PLANNING FOR TRANSPORTATION DISRUPTION

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Regional Transportation Commission of Southern Nevada
WHO WE ARE

Transit

Roadway Planning & Funding

Traffic Management Systems

Southern Nevada Strong
EMERGING TECHNOLOGIES QUESTIONS

- Old tech vs. New tech?
- How soon?
- Primary impacts on transportation?
- Secondary impacts?
- Impacts on consumers?
- Environmental justice?
- Government spending?
- Emergency responsiveness?
- Utopia or Dystopia?

Reasonable and knowledgeable people reach different conclusions about impacts
ACCELERATION OF TECHNOLOGY ADOPTION

Adoption of Technology in the US (1900 to the Present)

- Adoption Rates (%)
- Time Periods (1900 to 2010)

Technologies and their adoption rates:
- Telephone
- Electricity
- Cars
- Radio
- Fridge
- TV
- Air Travel
- Color TV
- Credit Card
- Microwave
- Video Games
- PC
- Cell Phone
- Internet
- Digital Camera
- MP3 Player
- Social Media
- HDTV
- Smartphone
- Tablet
5-YEAR CRASHES WITH SMART MOBILITY
2040 Congestion WITHOUT Smart Mobility
2040 Congestion WITH Smart Mobility
2040 Congestion WITH Smart Mobility
Potential Limits on Sprawl
- Pricing Tiers
- Shared Fleet/MaaS
- True Disruption
How to address emerging technologies?

- Possible future impacts
- Technology adoption pathways
- Emerging technology unknowns
- Decisions RTC will need to make
- Informing/engaging the public
- Implementing Studies and Planning
  - Five main studies/projects
Agency-wide Planning for Emerging Tech

Mobility Roadmap
~5 year planning horizon
Primary Topic: ITS
Secondary topics:
• Data management
• Industry partnerships

Internet of Things/Connectivity
1-10 year planning horizon
Primary Topic: Architecture
Secondary topics:
• Technology deployment
• Data sharing
**Agency-wide Planning for Emerging Tech**

**Impacts of TNCs/Tech**
- ~5 year planning horizon
- Primary Topic: TNCs
- Secondary topics:
  - Operations impacts
  - Demand & Fiscal impacts

**On Board Transit Plan**
- 1-20 year planning horizon
- Primary Topic: Transit Tech
- Secondary topics:
  - Opportunities & Threats
  - Reassessment “triggers”
AGENCY-WIDE PLANNING FOR EMERGING TECH

**Access2040 RTP**
- 20 year planning horizon
- Primary Topic: Infrastructure
- Secondary topics:
  - Established tech-related strategy
  - Early action items

**Emerging Technology Plan**
- 25+ year planning horizon
- Primary Topic: MPO Impacts
- Secondary topics:
  - Transitions & decision tree
  - Scenarios
  - Initial stakeholder decisions
**Secondary Strategy: Use Innovative Planning to Address Emerging Technologies & Trends**

Emerging technologies and their growing use will disrupt traditional transportation planning practices. To respond proactively, the RTC will develop innovative planning approaches that change how priorities are identified and how decisions are made. These new planning methods—which may take years to identify—will allow the RTC to develop effective, predictive, and timely responses to these disruptions.

Potential impacts are numerous. Engineering research indicates that connected and autonomous vehicles could nearly double effective road capacity, virtually eliminating traffic congestion and challenging the need for more capacity. At a certain threshold across the entire fleet, self-driving cars are expected to substantially reduce overall transportation crashes and fatalities. Transportation Network Companies and autonomous vehicles could drive down public transit operating costs and lead to changes in how transit is provided. RTC analysis of available data already shows that TNC ridership as a share of passengers at McCarran International Airport has doubled over a 6-month period. New ways of travel and vehicle ownership could change land use patterns, transportation revenue, and public transit preferences. With the actual impacts still unknown, the appropriate actions by the RTC (to avoid inefficient uses of resources for projects that may become unnecessary, avoid putting drivers, pedestrians, and bicyclists at risk, and accommodate these new trends and technologies) are difficult to determine until these technologies are more extensively adopted. To make smart decisions, some emerging planning-related questions may become:

- What infrastructure changes may be needed?
- When (or if) it will be appropriate to start changing how what types of infrastructure or capacity are provided.
- How will these trends influence how and how much people and household good travel?

**Potential Technology-Related Trends**

- Congestion, Crashes & Fatalities, Need for Road Expansion
- Overall VMT, Sprawl, Trip Distances, Travel Times
- Autonomous Vehicle Usage, Tech-Enabled Road Capacity, System Reliability

<table>
<thead>
<tr>
<th>Technology-Related Planning Needs</th>
<th>RTC Action</th>
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<tbody>
<tr>
<td>Incorporate emerging technologies into goals</td>
<td>Included in Access 2040</td>
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<tr>
<td>Establish policies &amp; plans with consideration for the future</td>
<td>Initiated in Access 2040</td>
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<tr>
<td>Develop scenario model with Emerging Technologies capabilities</td>
<td>Model development underway (2017)</td>
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<tr>
<td>Assess high-capacity transit impacts and requirements</td>
<td>High Capacity Transit Plan (2017-2018)</td>
</tr>
<tr>
<td>Evaluate road capacity needs</td>
<td>Emerging Technologies Planning Study (2017)</td>
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<tr>
<td>Forecast financial implications</td>
<td>Emerging Technologies Planning Study (2017)</td>
</tr>
<tr>
<td>Identify trigger points for longer-term actions</td>
<td>Emerging Technologies Planning Study (2017)</td>
</tr>
<tr>
<td>Evaluate and test use of AV para-transit vehicles</td>
<td>1-5 years</td>
</tr>
<tr>
<td>Update roadway policies and infrastructure to leverage the VMT impact</td>
<td>1-5 years</td>
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<tr>
<td>Develop new predictive models for pavement maintenance</td>
<td>1-5 years</td>
</tr>
<tr>
<td>Assess impacts on low-ridership transit routes</td>
<td>1-5 years</td>
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<tr>
<td>Provide analysis of transportation and land use impacts to support stakeholders</td>
<td>1-5 years</td>
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**Potential MPO-related Impacts**

- **Current Conditions**
- **Phase I** (TNC Intro)
- **Phase II** (AV Intro)
- **Phase III** (Shared ownership intro; AV adoption increasing)
- **Phase IV** (Wide AV adoption)
- **Phase V** (Shared, Autonomous, Electric)

- Technology starts providing Road Capacity (Appropriate to Slow Road Expansions?)
- Tech-provided capacity exceeds what construction can provide. (Appropriate to Stop Road Expansions?)
- Technology provides excess Road Capacity (Appropriate to Repurpose ROW?)

![Graph showing potential MPO-related impacts](image-url)
Need for Road Expansion, Congestion, Crashes & Fatalities

Autonomous Vehicle Usage, Tech-Enabled Road Capacity, System Reliability

Overall VMT, Sprawl, Trip Distances, Travel Times

Potential Technology-Related Trends

Near-Term (~5-10 years)  Mid-Term (~10-20 years)  Long-Term (~20+ years)
### Changes to Current Planning Measures?

<table>
<thead>
<tr>
<th>Current Planning Measure</th>
<th>New Planning Measures</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Miles Traveled</td>
<td>Occupied Miles Traveled (OMT)</td>
<td>Miles traveled by vehicles that are occupied by people (current VMT description)</td>
</tr>
<tr>
<td></td>
<td>Service Miles Traveled (SMT)</td>
<td>Miles traveled by unoccupied vehicles to conduct service tasks or errands not requiring a human passenger (will initially be very small proportion)</td>
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<tr>
<td></td>
<td>Repositioning Miles Traveled (RMT)</td>
<td>Miles traveled by unoccupied vehicles to reposition a shared vehicle for another occupant, or to wait for the vehicle’s owner to summon it (will initially grow as AVs are adopted, but decrease as shared ownership or MAAS increases)</td>
</tr>
<tr>
<td></td>
<td>Total VMT = OMT + SMT + RMT</td>
<td>Total Vehicle Miles Traveled (TVMT) is the sum of occupied vehicle miles traveled, service vehicle miles traveled, and repositioning miles traveled.</td>
</tr>
<tr>
<td>Person Miles Traveled</td>
<td>Person Miles Traveled</td>
<td>Miles traveled by people (will initially correspond closely to total VMT, and will vary from OMT based on vehicle occupancy rates)</td>
</tr>
</tbody>
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Other changes may include:
- Developing measures related to **time use** rather than trip distances
- New measures of **transportation productivity** incorporating commute time productivity
- Closer tracking of **transportation-related costs** (and how they influence people’s travel activity and vehicle trips)
- Travel diary surveys replaced by **vehicle use inventories** and reports
EMERGING TECHNOLOGIES DECISIONS

• Support a technology?
• When to make changes?
• Which – if any – downsides to accept?
• Should we engage to avoid negative impacts?
• Top priorities?
  – Congestion?
  – Environmental justice?
  – Taxes/Spending?
• What outcomes do we want?

Actively shape the future or respond to trends as they happen?
Establish a Strong Mandate

**Project Stages**
- State of Field Analysis: Summarize 6-8 selected reports/papers
- Preliminary Implications: Describe potential impacts, identify opportunities, ID potential trigger points, develop initial scenarios
- Delphi/Expert Panel: Develop Potential Timeline, identify scenarios
- Scenario Report & Final Decision Tree
- Initial (non-binding) Trigger Point Decisions
- Final Report

**Agency Input**
- RTC Staff: (work done by staff and/or consultant)
- Phone-based: (staff/consultant interviews & synthesizes expert input)
- (staff/consultant develops from Delphi synthesis)
- (staff/consultant develops "If/Then" paths)
- Public

**Stakeholder Input**
- RTC Staff: (work done by staff and/or consultant)
- Workshop: - LPAs: (Delphi presentations followed by workshop)
- (staff/consultant develops from Delphi process)
- LPAs: (develop "If/Then" paths)
- Public

**Leadership Input**
- informed
- informed
- informed
- TRAC & RTC Board: (develop "If/Then" paths)