4 Ways to Use New Transportation Technologies

The Strengthening Mobility and Revolutionizing Transportation (SMART) grant program provides funds to local governments to use advanced technologies to improve transportation efficiency and safety. The grant program funds demonstration projects for newer transportation technologies and is accepting applications for planning and prototyping (Stage 1 grants) through **July 12th, 2024**.

This is the last round of Stage 1 grants; upcoming SMART Stage 2 grants will allow those who received a grant in Stage 1 to apply for additional funds to expand their demonstration projects. The Local Infrastructure Hub library contains several resources on SMART grants, including winning Strategies, example winning applications, and bootcamp application resources.

Another grant program that encourages the use of new technologies is the Advanced Transportation Technologies and Innovative Mobility Deployment program, commonly known as ATTAIN. ATTAIN grants can be used for many of the same technologies as SMART grants and are expected to reopen in late fall 2024.

Because so many of the technologies that can be used for SMART and/or ATTAIN grants are new, their descriptions are often jargony or difficult to understand. Below the Local Infrastructure Hub used the list of previous SMART grant winners to put together some potential uses of eligible technologies as well as real life examples.

#1 If you want to improve transportation safety, you can:

- Install sensors that can tell when a vehicle, cyclist, or pedestrian is approaching
- Connect traffic lights with emergency vehicles to give them priority at intersections (using Cellular Vehicle-to-Everything (C-V2X) technologies)
- Use drones to collect speed data and implement real time speed management measures
- Install automated features on transit vehicles to prevent collisions or so they can more accurately respond in changing weather conditions
- Use drones to provide emergency or medical response supplies
- Use artificial intelligence and video analytics to better understand and respond to safety risks

Real Life Examples

The city of **Las Vegas, Nevada** is going to test sensors that passively detect pedestrians and respond by changing traffic lights automatically at several street crossings in popular pedestrian areas.

Cleveland, Ohio received a grant in 2022 to design and pilot a traffic signal system to address safety issues, as well as improve emergency response times.The project includes partnerships with Bike Cleveland and Clevelanders for PublicTransit. View the full case study and winning application.

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#2 If you want to make transportation more accessible, you can:

- Install traffic signals with accessible features, for example for people who are blind or deaf
- Create an integrated platform (website, app, etc.) for accessible transportation options
- Add indoor navigation, including accessibility information (ex. location of elevators), into transit mapping and navigation services to help passengers find where to transfer within a station
- Use self-driving vehicles to provide first- and last-mile microtransit that takes people from home to their nearest transit station and vice versa

Real Life Examples

The **San Francisco** Bay Area Rapid Transit (BART) District is going to create "digital wayfinding aids" or navigation tools for inside their transit stations that provide important information for people with disabilities, such as how to navigate within a station to make a transfer or where to find an elevator.

The city of **Talladega, Alabama** is working with the Alabama Institute for the Deaf and Blind to install traffic signals with accessible features, like noise and visual signals that tell pedestrians when it is safe to cross.

#3 If you want to reduce congestion, you can:

- Install traffic lights that respond to traffic conditions in real time
- Add traffic signals to freeway on-ramps to better control how many vehicles enter the freeway and at what speed
- Create a virtual model ("digital twin") to use for infrastructure simulations and planning
- Install "smart" counters that can collect detailed data about traffic, vehicle types, vehicle weights, etc. in addition to basic data about how many cars drive over

Real Life Examples

The **Colorado Department of Transportation** is adding automated ramp metering to highway on-ramps. These are traffic signals that limit how many vehicles can get on the highway at a time. These ramp metering signals will be able to adapt to real-time traffic conditions in order to reduce congestion associated with vehicles merging into traffic, which can create pinch points for traffic flow.

The city of **Philadelphia, Pennsylvania** received a grant in 2022 to implement advanced traffic sensors, smart traffic cameras, and upgrade signal technology. They used the grant to collect anonymous data on travel times, travel patterns, and routing to improve safety and traffic flow while also reducing congestion. View the [winning application](#).

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#4 If you want to improve transit passengers' experience, you can:

- Develop data standards and connected data systems, either between multiple city transit systems (ex. a bus system and a subway system) or between jurisdictions (ex. a transit system for a city and another for a neighboring suburb)
- Allow buses to "jump the queue" at intersections by using Cellular Vehicle-to-Everything (C-V2X) technologies

Real Life Example

The **Chicago Transit Authority** is piloting a "bus queue jump" at 10 intersections that will detect buses as they approach and adjust signals accordingly.

APPENDIX A: Full List of SMART-eligible technologies from the 2024 SMART NOFO

Coordinated Automation	Use of automated transportation and autonomous vehicles to minimize the impact on the accessibility of any other user group or mode of travel.
Connected Vehicles	Vehicles that send and receive information regarding vehicle movements in the network and use vehicle-to-vehicle and vehicle-to-everything communications to provide advanced and reliable connectivity.
Intelligent, Sensor-based Infrastructure	Deployment and use of a collective intelligent infrastructure that allows sensors to collect and report real-time data to inform everyday transportation-related operations and performance.
Systems Integration	Integration of intelligent transportation systems with other existing systems and other advanced transportation technologies.
Commerce Delivery and Logistics	Innovative data and technological solutions supporting efficient goods movement, such as connected vehicle probe data, road weather data, or global positioning data to improve on-time pickup and delivery, improved travel time reliability, reduced fuel consumption and emissions, and reduced labor and vehicle maintenance costs.

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APPENDIX A: Full List of SMART-eligible technologies from the **2024 SMART NOFO**, cont.	
Leveraging Use of Innovative Aviation Technology	Leveraging the use of innovative aviation technologies, such as unmanned aircraft systems, to support transportation safety and efficiencies, including traffic monitoring and infrastructure inspection.
Smart Grid	Developing a programmable and efficient energy transmission and distribution system to support the adoption or expansion of energy capture, electric vehicle deployment, or freight or commercial fleet fuel efficiency.
Smart Technology Traffic Signals	Improving the active management and functioning of traffic signals, including through: • Use of automated traffic signal performance measures; • Implementing strategies, activities, and projects that support active management of traffic signal operations, including through optimization of corridor timing; improved vehicle, pedestrian, and bicycle detection at traffic signals; or the use of connected vehicle technologies; • Replacement of outdated traffic signals; or • For an eligible entity serving a population of less than 500,000, paying the costs of temporary staffing hours dedicated to updating traffic signal technology