

THE BENEFITS OF TRANSPORTATION

THE SOLUTIONS STATE DOTS BRING TO PEOPLE AND THEIR COMMUNITIES



EXAMPLES OF STATE DOT PROJECTS FROM AROUND THE COUNTRY

The selection of state DOT projects below – covering everything from highways to rail and environmental mitigation efforts – showcases just some of the quality of life and economic benefits transportation investment provides to American communities large and small.



More examples from every state are available online at **benefits.transportation.org**.

THE BENEFITS OF TRANSPORTATION

Calculating the Benefits Transportation Infrastructure Investment Brings

Reducing travel times, generating higher levels of economic activity, and improving the environment all result from beefing up investments in the nation's transportation system.

When it comes to transportation projects, it's easy to get caught up in the numbers. For example, federal, state, and local governments spent \$441 billion on transportation infrastructure in 2017; an amount equal about 2.3 percent of the nation's gross domestic product. The largest component of that total, \$177 billion, went to highways, followed by water utilities, mass transit, and rail.

Those are numbers that are hard to grasp due to their sheer magnitude and relative lack of context. For instance: the price for a gallon of milk is clearly labeled on the grocery store shelf; the cost of a new car sitting on a dealership's lot is typically displayed on a label affixed to its windshield; and the cost for a haircut is stenciled on a barbershop's window.

That information derives from living in a market-based economy where the supply and demand for goods and services are determined through very clear price signals.

Where transportation infrastructure in concerned, there are no similar price signals to users of the system. While a project construction sign or web site might explain what is being invested, it does not always adequately describe what is being delivered in return.

Yet the benefit is there – and often larger than many might imagine. The Federal Highway Administration, for one, estimates that each dollar spent on road, highway, and bridge improvements results in an average benefit of \$5.20 in the form of reduced vehicle maintenance costs, reduced delays, reduced fuel consumption, improved safety, reduced road and bridge maintenance costs, and reduced emissions as a result of improved traffic flow.

Similarly, the American Public Transportation Association estimates that, over the long term, the total economic effect of "enhanced investment" in transit systems sustained over 20 years is in the range of 3.7 times the amount being spent annually.

That illustrates why we must look beyond the tangible products and technical aspects of our projects – such as steel, concrete, and equipment – to the fundamental purpose behind our work; the people served by the country's transportation network.

For the ultimate beneficiaries of the nation's transportation investments are American families, both as consumers from lower priced goods and as workers with better access to jobs.

To that end, this report illustrates the benefits generated by just a small sampling of the multitude of transportation infrastructure projects, large and small, completed over the last several years – showcasing how transportation investments allow people and goods to move safely and efficiently, while providing a high quality of life for all of our nation's citizens.

Want to know how state DOTs are benefiting your state? Visit benefits.transportation.org.

The Alaskan Way Viaduct/Tunnel Project

Cost: \$3.3 billion | Date Completed: 2019

The Problem/Challenge: Replacing a nearly 70-yearold elevated highway with a single two-mile-long double-decker tunnel designed to withstand strong earthquakes.

The Result/Benefits: Improved travel times and greater protection from earthquakes are the central benefits to the State Route 99 tunnel. SR 99 is one of only two northsouth highways through Seattle. It now travels underneath Seattle's downtown core inside the longest road tunnel in the U.S. and the largest-diameter single-bored tunnel in North America.

The tunnel replaced an elevated Alaskan Way Viaduct, which carried SR 99 above Seattle's waterfront for nearly seven decades. A 6.8 magnitude earthquake in 2001 damaged the viaduct, requiring extensive repairs to keep it functioning safely.

The Washington State Department of Transportation oversaw construction this state-of-the-art tunnel, designed to withstand an earthquake as powerful as a magnitude 9. Inside, sophisti-

cated ventilation systems keep fresh air moving. Heat sensors can detect a fire and trigger a deluge sprinkler system at the point of the fire. Intelligent traffic systems and a network of 300 cameras help keep traffic moving and monitor security. Emergency exits every 650 feet lead to a fire-safe emer-

t lead to a fire-safe emergency corridor equipped with its own ventilation system.

In the months after the SR 99 tunnel opened, the Washington State DOT demolished the Alaskan Way Viaduct, clearing the way for a re-imagined Seattle Waterfront. A new, multimodal surface street is under construction. There will be 20 acres of new park space and more than a mile of new shoreline views previously blocked by an elevated highway.

The SR 99 tunnel safely carries tens of thousands of vehicles every day underneath downtown Seattle. It pushed the limits of engineering, establishes a new standard for tunnel design and proves that new tunneling solutions are possible underneath large urban areas.











The Georgia PATH 400 Trail

Cost: \$28 million | Date Completed: First phase opened in 2015, second phase in 2018.

The Problem/Challenge: How to create more active transportation options for pedestrians and bicyclists in and around metropolitan Atlanta, using existing infrastructure where possible.

The Result/Benefits: PATH 400 provides a critical active transportation connection within the community, bringing together 8,000 residents within a 10-minute walking distance, while also providing direct access to the Buckhead and Lindbergh Metro Atlanta Regional Transit Authority (MARTA) stations within Metro Atlanta as well as the North Springs and Dunwoody stations through future phases.



The upshot of this project is that residents and visitors alike can enjoy greater connectivity to their destinations without relying on just motor vehicles to get around.

"There is no one solution for mobility for Georgia and Metro Atlanta. It is a multitude of approaches that have to play a role," noted Russell McMurry, commissioner of the Georgia Department of Transportation. "Along with keeping our infrastructure in good repair, Georgia DOT focuses on the future of mobility to keep Georgia competitive, both now and in the



years ahead. That's why we always keep an eye

on mobility enhancement through connectivity and transportation choice."

The Georgia DOT partnered with the PATH Foundation and Livable Buckhead to build this 5.2-mile pedestrian/bicycle greenway through the heart of Atlanta's north side, with the Georgia DOT using the right-of-way of PATH 400 and public land adjacent to two MARTA stations to do it; reclaiming what was previously a highway-only corridor and converting it into a multimodal trail.



Eller Drive/Intermodal Container Transfer Facility Overpass

Cost: \$42.5 million | Date Completed: 2016

The Problem/Challenge: Overhauling a roadway interchange just outside the main entrance to Port Everglades in Fort Lauderdale so it could not only handle more traffic volume, but to do so in a way that did not create congestion, interference between road/railroad freight movements, or harm to the environment.

The Result/Benefits: More efficient and safer freight movements – ones that did not impede motorist traffic – resulted from this overpass project.

Eller Drive connects the port directly to Interstate 595,

which in turn connects to Interstate 95, Interstate 75, Florida's Turnpike, and the Fort Lauderdale/Hollywood International Airport. The Eller Drive overpass and ramping system not only boosted access to that highway network, it incorporated a new bridge to provide at-grade separation for freight rail at the main access roadway into Port Everglades, helping eliminate traffic congestion. It also allows uninterrupted travel to and from the Port's cruise and container terminals, and is an integral connector for cruise traffic between Ft. Lauderdale, Hollywood International Airport, and Port Everglades

Finally, the construction project added storm water retention ponds, landscaping, and irrigation capabilities to the area to not only help protect the surrounding ecosystem but allow it to flourish as well.









The Utah Smart Transit Signal Priority Project

Cost: \$1 million | Date Completed: 2018

The Problem/Challenge: Traffic congestion affected the reliability of transit bus service along State Route 68 cutting through Salt Lake City.

The Result/Benefits: A 40 percent reduction in overall late bus arrivals for riders across the system, resulting from technology deployed by the Utah Department of Transportation versus the construction of additional roadway capacity, which would have further exacerbated traffic conditions.

Using interactive radio signals broadcast by the buses and 30 Dedicated Short Range Communication (DSRC) radios installed at traffic signals, the system detects when buses are running behind schedule and then grants additional "green light time" to buses at traffic signals so they can get back on schedule and meet the needs of Salt Lake City's ridership. As a result of installation of DSRC devices and implementation of technology in the transportation system, Utah now has a foundation in place to use the system for additional purposes. For example, the smart signal system now provides extra time for snow plows

so they can more effectively clear the roads to make them safer. The smart signal system will expand in the years to come, continually providing broader benefits to a safer, better integrated transportation system.











Wrong Way Driver Detection System

Cost: \$4 million | Date Completed: 2018

The Problem/Challenge: Combatting the problem of wrong-way driving after an increase in deadly crashes in 2016 and devising a system to alert law enforcement faster to locate and intercept wrong-way drivers.

The Results/Benefits: In January 2018, the Arizona Department of Transportation's wrong-way driver detection pilot system along Interstate 17 in Phoenix became operational; it is the first system in the nation to use thermal imaging for

detection of wrong-way vehicles. Thermal cameras were used for the primary detection at the ramp and mainline/freeway points of entry. The video clips from the cameras provide initial notification and subsequent tracking that allow Arizona DOT traffic operators and state troopers to visually verify and track the wrongway incursion. Combined with the thermal detection is enhanced driver-warning signage. Along with the

lower and oversized static "Wrong-Way" and "Do Not Enter" signs, this project added internally illuminated "Wrong-Way" signs with a flashing light emitting diode or LED border, providing an opportunity to notify the wrong-way driver and allow them to stop or self-correct before entering the main lanes of the freeway. The pilot project documented a significant number of vehicles that self-corrected on the exit ramp that may have been influenced by the placement of either the lighted signs or the oversized and lowered signs. The backbone of the detection pilot system is the decision support system, which will automatically deploy all countermeasures including the automatic positioning of closed circuit television cameras, activation of the lighted signs, the automatic population of warning messages to

upstream dynamic message signs, and activation of signals on upstream ramp meters to red to discourage new vehicles from entering the mainline. A public campaign — "Drive Aware, Get There" — supported efforts to educate drivers about the use of these countermeasures and how to respond appropriately. Data from the pilot project indicate a high success rate for self-corrections made on the exit ramp. During the data collection period, 109 incursions occurred within the pilot project limits. Of those incursions, 88 percent of vehicles self-correct-

ed on the exit ramp. Out of the 12 percent that did not self-correct on the ramp, only one resulted in an injury crash before law enforcement could intercept the entry.









Safe Routes to School

Cost: \$38 million | Date Completed: Ongoing

The Problem/Challenge: Improve safety, reduce traffic, and improve air quality near schools through a multidisciplinary approach focused on offering more alternative transportation choices, mainly via bicycle and pedestrian travel.

The Result/Benefits: Safe Routes to School aims to change the transportation habits of an entire generation by making it safer, easier, and more comfortable for students to walk and/or bike to school as well as in their daily lives. That's because only 17 percent of kids walk or bike to school today, versus nearly 50 percent in the 1960s, according to the National Center for Safe Routes to School.



Minnesota ranks third in the nation for its Safe Routes to School program, due in part to how it is funded with both federal and state dollars. The state's Safe Routes to School program is a partnership between Minnesota's departments of education, health, and transportation as well as local and national partners. The Minnesota DOT has awarded more than \$38 million in federal and state funds helping more than



450 Safe Routes plans and 140 infrastructure projects across the state since 2006. The key values driving this ongoing program are:

- Give all students the opportunity to walk and bicycle no matter their race, ethnicity, income level, age, ability or geographic location.
- Promote the health, academic, community, environmental, and independence-building benefits of walking and bicycling.
- Maintain safe walking and bicycling routes for use in all four seasons, to make walking and bicycling an easy choice for students.



The I-84 Waterbury Widening Project

Cost: \$330 million | Date Completed: 2019

The Problem/Challenge: Adding highway capacity while minimizing traffic disruptions and protecting the environment.

The Result/Benefits: Nearly 125,000 vehicles per day experienced only slight delays as the Connecticut Department of Transportation added a third highway lane to Interstate 84 near the town of Waterbury. Motorists gained additional time-saving convenience and greater overall safety with the addition of traffic signals, new highway lighting, and improved commuter parking lot designs that included access to bus stops. The Connecticut DOT also worked ecological preservation into the project as it relocated the Mad River and Beaver Pond Brook –



two bodies of water than run under I-84 – along with the addition of a pedestrian bridge over the Mad River. The project added a third travel lane to the highway, realigned the roadway, and reconfigured the interchange ramp by closing that portion of the interstate and re-routing traffic only at night while reducing the roadway width during peak hours to help ensure the traveling public could travel throughout the project – completing construction a year ahead of schedule.



Midwest Amtrak Route Overhaul Project

Cost: \$2 billion | Date Completed: 2017

The Problem/Challenge: Upgrading the most popular passenger rail line in the Midwest

The Result/Benefits: Faster trip times for commuters, as well as enhanced passenger amenities at select rail hubs, were the major benefits of this seven-year effort by the Illinois Department of Transportation to reconstruct 262 miles of track and facilities linking Chicago and St. Louis. The track improvements - on which the Illinois DOT worked with host railroad Union Pacific to complete – will allow Amtrak to eventually reach speeds of 110 mph, up from the typical 79 mph; enabling commuters and travelers to get to their destinations quicker. Dovetailing with that \$2 billion track upgrade effort, the Illinois DOT also overhauled the antiguated infrastructure and added modern conveniences to the Joliet Gateway Center; the first major rail station outside of Chicago along the Midwest Amtrak route to St. Louis. That \$51 million project re-built the 10,000-square foot station house that serves more than 1,000 commuters every day, as well as 60,000 annual riders on Amtrak's Texas Eagle and Lincoln Service trains. The new station also provides travelers with modern amenities, including new ticketing and baggage areas, rest rooms, retail space, and free Wi-Fi.







The Median Guard Cable Project

Cost: \$130,000 per mile to install and \$10,000 per mile per year to maintain Date Completed: Ongoing

The Problem/Challenge: Installing median cable barriers to reduce crossover crashes in Missouri.

The Result/Benefits: The Missouri Department of Transportation has installed more than 870 miles of guard cable since 2002. This has proven to be one of the most effective safety countermeasures ever deployed in Missouri, particularly along Interstates 70 and 44, which experienced 49 cross-median fatalities the year prior to the installation of median guard cable. The year after installation, cross-median fatalities dropped to three; a 94 percent decrease. Median guard cable prevents out-of-control cars and light trucks from "crossing over" the



median to potentially strike vehicles heading in the opposite direction. The system's steel cable and posts, when struck, effectively catch and decelerate vehicles, keeping them in the median.

While the median guard cable system is not designed to stop large trucks, there are many documented cases where it has. The Missouri DOT estimates that such median guard cable has saved more than 500 lives in Missouri since 2002 and prevented 1,100 serious injuries over the last decade.



The Route 72 Manahawkin Bay Bridges Project

Cost: \$319 million | Date Completed: 2019

The Problem/Challenge: Rehabilitating key traffic causeways while protecting the environment

The Result/Benefits: Improved travel time, multimodal access to recreational areas, and greater protection of the local ecology all resulted from the reconstruction of the Route 72 Manahawkin Bay Bridges connecting Stafford Township to Ship Bottom along the New Jersey shore. The New Jersey Department of Transportation partnered with the Federal Highway Administration to build a new second span and rehabilitate the original bridge to offer two lanes for vehicle traffic and full shoulders in each direction. The full shoul-

ders provide for a safe bicycling space and also as extra emergency coastal evacuation lanes. The agency also built a six-foot sidewalk across the old bridge span where one did not previously exist.

As part of this \$319 million bridge project, the New Jersey DOT partnered with the U.S. Fish and Wildlife Service on a \$9.6 million environmental project that enhanced Cedar Bonnet Island, a former dredge material storage site that is part of the Edwin B. Forsythe Wildlife Refuge. The environmental mitigation created wetlands, improved storm water basins in the ecologically sensitive Barnegat Bay watershed, and created the first public access to the island by building scenic walking trails.





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