

HOW A DDI WORKS

A diverging diamond interchange (DDI) is unique from a standard diamond interchange in that traffic on the minor road (SR 322) crosses to the left side of the road at signalized intersections prior to the major road (SR 222). This allows for direct left turns to/from the SR 222 ramps. Traffic on the minor road (SR 322) crosses back to the right side of the road at the far side signalized intersection.

The DDI configuration has several safety and operational advantages over a standard diamond interchange. Due to the crossover path along the minor road, there are fewer crossing (and total) conflict points than a standard diamond interchange which reduces the crash rate and potential for high severity crashes. The configuration of the DDI only requires 2 phases per signal cycle versus 3 phases in a standard diamond interchange. This allows the DDI to provide more green time to traffic which leads to an increase in overall capacity and can mitigate the potential for congestion.

As of July 2017, 89 diverging diamond interchanges (DDIs) have been opened to traffic in the United States. Pennsylvania's first DDI opened to traffic in September 2016 at the I-70 and SR 19 interchange near Washington, PA, southwest of Pittsburgh. Several other DDIs are in design throughout the state including the I-83 Exit 4 Interchange in York County and SR 422/Penn Street Interchange in Berks County.

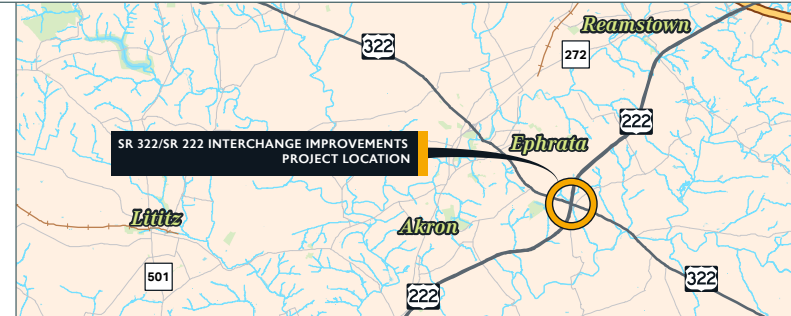
FOR FURTHER INFORMATION



PennDOT Project Manager
Dave Fratangeli | Project Manager
 PA Department of Transportation, District 8
 Highway Design Unit
 2140 Herr Street • Harrisburg, PA 17103
 717-705-6176
 dfratangel@pa.gov



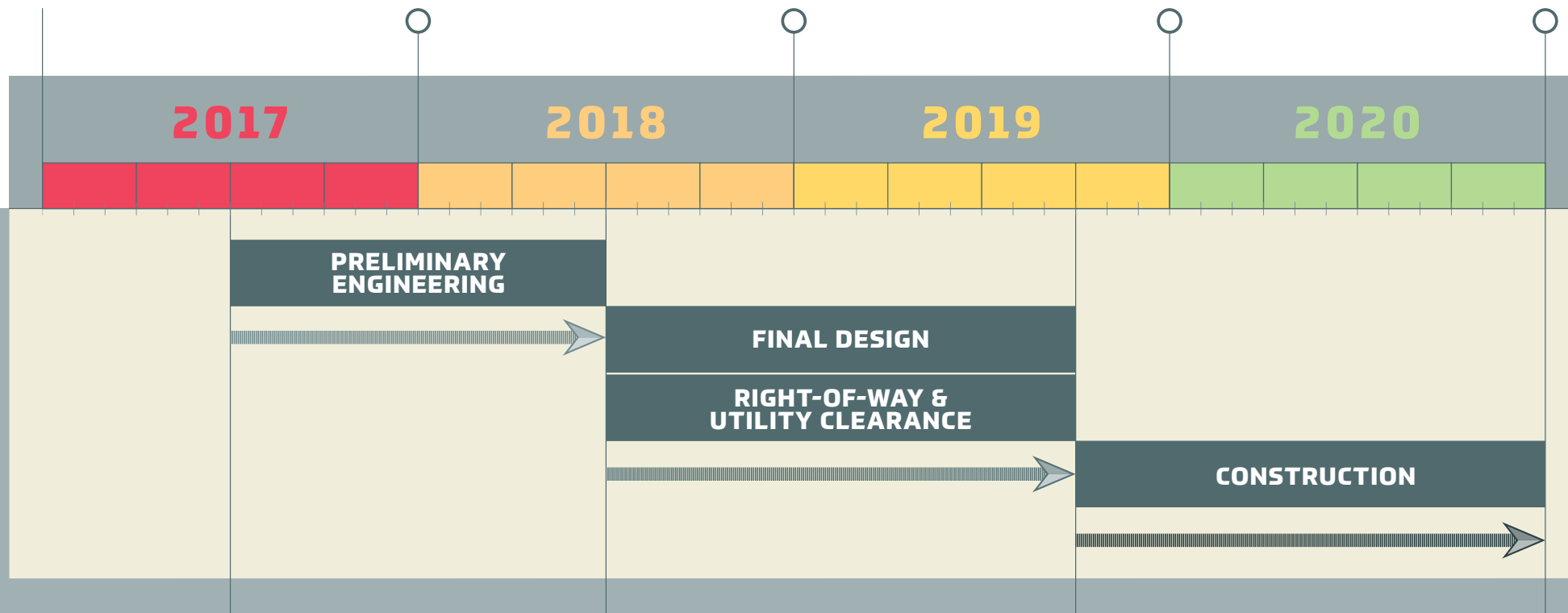
Design Project Manager
Rob Wills, P.E. | Associate
 Whitman, Requardt & Associates, LLP
 224 St. Charles Way, Suite 140 • York, PA 17402
 717-741-5057
 rwills@wrallp.com



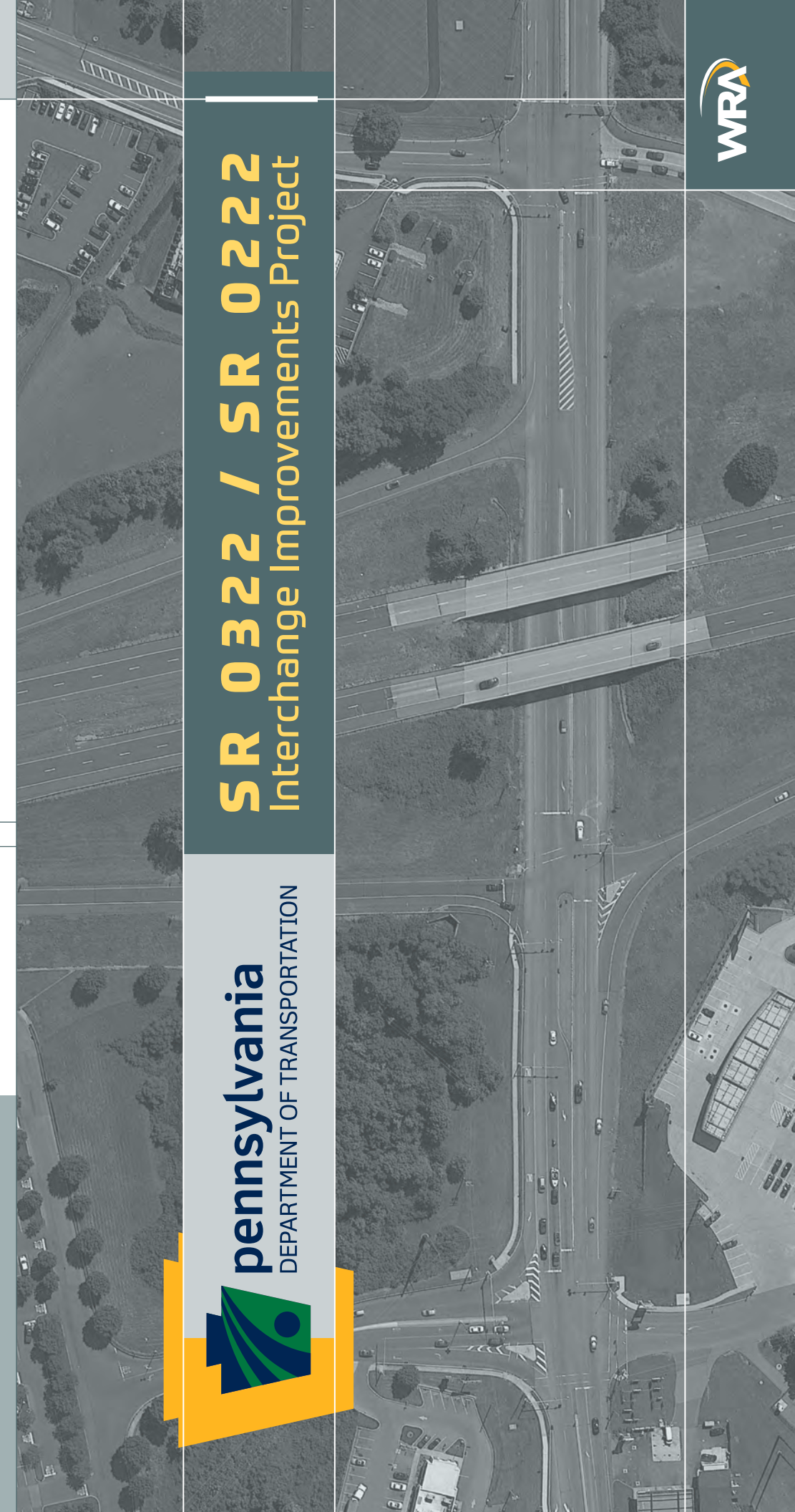
PROJECT TIMELINE

PennDOT has decided to move forward with the design and implementation of the diverging diamond interchange. This project option will be progressed through preliminary engineering, final design, right-of-way, utility clearance, and construction.

NOTE: Dates shown below are subject to change based upon funding, development of design, and permitting approvals.



SR 0322 / SR 0222
 Interchange Improvements Project



INTRODUCTION

On behalf of the Pennsylvania Department of Transportation (PennDOT), we would like to welcome you to this meeting to share the proposed improvements at the SR 322 and SR 222 Interchange located in Ephrata and West Earl Townships.

PennDOT District 8-0 and the Lancaster County Planning Commission completed a Road Safety Audit (RSA) of SR 322 from Ridge Avenue to the SR 222 Interchange in July 2013. The RSA identified several safety improvements and suggested consideration be given to reconstructing the SR 322 and SR 222 interchange. As a follow-up to the RSA, a study was completed in December 2013 to investigate the potential for replacing the existing diamond interchange with a Diverging Diamond Interchange (DDI) and a subsequent alternatives analysis was completed in December 2016.

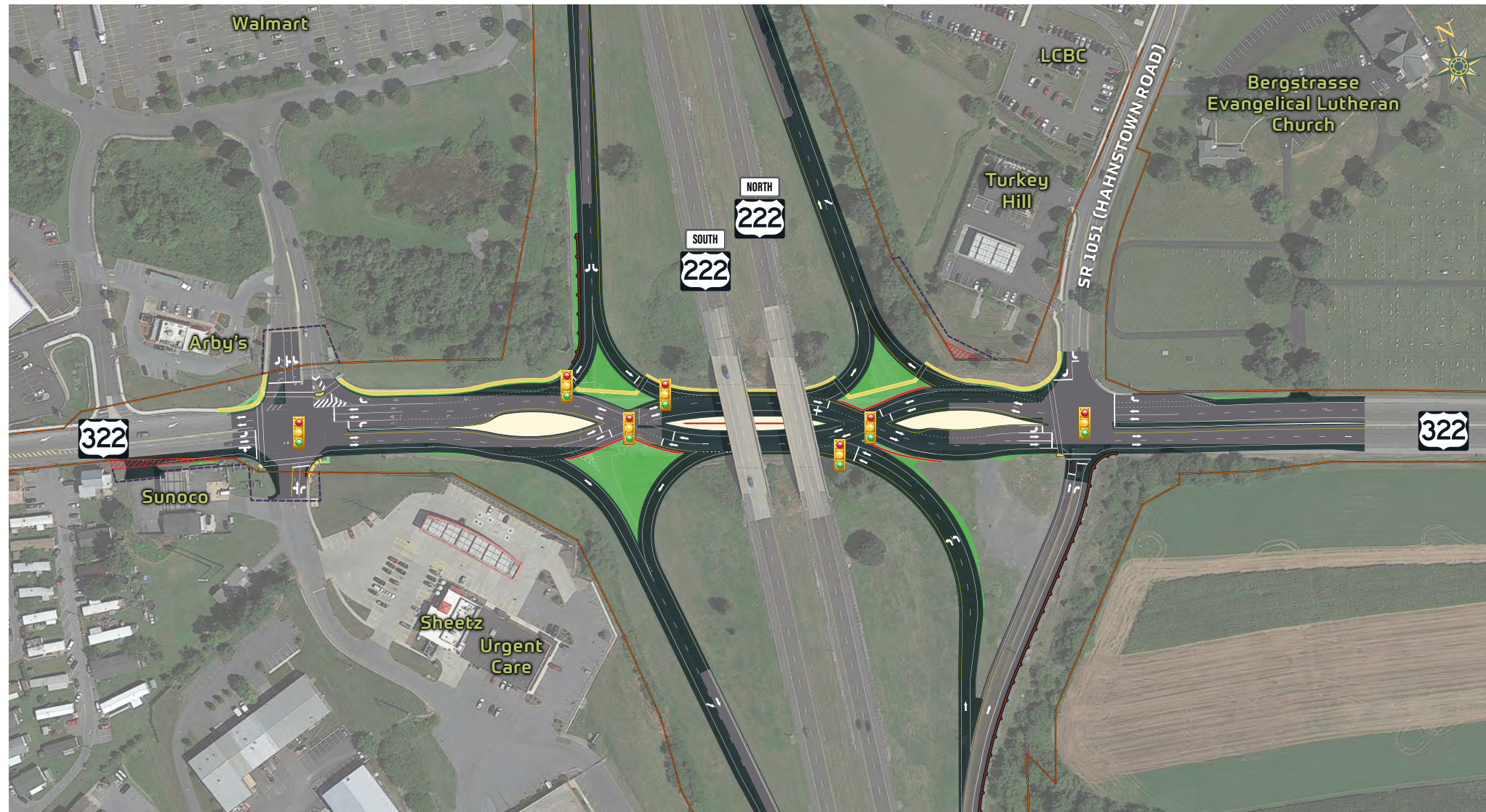
PURPOSE AND NEED

The primary purpose of the project is to improve safety within the project limits while maintaining or improving current and future traffic operations and accommodating all modes of transportation utilizing the SR 322 corridor.

- ▶ Improve Safety (Primary)
 - Reduce the number of conflict points
 - Eliminate mainline left-turn/through conflict (existing crash data indicates 43% angle crashes & 43% rear end crashes)
 - Reduce the number of and severity of future crashes (existing crash data indicates 46% of crashes resulted in injuries)
- ▶ Maintain or Improve Traffic Congestion (Secondary)
 - Provide dedicated turn lanes
 - Decrease queue spillback
- ▶ Maintain or Improve Multimodal Accommodations (Secondary)
 - Improve sidewalk connectivity along SR 322
 - Provide provision for bicycles and horse & buggies



PRELIMINARY DDI DESIGN



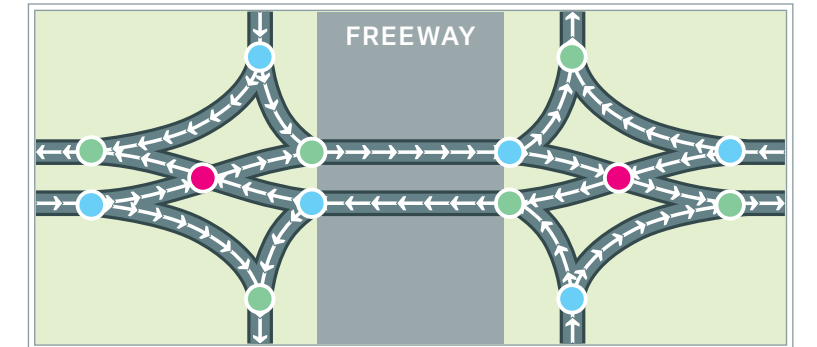
LEGEND

- PROPOSED NEW OR RECONSTRUCTED PAVEMENT
- PROPOSED CONCRETE ISLAND
- PROPOSED TOPSOIL & SEED (SHOWN IN SELECT AREAS)
- PROPOSED GUIDE RAIL
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED RESURFACING
- PROPOSED SIDEWALK
- PROPOSED CONCRETE BARRIER
- EXISTING RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY

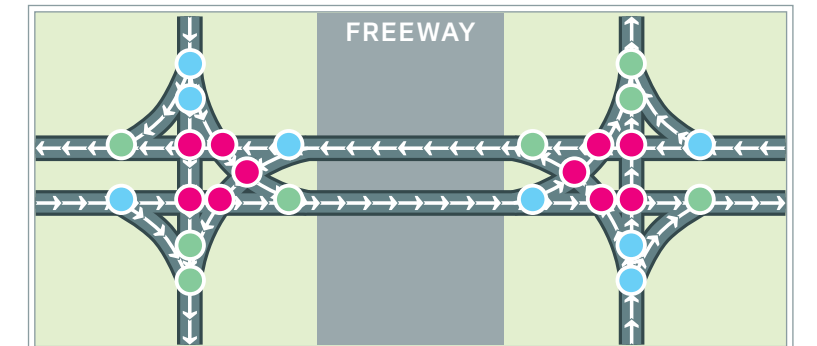
DDI BENEFITS

- ▶ Substantially reduces the number of conflicts compared to the tight diamond interchange points, improving safety.
- ▶ Substantially reduces the number of crossing conflicts between left-turn and through movements, reducing the likelihood for angle and head on crash types which tend to result in significant injuries
- ▶ Only requires two phase traffic signals with short cycle lengths, reducing delay for both motorized and non-motorized users.
- ▶ Significantly increases the capacity of left and right turning movements to and from the ramps.
- ▶ Significantly better at handling left turn movements under the SR 222 bridges.
- ▶ Maintains a similar footprint to existing conditions with minor right-of-way needs.
- ▶ Has better performance and offers lower delays, fewer stops, lower stop time and shorter queue lengths when compared to the performance of the conventional diamond design.

CONFLICT POINT DIAGRAM FOR DIVERGING DIAMOND INTERCHANGE (DDI)



CONFLICT POINT DIAGRAM FOR CONVENTIONAL DIAMOND INTERCHANGE



Type interchange	● Crossing	● Merging	● Diverging	TOTAL
Conventional diamond	10	8	8	26
Diverging diamond	2	6	6	14