

City Innovation Exchange Model Document

Challenge Brief

Intelligent Fault Management of Street Lights

Challenge Sector: **Urban Infra & Buildings**

Challenge Summary:

A 20-30 word description of the challenge, including relevant technical and operational requirements, constraints, and expected outcomes/benefits

A digitized system for identifying and locating faults, leakage of current, and breakage of cables in street lights across the city.

Challenge Scenario:

Describing the challenge broadly to help understand and visualise the scenario (use-case), scope, significance, and the magnitude of the problem as it is faced by the different types of beneficiaries.

The City has around 48,000 street lights installed across the city. But if any particular streetlight fails, identifying the exact location of the faulty streetlight is laborious and time consuming. Additionally current leakage in the network makes the situation even worse.

Whenever a street light goes faulty, or if there's a leakage of current, or breakage of cable, there is no organised method to detect and report the same to the relevant authorities. The leakage of current, especially, can be life-threatening if left undetected.

Currently, it would require a minimum of 1 to 2 days for resolving the complaints regarding street lights, with an approximate cost of Rs.1000 for changing a streetlight with a split up of Rs.150/- for Labour charge, Rs. 500/- for bucket lift truck, Rs. 150/- for truck driver, and Rs.200/- for fuel. And

Profile of the Target Beneficiaries:

Profiling the various types of beneficiaries in the city who face and are impacted by the challenge.

1. **Lineman:** The service personnel from the electricity department involved in identifying and fixing faulty streetlights.
2. **Electricity Department:** The electricity department is responsible for fixing faulty streetlights.

Solution Requirements:

1. **Functional requirements of the end-user** - *Brief description of the 'Jobs to be Done' including the needs to be fulfilled, gaps to be addressed, or challenges to be overcome, etc.*

- Consistent real-time detection of faulty street lights, leakage of current, and breakage of cables.
- Reporting of fault details with exact location of the fault in the city to the lineman, junior engineer.

2. Functional & Operational capabilities - *Description of the desired features and functionalities to solve the problem with relevant technical and operational requirements;*

- Real time monitoring of location of fault occurrence to reduce time consumed
- Single workspace to notify the type of fault and exact location of the fault occurrence to the sub-divisional engineer managing the operations central from the respective area/hub.

Expected Tangible Outcomes & Benefits:

Describing the significance of solving this problem, and estimating & quantifying the outcomes & benefits for the beneficiaries

1. **Lineman:** Lineman can save time & effort which otherwise could have been utilised in manually searching for the faulty street light, diagnosing the problem, etc.
2. **Electricity Department:** Officers, junior engineer and sub-divisional engineer, will get the notification of fault along with latitude and longitude and the cause of fault as soon as the fault occurs. This will improve the quality of services provided by the city.
3. **Citizens:** Faults can be identified and resolved without citizens' intervention or citizens raising any concern, this will boost their trust in authorities.

Gaps in the Current Solution:

Describing the gaps that are in current solutions or alternative methods being applied today for addressing the problem

Currently, citizens raise grievances for faulty street light through call, text, WhatsApp, or Web portal. The lineman has to manually find the faulty street light, diagnose the problem, and fix the same.

Gaps: This method is unorganised since there is no centralised way of detecting & recording faults. Also, the exact location of the faulty street light is not known. After receiving the request, the lineman from the electricity department has to move along with their vehicle to identify the faulty street light and manually diagnoses the problem with the street light. The lineman spends a considerable amount of time & effort in this process, and it takes a minimum of 1 to 2 days to rectify the problem altogether.

Deployment Constraints:

Deployment constraints and adoption barriers to be considered by Solution providers to indicate solving the problem. Constraints should answer the question: what are the barriers/constraints that the beneficiaries will face while adopting a new solution?

Primary Constraints/Adoption barriers include: Total Cost of Ownership, Maintenance/Service, Skills/Expertise, Installation/Integration, Resources/materials, Time consumption, Physical/personal risk, Product training, Changes to habits/process, Accessibility, Inability to assess the quality of the product/service [Risk Perception], Monitoring the usage/deployment, etc.

Possible Deployment Constraints:

1. **Installation/Integration:** The solution should be designed to seamlessly integrate/retrofit with existing street lights without making any changes/modifications.
2. **Product training:** The solution should be easy to use without any special product training required and avoid any changes to existing workflows.
3. **Maintenance/Service:** The solution should be robust with minimal need for maintenance.

Other Requirements/Remarks:

Additional critical Information which remains uncovered in the above such as Operational Constraints, Usability Constraints, Dependencies, Quality Standards, Regulatory requirements, Certifications, etc.

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