

Design Build  
Diverging Diamond  
SR 72/SR 1 Interchange

# Agenda

- Design Build
- Diverging Diamond
- SR 72/SR 1 Interchange

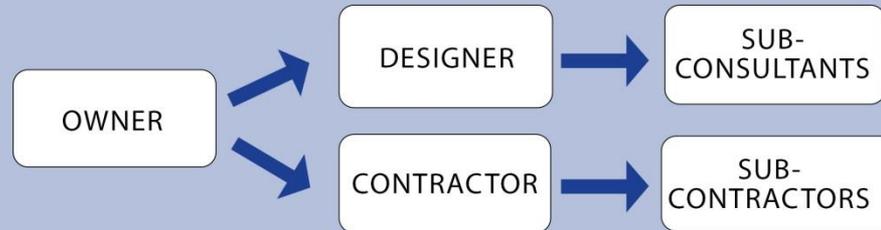
# What is Design Build

- “Design-Build is a method of project delivery in which one entity – the design-build team – works under a single contract with the project owner to provide design and construction services. One entity, one contract, one unified flow of work from initial concept through completion – thereby re-integrating the roles of designer and constructor “

## DESIGN-BUILD CONTRACTUAL RELATIONSHIP

# What is Design Build ?

### Traditional Project Delivery



Owner must manage two separate contracts; owner becomes middleman, settling disputes between the designer and the contractor. Designer and contractor can easily blame one another for cost overruns and other problems.

VS

### Design-Build Project Delivery



Owner manages only one contract with a single point of responsibility; designer and contractor are on the same team, providing unified recommendations. Changes are addressed by design-build entity, not used as excuses.



# Design Build

- Prescriptive Specifications— Tell a contractor how to do it

vs.

- Performance Specifications – Tell Design Build Team what you want as a final product

# Why Use Design Build ?

- Very viable for specific projects
- Value in having the design team and the builder/contractor work in unison
- Incorporate the builder's skills, techniques, equipment, resources and availability into the development of the design
- Share the Risks

# How to Select a Design Build Team

- Phase 1 - Request for Qualifications
- Phase 2 - Request for Proposals

Focus is on  
*Best Value* to the  
Department

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# Diverging Diamond Interchange

- An alternative to the conventional diamond interchanges
  - Directional crossovers on either side of the interchange
  - Eliminates the need for left-turning vehicles to cross the paths
- Improves the operations of turning movements to and from the freeway facility
- Reduces the number and severity of vehicle-to-vehicle conflict points

# Diverging Diamond Interchanges

## ● Where it is Effective

- High-volume left turns
- Need significant safety and efficiency improvements
- Optimize traffic movements through signalized intersections – left turn phase removed
- Reduce Environmental Impacts

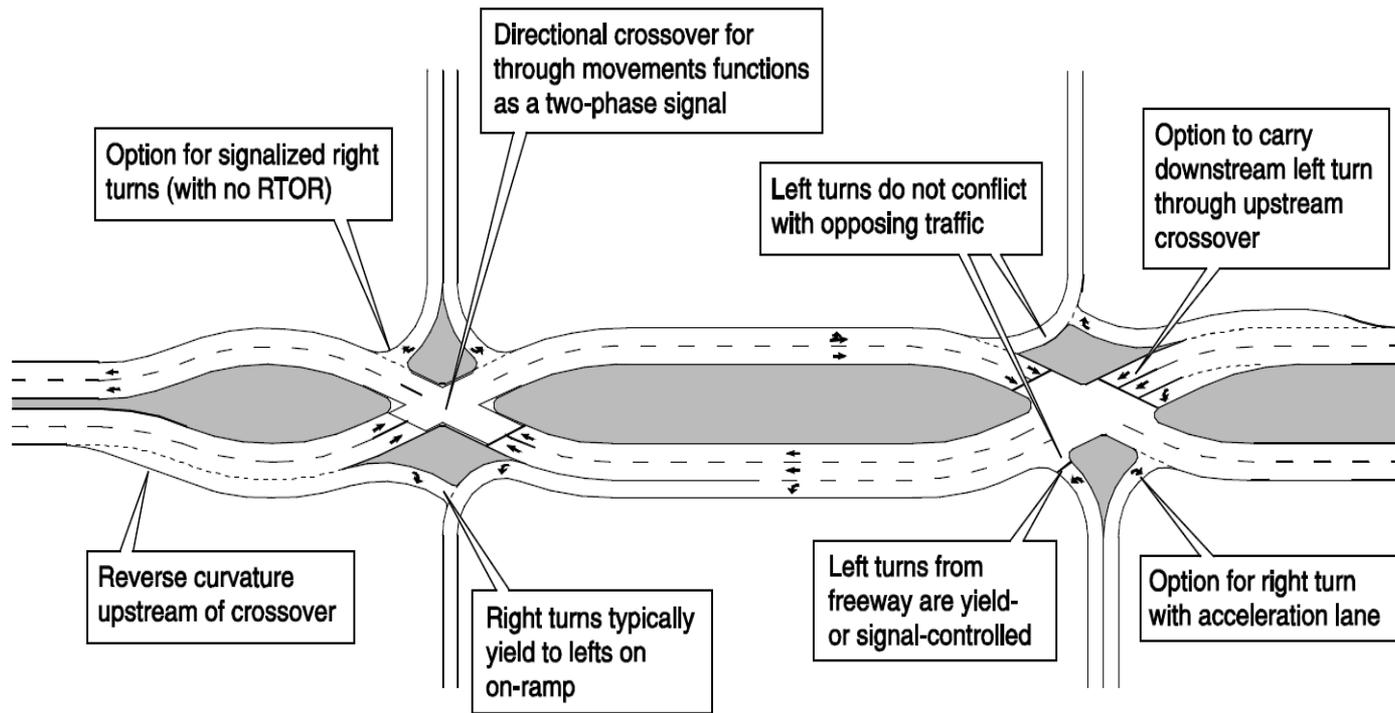
# Diverging Diamond Interchanges

- Project Challenges
  - Geometric Layout

# Typical Layout



## Diverging Diamond Interchange Informational Guide



**Exhibit 1-1. Key characteristics of a DDI.**

# Diverging Diamond Interchanges

- Project Challenges

- Geometric Layout
- Pedestrian/Bicycle Accessibility

# Considerations

- Center Walkway versus Outside Pedestrian Facilities
- Conflict Points
- Free-Flow Left-turn onto Freeway
- Communicating Direction of Traffic
- Pedestrian Channelization and Wayfinding
- Pedestrians with Disabilities

# Pedestrians/Bikes - Inside



# Pedestrians/Bikes - Outside



# Center Walkway - Single Structure



# Diverging Diamond Interchanges

- Project Challenges

- Geometric Layout
- Pedestrian/Bicycle Accessibility
- Overhead Signing

# UTAH DOT



# Missouri Department of Transportation



*“keep it simple”*

# Diverging Diamond Interchanges

- Project Challenges

- Geometric Layout
- Pedestrian/Bicycle Accessibility
- Overhead signing
- Construction Phasing

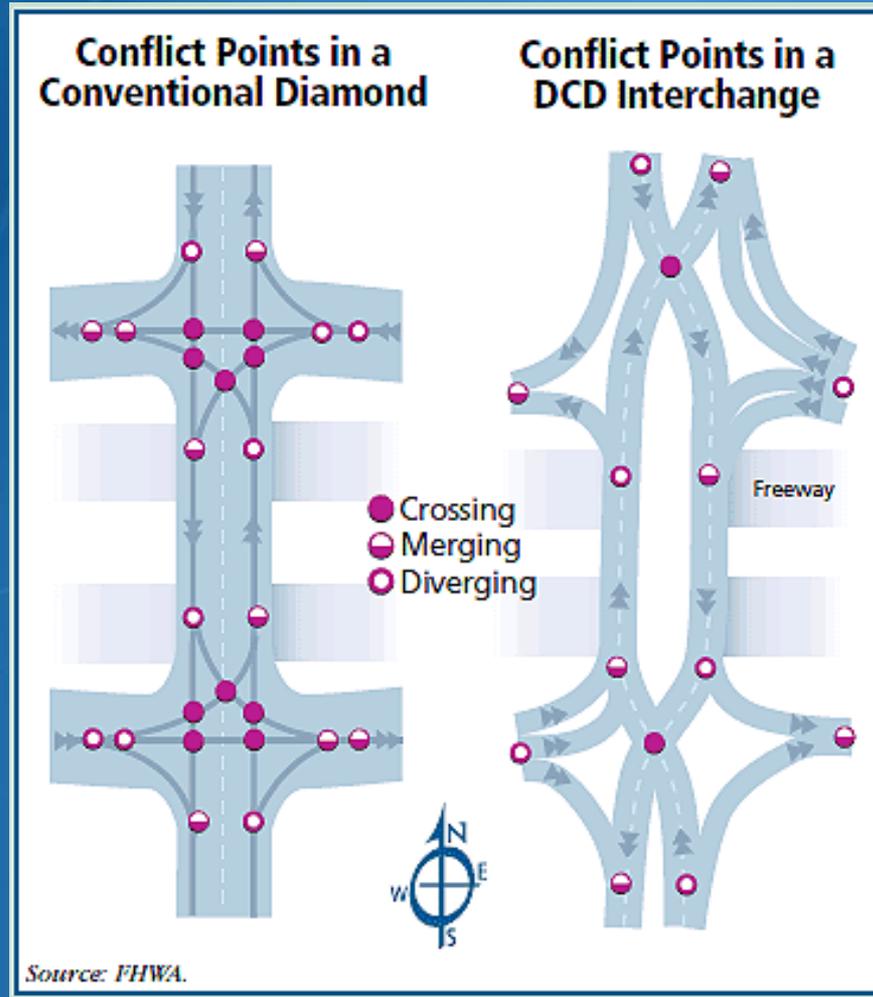
# Accessibility During Transition



# Diverging Diamond Safety Benefits

- Fewer conflict points

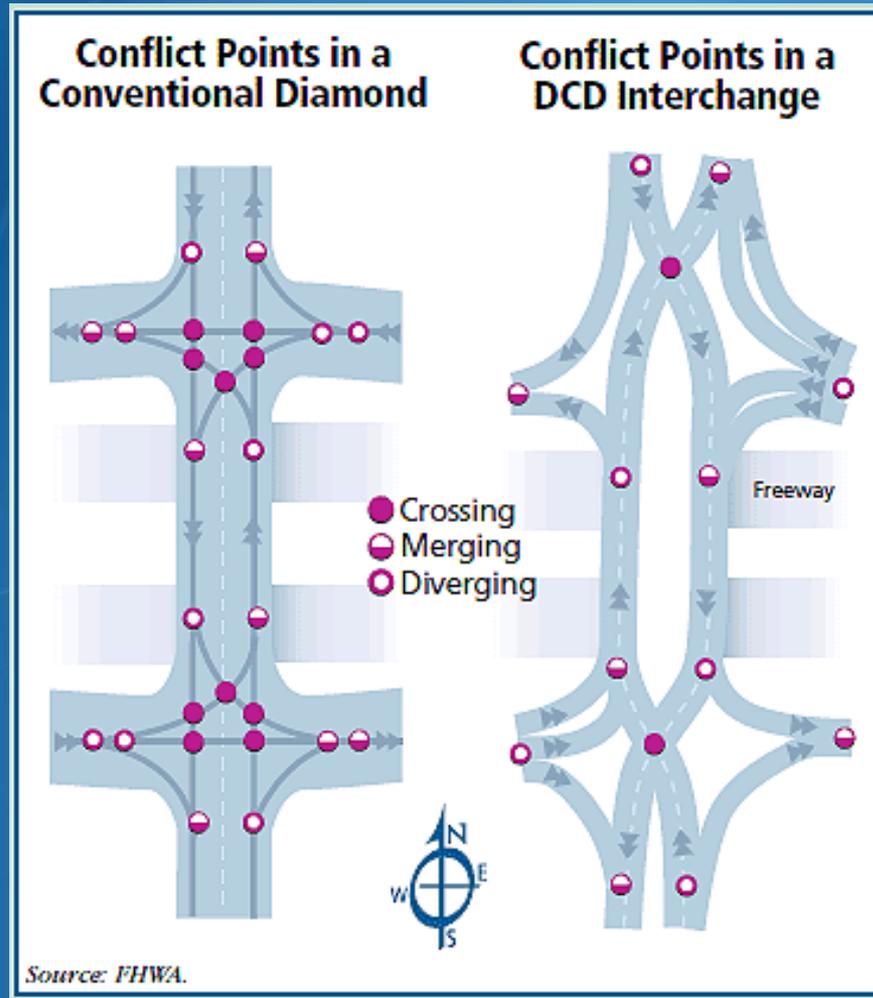
# 14 Conflict pts versus 26 Conflict Pts



# Diverging Diamond Safety Benefits

- Fewer conflict points
- Conflict points spread out throughout interchange

# Spread Out Conflict Areas



# Diverging Diamond Safety Benefits

- Fewer conflict points
- Conflict points spread out throughout interchange
- Better sight distance at turns

# Better Sight Lines



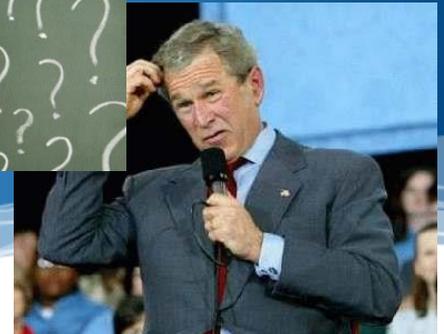
# Better Sight Lines



# Diverging Diamond Safety Benefits

- Fewer conflict points
- Conflict points spread out throughout interchange
- Better sight distance at turns
- Virtually No Driver Confusion

# “Say What.. I Drive Where ? ”



# Initial Public Perception



# Avoid Confusion



FHWA study and new DDI observations

# No Confusion

- MODOT DDI survey - 97% of drivers feel safer
- Springfield DDI - 60% reduction in collisions in a five-month
- Versailles, France DDI
  - Five-year time - 11 reported light crashes

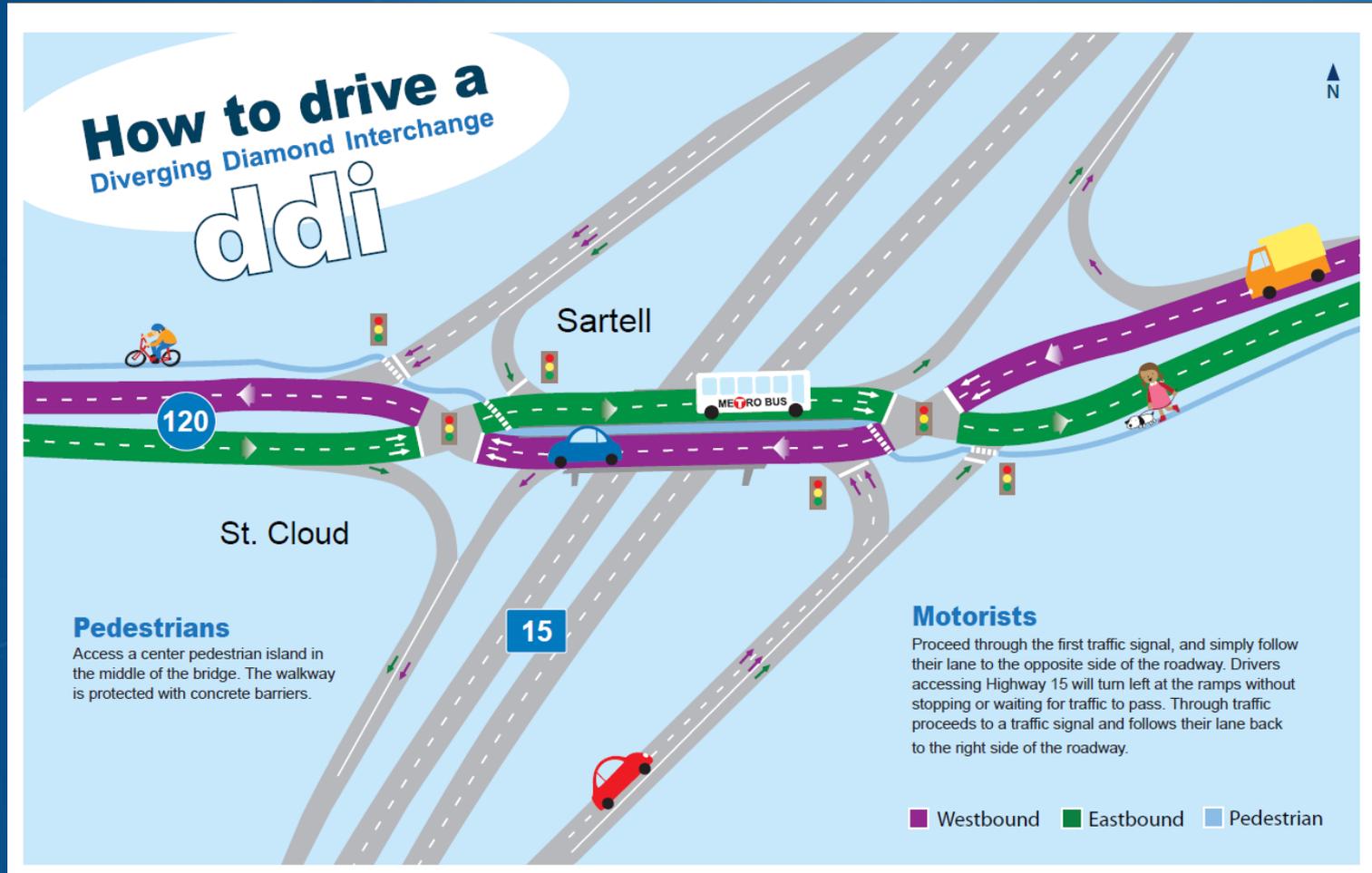
# Public understanding – Aerial Renderings



# Public Understanding- Virtual Drive-thru

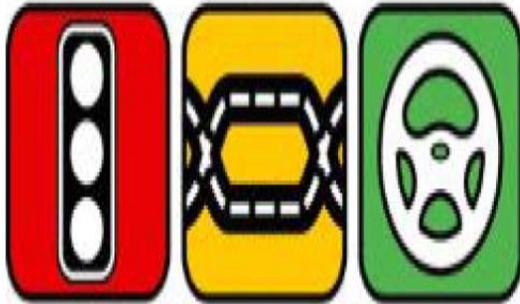


# Minnesota DOT Outreach



# Georgia DOT Outreach

## CAN YOU DDI?



ARRIVE ▶ CROSSOVER ▶ DRIVE

A joint project of PCIDs, GDOT, SRTA, Dunwoody and DeKalb County.

What is the DDI?

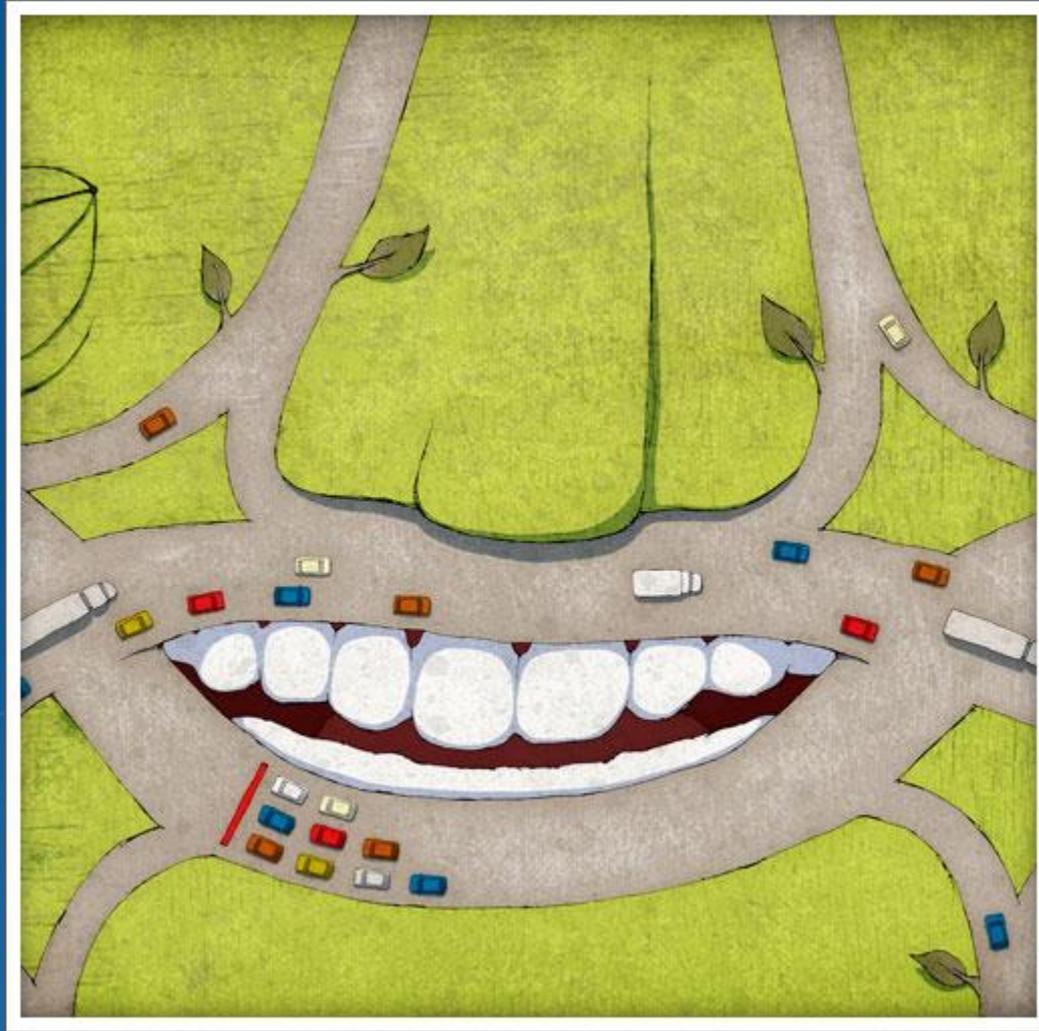
Project Updates

DDI in the News

Contact Us

1st In GEORGIA!

# Media Interpretation ???



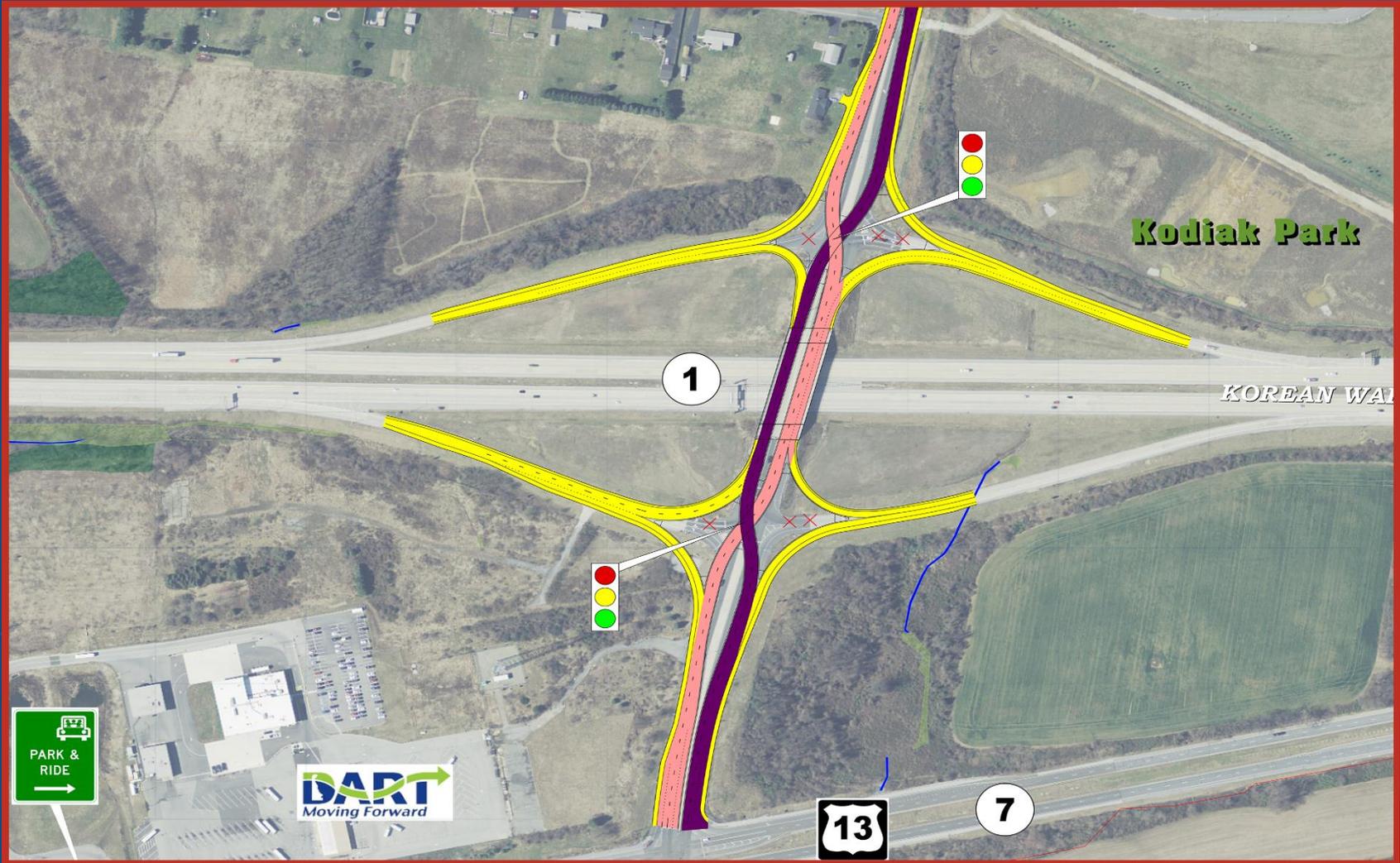
# Cost Effective Solutions

Interchange	Location	DDI Cost (real or estimated)	Alternative Design Cost	Cost Savings
I-44 / Route 13	Springfield, MO	\$3.2 Million	Over \$10 Million	about 70%
I-435 / Front Street	Kansas City, MO	\$6.7 Million	Diamond \$11.4 Million Single Point Urban Interchange (SPUI) \$25 Million	about 75%
SR-265 / SR-62	Utica, IN	\$52 Million	\$118 Million	\$66 Million
I-590 / Winton Road	Brighton, NY	\$3-\$4 Million	SPUI \$10 Million Triple Left Diamond \$13.6 Million	about 75%

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# SR 1/SR72 DDI Concept





# SR 1/SR72 DDI

- May 2015 - Project RFQ for the Design Build Teams
- August 2015 – Project RFP for the Shortlisted Design Build Teams
- December 2015 – Selection of Design build Team of Diamond Materials and JMT Engineers
  - Based on 3 part criteria of
    - Time ( 33 %)
    - Technical Proposal ( 33%)
    - Cost ( 33 %)

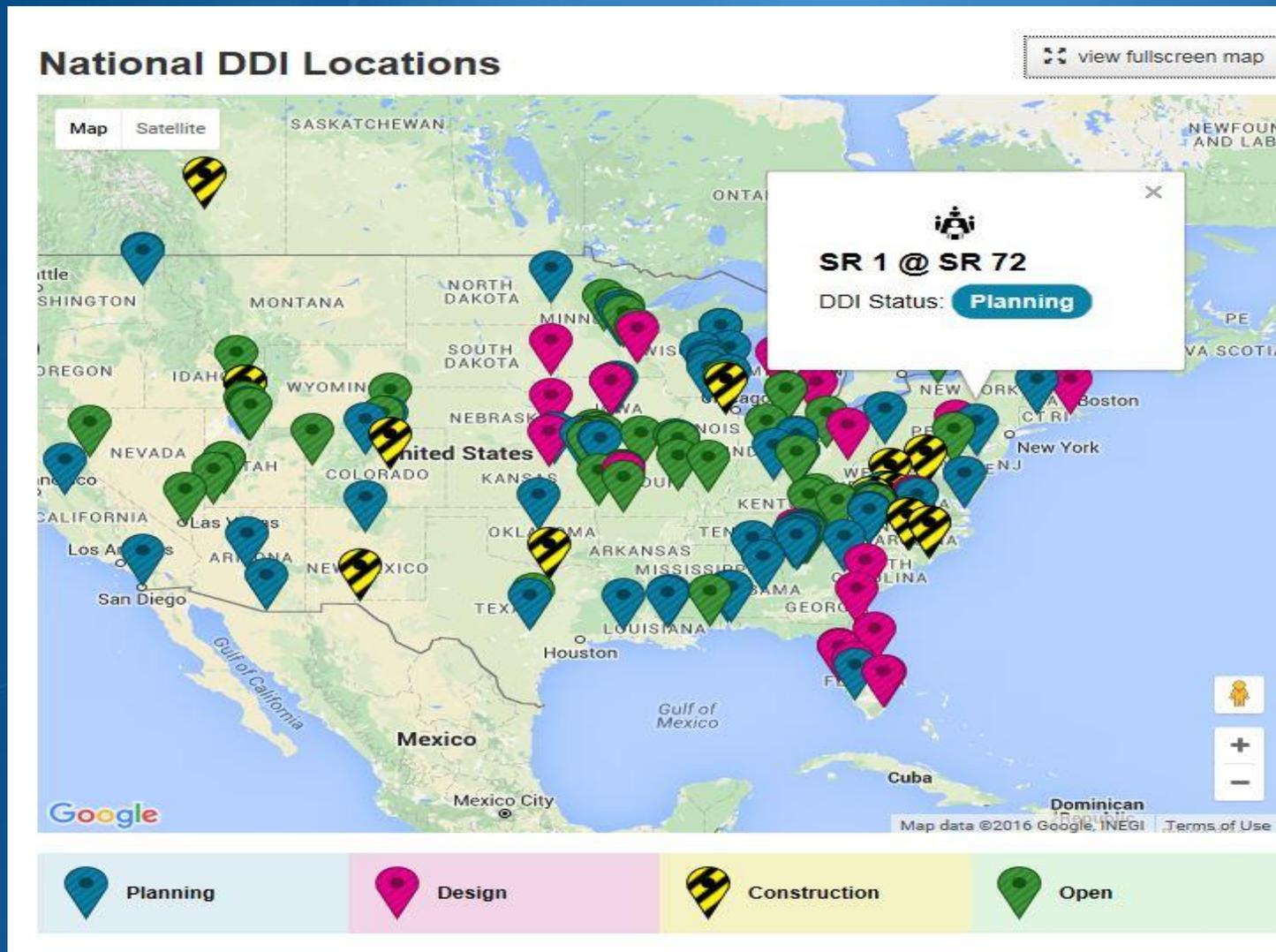
# SR 1/SR72 DDI

- Diverging Diamond Portion of the Project - \$ 4.9 M was within 5 % of Conceptual Estimate
- Design Schedule - Package 1 complete and approved in 2 months.
- Design Schedule - Package 2 complete and approved in 4 months

# SR 1/SR72 DDI

- Construction scheduled to be completed November 2016

# Where We Were - 2014





# Where We Are – 2016



STATE OF DELAWARE  
**DEPARTMENT OF TRANSPORTATION**  
800 BAY ROAD  
P.O. Box 778  
DOVER, DELAWARE 19903

JENNIFER COHAN  
SECRETARY

December 30, 2015

Michael Davis  
Diamond Materials, LLC  
242 North James Street, Suite 102  
Newport, DE 19804

Dear Mr. Davis:

Enclosed is your firm's executed copy of **Contract No. T201511002, Federal Aid Project No. NH-N356 (13), Design Build Project for SR1/SR72 Interchange, New Castle County**, which was awarded to you.

Sincerely,

Hope for a Great 2016 and  
Completion of the  
First DDI Interchange in  
Delaware

Thank You!