Hyderabad Traffic Integrated Management System (HTRIMS)

Introduction
Shri. C V Anand I.P.S
Additional Commissioner of Police, Traffic, Hyderabad
Hyderabad Traffic Context

- **26 lakh vehicles** on road in Hyderabad, fourth largest in India, **33 lakh in GHMC limits**
- **600 vehicles** added every day
- Hyderabad has only **9% of city** as road area as against 14%-18% in other metros
- Vehicle density **723 vehicles / km**, second largest in the country
- Almost no **foot paths** - pedestrians
Hyderabad Traffic Context
Present condition of Traffic signals

- 20 years old system
- Standalone signals
- Overhead cables / wiring
- Poor condition of signal aspects
- Only 130 working out of 168
- Insufficient: Primary – Secondary aspects
- No connectivity
- No UPS
- No ATC
- No manual function

CRITICAL TO TRAFFIC MANAGEMENT
HTRIMS - Project sanction and progress

- Concept and solution presented by Hyderabad Traffic Police to Hon’ble Chief Minister of A.P., Sri N.Kiran Kumar Reddy
- Hon’ble Chief Minister of A.P., sanctioned H-TRIMS project worth Rs.66.5 Crores
- Tender process by APTS
- BEL won tender in Feb, 2012
- Finance sanction in July, 2012
- Agreement signed between BEL, GHMC, HTP on 18th Aug, 2012
First of its Kind Project

- First time 221 Signal junctions are **automated and centrally controlled**
- First time with **Vehicle Actuated Technology**
- First time **ATC** (Area Traffic Control) with **Synchronized signal and Corridor management**
- First time **each road will have cameras to monitor the traffic congestions, density**
- First time **Fall back Connectivity**
First of its Kind Project

- First time **Fall back power management**
- First time **Green energy initiative**
- First time **Variable message boards** across the city directing the traffic flows - 20 VMS
- First time project **linked to SLA (Service Level Agreement)** – **Performance**: Paradigm shift from “Concept to Contract” to “Concept to Service”
- First time **Project managed with the support of third party** professional management team (PMU)
Project scope

• Set up **221 new signals and provide signaling services round the clock** at 221 Junctions (180 existing + 41 new) including 15 Secunderabad Cantonment Board Junctions in a span of 12 months in a phased manner

• Provide all 221 signals with **non-stop Connectivity and Power** with automatic fall back option to send data to the TCC

• **Position Cameras at every junction** to determine traffic flows continuously and manage the traffic intelligently – Integrating surveillance and violations

• Establish **20 Variable Message systems (VMS)**

• Establish a IT enabled **Traffic Command Center (TCC)** to monitor all 221 Signal junctions to synchronize signals across the city for smooth traffic flow
Project scope

• Equip the TCC **with Video Wall** to capture the traffic flows continuously across the city

• To operate the **signaling parameters remotely and/or manually from** the Traffic Command Centre (TCC) / or at the signal post based on the existing traffic information.

• **To monitor health of every signal point** from the centralized Traffic Command Centre (TCC) to attend to the failures/ breakdowns through a robust **IT solution that networks all signals**.

• Create a **Centralized Management Information System (MIS)** as a part of the IT solution for faster decision making in traffic emergency such as heavy rain fall, accidents, terrorist attack, VVIP movements etc

• **To train and manage the IT facility and** offer back-end support on the operations of the TCC using the departmental manpower
Partners in Progress

- Project is initiated by Department of Traffic Police and GHMC
- Technical process for selection of the partner by APTS
- Project Management and Technology advisory by ASCI
- Project Implementation by BEL
# Project Phasing

<table>
<thead>
<tr>
<th>Phase</th>
<th>Milestone</th>
<th>Timelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Establish minimum 90 Junctions</td>
<td>$T + 140$ days</td>
</tr>
<tr>
<td></td>
<td>Establish TCC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Establish CCR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Establish 2 VMS Boards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstrate IT solution</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Establish additional 131 Junctions</td>
<td>$T + 365$ days</td>
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<tr>
<td></td>
<td>Establish 18 VMS Boards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstrate IT solution for additional signals</td>
<td></td>
</tr>
</tbody>
</table>

$T :$ Starting date of the Project : 18\textsuperscript{th} August 2012

First time Incentive of 3% if project completed in 280 days

Penalty for non-delivery if project goes beyond 365 days
List of Locations for Phase 1

First Set of 50 Signals to be completed by September 30, 2012

Falling on COP-11 routes in Hyderabad and Cyberabad

<table>
<thead>
<tr>
<th>Location</th>
<th>Junction Name</th>
<th>Location</th>
<th>Junction Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karbala maidan</td>
<td>Whisper Valley Jn</td>
<td>Cyber tower Jn</td>
<td>S.R. Nagar jn</td>
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<tr>
<td>Rasoolpura</td>
<td>Khajaguda Jn</td>
<td>Khanamet Jn</td>
<td>Maithrrivanam jn</td>
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<td>YMCA Sec’bad.</td>
<td>TCS X Roads Jn</td>
<td>Children’s Park on the Upper Tank Bund</td>
<td>Shalimar j.n</td>
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<td>SBH</td>
<td>Cyber Gate Way Jn</td>
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<tr>
<td>CTO</td>
<td>Masabtank Junction</td>
<td>Old Saifabad Junction</td>
<td>Panjagutta j.n</td>
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<tr>
<td>Paradise</td>
<td>Khaja Mansion</td>
<td>Ayodhya Junction</td>
<td>K.C.P. jn</td>
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<tr>
<td>Ranigunj</td>
<td>Road 1/12 Junction</td>
<td>Humayun Nagar</td>
<td>Taj krishna jn</td>
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<tr>
<td>Greenland</td>
<td>MBNR ‘X’ Road Signal</td>
<td>Rethi Bowli</td>
<td>Rd.No. 1/10 Jn.</td>
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<tr>
<td>Monappa</td>
<td>Aramgarh</td>
<td>Naanal Nagar Junction</td>
<td>Malaysian town</td>
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<tr>
<td>Sri Nagar colony T Jn</td>
<td>Gachi bowli JN</td>
<td>Tolichowki</td>
<td>Tajmahal jn Abids</td>
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<td>KBR. Park</td>
<td>HCU T Jn</td>
<td>O.P Raidurgam Jn</td>
<td>GPO, Abids</td>
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<tr>
<td>Jubilee Hills Check Post</td>
<td>Kothaguda T Jn</td>
<td>MJ Market Jn.</td>
<td>A1 Nampally</td>
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<tr>
<td>Madnapur PS Junction</td>
<td>Kondapur jn</td>
<td>Taj Island Nampally</td>
<td>Chapel Road</td>
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<tr>
<td>COD Junction</td>
<td>Shilpa park T jn</td>
<td>Traffic Complex (PCR)</td>
<td>B.J.R.Statue</td>
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<tr>
<td>VR Nagar Junction</td>
<td>Silicon towers</td>
<td>SBH, Gun foundry</td>
<td></td>
</tr>
</tbody>
</table>

Falling on COP-11 routes in Hyderabad and Cyberabad.
Variable Message Sign Boards (VMS)

**Total Boards**: 20  
**In Hyderabad**: 15  
**In Cyberabad**: 05

**VMS: Variable Message Sign**

- Key element for safety and traffic control purposes.
- VMS is the only system that can guarantee real-time communication with drivers.

**SMS – Static Message Signs**

- Usually composed of one module, that can show a limited number of signs.
- Replaces static signs by improving visibility.

**VMS – Variable Message Signs**

- Modular design to adapt customer’s needs: alphanumeric + graphics modules.
- Full matrix – full colour Panels.
- Supports multiple control devices (cameras, sensors...) on it.
### HYDERABAD

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Junction</th>
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<tr>
<td>1.</td>
<td>Patny</td>
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<td>2.</td>
<td>C.T.O.</td>
</tr>
<tr>
<td>3.</td>
<td>Panjagutta</td>
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<td>4.</td>
<td>V.V.Statue</td>
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<tr>
<td>5.</td>
<td>Jubilee Hills checkpost</td>
</tr>
<tr>
<td>6.</td>
<td>Traffic Control Room</td>
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<tr>
<td>7.</td>
<td>Rethibowli</td>
</tr>
<tr>
<td>8.</td>
<td>RTC X Roads</td>
</tr>
<tr>
<td>9.</td>
<td>Moosarambagh</td>
</tr>
<tr>
<td>10.</td>
<td>I.S.Sadan</td>
</tr>
<tr>
<td>11.</td>
<td>H.P.S. Begumpet</td>
</tr>
<tr>
<td>12.</td>
<td>M.J.Market</td>
</tr>
<tr>
<td>13.</td>
<td>Sangeeth X Roads</td>
</tr>
<tr>
<td>14.</td>
<td>S.R.Nagar</td>
</tr>
<tr>
<td>15.</td>
<td>Bowenpally</td>
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</tbody>
</table>

### CYBERABAD

<table>
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<tr>
<th>S.No.</th>
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<tbody>
<tr>
<td>1.</td>
<td>Uppal X Roads</td>
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<tr>
<td>2.</td>
<td>Kukatpally</td>
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<tr>
<td>3.</td>
<td>Hi-Tech City</td>
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<tr>
<td>4.</td>
<td>Aramghar X Roads</td>
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<td>5.</td>
<td>Gachibowli</td>
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</tbody>
</table>
Example Police Control Room Jn.
Pedestrians facility
Masab Tank Junction

• Exclusive Pedestrian Signals (All signals red)
• Concurrent Pedestrian Signals
• Hooters for Pedestrian
HTRIMS

Project Design and Management

by

Sri Y Subrahmanyanam

Advisor – Administrative Staff College of India
Junction - Overview

Grid → Power Supply → Charge Controller → Controller Unit

Vehicle Detection

Primary Network

512 Kbps

Controller Unit

Secondary Line

GPRS Network

SMF Battery
TCC - Overview

Primary Network

GPRS Network

SERVER

SAN

Networking

UPS

Traffic Surveillance

Video Wall

Work Stations
Traffic Command Center (TCC)
HTRIMS Highlights

• 221 signals to be automated with central intelligent command center
• 221 signals enabled with Virtual loop cameras for Adaptive Traffic Control and synchronized signals
• Automatic adjustment of the signal timings based on the traffic flows and Adaptive Area Traffic control
• Automatic signal brightness control based on ambient light
HTRIMS Highlights

- Integration in surveillance on violations
- Variable Message system to alert the citizen on traffic flows and congestions
- Pedestrian controlled signals
- SMS based alerts to citizens
- Optimized traffic flow
- Establishment of TCC

Integrated Surveillance

VMS: Variable Message Sign

- Key element for safety and traffic control purposes.
- VMS is the only system that can guarantee real time communication with drivers.
- Modular design to adapt customer’s needs: alphanumeric + graphics modules.
- Full matrix – full colour Panels.
- Supports multiple control devices (cameras, sensors, …) on it.
HTRIMS Highlights

- Corridor Synchronization for optimized traffic flow

Note: International experience demonstrates Signal synchronization has
1. Improved average travel speed by 50%
2. Reduced delays in road network by 35%
3. Reduced fuel consumption by 22%
Traffic Management System - Major Works

- Traffic Signal
- O & M
- VMS
- Traffic Management System
- TCC & CCR
- Connectivity
<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
<th>Predecessors</th>
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<tr>
<td>1</td>
<td>Signing of Contract</td>
<td>6 days</td>
<td>Thu 8/2/12</td>
<td>Tue 8/7/12</td>
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<td>2</td>
<td>Traffic Signal (90 signal)</td>
<td>140 days</td>
<td>Wed 8/8/12</td>
<td>Tue 12/25/12</td>
<td>1</td>
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<tr>
<td>3</td>
<td>Procurement</td>
<td>90 days</td>
<td>Wed 8/9/12</td>
<td>Mon 11/12</td>
<td>1</td>
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<tr>
<td>4</td>
<td>Inhouse Assembly</td>
<td>60 days</td>
<td>Mon 9/17/12</td>
<td>Thu 11/16</td>
<td>35S=10 day</td>
</tr>
<tr>
<td>5</td>
<td>Testing</td>
<td>60 days</td>
<td>Tue 9/18/12</td>
<td>Fri 11/16</td>
<td>45S=1 day</td>
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<tr>
<td>6</td>
<td>Transportation</td>
<td>66 days</td>
<td>Mon 9/3/12</td>
<td>Fri 11/16</td>
<td>55S=1 day</td>
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<tr>
<td>7</td>
<td>Installation &amp; Commissioning</td>
<td>93 days</td>
<td>Sun 9/23/12</td>
<td>Mon 12/24</td>
<td>65S=1 day</td>
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<tr>
<td>8</td>
<td>Survey (3 Teams)</td>
<td>45 days</td>
<td>Sun 7/29/12</td>
<td>Tue 9/11</td>
<td>35S=10 day</td>
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<tr>
<td>9</td>
<td>Pole Installation (6 Teams)</td>
<td>45 days</td>
<td>Sun 9/23/12</td>
<td>Tue 11/6</td>
<td>87S</td>
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<tr>
<td>10</td>
<td>Drilling / Cutting (6 Teams)</td>
<td>55 days</td>
<td>Mon 9/24/12</td>
<td>Sat 11/17</td>
<td>95S=1 day</td>
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<td>11</td>
<td>Aspect Installation (4 Teams)</td>
<td>45 days</td>
<td>Mon 9/24/12</td>
<td>Wed 11/17</td>
<td>105S</td>
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<tr>
<td>12</td>
<td>Camera Installation (2 Teams)</td>
<td>45 days</td>
<td>Mon 9/24/12</td>
<td>Wed 11/17</td>
<td>115S</td>
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<td>13</td>
<td>Controller Installation (3 Teams)</td>
<td>55 days</td>
<td>Mon 9/24/12</td>
<td>Tue 11/27</td>
<td>125S</td>
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<td>14</td>
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<td>Wed 9/29/12</td>
<td>Tue 12/4</td>
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<td>15</td>
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<td>Sat 10/27/12</td>
<td>Tue 12/28</td>
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<td>16</td>
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<td>Wed 8/8/12</td>
<td>Sun 12/23</td>
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<td>17</td>
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<td>120 days</td>
<td>Wed 8/8/12</td>
<td>Wed 12/15</td>
<td>1</td>
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<tr>
<td>18</td>
<td>Testing</td>
<td>7 days</td>
<td>Thu 12/6/12</td>
<td>Wed 12/12</td>
<td>17</td>
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<tr>
<td>19</td>
<td>Transportation</td>
<td>7 days</td>
<td>Sat 12/9/12</td>
<td>Fri 12/14</td>
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<td>20</td>
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<td>Sat 12/15/12</td>
<td>Sun 12/16</td>
<td>19</td>
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<tr>
<td>21</td>
<td>TCC &amp; CCR</td>
<td>140 days</td>
<td>Wed 8/8/12</td>
<td>Tue 12/26</td>
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<td>22</td>
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<td>Thu 7/19/12</td>
<td>Tue 8/7</td>
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<td>Wed 8/8/12</td>
<td>Fri 10/26</td>
<td>225S</td>
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<tr>
<td>24</td>
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<td>60 days</td>
<td>Mon 9/17/12</td>
<td>Mon 10/11</td>
<td>265S=40 da</td>
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<td>25</td>
<td>Testing</td>
<td>15 days</td>
<td>Tue 10/3/12</td>
<td>Tue 10/18</td>
<td>26</td>
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<td>26</td>
<td>Transportation</td>
<td>3 days</td>
<td>Wed 10/7/12</td>
<td>Fri 10/19</td>
<td>27</td>
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<td>TCC / CCR establishment</td>
<td>60 days</td>
<td>Tue 9/30/12</td>
<td>Fri 10/25</td>
<td>255S=21 da</td>
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<tr>
<td>28</td>
<td>Installation &amp; Configuring</td>
<td>60 days</td>
<td>Sat 10/27/12</td>
<td>Tue 12/25</td>
<td>265S=10 da</td>
</tr>
<tr>
<td>29</td>
<td>Networking</td>
<td>30 days</td>
<td>Sat 10/27/12</td>
<td>Sun 11/25</td>
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<tr>
<td>30</td>
<td>Connectivity &amp; Configuring</td>
<td>60 days</td>
<td>Sat 10/27/12</td>
<td>Tue 12/29</td>
<td>29</td>
</tr>
<tr>
<td>31</td>
<td>Server &amp; Clients</td>
<td>20 days</td>
<td>Sat 10/27/12</td>
<td>Thu 11/15</td>
<td>20</td>
</tr>
<tr>
<td>32</td>
<td>Video Wall</td>
<td>10 days</td>
<td>Fri 11/16/12</td>
<td>Sun 11/25</td>
<td>33</td>
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<td>33</td>
<td>Integration</td>
<td>60 days</td>
<td>Sat 10/27/12</td>
<td>Tue 12/25</td>
<td>7FF,30S</td>
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</tbody>
</table>
O & M – Methodology using CMS/FMS

Complaint Call
Police / Public / Service Team

Help Desk Receives the Call
Enter the Complaint in CRM with phone number
Inform to Service Engineers
Auto complaint Generation / SMS

Attending the Complaint (Monitored by the Maintenance Coordinator)
Verification
Rectification
Inform back to Help Desk

Closing the Complaint
Verification back at site with the concerned phone number
Complaint Closing

Report Generation
Every Day monitoring
Web based Complaint Monitoring

Hyderabad Traffic Police

Viewing of Enquiry/Complaints

Category: Junction
View: All Complaints
From Date: 10-06-2011

Complaint Type:
- All Type

Complaint No.:

To Date:

SEARCH

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HTRIMS

Technical Aspects

by

Sri D Ravi Kumar

Project Manager

Bharat Electronics Limited, Bangalore
BEL - ITMS Scalable Solution

Network Infrastructure

IP Cameras & Surveillance System

Enforcement System

Servers

Video Analytics

Central Control and Management Software

VMS System

Possible integration with other data sources

Traffic Control and ATCS System
Online Status of Junctions

[Map of Hyderabad with a marker labeled "Hyderabad"]
Monitoring Screen
Monitoring Corridor

**ARVIND SUPER BAZAAR JUNCTION**
- Allocated Green Time: 38
- Utilized Time: 1
- Road Names:
  1. D.G. Petrol Bank
  2. Thygarraj Nagar
  3. BSK Police Station
  4. BSK BDA

**ASC JUNCTION**
- Allocated Green Time: 103
- Utilized Time: 1
- Road Names:
  1. Domil
  2. India Garage
  3. Trinity Circle

**BEL CIRCLE**
- Allocated Green Time: 73
- Utilized Time: 1
- Road Names:
  1. Kuvempu Circle
  2. Mathikere
  3. MES Road
  4. BCL

**ATTIGUPPE CHANDRA LAYOUT**
- Allocated Green Time: 38
- Utilized Time: 1
- Road Names:
  1. Vijayanagar
  2. BMCL
  3. Chandra Layout
Day Plan Configuration

**Configuration Panel**

IP Address: 11.1.5.67
Junction Name: PCR Jn.

**Day Plan**

Day Plan can be configured in two ways:

**Edit an Existing Day Plan**

Select Day:
- Sunday
- Monday
- Tuesday
- Wednesday

No. of Daily Transition: 5

<table>
<thead>
<tr>
<th>DTSTNo</th>
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<th>End Time</th>
<th>PlanType</th>
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<td>Vehicle Actuated</td>
<td>10</td>
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<td>10:0:0</td>
<td>11:0:0</td>
<td>Vehicle Actuated</td>
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<td>3</td>
<td>11:0:0</td>
<td>19:0:0</td>
<td>Vehicle Actuated</td>
<td>10</td>
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<tr>
<td>4</td>
<td>19:0:0</td>
<td>21:0:0</td>
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<td>5</td>
<td>21:0:0</td>
<td>23:0:0</td>
<td>Vehicle Actuated</td>
<td>10</td>
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</tbody>
</table>

**Apply Existing Day Plan to Other Day**

Copy Day Plan From:

Apply Day Plan To:
- Sunday
- Monday
- Tuesday
- Wednesday

**Apply Existing Transition to Others**

Copy Transition From:

Apply Transition To:
- 1
- 2
- 3
- 4

**Actions**

Send Day Plan
View Phase Data
Save
Copy Day Plan
Apply Transition
Send Junction Config
Cancel
Day Plan Configuration

Day Plan Phase Data

Junction Name: PCR Jn.
IPAddress: 11.1.5.67

<table>
<thead>
<tr>
<th>Phase No</th>
<th>Phase Type</th>
<th>Green</th>
<th>AmbBfrGrn</th>
<th>AmbAftGrn</th>
<th>RedBfrGrn</th>
<th>PedGreen</th>
<th>RedBeforePed</th>
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RoadNo | RoadName
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1 | KBR. Park
2 | Rasoolpura
3 | Greenland
4 | COD Junction
### Add Junctions

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Vehicle Actuated Signal

Pictorial view of Video loops at a Junction
Thank You