



Staff Report

TO: City Council
FROM: Jeff Hart, Director of Public Works
DATE: July 21, 2020
SUBJECT: Update on the Highland Springs/I-10 Interchange Project

Background and Analysis:

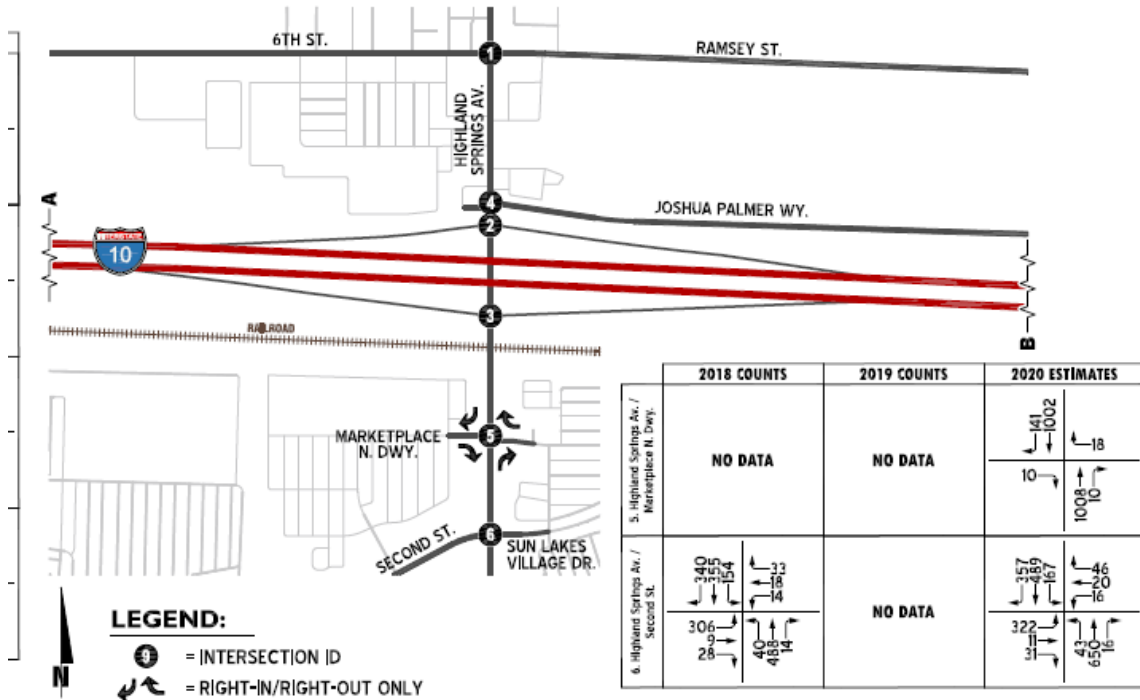
On September 17, 2019, the City Council approved a cooperative agreement between the Riverside County Transportation Commission (RCTC), the City of Banning, and the City of Beaumont for the preparation of a project study report (PSR) for the Highland Springs Interchange (Project). The Project is located adjacent to and within the jurisdictional boundaries of both the City of Banning and the City of Beaumont. Any of the alternatives that are currently being assessed will require improvements in both jurisdictions.

Staff has been actively working with design and traffic consultants for the project as well as staff from the City of Banning, RCTC, and Caltrans to develop the potential four alternatives for the Project moving forward. All four alternatives have been analyzed for level of service (LOS) delays at several key intersections. LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS "A", representing completely free-flow conditions, to LOS "F", representing breakdown in flow resulting in stop-and-go conditions. LOS "E" represents operations at or near capacity, an unstable level, where vehicles are operating with the minimum spacing for maintaining uniform flow.

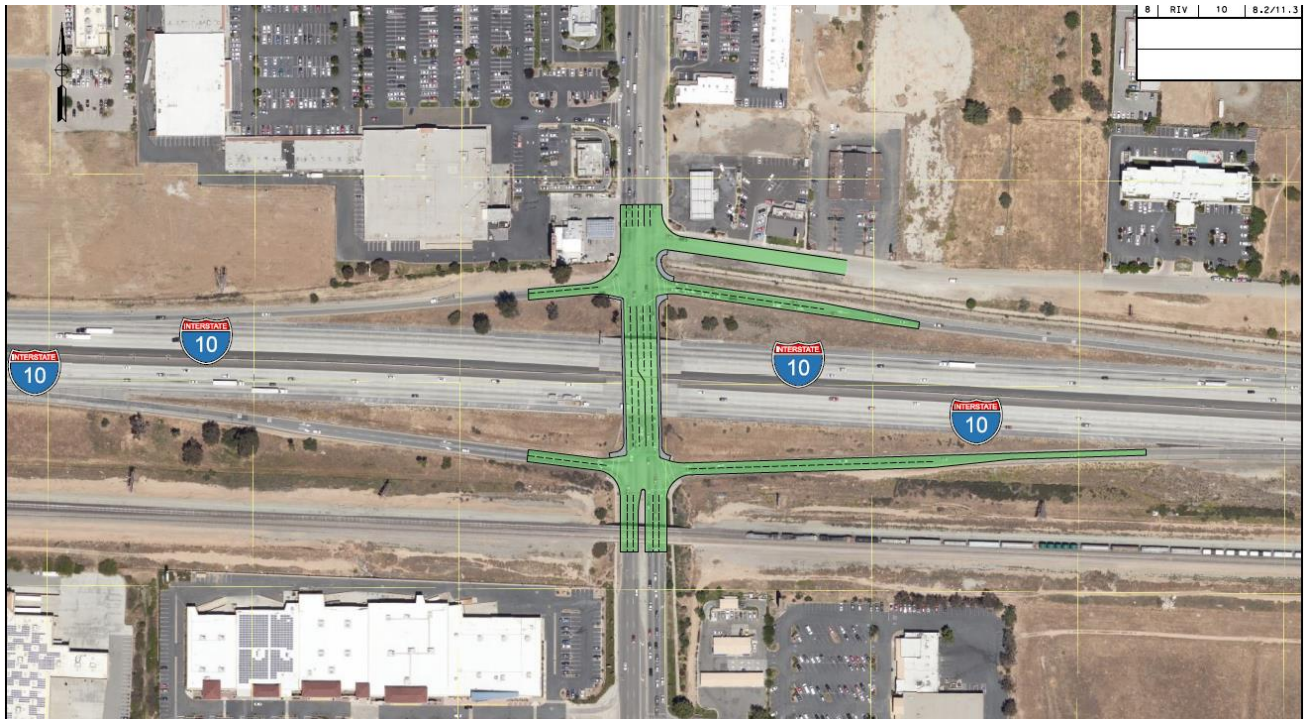
Alternative 1 is for the Project to remain as-is in its current configuration with no improvements planned (i.e. "no-build"). Traffic analysis shows that in this alternative current peak hour delays at several key intersections will substantially increase by the year 2040. The delay at the intersection of Highland Springs/I-10 westbound ramps would increase from 21 seconds in the AM peak hour to 41 seconds by 2040. Delays at the intersections of Highland Springs/I-10 eastbound ramps would increase from 22 seconds in the AM peak hour to 41 seconds by 2040. The following figure shows the intersections that were studied in the draft project Traffic Forecasting and Operational

Analysis (TFOA) report (see Attachment A), as well as a graphic for the existing condition.

Studied Intersections



Alternative 1, No-Build



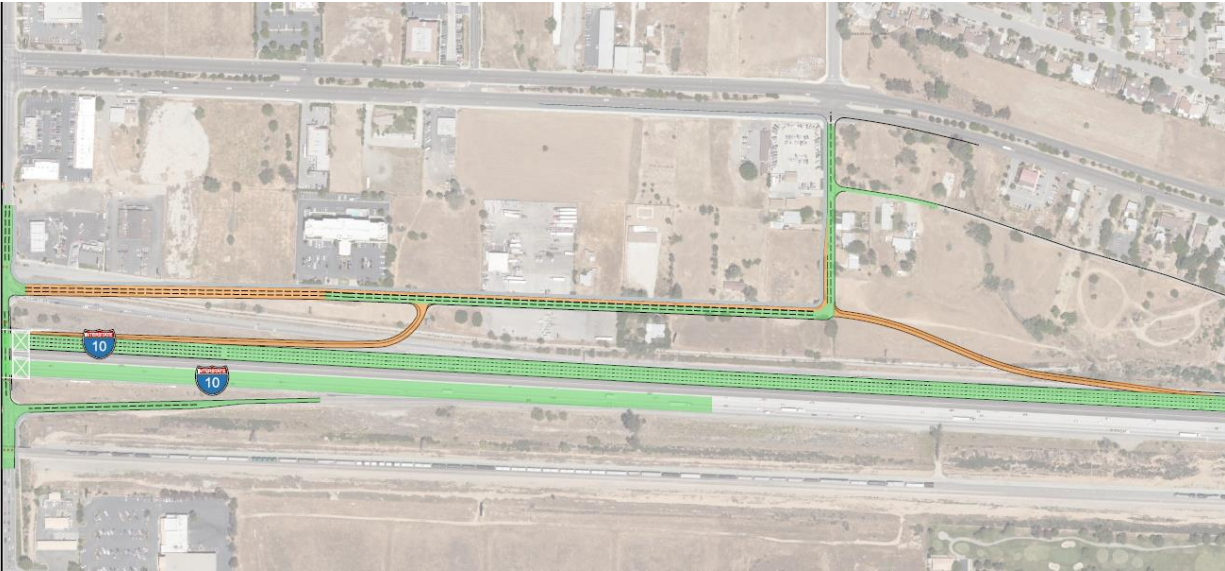
Alternative 2 would leave the westbound and eastbound on ramps as-is while reconfiguring the off ramps. Two options are currently being studied for Alternative 2, with the difference being the location of the westbound on ramp. Alternative 2, Option A would create a new westbound on ramp approximately ¼ mile east of Highland Springs Avenue, while Option B would create a new westbound on ramp approximately ½ mile east of Highland Springs (see following graphics). The new westbound off ramp would remain the same for either option. Both options would include a realignment of Joshua Palmer Avenue to align better with the existing westbound on ramp at Highland Springs Avenue. The realignment of Joshua Palmer Avenue will provide for a safer and more efficient operation of the signalized intersection.

Efficiency of Highland Springs Avenue improves significantly in 2040. The delay at the intersection of Highland Springs/I-10 westbound ramps would decrease from 41 seconds in the AM peak hour no build scenario to 11 seconds with the implementation of Alternative 2. Delays at the intersections of Highland Springs/I-10 eastbound ramps would decrease from 41 seconds in the AM peak hour no build scenario to 14 seconds with the implementation of Alternative 2.

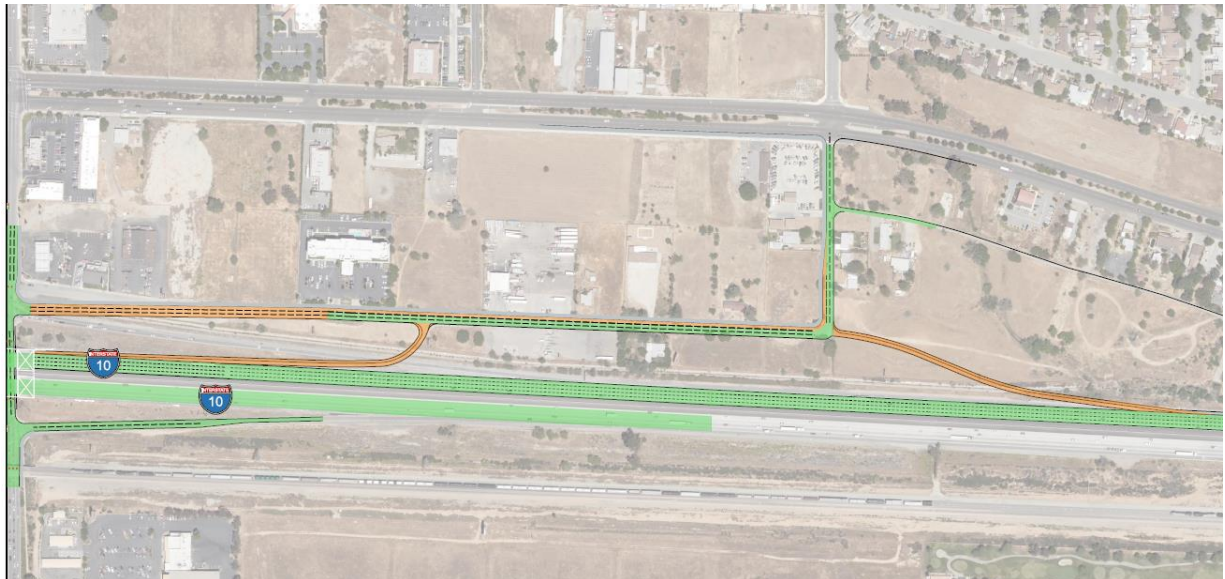
Alternative 2, East Bound Off Ramp



Alternative 2, West Bound Ramps (Option A)



Alternative 2, West Bound Ramps (Option B)



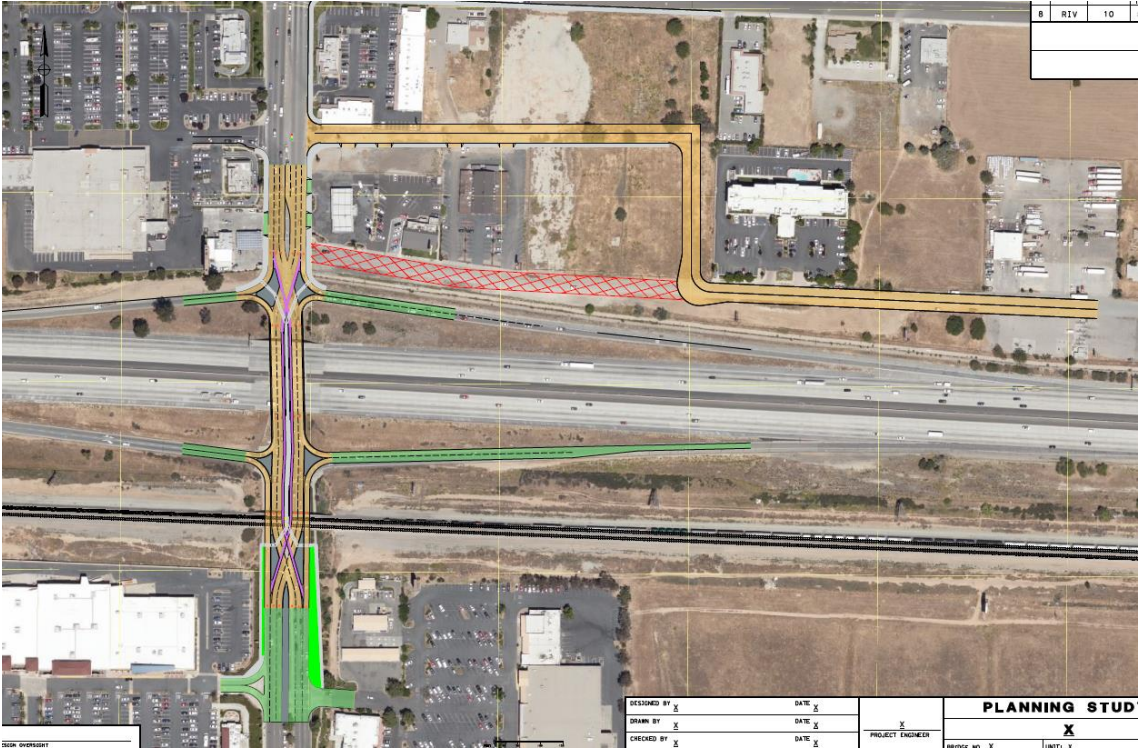
Alternatives 3 and 4 both utilize what is called a diverging diamond interchange. A diverging diamond interchange is an interchange in which the two directions of traffic on the cross street (above or below the freeway) cross to the opposite side on both sides of the bridge at the freeway. For these alternatives, the westbound and eastbound ramps would remain largely the same, with modifications being made at their respective connection points to Highland Springs Avenue. The primary difference between Alternatives 3 and 4 is the point in which northbound and southbound traffic return to their normal operating side of the road. For Alternative 3, traffic switches back to their normal side of the road just south of the I-10 underpass, at the intersection of Highland Springs Avenue and the eastbound ramps (see following graphic).

Alternative 3



For Alternative 4, traffic switches back to their normal side of the road just south of the railroad underpass (see following graphic).

Alternative 4



Both Alternatives 3 and 4 would entail a revised alignment of Joshua Palmer Avenue at Highland Springs. The relocation of Joshua Palmer Avenue further north allows for a much more efficient operation of the interchange, and more specifically the intersection of the west bound ramps and I-10.

Efficiency of the interchange in 2040 for Alternatives 3 and 4 also improves greatly versus the no-build scenario. The delays for the I-10 west bound ramps/Highland Springs Avenue intersection would decrease from 41 seconds to 13 seconds in the AM peak hour. Delays for the I-10 east bound ramps/Highland Springs Avenue intersection would decrease from 41 seconds to 14 seconds in the AM peak hour.

As previously stated, the difference between Alternatives 3 and 4 is the point at which traffic returns to their respective normal state of operation. The primary benefit of Alternative 4 is the increased stack length of traffic, primarily under the I-10 undercrossing. LOS remains similar for both Alternatives 3 and 4, but LOS is only one metric for measuring traffic flow and congestions. Stack length can play a significant role in traffic efficiency and Alternative 4 allows for significantly more storage between the westbound ramps/I-10 intersection and the eastbound ramps/I-10 intersections, a significant source of current congestion and only exacerbated by the expected growth by the year 2045. The storage length for Alternative 3 versus Alternative 4 is increased by nearly 200 feet.

Next Steps

- Completion of the PSR – April 2021,
- Project Approval and Environmental Document (PA/ED) – April 2023,
- Plans, Specifications, and Estimates (PS&E) – October 2024, and
- Commence Constructions – February 2025.

Fiscal Impact:

The cost to prepare this staff report is estimated to be \$750.

Recommended Action:

Receive and file the Highland Springs Interchange Update.