Moving Minds: The Next Transportation Infrastructure

Intelligent Transportation Systems
Smarter Transportation

Riz Khaliq, IBM Public Sector
A planet of smarter cities: In 2007, for the first time in history, the majority of the world’s population—3.3 billion people—lived in cities. By 2050, city dwellers are expected to make up 70% of Earth’s total population, or 6.4 billion people.
Smarter Transportation: A Key Component of a Smarter City

INSTRUMENTED
We now have the ability to measure, sense and see the exact condition of practically everything.

INTERCONNECTED
People, systems and objects can communicate and interact with each other in entirely new ways.

INTELLIGENT
We can respond to changes quickly and accurately, and get better results by predicting and optimizing for future events.
Transportation Influencers Model

- Spatial Development
- Population & Economy
- Environment
- Customer Interaction
- Mobile Workforce
- Innovative Pricing
- Ride Sharing and Transit Incentives
- Customer Interaction
- Dynamic Information Management
- Simulation & Modeling
- Information & Customer Management

- Macro Demand Influencers
- Transport Infrastructure Supply
- Funding mechanisms
- Build Infrastructure
- Strategy & Planning
- Environment
- Build Infrastructure
- Strategy & Planning

Traditional

Opportunity to innovate

Smarter Cities: Smarter Transportation
## Multimodal Transportation Maturity Model

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Silo</strong></td>
<td><strong>Centralized</strong></td>
<td><strong>Partially Integrated</strong></td>
<td><strong>Multimodal Integrated</strong></td>
<td><strong>Multimodal Optimized</strong></td>
</tr>
<tr>
<td><strong>Planning</strong></td>
<td>Functional Area Planning (single mode)</td>
<td>Project-based Planning (single mode)</td>
<td>Integrated across multiple modes</td>
<td>Integrated regional multimodal planning</td>
</tr>
<tr>
<td><strong>Performance Measurement</strong></td>
<td>Minimal</td>
<td>Defined metrics by mode</td>
<td>Limited across multiple silos</td>
<td>Continuous system-wide performance measurement</td>
</tr>
<tr>
<td><strong>Customer Management</strong></td>
<td>Minimal capability, no customer accounts</td>
<td>Customer accounts managed separately for each system/mode</td>
<td>Multi-channel account interaction per mode</td>
<td>Integrated multimodal incentives to optimize multimodal use</td>
</tr>
<tr>
<td><strong>Data Collection</strong></td>
<td>Limited or Manual Input</td>
<td>Near real-time for major routes</td>
<td>Real-time for major routes using multiple inputs</td>
<td>System-wide real-time data collection across all modes</td>
</tr>
<tr>
<td><strong>Data Integration</strong></td>
<td>Limited</td>
<td>Networked</td>
<td>Extended integration</td>
<td></td>
</tr>
<tr>
<td><strong>Analytics</strong></td>
<td>Ad-hoc analysis</td>
<td>Periodic, Systematic analysis</td>
<td>Detailed analysis in real-time</td>
<td>Multi-modal analysis in real-time</td>
</tr>
<tr>
<td><strong>Payment Methods</strong></td>
<td>Manual Cash Collection</td>
<td>Automatic Cash Machines</td>
<td>Electronic Payments</td>
<td>Multimodal, multi-media (fare cards, cell phones, etc)</td>
</tr>
<tr>
<td><strong>Incident Management</strong></td>
<td>Manual detection, response and recovery</td>
<td>Manual detection, coordinated response, manual recovery</td>
<td>Automated pre-planned multimodal recovery plans</td>
<td>Dynamic multimodal recovery plans based on real-time data</td>
</tr>
<tr>
<td><strong>Demand Management</strong></td>
<td>Individual static measures</td>
<td>Individual measures with long term variability</td>
<td>Dynamic pricing</td>
<td>Multimodal dynamic pricing</td>
</tr>
<tr>
<td><strong>Traveler Information</strong></td>
<td>Static Information</td>
<td>Static trip planning, limited real-time information</td>
<td>Location-based, on-journey multimodal information</td>
<td>Location-based, multimodal proactive re-routing</td>
</tr>
</tbody>
</table>

**Strategic Planning**
- **Real-time Information Creation Capability**
- **Real-time Intervention Capability**

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"Average" City: range

Leading Practice
IBM Intelligent Transportation Systems Offerings
Encompass a variety of strategies to deliver results

- Transportation Strategy and Planning
- Transportation Maturity Model
- Total Cost of Ownership Model

Integrated Fare Management
- Integrated payment solutions for multiple transportation modes
- Shared Back office across multiple cities
- Cloud Infrastructure

Transportation Advisory Services

Innovative Transportation Pricing
- Single Highway/Bridge Tolling
- Network of Tolled Highway (incl. HOT networks)
- City Congestion Charging
- Usage Based Pricing/Taxation

Transportation Information Management
- Improved Network Management
- Real Time Multimodal Traveler Information
- Performance Management and Reporting
- Traffic Prediction and Analytics
- Asset Management
- Visualization

IBM Intelligent Transportation Systems Offerings
Smarter Cities: Smarter Transportation

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## Selected IBM ITS Projects

### Stockholm Congestion Charging
Prime responsibility for the design, implementation and operation of the scheme.

### London Congestion Charging
Provision of a new enhanced central system and scheme operation for 5 yrs from Nov 09.

### Singapore Pricing, Traffic Prediction
- Built central system infrastructure in 1998
- Delivered an innovative “real time” traffic prediction tool
- Supporting LTA with trials for the implementation of a full Time Distance Place scheme

### Dublin Transit Automatic Fare Collection
- Multimodal fare management system
- Single smart card usable across multiple providers of transportation services
- Project to start in October 2008

### Brisbane Electronic Toll Collection
- A shared system that will allow of the centralized operation of five separate toll highways
- Each tolled facility will have the flexibility of setting its own variable toll rates

### LA County MTA DIOS
- Control inventory without jeopardizing parts availability and service levels
- Reduced inventory by 28% for the Pilot inventory sample of $15.4M

### Amtrak Reservation Systems
- Support the infrastructure for Amtrak's reservation system as well as the corporation's entire computing infrastructure
- Ticket volumes processed via the Web, telephone, and ticket counter channels, makes it one of the largest systems of its kind in the rail industry.

### Inter-operable Fare Collection
- System specification
- Procurement and Tender evaluation
- Program management office

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Thank You

Riz Khaliq
IBM Global Public Sector
rizkhaliq@us.ibm.com