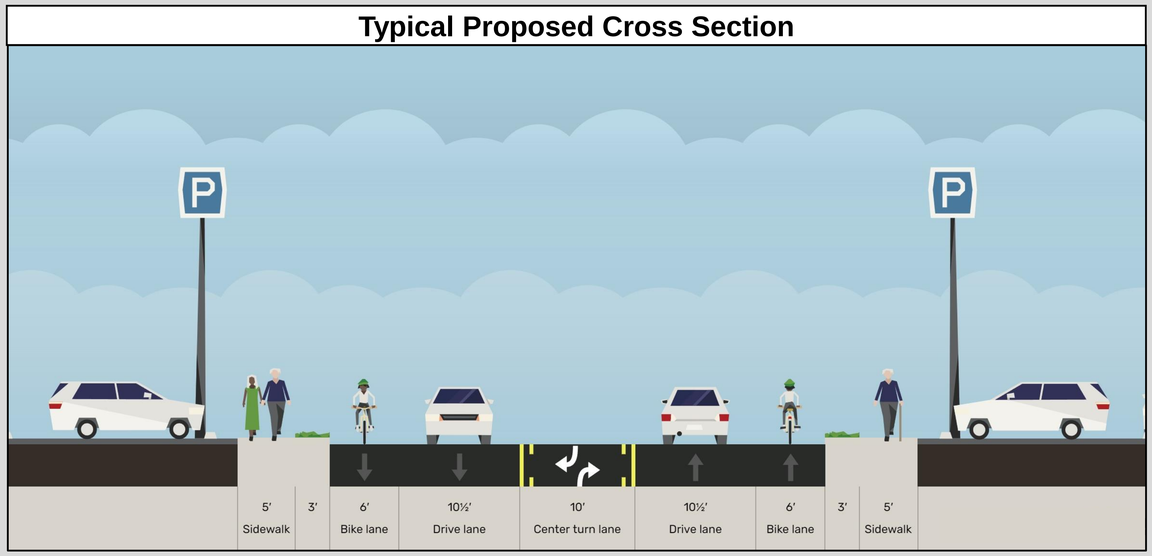
Table of Average Annual Growth along Maple Ave

	Average Daily Traffic Volume				
Year	Maple South of Oak Lawn	Maple North of Throckmorton	Maple North of Kings	Maple South of Hudnall	Maple North of Inwood
2004	13,880	14,430	15,530	10,800	7,880
2023	12,039	12,039	17,757	17,757	9,561
Average Annual Growth	-0.746%	-0.949%	0.708%	2.652%	1.023%
Average Annual Growth Across All Locations	**0.537%**				

Typical Existing Cross Section



Typical Proposed Cross Section



Existing vs. Proposed Cross Section

The existing cross section of Maple Avenue consists of four, 10½' travel lanes with a 5' sidewalk on either side. The proposed cross-section would utilize a **road diet by removing one lane and converting another into a 10' two-way left turn lane**. The extra space can then be used for **two 6' visually separated bike lanes** on either side of the street. The sidewalks on either side of the street would remain 5' on either side with a 3' offset from the bike lanes.

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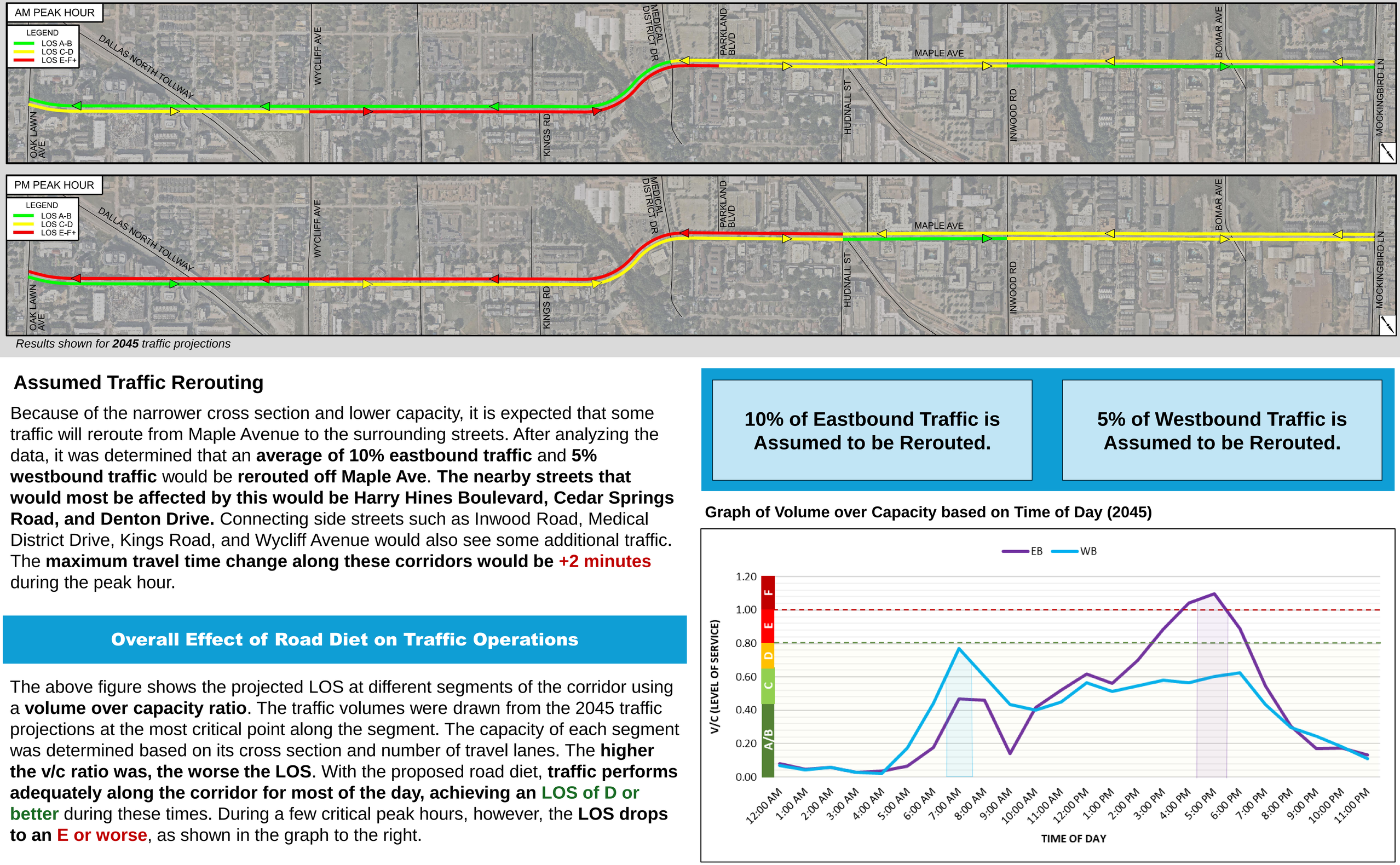
Maple Avenue Transportation Corridor Study Public Meeting

Road Diet (Lane Reduction) Traffic Analysis

Segment Capacity Analysis of Maple Avenue with Proposed Cross Section



*Results shown for **2045** traffic projections*

Assumed Traffic Rerouting

Because of the narrower cross section and lower capacity, it is expected that some traffic will reroute from Maple Avenue to the surrounding streets. After analyzing the data, it was determined that an **average of 10% eastbound traffic** and **5% westbound traffic** would be **rerouted off Maple Ave**. **The nearby streets that would most be affected by this would be Harry Hines Boulevard, Cedar Springs Road, and Denton Drive.** Connecting side streets such as Inwood Road, Medical District Drive, Kings Road, and Wycliff Avenue would also see some additional traffic. The **maximum travel time change along these corridors would be +2 minutes** during the peak hour.

10% of Eastbound Traffic is Assumed to be Rerouted.

5% of Westbound Traffic is Assumed to be Rerouted.

Overall Effect of Road Diet on Traffic Operations

The above figure shows the projected LOS at different segments of the corridor using a **volume over capacity ratio**. The traffic volumes were drawn from the 2045 traffic projections at the most critical point along the segment. The capacity of each segment was determined based on its cross section and number of travel lanes. The **higher the v/c ratio was, the worse the LOS**. With the proposed road diet, **traffic performs adequately along the corridor for most of the day, achieving an LOS of D or better** during these times. During a few critical peak hours, however, the **LOS drops to an E or worse**, as shown in the graph to the right.

Graph of Volume over Capacity based on Time of Day (2045)

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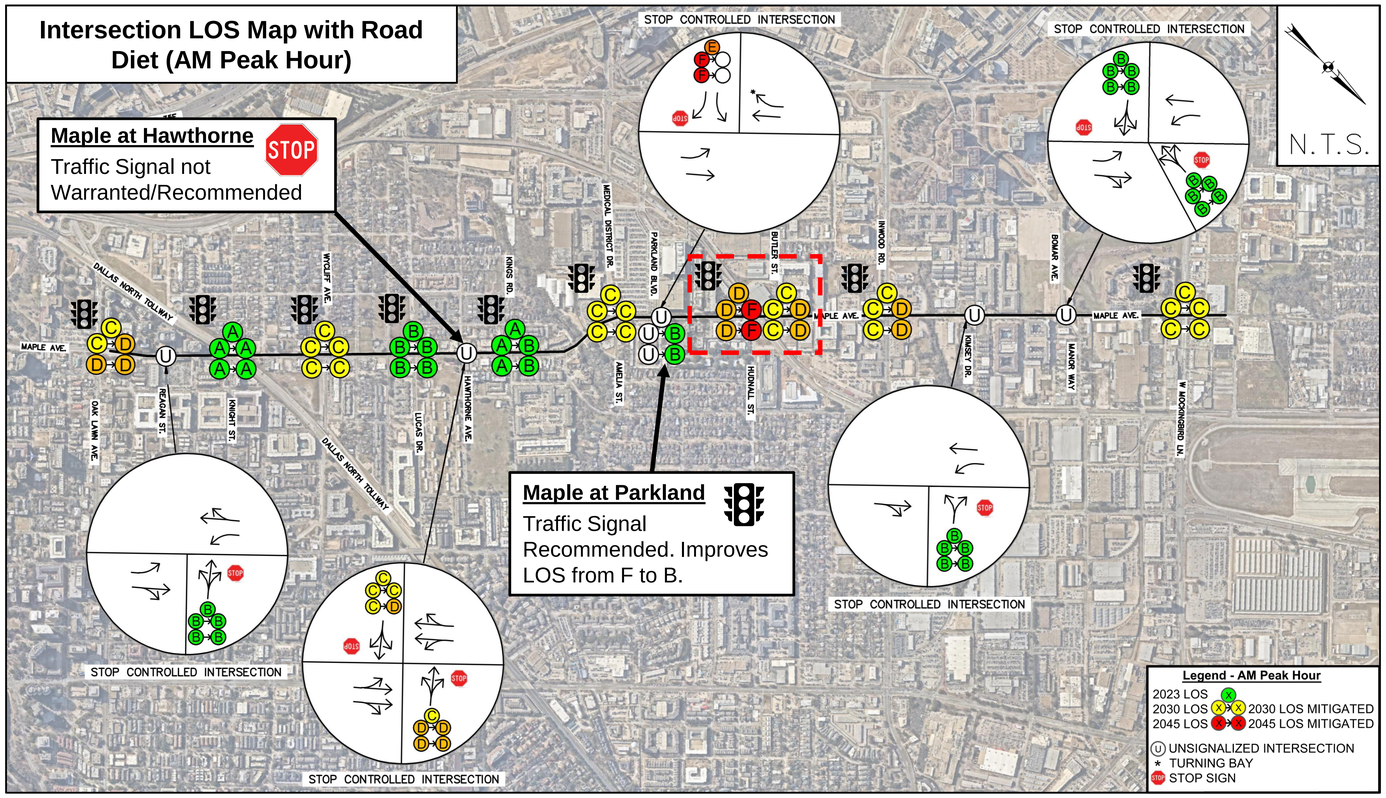
Maple Avenue Transportation Corridor Study Public Meeting

Road Diet (Lane Reduction) Traffic Analysis

Intersection LOS Map with Road Diet (AM Peak Hour)



LOS Evaluation

The LOS at each signalized intersection and select stop-controlled intersections was evaluated using the **average total delay with and without the road diet**. The road diet causes an increase in LOS across the board, with the **PM peak hour having significantly more delay than the AM peak hour.** However, after signal adjustments, **the majority of intersections perform adequately in both the AM and PM peak hour.** The only intersections that are failing are Maple at Hawthorne, Maple at Parkland, and Maple at Butler/Hudnall. The westbound approach of Hawthorne at Maple is failing in the PM peak hour, however, it **did not meet warrants for a traffic signal** and the **maximum delay remains less than 30 seconds/vehicle**. Therefore, it is recommended that this intersection **remain unsignalized**.

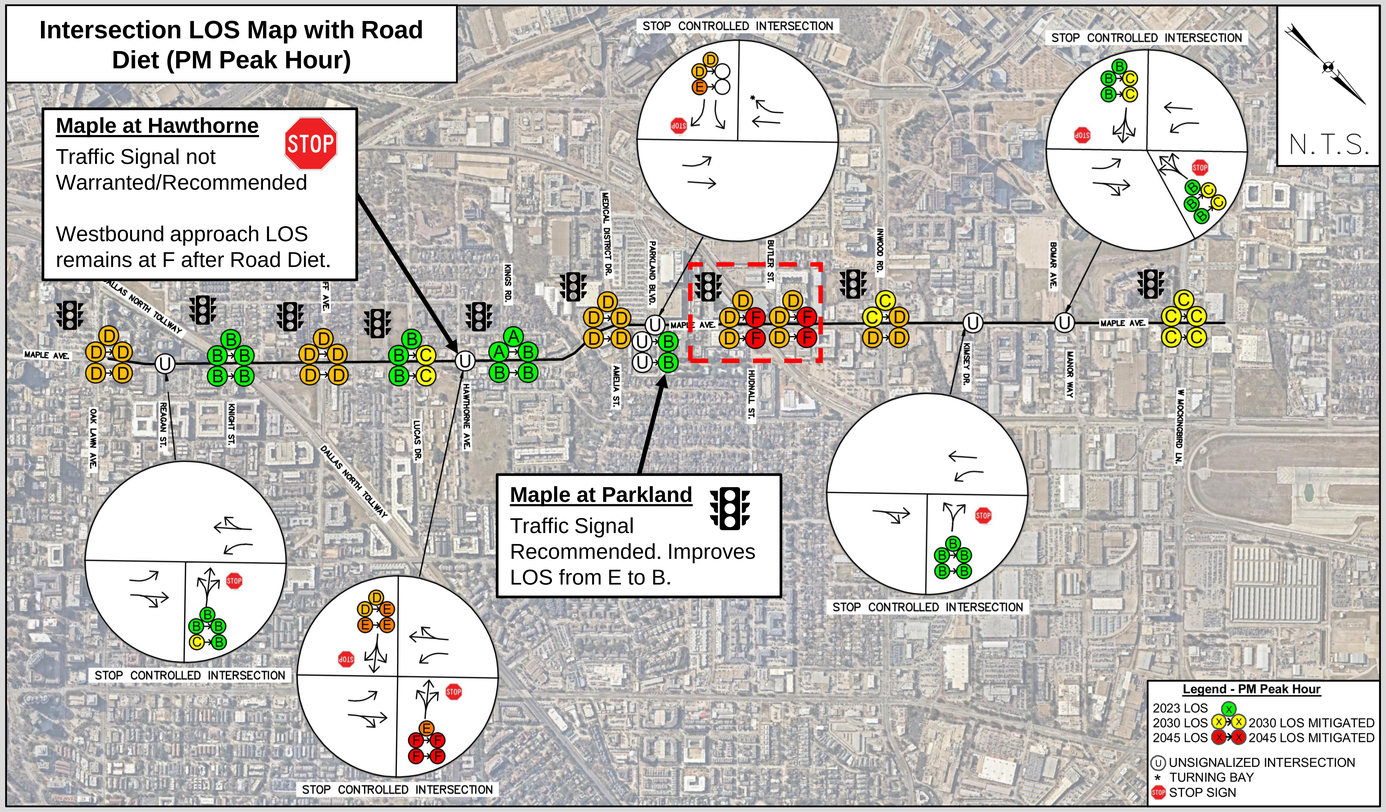
Signal Warrant Table for both AM and PM Peak Hours

Intersection	Scenario Year	Warrant Met?
Maple at Hawthorne	2023	No
	2030	No
	2045	No
Maple at Parkland	2023	No
	2030	Yes
	2045	Yes

Signal Warrant Information

A signal warrant was conducted on all unsignalized intersections that were operating at a **LOS of E or worse**. For both the AM and/or PM scenarios, the only intersection that **warranted a signal** was **Maple at Parkland**. Because of this and high pedestrian traffic in the area, we are **recommending a traffic signal be installed at this location.**

Intersection LOS Map with Road Diet (PM Peak Hour)



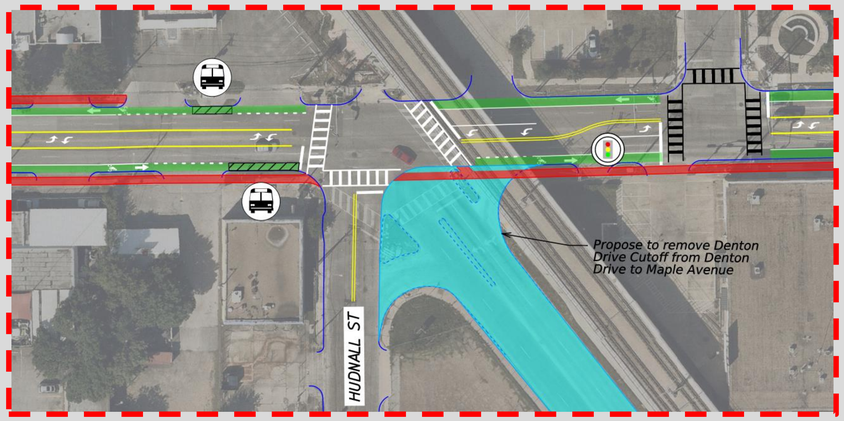
AM Peak Hour

10 out of 11 signalized intersections are projected to operate at **LOS D or better in 2045 with the road diet** and signal timing adjustments.

PM Peak Hour

9 out of 11 signalized intersections are projected to operate at **LOS D or better in 2045 with the road diet** and signal timing adjustments.

Proposed Closure of Denton Drive Cutoff



The intersections of Maple at Hudnall St/Denton Dr Cutoff and Maple at Butler St operate together using a **shared traffic controller**. Because of this, there is **little flexibility in signal timing adjustments**. One potential solution to this problem is to **close Denton Drive Cutoff**. This would **simplify the intersection** and allow for **more sophisticated signal timing changes** thereby improving the LOS.

Kimley»Horn