

Emerging Transportation Technology Strategic Plan for the St. Louis Region

AMPO Conference
Savannah, GA
October 18, 2017

**St. Louis Region
Emerging Transportation
Technology Strategic Plan**

June 2017

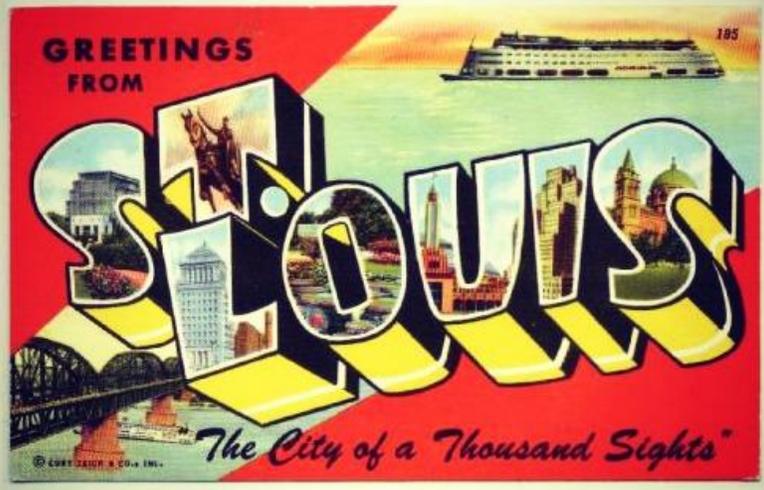
Prepared for
East-West Gateway Council of Governments
by
ICF

Overview

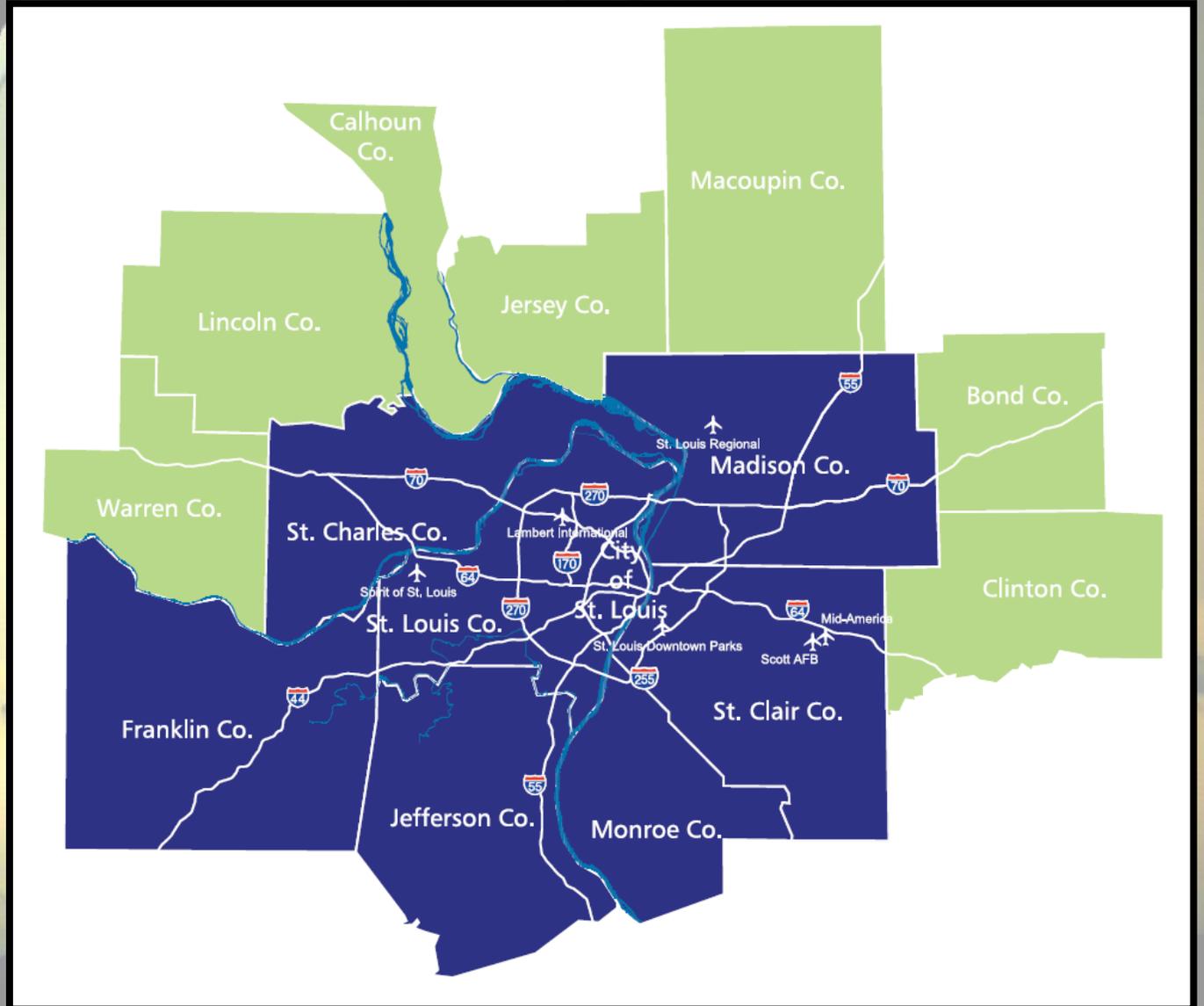
- Background
- Project Elements
 - Survey
 - Interviews
 - SWOT Analysis
 - Policy Implications
- Recommendations



East-West Gateway Region



- 8 Counties
- 203 Municipalities
- 2.6 million people
- \$141 billion dollar economy
- 10,612 miles of roads
- 758 miles of the federal interstate system
- 3,304 bridges
- 50 million annual transit trips



Connected2045: East-West Gateway Ten Guiding Principles



EWG's 10 Guiding Principles



Preserve and Maintain the Existing System

Ensure the transportation system remains in a state of good repair.



Support Public Transportation

Invest in public transportation to spur economic development, protect the environment and improve quality of life.



Support Neighborhoods & Communities

Connect communities to opportunities and resources across the region.



Foster a Vibrant Downtown & Central Core

Improve access to and mobility within the central core by all modes to increase the attractiveness of St. Louis and strengthen the regional economy.



Provide More Transportation Choices

Create viable alternatives to automobile travel by providing bicycle and pedestrian facilities.



Promote Safety and Security

Provide a safe and secure transportation system for all users.



Support a Diverse Economy with a Reliable System

Reduce congestion and improve travel time reliability to support the diverse economic sectors of the region.



Support Quality Job Development

Support the growth of wealth producing jobs that allow residents to save and return money to the economy.



Strengthen Intermodal Connections

Support freight movement and connections that are critical to the efficient flow of both people and goods.



Protect Air Quality and Environmental Assets

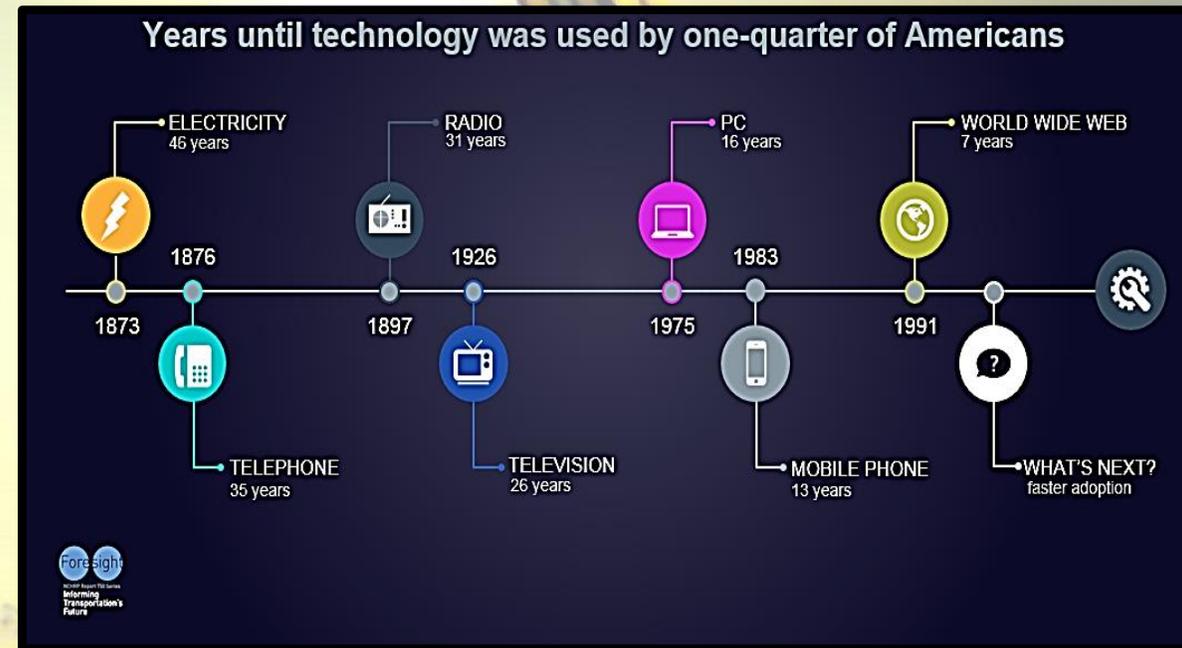
Encourage investments that recognize the linkages between the social, economic, and natural fabric of the region.

Background

- New technologies may fundamentally alter the way people travel in the future, with potentially dramatic impacts on safety, mobility, and system performance over the next 20-30 years.
- The pace of technology adoption is quickening.



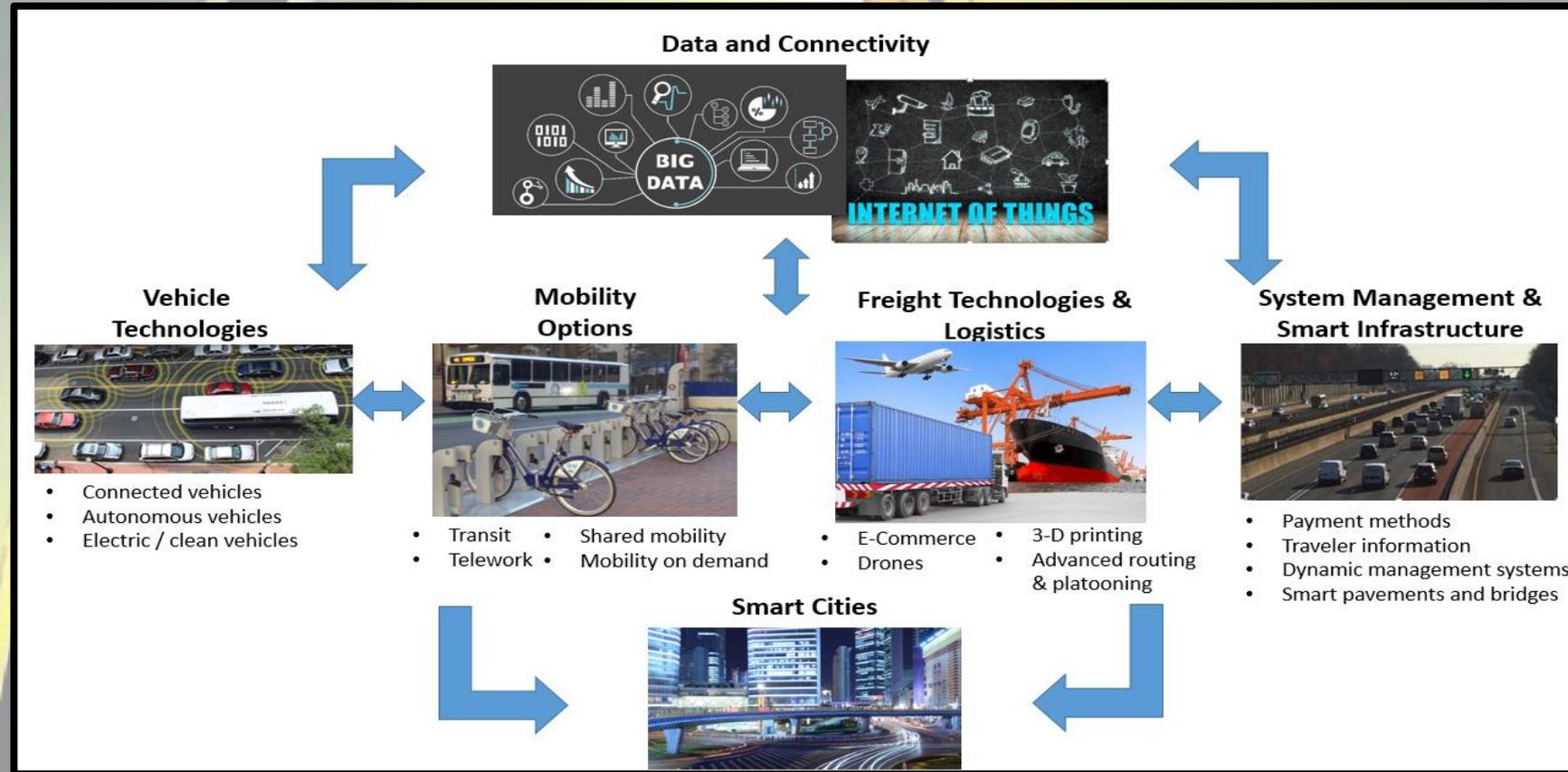
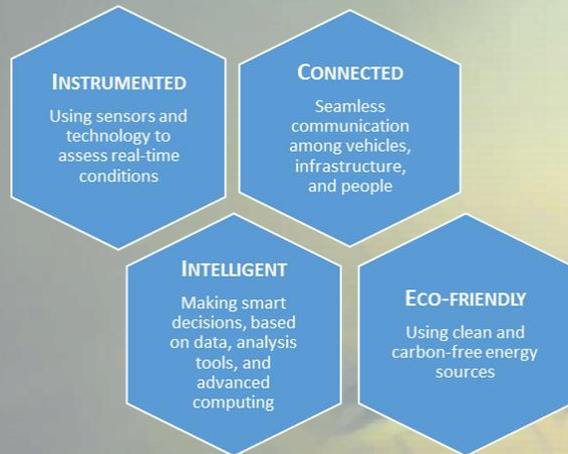
- The St. Louis Region needs to better prepare for the future in its regional transportation planning and investment decision-making.



Source: National Cooperative Highway Research Program, Foresight Series.

Emerging Transportation Technology Trends

Technology trends span several major areas, and overlap and synergize in powerful ways.



Synergies across technology trends

Project Elements

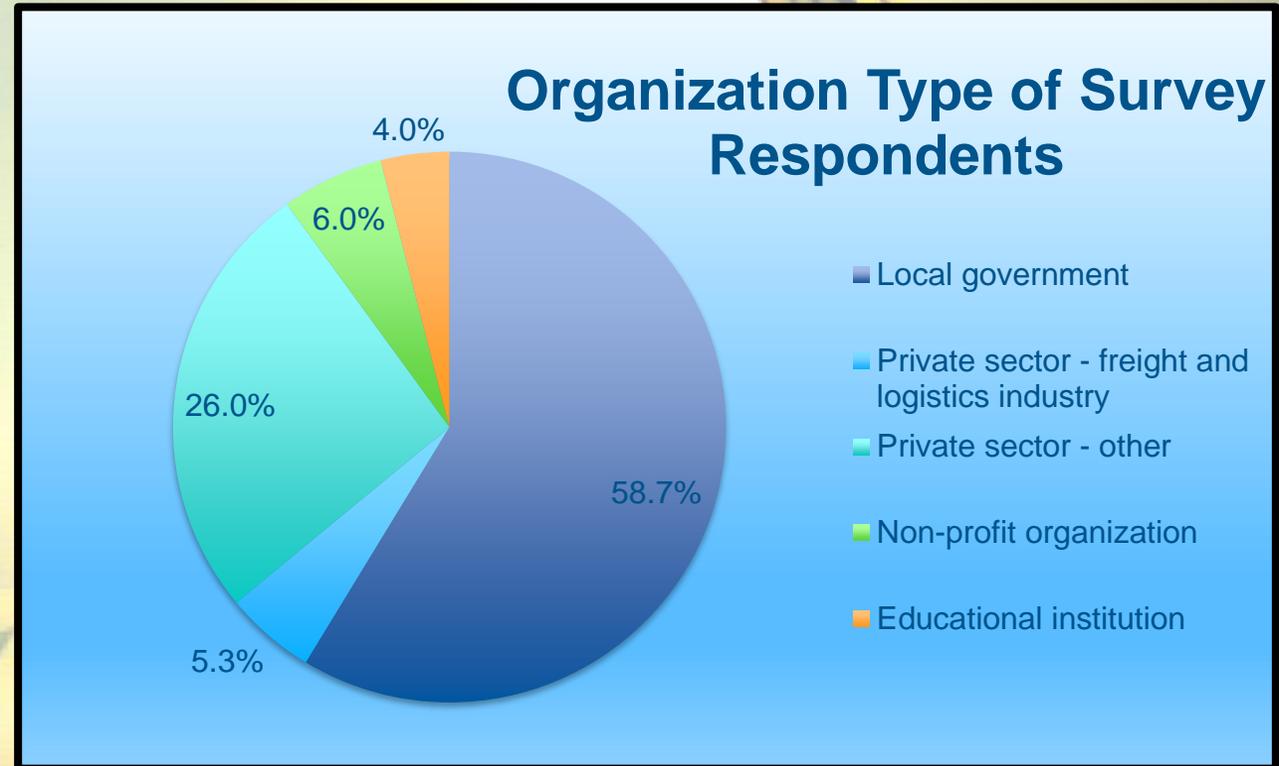
- Research & Analysis
- Survey
- Interviews
- Recommendations
- Final Plan



Survey

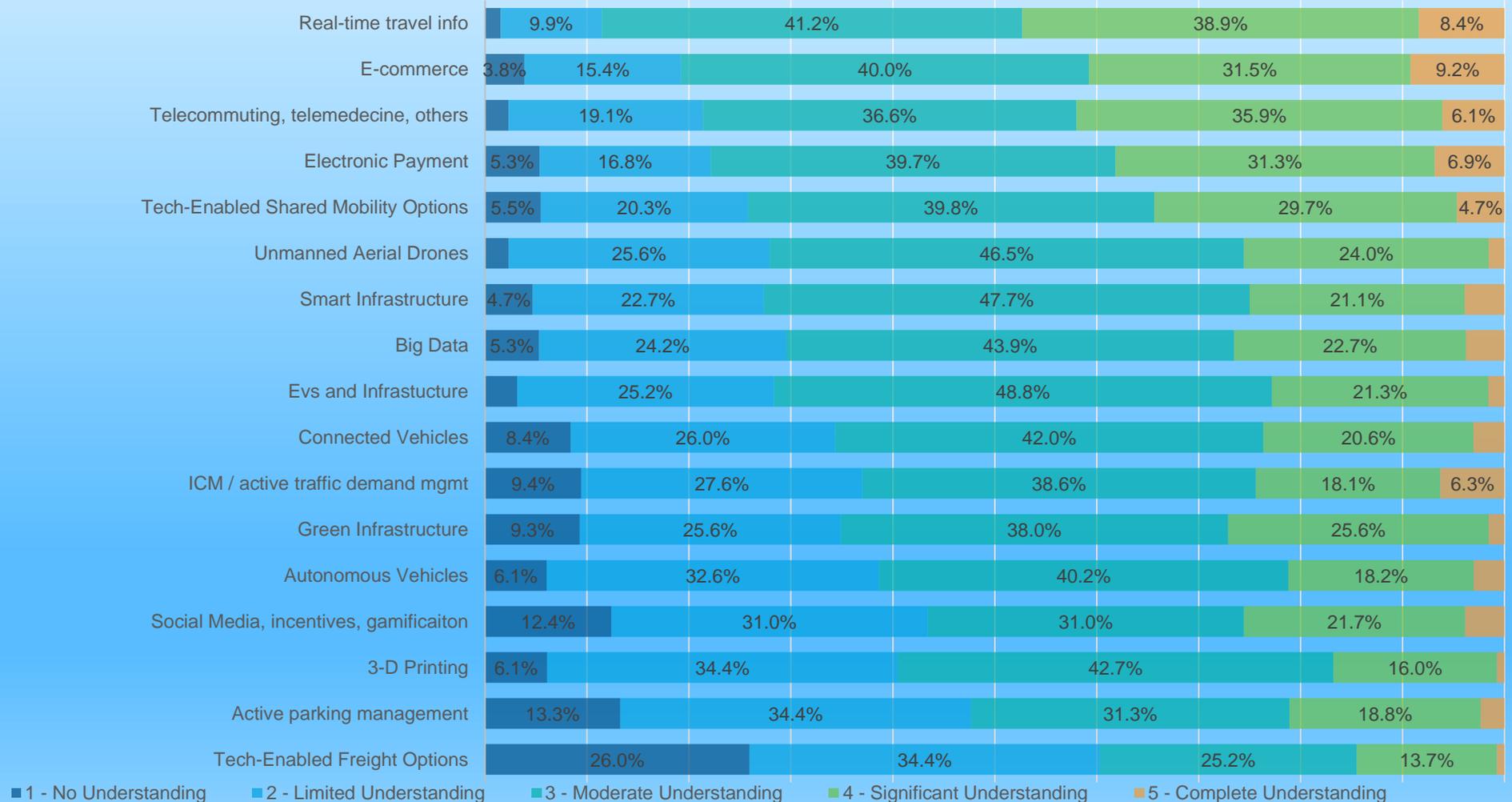
Organized to gather information on:

- Current level of understanding of emerging transportation technologies;
- Current activities related to, and investments being made in, emerging transportation technologies;
- Perspectives on the impacts of these technologies; and
- Desired regional coordination or policies related to transportation technology.

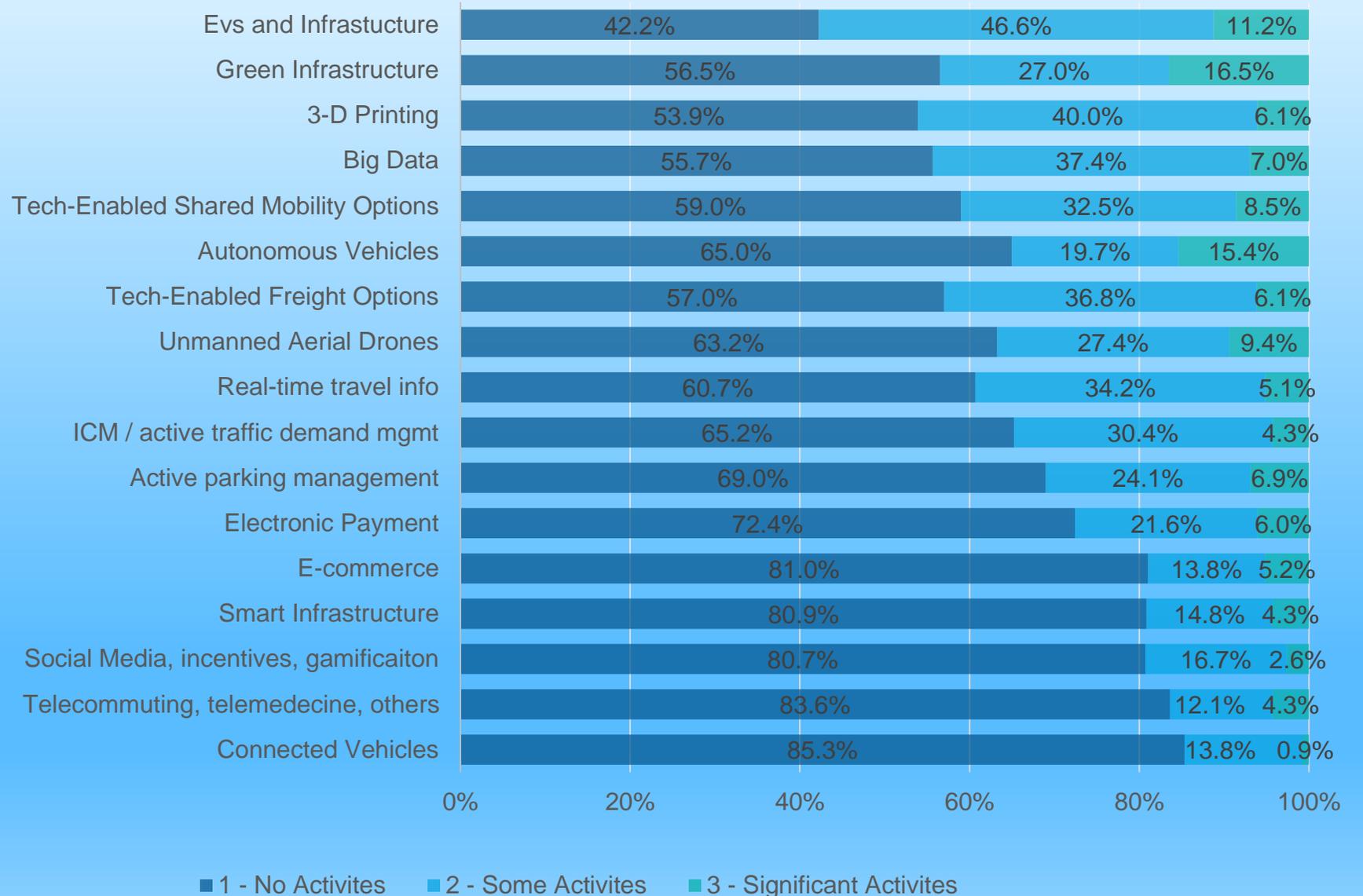


LEVEL OF UNDERSTANDING RELATED TO EMERGING TRANSPORTATION TECHNOLOGIES

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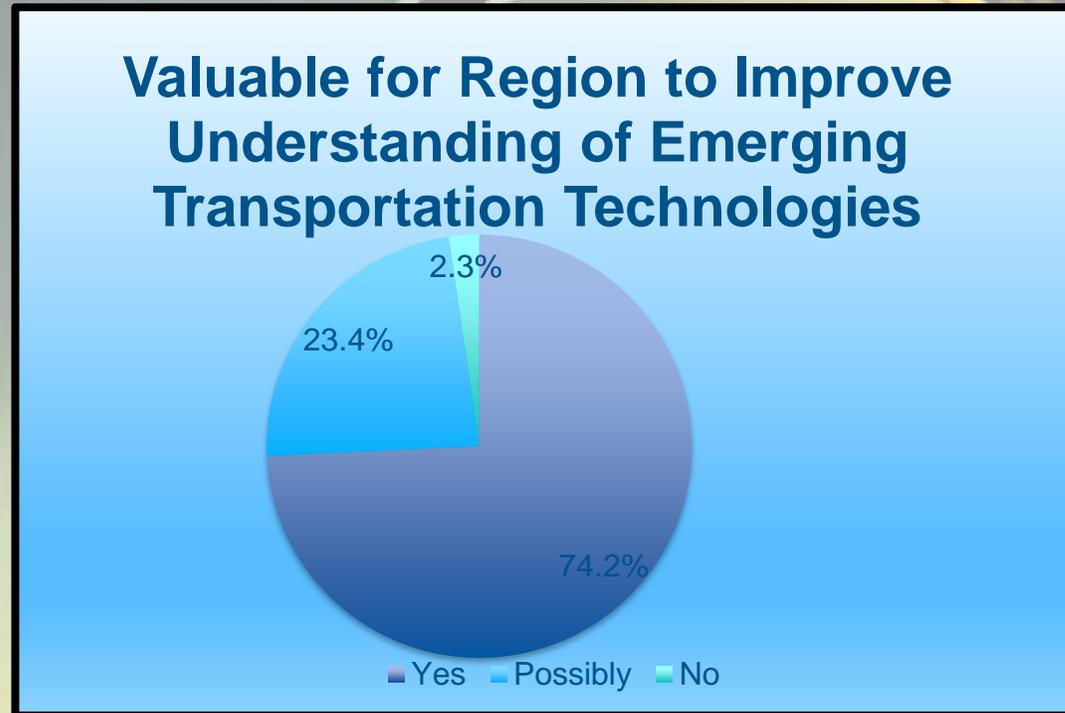


LEVEL OF ACTIVITIES RELATED TO EMERGING TRANSPORTATION TECHNOLOGIES



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Survey



Answer Options	Response Percent
Yes	86.5%
No	13.5%

If the deployment of emerging technologies in the St. Louis Region could be accelerated or steered in a certain direction, would you like that to happen?

Interviews - Themes

- Overall uncertainty –
 - adoption, comfort, acceptance, timeline
- Demographics
- Equity
- Funding
- Safety
- Congestion impacts
- Infrastructure investments
- Freight
- Impacts on transit
- Hyperloop

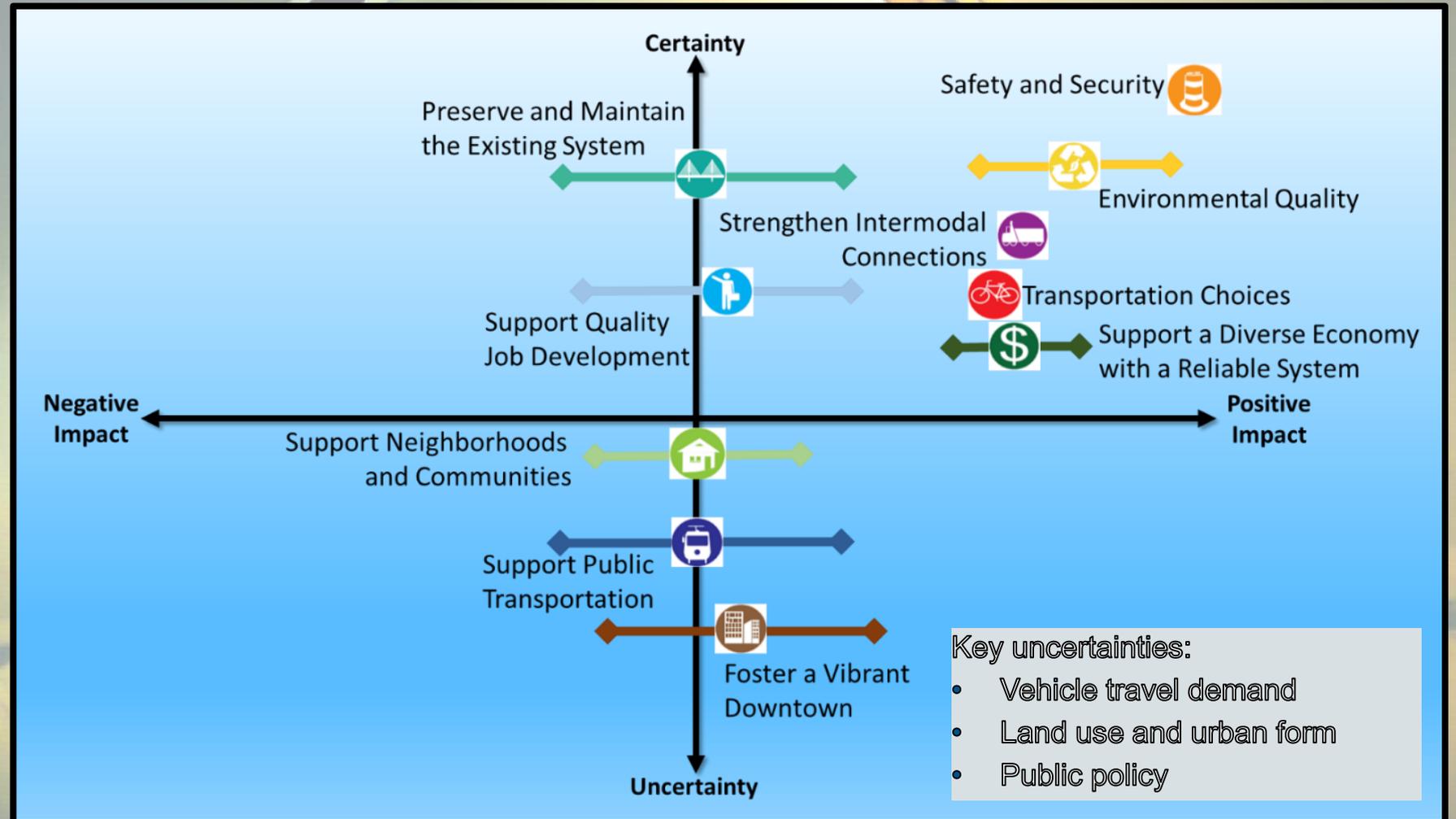


Strengths-Weaknesses-Opportunities-Threats (SWOT) Analysis

	To Leverage	To Overcome
Internal	<p>Strengths</p> <ul style="list-style-type: none"> • Multi-modal transportation system • Major freight hub • Mid-size region, potentially well geared toward pilot testing • Intelligent transportation systems (ITS) infrastructure • Interest from stakeholders 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Fragmented and complex government structure, across two states and multiple local governments • Population decline in urban core • Social barriers, including perceptions of inner-city crime • Sprawling region with low density and heavily car-centric travel patterns • Funding constraints 
External	<p>Opportunities</p> <ul style="list-style-type: none"> • Potential positive technology impacts: <ul style="list-style-type: none"> - Significant safety improvements from new vehicle technologies and automation - Reduced travel costs - Increased travel choices - Improved access, particularly for those currently with limited mobility and those without access to private vehicles - Improved system reliability - Possible transit service improvements and reduction in cost - Optimized supply chain, yielding economic benefits - Quality job development in emerging technology fields - Air pollutant and greenhouse gas reductions from green/low carbon technologies - Potential for clean energy generation • Federal grant programs • Private sector funding 	<p>Threats</p> <ul style="list-style-type: none"> • Potential adverse technology impacts: <ul style="list-style-type: none"> - Reduced funds from traditional transportation funding sources - Increases in vehicle travel and congestion - Increases in sprawl / decentralized development patterns - New options draw people off of public transit - Gaps in access by those who cannot afford - Cyber-security threats associated with new technology - Reduction in employment, as jobs related to driving could be displaced 

Implications of Emerging Transportation Technologies

- The expected impacts of emerging technologies on the Ten Guiding Principles are mixed. Many are positive, but several have high levels of uncertainty. Policy decisions may influence many of these impacts.



Implications of Emerging Transportation Technologies on EWG Guiding Principles

Guiding Principle

Potential Positive Impacts

Potential Negative Impacts

Preserve and Maintain the Existing System

- Use of drones for bridge inspections
- Instrumentation of highways to monitor conditions
- Pavements that can repair themselves, melt snow, and provide lighted lane striping

- Decline in traditional transportation funding sources through fuel taxes and vehicle registration fees

Support Public Transportation

- Improved transit signal priority, fare collection, and service enhancements
- Potential for greater integration with on-demand services that provide first-mile last-mile connections

- Potential for autonomous vehicles, transportation network companies, and other service providers to reduce transit market share

Support Neighborhoods and Communities

Throughout the Region

- May provide more access to opportunities for people without access to a private vehicle, as well as disabled and elderly populations

- Technology such as AVs might be primarily for those who can afford it
- Potential negative implications of e-commerce on community businesses

Foster a Vibrant Downtown

- Increased shared mobility options could enhance the demand for urban living and working environments
- Reduced vehicle and parking demands could provide more space to lower housing cost, add bike lanes, parks, or other amenities

- Reduced time burden of driving due to AVs could encourage more suburban sprawl
- Electronic access to health care, education, etc. could reduce benefits of being in the urban core

Provide More Transportation Choices

- Technology enhances alternatives to personal auto use, including bicycle sharing, microtransit, carsharing, and ridesourcing

Implications of Emerging Transportation Technologies on EWG Guiding Principles

Guiding Principle

Potential Positive Impacts

Potential Negative Impacts

Promote Safety and Security

- CV and AV technology reduces driver error; technologies are designed to reduce crashes, injuries, and fatalities

- Potential concerns about cyber-security in relation to CV and AV technology

Support a Diverse Economy with a Reliable System

- Improvements in monitoring roadway conditions, as well as safety improvements, should directly result in fewer vehicle incidents, which would improve reliability
- Better traveler information in vehicles enables travelers to re-route to minimize time stuck in congestion
- More vehicle throughput within the existing transportation system that should help to reduce traffic congestion

- Increased VMT could offset some of these benefits.

Support Quality Job Development

- Connectivity has the potential to reduce barriers to travel and facilitate market interaction and overall economic growth.
- Opportunities for quality job development in emerging fields, including advanced logistics and data analytics, as well as in the development of innovative technologies and services

- Vehicle automation could reduce direct employment in the transportation sector, as jobs related to driving (everything from truck drivers to taxi and transit service drivers) could be displaced

Strengthen Intermodal Connections

- Opportunities to optimize the supply chain through improved logistics and data sharing are anticipated, resulting in travel time savings
- Improvements in passenger connections between modes and services are expected

Protect Air Quality and Environmental Assets

- Potential for significant air pollutant and greenhouse gas emissions reductions from shifts to Evs
- Potential for clean energy generation throughout roadways, including solar and kinetic energy

- Increased VMT could offset some gains

Policy Areas of Focus in Regional Planning and Investment Decision Making

- **Safety** – Advancing deployment of safety innovations
- **Security** – Ensuring data privacy and cybersecurity
- **Urban Form and Public Transit** – Fostering policies that address the threats of increased decentralization due to technology and harness the advantages to support a vibrant central core and the success of public transportation
- **Reliability** – Using technology to improve access to real-time traveler information and optimize system reliability
- **Equity** – Using technology to enhance connections for underserved communities and ensuring that technology-based services don't bypass disadvantaged communities

Policy Areas of Focus in Regional Planning and Investment Decision Making

- **Freight and Logistics (Goods Movement)** – Using technology to enhance efficient goods movement and spur economic development
- **Infrastructure Preservation and Maintenance** – Applying technology to improve the monitoring of infrastructure conditions and strengthen transportation asset management
- **Transportation Funding** – Addressing the challenge of technology exacerbating the problem of limited revenues for transportation investment and maintenance
- **Environmental Quality** – Advancing the adoption of eco-friendly infrastructure and vehicles

Examples of Implementation Strategies

■ Safety

- Invest in V2I communications infrastructure to support safety applications for drivers and pedestrians

Responsibilities



Illinois and Missouri DOTs,
local governments

■ Urban Form and Public Transit

- Advance automation in public transportation and quality improvements (e.g., free Wi-Fi) through pilot programs



Metro

■ Equity

- Offer incentives for private services to provide services in marginalized areas, such as those with predominantly low-income populations



Metro and local governments

■ Infrastructure Preservation and Maintenance

- Evaluate use of advanced technologies to support monitoring conditions, including use of drones and vehicle-generated data

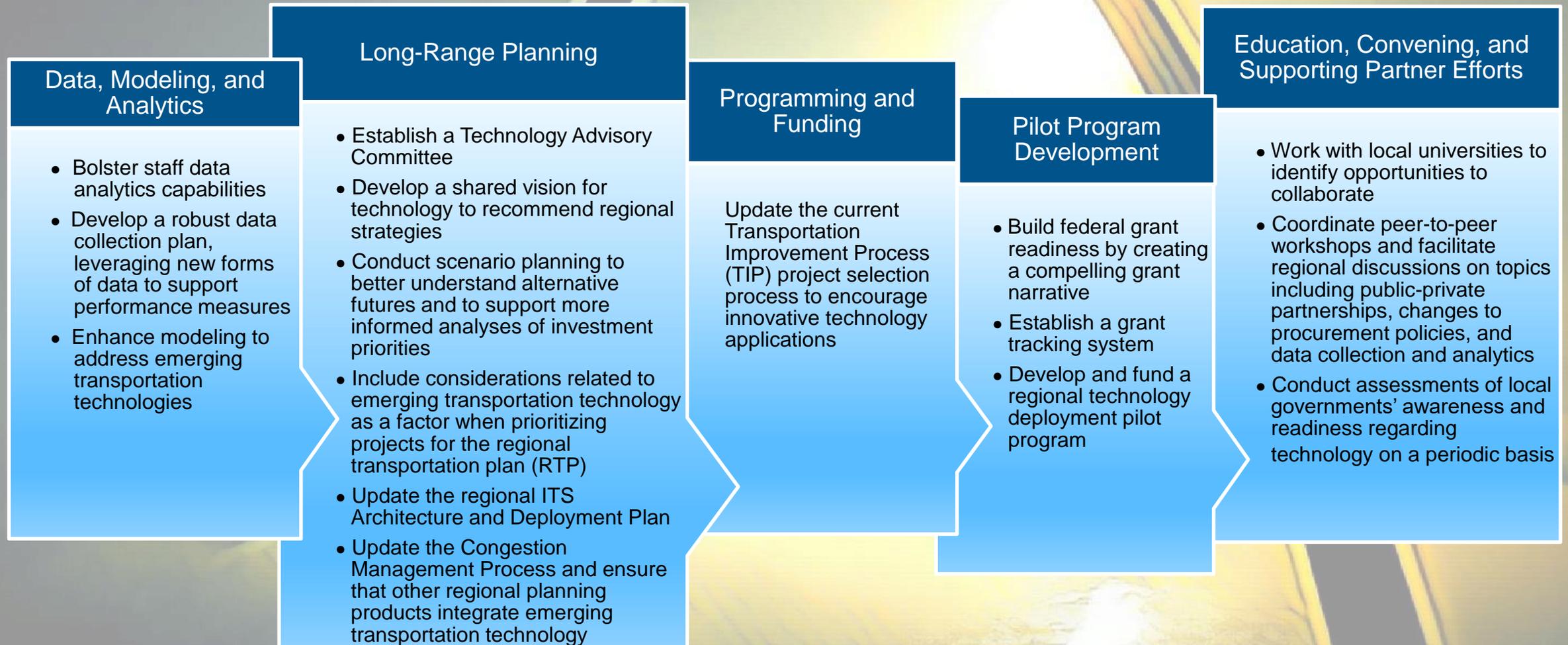


Illinois and Missouri DOTs,
Metro, and local
governments

Examples of Impacts to Investment Needs and Priorities

- **Reduced needs for new highway infrastructure - More efficient use of existing infrastructure, boosting effective capacity**
- **Impacts on public transportation services - Opportunity to restructure public transportation services with automation, smaller vehicles running at higher frequencies**
- **Impacts on ITS infrastructure - Shifts from radio advisories and dynamic message signs to direct dissemination of information to vehicles**
- **Changing needs associated with law enforcement - Less need for enforcement of issues such as red light running, speeding, impaired or distracted driving**
- **Reduced parking needs - Reduced needs for on-street and off-street parking**
- **Workforce development needs – Potential reduction in jobs associated with driving; needs for more tech-savvy workforce or redeployment to customer service**
- **Transportation funding – Reduced revenues through traditional transportation fuel taxes**

Recommendations: Moving Forward from Strategy to Implementation





Questions?

Peter Koepfel

peter@ewgateway.org

<http://www.ewgateway.org/transportation-planning/long-range-planning/>

314-421-4220

618-274-6120