Delaware Department of Transportation

SR 1 WIDENING
SR 273 to the Roth Bridge

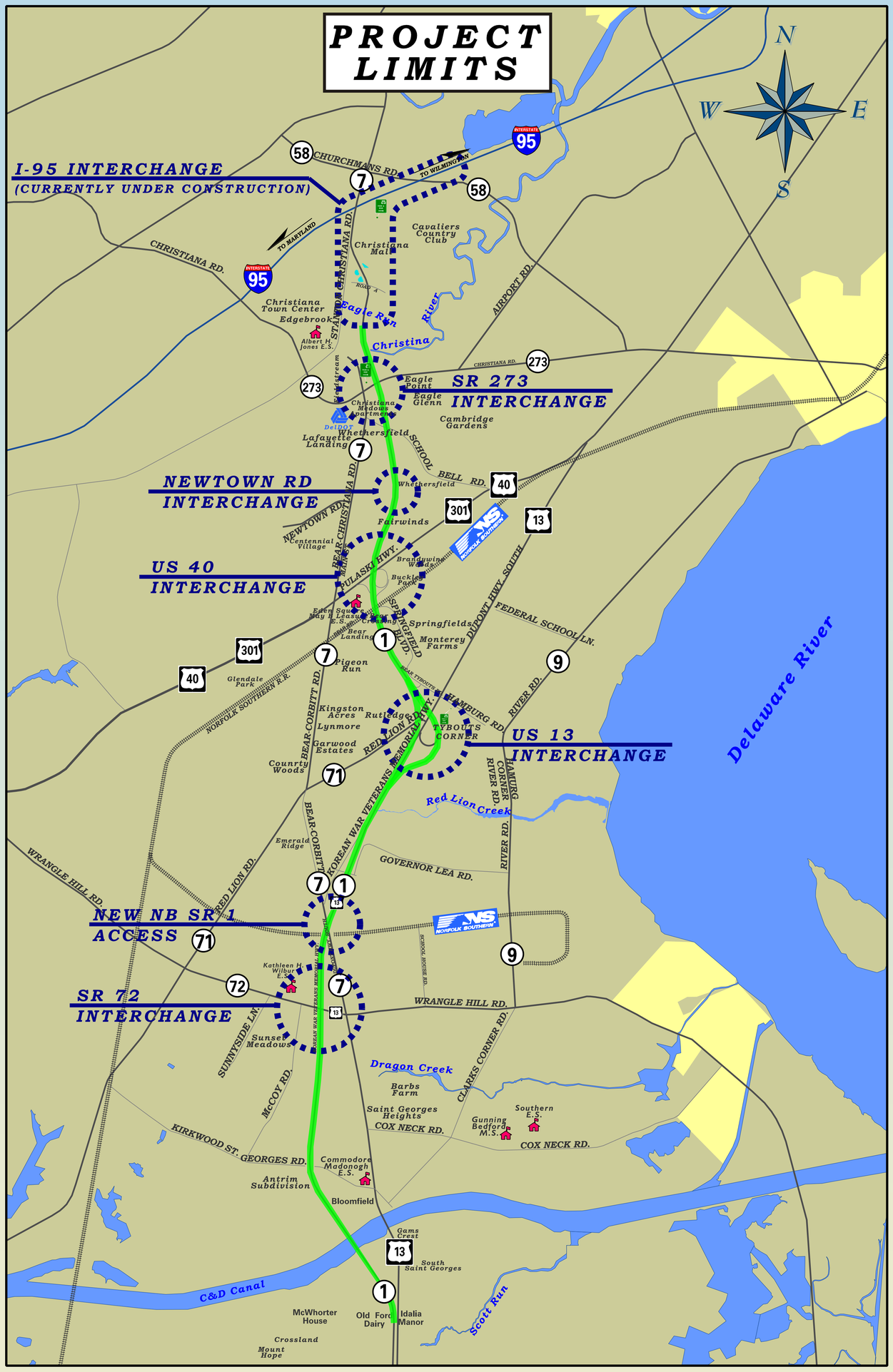
# WELCOME

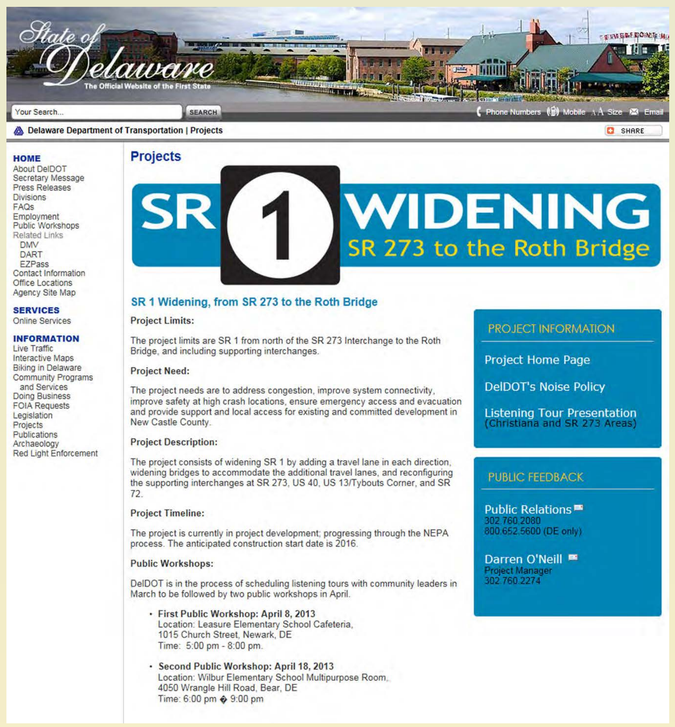
## Public Outreach

- ✓ *Listening Tour with Community Leaders, Completed March 2013*

- *Public Workshop - Alternatives Presentation:*
  - *Leasure Elementary School*
    *1015 Church Street, Newark, DE*
    *April 8, 2013 - 5 PM - 8PM*
  - *Wilbur Elementary School*
    *4050 Wrangle Hill Road, Bear, DE*
    *April 18, 2013 - 6PM - 9PM*

- *Public Workshop - Preferred Alternative & Draft Environmental Document:*
  *Fall 2013*




***SR1 Project Website: sr1.deldot.gov***

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# PURPOSE AND NEED

SR 1 WIDENING
SR 273 to the Roth Bridge

## Purpose and Need

- *Address congestion*
- *Improve system connectivity*
- *Improve local access*
- *Improve safety*
- *Ensure emergency access and evacuation*

## Improve System Connectivity and Local Access

- *Enhance connectivity and access between existing communities and rapidly growing areas in southern New Castle County to major employment centers along I-95, I-495 and I-295*

## SR 1 Corridor Traffic Projections

### Seasonal Traffic

- *SR 1 designated beach route*
  *20-30% higher in July and August*

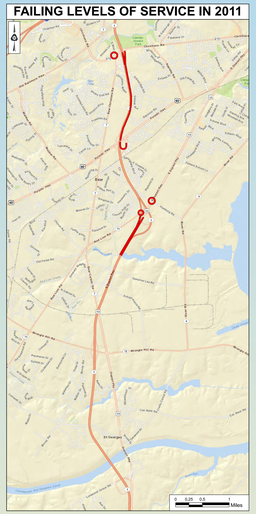
**Traffic Projections**
(based on WILMAPCO, NCC approved model)

| Location | 2011 | 2040 | Increase |
|---|---|---|---|
| SR 1 between US 40 and SR 273 | 76,500 | 125,000 | 63% |
| SR 1 between the Roth Bridge and US 13 | 79,500 | 140,000 | 76% |

## Address Congestion

### Existing Conditions (2011)

- *SR 1 Mainline between I-95 and US 40 in the AM is a failing condition*
- *Interchanges in a failing condition:*
  - *Entrance ramp to SR 1 from US 40 (AM)*
  - *Exit ramp from SR 1 to SR 273 (AM)*
  - *SR 1/ US 13 (Tybouts) Interchange (PM)*
  - *Entrance ramp to SR 1 from US 13 (PM)*

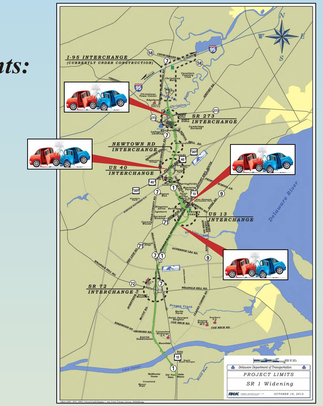



### Future Conditions (2040)

- *Every interchange entrance and exit is projected to fail during rush hour in 2040*

## Improve Safety

- *A total of 284 crashes were reported in the project corridor between January 2008 and December 2010*
- *DelDOT has identified 4 locations with frequent accidents that require improvements:*
  - *SR 273 through the SR 1 interchange*
  - *US 40 through the SR 1 interchange*
  - *Hamburg Road through the US 13 intersection (at Tybouts Corner)*
  - *SR 1 northbound through the diverge at US 13*




## Ensure Emergency Access and Evacuation

- *Emergency responders use SR 1*
- *SR 1 provides for access to Christiana Hospital*
- *SR 1 is a designated evacuation route for emergencies, hurricanes, homeland security threats, and potential hazardous materials incidents*

CHRISTIANA CARE HEALTH SYSTEM

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SR 1 WIDENING
SR 273 to the Roth Bridge

# ENVIRONMENTAL PROCESS AND PROJECT INPUT

## DEVELOP PROJECT PURPOSE AND NEED

- Traffic data collection and analysis
- Purpose and need for project improvements defined

## IDENTIFY ENVIRONMENTAL RESOURCES

- Communities – resources and facilities, demographics, land use
- Cultural Resources - standing historic structures and archeological resources
- Natural Resources – wetlands, streams, forests, floodplains, species and habitats

We Are Here

## DEVELOP TRANSPORTATION ALTERNATIVES & IDENTIFY IMPACTS

- Evaluate a range of options that balance traffic, safety, communities and resource impacts
- Impacts are determined based on limits of disturbance

PUBLIC OUTREACH

AGENCY COORDINATION

## IDENTIFY RECOMMENDED ALTERNATIVE

- While balancing public, agency and stakeholder interests DelDOT recommends an alternative to Federal Highway Administration (FHWA) that best meets the purpose and need for the project

## NEPA DOCUMENTATION & APPROVAL

**DRAFT**

- **Draft Environmental Document** – documents alternatives analysis explaining why options were not recommended and describes the recommended alternative; presents resource impacts and conceptual mitigation
- **Public and Agency Comment Period and Workshop**

**FINAL**

- **Final Environmental Document** – Addresses public and agency comments, final definition of project, conceptual mitigation plan
- FHWA Approval of Selected Alternative

PUBLIC OUTREACH

## FINAL DESIGN

- Final Mitigation Plan and Permits
- Right-of-way acquisition
- Design Plans

## CONSTRUCTION

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# CULTURAL RESOURCES

SR 1 WIDENING
SR 273 to the Roth Bridge

## What are Cultural Resources?

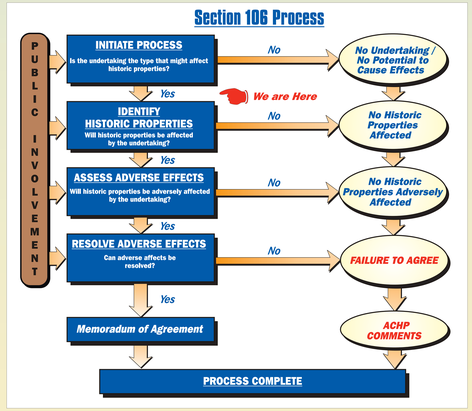
- *Cultural Resources, shown on the map in the middle, are standing structures including: buildings, structures, objects, sites and districts over 50 years of age. Archaeology sites are not shown on this map. Surveys and evaluations are ongoing to determine significance of these resources. These surveys and evaluations are being coordinated with the State Historic Preservation Office (SHPO).*

## Why Consider Cultural Resources?

- *Section 106 of the National Historic Preservation Act of 1996 requires federal agencies, including the Federal Highway Administration, to take into account the effects of their undertakings on historic properties (architectural and archeological resources).*

- *Section 4(f) of the US Department of Transportation Act requires the Federal Highway Administration to avoid adversely affecting use of historic properties unless there is no prudent and feasible alternative.*

- *The Section 106 process gives the public, other parties with an interest, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation (ACHP) opportunity to comment on proposed undertakings.*




## Cultural Resources Map

## Current Studies

- *As part of the SR 1 Widening Project effort, a survey must be undertaken to identify any cultural resources that might be impacted by the project. Archaeologists will be looking to find evidence of Native American and Historic period Archaeology sites in the project. Specifically, Archaeologists will be looking for building foundations, historic artifacts such as glass, and ceramics, as well as Native American artifacts such as arrowheads. Architectural historians will be photographing and researching buildings in the study area to determine which properties warrant consideration under the Section 106 process.*

- *It will be DelDOT's intent during the Cultural Resource Studies and Compliance Program with the State Historic Preservation Office to use and integrate the National Environmental Policy Act (NEPA) for Section 106 purposes. As such, consulting parties are important to identify and confirm during public workshops or outreach meetings under the Federal Highway Administration procedures.*
  - *During the Adverse Effects Assessment, impacts to historic properties can be direct or indirect as well as foreseeable in the future.*

## How Can You Help

- *If you have discovered an artifact - arrowhead, broken pottery, glass - while digging in your garden, live in a house that is more than 50 years old, or know someone who has stories or pictures of what the area looked like years ago, the archaeologists and architectural historians would like to talk to you. Please take a minute to bring this information to our attention by contacting the person listed below. Your information will contribute to our understanding of Delaware's cultural heritage.*

**For questions regarding the Cultural Resources Studies for this project, please contact:**


**Michael C. Hahn, AICP**
DelDOT Environmental Studies Office
302-760-2131
michaelc.hahn@state.de.us

DelDOT CULTURAL RESOURCES

**David Clarke (Archaeology)**
DelDOT Environmental Studies Office
302-760-2271
david.clarke@state.de.us


**For website outreach: https://www.deldot.gov/archaeology/**

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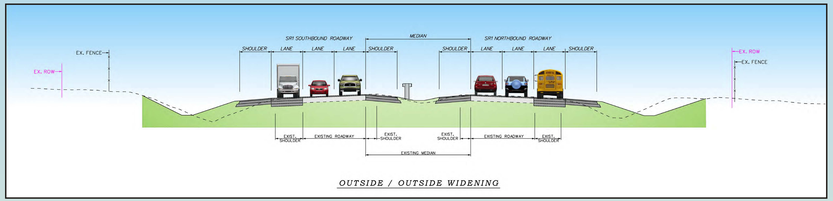
# MAINLINE WIDENING

SR 1 WIDENING
SR 273 to the Roth Bridge

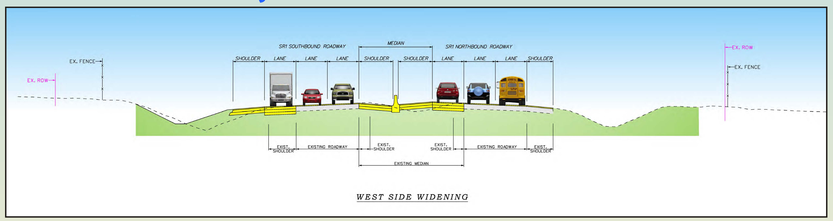
## Widening Options - SR 273 to Tybouts Interchange

### Outside / Outside Widening



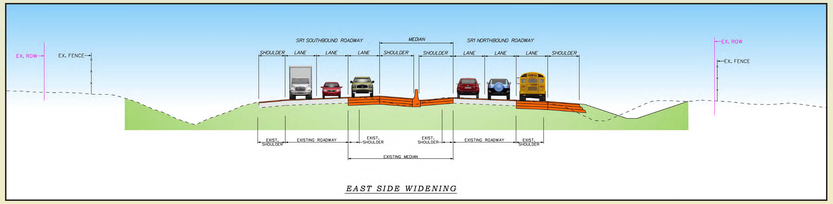

OUTSIDE / OUTSIDE WIDENING

### West Side Widening




WEST SIDE WIDENING

### East Side Widening




EAST SIDE WIDENING

## SR 273 Interchange to Tybouts Interchange

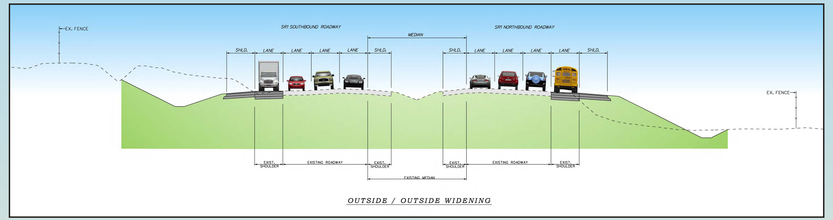
- *Increases capacity by providing 3 lanes in each direction.*
- *Alternatives must include 12' wide shoulders both in median and on outside.*
- *No local road overpass bridges*
- *Existing median - 40'*

## Tybouts Interchange to Roth Bridge

- *Increases capacity by providing 4 lanes in each direction.*
- *Alternatives must include 12' wide shoulders both in median and on outside.*
- *Local road overpass bridges require lane shifts to avoid existing bridge piers under the Inside-Outside widening option.*
- *Existing median varies (30'-42').*

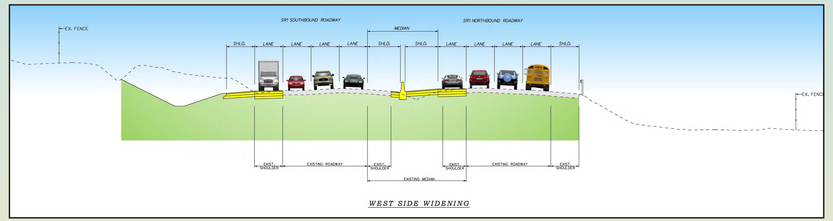
## Widening Options - Tybouts Interchange to Roth Bridge

### Outside / Outside Widening



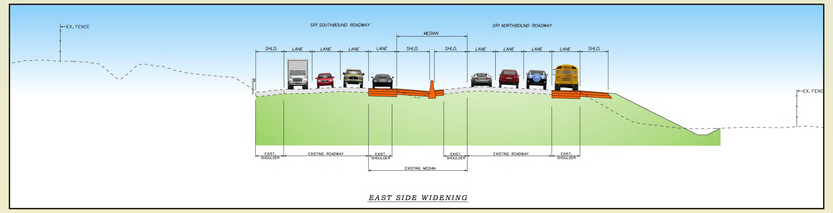

OUTSIDE / OUTSIDE WIDENING

### West Side Widening




WEST SIDE WIDENING

### East Side Widening




EAST SIDE WIDENING

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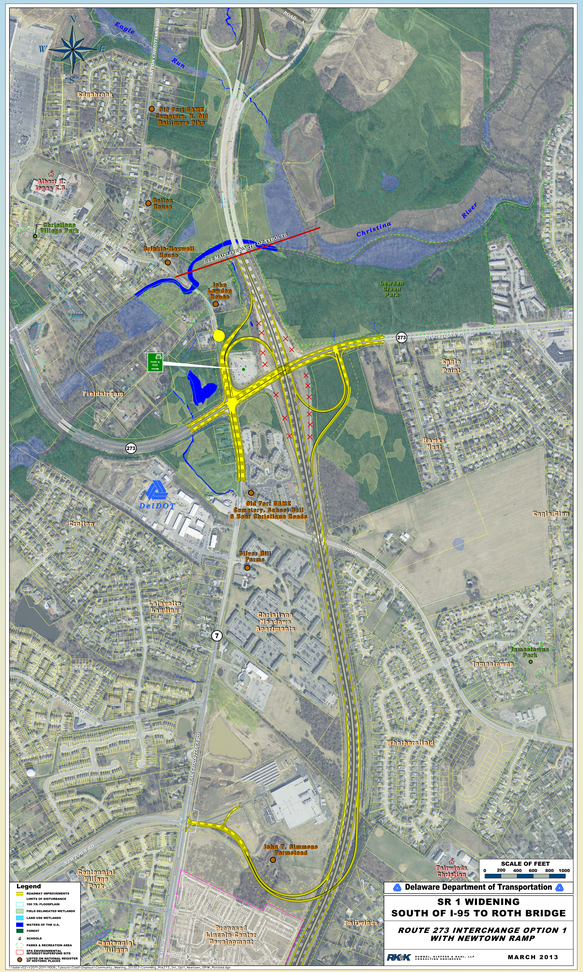
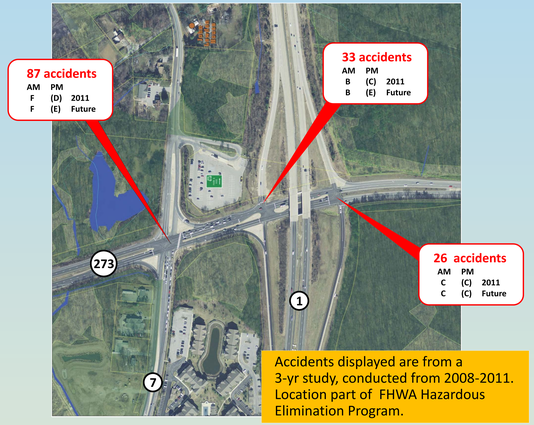
# SR 273 INTERCHANGE

SR 1 WIDENING
SR 273 to the Roth Bridge

## SR 273 Interchange Option 1



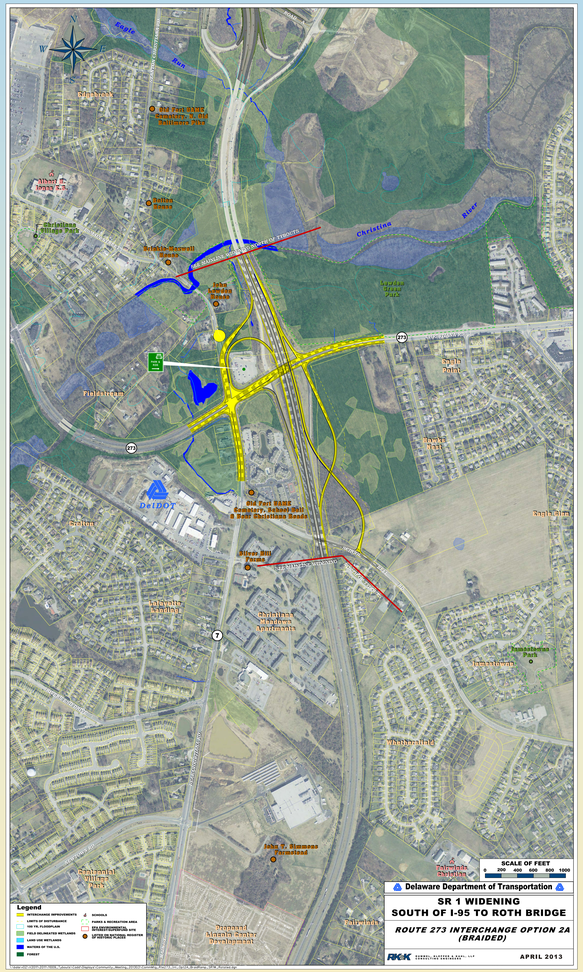

## Option 1

- *Replaces left-turn onto northbound SR 1 from eastbound SR 273 with free flow loop ramp.*
- *Replace southbound on-ramp with free flow loop ramp.*
- *Incorporates a partial interchange at Newtown Road - northbound-On / southbound-Off, reducing the amount of northbound and southbound traffic using ramps on SR 273.*

## Option 2

- *Adds a northbound SR 1 On-ramp from School Bell Road, reducing the amount of northbound traffic using ramps on SR 273.*
- *Replaces southbound On-ramp with free flow loop ramp.*

## SR 273 Interchange Option 2



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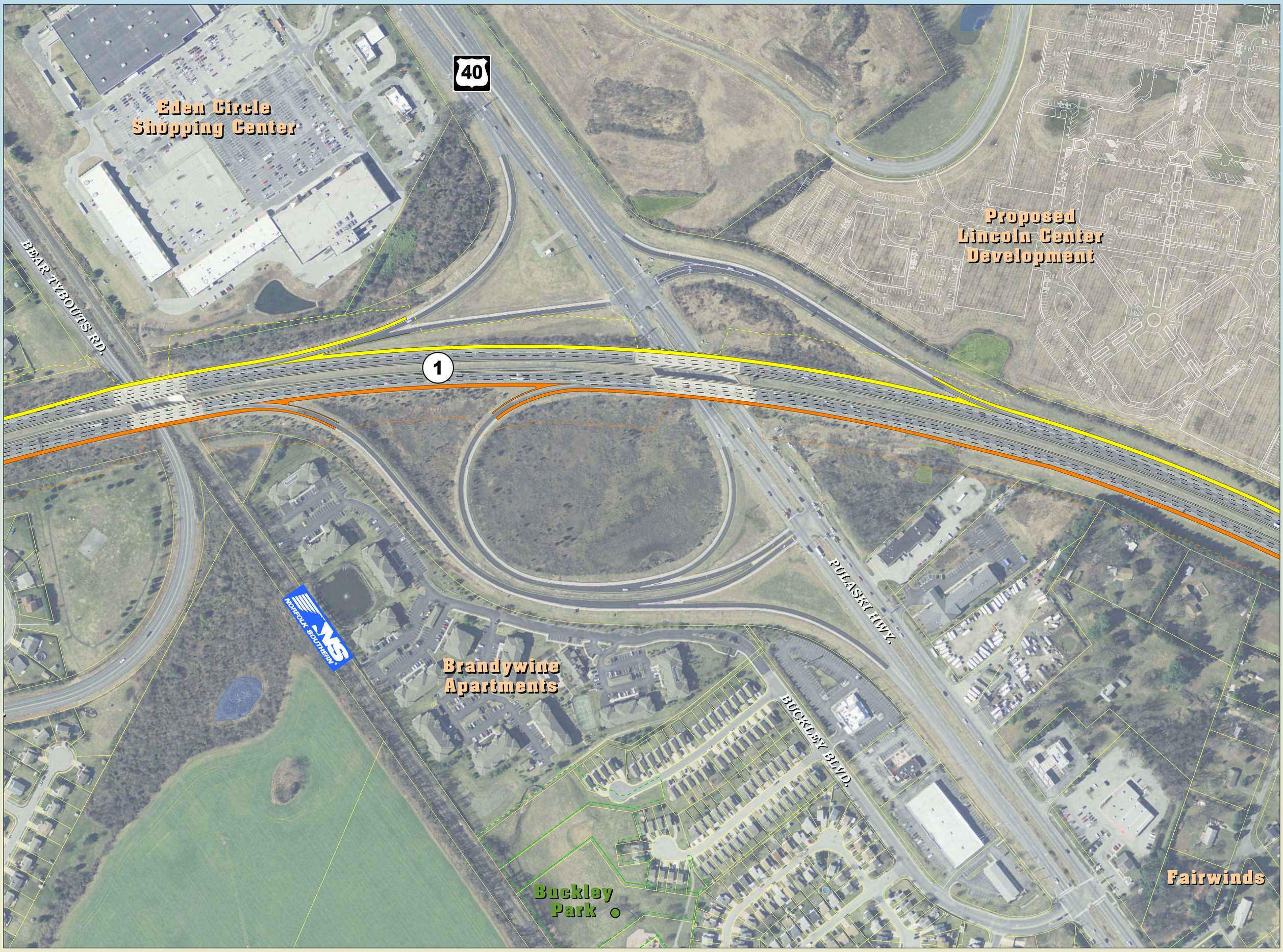
SR 1 WIDENING
SR 273 to the Roth Bridge

# US 40 INTERCHANGE




## Features of the US 40 Improvements

- ***Improvements to increase the merge area for acceleration / deceleration onto and off of SR 1.***
- ***Safety improvement to meet current FHWA standards.***

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# TYBOUTS INTERCHANGE

SR 1 WIDENING
SR 273 to the Roth Bridge

## Features of the Tybouts Interchange

- *All other options impacted the former Tybouts landfill - a Superfund site, and were eliminated.*
- *Allows for 2 continuous southbound SR 1 Lanes of through traffic.*
- *Eliminates the Red Lion Road (SR 71) / US 13 intersection. Replaces the signalized left-turn from northbound Red Lion Road with a direct connection to northbound US 13.*
- *Improves access from southbound SR 1 and US 13 to Red Lion Road (SR 71) by eliminating the stop condition on the ramp and improving the geometry.*
- *Improves safety at the US 13 / Hamburg Road intersection.*

## Tybouts Interchange Improvements

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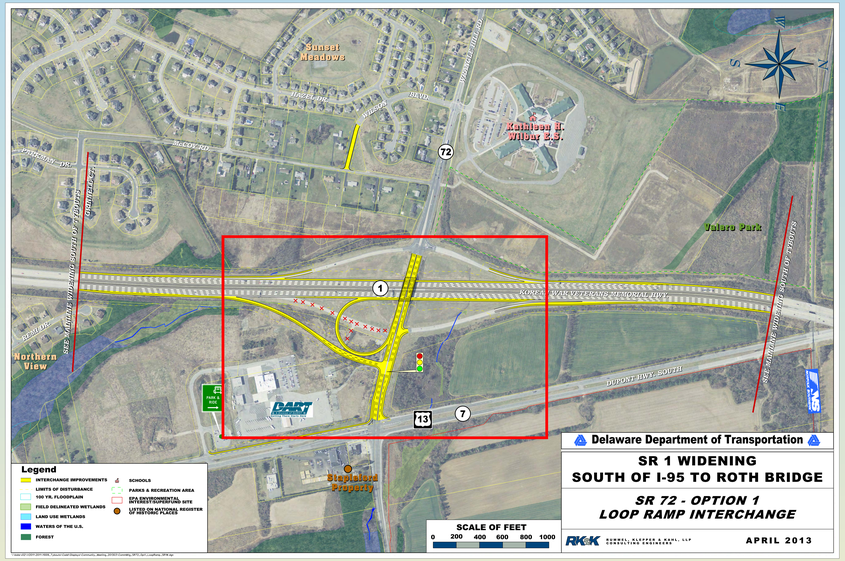
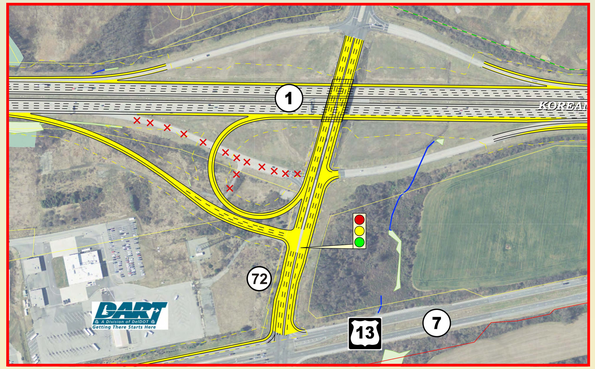
# SR 72 INTERCHANGE

SR 1 WIDENING
SR 273 to the Roth Bridge

## SR 72 - Option 1 *(Loop Ramp Interchange)*




## Features of the SR 72 Interchange Options

### Option 1 - Loop Ramp

- *Replaces signalized left-turn from eastbound SR 72 to northbound SR 1 Ramp with a free flowing Loop Ramp.*
- *Splits the traffic accessing northbound SR1.*
- *Adds an additional lane on southbound US 13 for free right turn movement from eastbound SR 72.*

### Option 2 - Diverging Diamond

- *All interchange movements from SR 72 are free flowing.*
- *Adds an additional lane on southbound US 13 for free right-turn movement from eastbound SR 72.*

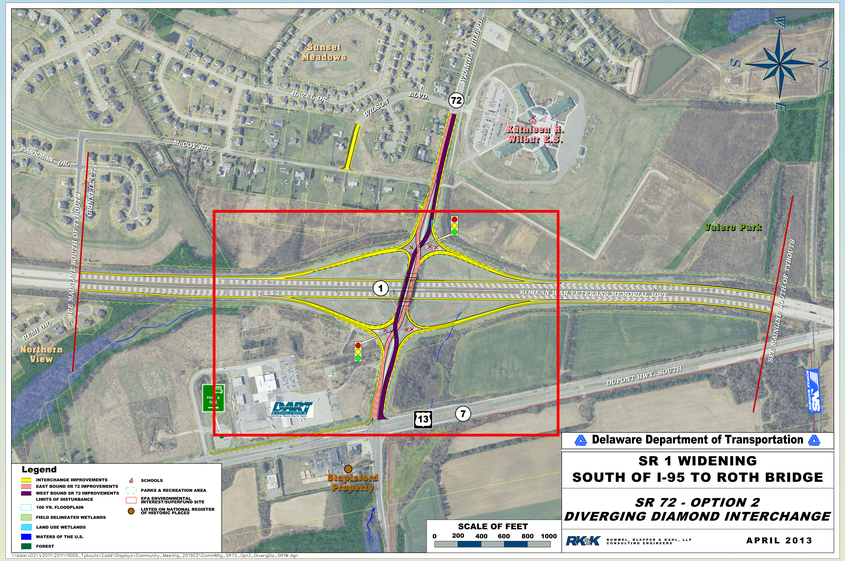
### What is a Diverging Diamond Interchange (DDI)?

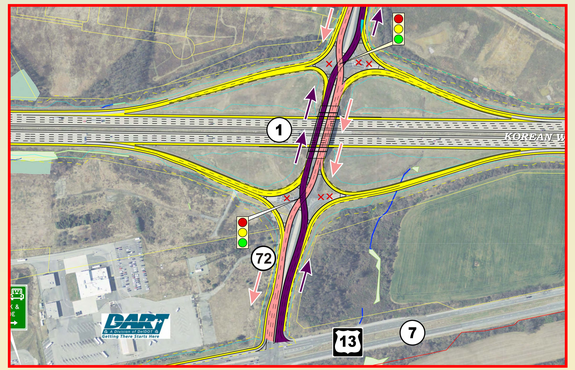
- *A free flow interchange where the two directions of local traffic (SR 72) cross to the opposite side on a bridge over the freeway (SR 1).*
- *The DDI, introduced to America in 2003, provides significant safety and efficiency improvements.*
- *"Best Engineering Innovation in 2009" by Popular Science.*
- *Missouri opened the first DDI in the United States June 21, 2009. Since then 16 DDI's have opened, the closest is in Hanover, MD (near Arundel Mills Mall).*

### DDI Highlights

- *Reduces delay by having 2-phase signals which means more green time on SR 72.*
- *Increases capacity of turning movements by eliminating need for left-turn lanes.*
- *Environmentally Friendly Design - reduces overall amount of pavement.*
- *Please see our video explaining the DDI Option for the SR 1 / SR 72 interchange.*

## SR 72 - Option 2 *(Diverging Diamond Interchange)*



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# NOISE ANALYSIS

SR 1 WIDENING
SR 273 to the Roth Bridge

## Noise Analysis

### Federal Noise Regulations

- *Title 23 of the Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise. Highway traffic noise studies, noise abatement procedures, coordination requirements and design noise levels in CFR Part 772 constitute the noise standards mandated by 23 U.S.C. 109(i). Design noise levels for various types of activity (land use) categories are summarized in the table below.*

| Activity Category | Activity Leq(h) | Evaluation Location | Activity Description |
|---|---|---|---|
| A | 57 | Exterior | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. |
| B | 67 | Exterior | Residential. |
| C | 67 | Exterior | Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings. |
| D | 52 | Interior | Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios. |
| E | 72 | Exterior | Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F. |
| F | ..... | ..... | Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing. |
| G | ..... | ..... | Undeveloped lands that are not permitted. |

### Noise Analysis Procedures

- *Identify Noise-Sensitive Land Uses*
- *Collect Existing Ambient Noise Levels*
- *Develop Existing Condition Computer Noise Model (FHWA TNM)*
- *Compare Computed and Measured Noise Levels – Model Calibration*
- *Analyze Transportation Alternatives*
- *Predict Design-Year Noise Levels*
- *Identify Noise Impacts*

## Noise Receptor Locations

## DelDOT's Noise Abatement Policy

- *DelDOT noise policy states that noise impact is assessed and mitigation is to be considered when either of the following conditions is satisfied:*
  - *Predicted design-year noise levels approach (defined as 1 dBA less) or exceed the FHWA noise abatement criteria, e.g. for Category B, a design-year noise level of 67 dBA or*
  - *An increase of 12 dBA or greater over existing conditions*
- *DelDOT policy for noise mitigation analysis requires that the mitigation be:*

➔ *FEASIBLE*

- *Achieves a minimum noise reduction of 5 dBA or greater noise reduction for impacted receptors;*
- *At least 3 receptors within a common noise environment, neighborhood or cluster of land uses achieves the 5 dBA reduction*

➔ *REASONABLE*

- *More than 50% of the benefitted receptors want the noise mitigation*
- *Provides a 9 dBA noise reduction to 25% of the benefitted receptors; and*
- *Noise mitigation be cost-effective, i.e. Cost not to exceed $25,000 per benefitted residence*

*Note: A benefitted residence is one that receives a noise reduction of at least 9 dBA, regardless of impact status*

## Noise Mitigation

- *With impacts, noise mitigation must be considered*
- *In addition to noise barriers, additional measures are examined for abatement feasibility, including:*
  - *Horizontal and vertical alignment modifications*
  - *Acquisition of adequate right-of-way to create a buffer between community and roadway*
- *The Project Team continues to evaluate these measures to minimize noise impacts*

## Noise Analysis Summary

- *904 noise receptors have been modelled*
- *251 receptors exceed the noise level criteria for the existing condition*
- *Noise impact/mitigation is currently being analyzed for the transportation alternatives*

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SR 1 WIDENING
SR 273 to the Roth Bridge

# COMMON NOISE LEVELS

| Common Outdoor Noise Levels | Noise Level dBA | Common Indoor Noise Levels |
|---|---|---|
| | 110 | Rock Band |
| Jet Flyover At 1,000 feet | 100 | Inside Subway Train (NY) |
| Gas Lawn Mower a 3 feet | | |
| Diesel Truck at 50 feet | 90 | Food Blender at 3 feet |
| Noise Urban Daytime | 80 | Garbage Disposal at 3 feet<br>Shouting at 3 feet |
| Gas Lawn Mower at 100 feet | 70 | Vacuum Cleaner at 10 feet |
| Commercial Area | | Normal Speech at 3 feet |
| | 60 | |
| | | Large Business Office |
| Quiet Urban Daytime | 50 | Dishwasher Next Room |
| Quiet Urban Nighttime | 40 | Small Theater, Large Conference Room (Background) |
| Quiet Suburban Nighttime | | Library |
| | 30 | |
| Quiet Rural Nighttime | | Bedroom at Night, Concert Hall (Background) |
| | 20 | |
| | | Broadcast and Recording Studio |
| | 10 | Threshold of Hearing |
| | 0 | |

Adapted from Guide on Evaluation and Attenuation of Traffic Noise, AASHTO -1974.

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# THANK YOU

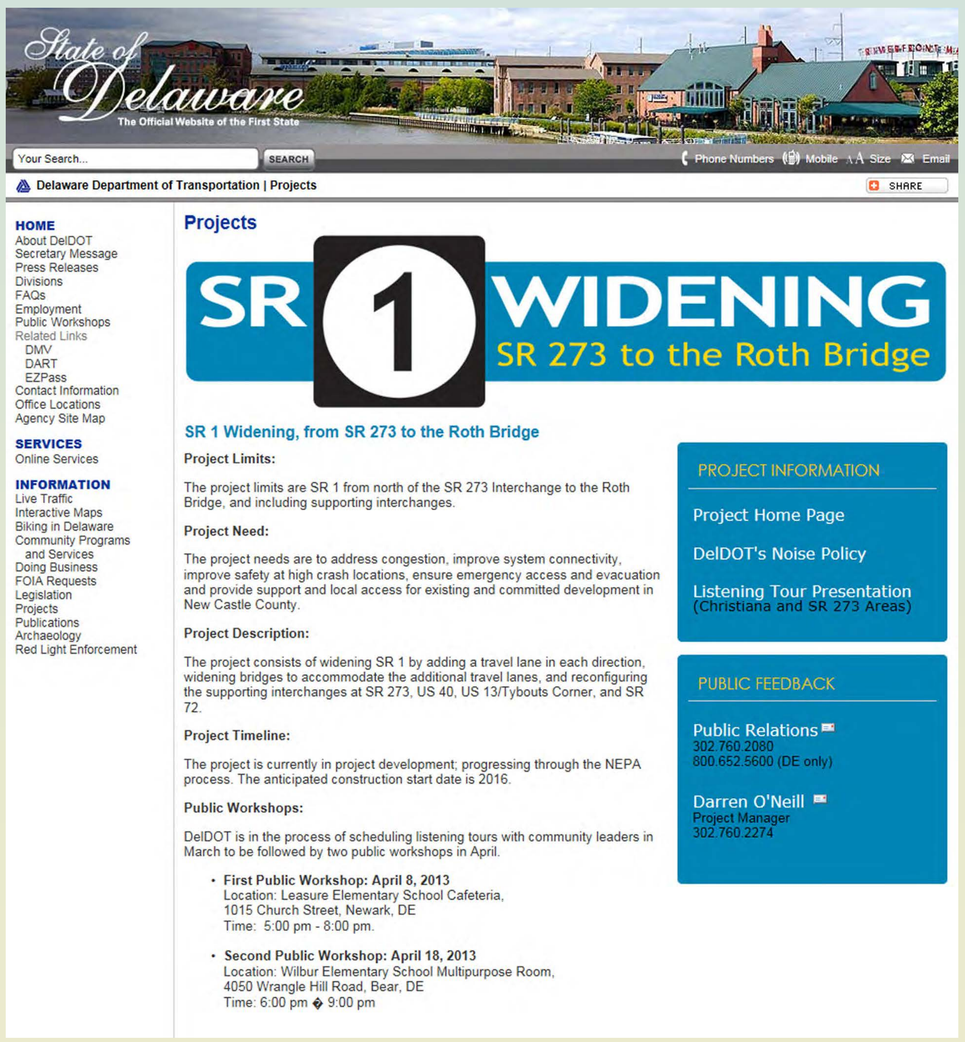
SR 1 WIDENING
SR 273 to the Roth Bridge

## *Thank you for participating in the SR 1 Workshop.*

- ***Please provide your thoughts by filling out the comment form***

## *Stay informed through the project website:*

## *sr1.deldot.gov*




## Project Schedule

- ***Public Workshop*** **-**
  ***Alternatives presentation***
  - ***Leasure Elementary School***
    ***April 8, 2013 - 5 PM-8PM***
  - ***Wilbur Elementary School***
    ***April 18, 2013 - 6PM-9PM***
- ***Public Workshop*** **-**
  ***Preferred Alternatives and Draft Environmental Document -*** ***Fall 2013***
- ***Capital Transportation Program***
  - ***Design - 2014 - 2016***
  - ***Construction Begins 2016***