**2017 ICMA Local Government Excellence Award Nomination**

**Community Partnership Awards**

**US 36/McCaslin Diverging Diamond Interchange**

**Town of Superior/City of Louisville - Colorado**

****

1. **Problem assessment, the challenge or need that prompted the local government to develop the program.**

The Town of Superior and City of Louisville are located between Denver and Boulder adjacent to US Highway 36, the main thoroughfare that opened as a four-lane highway in 1951. The first exit off the highway going east from Boulder provides access to Superior to the south and Louisville to the north. Like most interchanges of that time, it was constructed as a diamond interchange. The need for improvements at the US 36/McCaslin interchange has been discussed for decades due to traffic concerns. The first phase of an improvement plan for US 36 (US 36 Managed Lanes Project) was completed in 2003 with the construction of a loop in the southwest quadrant of the interchange, but the second phase stalled due to right-of-way requirements for a loop in the northeast quadrant.

In 2011 Superior, Louisville and the Colorado Department of Transportation (CDOT) jointly sponsored a study to re-examine alternatives for improving the interchange. 42,000 vehicles per day cross bridge and over 50,000 daily vehicles pass through the interchange resulting in heavy traffic. The study found that the existing infrastructure failed to serve the travel demand with excessive congestion and delay. As new interchange configurations were explored, the diverging diamond interchange (DDI) concept surfaced as a recommended alternative. Local managers began the design process that would ultimately result in the first DDI to be built in the Denver Metro Area and second in the state.

1. **Program implementation and costs.**

DDIs are commonly implemented to reduce delays, especially for sites with heavy left-turning movements to or from the freeway. At DDIs, traffic crosses over for both inbound movements to the interchange, allowing drivers to use the opposing side of the road between the two interchange signals and then enter the freeway on-ramps without travelling through a second signal. The DDI design eliminates the need for a left-turn phase dedicated to turning onto freeway on-ramps. This phase often causes significant queuing between the ramp terminals and spillback into upstream intersections. The signalized crossover intersections operate with just two phases, with each phase dedicated to the alternative opposing movements. The two-phase operation allows for shorter cycle lengths and reduced lost time per cycle compared to three- or four-phase operation at conventional diamond interchanges.

As the DDI design evolved, there were additional opportunities to improve not only traffic flow, but the level of service for all transportation modes. To accommodate the large number of busses traveling through the interchange, the project team designed bus lanes that were grade-separated at the eastbound off-ramp and westbound on-ramp. This feature allowed buses to bypass the traffic signals, saving more than one minute on each run. With 10,000 bus riders traveling though these underpasses, riders save 170 hours per day in travel time. Interchanges are also typically not pleasant environments for pedestrians. With high speed ramps to cross and conflicts with left-turning vehicles, pedestrians are often put in harm’s way. The team selected a center walkway for pedestrians after considering the geometry of the crossover intersections and walks on the outside of the bridge. The walkway is protected by barriers with embedded lighting, a basket-handle arch creating a canopy, and modern bus shelters at each end.

McCaslin Boulevard incorporates bike lanes for most of its 4-mile corridor except at the bridge over US 36 and serves as a connection to several regional corridors along Marshall Road and Coal Creek Trail. Since the DDI project needed to widen the McCaslin bridge to accommodate a sixth lane, the team felt this would be an opportune time to include additional width for bike lanes and create the missing link in an extensive trail network. The team decided to have 7-foot wide bikes that travel with the flow of traffic. Although this results in a longer distance to travel, cyclists avoid conflicts with left-turning vehicles. Additionally, east-west travel along the US 36 Commuter Bikeway is accommodated by the pedestrian/bike underpasses at the US 36 ramps and McCaslin. The final design of the DDI was approximately $14 million. The team applied for and received a FASTER Transit Grant for the bus ramps and along with funding from Superior, Louisville, and RTD, financing came together in time for the project to be included in the second phase of the US 36 Managed Lanes improvement plan.

1. **Tangible results or measurable outcomes of the program.**

Safety data has confirmed that the DDI has greatly improved safety for drivers, bicyclists, and pedestrians at the interchange since it opened in January 2016. During the first year of operation, there were zero injury ac­cidents, and non-injury accidents decreased by 36%. Previous traffic patterns required vehicles to cross oncoming traffic to access either US 36 or McCaslin, leaving drivers vulnerable to serious T-bone type accidents. The old interchange saw roughly two accidents each month. With the new DDI, which incorporated fewer conflict points and slower speeds, there were only 18 crashes at the intersection in 2016, all of which were low severity, rear-end, or sideswipe injuries crashes with no inju­ries. Additionally, the final design saved taxpayers roughly $25 million.

The 2009 CDOT *Final Environmental Impact Statement* recommended a 9-lane bridge and related improvements that would have cost upwards of $40 million. The DDI, including bus ramps, arch, walkway, and bike lanes, cost approximately $14 million. When the planning process started in 2011, there were only a handful of diverging diamond interchanges open in the United States. Today there are more than 80 across the country. The DDI is among the most innovative because of its multimodal features, which encourage bike and pedestrian use and has even reduced ride time for bus passengers. The dedicated bus under­passes and slip ramps have contributed to a 45% increase in ridership on the Flatiron Flyer, the region’s bus rapid transit service.

1. **Lessons learned during planning, implementation, and analysis of the program.**

The US 36/McCaslin interchange was converted to the DDI configuration in October 2015. Construction was a major challenge as the work zones reduced traffic capacity during the 18-month construction, which resulted in congestion and impacts on local businesses. At one point the interchange was completely closed for two weekends. With the completion of construction, however, traffic flow greatly improved. In fact, new businesses have continued to open on both sides of the DDI. Cyclists and pedestrians are also using the new facilities, and the US 36 Bikeway is more popular than ever. The process of working through the design and agreeing on a solution benefitting both jurisdictions has also led to studies for the sharing of other services.

1. **How the program raises awareness of the contributions of Local Government Managers.**

The DDI is a great example of how a successful partnership can raise awareness of the contributions of local government managers. The DDI demonstrates innovation, excellence, and success through multi-participant involvement by Superior and Louisville, as well as FHWA, CDOT, and RTD. The more efficient and effective services created by the DDI has resulted in an improved quality of life for residents and visitors. Whether accessing the highway by car, riding the Flatiron Flyer, or using the bike and pedestrian facilities, thousands of lives are positively affected every day by the DDI and the local government managers that supported its development. The contributions of Superior and Louisville’s managerial collaboration has been well documented over the last year. The success of the partnership has been recognized by the Denver Regional Council of Governments, American Planning Association, Institute of Transportation Engineers and American Public Works Association.