



# Smart City Street Light Solution

**DESIGNED and MADE IN INDIA**

Version 2.0

Powered by Neev Energy



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# 1. INTRODUCTION

The world is converting conventional street lights to LED.

Intellivolt Smart City Solution creates a wireless platform through connected and SMART LED street lights. This platform enhances the intrinsic benefits of LED street lights and also creates the foundation for cities to develop and offer SMART lighting services.

The Intellivolt solution provides centralized automation to control light points, monitor light performance, and report utility grade real-time energy consumption.

Intellivolt achieves this with a smart deployment of devices and software control systems, which together forms the smart street lighting solution.



## 2. BUSINESS CASE FOR SMART LED STREET LIGHTS

Connected LED Street lights have become the primary smart city enabler and application, as conventional street lights are prone to failure and high energy costs.

The advantages of converting to LED street lights are widely known and accepted with the primary reasons being energy efficiency and significantly lower maintenance.

It makes economical sense to make LED street lights smarter for the following reasons:

- Proactive, prompt maintenance and complaint resolution.
- Greater energy efficiency through dimming of light intensities during off-peak hours.
- Ultra-low operating cost.
- Additional revenue and value added streams through multiple smart services.



# 3. THE INTELLIVOLT SOLUTION

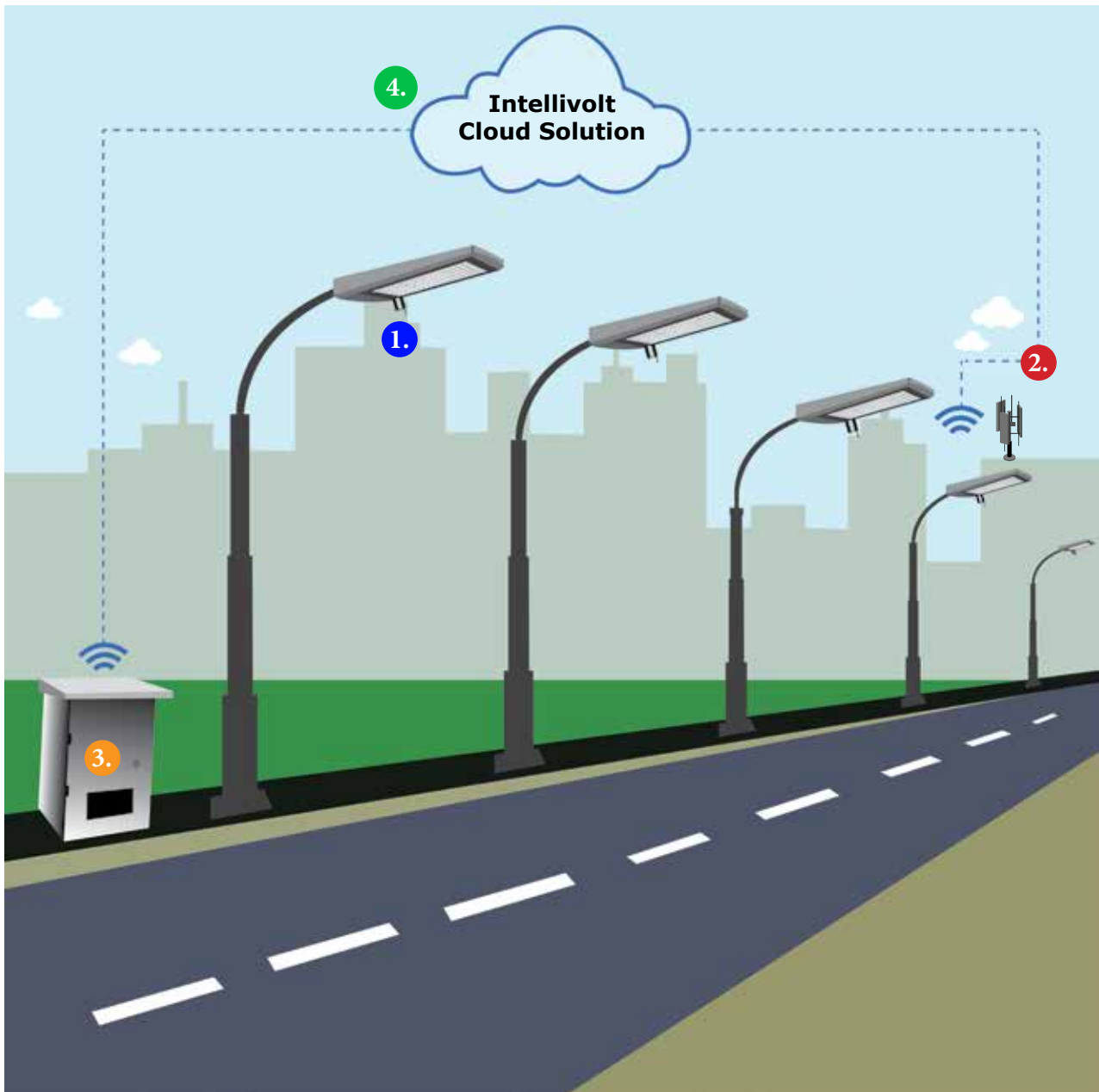
The Intellivolt solution allows a municipality or street light operator to seamlessly control street light operations and identify current operational status from a single window software application.

Each street light pole could either have a LED street light, Metal Halide or Sodium vapor light installed along with our Long Range Radio (LoRa) Light Control Unit (LCU). If the street light is a LED light, the solution offers ON/OFF and additional “dimming” control to save electricity on each such light, on other types of street lights only the ON/OFF function is available.

Each individual light that is fitted with a LCU has an ID and communicates with the cloud software platform over LoRa signals. The LoRa signals are received by a LoRaWAN gateway and then relayed to the cloud platform over a suitable backbone. Our unique LCU+ LoRaWAN gateway feature allows an operator to operate smart street lights at negligible connectivity cost. It further provides the wireless network to connect multiple LoRa enabled sensors and devices to provide various smart city applications.



# 4. SOLUTION ARCHITECTURE



The smart street lighting solution involves:

1. LoRa Light Control Unit (LCU)
2. LoRaWAN gateway
3. Remote Feeder Control (RFC) with GSM/LoRa
4. Intellivolt Cloud Solution

# 5. SOLUTION COMPONENTS

## 5.1 LoRa LIGHT CONTROL UNIT (LCU)

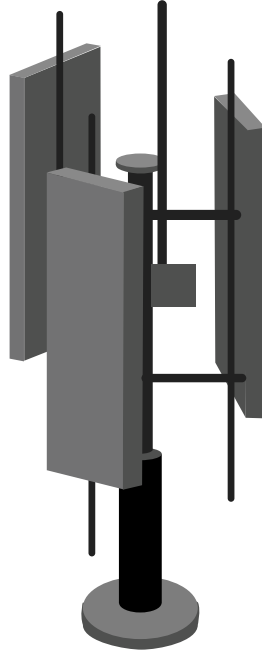


The Light Control Unit (LCU) has inbuilt wireless radio based on sub 1 GHz LPRF technology. The LCU enabled street lights form a long-range network based on LoRa and support two-way communication with the cloud-based lighting management server software. The LCU unit not only works with LED street lights but can also be used with other types of street lights.

This control unit is installed on every street light and provides an unique ID to every light. It enables several functions to be carried out on the LCU fitted street lights such as:

- On/off control
- Dim level setting
- Current consumption tracking
- Ambient light sensing (optional)
- Lamp surface level temperature sensing (optional)

## 5.2 LoRaWAN GATEWAY



The LoRaWAN is a gateway device for street lights that can be placed at strategic locations to ensure seamless LoRa network coverage in the particular region. This allows the LCU enabled street lights to communicate over the LoRaWAN gateway.

The placement of the LoRaWAN gateways may be optimized for maximum reach and as per site conditions. The LoRaWAN can communicate with about 10,000 LCUs within its coverage. These 10,000 nodes could be across types of sensors or devices which are LoRa enabled.

The LoRaWAN has options that allow it to communicate over the internet.



## 5.3 REMOTE FEEDER CONTROL (RFC) with GSM GATEWAY



The Remote Feeder Control (RFC) is a hardware device that allows on/off control and energy consumption tracking for multiple street lights connected through a power supply cable.

The Remote Feeder Control panel can be installed with any type of street lights and can be connected to a single phase or a three phase energy meter for tracking energy consumption of lights.

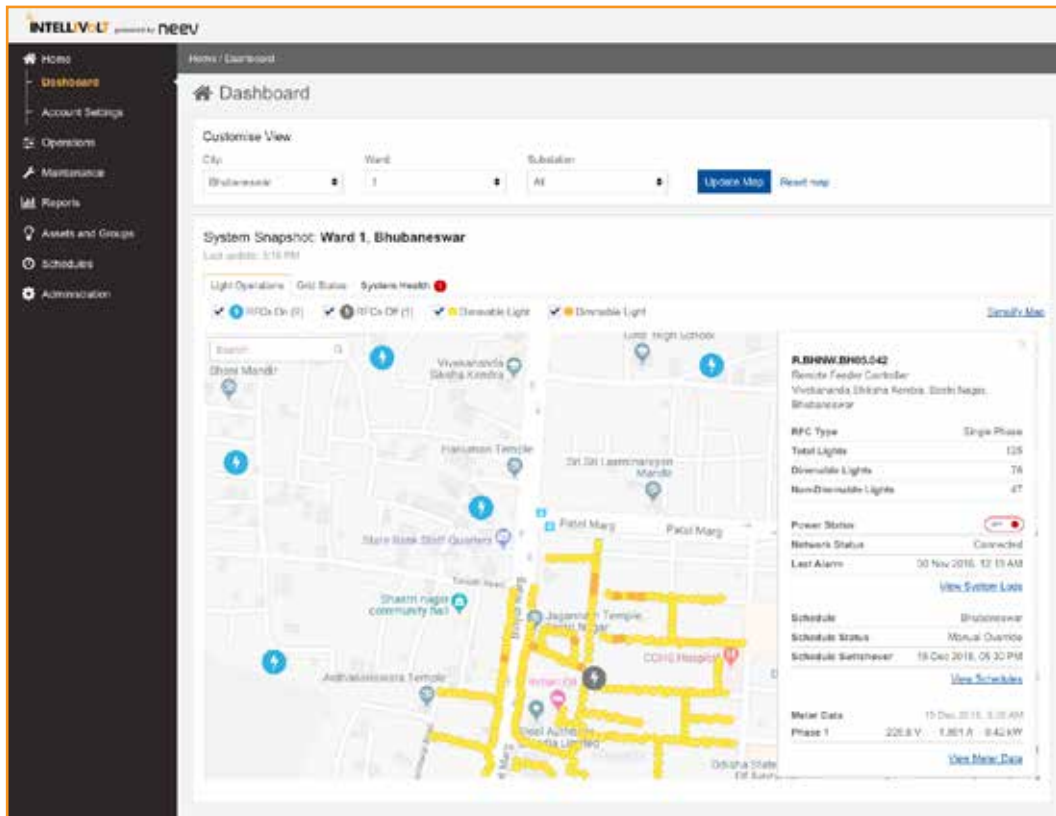
Remote Feeder Control panels can be controlled by a local manager by sending SMS messages to Remote Feeder Controls from authorized phones.

Remote feeder control is an ultra-low-cost automation system for street lights that can be retro fitted to most streetlight systems without necessarily upgrading street lights to LED.

## 5.4 INTELLIVOLT CLOUD SOLUTION

The Intellivolt cloud software platform provides server grade lighting management application that offers sophisticated controls, flexibility and real-time monitoring of data.

The salient features of the software application are:

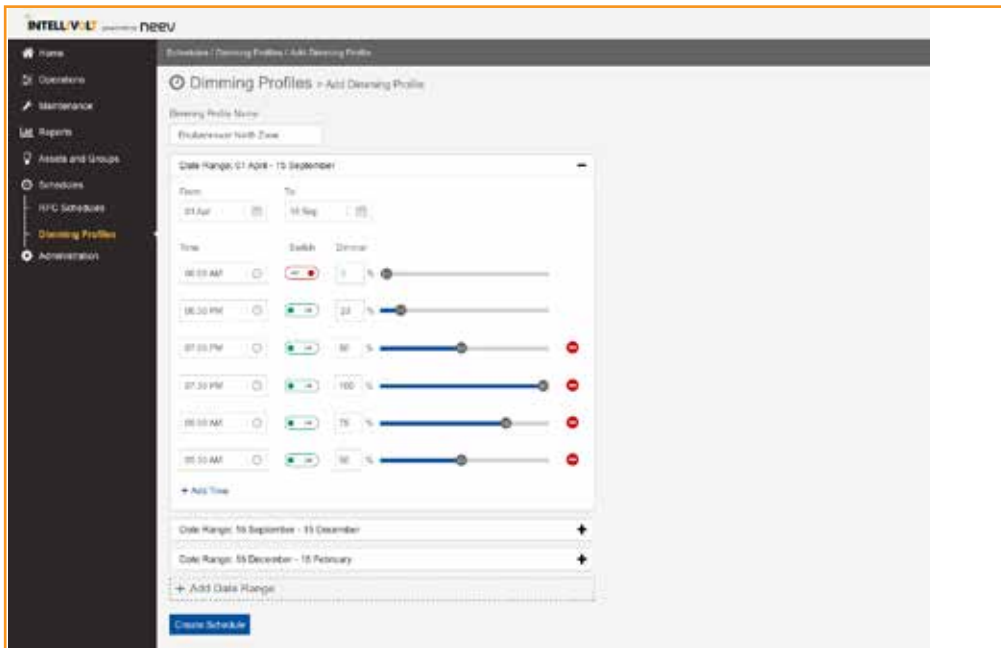


- Dashboard and advanced mapping interface – the software provides the ability to view the key deployments and status in a dashboard format. It also provides geo fencing, colour coding, filtering and tagging options on Google maps with the ability to control the deployments from the map itself.

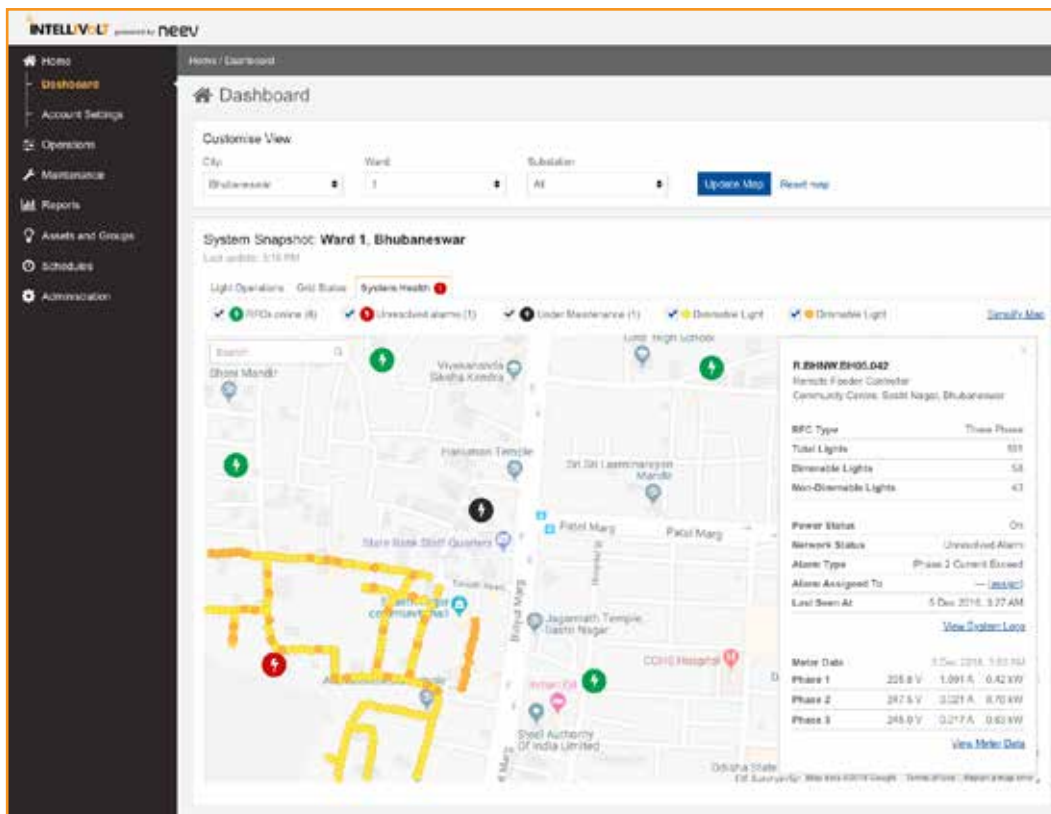
- Flexible Hosting Options – the software allows the flexibility of being operated either on the Intellivolt cloud, or customer server or any other third party integration.

- Multi-Area Operation and Interface – the software allows rights of administration that can be defined and settings to allow flexibility of viewing and operation at a single or a multi-area level.

# 5.4 INTELLVOLT CLOUD SOLUTION

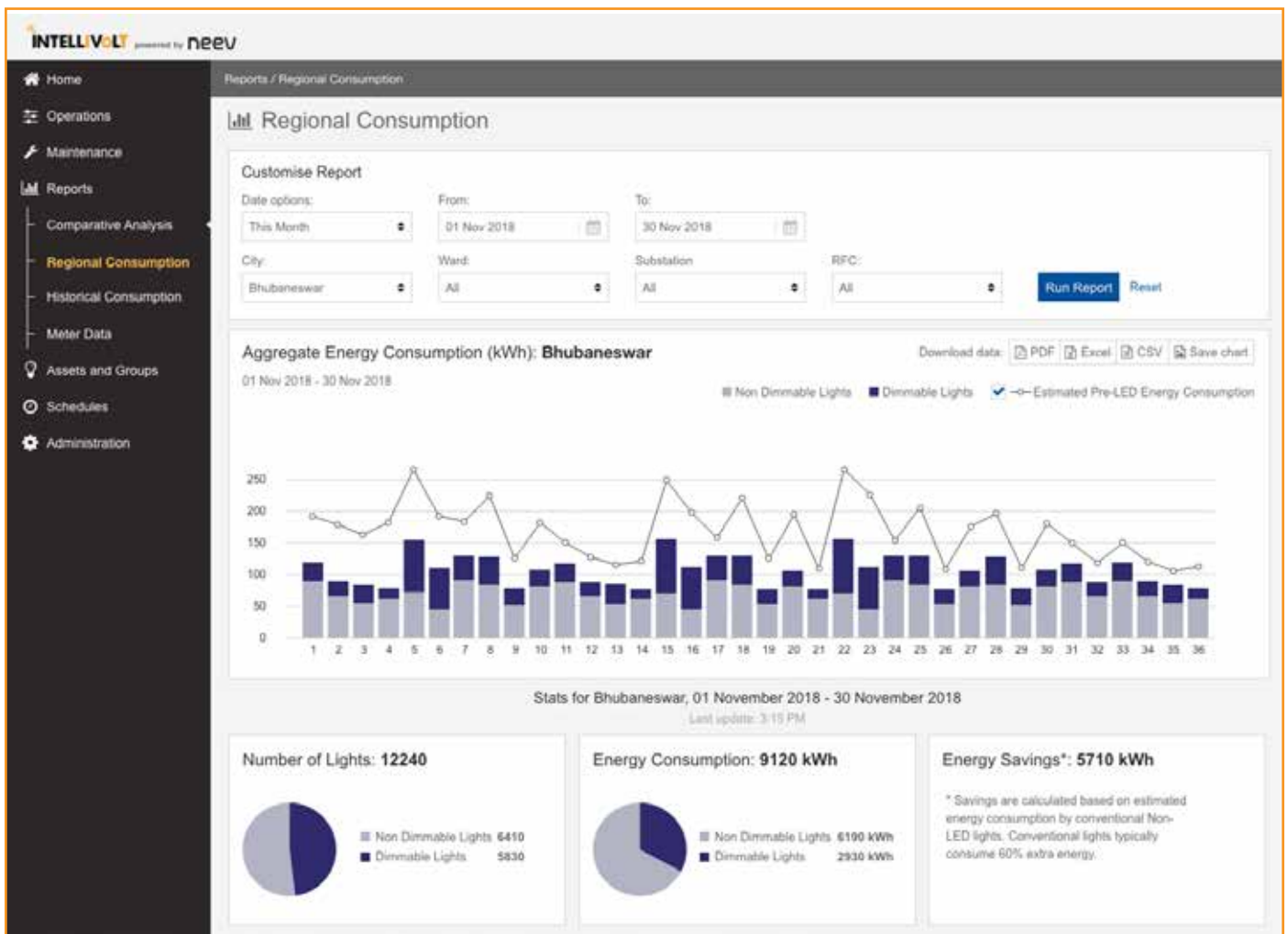
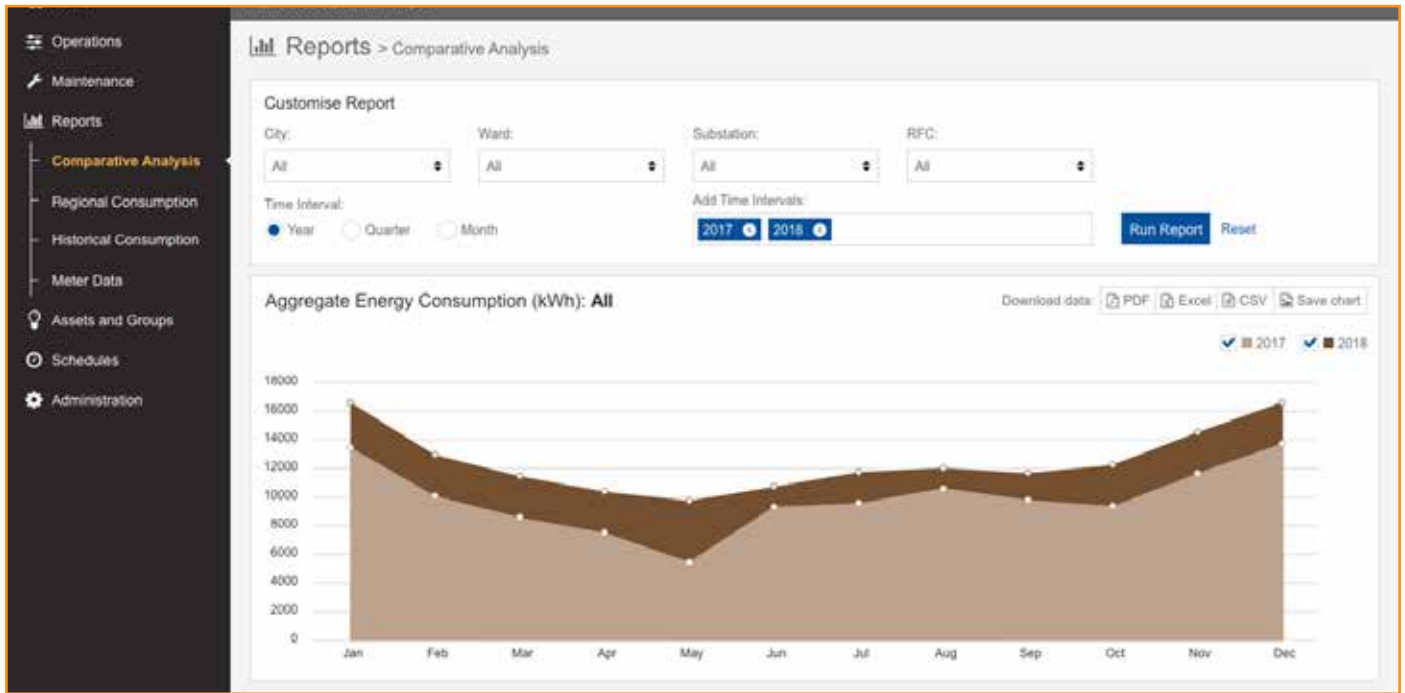


- Sophisticated Dimming and Grouping – the software provides the ability to control each individual light or a group of lights based on pre-defined schedule or manually. The grouping of lights provides the flexibility to the user to define the groups of lights at any point of time enabling real-time situational control.



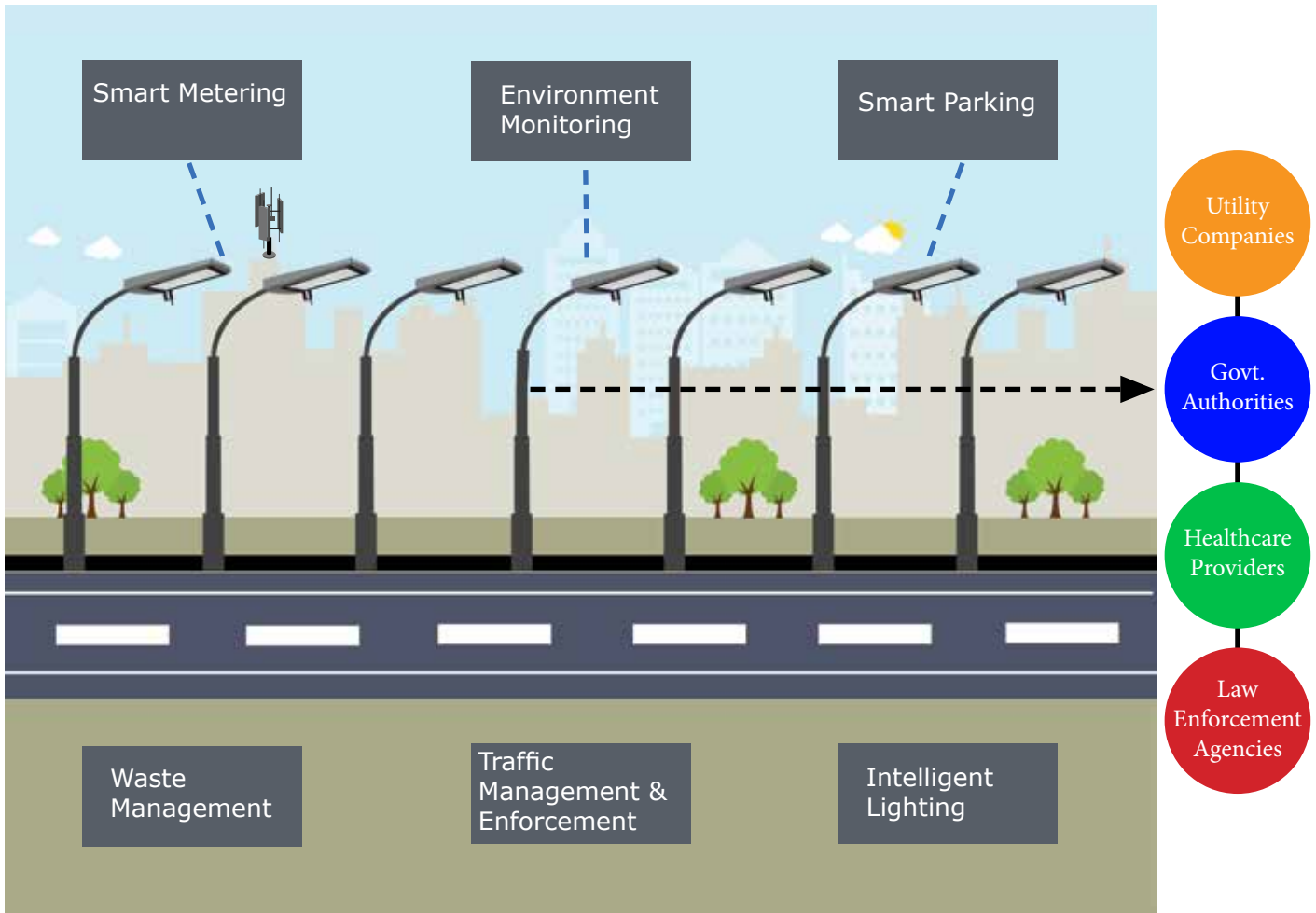
- Fault Diagnosis – the software provides an eye-catching alert system which draws the attention of the user to any faults in the street lighting system. This enables real-time monitoring of performance and up-time of the street lights and focused and prompt resolution of the fault.

# 5.4 INTELLVOLT CLOUD SOLUTION



- Energy Monitoring – the software provides revenue and audit grade energy consumption information.

# 6. PLATFORM FOR ENABLING SMART CITY



The Intellivolt solution is ideal for integrating a variety of applications for IoT applications in an urban environment. Our applications with LoRa would be an enabler for new services related to IoT and Smart City and is disruptive. It's distinguished advantages makes it suitable to address a massive IoT market segment, which existing cellular and Wi-Fi technologies have challenges to conquer.

**Experience Intellivolt – SMART Lighting for a connected world!**



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