Riyadh Advanced Traffic Control System

A step towards Saudi Arabia’s Vision 2030

Presentation for ITSNY 2023

Raymund Royandoyan, Sr. Mgr.
Insert Riyadh Smart Traffic Signals video with Audio
Riyadh Advanced Traffic Control System Project

- In February 2014 TransCore was awarded $100M contract
- Design, Build, Operate and Maintain 350 intersections in Riyadh
- Modernized intersections
- Communications infrastructure
- Central Hardware
- TransSuite and ACDSS
- 5-year Operations and Maintenance
- Project completed in September 2022
Riyadh Advanced Traffic Control System Project

• Modernized intersections
  • Civil works
  • New Traffic Signal Poles, signal heads and Pedestrian pushbuttons
  • New intersection wiring
  • New traffic controllers and cabinets
  • Uninterruptible Power Supplies

• Communications infrastructure
  • Private Microwave Network
  • 3G/4G Telecom Provider
  • Telecom Microwave Network
  • Fiber Optic Network
Riyadh Advanced Traffic Control System Project

• 5-year Operations and Maintenance
  • 24/7/365 Operations Personnel
  • 24/7/365 Maintenance Personnel

• Traffic Management
  • Coordinate incident response
  • Special Plans
  • Facilitate VIP Movement

• One-hour response plans
  • Power Failures
  • Equipment failures
  • Equipment Damage due to Accidents

• Preventive Maintenance

TransCore Proprietary and Confidential
Riyadh Advanced Traffic Control System Project

- Traffic Control Center
  - Located in King Abdulaziz Public Transportation Center
  - Co-located with METRO and BRT Operations
Riyadh Advanced Traffic Control System Project

- TransSuite Traffic Management Modules
  - Browser-based
  - English and Arabic

- Adaptive Control Decision Support System (ACDSS)
  - Provides various adaptive control dashboards

- TransCore’s Maintenance Online Management System (MOMS)
Adaptive Control - ACDSS
Traffic Adaptive - ACDSS

- Allows adaptive control to support a very dynamic changes in traffic conditions
- Provides various adaptive control modes
  - Adaptive isolated mode
  - Adaptive coordinated
  - Queue Management
  - Corridor Management
  - Area wide Control
Operational Improvements and Benefits
## Operational Improvements and Benefits

### Progressive Timeline

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Average Travel Time</th>
<th>Overall (%)</th>
<th>With ATCS + Adaptive Early Yield Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>King Khalid</td>
<td>Before (Pre ATCS)</td>
<td>Down to 7.0 mins</td>
<td>Down to 7.0 mins</td>
</tr>
<tr>
<td></td>
<td>With ATCS</td>
<td>Down to 7.5 mins</td>
<td>26%</td>
</tr>
<tr>
<td></td>
<td>With ATCS + Adaptive</td>
<td>Down to 8.5 mins</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>Up to 26%</td>
<td></td>
</tr>
</tbody>
</table>

- **Delay Reduction in (%):**
  - Up to 26%
Project Challenges
Project Challenges

- Implementation of U.S. based standards
- Compatibility of U.S. and European equipment
- Support of operational functionalities not being used in the U.S.
- Driver/Public behavior and expectations
- Surge of new drivers
- Unreliable/unstable electrical power grid
- Desert Environment
  - Heat
  - Dust
  - Rain/flooding
Program Status
Program Status

- Integrated with third party application to provide traffic data from TransSuite
- Centralized Transit Signal Priority (CTSP) recently deployed for Riyadh’s Bus Rapid Transit Routes
- Integration into TransSuite of additional 80 intersections
- Upcoming integration into TransSuite of additional 300 intersections
- Initial discussion with Red Crescent for implementation of centralized Emergency Vehicle Preemption (CEVP)