

South State Street //

Corridor Study



December 2017

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Introduction

The State Street corridor, between Ellsworth Road and Oakbrook Drive, is a vital gateway to the city of Ann Arbor, and a key artery for both commercial and residential traffic to and from the south. The current configuration of the roadway, designed and built in the 1960's is largely optimized for vehicle throughput. However, the corridor has a history of vehicular safety concerns, and is lacking in terms of access for all users, and facilitation of non-motorized traffic. Sidewalks are absent or inconsistent along much of the corridor, and there are no cycling facilities. Further, the current configuration of the roadway allows for a minimal number of safe pedestrian crossing locations, leaving much of the area disconnected at a pedestrian scale and prompting additional vehicle trips even for short distance travel. In addition, while being optimal for vehicle throughput along the corridor, the restricted turn access along the segment between I-94 and Eisenhower Parkway inhibits access to adjacent properties, resulting in circuitous routing and in some cases lengthening vehicle trips to reach destinations.

In conjunction with the South State Street Corridor Plan and the city's Non-Motorized Transportation Plan, the South State Street Transportation Corridor Study is to develop a transportation plan which addresses existing issues and improves conditions for all users, while supporting both the existing corridor uses and the long-term land use vision for the area.

EXISTING CONDITIONS

The study area analyzed as part of this process encompasses all of State Street from Oakbrook Drive (to the north) and Ellsworth Road (to the south) within the City of Ann Arbor and Pittsfield Township. This segment of State Street services two major destinations, Briarwood Mall and Ann Arbor Municipal Airport, as well as surrounding commercial properties and residential neighborhoods. Additionally, the State Street / I-94 interchange serves as a significant access point to Ann Arbor from the surrounding region.

This segment of State Street is typically a total of four travel lanes – two in each direction. A raised median separating northbound and southbound traffic exists from Ellsworth Road to Airport Boulevard and from the eastbound exit ramp of I-94 to Eisenhower Parkway. There are several intersections within the study area, each with unique geometrical characteristics. The speed limit throughout the study area is 35 miles per hour (MPH). While sidewalks are present within some of the study area, there are several segments where no sidewalks are present. On-street bicycle lanes are present north of Eisenhower Parkway and south of Ellsworth Road. There are no sidewalks or bicycle facilities across the State Street overpass over I-94, which effectively bisects the corridor from a non-motorized travel perspective. Controlled crossings of the corridor for pedestrians occur at only two locations along the corridor, which are approximately 0.8 miles apart:

- State Street/Eisenhower Parkway
- State Street/Airport Blvd/Research Blvd

All signalized intersections within the study area operate at an overall level of service (LOS) D or better, which is typically considered acceptable in urban areas. However, several specific movements and stop-controlled intersections operate at LOS E or F. Two intersections have significant crash patterns (State Street / Airport Boulevard and State Street / Ellsworth Road), while two segments have significant crash patterns (I-94 EB Exit to I-94 WB Exit and I-94 WB Exit to Briarwood Circle). The unconventional left-turn configuration at many intersections, where traffic must enter the median, and then complete a left turn from at a severe skew angle, results in documented safety issues for motorists.

The Ann Arbor Area Transportation Authority (AAATA) currently operates three fixed routes within the study area, including Route 6 (Ellsworth), Route 24 (South Main-East), and Route 62 (UM-State).

In summary, the existing conditions within the study area are not safe or welcoming for non-motorized travelers. The State Street / I-94 interchange also serves as a barrier between the southern portion of the study area and the northern portion of the study area. Additionally, there are several geometric / operational issues within the study area that inhibit efficient vehicle travel, specifically due to inconsistent intersection geometry and accessibility.

STUDY GOALS

As part of a concerted effort to expand on Ann Arbor's Complete Streets Policy, the city identified this segment of State Street as a high-priority corridor within its Non-Motorized Plan with specific goals of improving bicycle facilities and pedestrian crossings. This study was an outgrowth of these priorities, and a total of eight (8) goals were developed early in the process with community input to determine the most appropriate alternative for this segment of State Street. The study goals include:

Goal	Description
 Safety	Provide safe conditions for all travelers
 Entry	Create a more attractive entry to the city
 Pedestrians	Improve conditions for pedestrians along/across State Street
 Bicycles	Provide a safe place for bicyclists separate from travel lanes
 Transit	Enhance transit conditions through traffic flow and stop accessibility
 Vehicles	Maintain reasonable traffic operations along the corridor
 Land Use	Support planned land use described in the South State Street Corridor Plan
 Access	Ease accessibility of corridor businesses

Alternatives

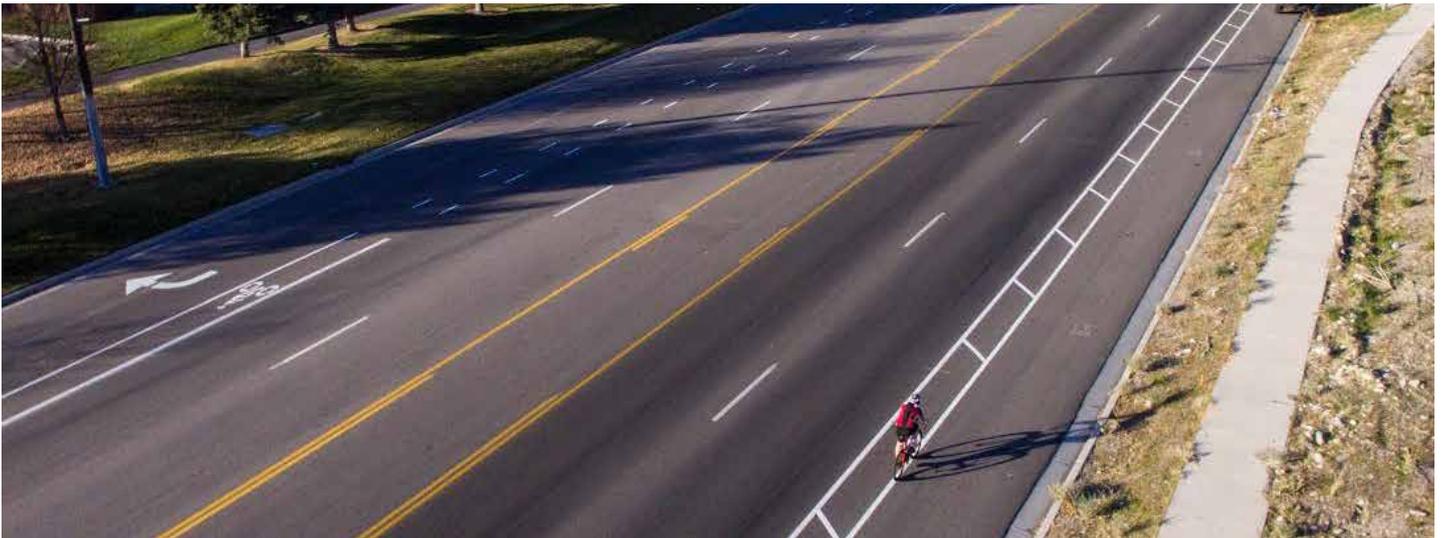
COMMON DESIGN FEATURES

In addition to the development of the study goals, the community determined three common design features to be included in each alternative. These common design features include:

Curbside Buffered Bicycle Lanes

Curbside Buffered Bicycle Lanes represent an expansion of the bicycle facilities that exist north of Eisenhower Parkway and south of Ellsworth Road. Inclusion of these facilities throughout the corridor would not only link these existing facilities, but would also elevate the design to provide a safer space for cyclists. In accordance with design standards developed by the National Association of Transportation Officials (NACTO) buffered bicycle lanes “are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. A buffered bicycle lane is allowed as per MUTCD guidelines for buffered preferential lanes (section 3D-01).”

Buffered bicycle lanes are more beneficial than conventional bicycle lanes because they provide additional distance between cyclists and vehicles, space for cyclists to pass each other without encroaching into the travel lane, and typically appeal to a wider cross-section of cyclists. Additionally, buffered bicycle lanes offer the flexibility to implement additional means of separation (i.e. bollards, curbs, landscape areas) within the existing buffer area.



Continuous Sidewalks

There are several segments along State Street within the study area where sidewalks are not present, creating a fragmented pedestrian network. Continuous sidewalks along the entire corridor were a priority for the community during the development of the study goals, and were advanced as a required common design feature across all alternatives. Newly constructed sidewalks will be designed to reflect the existing character of the study area and promote connectivity and pedestrian safety. Additionally, newly constructed sidewalks will be designed seamlessly with existing and proposed pedestrian crossings.

Limited Right-of-Way Impacts

The final common design feature desired by the community was to ensure that any right-of-way (ROW) impacts associated this project were limited to minor encroachments at intersections. As such, the alternatives developed for analysis were to be designed in a manner that the existing width of right-of-way along the State Street corridor could generally accommodate all associated features.

ALTERNATIVE #1: NARROW MEDIAN WITH DIRECT LEFT TURNS

Alternative #1 would transform State Street into a boulevard with four (4) travel lanes and a narrow median separating NB and SB travel lanes. Direct left-turns are maintained at all major intersections and select minor intersections. Traffic signals would be installed or reconfigured at Hilton/Victors Way, Waterworks, Mall Drive, EB I-94 ramp, and WB I-94 ramp. Geometric changes at select intersections would be included to improve pedestrian access and traffic flow.



ALTERNATIVE #2: NARROW MEDIAN WITH ROUNDABOUT INTERSECTIONS

Alternative #2 would transform State Street into a boulevard with four (4) travel lanes and a narrow median separating NB and SB travel lanes. Direct left-turns would be maintained at some major intersections and select minor intersections. Roundabout intersections would be installed at Airport/Research Park, Hilton/Victors Way, and Mall Drive. Geometric changes at select intersections would be included to improve pedestrian access and traffic flow.



ALTERNATIVE #3: WIDE MEDIAN WITH INDIRECT (“MICHIGAN”) LEFT TURNS

Alternative #3 would transform State Street into a boulevard with four (4) travel lanes and a wide median separating NB and SB travel lanes. Indirect left-turns would be installed to replace direct left-turns at Hilton/Victors Way and Briarwood Circle, while an additional indirect left-turn would be installed south of Eisenhower Parkway. Traffic signals would be installed or reconfigured at Waterworks, EB I-94 ramp, and WB I-94 ramp. Geometric changes at select intersections would be included to improve pedestrian access and traffic flow.



Evaluation

EVALUATION CRITERIA

The alternatives were evaluated by measuring whether they improve or worsen the existing conditions of State Street. A qualitative evaluation of performance of the alternative against the study goals was used for this evaluation, with each alternative given a grade of (1) best, (2) better than existing, (3) similar to existing, or (4) worse than existing across each metric. The evaluation was conducted with community and stakeholder input to ensure the alternatives reflect the desires of the community. The metrics associated with the study goals include:

Goal	Description
Safety	Provide safe conditions for all travelers
Entry	Create a more attractive entry to the city
Pedestrians	Improve conditions for pedestrians along/across State Street
Bicycles	Provide a safe place for bicyclists separate from travel lanes
Transit	Enhance transit conditions through traffic flow and stop accessibility
Vehicles	Maintain reasonable traffic operations along the corridor
Land Use	Support planned land use described in the South State Street Corridor Plan
Access	Ease accessibility of corridor businesses

EVALUATION OF ALTERNATIVES

As illustrated in the matrix below, Alternative #1 and Alternative #3 scored well when evaluated against the goals of the study. While Alternative #1 received high scores for pedestrians, bicycles, transit, and land use, Alternative #3 received high scores for safety, entry,

and access. Alternative #2 received average scores overall, while scoring poorly for transit and vehicles. The results of the evaluation are illustrated in the matrix below:

Alternative	Evaluation Criteria							
	 Safety	 Entry	 Pedestrians	 Bicycles	 Transit	 Land Use	 Vehicles	 Access
#1: Narrow Median								
#2: Roundabouts								
#3: Wide Median								

-  Best
-  Better Than Existing
-  Similar To Existing
-  Worse Than Existing

Recommended Alternative

HYBRID SOLUTION

Following the evaluation of alternatives and community input, a recommended alternative was developed that best achieves the goals of the study. The recommended alternative is a “hybrid solution” that combines the best characteristics of Alternative #1 and Alternative #3, creating a vision for State Street that balances all modes of transportation.

The recommended alternative will transform State Street into a boulevard in most portions of the roadway, generally with four (4) travel lanes, with a wide median separating NB and SB travel lanes between I-94 and Eisenhower Parkway, and at the intersection of Airport Blvd/Research Blvd. Indirect left-turn treatments would be used at all major intersections. Traffic signals would be installed or modified at Hilton Drive/Victors Way, Briarwood Circle, EB I-94 ramp, and WB I-94 ramp. Geometric changes at select intersections are included to improve pedestrian access and traffic flow. Additionally, all three common design features would be incorporated as part of the recommended alternative.

IMPROVEMENTS

The recommended alternative represents a significant improvement to State Street within the study area. Non-motorized travel is improved by installing buffered bicycle lanes and sidewalk throughout the length of the corridor, while additional crossing locations improve non-motorized accessibility to corridor businesses and to AAATA transit stops.

Additionally, the recommended alternative improves traffic flow and access by reducing the number of locations that require merging/ yielding in the median and improving left-turn access to side streets and driveways by nearly 50%. These improvements only reduce travel time by 1-2 minutes throughout the corridor in the AM and PM peak hours.

Beyond the improvements to mobility that the recommended alternative represents, landscaped medians with native plantings and trees mark a significant improvement to the aesthetics of the corridor. The medians are also able to accommodate green infrastructure treatments in the future, if so desired. These elements achieve the goal of creating a more attractive entry to the city.

Goal	Feature	No-Build Condition	Recommended Alternative
	Bike lanes and sidewalks along full corridor	NO	YES
	Number of pedestrian crossing points	2	8
	Number of left-turns requiring merging or yielding in the median	6	0
	Left-turn access to/from side streets and major driveways between I-94 and Eisenhower (% of possible movements)	50% (6 of 12)	92% (11 of 12)
	Median treatment north of I-94	Paved	Landscaped, with potential to incorporate water absorption/ rain garden features
	Total peak travel time along State Street (non-peak will be minimally affected)	AM NB: 4-5 minutes PM SB: 4-5 minutes	AM NB: 5-7 minutes PM SB: 4-6 minutes

VEHICLE SAFETY IMPROVEMENTS

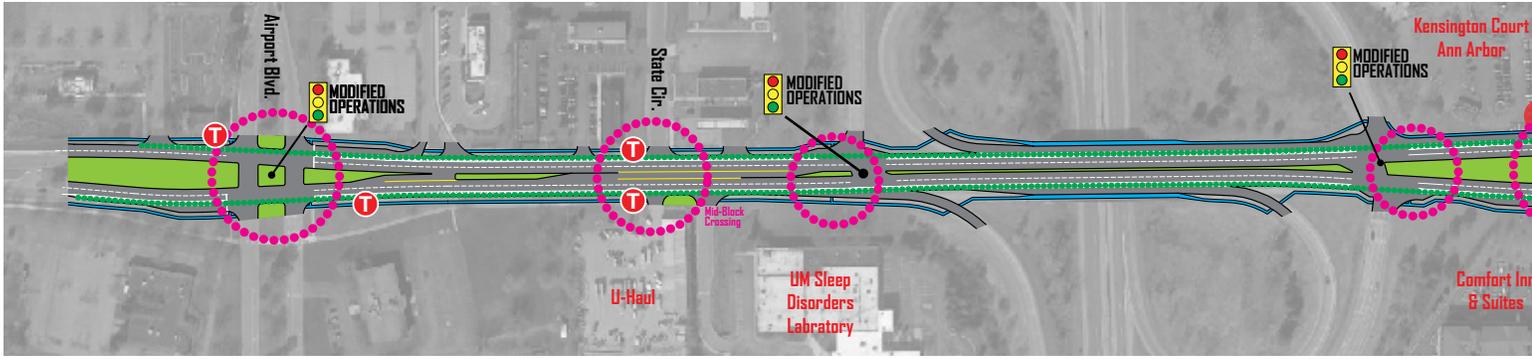
Location	5-Year Crashes	Crash Reduction From	Estimated Crash Reduction Potential
State St between I-94 EB and WB Ramps	24	Elimination of left-hand merging movements	90%
State St at Hilton/Victors Way	128	Removing direct left turn, adding signalization	40%
State St at Mall Dr	27	Removing direct left turn, adding signalization	60%

COST ESTIMATE

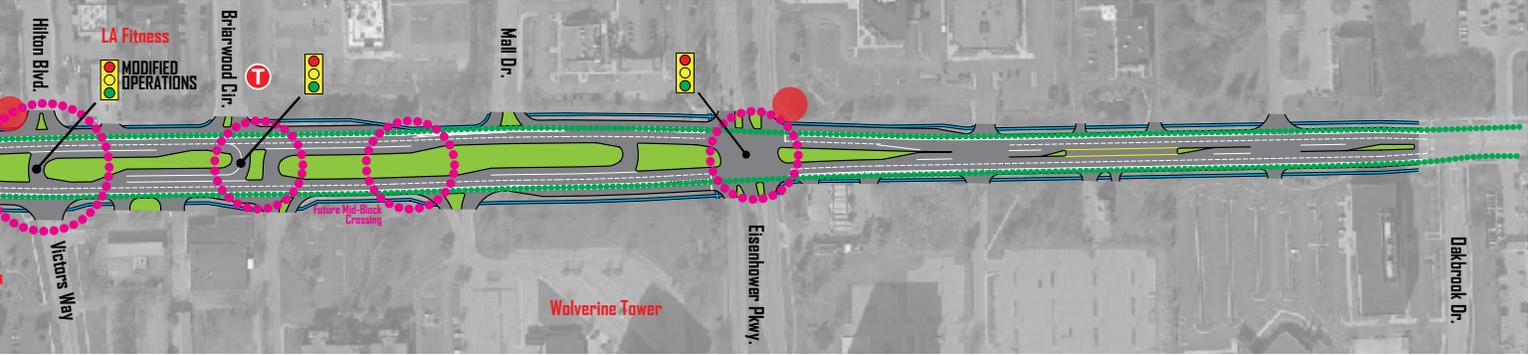
The following table summarizes the anticipated cost of the recommended alternative:

Roadway Construction	\$22,750,000
Bridge Construction	\$2,800,000
Right-of-Way Acquisition	\$150,000
Design	\$2,550,000
Construction Engineering	\$3,850,000
ESTIMATED PROJECT COST:	\$32,100,000

South State Street // Corridor Study



5'	10'	8'	11'	11'	30'
Walk	Landscape Buffer	Buffered Bike Lane	Travel Lane	Travel Lane	Wide Median
15' Pedestrian Zone					90' Road Pavement
120' Future Public Right-of-Way					



	11'	11'	8'	10'	5'
	Travel Lane	Travel Lane	Buffered Bike Lane	Landscape Buffer	Walk
ent				15' Pedestrian Zone	
Access					

Community Involvement

Community involvement was a critical factor in supporting the project in terms of goals development, evaluation, and validation of the recommended alternative. This involvement was incorporated over a series of meetings designed to inform stakeholders, engage in dialogue about priorities, and rate the alternatives for how well they would help to meet community goals.

PUBLIC MEETING #1

The South State Street Corridor Study team held a public event on October 22, 2015 at the Courtyard Marriott in Ann Arbor. The event included two separate meetings. The first was a Stakeholder Roundtable which was followed by a public open house. The Stakeholder Roundtable meeting was oriented towards business and property owners along the corridor. The meeting included a presentation of the issues and opportunities found along S. State Street from Ellsworth northerly to Oakbrook Dr as well as the three alternatives under consideration. In addition to the presentation and dialogue, the stakeholders were provided comment forms and asked to provide feedback for the team's use.

The second meeting running from 4:30 to 7:30 PM was an open house format available for the general public to review materials and provide feedback. Several information boards and detailed corridor maps were available. The public was able to interact with the team in direct conversation. Citizens provided comments on the corridor maps as well as completed feedback forms. The team received 24 total response sheets combined from both the stakeholder portion of the meeting and the general public. Based on feedback obtained through dialogue, comment forms and notations on the figures available for comment, a summary of feedback was assembled. Alternative #1 (narrow median) and Alternative #3 (wide median) were identified as the most preferable alternatives by both the public and stakeholder groups, while Alternative #2 (narrow medians and roundabouts) was the least preferred alternative for both groups.

PUBLIC MEETING #2

The South State Street Corridor Study team held a public meeting on November 2, 2017 at the Courtyard Marriott in Ann Arbor. The event included two separate meetings. The first was a Stakeholder Roundtable which was followed by a public open house. The presentation materials and format of the meetings were identical. The meetings included a presentation of project goals, original alternatives, evaluation process/results, recommended alternative, and next steps.

Presentations were conducted at 5:45pm and 6:45pm, followed by questions and answers. Comment forms were provided and completed by several attendees. Attendees expressed generally favorable reactions to the recommended alternative, but identified areas of concern to be addressed during subsequent phases of the project. The following is a summary of written and verbal comments provided by attendees of the public meeting:

- Concerns regarding bike safety and the need to identify to cross-street traffic that they are crossing a bike lane
- Concerns regarding pedestrian safety, particularly when crossing the I-94 on-ramps, and the need to design safety measures for pedestrians
- Consider prioritizing pedestrian crosswalks north of the project limits (between Oakbrook and Stimson)
- Consider adding a signature architectural feature to the corridor as a gateway
- Desire to see any mid-block pedestrian crossings receive proper design treatment, including potential for flashing beacon-type approach
- Desire to improve left-turn condition for cyclists between I-94 and Eisenhower
- Desire to ensure that maintenance is properly funded for any landscaping conducted as part of the project

Next Steps

To implement the recommended alternative, the City of Ann Arbor will consider any additional community input, incorporate the project into the Transportation Improvement Program (TIP), secure environmental clearance from the federal government, secure additional federal, state, and local funding for the project, and advance the project into the final design and construction phases.

ADDITIONAL COMMUNITY INPUT

The development of the recommended alternative included several community meetings over a multi-year period to ensure the goals of the study were reflected in the final vision. However, the City of Ann Arbor is committed to engaging with the community as the project advances into the design and construction phases to ensure that specific design elements are reflective of their desires. If you have any additional feedback on the recommend alternative prior to any formal community meetings associated with the design and construction phases, please visit the City of Ann Arbor website.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

The Transportation Improvement Program (TIP) is a 4-year financial program that describes the schedule for obligating federal funds to state and local projects across all modes of transportation. The Washtenaw Area Transportation Study (WATS) updates the TIP for the Ann Arbor area and channels associated funding to the City of Ann Arbor for transportation projects. The city will work with WATS to ensure this project is included in the TIP and is eligible for federal funding.

ENVIRONMENTAL CLEARANCE

The project will require National Environmental Policy Act (NEPA) review given the project's proposed use of federal funds. It is anticipated that the project could qualify for a NEPA Class of Action of Categorical Exclusion, pending further consideration of potential traffic and business impacts during construction. This takes into account that the project would 1) be consistent with existing land use and zoning (including floodplain regulations), 2) make extensive use of the existing corridor for the proposed transportation improvements (vehicular and pedestrian), and 3) require only a minor amount of new right-of-way. Depending on the overall funding for the project and sequence of phases, it may be necessary to complete the NEPA process on a phase-by-phase basis due to the potential for NEPA approval to sunset if construction on later phases is delayed.

SECURE FUNDING

In addition to federal funding made available by including this project in the TIP, the city may explore additional federal, state, and local funding sources to support the design and construction of the recommended alternative. Several federal sources, i.e. Congestion Mitigation and Air Quality Improvement (CMAQ) and Transportation Investment Generating Economic Recovery (TIGER), offer annual grants that are awarded on a competitive basis. These sources can typically supplement a large portion of major transportation projects at the local level. In addition to conventional public sources, the city may also explore contributions from private industry, either via charitable contributions or through formal means, such as a Business Improvement District (BID) or Corridor Improvement Authority (CIA) that leverage taxes to support area- or corridor-wide investments.

IMPLEMENTATION PLAN

There is potential for the construction of the recommended alternative to be phased in such a way as to provide benefits to portions of the corridor as funding becomes available. The following is a potential sequencing of the project to support this approach. Estimated costs are inclusive of construction, right-of-way acquisition, design, and construction engineering. (Note: multi-phased approach may result in marginal cost increases over the total project cost estimate due to reduced economies of scale).

Phase 1: Signage/Operational Improvements – Airport Blvd/Research Park Drive

Sequence Rationale	<ul style="list-style-type: none"> Low-cost safety improvement which can be implemented on existing roadway footprint
Design Elements	<ul style="list-style-type: none"> Permanent signage for new indirect left turn operational strategy Temporary delineation measures to inhibit direct left-turns within the intersection
Estimated Cost	\$100,000

Phase 2: Reconstruct State Street from I-94 WB Ramps to Oakbrook

Sequence Rationale	<ul style="list-style-type: none"> Highest-value segment in terms of improved safety and access for all users; extends existing bike lane network further south to major traffic generators
Design Elements	<ul style="list-style-type: none"> Final design for full roadway reconstruction, with temporary tie-in to existing configuration at I-94 WB ramp intersection Establish final right-of-way requirements and necessary acquisition areas Determine feasibility of constructing permanent sidewalk along the corridor in advance of full road reconstruction
Estimated Cost	\$150,000: Phase 2A (ROW acquisition) \$300,000: Phase 2B (Construct sidewalk if feasible) \$15,900,000: Phase 2C (Full roadway reconstruction)

Phase 3: Reconstruct I-94 Interchange Bridge/Ramp Intersections

Sequence Rationale	<ul style="list-style-type: none"> Value of improvements south of I-94 (primarily incorporation of bike lanes) is limited until the non-motorized transportation network is completed over I-94
Design Elements	<ul style="list-style-type: none"> Bridge deck replacement/reconfiguration Reconstruction of ramp terminal intersections, including new traffic signals Temporary tie-in to the existing configuration south of the I-94 EB ramps
Estimated Cost	\$9,450,000

Phase 4: Reconstruct State Street from Ellsworth Road to I-94 EB Ramps

Sequence Rationale	<ul style="list-style-type: none"> Value of improvements in this segment (primarily non-motorized improvements) are limited until north segments are complete
Design Elements	<ul style="list-style-type: none"> Final design for full roadway reconstruction Permanent signal modifications and signage for new operation at Airport Blvd/Research Park Drive
Estimated Cost	\$6,200,000



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