Emerging Technologies and Mass Transit Planning: Moving Bits to Move People

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Agenda

- Developments in transit technology, some historical background.
- Contemporary challenges.
- An approach to leveraging technology to support planning processes.
- Implementation examples.
- Implications for the future.
Technology helps to cut costs…
New seating design and advertising revenue...
Exterior advertising opportunities…
Advances in propulsion technologies…
Advances in propulsion technologies…
Advances in grade separation...
Advances in grade separation...
Electrification and multiple unit control...
Transit-Oriented Development
Station design for ease of transfer…
Station design for ease of transfer…
Hybrid Buses
Alternative Fuel Vehicles
Bus Rapid Transit

<table>
<thead>
<tr>
<th><strong>HOW GUIDE-O-MATIC SYSTEM COULD BE APPLIED TO A CTA BUS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SYSTEM IDENTIFICATION</strong></td>
</tr>
<tr>
<td>1. GUIDANCE WIRE</td>
</tr>
<tr>
<td>2. MAGNETIC FLUX LINES</td>
</tr>
<tr>
<td>3. SENSING UNIT</td>
</tr>
<tr>
<td>4. GUIDE BOX</td>
</tr>
<tr>
<td>5. RELAY PANEL</td>
</tr>
<tr>
<td>6. STEERING CONTROL LINE</td>
</tr>
<tr>
<td>7. STEERING MOTOR</td>
</tr>
<tr>
<td>8. FUEL ADJUSTMENT CONTROL LINE</td>
</tr>
<tr>
<td>9. BRAKING CONTROL LINE</td>
</tr>
<tr>
<td>10. OPERATOR CONTROL</td>
</tr>
<tr>
<td>11. BEACON CONTROL LOOP</td>
</tr>
<tr>
<td>12. BEACON ANTENNA</td>
</tr>
<tr>
<td>13. BEACON CONTROL RECEIVER</td>
</tr>
</tbody>
</table>
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Contemporary Challenges

- Changing Customer Habits
- Shifting Land Use/Development Patterns
- Aging Infrastructure
- Security
Addressing Contemporary Challenges With Planning

- Systematize approach to planning.
- Develop information infrastructure.
- Develop human capital.
- Support discourse by leveraging technology.
Elements of an Information Infrastructure

- Census Data
- Housing Data
- Land Use Data
- Aerial Orthophotos
- Route Infrastructure
- Schedule Information
- Spatially Intelligent Vehicles
- Performance
- Ridership Data
- Specialized Models
- Field Data
Feeding the Information Infrastructure
Rail Ridership Information
Vehicle-based Data Collection

On-Board Systems Projects

Radio Antenna

Radio/AVL System

UHF Link

GPS Antenna

WDOLS

FTP

DDU

VLU

New Radio

Automated Vehicle Maintenance
Automated Stop Annunciation
and signs

Integrated APC

Odometer, Door & Lift

Smart Signal Priority

On-Board AVL
and GPS

= Current

= RFCS Scope

= OBSI Scope

= RAVL Scope
Farebox-based Bus Ridership Tracking

![Graph showing bus ridership over hours]

- **Boardings**
  - Y-axis: 0 to 1,600
  - X-axis: Hour (1 to 23)
- **Lines**:
  - Orange: July 3rd
  - Blue: Avg July Sunday

The graph indicates that bus ridership varies throughout the day, with peaks in certain hours and troughs in others. The Orange line represents actual ridership on July 3rd, while the Blue line represents the average ridership on a July Sunday.
Automatic Passenger Counter (APC)  
Bus Ridership Tracking
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How do people share knowledge about the future of their communities?

- Recollect the Past
- Describe Present Conditions
- Speculate about the Future
<table>
<thead>
<tr>
<th>Influences of Information Technology towards...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Augmenting Recollection:</strong></td>
</tr>
<tr>
<td>Annotation Tools</td>
</tr>
<tr>
<td><strong>Augmenting Description:</strong></td>
</tr>
<tr>
<td>Navigational Aids</td>
</tr>
<tr>
<td><strong>Augmenting Speculation:</strong></td>
</tr>
<tr>
<td>Representational Aids</td>
</tr>
</tbody>
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Annotation Tools

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Navigational Aids allow spatially distributed collaborators to tour and discuss sites of concern through a combination of digital video, “spatially intelligent” objects, and interactive maps. Some recent examples include:


- Shiffer, et. al. (2001) CTA Rail Infrastructure Multimedia Tool for Project Management & Rail Operations

- Shiffer, et. al. (2001) Virtual Tour of CTA’s Harrison Curve
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Representational aids link concrete representations, such as video or sound clips of comparable examples, to otherwise abstract output. The result of this is an image of a place that changes in “real time” to fit a multitude of alternative scenarios being discussed. Some examples:

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Public Participation Inputs to the Transit Planning Process
Travel Survey Data
Planning Process

- Information Infrastructure
- Service Standards
- Data Streams
- Annotation Tools
- Navigational Aids
- Representational Aids
- Survey Research
- Public Input
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Innovate- Transit agencies need to work with academic institutions and private firms to identify creative solutions to transit problems (apply relevant technologies).

Implement- A key to the successful use of these tools and approaches is the ability to interpret and analyze their output. Human capital is critical.

Impact- Apply the tools and techniques here to continue the positive momentum of ridership growth (reshape the planning process and transit systems).
Contact Info

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