

# I-94 Operations Study

## Statement of Purpose and Need

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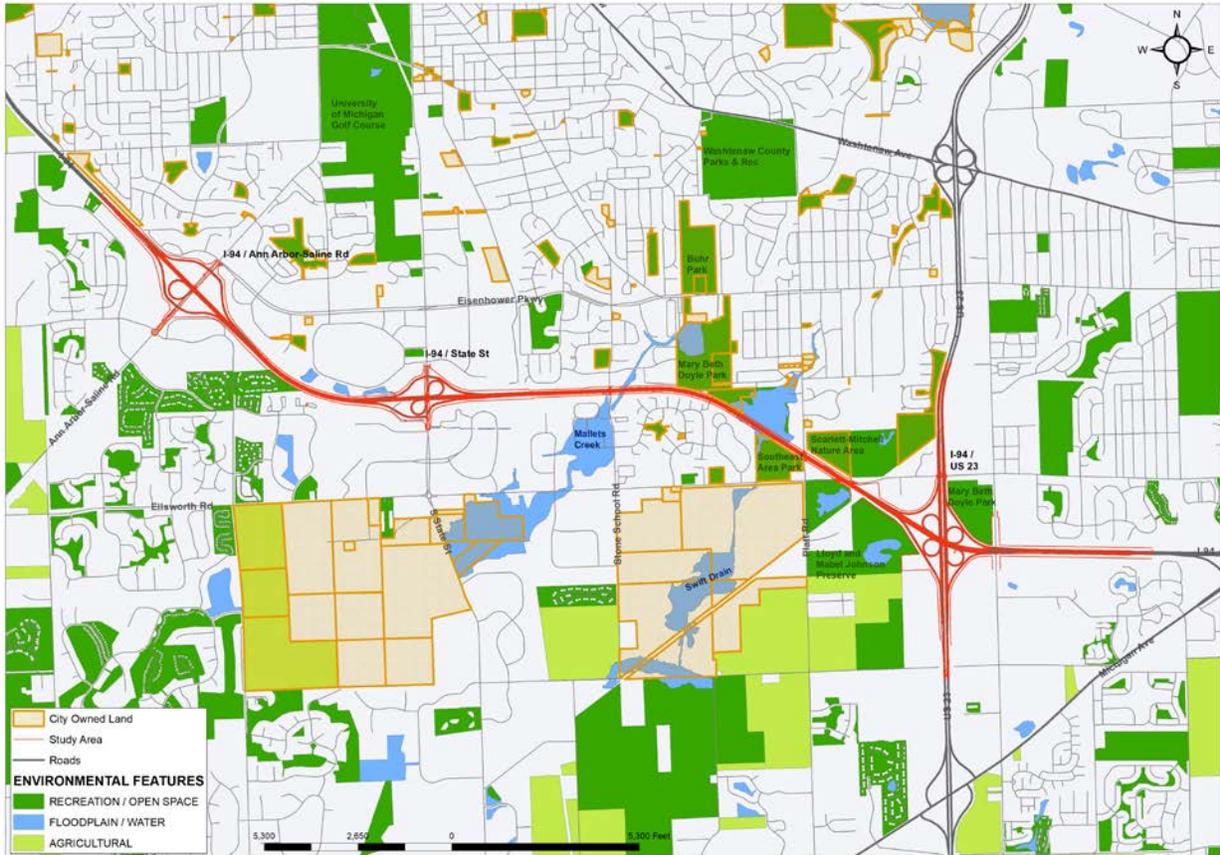
### Project Background

I-94 between Ann Arbor-Saline Road and US-23 is a heavily used commuter and freight corridor of regional and national significance. Within this segment, I-94 is a four-lane freeway and widens to a six-lane freeway to the east of US-23 and to the west beyond M-14. Traffic operations and safety conditions along the I-94 corridor between M-14 and US-23 prompted a preliminary internal analysis by the Michigan Department of Transportation (MDOT) in 2016 to identify concepts for operational improvements. From that analysis, the section between Ann Arbor-Saline Road and US-23 was identified to have critical operational needs. MDOT analyzed the options of an additional third travel lane in each direction, auxiliary lanes between interchanges, and a collector-distributor roadway at the US-23 interchange. Issues identified with adding a third travel lane include right of way (ROW) constraints that would likely require lane widths and shoulders narrower than current standards.

Subsequently, MDOT commissioned a study to provide a detailed review and enhanced analysis of the corridor improvements previously identified, as well as identify additional concepts to be analyzed and vetted through a public engagement process. This analysis will include an in-depth review of geometrics, safety performance, traffic operations, and planning-level construction cost estimates to identify a preferred concept that will be cost-effective and improve mobility, reliability, and safety along the corridor.

### Study Area

The initial study area from MDOT's 2016 study included I-94 from the Zeeb Road interchange to the US-12 interchange. The findings of this study indicated adequate capacity and operations west of the Ann Arbor-Saline Road interchange with forecasted traffic demand 20 years into the future. As a result, the study area for this more detailed study was truncated to immediately west of the Ann Arbor-Saline Road interchange to the US-12 interchange and includes the service interchanges at Ann Arbor-Saline Road and State Street, and the US-23 interchange US-23.



### Purpose of the Proposed Project

The purpose of the proposed improvements to the I-94 corridor is to enhance overall mobility, reliability, and safety along I-94 within the study area. The improvements will help improve the efficiency of an important international trade corridor that is vital to the U.S. economy. Specific objectives include:

- Reducing recurring peak-period congestion along the corridor and improving travel time reliability;
- Enhancing safety for all roadway users on this portion of the interstate system and interchanges;
- Providing reasonable capacity to address existing and 20-year forecasted 2045 traffic demand along the corridor; and
- Eliminating and minimizing existing substandard design elements, where feasible, that contribute to operational and safety issues.

Metrics for each of these objectives will be developed to compare a range of improvement concepts, resulting in selection of a preferred concept that meets these objectives while minimizing impacts on the surrounding community and environment. Improvement concepts should not preclude future transit or rideshare plans within the region.

### Need for the Proposed Project

I-94 is a vital component of the transportation network in Michigan and the United States. It is a major east-west route extending nearly 1,500 miles from Michigan's eastern border with Canada at the Blue Water Bridge international crossing in Port Huron to the western limit in Billings, Montana. It is a key commercial route for both international and national trade, moving people and goods across the state and country daily.

As one of the busiest trade corridors in the United States, it is vital to the economic competitiveness of Michigan and the nation. It is also a significant regional commuter route within the project limits, serving the Ann Arbor and greater Detroit metropolitan region. The segment between State Street and US-23 is in the top 10 of the highest volume two-lane freeway segments in Michigan, with an annual average daily traffic (AADT) of approximately 71,000 (2017).

The freeway carries high directional volumes during peak periods, resulting in frequent periods of congestion during the morning and evening commuter rush hours as the roadway capacity has not kept pace with the growing traffic demand. Outside of these peak times, operations are generally free-flow unless there is an incident or, seasonally, for University of Michigan football games. These periods of congestion not only impact I-94, but also regularly impact operations along US-23 at the system interchange and are a major contributor to user-delay within the region. In addition, a relatively high frequency of crashes due to congestion regularly impacts corridor flow, leading to volatile and unreliable travel times.

This portion of I-94 was built in the 1950s. Since original construction, the median barrier was constructed in 1975 and some bridge rehabilitation occurred throughout the 1970s to 1980s. The corridor has not received any significant geometric improvements since the 1950s.

In summary, specific factors directly contributing to the need for this project include:

#### Operations

- Recurring westbound I-94 congestion during the morning peak period regularly queues from the State Street interchange (Exit 177) to the US-12 entrance ramp near Willow Run Airport, leading to excessive user delays.
- Recurring eastbound I-94 congestion during the evening peak period regularly queues from the State Street interchange to the Ann Arbor-Saline Road interchange.
- I-94 congestion regularly spills back and impacts the surface street network at State Street, leading to excessive user delays.
- Existing and 20-year forecasted travel demand exceeds existing capacity of the corridor.
- Operational volatility due to congestion and regular crashes leads to poor travel time reliability.

#### Safety

- This portion of I-94 has the highest frequency of crashes and second-highest crash rate along I-94 between M-60 (Jackson, Michigan) and I-275.

- This portion of I-94 has the highest frequency and rate of severe crashes along I-94 between M-60 (Jackson, Michigan) and I-275.
- There is a high frequency of congestion-related crashes within the study corridor.
- There is a concentration of crashes along westbound I-94 in the weave area between the two loop ramps at the US-23 interchange.
- The eastbound I-94 exit ramp to northbound State Street has a crash trend on the interchange bridge deck where this movement merges with the free-flowing northbound State Street traffic.

### Geometrics

- Horizontal stopping sight distance along I-94 is substandard for a 70 mph speed limit through the US-23 interchange.
- Vertical clearance is substandard for the following bridges, which are also approaching their design life:
  - Stone School Road over I-94 (constructed in 1954).
  - Pedestrian/bicycle bridge at Stone School Road over I-94 (constructed in 1975).
  - Pedestrian bridge at Planview Court over I-94 (constructed in 1975).
- Entrance ramp tapers are substandard for the following:
  - All entrance ramps at the US-23 interchange.
  - All entrance ramps at the State Street interchange.
  - All entrance ramps at the Ann Arbor-Saline Road interchange.
- Exit ramp tapers are substandard for the following:
  - Westbound I-94 to northbound State Street.
  - Westbound I-94 to northbound Ann Arbor-Saline Road.
- Shoulder widths are substandard for the following:
  - Left shoulder of all ramps within the US-23 interchange.
  - Left shoulder of all ramps within the State Street interchange, except the southbound State Street loop ramp to eastbound I-94.
  - Left shoulder of all ramps within the Ann Arbor-Saline Road interchange, except the westbound I-94 ramp to northbound Ann Arbor-Saline Road.
- The vertical curve for both eastbound and westbound I-94 over the railroad tracks just east of State Street only meets current standards for 60 mph.