U.S. Department of Transportation
Federal Highway Administration

Interstate 15 and Main Street, American Fork, UT
DIVERGING DIAMOND INTERCHANGE

THE PROBLEM

The interchange at I 15 and Main Street experienced significant demand increases due to rapid population and commercial growth in the area. In addition, the conventional diamond interchange design had only a single lane and no left turn lane. It could take drivers 20 30 minutes to get through the interchange.

THE SOLUTION

Installation of the Nation's second Diverging Diamond Interchange.

THE OUTCOME

- The new DDI can comfortably accommodate 40,000 vehicles per day, 10,000 more than the conventional diamond interchange alternative.
- Illuminated pedestrian walkways are provided along both sides of Main Street through the interchange, and bicyclists can choose to ride in lane or along the shoulders adjacent to the right lanes in both directions.
- Overwhelmingly positive reaction from businesses and surrounding communities due to reductions in congestion and delay.

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INTERCHANGE LOCATION

40°22'36.3"N 111°49'07.6"W

Background

The Utah Department of Transportation (UDOT) selected the interchange located at Interstate 15 and Main Street in the city of American Fork for the Nation's second Diverging Diamond Interchange (DDI) design to address rapid population and commercial growth in the area. The original interchange, a conventional diamond design, had become overwhelmed with increasing demand as the area grew. This led to significant corridor congestion, with drivers on the cross street sometimes waiting up to 30 minutes to get through the interchange.[1]

> *"Right after we opened Pioneer Crossing, we did an extensive survey … what is your perception of this DDI? … the response was overwhelmingly … 85-90 percent … positive because they were comparing delay time … and it was night and day."*
>
> — *Daniel Avila, P.E., Deputy Program Director Access Utah County, Utah DOT*

Challenges

UDOT faced three challenges at this location. First, a new facility needed to support increasing demand on the corridor as the population continued to grow. Second, a new facility had to improve the flow of traffic along the corridor not only to facilitate the movement of goods and people, but also to address a growing concern about poor air quality—an issue that was exacerbated by lengthy queues of idling cars waiting their turn to proceed through the interchange. Finally, UDOT needed to be cost-conscious, implementing the most cost-effective solution to address mobility and environmental concerns.

View of the Pioneer Crossing DDI
Source: DDI Case Study Video FHWA-SA-14-043

Approach

UDOT investigated available options and focused on innovative designs because they offer a way to save money, improve capacity, and keep people moving so idling is minimized. UDOT's initial simulation of the DDI indicated it would reduce backup by 50 percent in the first year and continue to function well as traffic grew over the next two decades and beyond.[2]

Results

Opening day traffic at the new DDI matched the highest demand projected in models and demonstrated that the design works – reducing previously crippling delay and accommodating an additional 10,000 vehicles a day.[3] Due to the lower number of phases, pedestrians and bicyclists also spend much less time waiting for the green signal than would be the case in a conventional diamond interchange design. Pedestrian sidewalks are provided along both sides of Main Street through the entire interchange. Bicyclists may ride in the traffic lanes or along shoulders adjacent to the right lanes in each direction.

1 Interview with Eric Rasband, Salt Lake City, October 10, 2013.

2 Utah DOT, *UDOT Diverging Diamond Interchange (DDI) Observations & Experience*, UT-12.05 (April 2012). Available at: https://digitallibrary.utah.gov/awweb/awarchive?item=55020

3 Ibid.

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This Fact Sheet is a companion to the Video Case Study (FHWA-SA-14-043)