A PROPOSAL ON

INSTALLATION OF UNDERGROUND WI-FI NETWORK

IN

KATHMANDU METROPOLITIAN CITY

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## ABSTRACT

The goal of this proposal is to change the digital environment of Kathmandu Metropolitan City by providing a detailed plan for the installation of an underground Wi- Fi network. The project aims to support smart city projects and promote digital inclusion by offering residents, businesses, and tourists dependable, fast internet connection.

Many obstacles need to be overcome by Kathmandu's surface-level Wi-Fi installations, such as their vulnerability to environmental deterioration and frequent connectivity outages. Protected from these types of risks, a subterranean network provides a long- lasting solution that guarantees reliable, high-performing internet connectivity. The project comprises multiple essential elements, including comprehensive site surveys to identify the best spots for Wi-Fi access points, creating a secure and scalable network architecture, laying subterranean fiber optic cables, and setting up Wi-Fi access points at key locations throughout the city. To guarantee network performance and dependability, stringent testing procedures and quality control methods will be put in place. To ensure long-term functionality and resilience, an ongoing maintenance and support plan will also be devised. This project intends to close the digital gap, boost economic growth, and raise everyone's standard of living through improving connection and digital services. By enabling cutting-edge urban management applications and offering a solid platform for upcoming technological breakthroughs, it will assist Kathmandu's ambition for a smart city. This project, which should take a year to complete, aims to establish Kathmandu as a pioneer in urban development and digital innovation. With a wealth of network installation and management knowledge, Universal Wi-Fi Network Pvt. Ltd is dedicated to providing the Kathmandu Metropolitan City with a high-caliber solution.

Keywords: underground WI-FI, fiber optic cable, and WI-FI.

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# STATEMENT OF PROBLEM

Across its varied metropolitan topography, Kathmandu Metropolitan City has formidable obstacles in delivering consistent and dependable internet connection. Surface-level Wi-Fi installations that are now in place are very vulnerable to physical interference, environmental degradation, and frequent disruptions, which can result in inconsistent connectivity. Residents, businesses, and visitors who depend on reliable internet for a variety of vital tasks are negatively impacted by this irregularity, which also negatively affects the city's digital infrastructure. Furthermore, the digital gap is particularly noticeable in underprivileged communities, restricting access to important online services, learning materials, medical information, and employment prospects. Insufficient connectivity can be detrimental to both social justice and economic growth, excluding many areas from the advantages of the digital age.

Additionally, the current status of internet connectivity makes it difficult to implement smart city programs successfully. These initiatives depend on a stable network to run applications like environmental monitoring, public safety systems, and efficient traffic management. These applications are essential to maintaining the sustainable growth of the city and improving living conditions in urban areas. Furthermore, surface-level installation maintenance and repair are expensive and time-consuming, placing additional burden on municipal resources and taking money away from other important urban projects.

Subterranean Wi-Fi offers a practical way to solve these issues. The city may safeguard vital network infrastructure from physical harm and environmental threats by moving it below, resulting in a more dependable and steady internet connection. This strategy will boost economic growth, improve digital inclusion, and offer a solid platform for applications related to smart cities. A robust and efficient subterranean Wi-Fi network is essential for tackling these issues and accomplishing the city's long-term digital and development objectives in Kathmandu.

# RATIONALE

In Kathmandu Metropolitan City, setting up an underground Wi-Fi network is a calculated step to solve current connectivity problems and facilitate future expansion. This project's reasoning is based on a number of significant advantages. First of all, subterranean installations are naturally shielded from environmental threats including bad weather, physical harm, and vandalism, which increases network longevity and dependability. Users benefit from a constant and dependable internet experience as a result of this durability, which also results in reduced maintenance costs and fewer service interruptions. Second, this project helps Kathmandu realize its goal of becoming into a smart city. The implementation of smart city technologies, such as sophisticated traffic management systems, public safety programs, and environmental monitoring, depends critically on a strong Wi-Fi network. For these apps to run properly, they need dependable, fast internet access, and a subterranean network provides the stability these vital operations demand. Thirdly, improved internet access would encourage digital inclusion by giving all locals, even those living in underprivileged areas, fair access to online resources. By promoting social justice and providing new educational and economic opportunities, this inclusivity will aid in closing the digital gap. And last, a stable internet connection is necessary for economic growth. Businesses, investors, and visitors are drawn to well-connected cities, which boosts economic growth and raises standard of living for all citizens. By putting in place an underground Wi-Fi network, Kathmandu may establish itself as a pioneer in both urban development and digital innovation.

# OBJECTIVES

## GENERAL OBJECTIVES

The main goal of this project is to establish a thorough and dependable underground Wi- Fi network within Kathmandu Metropolitan City. This network aims to improve connectivity, assist smart city initiatives, encourage digital inclusion, and stimulate economic growth.

## SPECIFIC OBJECTIVES

The specific objectives of this proposal are:

* Improve Connectivity: Establish high-speed and reliable internet access throughout key areas of Kathmandu Metropolitan City, ensuring uninterrupted connectivity for residents, businesses, and tourists.
* Foster Digital Inclusion: Guarantee fair access to internet services for all residents, including marginalized and underserved communities, to bridge the digital gap and promote social equality.
* Enable Smart City Initiatives: Support the implementation and operation of smart city applications such as advanced traffic management systems, public safety measures, and environmental monitoring through a robust and dependable Wi-Fi network.
* Ensure Network Durability: Construct a resilient underground network infrastructure to minimize connectivity disruptions, lower maintenance expenses, and safeguard against environmental risks and physical harm.
* Stimulate Economic Development: Attract businesses, investors, and tourists by providing a dependable and accessible Wi-Fi network, thereby driving economic growth and enhancing residents' quality of life.
* Promote Innovation and Progress: Lay the groundwork for future technological advancements and digital services, positioning Kathmandu as a progressive, technologically savvy city.

# METHODOLOGY

To ensure the successful implementation of the underground Wi-Fi network project in Kathmandu Metropolitan City, we will employ the following methods and procedures, alongside utilizing a mixed methodology approach. Throughout this project, we will harness human and other resources as outlined below:

### Human Resources:

To ensure efficient project execution, a dedicated Project Manager will oversee the entire project. They will coordinate activities, manage timelines, and adhere to budget constraints. Network Engineers will be responsible for designing and deploying the network architecture, strategically placing Wi-Fi access points throughout Kathmandu. A specialized Site Survey Team will conduct detailed assessments to identify optimal locations for infrastructure placement and evaluate underground conditions to minimize disruption to existing utilities.

### Equipment:

High-quality fiber optic cables will be sourced locally to ensure efficient data transmission. Wi-Fi access points will be strategically positioned to maximize coverage across the city. Testing equipment will be used to verify network performance and conduct quality assurance checks during installation. Essential construction tools, such as excavation equipment and trenching machinery, will facilitate the installation of conduits and pipes to protect cables and ensure their durability underground. Cable enclosures and junction boxes will safeguard components and simplify future maintenance.

### Building Materials:

Building materials, including concrete and asphalt, will be used to reinstate excavation sites, minimizing disruption to city infrastructure after installation. These resources and methodologies are intended to establish a robust underground Wi-Fi network in Kathmandu. This network will enhance connectivity, support smart city initiatives, and promote digital inclusion across metropolitan areas.

### Implementation Process

* + The installation process will begin with a comprehensive site survey followed by the development of a detailed network design.
  + The project will then proceed with the procurement of all necessary materials and equipment, ensuring they meet the required specifications and quality standards.
  + The installation will involve drilling and laying fiber optic cables, setting up Wi-Fi access points, and placing protective enclosures. Coordination with local authorities will be essential to minimize disruption to existing infrastructure.
  + Once installed, the network will undergo thorough testing to ensure functionality and performance, followed by optimization for maximum coverage and reliability.
  + A maintenance schedule and support system will be established to ensure ongoing network management and troubleshooting.

# COST ESTIMATE

|  |  |  |
| --- | --- | --- |
| S. N | Particulars | Amount (in NRS) |
| 1 | Land | Rs. 110,000,000 |
| 2 | Equipment | Rs. 290,000,000 |
| 3 | Salary and Wages | Rs. 45,000,000 |
| 4 | Survey and Planning | Rs. 30,000,000 |
| 5 | Installation | Rs. 200,000,000 |
| 6 | Testing and Optimization | Rs. 25,000,000 |
| 7 | Maintenance Setup | Rs. 30,000,000 |
| 8 | Electricity | Rs. 20,000,000 |
| 9 | Transportation | Rs. 18,000,000 |
| 10 | Publication | Rs. 2,000,000 |
| 11 | Stationery | Rs. 500,000 |
| 12 | Rent | Rs. 10,500,000 |
| 13 | Food and Drinking Water | Rs. 3,000,000 |
|  | Total: | Rs. 783,000,000 |

# TIME MANAGEMENT

This section presents a tentative plan for the time management for different activities to be performed throughout the 22 months project duration.

|  |  |  |
| --- | --- | --- |
| S. N | Activities | Duration |
| 1 | Land Acquisition | 4 months |
| 2 | Survey and Planning | 2 months |
| 3 | Excavation | 2 months |
| 4 | Laying Cables and Foundation | 3 months |
| 5 | Construction of Network Framework | 5 months |
| 6 | Installation of Access Points | 1 months |
| 7 | Testing and Optimization | 2 months |
| 8 | Fencing and Finishing | 2 month |
| 9 | Handover and Training | 1 month |

# EVALUATION/FOLLOW-UP

To ensure regular evaluation of the progress on the installation of the underground

Wi-Fi network in Kathmandu Metropolitan City, the following techniques and strategies have been planned:

1. Regular updates on progress will be published bi-weekly in periodicals.
2. A detailed progress report will be submitted every three months to the relevant authorities.
3. Seminars will be scheduled periodically to present progress through seminar papers.
4. Routine site inspections will ensure adherence to planned work schedules.
5. Monthly meetings with key stakeholders will be convened to review progress and implement necessary adjustments.

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