Lindsey Street at Elm Avenue Project Update

Community Planning & Transportation Committee

November 30, 2023

Agenda

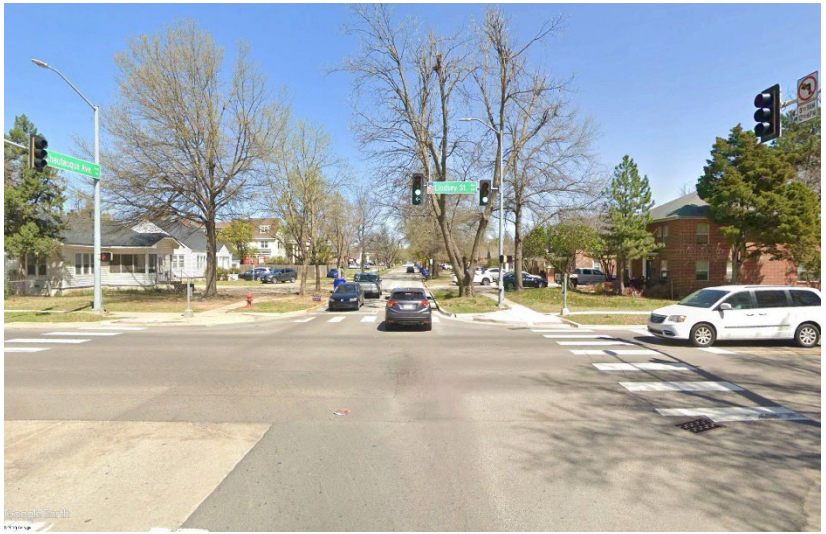
- Review of intersection geometrics
- A review of how the intersection operated prior to June 7, 2023
- Evaluating the Request to Change
- Description of changes that were implemented on June 7, 2023
- Summary

Lindsey at Elm: The Site

- The north/south Elm Avenue approaches to Lindsey Street are both single lane approaches with the left, through, and right turn movements made from the single lane
- For years, the north/south movements operated with a green ball meaning that all north/south movements occurred at the same time
- Any significant volume of either northbound or southbound left-turns would be stuck with no gaps to turn and might have to sit through multiple signal cycles

The Request to Change

- We had a very similar intersection just to the west on Lindsey Street at Chautauqua Avenue
- A few years ago, split phasing was introduced whereby the north and south approaches got green indications separate from one another
- This allows the left-turn to clear in a single phase of the traffic signal



Request for Lindsey and Elm

- Request was received to evaluate implementing the same solution as is in place at Lindsey and Chautauqua at Lindsey and Elm
- If implemented, the north/south approaches of Elm Avenue to Lindsey Street would receive green indications separate from one another
- The change would allow the left-turns to clear, most likely, in a single phase of the traffic signal

Intersection Evaluation

- Traffic volumes were collected when all schools, including OU and NPS were in session
- We already had a model of the Lindsey corridor from past signal timing efforts
- The newly collected traffic volumes were entered into the model
- Scenarios were run for comparison with and without the introduction of split-phasing on the two Elm Avenue approaches

Evaluation Results

- There are two basic items which need to be checked when considering the change to split-phasing at an intersection
- First, we need to measure the change on the level-of-service that will be experienced at the intersection and on the impacted approaches
- Second, there is a term we call bandwidth which is the amount of time available for traffic on the coordinated street, in this case on Lindsey Street, to be able to make it through this intersection without stopping. The change to split-phasing on Elm will impact the amount of green time available to move traffic on Lindsey.

Impact on Level-of-Service

Period	Overall LOS		NB LOS		SB LOS	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
AM Peak	C	C	E	E	E	D
Mid day	E	C	E	E	E	E
PM Peak	F	E	F	E	E	E

- In other words, the LOS either stayed the same or improved during each of the three peak periods

Impact on Delay

- Delay is shown below in seconds per vehicle

Period	Overall Delay		NB Delay		SB Delay	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
AM Peak	23.2	23.5	61.8	59.3	57.3	54.6
Midday	57.4	33.1	73.6	65.8	75.2	66.5
PM Peak	82.1	63.4	84.7	67.1	75.6	67.8

- In other words, there will be some significant delay reductions during the two worst peaks because those north/south vehicles will now be able to clear in a single traffic signal phase

Corridor Impact of the Change

- When Traffic Engineers talk about the ability of a motorist to get from one end of a coordinate system to the other with minimal number or no stops, we use the term Bandwidth

- A change like split-phasing of the two Elm Avenue approaches can have a negative impact on the Bandwidth because the time needed for the additional side street phase will have to come from green time previously allocated to Lindsey Street—changes are illustrated below

Period	Eastbound Bandwidth		Westbound Bandwidth	
	Existing	With Split-Phasing	Existing	With Split-Phasing
AM Peak	5 sec	6 sec	5 sec	5 sec
Midday	5 sec	3 sec	5 sec	1 sec
PM Peak	5 sec	2 sec	5 sec	2 sec

- As expected, there were some changes even though the AM Peak appeared unchanged. This was not unexpected and is probably expected by motorists who typically drive Lindsey Street.

Next Steps

- One of the things that causes tremendous bottlenecks on Lindsey Street through campus are the three separate pedestrian signals at the Van Vleet Oval
- One of the issues is that the three signals all turn red and/or green at the same when a pedestrian pushes the pushbutton at only one of the crosswalks
- The 2019 City Transportation Bond Program includes “Special Corridor” project on Lindsey Street between Elm and Jenkins and will address this

QUESTIONS?