



Executive Summary

Interstate 490 (I-490), Interstate 590 (I-590), NYS Route 590, and NYS Route 104 are four of greater Rochester's key transportation corridors. Together they link the City of Rochester with its eastern and southern suburbs. Hundreds of thousands of motorists use them daily to commute, provide services, and deliver goods to the community. The I-490/I-590/NYS Route 590 and NYS Route 104/NYS Route 590 interchanges are two important crossroads in Rochester's regional expressway system. The Genesee Transportation Council (GTC) and New York State Department of Transportation (NYSDOT) partnered to study these interchanges. The New York State Department of Transportation is also planning pavement maintenance projects on I-490, I-590, and NYS Route 590. The recommendations of this study can be considered during the development of future capital projects involving planning, programming, scoping, design, and construction moving forward.

Study Partners

The interchanges are owned and maintained by the NYSDOT; however, they are important to the entire community; therefore, the GTC and NYSDOT engaged representatives of several local agencies as partners in the study. Participants were involved in regular meetings, offered feedback on work products, and provided guidance to the study team regarding upcoming tasks. Steering committee members included representatives of the following agencies:

- Genesee Transportation Council (GTC)
- New York State Department of Transportation (NYSDOT)
- Monroe County Department of Transportation (MCDOT)
- City of Rochester
- Town of Brighton
- Town of Irondequoit
- Town of Penfield
- Town of Pittsford
- Town of Webster

Study Process

The study was progressed as follows:

- Complete an existing conditions inventory;
- Assess needs at each interchange;
- Examine potential alternative concepts; and
- Identify topics for future study or design.

Information was drawn from many different sources including aerial imagery, as-built construction drawings, NYSDOT and Monroe County Department of Transportation (MCDOT) databases, and a licensed traffic data clearinghouse. Field visits were also conducted.

It is assumed that improvements at both interchanges could be complete within the next ten years. A future design year of 2051 (20 years from the estimated time of completion, 2031) was selected for traffic forecasting and analysis purposes. Two growth scenarios were considered to account for possible changes in development patterns, employment, and personal behavior, post COVID-19:

- A “low growth” scenario assuming an average annual traffic growth rate of 0.25% per year. This represents a scenario where motor vehicle traffic volumes do not grow at the same rate one would have expected to see prior to events in the year 2020; and
- A “normal growth” scenario assuming an average annual growth rate of 0.5% per year, consistent with a review of available historic traffic data, consideration of Monroe County Department of Transportation (MCDOT) recommended growth rates for neighboring towns, and discussion with the GTC and NYSDOT Region 4.

Traffic data were obtained from New York State Department of Transportation’s Traffic Data Viewer and a number of other available sources. No new counts were taken. Average weekday morning and evening peak hour volumes were estimated and used along with geometry and traffic control data to develop microsimulation models. The microsimulation models were used to examine existing, no-build, and build condition operations. A set of quantitative results and an animation were produced for each case studied.

Available crash information was also reviewed and summarized. Crash data were obtained from the NYSDOT Accident Location Information System (ALIS) for each interchange over a five-year period ending in late 2019. The analysis revealed a large number of rear end crashes on mainline roadways at each interchange during peak travel periods, which may be due in part to stop and go traffic and lane changes caused by congestion. The crash pattern changes predominantly to “fixed object” during off peak periods when traffic is light. Congestion mitigation should provide a safety benefit during peak periods. Further investigation of the potential link between geometry, pavement surface condition, and the off-peak “fixed object” crash pattern should be investigated in the future.

Needs Assessment

Four key areas at the I-490/I-590/NYS Route 590 interchange stood out as deserving of further consideration:

- I-490 eastbound west of the Winton Road overpass
 - I-490 eastbound currently operates at capacity between the Culver Road overpass and Winton Road overpass during the evening peak hour. All vehicles in this area destined for I-590 or NYS Route 590 must position themselves in the right-hand lane. This causes them to mix with any traffic exiting to Winton Road. Traffic densities are expected to exceed capacity by 2051 with volumes in the range of 5,900 to 6,700 vehicles per hour.
- I-590 southbound approaching the ramp from I-490 westbound (merge) and from I-490 eastbound (lane addition)
 - The ramp from I-490 westbound to I-590 southbound carries more traffic than its counterpart connecting I-490 eastbound to I-590 southbound, yet vehicles on the eastbound to southbound ramp are afforded their own lane when they reach the mainline while those on the westbound to southbound ramp must merge. This area was identified for study during scoping. The area is also an identified crash hot spot. Rear end collisions regularly occur during peak hour periods.
 - Approximately 1,400 vehicles per hour on the ramp from I-490 westbound to I-590 southbound must merge into the right lane on I-590 during the morning peak. This happens on curved section of roadway at the base of the interchange. At the same time, nearly 4,000 commuters approaching the merge on I-590 southbound try to avoid conflicts by moving left into the center lane, resulting in additional congestion. Vehicular demand is expected to exceed capacity in this area within 10 years under a normal growth scenario.
- NYS Route 590 southbound approaching the I-490 interchange
 - This is an identified crash hot spot. Congestion is believed to be contributing to a pattern of rear-end, peak hour crashes.
 - Morning peak hour traffic densities are currently at capacity and expected to remain so throughout the year 2051. A trip through this segment can take up to 90% longer during the morning peak hour than during off-peak periods.

- NYS Route 590 northbound and the weave between the on-ramp from I-490 westbound and the off ramp to Blossom Road
 - The weaving area between the on ramp from I-490 eastbound to NYS Route 590 northbound and the off ramp from NYS Route 590 northbound to Blossom Road is relatively short at 1,150 feet long. Motorists must make multiple lane changes in this area to reach their intended destination during the evening peak hour. This can be difficult when volumes are high. The weave currently operates at capacity during the evening peak hour. Demand is expected to exceed capacity by 2051 under a normal growth scenario, which would lead to reduced speeds, more stop and go traffic, and potentially, additional rear end collisions.

One area at the NYS Route 104/NYS Route 590 interchange stood out as deserving of further consideration:

- NYS Route 590 northbound approaching and between the ramps to NYS Route 104 westbound and NYS Route 104 eastbound
 - The segments of roadway approaching each off-ramp are identified crash hot spots. The southern end of this stretch is notable for run off the road and fixed object type crashes while the northern part experiences more peak hour rear end collisions.
 - Evening peak hour traffic volumes currently meet or exceed capacity. This trend is expected to continue throughout 2051. In general, a larger number of vehicles exit NYS Route 590 headed for NYS Route 104 at both the westbound and eastbound exits; therefore, more traffic tends to utilize the right lanes in these areas, adding to congestion.
 - More than ten years ago, the ramp connecting NYS Route 590 northbound to NYS Route 104 eastbound had two lanes. The left lane merged into the existing three lane section on NYS Route 104 on a curve beneath the Ridge Road overpass. This resulted in crashes. The off-ramp was reduced to one lane as a result. In 2019 the NYSDOT temporarily modified striping inside the NYS Route 104/NYS Route 590 interchange to accommodate a scheduled closure of the bridge carrying NYS Route 104 over NYS Route 590. The modified configuration allowed two lanes to exit NYS Route 590 northbound toward NYS Route 104 eastbound. NYS Route 104 eastbound was reduced to one lane beyond the overpass and lanes continued toward the Irondequoit Bay Bridge. The study team was asked to examine the operational impacts of making that temporary change permanent during scoping.

Conceptual Alternatives

A stated purpose of this study was to examine potential benefits or drawbacks of component-level changes at each interchange as opposed to full-scale reconfiguration. Conceptual alternatives were developed to address areas with overlapping operational and safety issues identified during the needs assessment. Eight concepts were developed in total. Concepts 1, 2, 3, 5, 6 and 8 were deemed feasible. Concepts 4 and 7 were not and dismissed from further consideration. The feasible concepts are summarized as follows:

- Evening peak hour congestion and delays on I-490 eastbound between the Culver Road interchange and I-590/NYS Route 590
 - *Concept 1: Auxiliary lane along I-490 eastbound from Culver Road to I-590:* This would add a full auxiliary lane to I-490 eastbound. After construction, this area would operate at or below capacity during the evening peak throughout the year 2051 under all growth scenarios. I-490 is very close to Norris Drive in this area and potential impacts to an existing pedestrian overpass, noise wall, overhead sign structure, and the local roadway are of note. Cobbs Hill Park is also in close proximity to the proposed work. The planning level construction cost estimate is \$18.5 million.
- Morning peak hour congestion and delays on NYS Route 590 southbound approaching the entrances from I-490 eastbound and westbound
 - *Concept 2: Switch the configuration along I-590 southbound so vehicles from I-490 eastbound get an additional lane while those from I-490 westbound must merge:* This would provide vehicles entering I-590 from I-490 westbound with their own travel lane. The ramp from I-490 eastbound would connect to a 1,000-foot parallel acceleration lane and taper in prior to reaching the Highland Avenue overpass. This change would result in peak hour operation below capacity during the morning peak hour throughout 2051 under all growth scenarios. Existing bridge pier, bridge abutment, paved slope, roadside barrier, roadside slopes, and an adjacent noise barrier may be impacted by the proposed work. There are homes along the west side of I-590 that are eligible for inclusion on the National Register of Historic Places, but they are currently separated from the highway by the existing noise barrier. The planning level construction cost estimate is \$5.3 million.
- Recurring morning peak hour congestion and delays on NYS Route 590 southbound from the Browncroft Boulevard interchange to the I-490/NYS Route 590 split.
 - *Concept 3: Additional southbound lane from Browncroft Boulevard to I-490:* This would add a fourth southbound travel lane to NYS Route 590. This lane addition would improve morning peak hour operations throughout the year 2051 under all growth scenarios to below capacity. The existing bridges over Blossom Road and Browncroft Boulevard would need to be wider to accommodate this alternative. Moving the roadway closer to adjacent residential properties may trigger the need for noise studies. The planning level construction cost estimate is \$26.6 million.

- Evening peak hour congestion and delays on NYS Route 590 northbound approaching, within, and just beyond the weave between the on ramp from I-490 westbound and the off ramp to Blossom Road.
 - *Concept 5: Additional NYS Route 590 northbound lane from the I-490 westbound on-ramp to the Browncroft Boulevard off-ramp:* This would extend the weaving lane between the on ramp to NYS Route 590 northbound and the off ramp to Blossom Road up to Browncroft Boulevard. This is expected to provide operations at or below capacity throughout 2051 during the evening peak hour under all growth scenarios. The existing bridge over Blossom Road would need to be wider to accommodate this alternative. Moving the roadway closer to adjacent residential properties may trigger the need for noise studies. The planning level construction cost estimate is \$17.9 million.
- Evening peak hour congestion and delays on NYS Route 590 northbound approaching the NYS Route 104 interchange.
 - *Concepts 6 and 8: Extension of the right lane on approach to both exits along with two lanes on the ramp from NYS Route 590 northbound to NYS Route 104 eastbound and on NYS Route 104 eastbound:* This would extend the right lane on approach to the NYS Route 590 northbound exits to both NYS Route 104 westbound and NYS Route 104 eastbound as far as possible. This would provide additional space for drivers to select the proper lane. It would also retain the current two-lane section on NYS Route 104 eastbound through the interchange while reconfiguring the ramp from NYS Route 590 northbound to NYS Route 104 eastbound to also carry two lanes. This would require a four lane section on NYS Route 104 headed east which would end before reaching the Irondequoit Bay Bridge. This would result operations below capacity throughout 2051 during the evening peak hour under all growth scenarios.

Concept 6's proposed widening would require extending a box culvert and a steep, tall embankment. Concept 8 would impact an existing paved slope and guiderail beneath the Ridge Road overpass. The existing bridge carrying NYS Route 104 over a maintenance ramp would need to be wider to accommodate this alternative. The surrounding area is in a coastal zone and is within the Town of Irondequoit's Local Waterfront Revitalization Plan boundary. Previously undisturbed areas around the roadway are also classified as archaeologically sensitive. Planning level construction cost estimates for concepts 6 and 8 are \$2.2 million and \$9.3 million, respectively.

New York State Department of Transportation design criteria from the *Highway Design Manual* were used to develop the horizontal geometry and lane layouts that appear at the end of this Executive Summary. There are also graphics illustrating a preliminary guide sign concept for each interchange assuming incorporation of the conceptual alternatives. Properly designed and located guide signs, extending back to the first sign in each series, would assist motorists with navigation and contribute to a safer roadway environment.

Travel times through the I-490/I-590/NYS Route 590 interchange on NYS Route 590/I-590 southbound in the morning and I-590/NYS Route 590 northbound in the evening would be substantially reduced in comparison to the no-build condition with all feasible conceptual alternatives in place. Evening peak hour travel time increases on NYS Route 590 northbound would also be eliminated throughout 2051 at the NYS Route 104/NYS Route 590 interchange with Concepts 6 and 8 in place. The total vehicle hours of delay at the I-490/I-590/NYS Route 590 interchange would be reduced by 60% during the evening peak hour and 80% during the morning peak hour in comparison to the no-build condition by 2051. The total vehicle hours of delay at the NYS Route 104/NYS Route 590 interchange would be reduced by 80% in the evening peak hour throughout 2051 under the normal growth scenario.

Topics for Future Study

The scope, funding, and timeline of this study were not intended to allow for an exhaustive review of all related issues, similar to what would be accomplished during the development of a NYSDOT *Design Approval Document*. The following topics have been noted and should be considered during future stages of study or design:

- Traffic Volumes:
 - Collect origin and destination data to enhance microsimulation modeling
 - Collect new traffic data including daily and peak hour volumes, post COVID-19
- Crash Analyses:
 - Obtain and review crash reports from the New York State Department of Motor Vehicles
 - Break Priority Investigation Locations down by direction and conduct further review
 - Examine the potential relationship between geometry, pavement condition, and off-peak fixed object crashes along ramps to help identify appropriate spot safety enhancements
- Blossom Road Interchange and Weave Area:
 - Consider the potential benefits and disadvantages of two lanes on the ramp connecting I-490 westbound with NYS Route 590 northbound
 - Consider the potential benefits and disadvantages of larger-scale changes including grade separation of conflicting movements
- Drainage:
 - Investigate community concerns regarding outflows from a detention pond west of NYS Route 590, north of the I-490/I-590/NYS Route 590 interchange
- Separate Concept Analyses:
 - Create separate microsimulation models of each concept, rather than having them grouped together in one model, and run them to assess their individual effects

The areas studied and summarized in this document do not preclude other locations from being studied in greater detail in the future. The microsimulation models could be expanded to include more of the adjacent roadway network to understand the potential impact on upstream and downstream operations.



A new auxiliary lane would begin at the end of the Culver Road on-ramp to I-490 EB.

Reconstruction or replacement of a portion of the existing pedestrian overpass is likely needed. An existing pier south of I-490 would be impacted by roadway widening.

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Impacts to an existing noise wall and parking lane along the northern edge of Norris Drive are also anticipated. Coordination with the City of Rochester would be necessary.



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New parallel deceleration lane for Winton Road off ramp.

Impacts to the existing noise wall and a portion of Norris Drive are anticipated. This segment of Norris Drive could potentially be changed to one-way if there isn't adequate room to maintain two-way travel.

The new auxiliary lane would end at the off-ramp to I-590 southbound.

1 Auxiliary lane along I-490 eastbound from Culver Road to I-590

Operational Considerations: Eastbound I-490 currently operates at capacity (LOS E) during the evening peak hour. All vehicles destined for I-590 or NYS Route 590 must use the right lane, mixing with traffic exiting to Winton Road. LOS E conditions are anticipated to continue through 2031 and degrade to LOS F by 2051 under both the low and normal growth scenarios.

Conceptual Alternative: This concept would add a full auxiliary lane to I-490 eastbound. After construction, this area would continue to operate at or below capacity (LOS E or LOS D) during the evening peak throughout the year 2051 under all growth scenarios.

Constructability Considerations: There is limited space between I-490 eastbound and Norris Drive from Hillside Avenue to Winton Road. An existing pedestrian overpass, noise wall, overhead sign structure, and Norris Drive itself would be impacted by the proposed widening. The loss of parking along Norris Drive or the conversion of a segment of that roadway to one-way eastbound travel could be a concern for adjacent residents and businesses. Coordination with the City of Rochester and utility companies would be necessary to progress this alternative.

Environmental Considerations: No appreciable concerns unless property were needed from Cobbs Hill Park. That would invoke Section 4(f). Cobbs Hill Park is not on the Section 6(f) list, but the designer should consult with NYSORP. Any noise impacts to the park could also be of concern.

Planning-Level Construction Cost Estimate: \$18.5 million

2 Switch the merge along I-590 southbound from Ramp WS to Ramp ES

Operational Considerations: Morning peak hour congestion occurs on I-590 southbound as drivers approach the Ramp WS merge from I-490 westbound. Upstream motorists on I-590 tend to move into the center lane to avoid up to 1,200 merging vehicles over a typical morning peak hour. That volume is more than twice the volume entering on Ramp ES during the same timeframe (550 vph). The merge currently operates at capacity (LOS E) and is expected to exceed capacity (LOS F) as volumes grow throughout 2031 to 2051.

Conceptual Alternative: This concept provides vehicles entering I-590 from I-490 westbound (Ramp WS) their own travel lane. Ramp ES would feed into a 1,000-foot parallel acceleration lane, ending just north of the Highland Avenue overpass. This change would provide adequate capacity (LOS D) throughout 2051 under all growth scenarios. I-590 traffic approaching Ramp WS would no longer have to move into the center lane, reducing upstream lane changing and congestion.

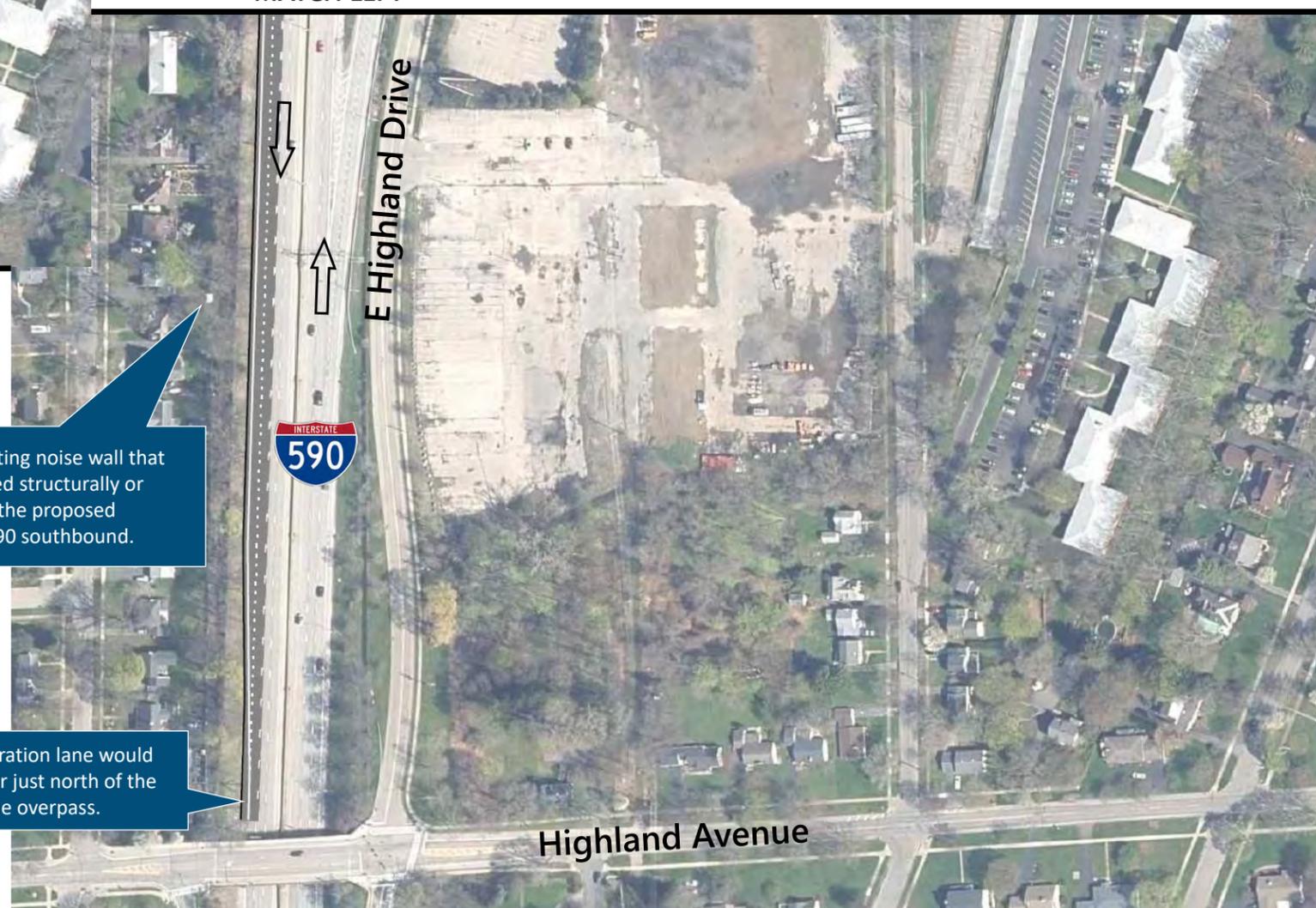
Constructability Considerations: Today Ramp WS begins to taper into I-590 southbound beneath Ramps EN and NEW. There is a paved slope, bridge abutment, and a bridge pier located near the right shoulder. There is also a grade difference between I-590 southbound and Ramp ES as they approach each other. New barrier, possibly combined with a short retaining wall, may be needed in these areas. In addition, there is an existing noise wall between I-590 and the adjacent Hillside Avenue neighborhood that should be evaluated for possible structural and/or functional impacts in conjunction with widening to install a new parallel acceleration lane for Ramp ES.

Environmental Considerations: Homes along the west side of I-590 are eligible for inclusion on the National Register of Historic Places, but they are currently separated from the highway by noise barriers.

Planning-Level Construction Cost Estimate: \$5.30 million



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There is an existing noise wall that may be impacted structurally or functionally by the proposed widening of I-590 southbound.

The new acceleration lane would end with a taper just north of the Highland Avenue overpass.

3 Additional southbound lane from Browncroft Boulevard to the I-490/NYS Route 590 split

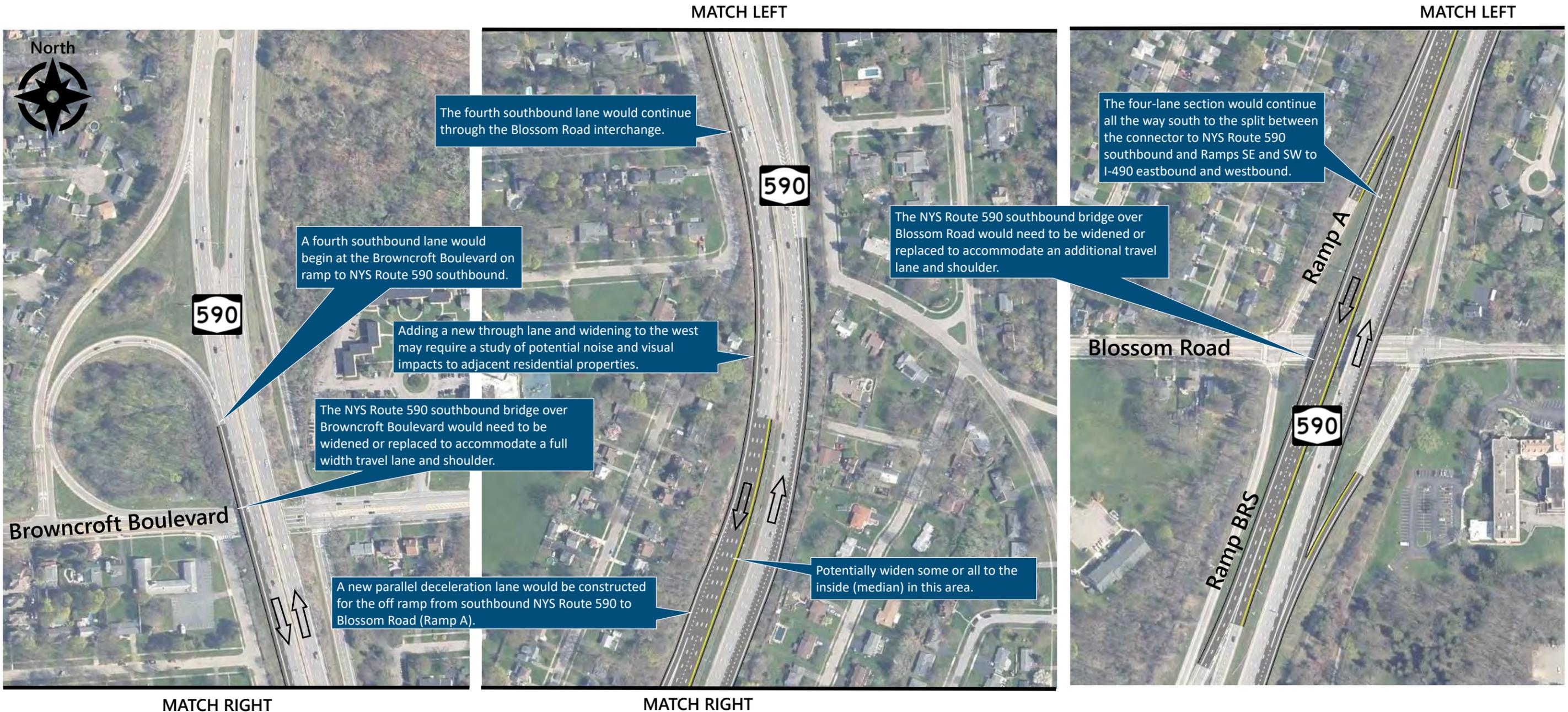
Operational Considerations: This segment of NYS Route 590 features recurring morning peak hour congestion. Traffic densities are currently at capacity (LOS E) and are projected to exceed capacity (LOS F) by 2031 and into 2051.

Conceptual Alternative: Concept 3 would add a fourth southbound travel lane to NYS Route 590 from the Browncroft Boulevard on-ramp to the I-490/NYS Route 590 split. The concept would also involve the construction of a new parallel deceleration lane for Ramp A connecting NYS Route 590 southbound to Blossom Road. The addition of this lane would improve operations throughout the year 2051 under all growth scenarios to LOS D or better (below capacity) during the morning peak hour.

Constructability Considerations: The existing NYS Route 590 bridges over Blossom Road and Browncroft Boulevard would need to be widened (rehabilitated or replaced) to accommodate a fourth southbound lane and full width shoulder.

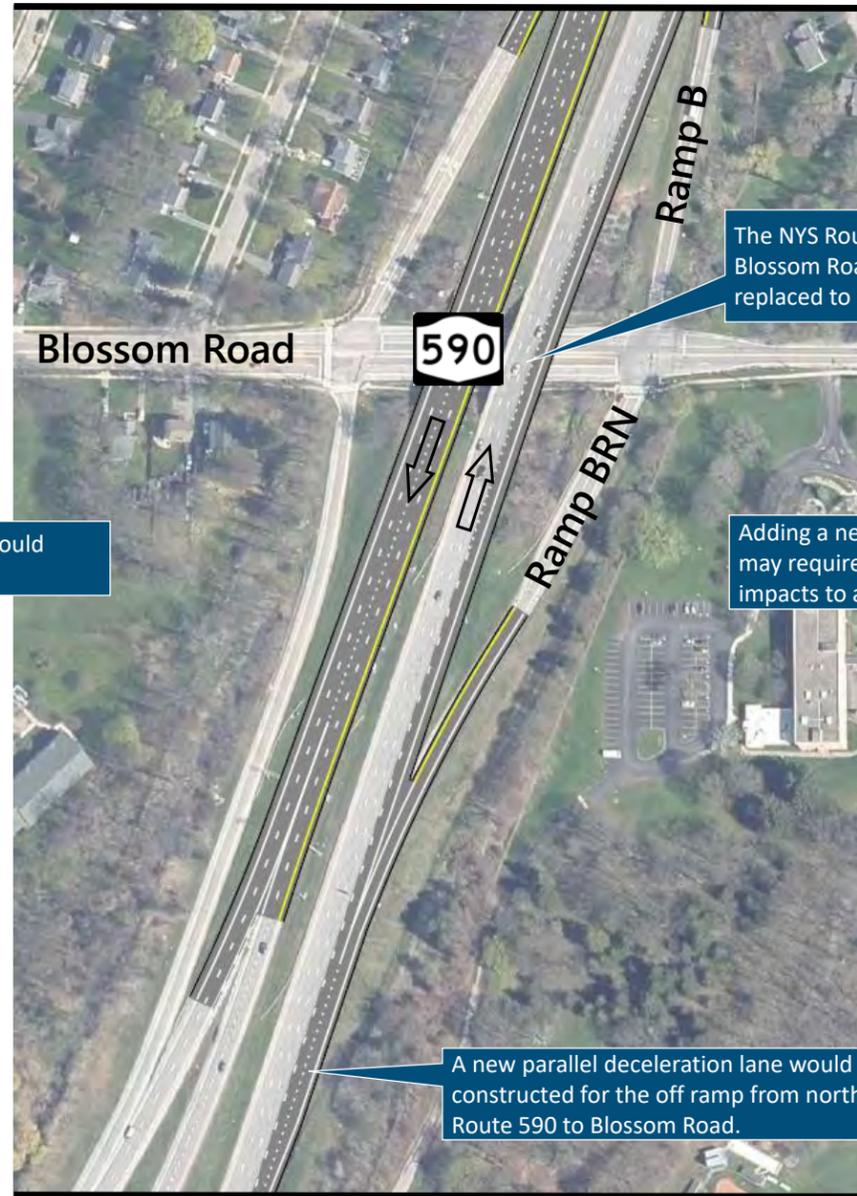
Environmental Considerations: Widening NYS Route 590 to the west and adding a fourth lane could trigger the need to study potential noise and visual impacts to adjacent residential properties and possible mitigation.

Planning-Level Construction Cost Estimate: \$26.6 million



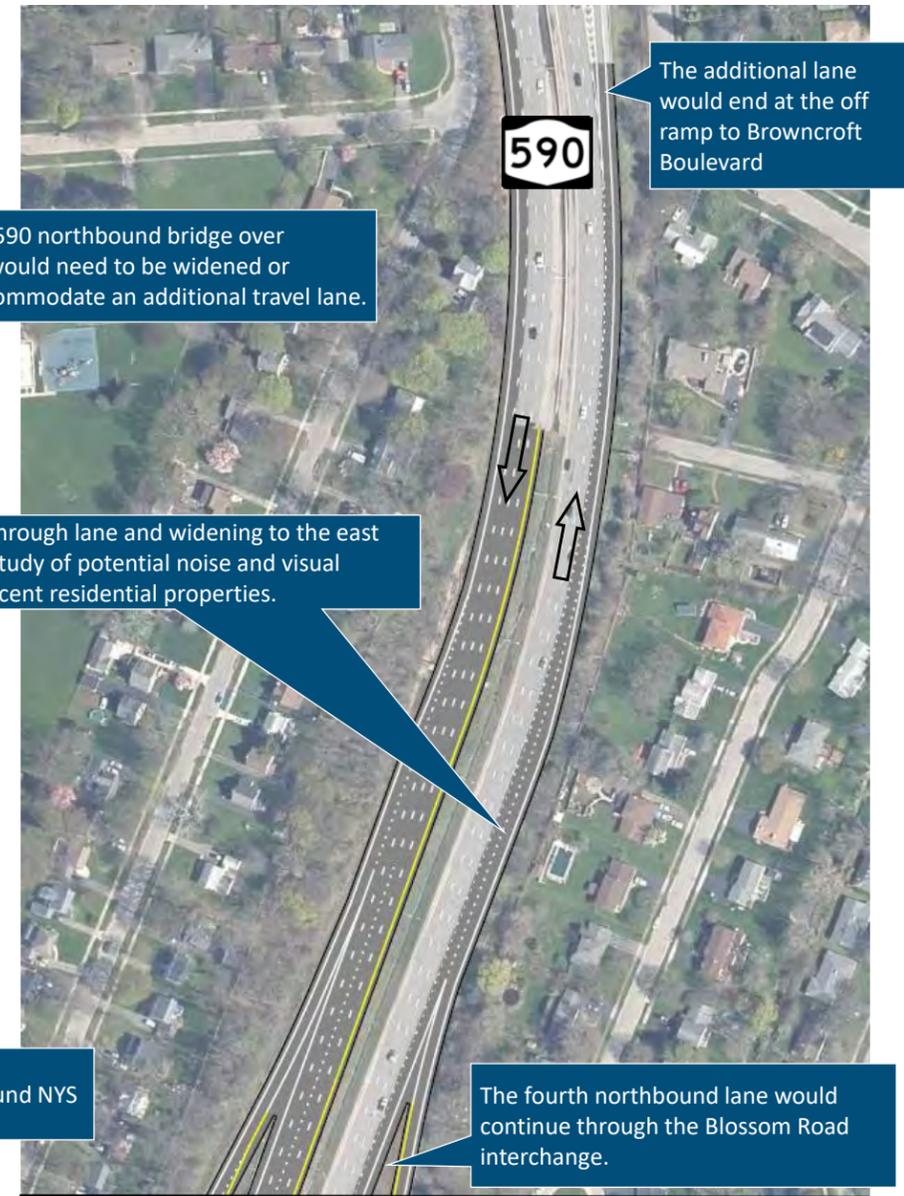


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4+5

Additional NYS Route 590 northbound lane from Ramp WN to the Browncroft Boulevard off-ramp

Operational Considerations: During the evening peak hour, the segment of NYS Route 590 northbound approaching Ramp WN is expected to reach capacity (LOS E) by 2051 under the low growth scenario and exceed capacity (LOS F) under a normal growth scenario. The 1,150-foot weaving area just downstream, between Ramp WN and Ramp BRN, also currently operates at capacity (LOS E) during the evening peak hour and is expected to exceed capacity (LOS F) by 2051 under the normal growth scenario. Congestion in this area tends to affect both the segments of NYS Route 590 and Ramp WN immediately upstream causing speeds as low as 20 miles per hour and stop and go travel. The segment of NYS Route 590 from Ramp BRN north to the Blossom Road overpass is also operating at capacity (LOS E).

Conceptual Alternative: Concept 5 grew out of Concept 4. Concept 4 would extend the weaving lane between Ramps WN and BRN across the bridge over Blossom Road and end it with a taper prior to the entrance of Ramp B. This would not eliminate projected LOS F (over capacity) conditions in the northbound direction, during the evening peak hour, from south of Ramp WN through the Blossom Road interchange. A congestion causing bottleneck would remain at the taper. Extending the lane through the Blossom Road interchange, adding a new parallel acceleration lane for Ramp B, and connecting the lane to the Browncroft Boulevard off ramp (Concept 5) is projected to provide operations at or below capacity (LOS E or better) throughout 2051 under the normal growth scenario. Anticipated peak hour speeds would improve to 40 miles per hour or higher.

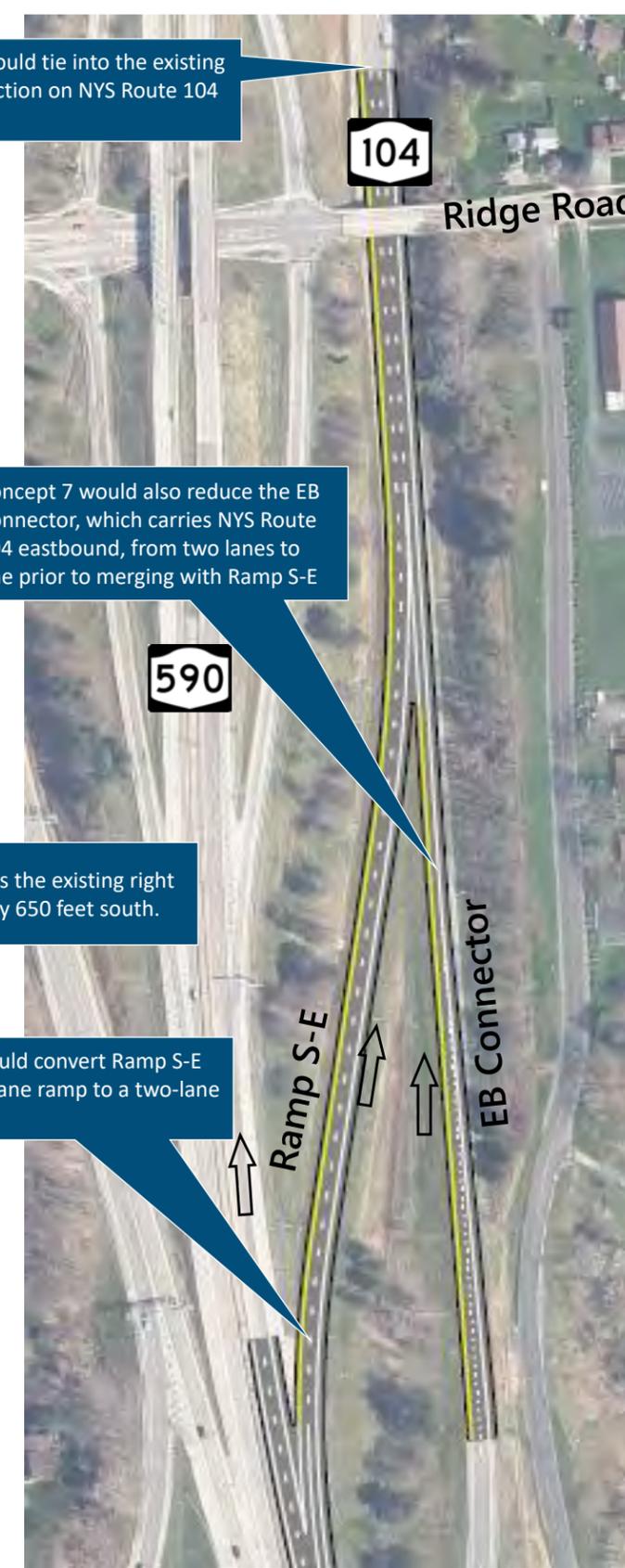
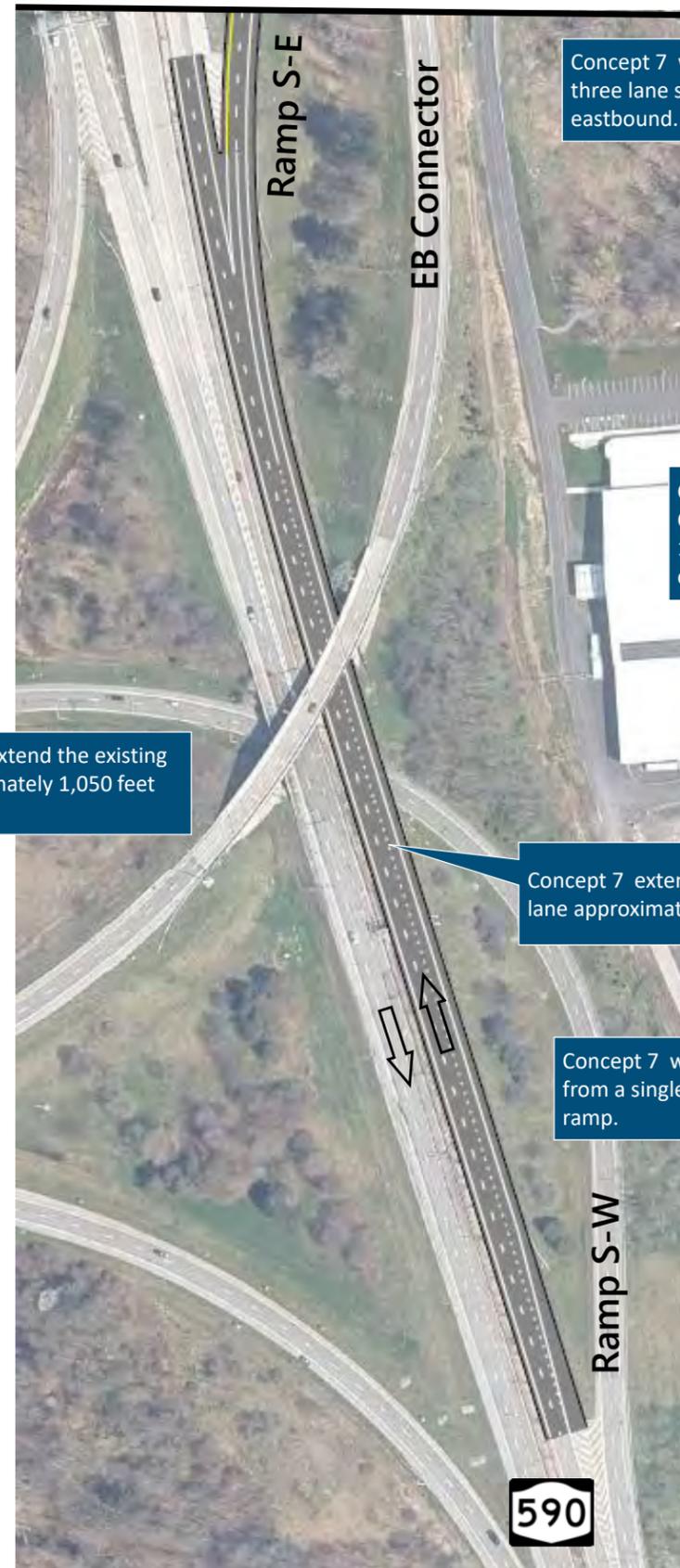
Constructability Considerations: The existing NYS Route 590 bridge over Blossom Road would need to be widened (rehabilitated or replaced) to accommodate a fourth northbound lane and full width shoulder.

Environmental Considerations: Widening NYS Route 590 to the east and adding a fourth lane may trigger the need to study potential noise and visual impacts to adjacent residential properties and the feasibility of mitigation.

Planning-Level Construction Cost Estimate: Concept 4: \$10.7 million, Concept 5: \$17.9 million



NYS Route 590 northbound over Blossom Road



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6+7 Two lanes on Ramp S-E and one lane on NYS Route 104 eastbound

Operational Considerations: The approach to the diverge between NYS Route 590 northbound and Ramp S-W is projected to operate over capacity (LOS F) in 2051 during the evening peak hour under a normal growth scenario. Vehicular speeds are expected to drop into the range of 30 miles per hour.

The NYSDOT temporarily modified the pavement markings on NYS Route 590 northbound, Ramp S-E, and the EB Connector in 2019 providing two lanes on Ramp S-E and one lane on the EB Connector. This was done as part of a construction project involving the bridge carrying NYS Route 104 eastbound over NYS Route 590. The study team was charged with testing if this change could and should be made permanent given existing traffic patterns and continuing growth to the east. As shown below, projected volumes on the two roadways are expected to be and remain similar during the evening peak hour from the year 2031 through 2051.

Roadway	Typical Vehicles Per Hour
Ramp S-E	1950-2150
EB Connector	2150-2400

Conceptual Alternative: Concept 6 would extend the right lane as far south as possible without impacting the Norton Street off-ramp. This would provide additional space for drivers to select the proper lane before reaching the exit to NYS Route 104 westbound (Ramp S-W).

Concept 7 would extend the right lane as far south as possible without impacting the diverge to Ramp S-W. This would provide additional space for drivers to select the proper lane before reaching the exit to NYS Route 104 eastbound. Concept 7 would also convert Ramp S-E from one lane to two lanes. The EB Connector would be reduced from two lanes to one using a 660-foot merging taper to tie directly into the existing three-lane section on NYS Route 104 eastbound.

Both the diverge to Ramp S-W and Ramp S-E would operate below capacity (LOS D or better) during the evening peak hour in the year 2051 under normal growth conditions with Concepts 6 and 7 in place; however, reducing NYS Route 104 eastbound (the EB connector) to a single lane would result in operations at capacity (LOS E). That LOS E led to the development of Concept 8.

Constructability Considerations: Concept 6's proposed widening requires extending a box culvert and a steep, tall embankment.

Environmental Considerations: The surrounding area is in a coastal zone and the Town of Irondequoit Local Waterfront Revitalization Plan boundary. Some federal and state coordination may necessary during design. Previously undisturbed areas around the roadway are also classified as archaeologically sensitive.

Planning-Level Construction Cost Estimate: Concept 6: \$2.2 million
Concept 7: \$1.2 million

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8 Two lanes on Ramp S-E and two lanes on NYS Route 104 eastbound

Operational Considerations: Concept 7 examined the potential effects of changing Ramp S-E to two lanes and reducing the EB Connector (NYS Route 104) to one lane, tying directly into the downstream three-lane section. That change is projected to result in operations at capacity (LOS E) on the EB connector in the evening peak hour under normal growth conditions by the year 2051.

Conceptual Alternative: Concept 8 would retain the current two-lane configuration on NYS Route 104 eastbound (the EB Connector) and modify NYS Route 104 downstream to carry four lanes until it tapers back to three at the Irondequoit Bay Bridge. The result would be greatly improved operations at LOS C or better throughout 2051 during the evening peak hour.

Constructability Considerations: NYS Route 104 would need to be widened beneath the Ridge Road overpass in order to carry a fourth travel lane and full width left shoulder. The existing brick paved slope and box beam guiderail would be impacted. The abutment would need to be checked for potential structural impacts. The existing bridge carrying NYS Route 104 eastbound over the maintenance ramp and the connection to that ramp would also be impacted by the proposed widening.

Environmental Considerations: The surrounding area is in a coastal zone and the Town of Irondequoit Local Waterfront Revitalization Plan boundary. Some federal and state coordination may necessary during design. Previously undisturbed areas around the roadway are also classified as archaeologically sensitive.

Planning-Level Construction Cost Estimate: \$9.3 million



Exhibit 4.1.4-1
 Concepts 1 - 3, and 5
 DRAFT Preliminary Signing Concept
 I-490 / I-590 / NYS Route 590
 UPWP 7952: Ramp Reconfiguration Study
 December 21, 2021



CONCEPT 8

Ridge Road



CONCEPT 6



Norton Street

Exhibit 4.1.4-2
 Concepts 6 and 8
 DRAFT Preliminary Signing Concept
 NYS Route 104 / NYS Route 590
 UPWP 7952: Ramp Reconfiguration Study
 December 21, 2021

