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Public Works

City Transit
263-8152

MEMORANDUM

To: Brian Stineman, Gregg Mandsager
FROM: Jim Edgmond, City Engineer
Andrew Fangman, City Planner
CC:
DATE: August 29, 2016
RE: Mississippi Drive Corridor Intersection Options

Equipment Maintenance
Roadway Maintenance
Collection & Drainage
Building & Grounds
Engineering

INTRODUCTION:

The design of the Mississippi Drive Corridor Project (MDCP) has developed multiple options for the intersections at 2nd Street and Mulberry Avenue and at Carver Corner. These options have been reviewed by City staff and we have the following recommendations.

RECOMMENDATIONS:

CARVER CORNER:

The options for this intersection are a (A) four legged roundabout, a (B) three legged roundabout and a (C) large radius sweep that will have Hershey Avenue tee into the midpoint of the sweep.

The most troublesome aspect of these intersections is that option A will require the NEPA EA to be opened and evaluated because this roundabout has a larger foot print and was not evaluated in the previous environmental work. The construction costs for these three options are approximately the same. **After evaluating these options supplied by the design consultant it is my/our recommendation that option A, the four legged roundabout be adopted for the project.** This is based upon the following:

1. The level of service for today's traffic and the projected traffic 20 years out is highest of the three options for this intersection.
2. This intersection will be safer because of the lower speeds and will be safer for pedestrians because of the lower speeds through the intersection.
3. This intersection will provide full access to Green Street.
4. This intersection will provide safe and easy access to currently legal trucks and allow easy access to slightly larger trucks in the future should the laws change.

While rebuilding Carver Corner as a large radius sweep does not technically warrant the installation of a full set of traffic signals, there are two major reasons why staff recommends that

**"I remember Muscatine for its sunsets. I have never seen any
on either side of the ocean that equaled them" — Mark Twain**

if the large radius sweep option is the one selected, that traffic signals be included. First currently on the combined Mississippi Drive/Grandview Avenue corridor there are no safe and inviting places for bikes and pedestrians to cross the corridor between Iowa Avenue and Warren/Oregon. This creates a 1.35 mile long barrier to bicyclists and pedestrians due to the 7,600 to 9,500 vehicles per day along this corridor. The Carver Corner intersection, which is close to the midpoint of this 1.35 mile stretch and relatively close to the riverfront trail access point located near the Hershey Avenue pump station makes this a logical place for safe and inviting pedestrian and bike access to the riverfront. Second, the left turn from Hershey Ave. onto Mississippi Drive would be difficult and the perception of the motoring public would be that the city had spent a million dollars and made the intersection worse than it was.

To address the perception that there is not a lot of pedestrian activity at the Carver Corner intersection staff would like to point out that the Grandview Ave. project will increase pedestrian traffic along and to this intersection due to sidewalks along the entire route. Also the existing intersection does not have any accommodation for pedestrians, the signal does not accommodate pedestrians and there are no marked pedestrian crossings. Once the Grandview Ave. project is built and the intersection of choice is built to accommodate pedestrians, and the area between this intersection and the river is redeveloped we feel there will be a substantial increase in bike and pedestrian activity to and through this intersection.

Recent City infrastructure investments have recognized the importance of this intersection to bike and pedestrian traffic. When Hershey Avenue was reconstructed in 2010 a 900 foot long 8 foot wide sidewalk, which meet the minimum width standards for being classified as a trail was built on the south side of Hershey Avenue from the trail access point by the Hershey Avenue pump station to the Carver Corner intersection. This is a reflection of the value of this trail access point as that is the only location from which the trail can be accessed from three-quarters of a mile in each direction. Creating a safe and attractive crossing at Carver Corner with the new intersection increases the value of this previous investment in bike and pedestrian infrastructure. Minimizing the importance of bike and pedestrian access at the new intersection means the value of this previous investment will never be fully realized.

It is for these reasons that staff strongly recommends the roundabout intersection over the large radius sweep intersection without signals.

This recommendation for the four legged roundabout is not done because it is fashionable or part of a new trend. It is done because this roundabout is the right solution for now and the future. The recommendation comes with the following condition. This intersection is recommended to be opted out of the main part of the construction so that the revised environmental work can be done and then a separate contract can be done to construct the roundabout at a not too distant time in the future. The tough but right decision now is to do the project and not compromise traffic performance or traffic safety for pedestrian and bicyclist safety because one of these intersection options is easier to accomplish.

MULBERRY AND 2ND STREET:

The options for this intersection are a (D) 4 legged roundabout, and a (E) more standard

intersection with traffic signals.

The most troublesome aspect of these options is that again option D probably requires a relook at the NEPA environmental work. The costs for these options are approximately the same with the roundabout being estimated as slightly less expensive than option E. **After evaluating these options supplied by the design consultant it is my/our recommendation that option D, the four legged roundabout be adopted for the project.** This is based upon the following:

1. The level of service for today's traffic and the projected traffic 20 years out is highest of the options for this intersection. It also accommodates current and future estimated truck traffic with less delay than the signalized intersection.
2. This intersection will be safer because of the lower speeds and will be safer for pedestrians because of the lower speeds through the intersection.
3. This intersection will provide full truck access to adjacent industries to use Mulberry Ave. if 2nd Street and Mulberry Avenue are closed due to a Mississippi high water event.
4. This intersection will provide safe and easy passage to currently legal trucks and allow easy passage to slightly larger trucks in the future should the laws change.

This recommendation also comes with the same condition as the first recommendation. This intersection should be opted out of the main portion of the MDCP the same as the Carver Corner intersection. This staged construction still allows the City to meet all the commitments for MDCP and still provide the design of the intersections that will meet the current and future needs of the City and major downtown traffic generators.

RECOMMENDATION/RATIONALE:

Recommend City Council accepts the recommendations as stated in this memo for the design of the intersections for the MDCP.

Recommend the City Council request the two intersections be opted out of the first construction contract so that time can be afforded to do the revision to the environmental work.

Mississippi Drive | Corridor Revitalization

9.1.2016 Council Meeting



A Destination Transportation Project...



Welcome!

Tonight's Agenda:

- Selection of preferred design alternatives at 'book ends' of the project
- Back-in angled parking confirmation
- Additional design direction?

Intersection Design | Carver Corner

Signalized (existing): Level of Service - B

Roundabout: Level of Service - A

Impacted Building



Intersection Design | **Carver Corner**

4 Leg Roundabout Alternative:

Pros:

- **Lower costs than signalized (EA) intersection**
- **Free flowing traffic**
- **Gateway to downtown**

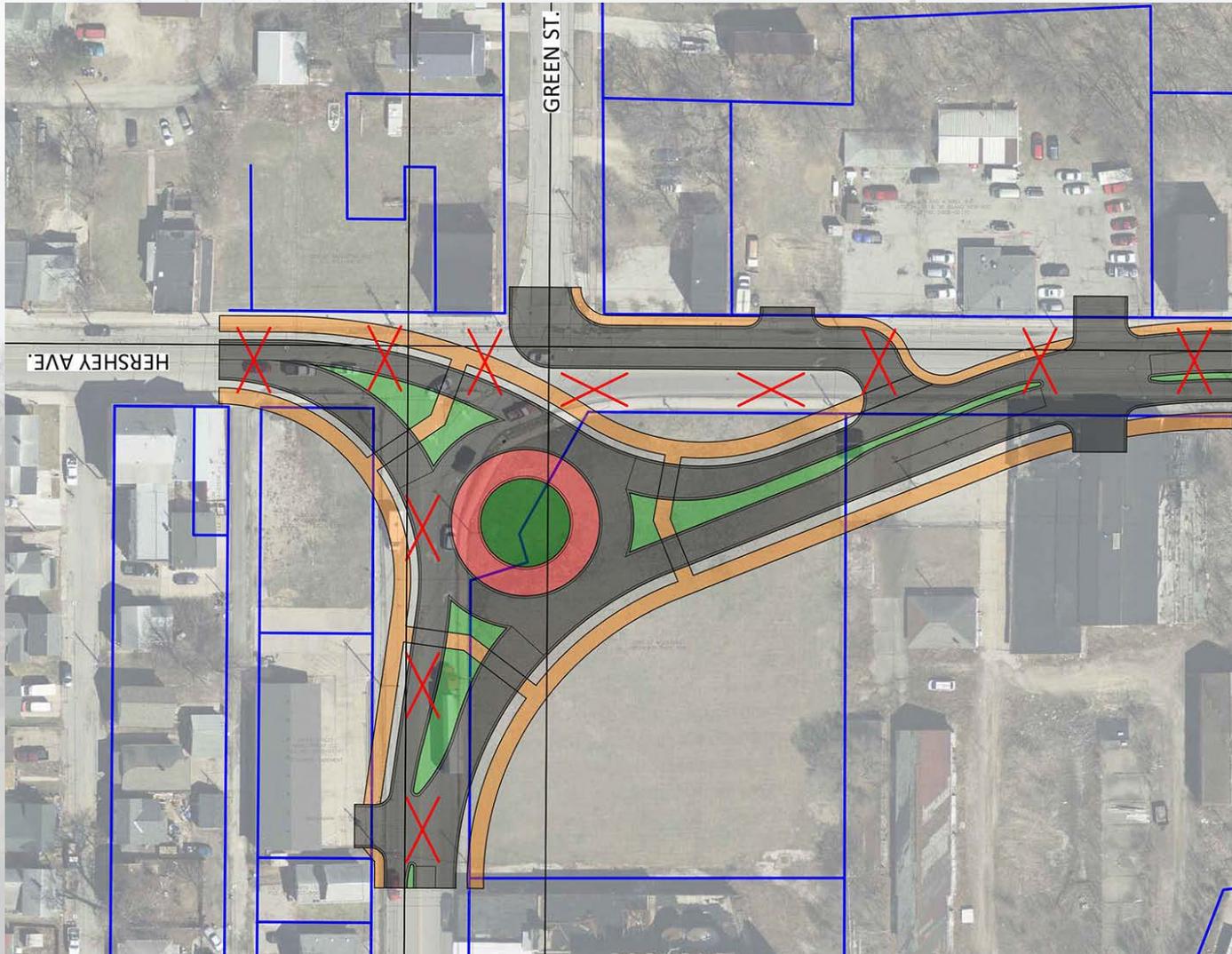
Cons:

- **Different traffic flow than before**
- **Impacts different properties than originally planned – necessitates EA revisions and delayed construction**



Intersection Design | Carver Corner

3 Leg Roundabout Alternative:



Intersection Design | **Carver Corner**

3 Leg Roundabout Alternative:

Pros:

- **Lower costs than signalized (EA) intersection**
- **Free flowing traffic**
- **Gateway to downtown**
- **Preserves historic eligible hotel**

Cons:

- **Different traffic flow than before**
- **Green St. is reoriented (potentially safer)**

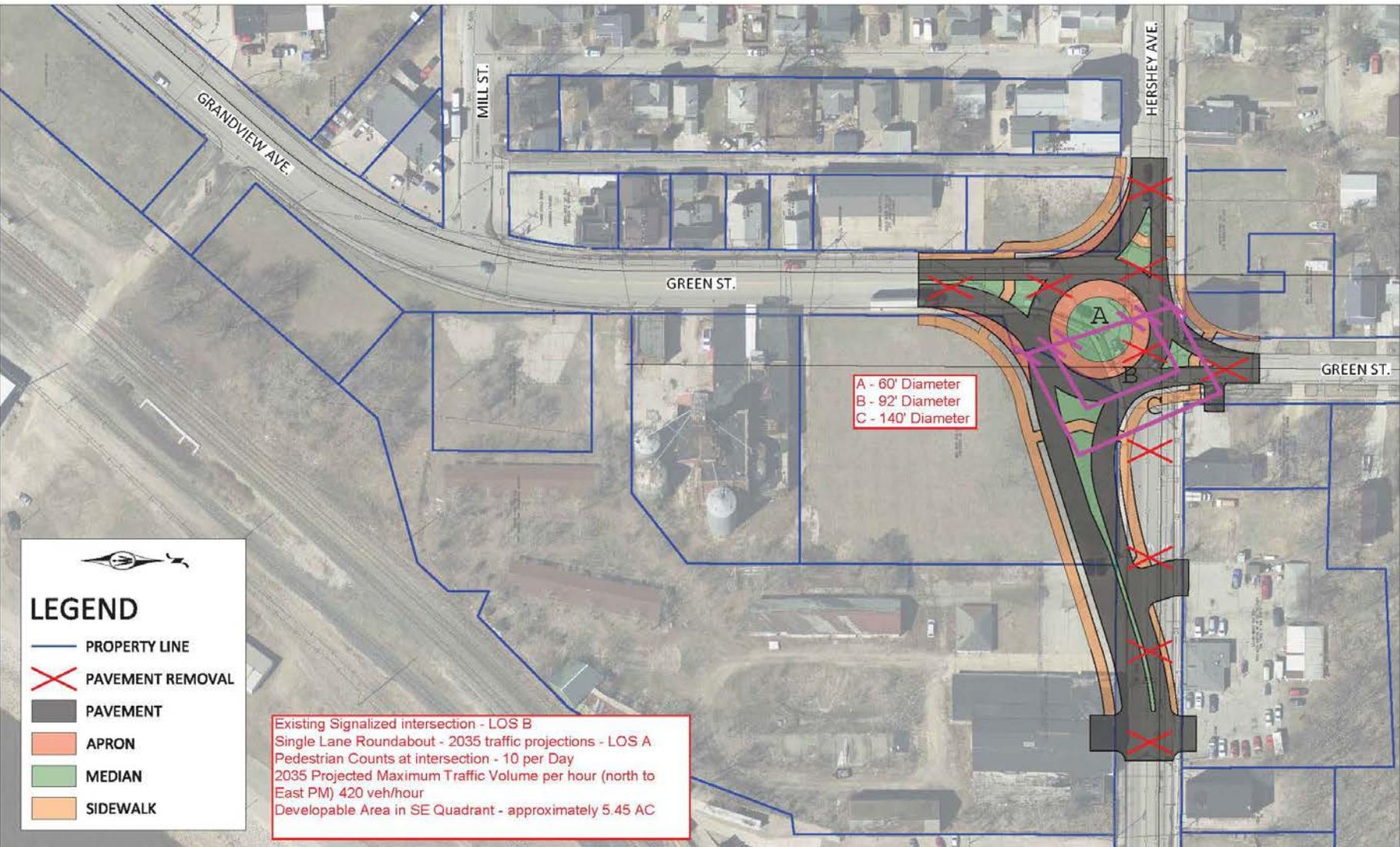
Intersection Design | **Carver Corner**

Cost Range for Alternatives:

Roundabout	\$1 Million
3-Leg Roundabout	\$1.1 Million
Sweep (w/ Ped Signal):	\$1.05 Million
EA preferred:	\$1.7 Million

***includes ROW and signalization costs**

Intersection Design | Carver Corner



A - 60' Diameter
 B - 92' Diameter
 C - 140' Diameter

Existing Signalized intersection - LOS B
 Single Lane Roundabout - 2035 traffic projections - LOS A
 Pedestrian Counts at intersection - 10 per Day
 2035 Projected Maximum Traffic Volume per hour (north to East PM) 420 veh/hour
 Developable Area in SE Quadrant - approximately 5.45 AC

LEGEND

- PROPERTY LINE
- PAVEMENT REMOVAL
- PAVEMENT
- APRON
- MEDIAN
- SIDEWALK



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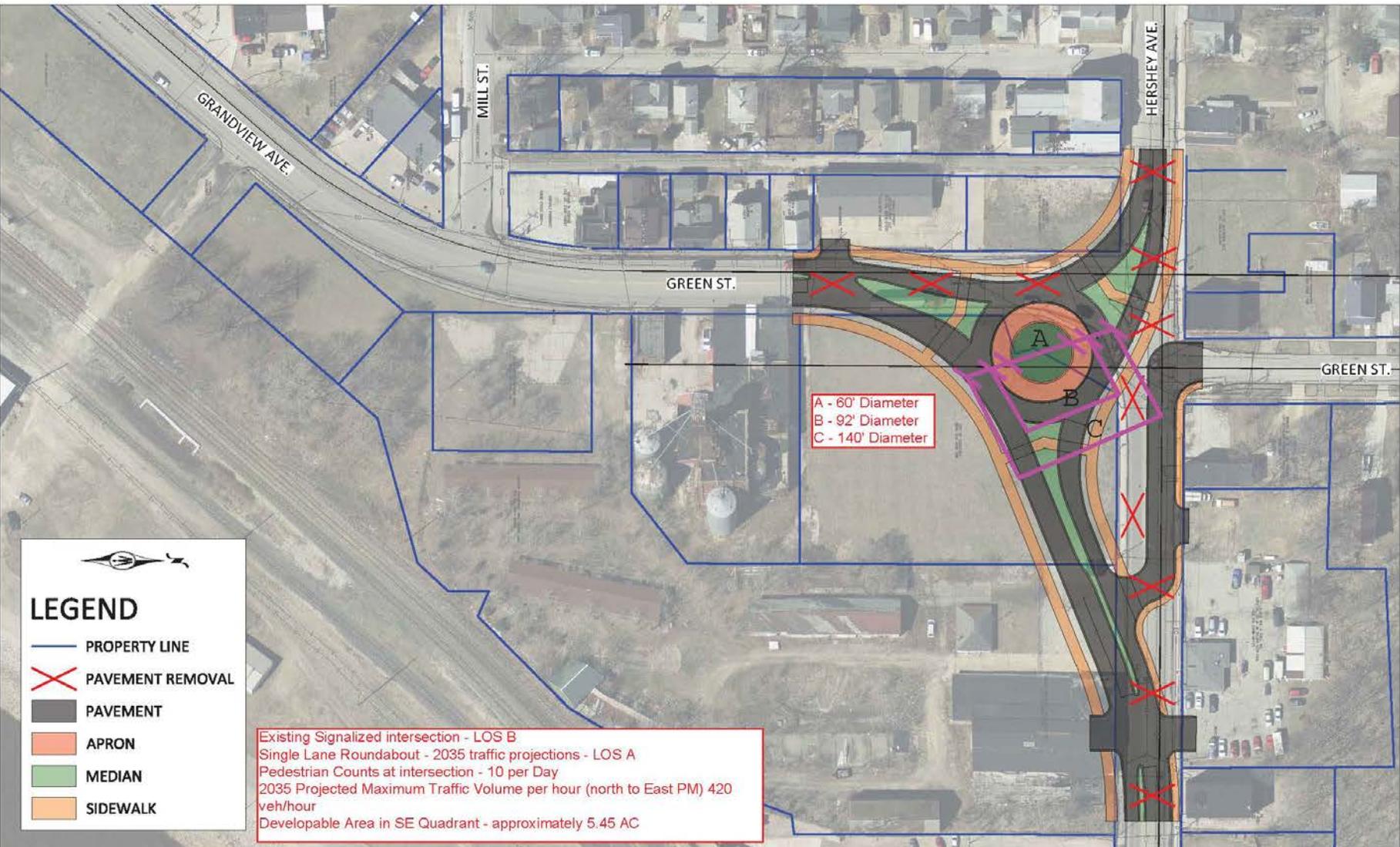
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MUSCATINE, IOWA
 MISSISSIPPI DRIVE CORRIDOR RECONSTRUCTION
 INTERSECTION - OPTION 1

SHEET
1

Intersection Design | Carver Corner



LEGEND

- PROPERTY LINE
- PAVEMENT REMOVAL
- PAVEMENT
- APRON
- MEDIAN
- SIDEWALK

Existing Signalized intersection - LOS B
 Single Lane Roundabout - 2035 traffic projections - LOS A
 Pedestrian Counts at intersection - 10 per Day
 2035 Projected Maximum Traffic Volume per hour (north to East PM) 420 veh/hour
 Developable Area in SE Quadrant - approximately 5.45 AC

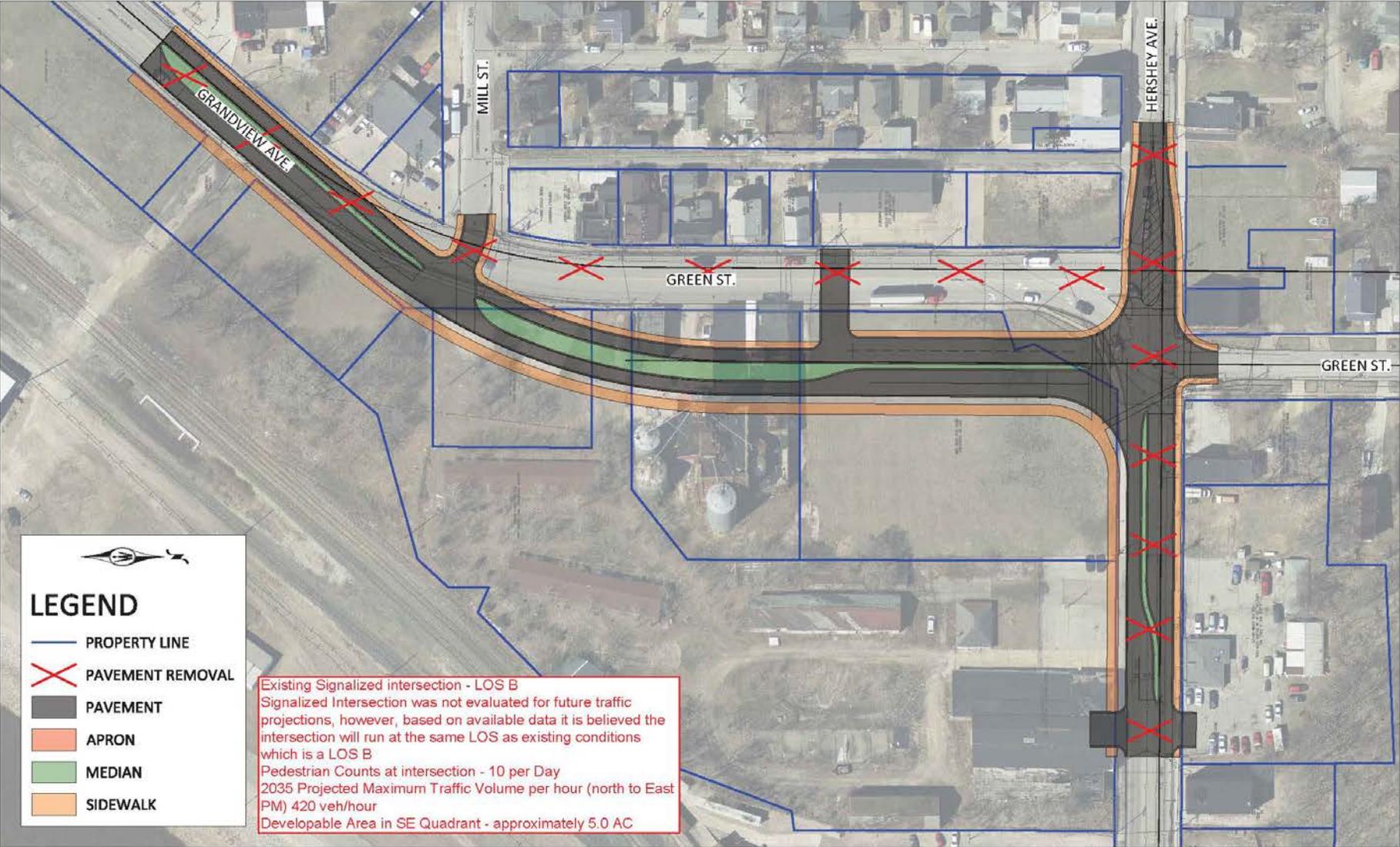


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MISSISSIPPI DRIVE CORRIDOR RECONSTRUCTION		3
INTERSECTION - OPTION 3		

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Intersection Design | Carver Corner



LEGEND

- PROPERTY LINE
- PAVEMENT REMOVAL
- PAVEMENT
- APRON
- MEDIAN
- SIDEWALK

Existing Signalized intersection - LOS B
 Signalized Intersection was not evaluated for future traffic projections, however, based on available data it is believed the intersection will run at the same LOS as existing conditions which is a LOS B
 Pedestrian Counts at intersection - 10 per Day
 2035 Projected Maximum Traffic Volume per hour (north to East PM) 420 veh/hour
 Developable Area in SE Quadrant - approximately 5.0 AC



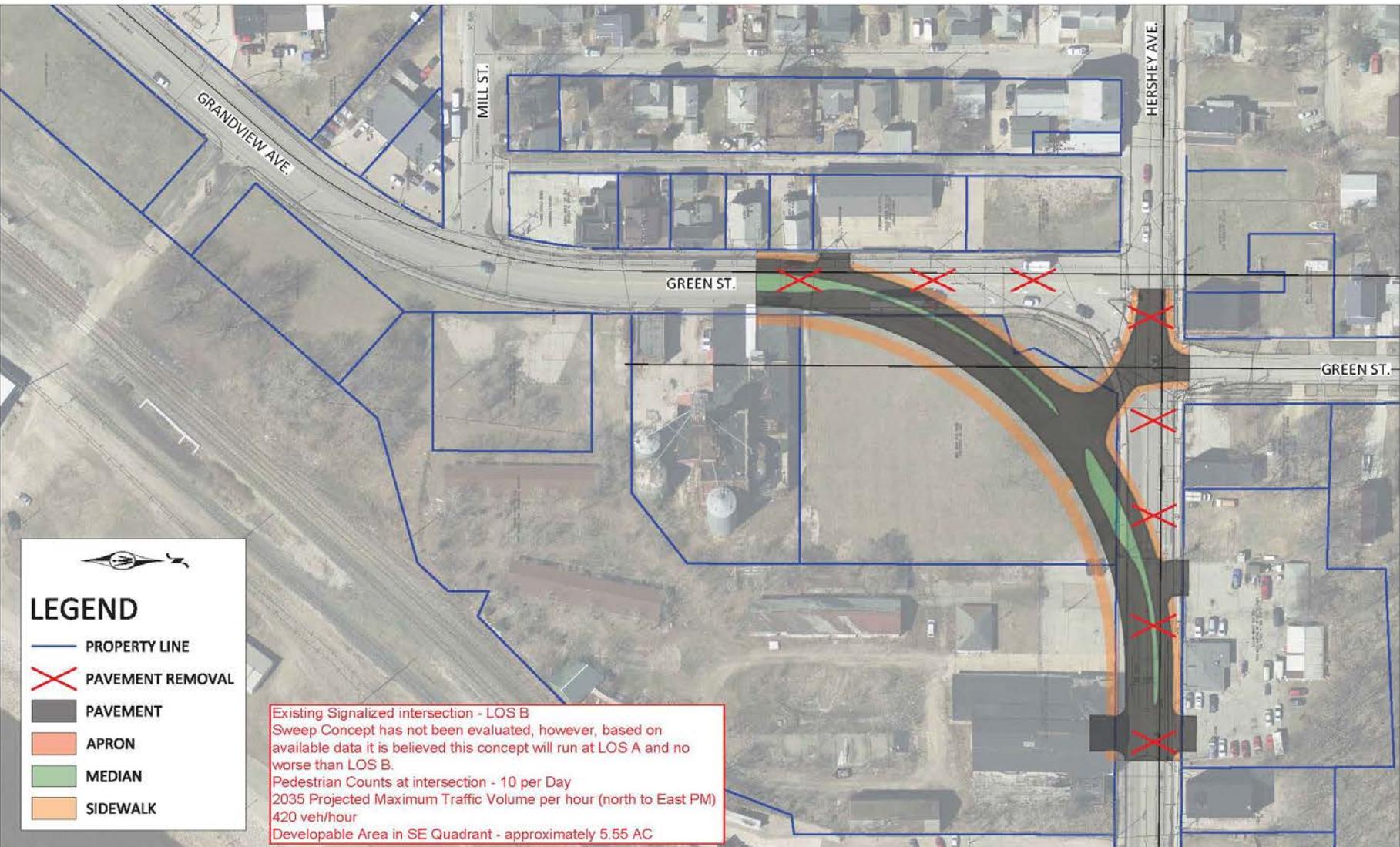
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INTERSECTION - OPTION 4			

Intersection Design | Carver Corner



LEGEND

- PROPERTY LINE
- PAVEMENT REMOVAL
- PAVEMENT
- APRON
- MEDIAN
- SIDEWALK

Existing Signalized intersection - LOS B
 Sweep Concept has not been evaluated, however, based on available data it is believed this concept will run at LOS A and no worse than LOS B.
 Pedestrian Counts at intersection - 10 per Day
 2035 Projected Maximum Traffic Volume per hour (north to East PM) 420 veh/hour
 Developable Area in SE Quadrant - approximately 5.55 AC



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Intersection Design | 2nd & Mulberry

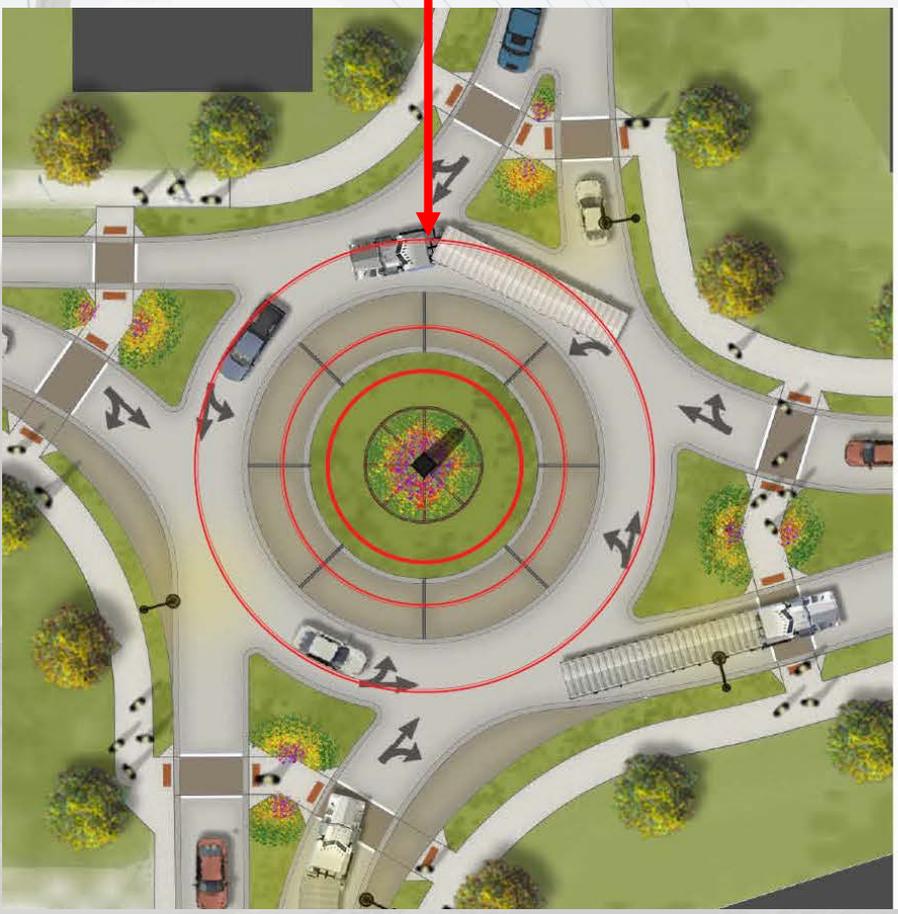
Signalized (existing): Level of Service – C/D
(event D/E)

Roundabout: Level of Surface - A



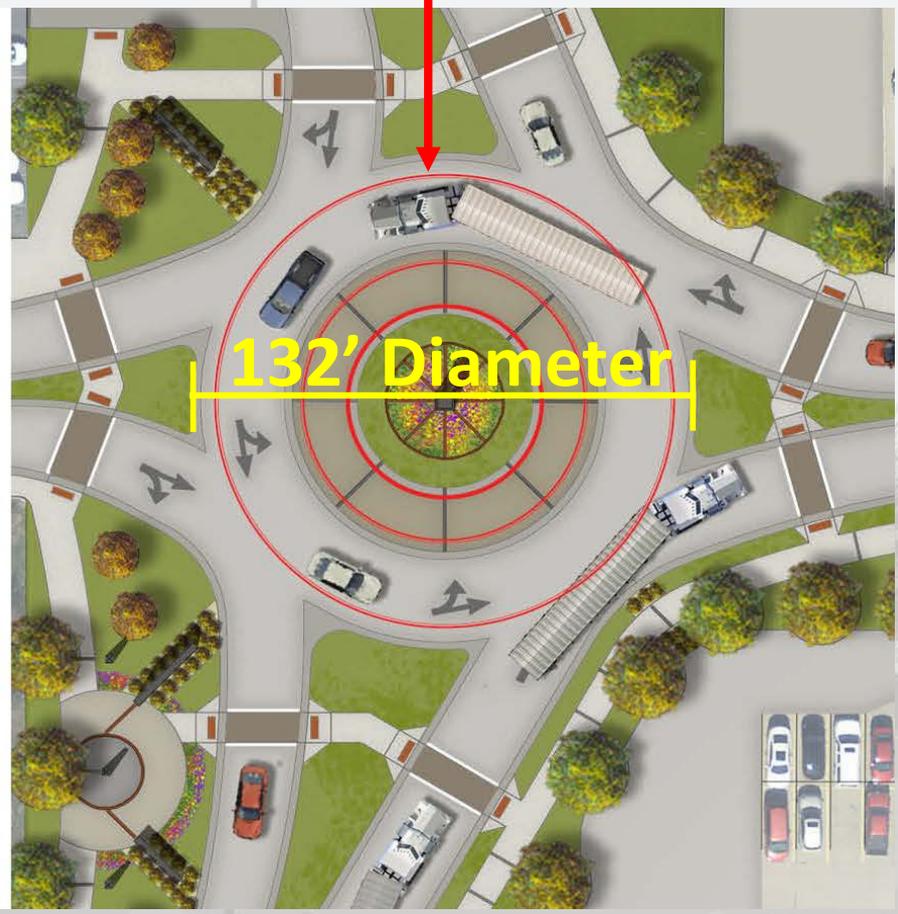
Roundabout Comparison | Cedar St. Overlay

Cedar Street Roundabout = 120' Diameter



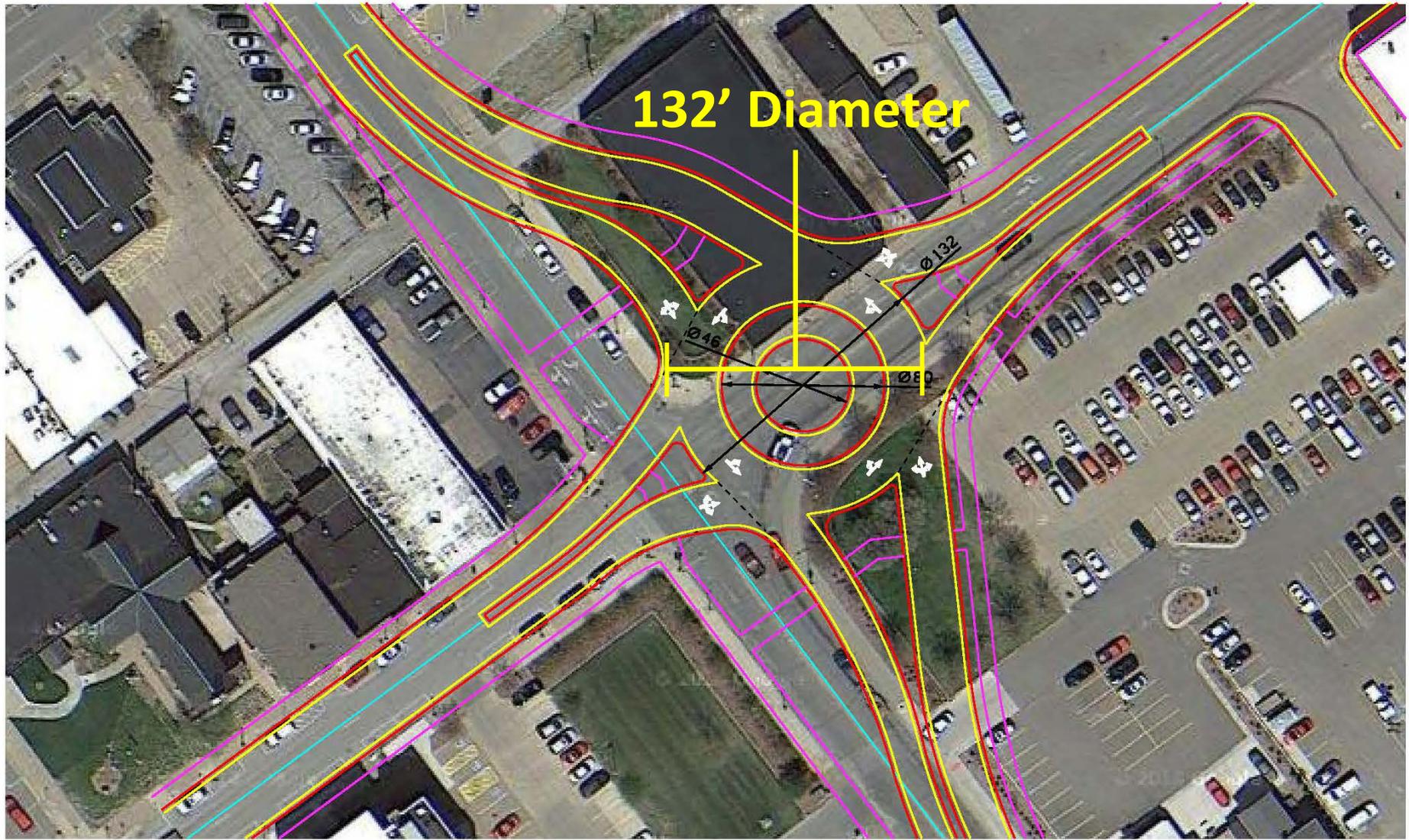
Carver Corner Roundabout Concept

Cedar Street Roundabout = 120' Diameter



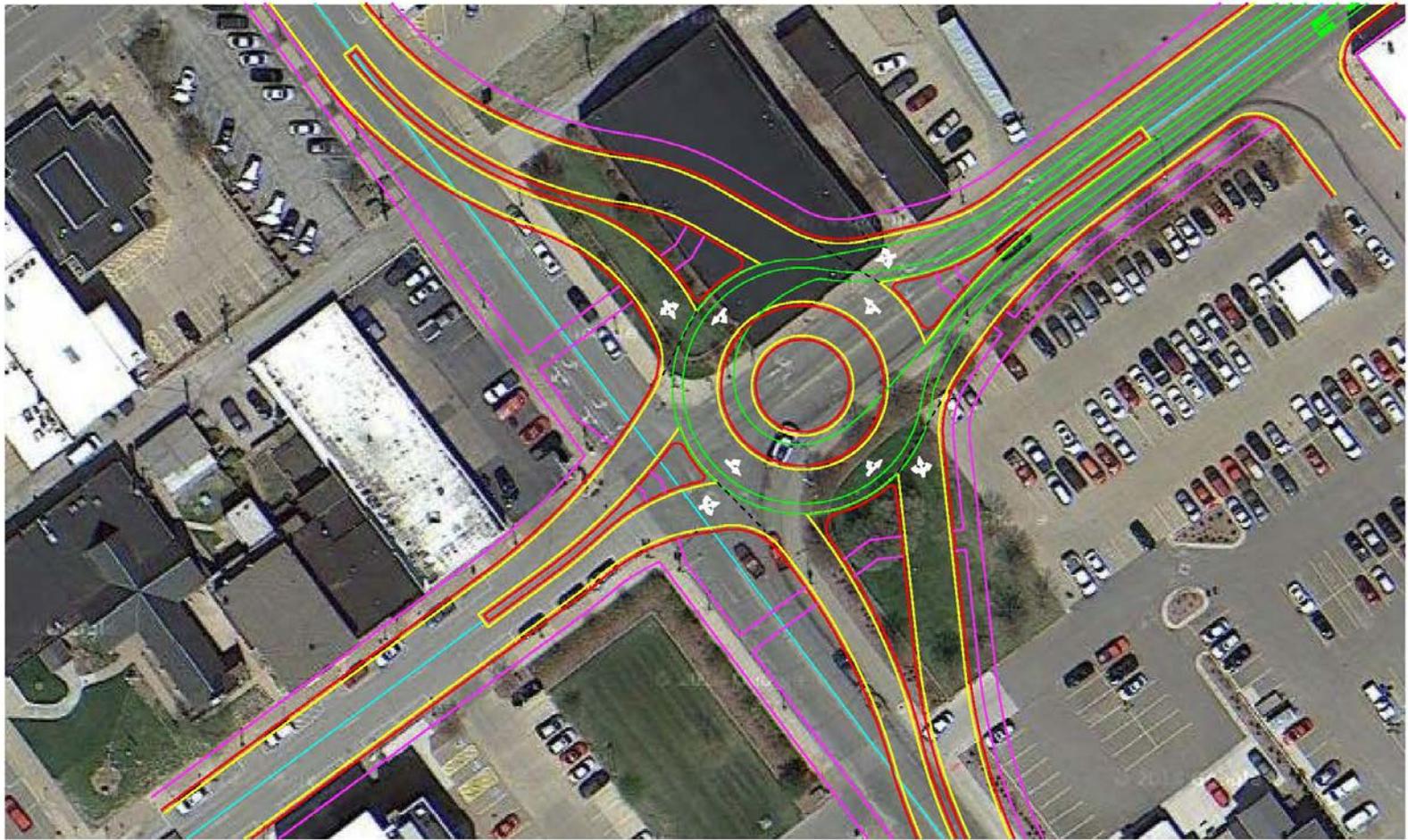
2nd & Mulberry Roundabout Concept

Roundabout Comparison | 2nd & Mulberry



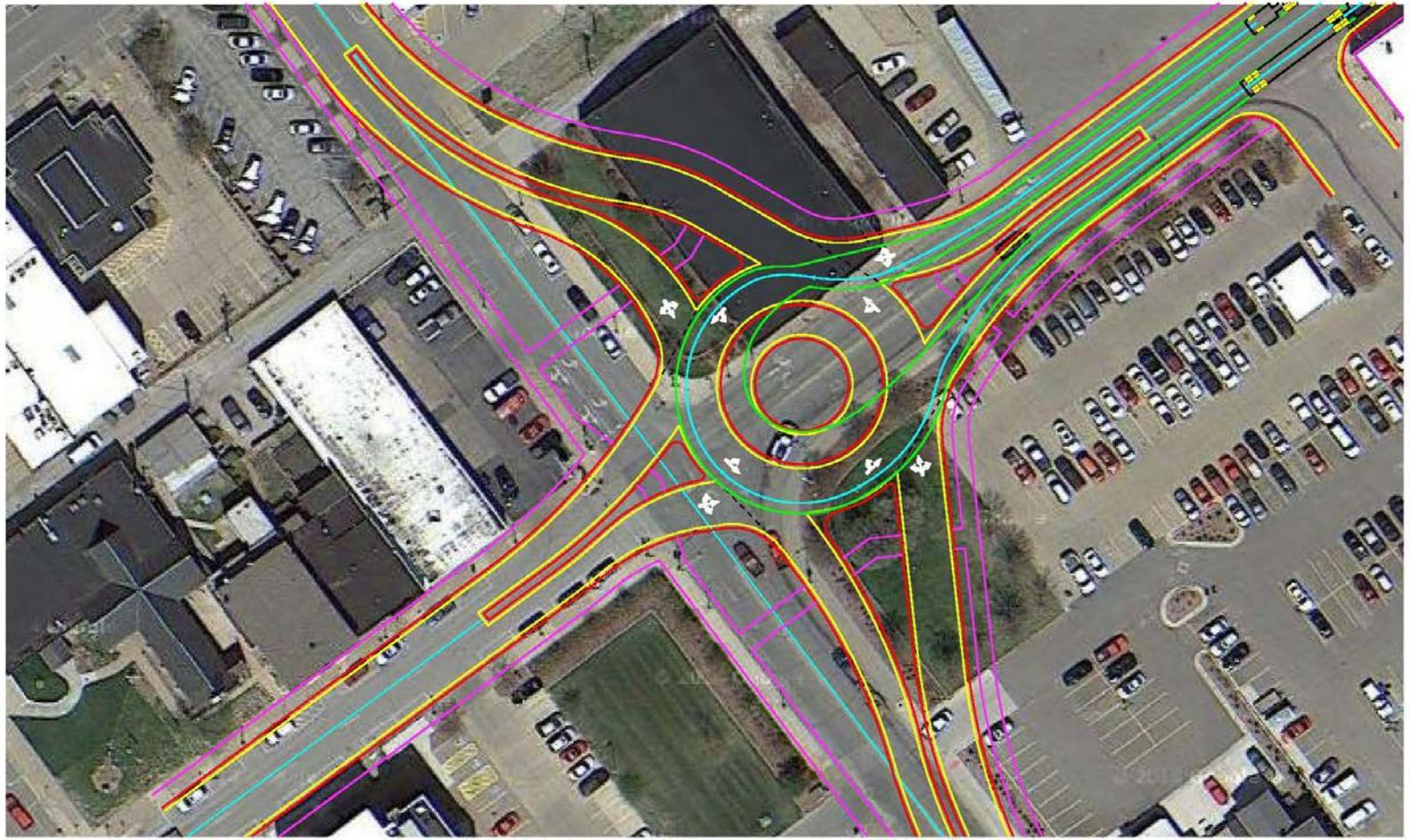
Roundabout Comparison | Turning Movements

Design Vehicle = WB67 (Interstate Semitrailer, 73.5' end to end)



Roundabout Comparison | Turning Movements

Design Vehicle = 60' Semitrailer



More & Safer Parking!

Mississippi Drive Parking Analysis:

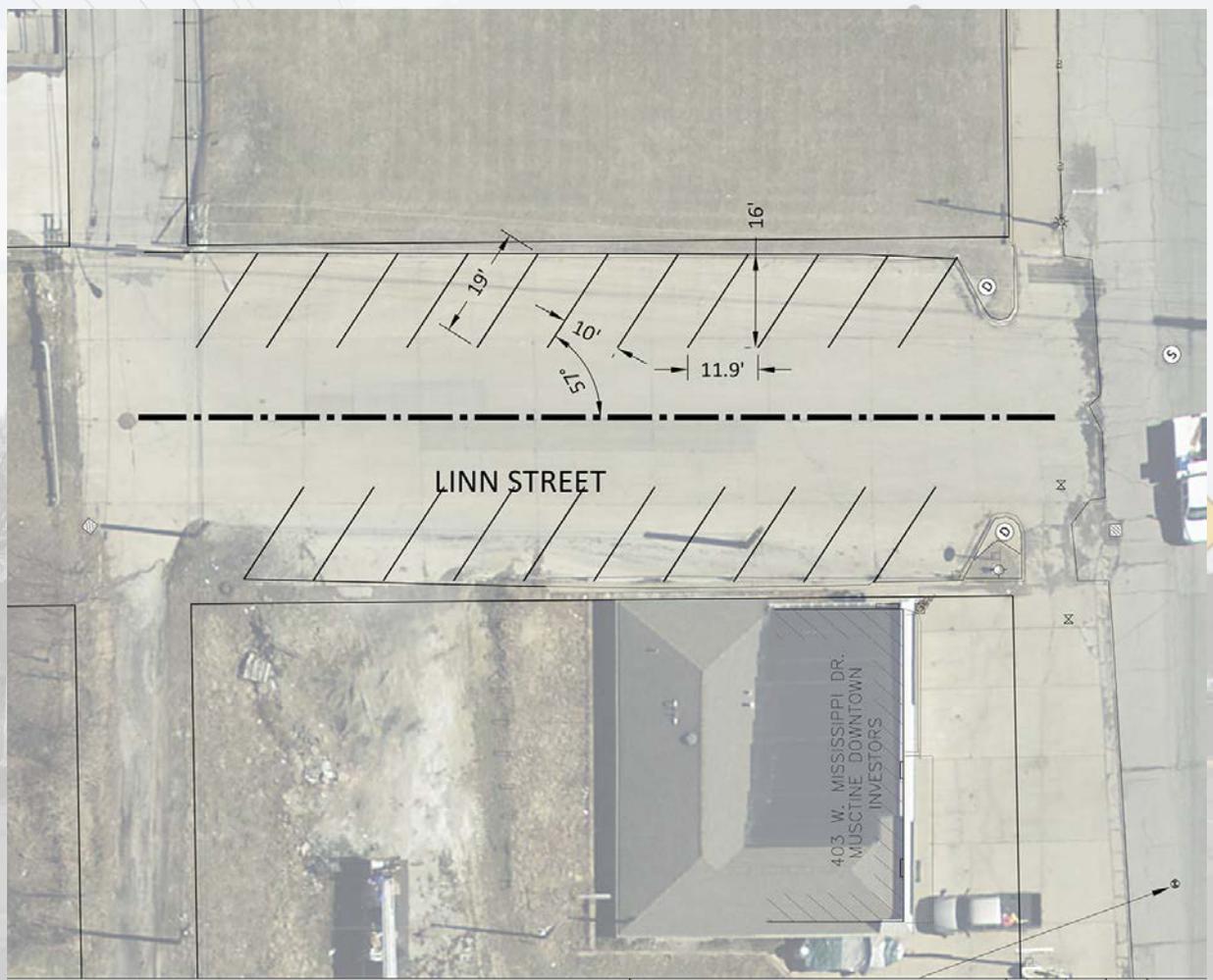
- Existing: 29 Spaces
- Tandem Stalls w/ Pull In/Out Buffer

Proposed Back-In Parking:

- Currently Proposed: 48 Spaces
- Northside of Mississippi Drive Only



Back In Parking | Test Lot



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Back In Parking | Test Lot

 City of Muscatine, Iowa - City Government   Jim Home



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August 11 at 3:15pm · 🌐

Learn more about the new back-in angled parking that is being demonstrated on Linn Street between Mississippi Drive and Alley #1!



Back-in Angled Parking is Being Demonstrated in Muscatine – Here's Your Guide!

Here's your guide to back-in angled parking that is now in Muscatine! Linn Street, between Mississippi Drive and Alley #1, was recently striped and prepared to...

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PEOPLE







Gove

LIKED B

Feedback for Options from Staff and Industry

- **Roundabouts at both intersections are a good near and long term solution to both Carver Corner and 2nd and Mulberry**
- **Three legged intersection suits traffic operations, redevelopment options, and fits within EA restrictions**
- **HNI has reviewed 2nd and Mulberry and can utilize both designs, but would prefer the roundabout for their operations**

Feedback for Options from Staff and Industry

- **Back in angled parking is a safer alternative to head in parking and allows more stalls than parallel parking**



Questions?

