Boston’s Unique Park&Pedal Program Is Successful and is Expanding

Initiated by Private Company in Cooperation with State Environmental and Transportation Officials

Boston’s successful Park&Pedal program added an additional 15 parking locations (hubs) to the existing four locations, providing more opportunities to commuters and other vehicle trip-makers to park their vehicle for free at a convenient location along the way. They then use a bicycle to complete their trip to downtown Boston or another activity center.

Participants save parking costs and reduce traffic congestion and vehicle emissions, while also getting some exercise.

The Park&Pedal program was conceived and planned by David Montague of Montague Bikes. At its initiation on July 31, 2015, representatives from the state departments of energy and environmental affairs, transportation, and conservation and recreation expressed their support for Park&Pedal. The program opened with four parking hubs.

Working collaboratively, the program’s creator, state officials, local businesses, non-profit organizations, and others, strategically located parking hubs near the City of Boston to start building the Park&Pedal network.

“Park&Pedal removes two key barriers that people face when considering riding to work, by allowing them to choose how far to ride, and where they feel comfortable riding,” said Montague, who parked and pedaled to work for more than 20 years.

Boston area transportation management associations (TMAs) are integrating Park&Pedal into their alternative commute and incentive plans, delivering the

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Final Rule on Transportation Planning Published by FHWA and FTA

Implements Changes to Planning Process Established by MAP-21 and the FAST Act

Changes to the planning process in the Final Rule on Statewide and Nonmetropolitan Transportation Planning and Metropolitan Transportation Planning, published on May 27, 2016, include:

- Requiring a performance-based approach to planning;
- A new emphasis on the nonmetropolitan transportation planning process, by requiring states to have a higher level of involvement with nonmetropolitan local officials and providing a process for creating regional transportation planning organizations;
- Adding a structural change to the membership of large metropolitan planning organizations (MPOs) to include transit provider representation;
- Adding a framework for voluntary scenario planning; and
- Implementing new authority for integrating the planning and environmental review processes as well as programmatic mitigation plans.

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AASHTO Committee Adopts Resolution Directing the Development of More Flexible Highway and Street Design Guidance

Calls for the Next Update to AASHTO’s Design Guidelines, Scheduled for Release in 2018, to Improve its Addressing of Multi-Modal Issues

The AASHTO (American Association of State Highway and Transportation Officials) Standing Committee on Highways approved a resolution during its annual spring meeting that calls for the next update to its design guidelines to address multi-modal issues more comprehensively. This committee is made up of engineers from various state DOTs, and brings together best-practices expertise from around the nation.

AASHTO’s Green Book (formally known as A Policy on Geometric Design of Highways and Streets) consists of research-based, peer-developed guidance that serves as the basis for the design of roads on the national highway system, as well as many state and local roads. An update to the Green Book is currently under development.

“Multi-modal design philosophies have been described using a variety of names, including context sensitive solutions; practical design and complete streets,” said Bud Wright, AASHTO executive director.

“Regardless of the name, the ultimate goal is always to design a safe transportation system that supports a greater quality of life and robust economy.”

AASHTO told the Urban Transportation Monitor that typically, the Green Book is updated every 6 years to eight years. The next edition of the AASHTO Green Book is tentatively scheduled for release in 2018, but the exact release date will be determined by a new National Cooperative Highway Research Program (NCHRP) research project that will get underway in the next few months.

While the current Green Book provides designers and engineers with the flexibility to implement a wide range of geometric designs, AASHTO suggests the following documents (published by AASHTO) are effective in addressing multi-modal street design issues in the interim:


Documents produced by other organizations such as the Federal Highway Administration (FHWA), Institute for Transportation Engineers (ITE), and the National Association of City Transportation Officials (NACTO) can provide additional ideas for solutions to transportation issues.

The AASHTO Technical Committee on Geometric Design will lead the technical effort to enhance existing flexibility and provide additional guidance in the revised AASHTO Green Book from the results of various NCHRP research projects currently underway, including the one mentioned above, as well as other research projects.

Once the technical committee finalizes its draft revisions, the subcommittee on design (made up of the design engineers from every AASHTO member department) will be formally balloted. Comments will be addressed, and then the Standing Committee on Highways (made up of the chief engineers from each AASHTO member department) will review and ballot the document. The AASHTO member departments include departments of transportation in all 50 states, the District of Columbia, and Puerto Rico.

For more information, contact Tony Dorsey, AASHTO, email: tدورsey@asahhto.org.
Oregon DOT to Apply Unique Channelizing Device to Establish Clear Path for Bicyclists in Work Zone

Typical Application When Work Area is Along the Shoulder or Edge of Lane

The Oregon Department of Transportation (ODOT) is planning to apply a lightweight plastic channelizing device, officially named a “Bicycle Channelizing Device (BCD)” to direct or guide bicycles through a work zone. The intent with the BCD is to establish a clear path for bicyclists to follow that keeps them safely out of the work area. Work taking place along the shoulder or edge of a lane that requires bicyclists to shift is a typical location for a BCD.

ODOT recently developed standard guidelines for their BCD. Some of the specifications included in the guidelines include that the BCD:

- must be made of tough, durable, low-density polyethylene or similar materials that will resist shattering or separation into multiple parts if struck by vehicular traffic;
- must accommodate a method for adding and removing temporary ballast of either water or sand;
- shall be free standing and not require outriggers or other braces that would protrude into the bicycle pathway;
- is interlocking, stable, and non-flexible. When individual segments are connected together as a system, the system must be able to turn a 90 degree angle within a radius of approximately 25 feet.

In addition each BCD unit shall be furnished in either orange or white so that the colors can be alternated through the work zone. The top surface of the unit shall be no lower than 12 inches and no higher than 24 inches above the ground, with the top of the BCD parallel to the bottom.

At this time, ODOT is still developing applications for the use of BCD. They are looking at placement details, length-of-need criteria, supplementary signing and/or pavement markings, etc. As these details develop and become public information, they will likely be published in the ODOT Traffic Control Plans Design Manual, and within the ODOT Traffic Standard Drawings, under the Temporary Traffic Control TM800 Series.

For more information, contact Scott M. McCanna, state work zone engineer, tel. (503) 986–3788, email: scott.m.mccanna@odot.state.or.us

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Final Rule on Transportation Planning

The Rule implements the changes to the planning process established by the Moving Ahead for Progress in the 21st Century (MAP-21) Act and the Fixing America’s Surface Transportation (FAST) Act. The changes make the regulations consistent with current statutory requirements.

MAP-21 transformed the federal aid program by establishing new requirements for performance management and performance-based planning and programming to ensure the most efficient investment of federal transportation funds. The FAST Act continued the performance management and performance-based planning and programming requirements of MAP-21 with minor changes.

The final rule is the sixth in a series of rules that the Federal Highway Administration and the Federal Transit Administration are issuing to establish the performance management framework introduced by MAP-21 and continued by the FAST Act. FHWA has published:

- Final Rules that established safety performance measures and integrated performance management into the Highway Safety Improvement Program (March 2016)
- A Notice of Proposed Rulemaking (NPRM) to propose performance measures to assess the condition of bridges and pavements (January 2015)
- A NPRM proposing a process for the development of State Asset Management Plans (February 2015)
- A System Performance/Freight/Congestion Mitigation and Air Quality Performance Measures NPRM, with a comment period open until August 20, 2016 (April 2016).
- In addition the FTA has published NPRMs to propose the requirements for the Public Transportation Agency Safety Plan (February 2016) and on Transit Asset Management to establish performance measures to assess the state of good repair of transit agency vehicles and facilities and equipment. (September 2015).

For more information, the following site contains the full version of the Final Rule: https://www.transit.dot.gov/regulations-and-guidance/transportation-planning/final-rule-state-wide-and-nonmetropolitan
Colorado DOT’s Innovative RoadX Program Selects Consultants, Solicits Ideas

*Selection of Consultants is First Step in an Ongoing Request for Industry Involvement*

Earlier this month the Colorado Department of Transportation (CDOT) selected AECOM, Atkins and CH2M to participate in their RoadX program out of 16 firms that submitted proposals. CDOT considers the selection of the consultants as the first step in an ongoing request for industry involvement.

RoadX is Colorado’s effort to be “a national leader in using innovative technology” to improve their transportation system. CDOT’s mission is to “partner with public and industry partners to make Colorado one of the most technologically advanced transportation systems in the nation, and a leader in safety and reliability.”

CDOT and the RoadX Program are encouraging individuals and teams to submit ideas that “explore using innovation and technology to improve the safety, efficiency and reliability of Colorado’s transportation system” to dot_roadx@state.co.us.

The Urban Transportation Monitor asked CDOT questions about the RoadX program. Peter Kozinski and Ryan Rice provided answers to the questions below:

**Q. Are technological solutions that will emerge from the RoadX program intended to supplement CDOT’s interstate and arterial capacity improvement program i.e. add capacity through construction, and not replace the capacity improvement program?**

**A.** RoadX is intended to drive new thinking about how we add capacity and improve mobility on our roadways. For instance an upcoming project on our mainline I-25 through central Denver, one where we will be “upgrading” our ramp metering and the algorithms to increase the capacity of our roads effectively, may have the end result of effectively adding a lane’s worth of capacity through improved technology. That said, there are certainly corridors in Colorado (specifically I-25 and I-70) that continue to need additional capacity improvements. Another element of RoadX will be to develop the modeling that can account for the impacts of a connected/autonomous future as we move forward with planning for capacity improvements.

**Q. Is the intent to apply the technological solutions along existing interstate freeways as well, not only new facilities such as managed lanes?**

**A.** We absolutely will be looking at how to apply the technological solutions along existing interstate freeways. Our first two projects, I-70 Mountain Connected Vehicles (where we will be piloting cellular and dedicated short range radio technologies for vehicle-to-vehicle and vehicle-to-infrastructure communication) and I-25 Managed Motorways apply technology solutions to two of our most challenging corridors. Upcoming efforts in transport/freight and rural road safety will also be focused on existing highways. Over time, we also plan to look at how we utilize our managed lanes to facilitate a broader environment for connected and autonomous vehicles.

**Q. How will integrated corridor management (ICM) fit in with the RoadX Program?**

**A.** This is a significant element for both RoadX and our Transportation Systems Management and Operations division. We are working collectively on how we focus on operations management in corridors and leveraging technology to facilitate the improved reliability and response to incidents. For instance, we are deploying Active Travel Management (ATM) signage in our US 36 corridor to manage the flow of traffic more effectively. Additionally recently we have deployed the NICE video system which uses advanced video technology to assist with incident detection and response. We have focused on Traffic Incident Management (TIM) training, working with our law enforcement partners and in the last year training 20 percent of responders. Lastly we are engaging actively in how we use data analytics as part of how we manage traffic operations.

**Q. What is the desired schedule to have in place a number of technological solutions – how many years from today?**

**A.** Our focus is rapid deployment of technology pilots that we then can deploy on a larger scale. So our goal is within the next five years, starting now.

**Q. How does the RoadX program differ from the typical Intelligent Transportation Systems applications such as ramp metering, speed harmonization, incident management schemes (variable message signs and ICM), congestion pricing, etc.?**

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Boston’s Unique Park&Pedal Program Is Successful

and incentive plans, delivering the program to the 400,000+ employees they service in the metro area. The TMAs join other employers interested in incorporating Park&Pedal into their incentive plans, including Harvard University. Montague told the Urban Transportation Monitor the key factors used when trying to find possible parking hubs were:

- Existing, underutilized weekday parking
- Ideally located between 3510 miles from area of employment
- Proximity to lower stress bike path/lanes
- Easy access from/proximity to congested roadways.

Approximately 11 of their 19 locations have access to bike paths/lanes. The hubs typically consist of parking spaces on lots that are underutilized. Park&Pedal parking is free. Montague Bikes have helped a number of different towns, cities, states, and private retailers install Park&Pedal programs.

When asked “what advice would you give other cities that might be interested in starting a similar program?” Montague said “I would suggest cities and countries review the www.parkandpedal.org website. We are happy to speak with them by phone or email to share our experience here in Boston. We have found that Park&Pedal offers a tremendous return on investment because the amount “invested” is so small: due to the fact that we use existing parking, the only thing that costs money is signs, paint (we like to paint the spaces green to differentiate them) and building awareness.”

Montague added: “We also will be encouraging private companies to consider Park&Pedal programs for their employees – one high tech company in Kendall Square (next to MIT in Boston) pays $400 for one parking space for one employee per month.” He explained “We suggest they open their own Park&Pedal lot an appropriate distance from their offices that costs them $50 per space per month, and use part of the $350/month savings to incentivize their employees to Park&Pedal, and keep some to operate the program. In this case, everyone wins, healthy and happy employees cost less in health care; and congestion, parking, and emissions near the office are improved.”

For more information, contact David Montague, tel. (800) 736-5348, email: dmontague@parkandpedal.org, or visit http://www.parkandpedal.org.

Colorado DOT’s Innovative RoadX Program

A. In many ways it takes the ITS applications and broadens them into a broader program that drives a particular focus on how technology transforms our transportation system. While many go straight to the connected, automated and ultimately autonomous vehicle future and what those vehicles can do, we believe through RoadX, car manufacturers, departments of transportation, technology partners and others will be focused on how to maximize the benefits of that future, collaborating on intelligent infrastructure, transformative multi-modal, bicycle and pedestrian technologies and the data platforms to ensure there is an autonomous transportation system and not just a vehicle.

Q. Since there is significant uncertainty among experts on the capacity increases and increased vehicle miles traveled due to connected vehicles/autonomous vehicles (CV/AV), as well as the rate of absorption of CV/AVs over time, how will the benefits and disbenefits of CV/AVs be taken into consideration?

A. We agree there is some uncertainty and because of that, as a department of transportation, we could sit and wait to see how the future plays out. However, in Colorado, we have decided that we want to embrace the future and prepare ourselves for the inevitability of the CV/AV future. How? We focus on creating a nimble organization that can respond to those changes. We create the data platforms and tools that can respond nimly and adapt and engage in this future. We create and build planning tools that can begin to model this future (taking into account the variety of uncertainty). We begin planning for the workforce of the future and the skill sets (data analytics, enhanced operations, software development, etc.) that will evolve our employees in getting ready for this future so we are leading and not waiting.

Q. What role will existing and future managed lanes play?

A. Colorado has focused on the development of managed lanes with the focus that through tolling we ensure that there are lanes that flow reliably into the future. We are planning for how we turn to technology as a method to manage that reliability - perhaps dedicating lanes to CV/AV vehicles.

Q. Since many consider the provision of additional measures to increase highway capacity (physically and operationally) as not sustainable in the long run, what components of RoadX are addressing sustainable solutions?

A. To quote our executive director, we might be reaching a point where we are at “peak road.” What is meant by this is that due to the advent of CV/AV technology we may be able to address capacity issues due to increased throughput and elimination of crashes, perhaps we can add additional capacity with a bit of paint - restriping the roads because 12-foot lanes may no longer be necessary due to the crash-control of connected vehicles. In Colorado we are also actively looking at how you engage mobility as a service, specifically leveraging shared services like Uber or Lyft to leverage use of our transit system, again focusing on broader sustainable mobility. When you put these thoughts together, they also have the potential to create more sustainable land-use strategies. Lastly, we are also exploring sustainability as it relates to the evolution of the EV (electronic vehicle) future and how our infrastructure supports potential charging and other services.

For more information, contact Amy Ford, Director of Communications, tel. (303) 757-9362, email: amy.ford@state.co.us, The RoadX website: https://www.codot.gov/programs/roadx.
Five Best Practices for Using Technology in Mobility Management

Derek Edwards, Associate and Project Manager, CS Software, Cambridge Systematics

Transportation agencies feel a deep commitment to improve the mobility of citizens who face transportation challenges, such as people with disabilities or those with financial or age-related limitations. Yet, fulfilling this commitment can be difficult.

First, information about transportation needs is widely dispersed not only among target populations, but also through many medical, social service and community organizations. Knowledge gaps are simply a fact of life.

Second, while public transportation agencies typically provide targeted services for those who face mobility problems, additional services may be available from dozens of other specialized groups such as shopping center shuttles, dialysis transports or volunteer-operated minivans that provide rides to and from the nearest hospital. This too can become a communications nightmare.

As a result, coordinating services is a constant challenge, particularly when most volunteer and social service agencies are operating under tight budgets with limited staff. While commercial transportation scheduling systems can address some of these problems, typically they are very expensive and require an investment in resources (time, money, personnel, training) that goes far beyond what these agencies can bear. To address these complex issues, mobility managers are moving toward a different approach—effective, multi-agency partnership and collaboration supported by inexpensive, open source software.

Open Source Software and its Applications

A growing number of transportation agencies recognize open source software (OSS) as a key strategy in achieving their improvement initiatives. Open source software is typically available free of charge without any license fees and can be modified or tailored to meet the agency’s specific needs. In addition, improvements made by one agency can be shared freely with other agencies, making service and operations better for everyone.

Early adoption of OSS is varied and widespread. New York, Seattle and Washington D.C. rely on OneBusAway to deliver real-time passenger information. Denver is revamping its trip planner to use the OpenTripPlanner platform. We understand that in Portland, Tri-Met (the tri-county metropolitan transportation district of Oregon) built its geographic information system infrastructure on open source tools and technologies. These platforms and products typically provide web and mobile interfaces for end users, along with application programming interfaces (APIs) that make the data available to custom and third-party applications.

For mobility managers, the RidePilot dispatching and coordination tool offers a ready platform for improving the level of coordination and operational efficiency of services, while the 1-Click platform provides an integrated trip planning and booking capability now in use in six U.S. cities.

The Role of Partnerships and Technology

Technology cannot accomplish anything without effective collaboration. When agencies with differing missions and diverse objectives work together to identify common transportation services goals, they are more likely to experience positive results. The Northeast Florida Mobility Coalition represents a great example. Covering seven highly populated...
Florida counties, many of which have substantial aging populations, the coalition brought together a wide variety of organizations to achieve three goals: greater leverage through teamwork, enhanced service availability and accessibility, and improved marketing/outreach to the target population. The coalition, which has been working to improve mobility management for more than a decade, relies heavily on input from its partnerships. This group adopted OSS as a key element of its strategy because the lower cost has enabled it to invest in coordinated and integrated technological regional planning tools.

Five Best Practices

It is not enough to cite technology as the sole foundation for an effective mobility management program. Teamwork and collaboration also play key roles. For maximum success in delivering best of class service, initiate and follow these five people-centered practices for using technology in mobility management:

Bring all parties to the table. The emphasis is on diverse viewpoints that reflect an equally diverse populace. Perhaps most important: the travelers who face mobility challenges must have a seat at the team’s table because it is vital to listen to those who are most immediately affected. They may have the best insight on needed improvements. It can be a tightrope walk, however, because not everyone—agencies or end users—will get what they want at the outset. Yet, it’s important to choose a path and work to keep everyone aligned and engaged.

Build regional teams. Begin by contacting peer representatives from the diverse community agencies, and show them how working together is in their best interests. Seek to identify common ground focusing on transportation and mobility issues until clear, common objectives are agreed upon. Maintain the interest of all parties by starting with small, achievable projects, and continue to team-build from there. At the same time, remember to reach out to other groups that have achieved success, and build on what they learned.

Use open source tools. Take advantage of existing open source mobility management software. Find a trusted technology partner who can help tailor the software to meet the region’s common objectives. Locate and contact other adopters of the software platform to learn the strengths of the system. Identify ways to share the cost of enhancements that will benefit all users.

Go step-by-step. Every project needs a long-term plan and vision, but it’s important to take small steps and demonstrate progress and success along the way. Get something deployed and in use quickly, and maintain open communication so all parties can provide feedback on what works well and what can be improved. Most important, act on the feedback received, and keep the needs of travelers in the cross-hairs at all times. When agencies demonstrate that their projects are responsive to the needs of the stakeholders and have a meaningful impact on travelers, everyone will stay engaged and work to make things better. In addition, don’t be afraid to change the long-term plan along the way because people often change their minds about what they really need once working software has been implemented.

Plan for the long term. Whatever the goals of the agency are, it is essential to have a plan that supports continued improvement and enhancement over time. Once the plan is in place, regularly communicate and demonstrate accomplishments to interested parties. Reach out to the national mobility management community to share the lessons learned and exchange ideas and software with others. Look for opportunities to leverage funds from federal, state or private organizations to maintain the program’s momentum.

Eye on the Future

Technology developments will continue to evolve over time and offer greater opportunities to deliver transportation services tailored to the needs of diverse communities. Using OSS as the foundation for technological enhancements creates new and expanded capabilities, more flexibility, improved efficiency and reduced costs. While technology will lay the groundwork, proven results occur when stakeholders work together by listening, planning, and collaborating in ways that result in enhanced rider-centered outcomes.

About the Author

Derek Edwards is an associate and project manager, CS Software, for Cambridge Systematics, Cambridge, MA. Cambridge Systematics leverages technology and ingenuity to advance the world of transportation including movement of people and goods, software design and development of partnerships. For more information, call (617) 354-0167 or visit www.camsys.com.
Supreme Court of Ohio Weighs In on Issues of Improvements, Maintenance and Current Standards

Last October the Ohio Supreme Court, by a margin of 4 to 3, held that decisions made by the Ohio Department of Transport (ODOT) regarding improvements, such as which sections of highway to improve; which not to improve; what types of improvements to make; and whether or not to improve surrounding areas, were protected by discretionary-function immunity. However, in executing decisions around improvements to a highway, ODOT had a duty to act in accordance with current construction standards, and it may be subject to liability should it fail to meet those standards.

The dissenting opinion argued that, on the contrary, this case was about the standards to which ODOT was held in implementing its decisions. Further, it argued that when ODOT undertook to make an improvement, the improvement should conform to its own standards contained in its own current Location and Design Manual. It argued that the majority opinion failed to answer the central issue in the case, which was: When does ODOT have a duty to live up to its own standards?

The majority reasoned that this case did not turn upon how ODOT chose to implement a decision, but on the three separate decisions themselves made by ODOT: its decision to improve one portion of the highway, its decision not to improve other portions of the highway, and its decision regarding the type of improvement to make. The majority reaffirmed prior holdings by the Supreme Court that had established ODOT’s immunity from liability for damages arising from its decisions regarding these particular issues.

The majority also emphasized that although the discretionary function of taking decisions carried immunity, immunity did not automatically extend to acts of implementation.

The case arose from a fatal accident in 2009 where a passenger was killed in a collision at an intersection between two state routes. Advance-warning signs and flashing lights were installed post construction of the highway, in 2002 and 2005, in response to safety concerns about the intersection. The fatal accident took place after these improvements.

The trial court granted ODOT’s motion. It found that at the time of construction ODOT’s Manual of Uniform Traffic Control Devices did not require it to install a three-light signal; and ODOT’s later decision to install flashing lights did not violate the requirements of the manual.

Initially the trial court denied summary judgment on the claim of insufficient sight distance, holding that material issues of fact existed. Some months later it reversed this ruling, finding that...
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Transportation Tort Liability

It held that it was clear that in the case at bar ODOT’s three decisions were protected by the discretionary-function doctrine: its decisions to improve a particular portion of the intersection, not to improve other portions of the intersection, and regarding the type of improvement (advance-warning signs and flashing lights instead of a three-light signal). Accordingly it held that ODOT was immune from liability resulting from those decisions.

Appellant made two other claims: that once ODOT decided to improve a portion of the highway it was liable for its determination of how to implement its decision; and that ODOT had a duty to make the highway around that specific area of improvement safe under current safety. The trial court also rejected plaintiff’s argument that when it installed the flashing lights ODOT had a duty to upgrade the intersection to current design standards, reasoning that the installation of the lights constituted highway maintenance, not highway improvement. On this basis, it held that ODOT did not have a duty to upgrade the intersection to current design standards. Plaintiffs appealed.

The court of appeals reversed the trial court’s judgment, holding that the installation of the flashing lights did constitute improvements rather than maintenance, thereby triggering a duty in ODOT to upgrade the intersection to current design standards. ODOT appealed to the Supreme Court.

The Supreme Court noted that ODOT did not object to the appeal court’s classification of its actions as improvements, but asked only that the Court accept jurisdiction over the following proposition of law: “When ODOT makes discrete highway improvements, only those particular improvements need to meet the current construction standards.”

The Court also noted that the court of appeals held that ODOT’s duty to maintain did not encompass a duty to redesign or reconstruct or upgrade public highways to current design standards, but when improving public highways it did have a duty to upgrade them to current design standards.

The Court agreed with ODOT that the phrase “discretionary-function doctrine” was shorthand to mean that the state cannot be sued for making basic policy decisions characterized by the exercise of a high degree of official judgment or discretion.

Based on its review of previous cases, the Court found the following to be protected decisions: to improve a highway; not to improve a highway; what type of improvement to make; and when to make the improvement, as long as it is made within a reasonable time.

The dissenters argued that the object of ODOT’s improvement was the entire intersection, not merely one discrete part of one highway, because the flashing traffic signals affected travel on both highways: a yellow flashing light for traffic moving east-west and a red flashing light for traffic moving north-south. Further, that this improvement triggered ODOT’s duty to conform it to the requirements of the then applicable Location and Design Manual, including those on intersection sight distance.

The dissenting opinion also noted that a change in standards in intersection sight distance did not require a major revamping, as modest additional safety measures were acceptable, such as advance warning signs and flashers and/or reduced speed limit zones in the vicinity of the intersection.

The dissenters agreed that whether to upgrade an intersection was part of ODOT’s discretionary function, but argued that it was not within ODOT’s discretion to ignore its own standards once it decided to undertake a highway improvement. Therefore they would affirm the decision of the court of appeals.
Product and Industry News

Cambridge, MA Company Plan to Provide Fully Autonomous Taxi Service in 2018

nuTonomy Inc., a software developer for self-driving cars located in Cambridge, MA, has completed the acquisition of funding to put them on a fast track to develop software and to offer a fully autonomous taxi service by 2018.

The company currently operates an R&D fleet of autonomous vehicles in Singapore, where it was the first private company to win governmental approval for testing on public roads.

Dr. Karl Iagnemma, co-founder and CEO of nuTonomy, stated “nuTonomy’s self-driving vehicle software unlocks access to a multi-trillion dollar global ‘robo-taxi’ opportunity. This funding will accelerate the pace of our progress in deploying self-driving vehicles in Singapore and beyond.”

In addition to Singapore, nuTonomy is operating self-driving cars in Michigan and the United Kingdom, where it tests software in partnership with major automotive industry players such as Jaguar Land Rover.

nuTonomy is developing the first-of-its-kind complete solution for operating large fleets of autonomous taxis; this includes software for autonomous vehicle navigation in urban environments, smartphone-based ride hailing, fleet routing and management, and controlling a vehicle remotely through teleoperation.

By optimizing paths for picking up and dropping passengers and with no driver costs, the nuTonomy system will potentially have lower costs compared to car-sharing services with drivers.

Building on 10+ years of research by co-founders Iagnemma and Prof. Emilio Frazzoli (CTO) at the Massachusetts Institute of Technology, nuTonomy has differentiated itself by pioneering technology for motion planning and decision-making that is based on methods that have been employed successfully in the development of spacecraft, airplanes, and other complex, safety-critical autonomous systems.

For more information, visit http://nutonomy.com/

Seattle is Latest City to Install Concert
Goal is to Increase Operational Efficiency of Existing Road Infrastructure and Reduce Impact of Major Incidents

Seattle, WA will be implementing Concert, provided by Siemens, which is an integrated traffic management platform that connects both Siemens and third-party systems across the city, including traffic control centers, intersection controllers, and parking guidance systems. The software will link these traffic planning and control systems so Seattle can take better advantage of its existing road infrastructure, lessen the impact of major traffic incidents, better manage traffic around large events and reduce overall congestion.

As part of this installation, Siemens has also named Seattle as one of the company’s Center of Excellence for Intelligent Traffic Technology. Understanding the impact intelligent software can have on significantly improving a city’s transportation system, Siemens will provide Seattle with its latest innovative technology to help expand the city’s smart traffic system infrastructure.

The Concert platform will integrate Siemens’ TACTICS traffic control system as well as the city’s existing dynamic message sign management system, the local travel time system, and the Washington Department of Transportation (WSDOT) freeway system.

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The software will consolidate into a central management platform data from these traffic platforms and other sources like weather reporting, existing road conditions, and traffic data on special events, such as concerts or ball games, taking place in and around the city. The resulting data will allow Seattle to identify traffic-related incidents quickly, determine the best response, and plan its traffic patterns more effectively.

With the insights provided by Concert, Seattle will have a real-time, comprehensive view into traffic as well as a powerful tool to manage the transportation network as a whole to maximum effect. Concert will enable the city to take advanced traffic management in its own hands, and to provide improved and responsible service to its citizens.

The extensive information will also be provided to operators, travelers, traffic control systems and traffic planners via dynamic maps, message signs and posts on the WSDOT website to optimize mobility and safety in Seattle, while decreasing environmental impacts of traffic.

Dimi Andrikos, Siemens Intelligent Traffic Systems, provided further information: “For completely saturated situations, the Concert system offers a means to prevent, shift or limit these situations by providing information, planning and traffic strategy implementation, so the severity of these situations can be decreased by information and preventive measures.”

Siemens also told the Urban Transportation Monitor that despite the considerable capabilities of smart phone navigation apps, these apps normally strive to optimize individual routes and are not aware of planned/future events. They also do not take overall traffic strategy into account. While Concert is not meant to compete with navigation apps and/or related services, but not everyone has access to those services, which normally require a GPS device in a car and/or a smartphone, data plan, etc. This is especially the case for underprivileged groups and for visitors or tourists who might not have a roaming function switched on. In these cases, Concert will be used to provide information on travel times and alternative routing information e.g. on dynamic message signs on strategic locations on the road network in and around Seattle.

Andrikos said “the integration of public transport in the traffic management system, and the information dissemination using the services mentioned earlier are an important aspect of intelligent transportation systems. With Concert, Seattle is now implementing the required foundation for these services in terms of the availability of the traffic data and strategies, and Concert can be extended to be a complete data platform including other modes of transport and to also provide such applications in the future.”

He added that this has been done successfully in, for example, Berlin and other cities that are focused strongly on the modal split change. “Public transport data such as bus schedules and real time arrival times can be integrated into the Concert system. This has already been done in many places around the world.”

“It is in fact a typical use case to have this data available in Concert in addition to travel times on the road networks in order to be able to give alternative routing options including suggestions for mode changes to travelers. This may be a valuable future expansion of the Concert system in Seattle.”

The cost of the Concert system to Seattle is $651,000. The system is expected to be operational next month.

This Week’s Survey Results (Survey 1)

Useful Apps for Transportation Professionals

Earlier this month, The Urban Transportation Monitor compiled useful apps from recent information obtained and from previous surveys. The apps are considered useful for transportation professionals depending on their area of work. The results are shown in the table below.

<table>
<thead>
<tr>
<th>NAME OF APP</th>
<th>DEVELOPER of APP</th>
<th>DESCRIPTION</th>
<th>COST OF APP</th>
<th>NUMBER OF USERS</th>
<th>WEBSITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridj</td>
<td>GroupZOOM Inc.</td>
<td>Bridj is a new kind of mass transit. There are no routes, fixed stops, or transfers. A flexible system is created that adapts to the way your city moves, instead of the other way around. To get started, just enter where your trip begins, and where you want to go. If you’re traveling within our service area, you will be matched up with other users headed the same way and information will be provided to indicate where to pick up the closest Bridj, and at what time. Your will then we’ll drop you off within a short walk of wherever you’re going.</td>
<td>Free</td>
<td>Operational in Boston, Washington and Kansas City</td>
<td><a href="http://www.bridj.com">http://www.bridj.com</a></td>
</tr>
<tr>
<td>QualiT</td>
<td>MIT’s Dept. of Urban Planning, Dept. of Civil and Environmental Engineering, and Singapore-MIT Alliance for Research and Technology (SMART), in collaboration with the Massachusetts Bay Transportation Authority (MBTA).</td>
<td>The app can be used by transit agencies to better understand people’s travel paths and modes by collecting anonymous location data through smartphone's GPS, Wifi, and GSM information. The app automatically prompts users to rate their trips. The app is in a testing phase and is only applicable to the Silver Line in Boston.</td>
<td>Free</td>
<td>In testing phase</td>
<td><a href="http://qualit.mit.edu/">http://qualit.mit.edu/</a> Contact: <a href="mailto:mbta.quality@mit.edu">mbta.quality@mit.edu</a></td>
</tr>
<tr>
<td>Go LA</td>
<td>Xerox Corporation</td>
<td>The app aggregates and calculates the time, cost, carbon footprint, and health benefits from walking, biking, driving your own car, parking, taking public transit, as well as the emerging private transportation options – such as Lyft, Zipcar, FlitWays and Uber – giving users a variety of ways to reach their destination.</td>
<td>Free</td>
<td>N/A</td>
<td>Bill McKee, Xerox, +1-585-423-4476, <a href="mailto:bill.mckee@xerox.com">bill.mckee@xerox.com</a> Jamie Palmeroni, Text100 for Xerox, +1-585-697-7762, <a href="mailto:jamie.palmeroni@text100.com">jamie.palmeroni@text100.com</a></td>
</tr>
<tr>
<td>Traffic Count</td>
<td>Fulcrum</td>
<td>Used by local municipalities to identify which routes are used most, and to either improve that road or provide an alternative if there is an excessive amount of traffic. This app can be fully customized. Fulcrum is a hosted mobile forms platform that enables you to build custom apps for rapidly capturing information from the field.</td>
<td>N/A</td>
<td>N/A</td>
<td><a href="http://www.fulcrumapp.com/apps/traffic-count/">http://www.fulcrumapp.com/apps/traffic-count/</a></td>
</tr>
<tr>
<td>Traffic Sign Inventory</td>
<td>Fulcrum</td>
<td>Used to inspect and report street sign damage and condition easily and quickly. Various transportation organizations can use this form to insure that signs are maintained to MUTCD or DOT standards. Features built into this app include placement, condition, type of damage, reflectivity and more. This app is easily customizable for additional fields. Fulcrum is a hosted mobile forms platform that enables you to build custom apps for rapidly capturing information from the field.</td>
<td>N/A</td>
<td>N/A</td>
<td><a href="http://www.fulcrumapp.com/apps/traffic-sign-inventory/">http://www.fulcrumapp.com/apps/traffic-sign-inventory/</a></td>
</tr>
</tbody>
</table>
### Useful Apps for Transportation Professionals (continued)

<table>
<thead>
<tr>
<th>NAME OF APP</th>
<th>DEVELOPER of APP</th>
<th>DESCRIPTION</th>
<th>COST OF APP</th>
<th>NUMBER OF USERS</th>
<th>WEBSITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Control on the Fly</td>
<td>Riley Traffic Consultants, LLC</td>
<td>This app produces a diagram of an MUTCD based Traffic Control Plan for a construction work zone, when the speed (MPH) roadway with, shift width, and selection of one of 10 common traffic control scenarios. It calculates taper length, sign spacing and signing plan. Plans compliant with UDOT Standard Drawings.</td>
<td>$4.99</td>
<td>N/A</td>
<td><a href="http://www.rileytraffic.com/">http://www.rileytraffic.com/</a></td>
</tr>
<tr>
<td>Transportation Jobs</td>
<td>Dimitar Zhelyazkov</td>
<td>Find jobs using Transportation, the most comprehensive search engine for Transportation. In a single search, Transportation offers free access to millions of jobs from thousands of company websites and job boards.</td>
<td>Free</td>
<td>N/A</td>
<td>DMS 2011 Inc, <a href="http://magichire.net/">http://magichire.net/</a></td>
</tr>
<tr>
<td>Traffic Queue</td>
<td>Stepan Zubachyk</td>
<td>This App is designed for determination of the maximum length of queued vehicles on an isolated intersection. For the App development there have been used simulation methods, which are the combination of analytical calculation and experiment, and herewith it allows to adequately reproduce a real process at a signal controlled intersection. The main component of this process is the arrival of vehicles to the intersection, namely the time intervals between cars that are described in the App by probability laws of distribution.</td>
<td>$0.99</td>
<td>N/A</td>
<td>Website not available. Email: <a href="mailto:chikabuz@gmail.com">chikabuz@gmail.com</a></td>
</tr>
<tr>
<td>FAZWEAVE</td>
<td>Joseph Fazio</td>
<td>FAZWEAVE - freeway weaving segment operation analysis and design FAZRAMP - freeway merge and diverge segment analysis and design FAZBASIC - basic freeway segment operations and design FAZEF - tool to determine design superelevation rate and design coefficient of side friction FAZBICYCLE - bicycle operations tool for off-street, signalized intersection, two-lane highway, multilane highway, urban street segment, and urban street facilities FAZPEDESTRIAN - pedestrian operations tool for off-street, signalized intersection, urban street segment facilities FAZMULTILAN E - multilane highway operation analysis and design tool FAZTWOLANE - two-lane highway operation analysis and design tool FAZINTERCHANGE - tool to determine minimum freeway interchange spacing and speed-change lane lengths</td>
<td>Apps range from about $40 to $650 per year. Apps are free for professo rs and their students on a course basis.</td>
<td>N/A</td>
<td><a href="http://www.fazioeware.com/">http://www.fazioeware.com/</a></td>
</tr>
<tr>
<td>Waze</td>
<td>Ehud Shabtai and Amir Shinar</td>
<td>After typing in their destination address, users just drive with the app open on their phone to passively contribute traffic and other road data, but they can also take a more active role by sharing road reports on accidents, police traps,</td>
<td>Free</td>
<td>More than 50 million worldwide.</td>
<td><a href="https://www.waze.com/">https://www.waze.com/</a></td>
</tr>
</tbody>
</table>
## Useful Apps for Transportation Professionals (continued)

<table>
<thead>
<tr>
<th>NAME OF APP</th>
<th>DEVELOPER of APP</th>
<th>DESCRIPTION</th>
<th>COST</th>
<th>NUMBER OF USERS</th>
<th>WEBSITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUTCD</td>
<td>Trafdata</td>
<td>The MUTCD app is a mobile friendly version of the 2012 Federal Manual on Uniform Traffic Control Devices.</td>
<td>$5</td>
<td>2,000</td>
<td><a href="http://www.trafdata.com">www.trafdata.com</a></td>
</tr>
<tr>
<td>TurnCount</td>
<td>Trafdata</td>
<td>The TurnCount and TurnCount Lite apps are manual intersection movement counting apps. They were designed to replace the manual counting board used by traffic engineers and planners at intersections.</td>
<td>$39.99</td>
<td>1,000</td>
<td><a href="http://www.trafdata.com">www.trafdata.com</a></td>
</tr>
<tr>
<td>TurnCount Lite</td>
<td>Trafdata</td>
<td>The TurnCount and TurnCount Lite apps are manual intersection movement counting apps. They were designed to replace the manual counting board used by traffic engineers and planners at intersections.</td>
<td>$19.99</td>
<td>500</td>
<td><a href="http://www.trafdata.com">www.trafdata.com</a></td>
</tr>
<tr>
<td>Traffic Signal Pro</td>
<td>Reedwick, LLC</td>
<td>Traffic Signal Pro is the first App of its kind. It offers a systematic approach to traffic signal troubleshooting that will improve safety and the efficiency of traffic, all while reducing cost. Traffic Signal Pro App is designed to simplify the process of troubleshooting a malfunctioning traffic signal. The App has an added benefit of being an educational training tool that familiarizes the user with the components and functions in a 332 cabinet. The goal at Traffic Signal Pro is to provide an easy and accessible way to effectively and efficiently troubleshoot a malfunctioning traffic signal.</td>
<td>$199.99</td>
<td>N/A</td>
<td><a href="http://trafficsignalpro.com/wp_build/">http://trafficsignalpro.com/wp_build/</a></td>
</tr>
<tr>
<td>Evernote</td>
<td>Evernote</td>
<td>Mobile briefcase of information such as project specific specifications, plans, details, proposals. Evernote syncs between devices. Facilitates working anywhere and staying productive: write notes, checklists, and do research.</td>
<td>$4.99 and higher</td>
<td>N/A</td>
<td><a href="https://evernote.com/">https://evernote.com/</a></td>
</tr>
<tr>
<td>LogMeIn</td>
<td>LogMeIn</td>
<td>Enable a secure connection to a person's desktop or laptop from any computer or from their iPad/iPhone. Access applications and files.</td>
<td>$99 per year</td>
<td>N/A</td>
<td><a href="http://www.logmein.com">www.logmein.com</a></td>
</tr>
<tr>
<td>PDF Expert</td>
<td>Readdle</td>
<td>Enables on screen writing and typing over PDF documents and then email them back. Excellent for reviewing plans remotely and sending back to designers in the office. Allows mark up of PDF documents with highlights and handwriting, insert text, sign and merge PDFs from iPhone</td>
<td>$9.99</td>
<td>N/A</td>
<td><a href="https://readdle.com/pdfexpert5">https://readdle.com/pdfexpert5</a></td>
</tr>
<tr>
<td>Calcbot</td>
<td>Tapbots LLC</td>
<td>Engineering unit conversions</td>
<td>$1.99</td>
<td>N/A</td>
<td><a href="https://tapbots.com">https://tapbots.com</a></td>
</tr>
</tbody>
</table>
This Month’s Survey Results (Survey 2)

Automated Guideway Transit (AGT)

The Urban Transportation Monitor conducted a survey on Automated Guideway Transit (AGT) earlier this month. Questionnaires were sent to nine operating systems mainly in the U.S. Information was obtained from four of the nine systems. The results of the survey are published here. The three systems for which updated information was not received is marked by an asterisk on the next pages.

Automated Guideway Transit Contacts

<table>
<thead>
<tr>
<th>NAME OF AGT SYSTEM ORGANIZATION</th>
<th>AGT CONTACT PERSON</th>
<th>CONTACT INFORMATION (email)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGTS City and County of Denver - Aviation</td>
<td>Sokhorn Chhim</td>
<td><a href="mailto:sokhorn.chhim@flydenver.com">sokhorn.chhim@flydenver.com</a></td>
</tr>
<tr>
<td>Las Colinas Area Personal Transit System (APT) Dulles County Utility and Reclamation District</td>
<td>Paul Brown</td>
<td><a href="mailto:pbrown@dcurd.org">pbrown@dcurd.org</a></td>
</tr>
<tr>
<td>Metromover Miami Dade Transit</td>
<td>Buford Whitaker</td>
<td><a href="mailto:wtk@miamidade.gov">wtk@miamidade.gov</a></td>
</tr>
<tr>
<td>Airport Transit System (ATS) O’Hare Airport Transit System, Inc.</td>
<td>Christine Baker</td>
<td>P.O. Box 66511Chicago, IL 60666(773) <a href="mailto:601-1801cbaker@ohareats.com">601-1801cbaker@ohareats.com</a></td>
</tr>
<tr>
<td>Heathrow Pod (Ultra Personal Rapid Transit) Commissioned by the British Airport Authority</td>
<td>Nathan Hill</td>
<td><a href="mailto:Nathan_Hill@heathrow.com">Nathan_Hill@heathrow.com</a></td>
</tr>
<tr>
<td>SkyTrain BC Rapid Transit Co (part of TransLink)</td>
<td>Ian Fisher</td>
<td><a href="mailto:ian.fisher@bcrtc.ca">ian.fisher@bcrtc.ca</a></td>
</tr>
</tbody>
</table>
Characteristics of Automated Guideway Transit

<table>
<thead>
<tr>
<th>NAME OF SYSTEM, LOCATION</th>
<th>AGTS</th>
<th>Las Colinas Area Personal Transit System (APT), Dallas County Utility and Reclamation District, Irving, TX</th>
<th>Metro mover, Miami Dade Transit, Miami, FL*</th>
<th>Airport Transit System (ATS), O'Hare Airport Transit System, Inc., Chicago, IL</th>
<th>Heathrow Pod (Ultra Personal Rapid Transit), London Heathrow Airport*</th>
<th>SkyTrain Vancouver, BC, Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>LENGTH OF PRESENT SYSTEM?</td>
<td>2.5 miles</td>
<td>1.5 miles</td>
<td>4.4 miles</td>
<td>2.7 miles</td>
<td>2.4 miles</td>
<td>30.4 miles</td>
</tr>
<tr>
<td>NO. OF STATIONS IN PRESENT SYSTEM?</td>
<td>4</td>
<td>4</td>
<td>20</td>
<td>5</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>ARE ANY STATIONS OFF-LINE?</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>ARE PLATFORM DOORS OR SCREENS USED?</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>TYPE OF PROPULSION?</td>
<td>600v DC electric motors.</td>
<td>240v DC electric motors.</td>
<td>DC motors</td>
<td>750v DC traction motors</td>
<td>Battery powered vehicles.</td>
<td>600 v three-phase LIM</td>
</tr>
<tr>
<td>METHOD OF MONITORING UNAUTHORIZED ENTRY OF TRACKWAY</td>
<td>CCTV cameras</td>
<td>Guideway is grade separated. Other measures include security barriers, CCTV monitoring and alarm systems.</td>
<td>Cameras and alarmed gates.</td>
<td>Alarmed door access to track. Control center receives alarms for access doors, and loss of closed/locked status on vehicle or platform doors.</td>
<td>Guideway fenced off from passengers. Glass doors at stations prevent entry to guideway via station access. Additionally, control room CCTV monitors guideway.</td>
<td>Vibration sensing plates, infrared and optical sensors, CCTV, door alarm switches.</td>
</tr>
<tr>
<td>NUMBER OF OPERATIONAL PASSENGER-CARRYING VEHICLES</td>
<td>31</td>
<td>4</td>
<td>32</td>
<td>15</td>
<td>21</td>
<td>258</td>
</tr>
<tr>
<td>SEATING/Crush CAPACITY OF VEHICLES</td>
<td>Removed seating to increase capacity.</td>
<td>16/60</td>
<td>8/92</td>
<td>4/114</td>
<td>4/6</td>
<td>33/130</td>
</tr>
<tr>
<td>MINIMUM HEADWAY (SEC.)</td>
<td>90 sec.</td>
<td>N/A</td>
<td>90 sec.</td>
<td>135 sec.</td>
<td>6.4 sec.</td>
<td>75 sec.</td>
</tr>
<tr>
<td>PRESENT WEEKDAY PASSENGER VOLUME</td>
<td>59,000</td>
<td>515</td>
<td>30,000</td>
<td>45,000 to 50,000</td>
<td>1,300</td>
<td>300,000</td>
</tr>
</tbody>
</table>

N/A = not available
* Updated system information not received for this survey
### Characteristics of Automated Guideway Transit (continue)

<table>
<thead>
<tr>
<th>NAME OF SYSTEM, LOCATION</th>
<th>AGTS, Denver International Airport, Denver, CO</th>
<th>Las Colinas Area Personal Transit System (APT), Dallas County Utility and Reclamation District, Irving TX</th>
<th>Metromover, Miami Dade Airport Transit System (ATS), O'Hare Airport Transit System, Inc., Chicago, IL</th>
<th>Heathrow Pod (Ultra Personal Rapid Transit), London Heathrow Airport*</th>
<th>Skytrain, Vancouver, BC, Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM OPERATING SPEED (MPH)</td>
<td>30 mph</td>
<td>30 mph</td>
<td>47 mph</td>
<td>25 mph</td>
<td>50</td>
</tr>
<tr>
<td>AVERAGE OPERATING SPEED IN PEAK PERIOD, STOPS INCLUDED (MPH)</td>
<td>30 mph</td>
<td>15 mph</td>
<td>10 mph</td>
<td>20 mph</td>
<td>26</td>
</tr>
<tr>
<td>BASE FARE (CENTS)</td>
<td>free</td>
<td>free</td>
<td>free</td>
<td>free (implicit in car park charges)</td>
<td>275</td>
</tr>
<tr>
<td>TYPE OF AGT SYSTEM</td>
<td>Pinched loop, airport</td>
<td>Circulator/distributor</td>
<td>Circulator/distributor</td>
<td>Airport People Mover that connects terminal and long term parking</td>
<td>Rapid transit</td>
</tr>
<tr>
<td>NO. OF SERVICE INTERRUPTIONS YEAR THROUGH SYSTEM BREAKDOWN</td>
<td>2 to 3 times (total shutdown)</td>
<td>99.98% availability</td>
<td>130 (&gt; 3 min.)</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>BEST FEATURES OF SYSTEM</td>
<td>A driverless system (no operator/driver needed unless there is an emergency)</td>
<td>Fully grade separated guideway Secure climate controlled stations and trains Major amenity for the Las Colinas Urban Center</td>
<td>The two sub-systems that are very reliable are the traction power and train control</td>
<td>Safety, flexibility and reliability. After more than 25 years of 24/7 operation, the system continues to work well. Because of the redundancy of equipment and multiple crossover switches throughout the system, most failures and preventative maintenance can be addressed without interrupting service.</td>
<td>Close headways, service flexibility, general reliability of basic ATC system.</td>
</tr>
<tr>
<td>WORST FEATURES OF SYSTEM</td>
<td>None</td>
<td>Age of vehicles complicates availability of repair parts and services</td>
<td>The door system on the vehicles has the highest failure rate of all sub-system.</td>
<td>The guideway is out-side and mostly elevated. The exposure to Chicago's extreme weather is challenging for both operating the trains and performing maintenance on the guideway.</td>
<td>Susceptibility to intrusions and false alarms. Hard response to some minor failure modes.</td>
</tr>
<tr>
<td>ADVICE GIVEN TO ANY ORGANIZATION CONSIDERING THE IMPLEMENTATION OF AN AGT SYSTEM?</td>
<td>In the long run, mass transportation system will save time, monies, congestion reduction, economy and environment. Consider use of public/private partnerships for station construction and maintenance.</td>
<td>Have someone with experience in maintenance and operations participate in the design reviews.</td>
<td>Select a system that provides the most flexibility to support service requirements (e.g., 24/7 operations) and location (environmental effects) of the system.</td>
<td>PRT offers two-dimensional transit, rather than linear transit. PRT can serve a two-dimensional area of buildings and activities.</td>
<td>Get a well-qualified, proven ATC supplier.</td>
</tr>
<tr>
<td>Do you believe there is a future for AGT systems? Please provide a reason for your answer.</td>
<td>Yes, definitely needed for mass transportation system because of population growth.</td>
<td>Yes. For “other” forms of mass transit to work, there must be a convenient reliable distributor system for the “last mile,” creating opportunities for AGT systems.</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes, though our systems is really a full-fledged rapid transit system supporting relatively long trips, not typical AGT. Nevertheless, AGT still has strong applications in airports and other similar, high volume, short distance, high frequency settings.</td>
</tr>
</tbody>
</table>

N/A = not available

* Updated system information not received for this survey
REQUESTS FOR PROPOSALS

1. TRANS Passenger Travel Demand Model

Agency: The City of Ottawa
Deadline: July 13, at 3 p.m. local time
Contact: Shaloo Sobti, Purchasing Officer, email: Shaloo.Sobti@ottawa.ca
Website: http://burlingtonnc.gov/132/Purchasing
Tel. (336) 222-5110

Description: A major transportation corridor connecting three cities starting from the city of Hermosa Beach at the southern end and extending north through Redondo Beach and Manhattan Beach to Rosecrans Avenue. The Aviation Boulevard Corridor Plan would include preparation of transportation studies; solicit public and stakeholder input, and researching innovative and best practice concepts through the customized Living Streets Design Manual to provide recommendations for corridor enhancements as well as sustainable communities’ strategies.

Deadline: July 28, 2016, at 4 p.m. EST
Contact: Randy Eldorado, Consultant Services Engineer, email: andy.eldorado@nebraska.gov, tel. (402) 479-4778.

Description: The City of Burlington is seeking proposals from professional consulting firms to complete a corridor planning study, with a focus on development of a four-MPO coordinated household travel survey program. The Metropolitan Transportation Commission (MTC), in cooperation with metropolitan planning organizations (MPO) for the Los Angeles, Sacramento, and San Diego regions, is issuing a request for proposals (RFP) for the development of a four-MPO coordinated household travel survey program.

Deadline: September 29, 2016, at 4 p.m. (PST)
Contact: Shimon Israel, Transportation Planner, tel. (415) 778-5239, email: sisrael@mtc.ca.gov
Website: http://procurements.mtc.ca.gov/Solicitations/solicitation-list.html

Description: The Metropolitan Transportation Commission (MTC), in cooperation with metropolitan planning organizations (MPO) for the Los Angeles, Sacramento, and San Diego regions, is issuing a request for proposals (RFP) for the development of a four-MPO coordinated household travel survey program.

Deadline: July 28, 2016, at 4 p.m. EST
Contact: Tel. (336) 222-5110
Website: http://burlingtonnc.gov/132/Purchasing

Description: The San Francisco Bay Area’s Metropolitan Transportation Commission (MTC), in cooperation with the metropolitan planning organizations (MPO) for the Los Angeles, Sacramento, and San Diego regions, is issuing a request for proposals (RFP) for the development of a four-MPO coordinated household travel survey program. The program will be developed in three phases: (1) survey development; (2) maintenance of the survey program; and (3) data collection. The selected consultant will work with representatives from MTC and the three other MPOs to develop a survey instrument and procedures for data collection within the four respective regions. Example data collected may include household and person demographic characteristics, household vehicle inventory, person activity and trip diaries with fully geocoded trip locations, GPS data collection for trips, and other household, person, vehicle, and travel-related variables. Additional information about the scope of this project and its phasing is included in the RFP. The Request for Proposal (RFP) documents for this project are available for download on the MTC website at https://mtc.bonfirehub.com/login.

Deadline: July 13, 2006 at 5 p.m.
Contact: Email all inquiries/questions to Randy Eldorado, Consultant Services Engineer, email: andy.eldorado@nebraska.gov, tel. (402) 479-4778.

Description: The City of Burlington is seeking proposals from professional consulting firms to complete a corridor planning study, with a focus on development of a four-MPO coordinated household travel survey program. The Metropolitan Transportation Commission (MTC), in cooperation with metropolitan planning organizations (MPO) for the Los Angeles, Sacramento, and San Diego regions, is issuing a request for proposals (RFP) for the development of a four-MPO coordinated household travel survey program.

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Contact: Shimon Israel, Transportation Planner, tel. (415) 778-5239, email: sisrael@mtc.ca.gov
Website: http://procurements.mtc.ca.gov/Solicitations/solicitation-list.html

Description: The Metropolitan Transportation Commission (MTC), in cooperation with metropolitan planning organizations (MPO) for the Los Angeles, Sacramento, and San Diego regions, is issuing a request for proposals (RFP) for the development of a four-MPO coordinated household travel survey program. The program will be developed in three phases: (1) survey development; (2) maintenance of the survey program; and (3) data collection. The selected consultant will work with representatives from MTC and the three other MPOs to develop a survey instrument and procedures for data collection within the four respective regions. Example data collected may include household and person demographic characteristics, household vehicle inventory, person activity and trip diaries with fully geocoded trip locations, GPS data collection for trips, and other household, person, vehicle, and travel-related variables. Additional information about the scope of this project and its phasing is included in the RFP. The Request for Proposal (RFP) documents for this project are available for download on the MTC website at https://mtc.bonfirehub.com/login.

Deadline: July 13, 2006 at 5 p.m.
Contact: Email all inquiries/questions to Randy Eldorado, Consultant Services Engineer, email: andy.eldorado@nebraska.gov, tel. (402) 479-4778.

Description: The City of Burlington is seeking proposals from professional consulting firms to complete a corridor planning study, with a focus on development of a four-MPO coordinated household travel survey program. The Metropolitan Transportation Commission (MTC), in cooperation with metropolitan planning organizations (MPO) for the Los Angeles, Sacramento, and San Diego regions, is issuing a request for proposals (RFP) for the development of a four-MPO coordinated household travel survey program. The program will be developed in three phases: (1) survey development; (2) maintenance of the survey program; and (3) data collection. The selected consultant will work with representatives from MTC and the three other MPOs to develop a survey instrument and procedures for data collection within the four respective regions. Example data collected may include household and person demographic characteristics, household vehicle inventory, person activity and trip diaries with fully geocoded trip locations, GPS data collection for trips, and other household, person, vehicle, and travel-related variables. Additional information about the scope of this project and its phasing is included in the RFP. The Request for Proposal (RFP) documents for this project are available for download on the MTC website at https://mtc.bonfirehub.com/login.

3. Development of a Household Travel Survey Program

Agency: Metropolitan Transportation Commission, San Francisco
Deadline: July 28, 2016, at 4 p.m. EST
Contact: Tel. (336) 222-5110
Website: http://burlingtonnc.gov/132/Purchasing

Description: The City of Burlington is seeking proposals from professional consulting firms to complete a corridor planning study, with a focus on development of a four-MPO coordinated household travel survey program. The Metropolitan Transportation Commission (MTC), in cooperation with metropolitan planning organizations (MPO) for the Los Angeles, Sacramento, and San Diego regions, is issuing a request for proposals (RFP) for the development of a four-MPO coordinated household travel survey program. The program will be developed in three phases: (1) survey development; (2) maintenance of the survey program; and (3) data collection. The selected consultant will work with representatives from MTC and the three other MPOs to develop a survey instrument and procedures for data collection within the four respective regions. Example data collected may include household and person demographic characteristics, household vehicle inventory, person activity and trip diaries with fully geocoded trip locations, GPS data collection for trips, and other household, person, vehicle, and travel-related variables. Additional information about the scope of this project and its phasing is included in the RFP. The Request for Proposal (RFP) documents for this project are available for download on the MTC website at https://mtc.bonfirehub.com/login.

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## CONFERENCES

<table>
<thead>
<tr>
<th>DATES</th>
<th>CONFERENCE AND SPONSOR</th>
<th>CITY</th>
<th>VENUE</th>
<th>MAIN TOPICS</th>
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</thead>
<tbody>
<tr>
<td>July 2-3</td>
<td>Symposium on Innovations in Traffic Flow Theory and Characteristics in the Era of Autonomous Vehicles, Big Data, and the Internet of Things and Traffic Flow Theory and Characteristics Committee (AHB45) 2016 Summer Meeting</td>
<td>Sydney, Australia</td>
<td>N/A</td>
<td>The conference will facilitate discussions on topics related to traffic flow theory and characteristics including, but not limited to, autonomous and connected vehicles; applications of big data and the Internet of Things (IoT) in traffic operations and management; network traffic flow theory, dynamics, and control; and pedestrian and crowd modeling</td>
<td><a href="http://www.trb.org/Calendar/Blurbs/174337.aspx">http://www.trb.org/Calendar/Blurbs/174337.aspx</a></td>
</tr>
<tr>
<td>July 6-7</td>
<td>3rd International Conference on Access Management (TRB, SAICE)</td>
<td>Pretoria, South Africa</td>
<td>CSIR Conference Centre, Pretoria</td>
<td>The conference is designed to help stimulate continued world-wide improvements to access management state of the art. The conference will focus on the latest research, policies, innovative practices, safety, and operational effects related to access management. Specific areas to be addressed include access management concepts; road systems and classification; interaction with land use planning; geometric design considerations; and more.</td>
<td><a href="http://www.accessmanagement.info/Event/2016-trl-conference-s-africa">http://www.accessmanagement.info/Event/2016-trl-conference-s-africa</a></td>
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<tr>
<td>July 11-12</td>
<td>11th National Conference on Transportation Asset Management (Transportation Research Board)</td>
<td>Minneapolis, MN</td>
<td>N/A</td>
<td>The conference is expected to cover a broad range of topics on surface transportation modes of interest to agencies in the early stages of implementation of asset management as well as agencies that are in later stages of the implementation process.</td>
<td><a href="http://www.trb.org/Calendar/Blurbs/171403.aspx">http://www.trb.org/Calendar/Blurbs/171403.aspx</a></td>
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<tr>
<td>July 19-21</td>
<td>Automated Vehicles Symposium 2016 (Transportation Research Board)</td>
<td>San Francisco, CA</td>
<td>Hilton San Francisco Union Square</td>
<td>Challenges and opportunities related to the increasing automation of motor vehicles as well as the environments in which they operate. The workshop will build on previous workshops providing updates on the state-of-the-art in road vehicle automation research</td>
<td><a href="http://www.automatedvehiclesymposium.org/new-item8/registration">http://www.automatedvehiclesymposium.org/new-item8/registration</a></td>
</tr>
<tr>
<td>July 22-25</td>
<td>National Association of Counties (NACo) Annual Conference and Exposition</td>
<td>Long Beach, CA</td>
<td>Long Beach Convention and Entertainment Center</td>
<td>The Annual Conference provides county officials with a great opportunity to vote on NACo’s policies related to federal legislation and regulation; elect officers; network with colleagues; learn about innovative county programs; find out about issues impacting counties across the country; and view products and services from participating companies and exhibitors.</td>
<td><a href="http://www.naco.org/events/nacos-81st-annual-conference-exposition">http://www.naco.org/events/nacos-81st-annual-conference-exposition</a></td>
</tr>
<tr>
<td>July 30-Aug. 3</td>
<td>2016 ACT International Conference</td>
<td>Portland, OR</td>
<td>Hilton Portland &amp; Executive Tower</td>
<td>Wide range of transportation demand management, transportation options, mobility on-demand, shared use mobility, public policy, and commuter transportation services.</td>
<td><a href="http://www.actconf.org/index.cfm">http://www.actconf.org/index.cfm</a></td>
</tr>
<tr>
<td>Aug. 4-5</td>
<td>Transportation Planning and Air Quality (ASCE, AWMA, FHWA, Minnesota Department of Transportation)</td>
<td>Minneapolis, MN</td>
<td>Crowne Plaza Minneapolis Northstar Downtown Hotel</td>
<td>The conference will focus on the theme of “The Changing Landscape of Transportation and Air Quality: Confronting the Challenging at the Global, Regional, and Local Scales.” Topics include multimodal passenger transportation and air quality issues, greenhouse gas emissions reduction strategies, emissions and air quality impacts of alternative fuels, innovative vehicle and information technology solutions to transportation air quality, and more.</td>
<td><a href="http://register.extension.iastate.edu/2016t">http://register.extension.iastate.edu/2016t</a> pkg</td>
</tr>
<tr>
<td>Aug. 8-11</td>
<td>Mid America Association of State Transportation Officials (MAASTO) Annual Meeting</td>
<td>Minneapolis, MN</td>
<td>Radisson Blu Minneapolis</td>
<td>Measuring the Impact of Transportation Investments; Transportation Finances and Efficiencies; Multi-Modal Approach to Project Planning and Programming Optimizing Freight Networks</td>
<td><a href="http://www.dot.state.mn.us/maasto2016/index.html">http://www.dot.state.mn.us/maasto2016/index.html</a></td>
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N/A = Not Available; m = member; nm = non-member. To list your transportation conferences here FREE, send all information as above to: The UTM Conference Dept., P.O. Box 12300, Burke, VA 22009-2300, or call (703) 764-0512, or fax (703) 764-0516, or email: editors@lawelypublications.com.
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<td>Aug. 14-17</td>
<td><strong>ITE 2016 Annual Meeting</strong> (Institute of Transportation Engineers)</td>
<td>Anaheim, CA</td>
<td>Anaheim Marriott</td>
<td>Connected Vehicles: Irrelevant in an Autonomous World?; Did You Set Yourself Up for Failure: Making Multimodal Work; Farewell to Level of Service: The California Way; Is a Round Peg Right for a Square Hole?; Creative Concepts in Intersection Design; Measuring Up: Performance Management Tools; Opening a Window into Global Design Practices; Promoting Healthy Communities Through Active Transportation; Ready or Not...Self-Driving Vehicles Coming to a City Near You; Saving the Earth: Making Communities Better through Transit; The Traffic Impact Study is Dead – Long Live the Transportation Impact Study; Vanishing Point: Vision Zero; Do You Need an Alternative (Road) Diet? Complete Streets Choices, and more</td>
<td><a href="http://www.ite.org/annualmeeting/about.asp">http://www.ite.org/annualmeeting/about.asp</a></td>
</tr>
<tr>
<td>Sept. 11-14</td>
<td><strong>American Public Transportation Association’s Annual Meeting</strong></td>
<td>Los Angeles, CA</td>
<td>N/A</td>
<td>The American Public Transportation Association holds its annual meeting.</td>
<td><a href="http://www.apta.com/mc/Pages/Future.aspx">http://www.apta.com/mc/Pages/Future.aspx</a></td>
</tr>
<tr>
<td>Sept. 12-15</td>
<td><strong>“Pro Walk-Pro Bike-Pro Place” Conference</strong></td>
<td>Vancouver, Canada</td>
<td>N/A</td>
<td>The premier conference in North America for walking and bicycling professionals from the public and private sectors. The 19th Pro Walk/Pro Bike/Pro Place in Vancouver is expected to draw 1,000 city planners, transportation engineers, public health advocates, elected officials, community leaders, and professional walking and bicycling advocates.</td>
<td><a href="http://www.pps.org/walkbikplaces2016/">http://www.pps.org/walkbikplaces2016/</a></td>
</tr>
<tr>
<td>Sept. 25-28</td>
<td><strong>2016 Transportation Association of Canada Conference and Exhibition</strong></td>
<td>Toronto, Canada</td>
<td>Sheraton Centre Toronto Hotel</td>
<td>Conference will highlight efficient transportation principles, but a wide variety of topics are covered such as Moving Smarter in Canadian Cities; Safely Managing Road Users; Next Generation Regional Corridor Management; Cross Asset Analysis and Optimization – Solutions for Informed Decision Making; Managing Social Media throughout Project Life Cycle – Opportunities and Challenges.</td>
<td><a href="http://tac-atc.ca/en">http://tac-atc.ca/en</a></td>
</tr>
<tr>
<td>Sept. 26-28</td>
<td><strong>International Conference on Demand Responsive Transportation</strong></td>
<td>Breckenridge, CO</td>
<td>The Village at Breckenridge</td>
<td>The conference will provide an opportunity for paratransit professionals from around world to discuss ideas and trends in the areas of technology and communication, industry partnerships, service concepts, innovation, Americans with Disabilities Act compliance, health and wellness issues, and performance measurement.</td>
<td><a href="http://www.cvent.com/events/international-conference-on-demand-responsive-transportation-paratransit-from-dial-a-ride-to-technol/event-summary-45d24ee261da4c6e3e1a7a2d3dc1e32c7e1a.spx">http://www.cvent.com/events/international-conference-on-demand-responsive-transportation-paratransit-from-dial-a-ride-to-technol/event-summary-45d24ee261da4c6e3e1a7a2d3dc1e32c7e1a.spx</a></td>
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<tr>
<td>Oct. 5-7</td>
<td><strong>European Transport Conference (Association For European Transport)</strong></td>
<td>Barcelona, Spain</td>
<td>Casa Convalescensia,</td>
<td>The range of topics and the multi-seminar approach makes ETC unique among transport conferences held in Europe. The Conference program covers supranational, national and local policy, and the implementation of projects at a local level. Issues of key importance are picked out each year for special examination and will be introduced in daily plenary sessions.</td>
<td><a href="http://etcproceedings.org/">http://etcproceedings.org/</a></td>
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<tr>
<td>Oct. 10-14</td>
<td><strong>ITS World Congress 2106 (Hosted by ITS Australia)</strong></td>
<td>Melbourne, Australia</td>
<td></td>
<td>Congress theme will be “ITS – Enhancing Liveable Cities and Communities”. The Congress will bring together 7,000 global ITS professionals for a comprehensive program with hundreds of speakers, an exhibition, equipment demonstrations and technical tours.</td>
<td><a href="http://www.itsworldcongress2016.com/">http://www.itsworldcongress2016.com/</a></td>
</tr>
<tr>
<td>Oct. 25-28</td>
<td><strong>AMPO Annual Conference</strong></td>
<td>Fort Worth, TX</td>
<td>The Worthington Renaissance Fort Worth Hotel</td>
<td>Bicycle / Pedestrian Planning; Coordination and Collaboration with Key Partners; Environmental Justice/Limited English Proficiency Plans (LEP)/Title VI; Disadvantaged Business Enterprise Certification; Freight; Funding and Financing, and other topics</td>
<td><a href="http://www.ampo.org/call-for-presentation-proposals/">http://www.ampo.org/call-for-presentation-proposals/</a></td>
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<td>Nov. 3</td>
<td>2016 Research Conference (University of Minnesota)</td>
<td>Minneapolis, MN</td>
<td>The Commons Hotel</td>
<td>The conference convenes researchers and practitioners from Minnesota and the Upper Midwest to highlight new learning, emerging ideas, and the latest innovations in transportation. Attendees will learn about research findings, implementation efforts, and engagement activities related to a variety of transportation topics.</td>
<td><a href="http://www.cts.umn.edu/events/conference2016">http://www.cts.umn.edu/events/conference2016</a></td>
</tr>
<tr>
<td>Nov. 11-15</td>
<td>AASHTO 2016 Annual Meeting</td>
<td>Boston, MA</td>
<td>Westin Boston Waterfront</td>
<td>One of the industry’s most important gatherings of transportation, government and commercial organizations. The Annual Meeting offers transportation executives the opportunity to network and share the latest in industry policies and innovations.</td>
<td><a href="http://www.cvent.com/events/aashto-2016-annual-meeting/event-summary-9344e8b1e22f4b53bf63915670566912.aspx">http://www.cvent.com/events/aashto-2016-annual-meeting/event-summary-9344e8b1e22f4b53bf63915670566912.aspx</a></td>
</tr>
<tr>
<td>Nov. 16-19</td>
<td>National League of Cities City Summit</td>
<td>Pittsburgh, PA</td>
<td>N/A</td>
<td>Smart cities, drones, autonomous vehicles</td>
<td><a href="http://citysummit.nlc.org/">http://citysummit.nlc.org/</a></td>
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</table>

**2017**

| Jan. 8-12 | TRB 96th Annual Meeting | Washington, DC | Walter E. Washington Convention Center, | The meeting program will cover all transportation modes, with more than 5,000 presentations in nearly 750 sessions and workshops, | http://www.trb.org/AnnualMeeting/AnnualMeeting.aspx |
| April 10-12 | International Congress on Transport Infrastructure and Systems (AIIT, the Italian Association for Traffic and Transport Engineering) | Rome, Italy | N/A | The objective of the AIIT International Congress TIS Rome 2017 is to promote transport as a growing industry, and its current significance. The Congress provides a forum for discussion, interactions and exchange among researchers, scientists and engineers whose fields of interest are transport and infrastructure engineering. The congress is organized by the Italian Association for Traffic and Transport Engineering AIIT founded in 1957. The meeting program will cover all transportation modes, with more than 100 presentations in sessions and workshops, addressing topics of interest to policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions. | http://tisroma.aiit.it/ |