



I-95/SR1 INTERCHANGE IMPROVEMENTS TIGER GRANT APPLICATION September 9, 2009

The Delaware Department of Transportation (DelDOT) is submitting this application for a TIGER (Transportation Investment Generating Economic Recovery) Discretionary Grant for the I-95/SR1 Interchange Improvements project. The information included in this application is based on guidance published in the Federal Register on May 18, 2009 and revised on June 17, 2009 and generally follows the “Contents of Application” noted in the Federal Register.

BASIC DATA

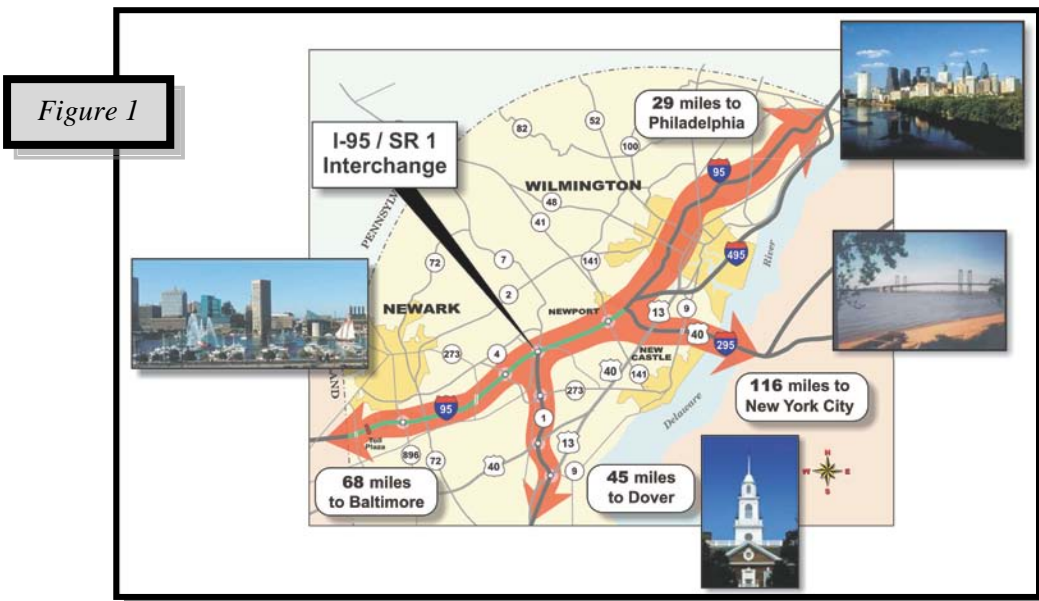
Project Type: Highway Improvement
Location: I-95/SR1 Interchange (see Figure 1); New Castle County, Delaware
Congressional District: First
Area Type: Urban
Requested TIGER Grant Funds: \$44 million
DUNS & Contractor Registration Requirement: DelDOT’s Dun number is 809856008. DelDOT will include provisions in the construction contract solicitation requiring contractors that submit bids to show evidence that they have a DUNS number and a current registration in the Central Contractor Registration.

CONTACT INFORMATION

Natalie Barnhart, P.E.
Chief Engineer
State of Delaware
Department of Transportation
Natalie.Barnhart@state.de.us
(302) 760-2305
800 Bay Road
P.O. Box 778
Dover, Delaware 19903

SUMMARY

The \$197 million I-95/SR 1 interchange project will remove a bottleneck on I-95, the east coast’s “Main Street”, by replacing an obsolete 1960’s cloverleaf interchange with one that will accommodate the interchange of two expressways and satisfy existing and projected traffic needs; address congestion; improve safety; reduce travel times, fuel consumption and greenhouse gas emissions; provide transportation choices by enhancing accessibility to commuter rail and bus transit; enhance accessibility to and support significant existing and committed development (13 and 5 million square feet, respectively) surrounding the interchange; retain and create a significant number of private development jobs (23,500 by 2034) and interchange construction related jobs (4,851), generate tax revenues and economic benefits; and improve job opportunities and accessibility for disadvantaged populations.





PROJECT DESCRIPTION

BACKGROUND: I-95, [the east coast's "Main Street"](#), extends approximately eleven miles through northern New Castle County, Delaware, from the Maryland state line through Wilmington, to the Pennsylvania state line. Just south of Wilmington, I-295 extends east from I-95 to the Delaware Memorial Bridge, New Jersey and the New Jersey Turnpike. State Route 1 (SR1) is Delaware's north-south "Main Street" and extends as an expressway from I-95 at Churchmans Crossing, a major development area, to Dover, then south as a major arterial to the Atlantic Ocean resorts of Rehoboth and Bethany, Delaware and Ocean City, Maryland.

The interchange between I-95 and SR1 has been described by the Delaware press and our federal and state elected officials as the most important yet most congested intersection (really an interchange) in the State of Delaware. When originally constructed in the early 1960s, [the cloverleaf interchange](#) between I-95 and then SR7 provided an interstate connection to a low volume two-lane local rural road. Over the past 40 years, SR7 south of I-95, has evolved into a multi-lane expressway (SR1) that represents the major north-south spine road in Delaware. Only minor adjustments were made to the I-95/SR1 interchange, as part of the initial construction of the SR1 project. The interchange serves a wide variety of travelers, including: interstate traffic along the eastern seaboard; traffic to local commercial and office development; daily commuters; truck traffic carrying freight; and seasonal traffic traveling to Delaware, New Jersey, and Maryland Atlantic beaches.

DETAILED DESCRIPTION OF THE I-95/SR1 INTERCHANGE IMPROVEMENTS: The proposed I-95/SR1 interchange improvements, as refined in the FHWA approved 2009 Environmental Reevaluation and the FHWA approved 2009 Interchange Modification Report (IMR), include the construction of physically separated directional ramps (55 mph design speed) carrying through traffic from southbound I-95 to southbound SR1 and from northbound SR1 to northbound I-95, thus separating freeway-to-freeway traffic from local traffic. The improvements also include modifications to the northbound SR1 alignment and modifications to various interchange ramps to improve traffic operations and safety. The following is a detailed description of the interchange improvements, which can be viewed on a [video](#) and is illustrated on [plan sheets](#).

Southbound: Beginning north of the Churchmans Road Bridge (bridge reconstruction completed in December 2008, to accommodate a 5th lane in each direction on I-95), southbound I-95 widens to the outside, with two new outside lanes forming the new directional Ramp A to southbound SR1. Ramp A would widen to three lanes before crossing over I-95. After crossing over I-95:

- The right lane would diverge as Ramp G1 and provide access to the Christiana Mall Road and Road A (both local roads provide access to the Christiana Mall (1.2 msf), the bus transit transfer hub/park and ride facility at Christiana Mall and the significant existing and committed development in the Churchmans Crossing area (*see pages 8 and 16*).
- The two inside (left) lanes of Ramp A continue through the interchange, separated from local traffic, and extend as southbound SR1.
- Access for local traffic on existing southbound SR1 would remain unchanged.

Northbound: Beginning south of Road A, northbound SR1 would widen to a four-lane roadway.

- The right lane of SR1 northbound would diverge to provide local access via Road A.
- The three left lanes of SR1 northbound would widen to form four lanes:



- The two left lanes (Ramp B) would provide a direct two-lane connection to northbound I-95. Ramp B overpasses SR1 and approaches I-95, north of the Christiana Mall Road, where the two lanes would split.
 - The left lane of Ramp B, physically separated from local traffic, would overpass northbound I-95 and extend as the left/median lane of I-95 (accommodates traffic destined for Wilmington and Philadelphia via I-95 or I-495).
Note: Having Ramp B become the median lane of I-95 avoids a major weave on the I-95 mainline, i.e. SR1 northbound traffic destined for Wilmington and Pennsylvania does NOT have to weave across three high speed lanes of northbound I-95 between I-95/SR1 and the I-95/I-295/I-495 interchange to the north.
 - The right lane (Ramp B1) would collect traffic from northbound SR1 and the Christiana Mall area before merging into the outside lane (5th lane) of northbound I-95, north of Churchmans Road (primarily accommodates traffic destined for I-295 and New Jersey).
- The two right lanes of northbound SR1 would continue and become SR7 northbound, north of I-95, providing access to the significant Churchmans Crossing development surrounding the interchange (*see pages 8 and 16*).
- Access for local traffic on SR1 northbound would remain unchanged.

As discussed in greater detail, later herein, these improvements will enhance accessibility to existing bus and commuter rail transit facilities, major existing and expanding development in Delaware’s key Churchmans Crossing growth area, surrounding the interchange, and commuter accessibility from nearby EJ areas and the significant residential growth area south of I-95 to jobs in Churchmans Crossing, Wilmington and the Philadelphia areas.

ADDRESSING AN URBAN AREA NEED: In 1995, DelDOT initiated an effort to address transportation needs in the rapidly developing and congested Churchmans Crossing area, surrounding the I-95/SR1 interchange. The study was a cooperative effort by DelDOT, New Castle County, the Wilmington Area Planning Council (WILMAPCO), community and business leaders and elected officials.

A Steering Committee of key stakeholders guided the effort to:

- Enhance the area’s quality of life;
- Plan for sustainable growth and development; and
- Provide an opportunity for transportation choices.

The ultimately implemented improvements and programs included, among others: the construction of the new [Fairplay commuter rail station at Churchmans Crossing](#) on AMTRAK’s Northeast Corridor (approximately 2 miles north of the I-95/SR1 interchange); the creation of a [bus transit transfer hub/park and ride facility at the Christiana Mall](#) (immediately adjacent to the I-95/SR1 interchange) to provide and enhance local bus service and initiate express bus service to Wilmington and Newark; the installation of video cameras, variable message signs, loop detectors, and associated electronic devices to provide information to DelDOT’s Transportation Management Center (TMC), as part of DelDOT’s traveler advisory system to alert motorists of incidents and events; and the establishment of programs by DelDOT and TMA Delaware to promote alternatives to single occupancy vehicle usage such as carpool, bike, walk, transit, and telecommuting. These initiatives focused on reducing the volume of



traffic on I-95 in Delaware and improving the efficiency, operation, and management of the I-95 corridor.

While the commuter rail and bus transit, ITS and TDM initiatives, implemented between 1995 and 2000 (planned for further enhancements as discussed later herein), were successful in providing transportation choices, generating increased transit usage and heightened traveler awareness, they were unsuccessful in slowing the growth of traffic on I-95 and SR1.

Consequently, in 2002, DelDOT reinitiated the **I-95 Corridor Improvements Program** to implement capacity improvements along the I-95 corridor. The following resulting capacity improvements, when combined with the earlier non-highway improvements, provide a multi-modal approach to meeting the local urban area's needs, along with regional and national needs:

- Churchmans Road Bridge over I-95 reconstruction to accommodate widening the mainline of I-95 from four to five lanes in each direction (\$ 16.6 million completed in 2007);
- I-95 mainline widening from four to five lanes in each direction from SR1 to the I-95/I-295/I-495 interchange (\$56.4 million completed in October 2008);
- I-95 Newark Toll Plaza improvements to provide highway speed electronic toll collection (\$48 million – scheduled for construction in 2010/2011);
- I-95/SR1 interchange improvements (\$174 million - scheduled for construction in the spring of 2011 – **subject of this application**).

(Note: Cost shown above are for construction only.)

ADDRESSING TRANSPORTATION CHALLENGES

Existing and Projected Passenger and/or Freight Volumes: Traffic counts conducted in the study area indicate that the average daily traffic (ADT) on I-95 through the SR1 interchange was over 207,000 vehicles per day in the year 2008, while the average daily traffic on SR1 approaching I-95 from the south was approximately 85,000 vehicles per day, including approximately 15 percent trucks. The traffic demand for the year 2030 is expected to increase to approximately 273,000 vehicles per day on I-95 and approximately 117,000 vehicles per day on SR1.

In 2005, 100.7 million tons of freight, with a dollar value of \$66.1 billion, passed through the I-95 toll plaza, just to the south of the I-95/SR 1 Interchange. Projections indicate the equivalent of 195.4 million tons, with a value of \$128 billion, in 2030. These represent a nearly doubling of freight to be handled at the plaza. The figures at the I-95/SR 1 Interchange would be expected to be even greater when including freight carried by SR 1 and the anticipated connection of US 301 (another east coast commerce route) to SR 1 and I-95 in 2015 ([click here for truck freight graphic](#)).

Congestion Level: The I-95/SR1 interchange is the site of severe, daily congestion. Average vehicle speeds on I-95 through the SR1 interchange are below typical interstate highway speeds, particularly during the peak periods, and travelers experience extensive delays and lengthy travel times. Additionally, daily two-mile backups occur on SR1 northbound approaching the I-95/SR1 interchange during the AM peak period; and even longer backups occur on southbound I-95 during the PM peak period as vehicles attempt to exit to SR1 southbound and queues spill back from the C-D road onto the I-95 mainline lanes. As volumes increase in the future, traffic conditions will continue to deteriorate, with greater delays, longer travel times, extended periods of congestion along the I-95 and SR1 corridors, and a potential increase in traffic crashes. The following quantifies the capacity analyses results at critical locations within the interchange.



Complete ADT and peak hour traffic projections and detailed level of service (LOS) results for the interchange and surrounding area are presented in the FHWA approved [2009 Interstate Modification Report \(IMR\)](#) for the interchange.

Existing Congestion: Capacity analyses were performed for the I-95/SR1 interchange project in the year 2008 using Highway Capacity Software (HCS). [The results indicate the following four \(4\) movements within the I-95/SR1 interchange currently operate at level of service \(LOS\) F.](#)

- ① During the AM peak period, the merge from northbound SR1 to northbound I-95 operates at LOS F (improved)
- ② During the AM peak period, the northbound freeway segment on I-95 north of the SR1 interchange is over capacity (improved)
- ③ During the PM peak period, the weave on the southbound I-95 C-D road between the northeast and northwest quadrant loop ramps operates at LOS F (eliminated)
- ④ During the PM peak period, the weave along southbound SR7 between the I-95 loop ramps operates at LOS F (eliminated)

All four failing movements will be improved to an acceptable level of service and/or eliminated by the proposed I-95/SR1 Interchange Improvements.

Future Congestion: HCS analyses were also performed for the design year (2030) for the No-Build and Build conditions using the forecast volumes. [In addition to the four locations that fail under existing conditions, the following six locations are projected to operate at LOS E or LOS F by the year 2030 under No-Build conditions.](#)

- ⑤ The diverge from southbound I-95 to the SR1 C-D Road is projected to operate at LOS F during the PM peak period (improved)
- ⑥ The weave along northbound I-95 between the SR1 loop ramps is projected to operate at LOS E during the AM peak period (eliminated)
- ⑦ The merge on northbound SR1 from Road A is projected to operate at LOS F during the AM peak period (improved)
- ⑧ The weave along northbound SR1 between the Christiana Mall and I-95 is projected to operate at LOS F during the AM peak period (improved)
- ⑨ The weave along southbound SR1 between I-95 and the Christiana Mall is projected to operate at LOS E during the PM peak period (improved)
- ⑩ The weave along southbound SR1 between the Christiana Mall and Road A is projected to operate at LOS E during the PM peak period (improved)

All ten locations will be improved to an acceptable level of service and/or eliminated by the proposed I-95/SR1 Interchange Improvements.

INFRASTRUCTURE CONDITION

Obsolete Design: The existing I-95 cloverleaf interchange was initially designed in the late 1950's and constructed in the early 1960's to accommodate traffic from SR7, a low-volume two-lane local rural road at the time. Subsequent to initial interchange construction, the portion of SR7 south of I-95 was converted to SR1, an expressway that extends from I-95 to Dover and has become the major north-south spine road in Delaware. Consequently, the current design of the I-95/SR1 interchange is outdated and substandard.



Examples of the obsolete cloverleaf design can be found in the geometry of the interchange ramps. The existing loop ramps have minimum radii of 229 feet (30 MPH); the geometry of the outer ramps is only slightly better with minimum radii of 450 feet (35 MPH). As a result, traffic using these ramps must slow from 55 mph (or greater) down to 35 mph (or less) and then accelerate back to 55 mph (or greater). The required change in speed for vehicles using these ramps is further hampered by the substandard lengths of deceleration and acceleration lanes available on both I-95 and SR1. These factors contribute to an increase in congestion, a decreased level of service and an increase in crash rates.

The existing cloverleaf interchange configuration is not consistent with the current function of the interchange. The interchange currently acts as a major connection between two freeway-type facilities (I-95 and SR1). The existing cloverleaf design does not provide for the needed directional-type movements between the two expressways. The current cloverleaf configuration creates conflicts between merging and weaving local and through traffic.

The proposed I-95 / SR 1 Interchange improvements will eliminate a “choke point” on I-95 and SR 1 by replacing the existing obsolete interchange with one meeting current design standards.

Pavement: The pavement condition of the I-95/SR1 interchange ramps are in fair condition, with ratings predominantly in the 50s and 60s; as compared to I-95, which has a rating in the 90s (very good), as a result of the resurfacing of I-95 associated with the 5th Lane Widening project completed in December 2008 ratings. SR1 ratings are predominantly in the 60s (good) ([see DelDOT’s pavement ratings for the I-95/SR1 interchange area](#)).

For the ramps within the interchange rated in good condition, it was determined that a thin overlay treatment was needed to maintain the ride ability of the surface. The structure of the road has deteriorated but an interim treatment was necessary to maintain the surface until the interchange reconstruction project commences.

SAFETY EXPERIENCES: The I-95 corridor experienced substantial traffic growth throughout the 1990s, until the corridor reached saturated conditions in the early 2000s. A review of crash data during that time period indicates that there was a direct correlation between congestion levels and crash rates. Over the four-year period from 1998 to 2001, the average crash rate on I-95 increased steadily from 73 per 100 million vehicle miles (mvm) in 1998 to 90 per 100 mvm in 2001. Rear-end collisions were the most common crash type, accounting for 56 percent of all crashes. This crash pattern is typical of congested freeways, where stop-and-go traffic frequently occurs during the peak hours.

Recently, as traffic volumes have reached saturation and commuters have become accustomed to the typical daily congestion locations, crash rates have reduced slightly. However, rear-end crashes remain the primary crash type along I-95. Since these crashes are primarily caused by congestion and lane changes due to merges, diverges, and weaves, operational and capacity improvements at appropriate locations would be expected to provide an improvement in the safety of the roadway.

The I-95/SR1 interchange improvements are projected to reduce crashes as discussed under the selection Criteria, *pages 15 and 16*.



The I-95/SR 1 Interchange will also address additional transportation challenges that are discussed under Selection Criteria, as noted below:

- Reducing travel times (page 10), user costs (page 10), fuel consumption (page 13), and greenhouse gases (page 14);
- Improving accessibility to the existing bus transit transfer hub/park and ride facility at Christiana Mall (page 10);
- Improving accessibility to the existing Fairplay at Churchmans Crossing Commuter Rail Station (pages 11 and 12);
- Improving accessibility to additional near, mid and long-term transit and highway improvements (page 11);
- Improving accessibility for Disadvantaged Populations (pages 11 and 13); and
- Improving accessibility for commuters that live south of I-95 and commute each day to jobs in Churchmans Crossing, Wilmington and Philadelphia (page 13).

PROJECT PARTIES

The Delaware Department of Transportation (DelDOT) is the grant recipient and the sole implementing agency. As such, DelDOT acknowledges that US DOT reserves the right to ask DelDOT to supplement the data in this application.

GRANT FUNDS AND SOURCES AND USES OF PROJECT FUNDS

DelDOT is requesting \$44 million in TIGER Grant funds for the I-95/SR 1 Interchange, which has a total estimated cost of \$197 million.

TABLE 1: Grant Funds and Sources and Uses of Total Project Funds

| SOURCES | AMOUNT* | PERCENTAGE | USES | TIGER | DELDOT | FHWA | TOTAL |
|----------------------|----------------|---------------|--------------|-------------|-------------|--------------|--------------|
| Delaware TTF | \$ 30.6 | 15.6% | PE | | 1.4 | 5.6 | 7.0 |
| FHWA | \$122.4 | 62.1% | ROW | | 3.2 | 12.8 | 16.0 |
| TIGER Funds | \$ 44.0 | 22.3% | Construction | 44.0 | 26.0 | 104.0 | 174.0 |
| Total Project | \$197.0 | 100.0% | Total | 44.0 | 30.6 | 122.4 | 197.0 |

*millions

SELECTION CRITERIA

LONG-TERM OUTCOMES (PRIMARY SELECTION CRITERIA) – State of Good Repair

Improving the Condition of Existing Transportation Facilities or Systems: The I-95/SR1 interchange improvements are part of DelDOT’s state-wide efforts to maintain transportation facilities in a state of good repair, and at that same time, to upgrade an obsolete 1960s traditional cloverleaf design between I-95 and a rural highway to a modern 2009 interchange between two expressways, with appropriate highway speed directional ramps that will accommodate existing and projected future traffic relieving a “choke point” on I-95 and SR 1. The project will eliminate the functional obsolescence of the existing interchange; improve traffic operations (Pages 5 and 6); and improve pavement conditions (page 5).

Current Condition of I-95/SR1 Interchange is a Threat to Economic Growth and Stability: The I-95/SR1 interchange is located in the center of and provides critical access to the Churchmans Crossing development area. As described on pages 5 and 6, the existing obsolete and congested interchange, with four existing and ten projected LOS F – failing traffic movements, serves as a significant threat to the existing and significant committed/projected economic growth in the key



Churchmans Crossing area. The I-95/SR 1 Interchange improvements are critical to the stability of the area. The economic impact of the I-95/SR1 interchange improvements on the Churchmans Crossing area is discussed in detail on *pages 8 through 10 and 16 through 18*.

Appropriately Capitalized Up Front: The I-95/SR1 Interchange Improvements Project is currently funded in DelDOT’s 6-year [Capital Transportation Program \(CTP\)](#) - \$169 of the \$174 million construction cost. The \$44 million in TIGER Grant Funds would allow DelDOT to reallocate the funds, currently programmed for the I-95/SR 1 Interchange, and to restore other critical projects that have been cut from the capital program.

Sustainable Revenue Source for Long-Term Operations and Maintenance: A sustainable source of revenue, Delaware’s dedicated State Transportation Trust Fund, is available for long-term operations and maintenance. Along with safety, system preservation has been for many years, and remains DelDOT’s top priority. Taking care of the existing infrastructure and operations takes precedence over expanding DelDOT’s services and infrastructure.

I-95/SR1 Interchange – Current Condition and Performance: These conditions and how the project will improve performance and conditions are presented on *pages 4 to 6*, respectively, and in the FHWA approved IMR.

Minimizing Future Life Cycle Costs: In an effort to minimize future life cycle costs, a number of actions will be incorporated into the interchange design/construction including: 1) steel girders are proposed to be weathering steel, eliminating the need for future painting; 2) steel reinforcing is proposed to be epoxy coated to increase corrosion protection; 3) HPC (High Performance Concrete) is proposed for bridge decks to decrease permeability of the concrete and thereby minimize water and chloride penetration ensuring longer life for the embedded reinforcing steel and concrete integral piers will eliminate the need to maintain bearings at the piers. In addition to these measures, by choosing a Portland cement concrete paving section, DelDOT will have a lower life cycle cost due to the lower future maintenance costs of the concrete section. An additional benefit of less future maintenance will be safety by not having to have workers exposed to lane closures while performing the maintenance.

LONG-TERM OUTCOMES (PRIMARY SELECTION CRITERIA) – Economic Competitiveness

Long-Term Promotion of Growth in Employment, Production or High Value Economic Activity: The I-95/SR1 interchange improvements are important to the economic competitiveness of the United States, by removing a major bottleneck on I-95, our nation’s east coast “Main Street”. Removing this bottleneck will facilitate the movement of commercial and personal travel along the east coast.

The I-95/SR1 interchange improvements will also remove a threat to economic growth in one of Delaware’s most important economic growth areas, Churchmans Crossing, with 8 million square feet (msf) of existing non-residential development and 5.2 msf of committed future non-residential development. Completion of the interchange improvements will support the significant development projected for the Churchmans Crossing area, as well as provide mid and long-term benefits to the State of Delaware. [Click here for map and tables indicating existing and committed economic development in Churchmans Crossing area.](#)



The I-95/SR1 Interchange Improvements are critical to sustaining the economic growth in the Churchmans Crossing area. A study prepared by the Center for Applied Demography & Survey Research at the University of Delaware identified the following potential economic benefits in the Churchmans Crossing area:

GDP: Annual Gross Domestic Product (GDP) for Delaware will increase \$2.0 billion by 2025 and \$4.7 billion by 2034. The cumulative economic benefit of the 23 commercial and 4 residential land development projects on the State of Delaware after twenty years is \$42.3 billion.

Jobs: By 2034, the 27 committed (*see page 17*) residential and commercial land development projects supported by the I-95/SR 1 Interchange improvements project could create 10,200 direct jobs and create another 13,250 indirect jobs (23,450 total jobs).

Job Types: Would include a significant number in banking/finance (3,700) and retail (4,000), along with office commercial (1,700), light industry/warehouse (260) and medical services (200). These jobs are located in close proximity to a number of economically distressed areas ([click here for map of EJ areas](#)) and are accessible from the Wilmington and Newark areas by highway, transit or commuter rail. This accessibility is enhanced by the I-95/SR 1 Interchange improvements (*page 12*).

Tax Revenue: As much as \$1.4 billion in total additional tax revenues could be generated over the next 20 years. This is an average of about \$70 million per year in additional tax revenue.

Additional Economic Benefits:

- The construction value of the 23 commercial projects is over \$700 million (2008 \$).
- Infrastructure/construction spending could create up to 380 new jobs by 2012.
- Consumption could increase \$0.7 billion by 2025 and \$1.6 billion by 2034. The cumulative impact on the state after twenty years is \$13.9 billion.
- Annual state and local tax revenue could increase by as much as \$4.5 million by 2015, \$66 million by 2025, and \$156 million by 2034. Most of this revenue comes in the form of personal income tax.
- Annual personal income could increase \$0.9 billion by 2025 and \$2.1 billion by 2034.
- State population could increase 8,100 people by 2025 and 19,400 by 2034.
- 1,450 additional construction jobs could be added by 2034 to support investment spending from the 27 projects, and additional “multiplier” business development.
- Each of the four residential projects will generate approximately 67 temporary construction jobs and \$5.5 million in GDP each year under construction.
- Annual property taxes from the four residential projects could increase by \$686,000 (2008 \$) once finished.

[Click here for Economic Impact on Delaware’s Economy: The Development of Churchmans Crossing, by the University of Delaware, Center for Applied Demography & Survey Research.](#)

The near-term economic benefits of constructing the I-95/SR1 interchange improvements are presented on *page 19*).

Improve Long-Term Efficiency, Reliability or Cost Competitiveness in the Movement of Workers or Goods: The I-95/SR1 interchange improvements will, in the long term, reduce travel



times, fuel consumption, and improve safety; thus improving long-term efficiency, reliability and competitiveness in the movement of workers and goods on the national, regional and local level.

Makes Improvements that Allow for Expansion, Hiring or other Growth in the Private Sector Production at Specific Locations, Particularly Economically Distressed Areas: The I-95/SR1 interchange improvements will support significant economic growth in the Churchmans Crossing area, as documented in the University of Delaware Study noted above, thus supporting new investment in development expansion and hiring in the immediate area of the surrounding EJ areas (see *pages 17 and 18*).

Economic development in the Churchmans Crossing area associated with committed projects is projected to result in [\\$700 million in non-residential construction](#) and [the creation of up to approximately 5,000 direct jobs between 2014 and 2025 and up to 5,000 additional direct jobs between 2026 and 2034](#). Total jobs created is projected to be up to 23,500 by 2034 (1.3 multiplier effect)

Integration/Better Use of all Existing Transportation Infrastructure: The I-95/SR1 interchange improvements benefit more than the interstate, regional and local highway traveler. The interchange improvements will benefit bus transit and commuter rail transit (*pages 11 and 12*), along with economically distressed areas (*page 12*).

LONG-TERM OUTCOMES (PRIMARY SELECTION CRITERIA) – Livability

Improving the quality of living and working environment and experience of people in communities

Enhance User Mobility by Reducing Travel Times and User Costs: The I-95/SR1 interchange improvements are projected to significantly improve mobility by reducing travel times for motorists. [A CORSIM simulation model of the study area has been developed for No-Build and Build conditions to test the operational impacts of the I-95/SR1 Interchange improvements in design year 2030](#). The analysis results indicate an average travel time savings of 9 minutes per vehicle on southbound I-95 in the PM peak period, 6 minutes per vehicle on southbound I-95 to southbound SR 1 and northbound SR 1 to northbound I-95 ramps, and several additional minor time savings.

These travel time savings will provide benefits to many users of the interchange, including interstate commerce, local commuters, transit users accessing the nearby Fairplay Commuter Rail Station, bus patrons connecting to the bus transit transfer hub/park and ride facility at Christiana Mall, and seasonal long-distance travelers, promoting regional travel and tourism along the east coast.

During the 20-year period following project completion (2014 to 2033), this equates to a total time savings of approximately 9 million vehicle-hours (8 million autos/1 million trucks) for users of the I-95/SR1 interchange. Assuming a value of time of approximately \$16 per hour for autos and \$24 per hour for trucks (based on formulas from the 2003 AASHTO publication [User Benefit Analysis for Highways](#)), **the total projected user cost savings for the project is approximately \$500 million (\$415 million autos/\$85 million trucks)**. In the 2014 opening year, the projected user cost savings is \$24.2 million ([click here for supporting material on road user benefits](#)).

The I-95/SR1 interchange improvements would also enhance accessibility, by reducing travel times and improving safety. The interchange improvements separate through traffic from local traffic, thus improving the journey of interstate, regional and local travelers.



For example, DelDOT’s overall regional traffic model indicates that the interchange improvements would reduce overall travel time by 5 minutes for the following, when compared to the No Build in the near, mid and long term (2014, 2020 and 2030):

| | <u>2014</u> | <u>2020</u> | <u>2030</u> |
|------------|-------------|-------------|-------------|
| People | 51,000 | 94,000 | 57,000 |
| Households | 19,000 | 36,000 | 22,000 |
| Employees | 19,000 | 25,000 | 22,000 |

Improve Transportation Choices by Enhancing Points of Modal Connectivity and by Reducing Congestion on Existing Modal Access: The I-95/SR1 interchange improvements will significantly enhance user mobility through the improvement of traffic operations and safety on I-95, SR1 and the through interchange area (*pages 4 and 5*). In turn, these interchange improvements will enhance connections to existing commuter rail and bus service and anticipated near and long-term transit and roadway improvements:

Fairplay Commuter Rail Station at Churchmans Crossing: The I-95/SR1 interchange improvements will address existing and projected congestion, improve safety, reduce travel times on I-95, SR 1 and SR7 and thus improve accessibility to the Fairplay Commuter Rail Station at Churchmans Crossing, located about 2 miles north of the interchange, which provides direct commuter rail connections to Newark, Wilmington and Philadelphia; and in the future, hopefully to Baltimore and Washington, D.C. via MARC Service Extension. Four bus routes that stop at the bus transit transfer hub/park and ride facility at the Christiana Mall provide service to the Fairplay commuter rail station.

Transit Transfer Hub/Park and Ride Facility at Christiana Mall: The I-95/SR1 interchange improvements will address existing and projected congestion, improve safety and reduce travel times, by separating through and local traffic, thus enhancing access to the bus transit transfer hub/park and ride facility at the Christiana Mall and increasing efficiency and reliability of the 13 regular bus routes that provide regular and express services to Fairplay commuter rail station, Wilmington, Newark, Dover and Bear, New Castle, Christiana Hospital, Morgan Center, Delaware Technical and Community College and Christiana Mall.

Meeting Additional Near, Mid and Long-Term National, State and Local Area Needs: There are a number of additional near, mid and long-term transportation improvements that benefit from the I-95/SR1 interchange improvements, including:

Commuter Rail Service in I-95/Northeast Corridors (Near-Term: State and Local Needs): Ongoing, cooperative efforts by DelDOT, AMTRAK and SEPTA, include improvements to the Northeast Corridor between Newark and Wilmington, to accommodate enhanced commuter rail service between Newark, Wilmington, Philadelphia and intermediate points. Construction of the \$75.5 million in improvements is scheduled to begin in the fall of 2009 and be completed in 2012.

US 301 in Delaware (Near-Term: National, State and Local Needs): The improved I-95/SR1 interchange will support the future connection of new US 301 to SR1 south of the Chesapeake and Delaware (C&D) Canal, facilitating interstate traffic traveling along the east coast on US 301.

US 301 in Maryland is a four-lane and six-lane limited and controlled access facility. In Delaware, US 301 is only a two-lane roadway (one lane in each direction), without access controls for much of its



length. DelDOT's plans include the construction of a new four-lane limited access US 301 on new location from the Maryland line to SR1, south of the C&D Canal. The project is currently under final design. The construction of [new US 301](#) will result in an expressway-type facility from the Maryland line to I-95 at the I-95/SR1 interchange. The current DelDOT schedule would have new US 301 opened to traffic in 2015, as a toll facility.

The I-95/SR1 interchange improvements are being designed to accommodate the traffic resulting from the connection of new US 301 to SR1, just south of the C&D Canal.

Extension of MARC Service from Perryville, MD to Newark, DE (Long-Term: Multi-state and National Needs): DelDOT is working with Maryland DOT (MDOT), in an effort to complete the missing twenty mile gap in local commuter rail service, by extending MARC service from Perryville, MD to Newark, DE, thus resulting in commuter rail service that would extend from Richmond, VA to New London, CT.

I-95 Improvements (Long-Term: National, State and Local Needs): Also planned beyond 2030 is the provision of collector-distributor (CD) roads on I-95, from the I-95 interchange south of SR1 (SR 273) to the I-95/I-295/I-495 interchange, to accommodate long term I-95 traffic needs. The I-95/SR1 interchange improvements are being designed to accommodate the future provision of collector-distributor (CD) roads on I-95.

Improve Accessibility to Transport Services and Other Commodities/Services for Disadvantaged Populations, Non-Drivers, Senior Citizens and Persons with Disabilities or Make Services More Readily Available to these Groups: Most of the disadvantaged populations (e.g., environmental justice (EJ) populations and transportation disadvantaged (TJ) populations) are not located directly adjacent to the I-95/SR1 interchange improvement area ([click here for EJ areas in the vicinity of the I-95/SR1 interchange](#)).

However, the transit transfer hub/park and ride facility provides a convenient transfer location for those in nearby EJ areas to the southeast and southwest, using bus transit to commute to and from work, medical facilities and shopping locations in the Churchmans Crossing area, such as the Christiana Medical Center; Christiana Hospital and Medical Arts Pavilion; the Delaware Technical and Community College Stanton Campus; the Westgate Corporate Center and Christiana Executive Campus; and the Christiana Mall and several smaller retail shopping areas.. The interchange improvements would also improve bus transit service from the EJ and TJ populations located in the Wilmington area and traveling on I-95 to local jobs/services in the Churchmans Crossing area and to Newark.

There are 12 bus routes and one commuter rail line that serve the area surrounding the I-95/SR1 interchange. These bus lines provide opportunities for persons from economically distressed areas to access jobs, educational opportunities and health care such as the Kimberton/Brookside area of Newark, southeast areas of Wilmington such as Southbridge and Collins Park and the Knollwood Community in Claymont. The improved access, efficiency and reliability of bus transit service as a result of the interchange improvements will provide persons with more transit options to work; shopping; and educational, recreational or medical facilities for persons from communities that are economically challenged.



The improvements at the interchange will facilitate more reliable transit service, shorter trip times and safer travel through the interchange by decreasing congestion and improving operations in the interchange.

DelDOT analysis results indicate that Moderate and Significant EJ area population travel times to Churchmans Crossing (jobs, shopping, medical, etc., will be reduced: [Click here to see supporting graph.](#)

Improved Connection Between Residential and Commercial Areas: The I-95/SR1 interchange improvements will enhance connections between residential areas and the extensive commercial development in the Churchmans Crossing area, including the Christiana Mall (Delaware’s largest shopping mall), located immediately adjacent to the I-95/SR1 interchange. [Click here to view map of residential development growth of local areas that will utilize the improved interchange.](#)

I-95/SR1 Interchange Improvements Project is the Result of a Planning Process which Coordinated Land-Use Planning Decisions and Encouraged Community Participation:

DelDOT’s 1995 to 1997 effort, to identify and address the needs in the Churchmans Crossing area, was a joint land use and transportation effort by DelDOT, New Castle County, WILMAPCO, community and business leaders and elected officials ([click to access Land Use/Transportation Study](#)), which coordinated transportation and land use decisions for the Churchmans Crossing area, i.e. the area surrounding the I-95/SR1 interchange. This effort involved significant community participation, including residential, institutional and commercial. The effort has resulted in the implementation of significant community infrastructure and stronger ordinances coordinating land use and transportation planning, including:

- Improved New Castle County Land Use/Transportation Coordination Regulations (Adopted by New Castle County)
- Strengthened Adequate Public Facilities Ordinance (Adopted by New Castle County)
- Fairplay Commuter Rail Station
- Bus Transit Hub at Christiana Mall (serviced by 13 routes)
- Expanded bus service – five new bus routes, including express service, bus service to the Fairplay station and shuttle routes in the Churchmans Crossing area
- 67 bus stop improvements
- 13.2 miles of new sidewalks
- Numerous HSIP improvements
- Expanded ITS to Statewide Transportation Management Center (TMC) – operated 24/7
- Traveler Advisory Radio (1380 AM)
- Real Time Website (www.deldot.net)
- Partnership with TMA Delaware (Transportation Management Association)

LONG-TERM OUTCOMES (PRIMARY SELECTION CRITERIA) – Sustainability

Reducing Fuel Consumption and Greenhouse Gas Emissions: The CORSIM model, previously discussed, provides output data for a variety of categories, including fuel consumption and greenhouse gas emissions (HC, CO, and NO_x). The table below compares the fuel consumption and greenhouse gas emissions during the AM and PM peak hours for the I-95/SR1 interchange improvements compared to the No-Build condition in the design year of 2030.



| TABLE 3: CORSIM Results – Build vs. No-Build Fuel Consumption and Greenhouse Gas Emissions | | | | | | |
|---|----------|-------|-------------|----------|-------|-------------|
| | AM Peak | | | PM Peak | | |
| | No Build | Build | Improvement | No Build | Build | Improvement |
| Fuel Consumption (MPG) | 14.4 | 15.3 | 6% | 12.2 | 14.1 | 16% |
| HC Emissions (grams/mile) | 1.06 | 1.02 | 4% | 1.15 | 1.10 | 4% |
| CO Emissions (grams/mile) | 27.6 | 26.5 | 4% | 28.9 | 28.9 | 0% |
| NO_x Emissions (grams/mile) | 3.11 | 3.01 | 3% | 3.31 | 3.20 | 3% |

Fuel Consumption: The CORSIM results shown in Table 3 above indicate that the improved I-95/SR1 interchange is projected to increase fuel economy (miles per gallon) by approximately 6% during the AM peak hour and by approximately 16% during the PM peak hour. These results translate to the I-95/SR1 interchange improvements resulting in an average savings of approximately 4,000 gallons of fuel each day, approximately 1.5 million gallons of fuel saved each year, and approximately 29 million gallons of fuel saved during the 20-year period following project completion from 2014 to 2033. Using the September 10, 2009 Average Delaware price for regular (\$2.555) and diesel (\$2.656), the projected total savings is nearly \$100 million, or approximately \$5.0 million in 2014 opening year.

CO2 Emissions: Using the EPA estimates of 19.4 pounds of CO₂ emissions from each gallon of gasoline consumed and 22.4 pounds of CO₂ emissions from each gallon of diesel fuel consumed, the fuel savings from the I-95/SR1 interchange improvements are also projected to reduce carbon emissions by about 40 tons daily, 15,000 tons yearly, and about 280,000 tons during the 20-year period following project completion from 2014 to 2033.

HC, CO, and NO_x Emissions: The CORSIM results in Table 3 above also indicate that greenhouse emissions (grams per mile) are projected to be reduced by about 3% to 4% during the peak hours if the I-95/SR1 interchange improvements are implemented. During the 20-year period following project completion from 2014 to 2033, HC emissions are projected to decrease by approximately 185 tons, CO emissions are projected to decrease by approximately 2,150 tons, and NO_x emissions are projected to decrease by approximately 440 tons.

Decrease in Movement of People or Goods by Less Energy Efficient Vehicles or Systems: The I-95/SR1 interchange improvements will improve accessibility to the Fairplay commuter rail station and the bus transit transfer hub/park and ride facility at Christiana Mall. The improvements will also facilitate more reliable bus transit travel time and safer travel through the interchange. The interchange improvements, along with the DelDOT/AMTRAK improvements to the northeast corridor that will expand commuter rail service, will result in an increase in the movement of people by more efficient systems.

Maintain, Protect & Enhance the Environment: Avoidance and minimization of impacts to wetlands were an important consideration during the development and design of the interchange improvements. Wetlands and other waters of the U.S. impacts have been avoided or minimized, by maximizing slopes and constructing retaining walls, thereby reducing fill impacts. No endangered species were located near the project. This project will create wetlands and improve habitat connectivity through the creation of the Cathcart wetland mitigation site. The project will impact five small roadside wetlands (0.3 acres) DelDOT has created 3 acres of tidal wetlands at the Cathcart mitigation site to compensate for these impacts. The mitigation site is located on a former local



dumping ground and construction involved the excavation and removal of dumped trash and debris prior to planting. The created tidal wetland provides a large high quality habitat, replacing several discontinuous small low quality roadside features. Habitat connectivity has been improved by consolidating habitat from along the roadside to a large site adjacent to the Christina River.

- Avoidance of environmental impacts
 - Section 4(f) – No resources impacted
 - Section 106 – MOA executed and included in EA
 - Wetlands/Waters – Have received Corps of Engineers and DNREC permits. The interchange will impact 0.3 acres of nontidal wetlands which will be mitigated at the Cathcart Mitigation Site. The site was constructed in spring 2008, monitored in the Fall of 2008 and is considered successful.
 - Flood Plains – None affected
 - Environmental Justice – No effect
 - Air Quality – Conformity confirmed (see *Section VII – page 28*)
 - Threatened/Endangered Species – No Effect
 - Essential Fish Habitat – No Effect
 - Bald Eagle Protection – No Effect

LONG-TERM OUTCOMES (PRIMARY SELECTION CRITERIA) – Safety: The proposed I-95/SR1 interchange improvements would be expected to improve safety and reduce the crash frequency in the study area. The crashes in the study area are primarily caused by congestion and lane changes due to merges, diverges, and weaves. Since the preferred alternative eliminates three weaving sections within the I-95/SR1 interchange, including one along the mainline segment of I-95 northbound, the operational and capacity improvements from the I-95/SR1 interchange improvements would be expected to provide an improvement of safety in the corridor. DelDOT has reviewed the FHWA Desktop Reference for Crash Reduction Factors (Report No. FHWA-SA-07-015) dated September 2007. The following crash countermeasures recommended in the FHWA report are included in the design of the proposed I-95/SR1 interchange improvements:

- Install barrier (on SR1 to separate through and local lanes);
- Increase number of lanes (ramps, SR1, and I-95 (from related project)); and
- Improve pavement friction (resurfacing).

To quantify the expected reduction in crashes resulting from the interchange improvements, crash data for the interchange area was obtained for the three year period between May 2005 and April 2008. During this three-year period, 413 crashes were reported on I-95 within the interchange influence area, SR1 within the interchange influence area, and on the interchange ramps with the project area. This represents an annual average of 138 crashes per year. While no fatalities were reported, twenty (20) percent of these crashes resulted in personal injury.

Based on research conducted for the Florida Department of Transportation¹, a series of Crash Reduction Factors (CRF) were developed. This research showed that the act of modifying freeway entrance and exit ramps resulted in a 25 percent reduction in crashes (a CRF of 25). Because this project would modify numerous entrance and exit ramps at the I-95 / SR1 interchange, a 25 percent reduction in crashes due to the improvements, seemed reasonable and was assumed.

Based on this CRF, it is estimated that in the project completion year (2014), the total number of crashes at the interchange could be reduced by 38, including 8 injury crashes, due to the proposed



improvements. Based on the projected increase in traffic in the interchange area (1.25 percent annually), by 2034, these improvements could reduce the number of crashes at the interchange by 48 crashes, including 10 injury crashes, annually. Using data from the NHTSA², the economic cost of fatal, personal injury, and property damage only crashes were obtained. The costs assumed in this analysis are summarized in Table 4 below. It should be noted that no reduction in fatal crashes was assumed, due to the difficulty in projecting future fatal crashes.

| TABLE 4: Estimated Cost Savings by Crash Type | |
|---|-----------|
| Fatal | \$977,000 |
| Injury (Weighted Average of 5 Injury Accident Types) | \$23,700 |
| Property Damage Only | \$2,500 |

Over the twenty year period following project completion between 2014 and 2033, the reduction in crashes due to the proposed Interchange Improvements could potentially result in a total savings of over \$5.6 million or nearly \$300,000 per year.

1. Florida Department of Transportation. Update of Florida Crash Reduction Factors and Countermeasures to Improve the Development of District Safety Projects. Final Report. April 2005.
2. National Highway Traffic Safety Administration. The Economic Impact of Motor Vehicle Crashes 2000. May 2002.

LONG-TERM OUTCOMES (PRIMARY SELECTION CRITERIA) – Benefit-Cost Analysis

A Benefit-Cost Analysis was performed based on the project’s benefits for the five long-term outcomes.

User Benefits (Quantitative): There are four primary quantifiable benefits from the project. The most significant benefits of the project are the delay cost savings for direct users of the project (in this case, the motorists that would experience less delay on I-95 and SR1 as a result of the project). The net savings in delay costs are approximately \$500 million for the 2014 to 2033 time period and approximately \$25.0 million for opening year 2014.

The second most significant quantifiable benefit is the reduction of fuel consumption. As noted on page 14, the projected fuel cost savings are \$100 million for the 2014 to 2033 period, or \$5.0 million in the 2014 opening year. In addition to the fuel cost savings, US DOT has indicated that a figure of \$33 per metric ton of carbon may be used to measure global benefits of reducing CO₂ emissions. Based on an anticipated reduction of 15,000 tons of CO₂ in the 2014 opening year, a savings of approximately \$0.5 million is anticipated.

Finally, the reduction in crashes, due to the proposed interchange improvements, could potentially result in a savings of \$5.6 million in 2014 to 2033, or about \$300,000 per year, as noted above.

The total annual savings from the four benefits is over \$30 million in opening year 2014.

Costs: The capital construction cost of the project is \$174 million. Assuming an interest rate of 7 percent, as suggested by US DOT and assuming an economic life of capital assets of 20 years, the annualized cost of the project is \$15.2 million.

Benefit-Cost Ratio: Dividing the calculated annual benefits by the annualized costs results in a project benefit-cost ratio of 2.02.



Other Benefits: The project will result in other significant benefits that have not been accounted for in the above analysis, including the estimated impact on Delaware’s GDP in the 2014 opening year of up to \$23 million, due to the interchange project and the private development in the Churchmans Crossing area.

JOB CREATION AND ECONOMIC STIMULUS (PRIMARY SELECTION CRITERIA)-

Job Creation: The Churchmans Crossing area has a significant number of committed developments, about 88.3% or 4.5 msf of the proposed 5.2 msf. Reaching a committed status requires a great deal of money, time and effort. A committed project for larger projects requires that architects design building blueprints, engineers assess the impact the building will have on the environment (and vice versa), traffic analysts forecast the load that each plan places on roadways, sewage designs are coordinated with utility companies, residents are given time to voice their concerns, and government officials must inspect and check off on a litany of compliances and regulations. Committed projects are a best estimate of what will be developed in the project area.

Because “committed” development projects have virtually cleared the New Castle County Land use process, they are positioned for timely implementation, resulting in rapid economic impact, in essence, “ready to go”, as the economy continues to turn around. These projects will not be slowed by bureaucratic “red tape.”

The 1.2 msf Christiana Mall (largest in Delaware) is currently undergoing a major renovation and expansion. Their expansion plans have been coordinated with the I-95/SR1 Interchange Improvement Plans; in fact, the Mall is currently relocating their ring road in advance and anticipation of the major interchange improvements.

Projections indicate that the 27 committed development projects, supported by the I-95/SR1 interchange improvements could create up to 1,100 to 1,300 jobs each year, or approximately 23,500 jobs by 2034 (10,209 direct jobs by the committed projects and 13,255 indirect jobs).

A wide range of jobs types are projected, with a significant number in banking/finance (3,700) and retail (4,000), along with office commercial, light industry/warehouse and medical services. The Gross Domestic Product (GDP) could increase by \$144 million (2008\$) in 2015, potentially rising to \$2.0 billion in 2025 and \$4.7 billion by 2034.

In addition, 1,450 construction jobs associated with the 27 development projects could be added by 2034. Local building contractors, subcontractors and suppliers would benefit from this significant construction. [Click here to see University of Delaware Study.](#)

Ensuring Participation of Disadvantaged Individuals and Businesses: DelDOT’s ARRA projects are featured prominently on [DelDOT’s Web page](#). In DelDOT’s effort to make information regarding opportunities for work under the ARRA projects available to DBE firms, the Agency featured information in the Spring 2009 DBE Newsletter in an article titled “Getting a Head Start on the Stimulus”. This article provides step-by-step instructions on how to view upcoming projects, including how to determine those firms who have purchased project plans, and encourages DBE firms to reach out to firms who have shown an interest in DelDOT projects. (The DBE newsletter can be



found by selecting Doing Business on DelDOT's home page, then selecting the [Disadvantaged Business Enterprise Program link](#) under External Civil Rights Program.)

DelDOT's Civil Rights Office provided two training opportunities for DBE firms, specifically focusing on upcoming ARRA projects, in February and March 2009; one class was conducted in Dover, and one was conducted in Bear. Representatives participated in the following additional outreach activities:

- Mastering the Maze – Women Winning Contracts event conducted on June 16.
- Federal Contracting-Based Programs for Small Businesses event conducted June 23, 2009.
- Increasing Opportunities for Minority and Women Businesses event conducted on June 27, 2009.

As a recipient of federal funding, DelDOT is required to ensure compliance with federal regulations (including EEO) on all federally funded projects. DelDOT is accustomed to ensuring this compliance using programs developed in our Civil Rights Office, including monitoring to adherence for Contractor Compliance, On-the-Job-Training (OJT), and Disadvantaged Business Enterprise (DBE) programs. Each federally-participating project is reviewed to determine the applicability of both a DBE and an OJT goal, based on the project's type, duration, and other factors. Once DBE and/or OJT goals are set for a project, DelDOT's Civil Rights Office monitors projects to ensure progress toward meeting the goals, as well as timely subcontractor payments, adherence to EEO requirements, and timely resolution of complaints. Descriptions of DelDOT's Civil Rights programs can be found on the DelDOT Website by selecting [Doing Business](#), then referencing the External Civil Rights Program section.

Current Design Status/Technical Feasibility: The I-95/SR1 Interchange Improvements Project is currently in final design. Construction contract documents are currently 60% complete. Semi-Final bid documents will be completed in January 2010, Final Bid documents in June 2010, PS&E documents submitted to FHWA in September 2010, with advertisement for bids occurring in November 2010 and construction beginning in March 2011.

Advance Contract - Mall Ring Road: A \$5 million advance contract to the I-95/SR1 interchange is already under construction. The first critical path item for the interchange improvements is the relocation of the four-lane (two lanes in each direction) Christiana Mall Ring Road, approximately 200' to the east to clear the way for major construction activities. With completion of the Mall Ring Road in October 2009, the successful contractor(s) for the interchange improvements will be in a position to move quickly into heavy highway/bridge construction, including the relocation of northbound SR1 and construction of the major highway speed Ramps A & B.

Construction Schedule: The construction of the I-95/SR1 interchange improvements would begin in March 2011 and be completed by June 2014. *We anticipate, based on our A+B bidding experience on the I-95 5th Lane Widening project discussed below, that this traditionally developed construction schedule will be significantly reduced by the successful contractor.* [Click for details of Construction Schedule.](#) Construction funds can be spent steadily and expeditiously once construction begins, in part because of the advance construction currently underway.



Creating Construction Related Jobs: Using an accepted 2007 FHWA approach, the I-95/SR1 interchange improvements Project is projected to support:

- 1,663 Construction Jobs
- 754 Supporting Industries Jobs
- 2,434 Induced Jobs
- 4,851 Total Jobs

[Click here for backup information on construction related jobs.](#)

Projected Cash Flow and Jobs During Each Quarter of Construction: The following table indicates projected cash flow and the direct, on project jobs, supporting jobs and induced jobs expected to be created/sustained during each quarter of construction:

| TABLE 5: I-95 / SR1 Mall Interchange Improvements Cash Flow and Job Creation by Quarter (jobs in person-years) | | | | | | |
|---|------------------------------|------------------------------------|---|---|--|-------------------------------|
| Quarter | Est. Cash Flow % per Quarter | Est. Cash Flow Dollars per Quarter | Construction Oriented Employment Person-Years | Supporting Industries Employment Person-years | Induced Employment Person-years (17,453/\$1.25B) | Total Employment Person-years |
| 1 | 5.0% | \$8,717,914 | 83 | 38 | 122 | 243 |
| 2 | 4.0% | \$6,974,331 | 67 | 30 | 97 | 194 |
| 3 | 5.5% | \$9,589,705 | 91 | 41 | 134 | 267 |
| 4 | 7.0% | \$12,205,079 | 116 | 53 | 170 | 340 |
| 5 | 8.0% | \$13,948,662 | 133 | 60 | 195 | 388 |
| 6 | 9.0% | \$15,692,245 | 150 | 68 | 219 | 437 |
| 7 | 9.5% | \$16,564,036 | 158 | 72 | 231 | 461 |
| 8 | 9.5% | \$16,564,036 | 158 | 72 | 231 | 461 |
| 9 | 8.5% | \$14,820,453 | 141 | 64 | 207 | 412 |
| 10 | 8.0% | \$13,948,662 | 133 | 60 | 195 | 388 |
| 11 | 8.0% | \$13,948,662 | 133 | 60 | 195 | 388 |
| 12 | 7.0% | \$12,205,079 | 116 | 53 | 170 | 340 |
| 13 | 5.0% | \$8,717,914 | 83 | 38 | 122 | 243 |
| 14 | 4.0% | \$6,974,331 | 67 | 30 | 97 | 194 |
| 15 | 2.0% | \$3,487,166 | 33 | 15 | 49 | 97 |
| 100.0% | \$174,358,275 | 1,663 | 754 | 2,434 | 4,851 | |

DelDOT proposes to expend the \$44 million in TIGER funds between March 2011 and February 2012. The following is the projected annual cash flow:

- March 2011 – February 2012: \$44M (\$44M TIGER Grant)
- March 2012 – February 2013: \$63M (\$63M DelDOT/FHWA Funds)
- March 2013 – February 2014: \$55M (DelDOT/FHWA Funds)
- March 2014 – June 2014: \$12M (DelDOT/FHWA Funds)

Environmental Approvals: DelDOT has secured all required environmental approvals for the interchange improvements, having completed the National Environmental Policy Act (NEPA) process and having received all required Federal, State, and Local permits and approvals. [Click here to see the](#)



[NEPA approvals for the project. Click here to see the Federal, State and Local permit approvals for the project.](#)

Legislative Approvals: The I-95/SR1 Interchange Improvements Project is contained in [DelDOT’s Capital Transportation Program \(CTP\)](#) that is recommended by Delaware’s Secretary of Transportation and Governor and approved annually by the State Legislature. Funding for FY 2010 has been approved by the State Legislature with future years shown in the CTP. Future funding approvals are anticipated on an annual basis, consistent with normal Delaware legislative practices. [Click here to see letter from Delaware’s Congressional Delegation supporting the application.](#)

State and Local Planning: The I-95/SR1 Interchange Improvement Project is included in WILMAPCO’s (Wilmington Area Planning Council – MPO for New Castle County Delaware and Cecil County Maryland) [Transportation Improvement Program \(TIP\)](#), the [Statewide Transportation Improvement Program \(STIP\)](#) and the [Regional Transportation Plan \(RTP\)](#) – fiscally constrained long-range transportation plan). An administrative change, requiring 2 weeks or less, would be made to these documents, upon receipt of a TIGER Grant. [Click here to view the WILMAPCO Council’s resolution supporting this application.](#)

Financial Feasibility - Ability to Manage Grants/Stable and Reliable Commitments: DelDOT is experienced in managing FHWA funding, being the recipient of such funds for the State of Delaware. Delaware has a dedicated State Transportation Trust Fund (TTF) to fund its debt service and multi-modal operating, maintenance and capital programs. DelDOT’s conservative approach to funding capital projects includes a 50% “pay go” policy that results in excellent bond coverage factors and ratings by the agencies (Aa3 and AA+ unenhanced and AAA Insured Bonds).

Financial Feasibility - Construction Cost Estimate – Sources of Funds:

| TABLE 6: Construction Cost Estimate Sources of Funds | | |
|---|----------------|-------------------|
| Sources of Funds | Amount* | Percentage |
| Delaware TTF | \$ 26 | 15.0% |
| FHWA | \$ 104 | 60% |
| TIGER Funds | \$ 44 | 25% |
| Total | \$174 | 100.0% |

(\$ millions)

The construction cost estimate ([click here for Construction Cost Estimate and Backup Data](#)) uses major quantities from the 60% complete final design plans to develop the base construction cost, which includes 25% for contingencies, since all bid items have not been determined at this time. The total construction cost estimate also includes Miscellaneous Items¹ 1(15%), Contractor’s Construction Engineering¹ (5%), Contractor’s Initial Expense¹ (5%), Construction Contingencies¹ (change orders and claims) (10%) and Construction Engineering and Inspection² (15%). [⁽¹⁾ % of base construction cost / ⁽²⁾ % of total construction cost]

Viability and Completeness of Financing Package: The current DelDOT CTP includes \$169 million of the current construction cost estimate of \$174 million for the interchange improvements. The TIGER Grant would fund the March 2011 to February 2012 construction. DelDOT (State Transportation Trust Funds) and Federal Aid Highway Funds would fund construction in the



remainder of fiscal years 2012, 2013 and 2014 (\$130 million). The \$44 million in TIGER Grant Funds would allow DelDOT to reallocate the funds, currently programmed for the I-95/SR1 Interchange, and to restore other critical projects that have been cut from the capital program.

INNOVATION (SECONDARY SELECTION CRITERIA) - TECHNOLOGY

I-95 Mainline: The I-95 Fifth Lane Widening contract, completed in December 2008, provided a new CCTV camera, relocated an existing CCTV camera, and provided a new overheight detection system. It also provided communications infrastructure throughout the entire project area including conduit, fiber optic cable, and connection to the regional Consortium fiber on I-95. These devices are constructed and field integration is underway to make the devices operational.

A separate ITS deployment will provide two dynamic message signs (one in each direction on I-95), two CCTV cameras in the I-95/SR141 interchange, and nine traffic sensors located throughout the project area. These devices are currently being designed, with construction scheduled for completion in early 2010.

I-95/SR1 Interchange: The I-95/SR1 Interchange Improvements Project will include Intelligent Transportation System (ITS) devices which will allow DelDOT to provide real time traffic management services in the project area. The ITS elements will allow DelDOT to significantly enhance the operational performance of the I-95/SR1 interchange by providing the ability to detect incidents which impede free traffic flow, providing surveillance of incidents and overall traffic operations, and providing the ability to disseminate information to motorists.

The proposed ITS network for the project is consistent with DelDOT's ITS applications for similar interchanges in Delaware. The proposed devices include one dynamic message sign, ten traffic sensors, two new CCTV cameras, one relocated CCTV camera, and two roadway weather stations. A third CCTV camera has already been installed as part of the Mall Ring Road improvements. Communications infrastructure in the project area, including conduit and fiber optic cable, will also be included.

DelDOT Transportation Management Center (TMC): The DelDOT Transportation Management Center (TMC) is located in Smyrna and provides DelDOT with the ability to detect, manage, monitor and clear incidents statewide. The TMC includes control software and displays of all devices statewide. It is staffed 24 hour a day, seven days a week to manage traffic under all conditions. DelDOT has prepared operating scenarios to allow quick response from all DelDOT personnel, including instructions for contacting emergency response agencies. All roadside ITS devices are connected with the TMC, providing DelDOT the ability to make decisions to manage traffic based on real-time conditions.

INNOVATION (SECONDARY SELECTION CRITERIA) - APPROACHES

Project Delivery: DelDOT would intend to accelerate the construction schedule by using the A (contract bid items) + B (time to complete the construction, based on road user cost/day) procurement approach.

DelDOT successfully utilized the A+B procurement method on the I-95 Mainline 5th Lane Widening contract, which was completed on time in October 2008 (no assessment of liquidated damages or road user costs) and \$7 million under budget. The successful bidder completed the project on an



accelerated schedule of 544 calendar days, half the time of the second bidder (1,091 calendar days). The success of the project has been recognized at all levels, including as the East Coast’s Regional Winner of NASTO’s America’s Transportation Award and by AASHTO as one of the top 10 projects in the country.

The advantages gained by using the A+B method of bidding for the I-95/SR1 interchange project include:

- Shortened project duration;
- Reduced impact to the traveling public;
- Encouraged innovative construction techniques;
- Reduced Traffic Control Costs;
- Reduced impact on existing and anticipated extensive commercial and business development in the interchange area; and
- Promotion of public perception that consistent progress is being made on a daily basis.

The A+B bidding creates the situation where the contractor not only focuses on the low bid for the contract items, but also focuses on being creative in generating a working schedule. Constructing the I-95/SR1 interchange improvements, the most heavily traveled interchange in the region, in the shortest amount of time is of the utmost importance. The A+B bid approach encourages the contractor to be creative, in order to construct the project at a reduced cost, in the shortest amount of time.

Congestion Management and Safety Management:

DelDOT will provide congestion and safety management for the I-95/SR1 interchange both during construction and in full operation. A Transportation Management Plan (TMP) is currently being developed to maximize safety and minimize congestion. The TMP will implement the appropriate traffic operations strategies such as demand management, corridor/network management, work zone safety, incident management, traffic enforcement, and public outreach strategies. During full operation of the interchange, DelDOT will utilize the ITS network to detect incidents, manage clearing of the incidents, and disseminate appropriate information to motorists to minimize congestion and increase safety. DelDOT’s statewide Transportation Management Center (TMC) will manage this effort. In addition, DelDOT will work with the Transportation Management Team of Northern New Castle County, a group including emergency response and enforcement agencies, to update procedures to maximize efficiency and safety with respect to incident response, management and clearing.

PARTNERSHIP-INTEGRATION (SECONDARY SELECTION CRITERIA)

Involvement of Non-Federal Funds: The I-95/SR1 interchange improvements involve the following funding, assuming award of a TIGER Grant:

| TABLE 7: I-95/SR1 Interchange Improvements Funding | | |
|---|----------------|-------------------|
| Sources of Total Funds (PE, ROW, Construction) | Amount | Percentage |
| Delaware TTF | \$ 30.6 | 15.6% |
| FHWA | \$122.4 | 62.1% |
| TIGER Funds | \$ 44.0 | 22.3% |
| Total Project | \$197.0 | 100.0% |

* millions



Project cannot be readily and efficiently completed without Federal assistance: As a result of the current recession, DelDOT has reduced their capital program on three separate occasions. Delaware's dedicated Transportation Trust Fund experienced a significant decline in revenues. Gasoline tax revenues, document fees (sales tax on vehicle purchases), and registration fees continue to decline. DelDOT has not yet seen the bottom to the revenue decline. Increased federal funding, including opportunities such as the TIGER Grants, provides the only near-term solution for Delaware to maintain a bare bones capital program. The \$44 million in TIGER Grant Funds would allow DelDOT to reallocate the funds, currently programmed for the I-95/SR1 Interchange, and to restore other critical projects that have been cut from the capital program.

Jurisdictional and Stakeholder Collaboration: DelDOT has coordinated the I-95 Corridor Improvements Program, which includes the I-95/SR1 interchange improvements, with the Maryland Department of Transportation (MDOT) and the Maryland Transportation Authority (MdTA), through the Wilmington Area Planning Council (WILMAPCO). MDOT is a member of the Council, as is Cecil County (the Maryland county adjacent to the interchange) and New Castle County, Delaware (jurisdiction in which the I-95/SR1 interchange is located). The I-95 corridor improvements have also been coordinated with the Delaware River and Bay Authority (DRBA), the owners and operators of the Delaware Memorial Bridge, the connection to I-295 in New Jersey and the New Jersey Turnpike (click here to see the WILMAPCO Council Resolution supporting this application).

FEDERAL WAGE RATE REQUIREMENTS

To ensure conformance to federal wage rate requirements, DelDOT's Audit group makes unannounced periodic site visits to ARRA construction sites, to confirm workers and verify their assignments. During the quarterly project audits, the worker information gathered from the site visits is compared to actual contractor payroll, to verify that the payroll is accurate and to ensure that federal wage rates are paid according to labor categories.

In order to ensure that ARRA projects are conforming to federal regulations regarding workforce, wage rates, and Disadvantaged Business Enterprise (DBE) participation, DelDOT's Audit group conducts quarterly project audits and periodic unannounced worksite visits. The quarterly audits review expenditures, verifying adequate documentation to support those expenditures, and ensure that federal wage rates are met by reviewing contractor payroll. Conducting audits on a quarterly basis allows corrections to be implemented quickly, should concerns arise as a result of the audit. The periodic site visits confirm the workers actually employed on the job and the type of work accomplished by each worker, and assist in the confirmation of the use of DBEs and the conformance with federal wage rates. The DBE Program monitors timely payments to subcontractors and adherence to OJT goals on a monthly basis. [Click here for Federal Wage Rate Certification.](#)

NATIONAL ENVIRONMENTAL POLICY ACT REQUIREMENT

The Environmental Assessment for the project was issued in January 2005 and a Finding of No Significant Impact (FONSI) was issued by FHWA on March 2, 2005. A reevaluation was completed in June 2006 and FHWA concurred that the previously issued FONSI remained in effect (July 27, 2006). A second reevaluation, including air quality, was completed in February 2009 and FHWA concurred that the previously issued FONSI remained in effect. The project meets the Clean Air Act and 40 CFR 93.109 requirements.



ENVIRONMENTALLY RELATED FEDERAL, STATE AND LOCAL ACTIONS

Required permits from the Corps of Engineers (Department of the Army Individual Permit CENAP-OP-R-200300700-11) and the Delaware Department of Natural Resources and Environmental Control (Subaqueous Lands Permit: SP-014/06; Wetlands Permit: WE-388/06; and Water Quality Certification: WQ-389/06) have been secured for the I-95/SR1 interchange improvements. See *pages 13, 14 and 18* for additional environmental information.

PROTECTION OF CONFIDENTIAL BUSINESS INFORMATION

No confidential information is contained in this application.

PROJECT BENEFITS / REPORTING REQUIREMENTS

DelDOT will fully comply with the reporting and certification requirements described in the application requirements.

CERTIFICATION REQUIREMENTS

DelDOT will fully comply with the certification requirements of the Recovery Act to the extent applicable.