Adaptive Traffic Control System

Bringing Intelligence to Intersections
→ Signal timings derived from the statistical data
→ Duration and order of all green phases are fixed
→ Cannot respond to real-time demand
→ Requires frequent re-configurations and updates
Challenges in INDIA

- Low level of lane discipline
- High mix of traffic
- Lack of local expertise
- Poor junction geometry
- Lack of expertise
- Power and Network connectivity interruptions
Adaptive Traffic Control System

A solution for a smooth and safer journeys
What is **ATCS**?

Adaptive Traffic Control System adapts to real-time traffic patterns to optimize the traffic flow by dynamically change the green split timings.
An ATCS uses Advanced Machine Learning algorithms that adjust

- Cycle length
- Phase sequence to

Minimize delays
Reduce the number of stops
Decrease the travel time
OBJECTIVES

- Improve Safety in travel
- Reduce Journey Time
- Optimally utilize traffic Infra.
- Increase Operational Efficiency
- Real Time Information management
- Create a platform for sharing traffic info across the city
Where is ATCS most effective?

Where frequent and unpredictable changes of demand, events, weather situations, etc., creates unexpected fluctuations in the system.

Where unpredictable traffic changes results in delays or stops that cannot be addressed by conventional signal timing.

ATCS does not necessarily solve the capacity problems of over saturated corridors.
Adaptive Traffic Control System

Completely Designed for Indian Traffic Conditions

Employs advanced Machine Learning Algorithms

Traffic data from junctions is consolidated in a central traffic system

Dynamically adapts to changing traffic conditions

Junction green-green synchronization
ATCS ELEMENTS

1. Vehicle Detectors
2. LED signal lamps
3. Countdown timers
4. Edge Application
5. Master Controller
6. Web Interface
7. Adaptive Algorithm
8. Real-time reports
9. ML based Forecasting
10. API Services
Inputs derived from Cameras/Sensors/Radar will allow the ATCS Controller to adaptively adjust the junction timing pattern and communicate the same to the next junction and the control room.
VEHICLE DETECTORS

Detects traffic flow, headway, average speed, occupancy and queue length by using in-built advanced machine learning algorithms. Cover up-to 1-3 lanes at a time and has 90% detection accuracy.

Any adaptive traffic control system relies upon good detection of the current conditions in real-time in order to allow a quick and effective response to any changes in the current traffic situation.
LED SIGNAL LAMPS

→ EN 12368 Compliant
→ Premium quality LEDs
→ 10+ years working life
→ Designed as per Indian Conditions
COUNTDOWN TIMERS

→ EN 12966 Compliant
→ Signal time indications to road commuters
→ 10+ years working life
→ Designed as per Indian Conditions
The well advanced ATCS algorithm fulfil the ATCS main objectives based on Indian traffic conditions. ATCS algorithm determines optimized red-green phases of traffic signals in order to achieve junctions green-green synchronization.
ATCS EDGE APPLICATION

Offers a high-level framework which provides a single access point for all the component systems and support for the whole life cycle of a system: implementation, operation, updating and planning.

- Process Vehicle detector data
- Capture and store all signalling events
- Able to run junction in VA/Fixed modes when networks fails
- Auto data backup & recovery mechanism
- In built edge computing capabilities
Intelligent Web browser-based access, requiring no local setup on the control centre with hierarchy based secured login to operators and city managers for their dynamic and strategic planning in real time.
Live monitoring for quick insights & decisions
### Signal Configuration

**Existing Stages for Selected Junction**

<table>
<thead>
<tr>
<th>Stage Name</th>
<th>GH3-GH3</th>
<th>CH2-CH3</th>
<th>CH4-CH3</th>
<th>CH4-CH5</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3-O-GH3-Green</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>G3-O-GH3-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH2-CH3-Green</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH2-CH3-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH3-CH3-Amber</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH3-CH3-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH4-CH4-Amber</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH4-CH4-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH5-CH5</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH5-CH5-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>ALL RED</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
</tbody>
</table>

**Existing Cycles**

<table>
<thead>
<tr>
<th>Stage Name</th>
<th>G3-O-GH3</th>
<th>CH2-CH3</th>
<th>CH4-CH3</th>
<th>CH4-CH5</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3-O-GH3-Green</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>G3-O-GH3-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH2-CH3-Green</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH2-CH3-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH3-CH3-Amber</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH3-CH3-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH4-CH4-Amber</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH4-CH4-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH5-CH5</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>CH5-CH5-Red</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>ALL RED</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
</tbody>
</table>
# Day plans Configuration

## Day Plans & Special Day Plans

**Select Location:** CHS-KishanChowkBhawan

1. **Slot Name**: Slot Information
   - **Stage Name**: Stage Information
     - **Time**: Time Information

### Slot 1
- **GH1-GH1-Green**: Time: 20
- **CH1-CH1-Green**: Time: 30
- **CH4-CH1-Green**: Time: 30

### Slot 2
- **GH1-GH1-Green**: Time: 25
- **GH1-GH1-Amber**: Time: 5
- **CH1-CH1-Green**: Time: 15
- **CH4-CH1-Amber**: Time: 5
- **CH1-GH1-Amber**: Time: 5
- **CH1-Pedestrian**: Time: 5
Green Corridor Feature
Exceptionally flexible and user-friendly graphical interface which is also multilingual. The clear graphics allow rapid and intuitive interpretation of the real-time status of the network.
ATCS uses machine learning algorithms to analyse real-time traffic data to determine signal timings that are optimal for existing traffic conditions along the corridors.
MACHINE LEARNING BASED TRAFFIC FORECASTING

Advanced Machine Learning Algorithms for Forecasting
This gives all applications access to high quality data, which is available to operators and city managers for their strategic planning. The DBs themselves remain independent in order to keep the system open and flexible.
Bus priority compensation and emergency vehicle pre-emption.

Integration to share the predicted forecasts to different dissemination systems.

Suggestions to future infra requirements based on the real time traffic density.

Power saving by regulating the intensity based on ambient light sensor.
Gandhinagar Smart City, India’s first smart city, and the second planned city after Chandigarh. Efftronics ATCS played a major role in solving the most vulnerable traffic problems and leads to the Vision of the city of being an equitable urban centre that provides a high quality of life to all its citizens.

- Reduce travel times by 20%
- Less waiting time
- Reduce Number of stops in a corridor by 30%
- 20% more friendly to environment
Thank You

Follow us

www.efftronics.com  @efftronics_ltd  /efftronics  /company/efftronics