ITS IMPLEMENTATION
A CASE STUDY ON HYDERABAD METRO

Anil Kumar Saini
Chief Operating Officer
L&T Metro Rail (Hyderabad) Limited
Intelligent Transport Systems

- Improved end-to-end customer experience
- Seamless Mobility/Multimodal Journey
- Shared Mobility Options
- Revenue Enhancement
- Optimized Opex
- Efficient O&M
- Consumer Behaviour Intelligence
- Flexible Service Delivery
- Improved Safety
- Mobility as a service
- Connected Assets
Intelligent Transport Systems - Hyderabad Metro Rail

1. Communication Based Train Control
2. Asset Management System
3. Open Loop Payment System
4. Data Intelligence
5. Mobile Application for User Convenience
6. Integration with City Infrastructure

Intelligent Transport System
Communication Based Train Control

- Real time information
- Better reliability
- Flexible schedules
- Better energy efficiency
- Reduced Headway (90secs)
- Improved Safety
Maximo asset management software integrated with IoT sensors for:

- Asset Registry
- Real time fault data & analysis
- Maintenance Planning
- Inventory Management
- Crew Rostering
- Predictive Maintenance
- Optimized O&M costs
Open Loop EMV Account Based AFC System

- World is moving to Open Loop EMV ticketing
- Banks to manage the ticketing systems
- Low cost and efficient ticketing options like QR codes
- CAPEX and card management by Banks
- Easy integration to other modes of transport
- Interoperable payment ecosystem in the city
Mobile Application

✓ Journey Planner- Multi Modal Integration
✓ Buy / Recharge Smart Card
✓ Shared Rides
Mobile Application

Journey Planner

Buy / Recharge Card
Data Intelligence Approach => Data Driven Company

- No more data processing time
- Automatized dashboards / calculations
- Good knowledge / quality of data
- Intuitive visualization / understanding of data
Data Intelligence & Performance Improvement

DB n°6 - Revenue per transaction type

Revenue - Transactions per Type (Cst/Csc, Cash/Non Cash...) - Monthly Totals

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<tr>
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<tbody>
<tr>
<td>Cst Cash</td>
<td>33 755</td>
<td>38 326</td>
<td>12 852</td>
<td>27 425</td>
</tr>
<tr>
<td>Cst Non Cash</td>
<td>26 792</td>
<td>30 112</td>
<td>40 037</td>
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<tr>
<td>Add Value Non Cash</td>
<td>34 780</td>
<td>34 780</td>
<td>34 780</td>
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<tr>
<td>Add Value Cash</td>
<td>1,37M</td>
<td>4,42M</td>
<td>5,33M</td>
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<tr>
<td>Add Value Cash</td>
<td>5,27M</td>
<td>5,72M</td>
<td>5,33M</td>
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Transaction Type:
- Ticket Replacement
- Csc Non Cash
- Csc Lost Stolen
- Add Value Cancellation
- Csc Cash
- Administrative Hand...
- Ticket Refund
- Ticket Adjustment
- Add Value Cash
- Add Value Non Cash
- Cst Non Cash
- Cst Cash

Revenue - Revenue per Type (Cst/Csc, Cash/Non Cash...) - Monthly Totals

Revenue - Transactions per Type (Cst/Csc, Cash/Non Cash...) - Weekly totals

Transactions

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Revenue (Unit Revenues)

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L&T Metro Rail
# Data Intelligence & Performance Improvement

## DB n°7 - Fare Evasion Analysis

### Penalty Reason - Ranking and top 80%

<table>
<thead>
<tr>
<th>Penalty Reason Code</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>06-Mismatch At Entry</td>
<td>95%</td>
</tr>
<tr>
<td>04-Overstaying In The System</td>
<td>33.80%</td>
</tr>
<tr>
<td>07-Mismatch At Exit</td>
<td>21.78%</td>
</tr>
<tr>
<td>02-Ticket-Less Travellers</td>
<td>14.73%</td>
</tr>
<tr>
<td>10-Unreadable Ticket</td>
<td>6.01%</td>
</tr>
<tr>
<td>15-Over Travel</td>
<td>5.73%</td>
</tr>
<tr>
<td>01-Carrying Away Token Without Depositing At Exit Gate</td>
<td>4.92%</td>
</tr>
<tr>
<td>11-Luggage Limit</td>
<td>4.00%</td>
</tr>
<tr>
<td>12-Luggage Limit</td>
<td>3.32%</td>
</tr>
<tr>
<td>09-Not Sale Station</td>
<td>1.66%</td>
</tr>
<tr>
<td>03-Over Travelling</td>
<td>0.86%</td>
</tr>
</tbody>
</table>

### Fare Evasion Analysis - Top penalty reasons

- **33.80%**: 06-Mismatch At Entry
- **21.78%**: 04-Overstaying In The System
- **14.73%**: 07-Mismatch At Exit
- **6.01%**: 01-Carrying Away Token Without Depositing At Exit Gate
- **5.73%**: 11-Luggage Limit
- **4.92%**: Other

### Penalty Reason - Weekly Profile

- **06-Mismatch At Entry**
- **04-Overstaying In The System**
- **07-Mismatch At Exit**
- **02-Ticket-Less Travellers**
- **10-Unreadable Ticket**
- **15-Over Travel**
- **01-Carrying Away Token Without Depositing At Exit Gate**
- **11-Luggage Limit**
- **Other**

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**Penalty Reason Code (groups):**
- 06-Mismatch At Entry
- 04-Overstaying In The System
- 02-Ticket-Less Travellers
- 07-Mismatch At Exit
- 10-Unreadable Ticket
- 15-Over Travel

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Interface to City Infrastructure

✓ Hyderabad is implementing city surveillance system
✓ It is planned to integrate with metro in future
✓ Metro feedback to city surveillance and vice versa

Advantages:

✓ Complete data and information available with command & control center
✓ Real time traffic data integration
✓ Improved transport planning
✓ Better management of incidences
✓ Enhanced customer experience
Summary & Conclusion

- **ITS implementation- Need of the hour**
- **ITS leads to efficient Asset Utilization & Improved travel experience for customers**
- **Integration of all modes of transport is essential**
- **All transport agencies shall work together in this direction**
THANK YOU