Mountain View Automated Guideway Transit Feasibility Study

Community Meeting September 25, 2017

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Agenda

- Presentation
- Questions and Answers Session
- Moderated Discussion: Issues/Trade-Offs
Purpose of Meeting

- Present Findings of Evaluation
  - Highlight key parameters of Evaluation Criteria
  - Educate on potential service levels and infrastructure tradeoffs
- Feedback
  - Community feedback from key issues/ trade-offs discussion
Introduction

- **Purpose of Study**
  - **The Challenge**
    - Employment and housing growth
    - Caltrain rider growth
    - Achieving city goals for mode shift
  - **The Goal**
    - Determine the feasibility, and impacts/benefits of Automated Guideway Transit (AGT)
    - How would AGT be integrated into community over time
Issues/Trade-offs

- Passenger Experience
  - Vehicle size
  - Type and frequency of service
- Infrastructure
  - Community impacts
- Technology Maturity
  - Current cost and future evolution of technology
  - Expandability/Adaptability
Purpose: Presented study and Automated Guideway Transit (AGT) types and engage community with respect to study objectives and AGT system characteristics.
Previous Outreach Meeting

- Technology
  - Nothing intrusive
  - Frequent service and smaller vehicles especially in the residential areas
  - Land use consideration, concern about where the land will come from

- Priorities/Considerations
  - Weighing “fast service” versus “adaptable”
  - Need to prioritize

- Goals and Values
  - Adaptable, expandable to connect multiple points in Mountain View and beyond
  - Compatibility with multimodal transportation—i.e. bikes, personalized transportation
  - First and last mile connectivity is important
AGT Technologies

- Aerial Cable
- Automated People Mover (APM)
- Automated Transit Network (ATN)
  - Group Rapid Transit (GRT)
  - Personal Rapid Transit (PRT)
- Autonomous Transit (AV)
Candidate Corridors

- Connect key nodes
  - Downtown Transit Center
  - North Bayshore
  - Moffett Field and NASA
- Representative alignments
  - Potential service areas
  - Physical/environmental limitations
Representative Alignments
## Evaluation Criteria

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>CRITERIA</th>
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</thead>
<tbody>
<tr>
<td>Operations</td>
<td>1 Ability to serve market demand estimate</td>
</tr>
<tr>
<td></td>
<td>2 Flexibility in service / responsiveness to daily demand</td>
</tr>
<tr>
<td>Financial and Economic</td>
<td>3 Financial feasibility</td>
</tr>
<tr>
<td></td>
<td>4 Ability to add stations to serve existing or new developments</td>
</tr>
<tr>
<td>Neighborhood Connectivity and Impact</td>
<td>5 Ability to extend the system</td>
</tr>
<tr>
<td></td>
<td>6 Possible impact on neighborhoods</td>
</tr>
<tr>
<td>Customer Experience</td>
<td>7 Provides convenient and high-level service</td>
</tr>
<tr>
<td>System Delivery</td>
<td>8 Integration into Transit Center</td>
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<td></td>
<td>9 Ability to fit within the local environment</td>
</tr>
<tr>
<td></td>
<td>10 Adaptability of infrastructure</td>
</tr>
<tr>
<td>Technology Development</td>
<td>11 Level of technology maturity</td>
</tr>
</tbody>
</table>
Findings and Issues/Trade-offs

- Methodology
- Findings focus on 3 main areas of issues and trade-offs
  - Passenger Experience
  - Infrastructure
  - Technology Maturity
- Generate discussion and get feedback
Methodology

- **Technology simulations to estimate operational characteristics**
  - Inputs: Representative alignment, station locations, dwell times, vehicle/passenger comfort parameters, bikes on vehicles

- **Demand: Peak loading at Transit Center (Caltrain and VTA LRT connecting to AGT)**
  - Peak 10 min period: 330 passengers at Transit Center
  - Daily Ridership: 4,000 to 9,000 passengers
Passenger Experience

- Vehicle size: Small vs. Mid vs. Large Vehicles
- Smaller vehicles with higher frequency vs. Larger vehicles with lower frequency
- Flexible, more personalized point-to-point service vs. higher capacity, typical transit service
- Sharing vehicles: Personal vs. Group
- Meeting needs of all riders: ability to accommodate bikes, ADA, etc.
## Operational Information

<table>
<thead>
<tr>
<th></th>
<th>Aerial Cable</th>
<th>APM</th>
<th>ATN (PRT/GRT)</th>
<th>AV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Capacity (passengers)</td>
<td>14 – 32</td>
<td>80</td>
<td>3 / 21</td>
<td>10 – 20</td>
</tr>
<tr>
<td>Travel Time To N. Bayshore* (min)</td>
<td>11</td>
<td>7</td>
<td>6 / 7</td>
<td>6 – 7</td>
</tr>
<tr>
<td>Frequency To N. Bayshore*</td>
<td>30 sec – 1 min</td>
<td>4 min</td>
<td>10 sec / 45 sec</td>
<td>30 sec - 1 min</td>
</tr>
<tr>
<td>Ability to use same technology for North Bayshore network</td>
<td>✔</td>
<td>✔</td>
<td></td>
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</tr>
</tbody>
</table>

*N. Bayshore – Shoreline/Charleston station
VALUES ARE HIGH-LEVEL ESTIMATES ONLY
Passenger Experience

- Meeting needs of all riders
  - Ability to accommodate bikes, ADA, etc.
- Evacuation: Emergency walkway availability
Infrastructure

- Privacy vs. Visual impacts
- Intermittent Towers/structures vs. Consistent Column/viaduct structure
- Reduced traffic congestion and traffic calming vs. Visual impacts of structures
Community Impact

- **Noise**
  - Aerial Cable: Continuous, regular sound
  - APM/ATN/AV: Intermittent as vehicle passes
- **Visual**
  - Aerial Cable: Intermittent Towers
  - APM/ATN/AV: Consistent Columns
- **Privacy**
  - Aerial Cable: Operation over private property
- **Environmental**
Community Impact

- Technologies incorporated into community
  - Potential to extend beyond the Transit Center to N. Bayshore connection
  - Infrastructure renderings:

Automated People Mover

Autonomous / Group Rapid Transit

Aerial Cable Transit

Source: Kimley-Horn
Corridor Challenges
Corridor Challenges

Key Areas:
- 101 and 85
- Shoreline/ Central Expy Way
- Geometry Constraints
- PG&E

Example of an APM system making a 330 ft turn on Charleston Blvd and Shoreline Blvd

Example of an ATN system making a 100 ft turn on Charleston Blvd and Shoreline Blvd
Technology Maturity

- Cost vs. Evolving Technology/Risk
- Install/build now (dedicated guideway) vs. Wait for Autonomous Transit technology to mature (allowing semi-exclusive or exclusive roadway lanes with crossings)
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<tbody>
<tr>
<td>Capital Cost (per mile)</td>
<td>$35M - $50M</td>
<td>$130M - $195M</td>
<td>$85M - $130M</td>
<td>$85M - $135M</td>
</tr>
<tr>
<td>O&amp;M Cost (per year)</td>
<td>$6M - $8M</td>
<td>$11M - $17M</td>
<td>$6M - $8M</td>
<td>$5M - $8M</td>
</tr>
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**Capital Cost Estimate**
- Systems: Vehicles, guidance, power, communications, train control, etc.
- Facilities: Civil works for stations, guideway, maintenance facility

**O&M Cost Estimate**
- Annual cost to operate and maintain the system (staff, central control operators, parts and consumables, etc.)

*VALUES ARE IN 2017 USD*
Expandability and Adaptability

- Extending System or Adding Midline Stations
  - Aerial Cable: Very difficult
  - APM, ATN, AV: Possible; pre-planning minimizes impact
- Adapting facilities for other technologies
  - Aerial Cable: Not possible
  - APM, ATN, AV:
    - Guideway structures: can be re-used for equal or smaller technologies
    - Stations: may need re-designing to meet operations of different technologies
Next Steps

- Council Study Session – October 17
- Finalize Evaluation and Study Results
- Report to Council in early 2018
Discussion

- Issues/Trade-Offs
  - Passenger Experience
    - Vehicle size
    - Frequency of service
  - Infrastructure
    - Community impacts
    - Representative routes
  - Technology Maturity
    - Current cost and future evolution of technology
    - Expandability/Adaptability
Thank You!

- Website: https://MountainViewAGTFeasibility.com