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**MEMORANDUM**

October 24, 2017

**TO:** Members of the Transportation Legislation Review Committee  
**FROM:** Ryan Long, Fiscal Analyst, 303-866-2066  
**SUBJECT:** Use of Communication and Technology on Colorado's Roadways

**Summary**

This memorandum provides an overview of travel information available to drivers in Colorado. It also outlines the RoadX program in the Colorado Department of Transportation, which seeks to integrate emerging technologies into Colorado's roadways.

**Travel Information Available to Drivers**

The Transportation Systems Management and Operations Division within the Colorado Department of Transportation (CDOT) maintains information systems that provide drivers with real-time travel information through four main communication methods.

- [COtrip.org](http://COtrip.org) – This website displays interactive maps, route information, travel alerts, weather conditions, construction information, and other various alerts for drivers.
- **511** – Drivers can call 511 to receive real-time road and weather conditions; construction updates; special events; travel times; and connections to similar services in nearby states.
- **CDOT smartphone app** – This mobile application was developed through a public-private partnership<sup>1</sup> and provides drivers with real-time traffic information.
- **Variable message signs** – These electronic signs are posted on state highways and provide real-time travel information on road closures, alternative routes, and road conditions.

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<sup>1</sup> A public-private partnership occurs when a government entity contracts with a private entity to design, finance, construct, operate, or maintain an infrastructure project. More information on public-private partnerships can be found [here](#).

CDOT collects real-time travel information through various means, including: closed circuit television; road weather information systems; ramp meters; travel time readers using toll transponders; radar; and crash data. These data are shared with CDOT regions, a variety of local governments, and law enforcement agencies.

**Telecommunications.** CDOT administers a fiber optic telecommunications “backbone” along several highways in Colorado. CDOT uses this transmission line to operate its Intelligent Transportation Systems (ITS) infrastructure to gather data, which the department uses to manage traffic and traffic incidents while providing real-time information to the traveling public. Partners, such as institutions of higher education, K-12 education, emergency services, local transportation agencies, and tertiary partners also use the transmission line. For example, CDOT has provided high-speed connectivity to 18 school districts and has a fiber optic lease agreement with Comcast for fiber usage along I-70 between Golden and Vail.

## RoadX Program

RoadX is a CDOT program tasked with integrating emerging technologies into Colorado’s roadways. Its mission is to use real-time data to relieve congestion, implement technology to warn motorists of traffic conditions, and prepare infrastructure for connected vehicles. The current five-year plan for RoadX allocates \$90 million to the following categories:

- projects - \$54 million;
- infrastructure - \$30 million; and
- planning and policy - \$6 million.

The Transportation Commission, which consists of 11 nonpartisan commissioners, has the authority to spend state transportation revenue and pays for RoadX through allocations from the State Highway Fund and federal reimbursements for eligible expenditures. Further information on RoadX can be found [here](#). Current Road X projects are described below.

**Smart I-25.** The goal of the Smart I-25 program is to upgrade the software and traffic sensors that monitor traffic on northbound I-25 between Ridgegate Parkway and University Boulevard. CDOT will use these upgrades to adjust the timing of meter lights on highway on-ramps and nearby street lights, with the goal of controlling the flow of traffic on I-25. The Victoria State Department of Transportation in Melbourne, Australia, first developed and implemented this technology. The total anticipated investment in this project is about \$7 million, with an expected completion date in the summer of 2018.

**Smart 70.** This project is intended to create a connected vehicle environment along the I-70 mountain corridor, with the goal of providing drivers with real-time data related to road and weather conditions. Initially, communication linkages between vehicles will occur through a smartphone app. CDOT has partnered with the international mapping firm HERE for this project. The total anticipated investment in this project is \$10 million.

**Smart truck parking.** This project integrates existing parking facilities into a Truck Parking Information Management System, which uses detection and cloud-based software that can report available parking spots to truck drivers. The anticipated investment in this project is \$9 million. CDOT is planning to begin construction in January 2018, with operations commencing in December 2019.

***Bicycle and Pedestrian Challenge.*** RoadX worked in partnership with the Colorado Innovation Network, a division of the Office of Economic Development and International Trade, to solicit ideas for technological solutions to protect bicyclists and pedestrians in Colorado. A total of \$500,000 was awarded to winners to assist in the development of actionable concepts.

***Panasonic partnership.*** CDOT has partnered with Panasonic to create an ecosystem for smart vehicles, autonomous cars, and infrastructure to share data on information about roadway and safety conditions instantaneously between cars. Data will eventually be shared among dedicated short road communications devices that will be installed in all new cars by 2020.

***Hyperloop One.*** Hyperloop One is proposing to build magnetic-levitation technology to carry passengers at speeds of up to 700 mph. As of September 2017, Colorado was chosen as one of ten winners of its Hyperloop One Global Challenge, which was created to identify the strongest possible Hyperloop routes in the world. Hyperloop One and CDOT, in conjunction with the firm AECOM, will enter a public-private partnership to do a feasibility study in Colorado that considers a route from Cheyenne, Wyoming, to Pueblo, Colorado.