



**Base IMIS**  
**User Manual**  
**(DRAFT)**

Empowering  
Development  
through Data-  
driven Innovation  
and Information  
Technology  
Solutions

**Integrated Municipal Information System (IMIS)**  
Innovative Solution Pvt. Ltd (ISPL)

## Base IMIS User Manual

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Version 0.9.0

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## **1. INTRODUCTION**

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### **1.1 Overview**

The purpose of this user manual is to guide the users of IMIS on the functionalities of the web interface of IMIS. It provides detailed step-by-step procedures of all functionalities found within the IMIS web application as well as the working principle of IMIS.

The Integrated Municipal Information System (IMIS) is a comprehensive digital platform designed to transform how municipalities manage sanitation systems and services, aligning with the principles of Citywide Inclusive Sanitation (CWIS) to achieve Sustainable Development Goal (SDG) 6.2. IMIS equips municipal authorities with tools to plan, monitor, and optimize sanitation service delivery, ensuring equitable access for all, particularly underserved communities. By integrating geospatial data, real-time service tracking, and sanitation-specific analytics, IMIS supports evidence-based decision-making and enhances resource allocation to improve sanitation outcomes.

IMIS also functions as a Digital Public Infrastructure (DPI) at the sub-national level, facilitating the generation and organization of critical data for urban sanitation management. Beyond supporting local governance, IMIS serves as a foundational data system that feeds data into national-level systems for monitoring CWIS indicators and other metrics critical for achieving sanitation targets. This capability ensures alignment between municipal operations and broader national objectives, creating a seamless flow of actionable data across governance levels.

IMIS supports the Planning, Management, and Monitoring & Evaluation (M&E) framework for CWIS systems and services (see Figure 1-1). This framework emphasizes a structured approach to achieving inclusive and sustainable sanitation outcomes. The Planning component focuses on equitable and gender-inclusive strategies, sustainable financing, and transparent pricing mechanisms. The Management component ensures the safe, accountable, and financially sustainable operation of sanitation systems. The M&E component assesses service quality, equitable distribution, and the performance of sanitation authorities. Together, these components create a continuous feedback loop that helps municipalities refine their strategies and align them with national sanitation goals.

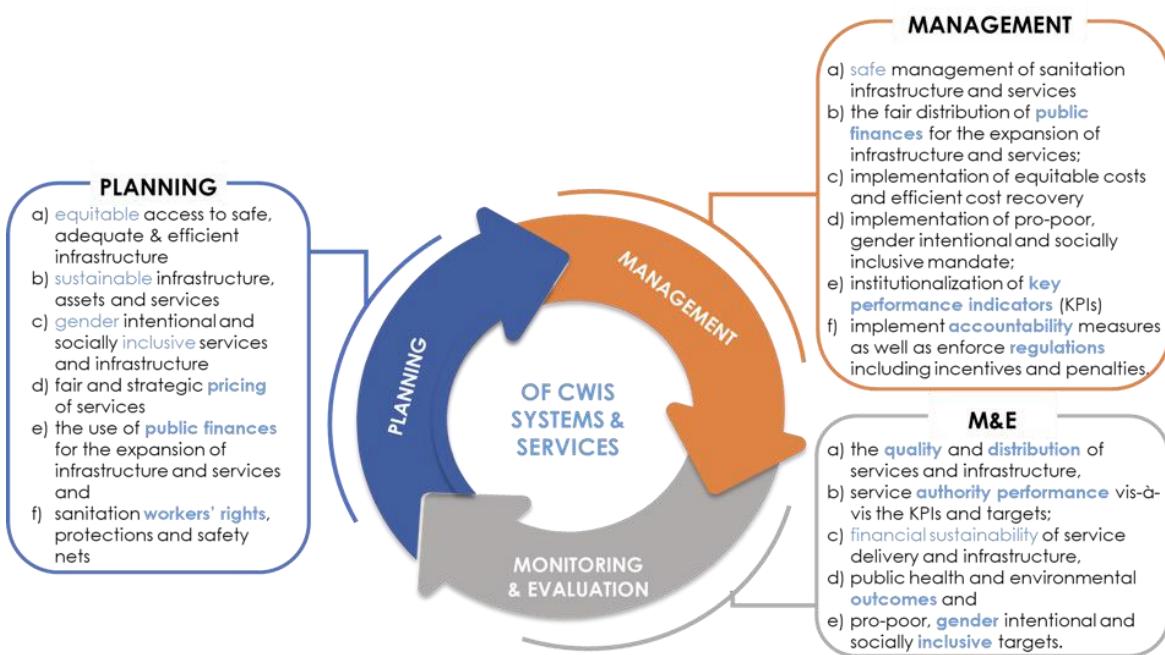


Figure 1-1 Planning, Management and Monitoring & Evaluation Framework for implementing CWIS Approach

IMIS comprises ten functional modules, seven of which are core modules directly addressing sanitation systems and services, such as faecal sludge management, sewer connections, and public toilet operations. The remaining three value-added modules enhance complementary municipal services, including property tax collection, solid waste management, and water supply billing. Combined with the **Urban Management Decision Support System (UMDSS)**—a powerful tool for spatial analysis, mapping, and decision-making—IMIS empowers municipalities to adopt CWIS principles while contributing to broader urban governance. Each of these modules are discussed under sub chapter “Modules”.

Built on robust open-source technologies like PHP, PostgreSQL, and OpenLayers, IMIS is made freely available under the **Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license**. This licensing ensures that municipalities and stakeholders can access, use, and adapt the system to their needs while promoting collaboration and innovation in sanitation and urban governance. Its intuitive dashboards enable municipalities to track CWIS indicators, Key Performance Indicators (KPIs), and other metrics essential for sanitation management. As a sub-national data system and DPI, IMIS strengthens municipalities’ ability to achieve sanitation objectives locally while feeding reliable, standardized data into national systems for effective CWIS monitoring and governance.

## 1.2 Modules

The Integrated Municipal Information System (IMIS) consists of ten functional modules: seven core modules and three value-added modules (see Figure 1-2). The seven core modules include the Building Information Management System (BIMS), Utility Information Management System (UIMS), Faecal Sludge Information Management System (FSIMS), Community Toilet/Public Toilet Information Management System (CTPIMS), Sewer Connection Information

Management System (SCIMS), Public Health Information Support System (PHISS), and the Urban Management Decision Support System (UMDSS). The three value-added modules are the Property Tax Collection Information Support System (PTCISS), Solid Waste Information Support System (SWISS), and the Water Supply Information Support System (WSISS). These value-added modules primarily support property tax collection, solid waste management, and water supply billing units, utilizing IMIS as a digital infrastructure to enhance services and improve revenue collection processes. Unlike the core modules, these value-added modules rely on data imported from respective municipal units during their regular business processes, as IMIS does not create data for them. Additionally, they do not directly impact sanitation systems and services under the Citywide Inclusive Sanitation (CWIS) approach.

Conversely, all core modules, except for UMDSS, generate and utilize their own data for various analyses, significantly contributing to the management of sanitation systems and services within the CWIS framework. UMDSS, while not creating data itself, consolidates data from other modules to facilitate decision-making related to sanitation systems, services, and broader urban management issues through its various analytical tools. Access to these modules is determined by the functional roles of municipal staff, executives, and stakeholders, ensuring their integration into daily municipal operations for effective management.

The use of these modules must be embedded into the regular workflows of corresponding departments or units within the municipality. For instance, the FSTP operator, responsible for recording logs of faecal sludge disposed of at the FSTP, is required to use the “Sludge Collection” functional sub-module within FSIMS. Similarly, emptying operators must use the IMIS-provided mobile application to capture data during containment emptying processes under the relevant sub-modules. This integration ensures that information within IMIS is continuously updated without the need for additional resources dedicated solely to data entry.

Each of these ten functional modules is discussed in detail in subsequent sections of this chapter. Additionally, IMIS includes a dedicated Settings module, which focuses on system administration and is covered at the end of the chapter. This structured approach ensures that IMIS is seamlessly integrated into the municipality’s operational framework, supporting both sanitation and urban management.



Figure 1-2 Functional Modules of IMIS

### 1.2.1 Building Information Management System (BIMS)

The BIMS is a core module of the IMIS that serves as a comprehensive database of all buildings within a municipality. It encompasses detailed information about each building, including: Physical attributes (structure type, number of floors, and year of construction); Location details (address and geographical coordinates with building footprints); Usage and ownership (Building usage, ownership status, and associated tax codes); Utilities and services (sources of water, solid waste management services, access to sanitation, access to roads, etc); Demographics and classifications (basic demographic data and classifications for low-income community areas). Buildings are central to IMIS, functioning as the foundational entities that interconnect all other components essential for efficient municipal service delivery.

The building database in IMIS is established using a GIS framework. High-resolution satellite or drone imagery is used to digitize building footprints, which are then verified through field checks and house-to-house surveys. House-to-house survey also collects all other required attributes data about buildings.

New buildings constructed post-IMIS implementation are recorded through the IMIS mobile application during the building permit process and updated for new constructions. The app,

currently available for Android, captures building footprints and related data for new structures. Additional building attributes are updated during municipality's business process in delivering various services such as sanitation assessments, sanitation service delivery and other services. However, this needs to be incorporated into the municipality's service delivery policy.

BIMS provides an interactive dashboard dedicated to building related information. This dashboard provides visual insights into building data from multiple perspectives. BIMS provides comprehensive interfaces and tools for data entry, updates, queries, and analysis. The system has a map-based integration feature that provides geospatial visualization tools for location identification. The module has data extraction tools that have capability for generating data in various formats, including CSV, Shapefiles, and KML files.

BIMS offers municipalities valuable insights into Building infrastructure status, utility and service access and the critical data for planning, management and monitoring and evaluation of sanitation system and services in CWIS approach.

The data maintained by BIMS helps municipality to monitor the CWIS indicators such as (i) % of LIC population with access to safe individual toilets / % of total population with access to safe individual toilets, (ii) Population with access to safe individual toilets, and (iii) Low-income community (LIC) population with access to safe individual toilets.

### **1.2.2 Utility Information Management System (UIMS)**

**UIMS**, a core module of the **IMIS**, is designed to manage detailed spatial and attribute data for municipal utilities such as roads, stormwater drains, water supply networks, and sewer systems. UIMS plays a critical role in achieving **CWIS** by enabling municipalities to monitor sanitation infrastructure, identify service gaps, and ensure equitable access to sanitation services, particularly for low-income community (LIC) areas. Through its integration with the **BIMS**, UIMS provides granular insights into utility connectivity for each building, including sewer and drainage links, and water supply access. This integration helps municipalities target underserved areas, plan infrastructure expansions, and prioritize investments in sanitation services.

A key feature of UIMS is its interactive dashboard, which delivers real-time visualizations on sanitation-related utilities. The system empowers municipalities to monitor sanitation coverage trends, identify gaps, and make data-driven decisions to address inequities in service delivery. UIMS also includes advanced map-based input tools integrated with the **UMDSS**, allowing municipalities to add or update utility infrastructure directly within the platform. Currently this tool is available for creating and updating roads only. In the case of other utilities, they need to be digitized and merged with existing data and import in corresponding utilities database of IMIS with the help of skilled GIS people. In the case of attribute data, they can be updated for all kinds of utilities directly from the user interface. UMDSS has provided tools to export data in flexible formats, such as CSV, SHP, and KML ensuring seamless sharing and integration with other municipal services.

### **1.2.3 Faecal Sludge Information Management System (FSIMS)**

The FSIMS is another core and most important module CWIS. This module enables municipality to digitalize and manage all data related to sanitation systems and services. FSIMS digitalize the complete sanitation service chain from application request for emptying service to the safe disposal of faecal sludge at the treatment plant and the reuse of the treated waste.

The FSIMS is further categorized into five sub-modules:

- a. **FSM Dashboard (FSMD):** The FSMD provides information related FSM services, overall, from containment emptying to transfer and disposal of waste in the FSTP. FSMD provides information about the number of containments; service providers; resources used for service delivery; applications received and responded; containments emptying status, volume of sludge collected, emptied and disposed; and the revenue generated,
- b. **Containment Information Management System (CIMS):** The CIMS maintains the information about the containments in the city, with their location information and attribute information such as building identification number (in case of multiple building served one containment, BIN of main building responsible for taking care of the containment), sanitation system type, dimensions, volume, last emptying date, next emptying date, etc. If a building is connected to a sewer network, that information is maintained in the building database. However, this module does not include a separate feature for adding new containments, if new containment must be added, it has to be updated in corresponding building in building database, through BIMS. A containment may be shared by multiple buildings or vice versa.
- c. **Service Provider Information Management System (SPIMS):** The SPIMS maintains the information related to the sanitation service providers registered with the city that provide emptying services within the city. This information is maintained by municipal authority whereas, two other functionalities employee information and desludging vehicles for service provider to maintain their information about their employees and the desludging vehicles. Only those service providers, employees and vehicles registered in this system are eligible to provide emptying, transporting and disposing faecal sludge in the FSTP or area designated by the municipality. This information helps municipality and service providers for efficient management of the resources and efficient service delivery. The information provided by SPIMS also helps monitoring KPIs set by municipality for service providers and tracking emptying vehicles to ensure that the waste emptied from the containment is transported and disposed in the area designated for disposing waste or FSTP allocated by the municipality.
- d. **Treatment Plant Information Management System (TPIMS):** The TPIMS maintains the information related to the treatment plants that could be FSTP, Centralized Wastewater Treatment Plant, Decentralized Wastewater Treatment Plant or Co-treatment Plant, those used by the city to dispose and treat collected faecal sludge or wastewater. In

addition to this, this sub-module also maintains water sample test data with the standard parameters used for monitoring the performance of the treatment plants in the city.

The information maintained by TPIMS along the information maintained by BIMS and the ESIMS, helps municipal to monitor the CWIS indicators such as (i) FS treatment capacity as a % of total FS generated from non-sewered connections, (ii) FS treatment capacity as a % of volume disposed at the treatment plant, (iii) WW treatment capacity as a % of total WW generated from sewer connections and greywater and supernatant generated from non-sewered connections, and (iv) Effectiveness of FS treatment in meeting prescribed standards for effluent discharge.

- e. Emptying Service Information Management System (ESIMS): The Emptying Service IMS digitalizes the sanitation service chain and enables the city to manage the entire sanitation service chain, starting from application requests for emptying service from the customer to the safe disposal of faecal sludge at the treatment plant. All the activities involved in this process can be monitored in real-time through ESIMS. The module is divided into four categories according to the different stages of the sanitation service chain i.e. application, emptying, sludge collection and feedback. The complete service chain is managed and maintained through the application section; however, the individual sections maintain further detailed information. There are several functional modules under this sub-module:
  - Application – this functional module is accessible to helpdesk and FSTP operator. The helpdesk uses it for receiving and maintaining application for customer's emptying request and collecting and maintain feedback data. FSTP operators use it for updating sludge transferred from the emptied containment and disposed in the FSTP. There is a function to generate reports of emptying service under this functional module. Helpdesks generally are the part of the municipality's sanitation department, emptier are part of the service providers and FSTP operators can be part of the municipality or the private operator as of municipality's policy.
  - Emptying – there is an easy-to-use native mobile application (android) that allows collection of the emptying information while providing the emptying service, such information can be updated in real-time. The mobile application is used by emptier to collect the information such as emptying start and end time, number of trips, total cost for emptying, and the payment receipt number. Emptying details can be viewed in real-time by the help desk and other municipal staff who have access to this module.
  - Sludge collection – FSTP operator in FSTP updates the FS disposal record that includes date, time and volume of waste disposed in the FSTP through the functional module Application through the web app as the waste is transferred and disposed in FSTP. Help desk can view these records in real-time through this functional module.

- Feedback – this functional module is accessible to the helpdesk, after completing sanitation service chain from emptying to disposal of the waste in the FSTP.
- Help desks – this functional module is used to create help desk and update their information. Help desks generally are under municipality itself, but the system has the capability of managing multiple help desks.

Data maintained by FSIMS along with the building data and LIC data enables CWIS Information Management System to generate CWIS indicators such as (i) IHHL onsite sanitation system that have been desludged, (ii) Collected FS disposed at the treatment plant or designated disposal site, (iii) Low income onsite sanitation systems that have been desludged, (iv) FS collected from LIC that is disposed at treatment plant or designated area, (v) Educational institutions where FS generated is safely transported to TP or safely disposed in situ, (vi) Healthcare facilities where FS generated is safely transported to TP or safely disposed in situ, and (vii) Desludging services completed mechanically or semi-mechanically.

The data export tools under FSIMS allow users to export data in CSV, Shape and KML format where applicable.

#### **1.2.4 Community Toilet / Public Toilet Information Management System (PTCTIMS)**

The PTCTIMIS is another core module of the system that maintains the information about the Public Toilets (PT) and Community Toilets (CT) in the city. The module enables municipal authority to maintain geographic locations of the PTs and the CTs in the city with their capacities and facilities along with daily user logs in case of PTs. In the case of CTs, PTCTIMIS maintains the number of households and the population served by CTs, based on the household and population data maintained by building databases in the system. Data export feature of the module enables users to export data PT/CT data in CSV format. Mapping features of UMDSS with this data enables municipal authorities to map the locations of the PTs/CTs with their operational condition and it has also provided a tool to map the buildings which are served by a specific CT.

CT information along with building information maintained by PTCTIMIS helps monitoring four major CWIS indicators (i) Dependent population with access to safe shared facilities, (ii) Shared facilities that adhere to principles of universal design, (iii) Shared facility users who are women, and (iv) Average distance from household to shared facility. Similarly, PT information along with containment emptying data enables municipal authority to monitor CWIS indicators (i) PT where faecal sludge generated is safely transported to treatment plant or safely disposed in situ, (ii) PT that adhere to principles of universal design, and (iii) PT users who are women.

## **1.2.5 Sewer Connection Information Management System (SCISS)**

The SCIMS is a core module that enables the city to maintain information on new sewer connections established between a building and sewer network within the city. This module provides a native mobile application (android) that allows the collection of the unique ID of both the building and the corresponding sewer network through a field survey. The collected building ID as well as sewer ID are maintained by this module, and once approved it is reflected in the BIMS, which updates the sanitation system and utility information of the building.

## **1.2.6 Public Health Information Support System (PHIIS)**

PHIIS is another core module of the IMIS, designed to empower municipalities in monitoring and addressing public health and sanitation challenges. PHIIS enables the collection and maintenance of water sample data from various sources, including groundwater, surface water, and treated wastewater, to ensure compliance with water contamination standards. This functionality directly aligns with the CWIS objective of monitoring environmental outcomes associated with sanitation systems. Additionally, PHIIS records and tracks cases of waterborne diseases across the city, providing municipalities with crucial data to understand and mitigate public health risks.

One of the standout features of PHIIS is its ability to maintain spatial and attribute data related to hotspot areas where waterborne diseases, such as diarrhea, cholera, dysentery, and typhoid, have been detected. The system also tracks fatalities linked to these diseases, offering a comprehensive overview of the impact on affected households and populations. By integrating this information with the UDSS municipal authorities can conduct detailed analyses of disease prevalence and its underlying causes. This data-driven approach enables strategic planning, targeted interventions, and efficient allocation of resources to reduce health risks in vulnerable areas.

Water sample data and waterborne cases data maintained by PHIIS helps municipality to monitor the CWIS indicators (i) Water contamination compliance of the water sources such as groundwater, surface water and treated wastewater, and (ii) Incidence of faecal-oral pathway diseases (e.g. diarrhea, cholera, dysentery and typhoid). With this information, municipalities can assess the effectiveness of sanitation systems in protecting public health and identify areas requiring urgent attention. By addressing these indicators, PHIIS supports municipalities in achieving CWIS objectives, ensuring safe water quality and reducing the prevalence of sanitation-related diseases. The data export tools under PHIIS allow users to export data in CSV, Shape and KML format where applicable.

## **1.2.7 Property Tax Collection Information Support System (PTCISS)**

PTCISS is a value-added module integrated into the Integrated Municipal Information System (IMIS), designed to help municipalities monitor and manage property tax collection citywide through powerful map-based visualization tools. It enables city authorities to import property tax data maintained by the municipal property tax collection department into IMIS using a user-

friendly data import tool supporting CSV formats. Once the data is integrated, property tax collection information is displayed in graphical formats on the IMIS dashboard and visualized on maps using tools provided by UMDSS. This facilitates quick and intuitive analysis of tax collection status across various parts of the city.

Mapping property tax data provides actionable insights by identifying high-default areas (regions with a significant number of defaulters) and efficient collection zones (areas with fewer defaulters or higher compliance rates). These insights enable the property tax department to focus on areas requiring attention, thereby improving efficiency and compliance. The information generated by PTCISS empowers city authorities to engage in strategic planning and evidence-based decision-making, allowing them to: (a) develop better tax collection strategies, (b) formulate effective policies to increase compliance, and (c) plan for equitable tax management across different city regions.

PTCISS also includes Data Export Tools, enabling municipal authorities to export building data along with their tax payment status. Additionally, it highlights mismatched tax records between the building data maintained in IMIS and the input tax data provided by the property tax department. This functionality helps identify and resolve discrepancies, ensuring data accuracy and transparency.

Currently, PTCISS relies on periodic manual updates using CSV-based imports to maintain data accuracy. However, the system is designed to be future-ready, with the capability to support real-time data integration through an API if the city's property tax collection system provides connectivity access. This upgrade would enable automated and efficient data synchronization as municipal technology evolves.

By leveraging the features and insights provided by PTCISS, municipalities can streamline property tax management, improve transparency, and enhance revenue collection efficiency. These improvements contribute significantly to better urban governance and equitable service delivery.

### **1.2.8 Solid Waste Information Support System (SWISS)**

The SWISS that enhances the management of solid waste services and fee collection. The module includes a tool for importing a municipality's solid waste customer data, including their last solid waste management service fee payment date, in CSV format. Based on this imported data, the SWISS module generates and maintains solid waste management customer records in IMIS, along with their fee payment status. It also provides tools to export building data with their solid waste service fee payment status and identifies discrepancies by highlighting records that exist in the municipality's solid waste customer database but are missing from IMIS.

Using the imported data, UMDSS in IMIS helps municipal authorities map buildings with or without solid waste management services and their respective fee payment statuses. This mapping capability enables municipalities to monitor service coverage, assess the status of fee collections, and identify geographic trends in solid waste management service delivery. By integrating solid waste management customer data with building records in IMIS, the SWISS

module equips municipal authorities with actionable insights to make informed decisions regarding solid waste services.

The visualized data provided by SWISS supports municipalities in formulating policies to enhance the solid waste management service and fee collection processes. It also aids in optimizing resource allocation and improving overall service delivery by identifying areas requiring attention or adjustments. This integration is currently carried out manually on a periodic basis to ensure the data in IMIS remains up to date. Like the PTCIIS module, SWISS does not yet support real-time data integration through an API.

### **1.2.9 Water Supply Information Support System (WSIIS)**

The WSIIS is another value-added module within the **IMIS**, designed to enhance the management of water supply services and fee collection. The WSIIS includes a data importing tool that allows municipalities to upload water supply customer data, including their last fee payment date, in CSV format. Based on this imported data, the WSIIS module generates and maintains records of water supply customers along with their fee payment status. It also provides tools to export building data with their water supply service and fee payment statuses and highlights discrepancies by identifying records present in the municipality's water supply customer database but missing in IMIS.

Using the imported data, the UMDSS in IMIS enables municipal authorities to visualize the water supply fee payment status of buildings in maps of the City within IMIS. This capability allows municipalities to monitor fee collection statuses and assess geographic trends in water supply fee payments. By integrating water supply customer data with building information in IMIS, the WSIIS module equips municipal authorities with actionable insights to make informed decisions regarding water supply services.

The visualized data provided by WSIIS supports the development of policies aimed at improving water supply fee collection processes, optimizing resource allocation, and enhancing overall service delivery. This integration helps municipalities target areas requiring attention, ensuring more effective and equitable water supply service management.

Currently, as with the PTCIIS and SWISS modules, the integration of data into WSIIS must be carried out manually on a periodic basis to maintain accuracy.

### **1.2.10 Urban Management Decision Support System (UMDSS)**

The UMDSS is one of the core and powerful tools in IMIS, it provides advanced capabilities for spatial analysis, mapping, data export, and dashboard visualizations. These tools empower city authorities to engage in evidence-based planning, management, monitoring, and decision-making for planning, management and monitoring and evaluation of sanitation system and services as well as a broader municipal urban management activity. In addition to the UMDSS module, there are IMIS Dashboard, Building Dashboard under BIMS, FSM Dashboard under FSIMS, Utility Dashboard of IMIS, CWISIMS Module including CWIS and KPI dashboard under CWISIMS are also has been considered as the components of UMDSS.

## i. UMDSS

The UMDSS provides Export Data and Map Feature Sub-modules.

Export Data:

- The Export Data sub-module enables users to export data layers in flexible formats such as SHP and KML. Users can customize exports by selecting specific ward(s) or combining layers to suit their needs.

Map Feature:

- The Map Feature is a powerful interactive map interface which provides a dynamic platform to visualize and analyze spatial data created by various modules and sub-modules in IMIS. It displays all spatial information with categorical styling based on attribute information, presenting summarized layers at city, ward and 0.5 km grid levels.
- The interface includes various spatial and complex tools that provide both basic and advanced functionalities, catering to a wide range of municipal operations. From navigation and visualization to sanitation-specific analyses and data updates, these features enhance decision-making by offering precise and actionable insights. These tools are – (i) Navigation and Map Interaction Tools (Zoom In & Zoom Out, Municipal Extent, Navigate, Info, Coordinate Information, Locate Point by Coordinate, (ii) Measurement Tools (Measure Distance, Measure Area), (iii) Printing and Support Tools (Print Map, Help), (iv) Sanitation-Specific Analysis Tools (Find Nearest Road, Find Building Connected to Containment, Find Containment Connected to Building, Find Associated Building, (iv) Editing Tools (Add Roads, Remove Markers).
- The integration of tools like Find Nearest Road and Containment Analysis directly supports Citywide Inclusive Sanitation (CWIS) goals, while features like Measure Area, Print Map, and Add Roads contribute to broader urban management and planning efforts. By using these tools, municipal authorities can efficiently monitor sanitation systems, plan infrastructure upgrades, and ensure equitable service delivery across the city.
- UMDSS also offer some specialized tools – (i) Service Delivery Tools for tracking (Applications, Emptied Applications Not Reached to Treatment Plant, Containments Proposed to Be Emptied, Feedback Chart (FSM Service Quality), (ii) General Tools for tracking (Buildings by Structure Type, Property Tax Collection, Water Supply), (iii) Data Export Tools (Filter by Wards, Export Data Set, Building Owner Information), (iv) Decision Tools (Tax Due Buildings, Sewers Potential Buildings, Buildings to Sewer, Buildings to Road, Hard to Reach Buildings, Building Close to Water Bodies, Buildings Using Community Toilets, Area Population), (V) Summary Information Tools (Summary Information Buffer Filter, Water Bodies Buffer Summary Information, Wards Summary Information, Road Buffer Summary Information, Point Buffer Summary Information).

These tools enhance decision-making by providing targeted insights into property, utility, and demographic data. They allow municipalities to analyze specific areas, prioritize

interventions, and support efficient planning, management and monitoring and evaluation of CWIS sanitation system and services, and overall urban management.

## **ii. CWIS Information Management System (CWISIMS):**

CWISIMS is a vital module of the **IMIS** that provides tools to generate CWIS indicators for the city and Key Performance Indicators (KPIs) to monitor the performance of sanitation service providers for a specified year. CWISIMS allows municipalities to set targets for each indicator in alignment with city policies and standards, and it includes a dashboard for the visualization of these indicators. The generated indicator data is maintained in a database, enabling easy access and review when needed, ensuring effective monitoring and planning.

- (i) CWIS Dashboard - The CWIS Dashboard tracks 22 sanitation indicators (Annex 1), which are generated annually. These indicators are informed by data maintained across various modules and sub-modules within IMIS, making them integral to understanding citywide sanitation performance. The indicators are based on the CWIS framework developed by Athena Informatics, ensuring consistency with globally recognized standards for inclusive sanitation monitoring. This dashboard provides municipalities with a centralized platform for tracking sanitation progress and assessing the effectiveness of implemented policies and services.
- (ii) KPI Dashboard – The KPI Dashboard complements the CWIS Dashboard by focusing on the performance of sanitation service providers. It monitors seven critical KPIs (1. Application Response Efficiency, 2. Customer Satisfaction, 3. PPE Compliance, 4. Safe Desludging, 5. Faecal Sludge Collection Ration, 6. Response Time, 7. Inclusion), which are also generated annually, using sanitation service data related to faecal sludge management (FSM) service delivery. These KPIs are designed to evaluate the efficiency and quality of services provided by sanitation operators, based on metrics developed by SNV Bangladesh. By leveraging this dashboard, municipalities can benchmark service provider performance and identify areas for operational improvement within their sanitation systems.
- (iii) CWISIMS, through its dual focus on CWIS indicators and KPIs, provides municipalities with robust tools for monitoring and improving their sanitation systems. By aligning indicator and KPI tracking with international standards and municipal goals, it ensures data-driven decision-making and continuous improvement in sanitation service delivery and management.

## **iii. Dashboards**

There are all together six Dashboards considered as the components of UDSS of the IMIS include six dashboards that serve as its core components: (i) IMIS Dashboard, (ii) Building Dashboard, (iii) FSM Dashboard, (iv) Utility Dashboard, (v) CWIS Dashboard, and (vi) KPI Dashboard. Five of these dashboards have been discussed under their respective functional modules and sub-modules. The remaining dashboard, the IMIS Dashboard, is detailed below.

The IMIS Dashboard serves as the central platform within the IMIS, offering a comprehensive overview of municipal data. It integrates information on building infrastructure, utilities (such as roads, drains, sewer, and water supply), sanitation systems and services, public and community toilets, public health, tax collection, water bill payments, and solid waste management. This dashboard provides municipalities with a unified interface for monitoring and managing citywide operations effectively, supporting informed decision-making and efficient service delivery.

The Urban Management Decision Support System (UMDSS) enables municipalities to implement Citywide Inclusive Sanitation (CWIS) principles, supporting the planning, monitoring, and management of sanitation systems and services through a CWIS-focused approach. It also enhances revenue collection processes, including tax collection, water bill payments, and fees for solid waste management services, while providing actionable spatial insights to improve overall urban management. With its powerful analytical tools, UMDSS empowers municipalities to achieve greater efficiency, transparency, and inclusivity, not only in sanitation management but also in broader urban governance and service delivery.

### **1.2.11 Settings**

This is a module to allows administrators to manage user access and control permissions within the system. Features include:

User Credentials - securely store and manage user authentication details, including usernames, passwords options.

Roles Management- Create and assign roles to users, defining their access level and responsibilities. Roles can be customized to reflect specific job functions.

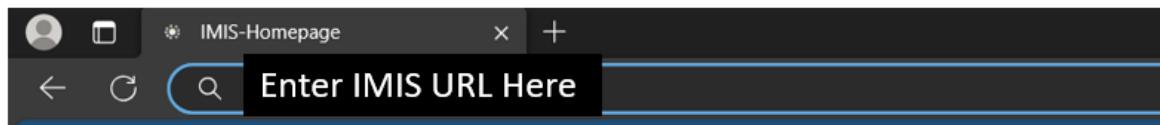
Permissions Control - fine-tune access by assigning permissions to roles or individuals, ensuring users can only interact with data and features relevant to their role.

## **2. ACCESSING THE IMIS**

When accessing the IMIS web application through a browser, users are directed to the landing page, which provides a general overview of IMIS. To proceed, users can click on the 'SIGN IN' button, triggering a pop-up where they are prompted to enter their login credentials. The IMIS web application is compatible with all major browsers.

### **2.1 Navigation to IMIS Home Page**

- Open any browser to access the **IMIS Web Application**.
- Enter the provided IMIS URL to navigate to the Home Page.



#### **Overview:**



*Figure 2- 1 IMIS landing Page*

The Home Page of IMIS has the following sections:

- Home - The "Home" section is the landing page of the IMIS website. It serves as the main gateway for users, providing an overview of IMIS.
- About – The “About” section provides detailed information about IMIS.

- Functional Modules – The “Functional Modules” consists an overview of the modules that are available in IMIS.
- Contact – The “Contact” section is where users can find essential contact information for IMIS.
- SIGN IN – The “SIGN IN” section is a login portal for registered users or members.

## 2.2 Sign In to IMIS

- Click on the ***Sign In*** button



- Enter the valid credentials as provided username and password, then click on the ***Log In*** button.

The screenshot shows the 'Integrated Municipal Information System' login window. The title bar says 'Integrated Municipal Information System' and the main heading is 'Log in'. There are two input fields: 'Email or Username' and 'Password', each with a corresponding icon (envelope for email and lock for password). Below the password field are two checkboxes: 'Show password' and 'Remember Me'. A large blue 'Log In' button is centered at the bottom. At the very bottom of the window, there is a link 'Forgot Your Password?'. The background of the window is white, while the buttons and text are in shades of grey and blue.

Figure 2- 2 Login Prompt

## Overview:

- After successfully logging in, the user is redirected to the IMIS Dashboard.
- If the user wants to stay logged in, they should check the "Remember Me" option (refer to section 2.4).

## 2.3 Resetting Password

- The user can reset their password by Clicking on the ***Forgot Your Password?*** hyperlink.
- The Reset Password Page is displayed where the user is prompted to fill in the user's correct email ID and select the **Send Password Reset Link**.
- A link to reset the user's password is sent to the corresponding email ID.
- The user needs to follow that link and reset their password.

The screenshot shows a web-based application window titled 'Integrated Municipal Information System'. At the top center is a 'Reset Password' button. Below it is a text input field labeled 'Email Address'. At the bottom is a blue rectangular button labeled 'Send Password Reset Link'.

Figure 2- 3 Reset Password Prompt

## 2.4 Remember Password

- Instead of entering the password repeatedly, the user can save it for convenience.
- The user can check the “**Remember Me**” checkbox which is available on the SIGN IN form.

## Integrated Municipal Information System

Log in

Email or Username  

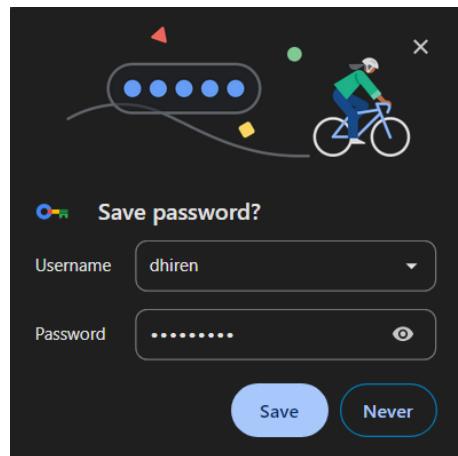
Password  

Show password  Remember Me

**Log In**

[Forgot Your Password?](#)

- The password will be saved in the user's browser.
- The save password prompt is displayed after the user checks the "**Remember Me**" checkbox and signs in.



### 3. DASHBOARD

Upon successful login, the user will be directed to the IMIS Dashboard, as shown below. The IMIS Dashboard serves as the central platform within the IMIS, offering a comprehensive overview of municipal data. It integrates information on building infrastructure, utilities (such as roads, drains, sewer, and water supply), sanitation systems and services, public and community toilets, public health, tax collection, water bill payments, and solid waste management. This dashboard provides municipalities with a unified interface for monitoring and managing citywide operations effectively, supporting informed decision-making and efficient service delivery.

Including the IMIS dashboard, there are all together six Dashboards considered as the components of Urban Management Decision Support System of the IMIS include six dashboards that serve as its core components: (i) IMIS Dashboard, (ii) Building Dashboard, (iii) FSM Dashboard, (iv) Utility Dashboard, (v) CWIS Dashboard, and (vi) KPI Dashboard. Five of these dashboards have been discussed under their respective functional modules and sub-modules.

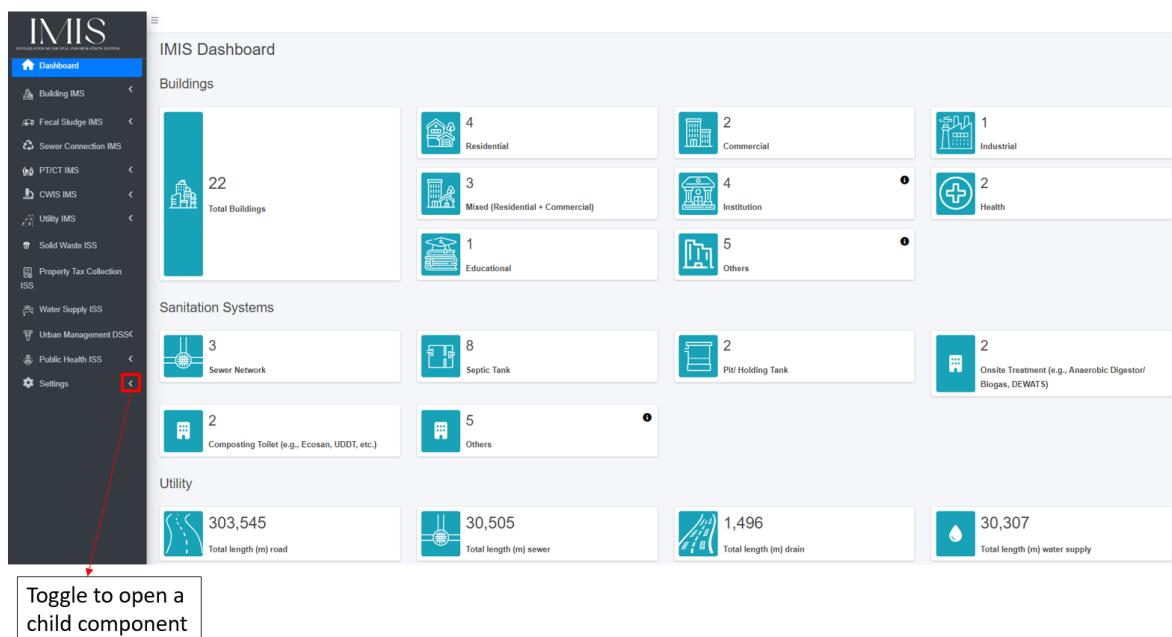


Figure 3- 1 IMIS Dashboard

## **4. SIDEBAR**

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The sidebar is a navigation tool that enables users to move between different pages. It contains various sections categorized by functional modules and their corresponding functionalities, which can be expanded or collapsed. The sidebar features ten different modules, and their sub-modules. Some modules can be further expanded to reveal a child menu. Depending on user credentials, only specific modules will be available to certain users. Different roles are predefined in the system that are further explained in Section (roles and permission). Each of the modules listed below are further explained in the sections below.

1. Dashboard
2. Building IMS
3. Fecal Sludge IMS
4. Sewer Connection IMS
5. PT/CT IMS
6. CWIS IMS
7. Utility IMS
8. Solid Waste ISS
9. Property Tax Collection ISS
10. Water Supply ISS
11. Urban Management DSS
12. Public Health ISS
13. Settings

## 5. FILTERS

Each sub-module that displays records includes a range of filters based on the attributes maintained by the module or page. These filters enable users to refine and sort information according to various attributes specific to the records. Additionally, the export tool is fully compatible with these filters, ensuring efficient and accurate data export.

### 5.1 Navigation to Filter

- Initially, all filters are hidden. Select the **Show Filter** button to expand the filter.

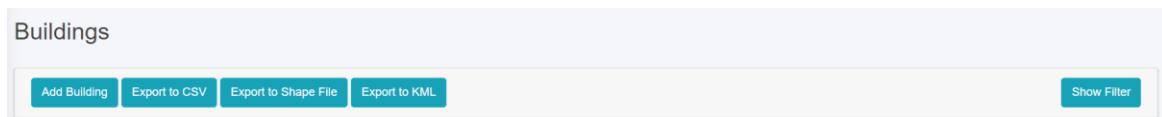


Figure 5- 1 Filter Toggle

#### Overview:

- The user must select the **Show Filter** button to view the filter.
- Enter its appropriate value and click on the Filter button. E.g., Structure Type > RCC Framed and Ward >Ward 1.
- To remove the filter, click **Reset**.

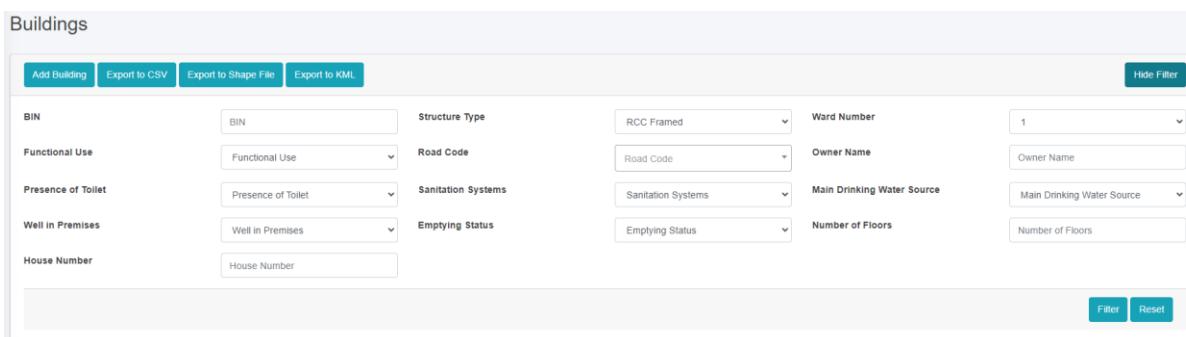


Figure 5- 2 Filter Search Fields

- The filtered data using the multiple search fields is shown below (e.g. Structure Type: Load Bearing, Functional Use: Agricultural & Farm and Sanitation Systems: Septic Tank)

Add Building | Export to CSV | Export to Shape File | Export to KML | Hide Filter

BIN	BIN	Structure Type	RCC Framed	Ward Number	1
Functional Use	Functional Use	Road Code	Road Code	Owner Name	Owner Name
Presence of Toilet	Presence of Toilet	Sanitation Systems	Sanitation Systems	Main Drinking Water Source	Main Drinking Water Source
Well in Premises	Well in Premises	Emptying Status	Emptying Status	Number of Floors	Number of Floors
House Number	House Number				

Show 10 entries | Filter | Reset

BIN	House Number	Road Code	Ward	Structure Type	Number of Floors	Presence of Toilet	Sanitation Systems	Owner Name	Actions
B000027	R001770-01	R001770	1	RCC framed	5	Yes	Pit Holding Tank	Person Name3	
B000020	R000372-01	R000372	1	RCC framed	3	Yes	Septic Tank	Suman Shrestha	
B000002	R000001-01	R000001	1	RCC framed	3	Yes	Sever Network	Rita Thakuri	

Figure 5- 3 Multiple Fields using Filter

## 6. ACTIONS

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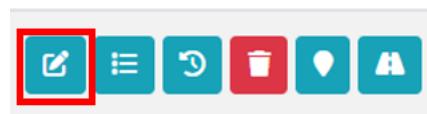
Each sub-module that displays records also has a variety of Actions available. The user can modify and delete individual records using these Actions, as well as view the details, history, and spatial location of the record. They are in the column marked "Actions." Each sub-module contains actions required according to the functionalities. Depending on the user's access credentials, the actions are displayed.

*Table 6- 1 List of Actions*

ICON	Name	Functionality
	Edit	Opens form to edit the record details
	Detail	Shows detailed information about the record
	History	Shows information about the log history of edits
	Delete	Delete record data
	Map	Shows the spatial location of the record on a map
	Login Activity	Shows the login activity of the user
	Connected Buildings	Shows buildings connected to Containment
	Type Change History	Gives detailed information on the changes made to the containment type
	Nearest Road	Shows the nearest road that is linked to the building/containment
	Emptying Service History	Displays the containment emptying information

## 6.1 Edit Record

- Click on **Edit** in the Action column of the List.



- Change the values of the desired form fields and click **Save**.

### Overview:

- Users can select the edit button to add information to empty fields or modify existing entries as needed.
- Click on the **Back to List** button if the user does not want to save any changes.

Edit Building

House Number : B000035

**Owner Information**

Owner Name*	Person Name17
Owner Gender*	Female
Owner Contact Number*	1234567897

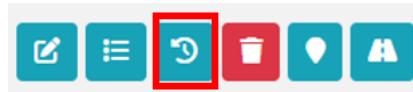
**Building Information**

Main Building*	Yes
Ward Number*	8
Road Code*	R000005
House Number	R000005-5
House Locality/Address	House Locality/Address
Tax Code/Holding ID*	TR45/112
Structure Type*	CGI Sheet
Surveyed Date	09/22/2024
Construction Date*	01/01/2024
Number of Floors*	8
Functional Use of Building*	Educational
Use Category of Building	Use Category of Building

Figure 6- 1 Edit Record

## 6.2 View History

- Click on the **History** button in the Action column of the List.



### Overview:

- Users can view the changes made to the individual attributes of the record, including the user who made the record, the values that were edited, and the date when it was edited.
- Click on **Back to List** to go back

### Service Provider History

[Back to List](#)

- Innovative Solution created this resource at 2024-03-11 12:55:11
- Innovative Solution changed contact\_person from David Magar to Basanta Magar on 2024-03-11 12:55:4
- Innovative Solution changed total\_trips from 3 to 5 on 2024-03-11 12:55:49
- Innovative Solution changed contact\_gender from Male to Female on 2024-03-11 12:55:49

Figure 6- 2 Record History

## 6.3 Delete Record

- To delete a record, click on the **Delete** button in the Action column of the list.



### Overview:

- After clicking the delete button, it will display a confirmation dialog. Click the ‘Yes, delete it!’ button in the confirmation dialog to delete the record.



## Are you sure?

You won't be able to revert this!

Yes, delete it! Cancel

Figure 6- 3 Delete Confirmation Dialog

**Note:** Once deleted, the record cannot be recovered by the user. The alternative to deleting is to change the record's status to inactive/non-operational if the status field is available. This way, the user won't need to delete the record.

The records that are deleted through the interface can be retrieved in cases of accidental deletion. Please contact the technical support team if such events occur.

## 6.4 View on Map

- Click on the **Map** button in the Action column of the List to view the spatial location of the record with a marker.



**Note:** The map button will be available only if spatial information is maintained in the record.

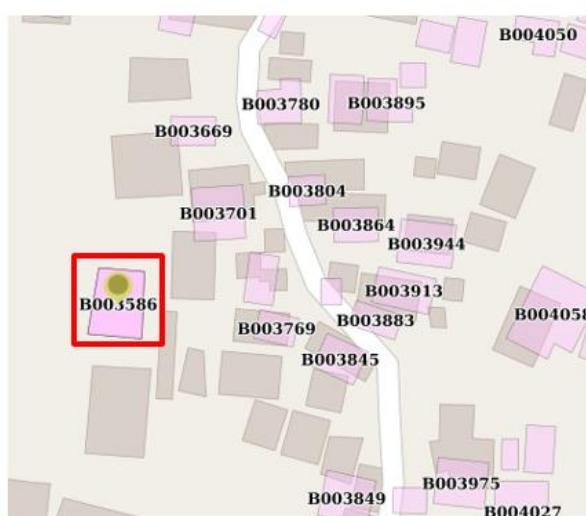
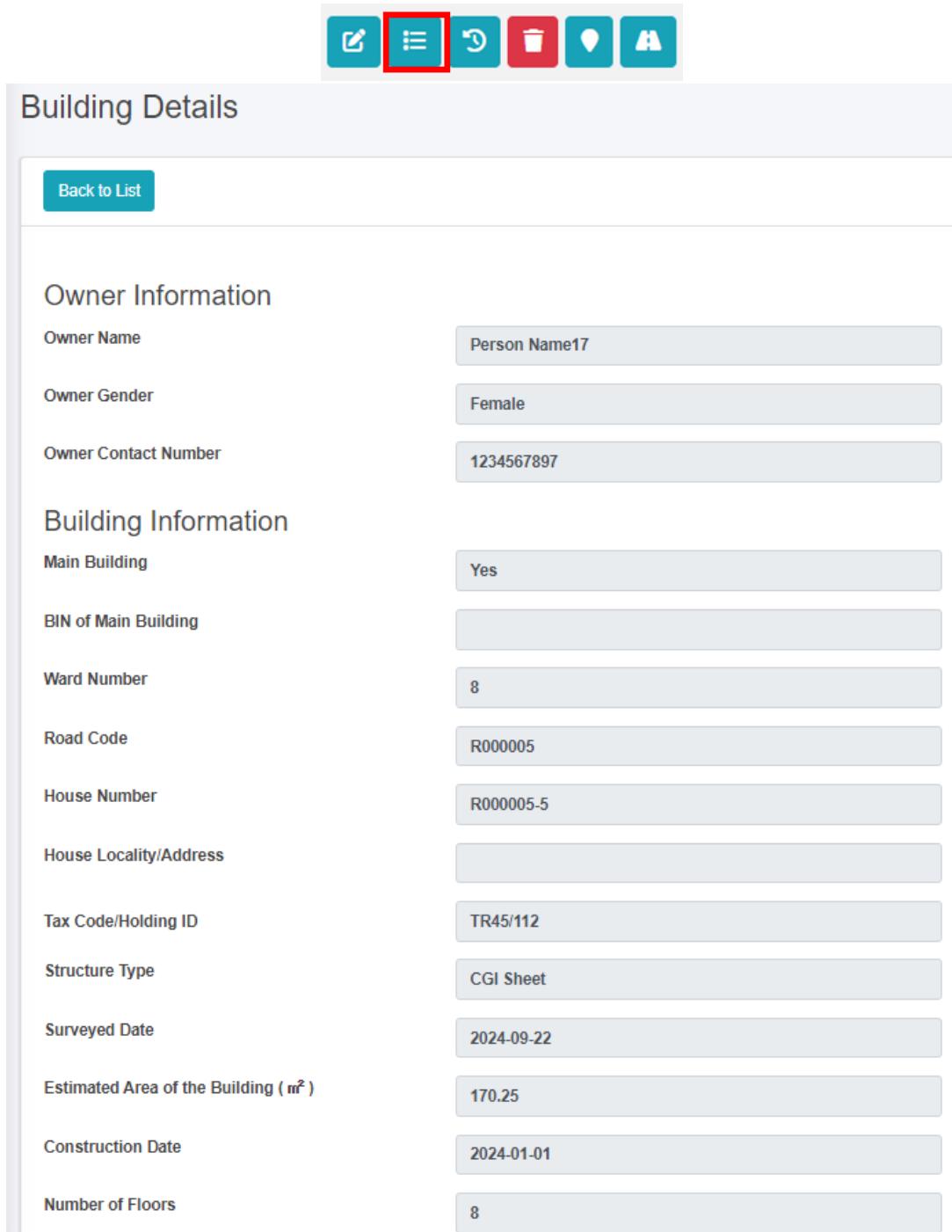


Figure 6- 4 View on Map

## 6.5 Show Details of Record

- Click on the **Detail** button in the Action column to view the attribute information maintained for the record.



Building Details

Back to List

**Owner Information**

Owner Name	Person Name17
Owner Gender	Female
Owner Contact Number	1234567897

**Building Information**

Main Building	Yes
BIN of Main Building	
Ward Number	8
Road Code	R000005
House Number	R000005-5
House Locality/Address	
Tax Code/Holding ID	TR45/112
Structure Type	CGI Sheet
Surveyed Date	2024-09-22
Estimated Area of the Building ( m <sup>2</sup> )	170.25
Construction Date	2024-01-01
Number of Floors	8

Figure 6- 5 Record Details

## 6.6 View Nearest Road of Record

- Click on the **Nearest Road** button, to view the nearest road that links to the building/containment.



**Note:** View Nearest Road of Record is available only in the Building/ Containment Module.

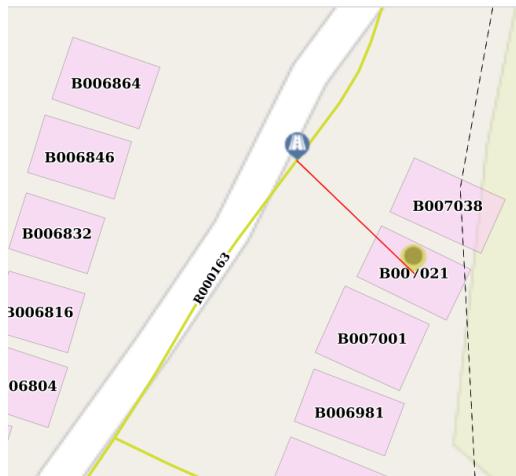


Figure 6- 6 View Nearest Road

## 6.7 View Login Activity

- Click the **Login Activity** button in the Action column of the list to view the last login times and their IP addresses.

**Note:** View login activity is available only in the Users module.



**Login Activity**

Full Name	Municipality Executive
Last Login At	2024-02-25 21:44:59
Last Login IP	Last Login IP address

[Back to List](#)

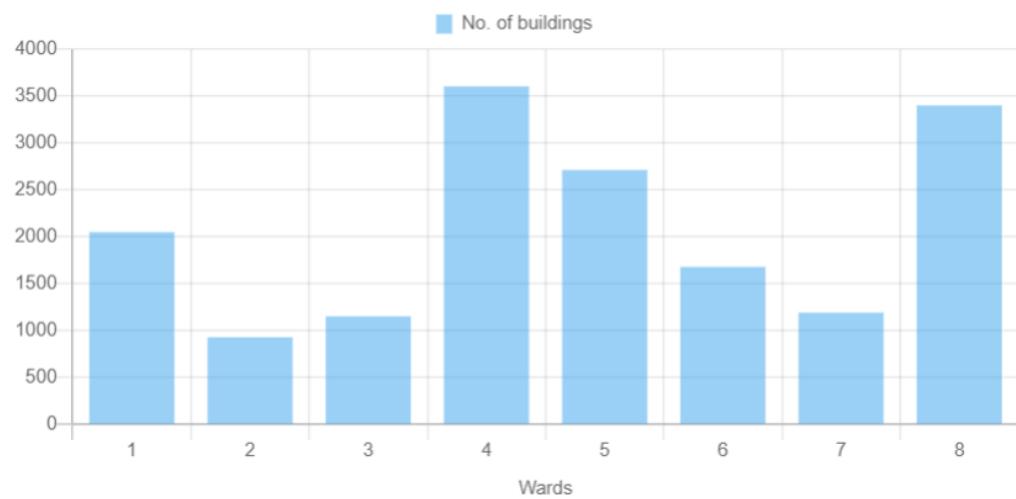
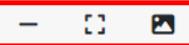
Figure 6- 7 Login activity

## 6.8 Card Tools

The user can undertake diverse actions using the card tools, including minimizing and maximizing the card. Furthermore, the option to download the chart as an image enhances the user's capability to evaluate the information.

Icon	Name	Tasks that will be performed
-	Minimize	Minimize the card.
[+]	Maximize	Maximize the card.
[img]	Download Image	Download the card as an image.

## Building by Wards

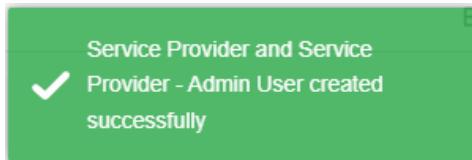


## **7. SYSTEM NOTIFICATIONS**

---

### **7.1 Save**

After the User fills out a form and Clicks Save, the user will be notified by the System with a pop-up message as shown below:



**Note:** The above pop-up message is just an example, and the wording may differ according to the form filled.

### **7.2 Mandatory Field Missing Error**

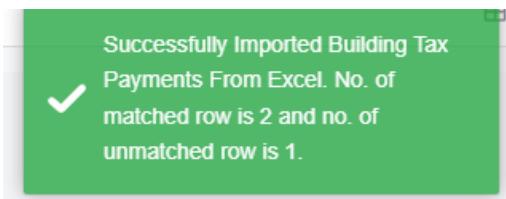
While filling out a form if the user leaves out a mandatory field, a mandatory field will be marked with a red asterisk (\*), and the System will notify the user with the following error message:



**Note:** The above pop-up message is just an example, and the wording may differ according to the form filled.

### **7.3 Successfully Imported**

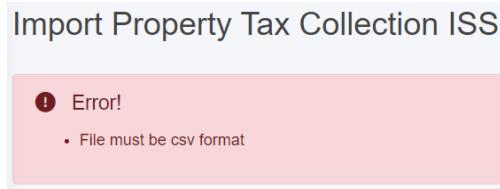
When the user imports a CSV file, this will validate the data against the existing system data and provide a message as:



**Note:** The above pop-up message is just an example, and the wording may differ according to the type of document imported.

## 7.4 Import Format Error

If the User attempts to import data in an invalid format, the system will notify the user with an error message as shown below:



**Note:** The above pop-up message is just an example, and the wording may differ according to the type of document imported.

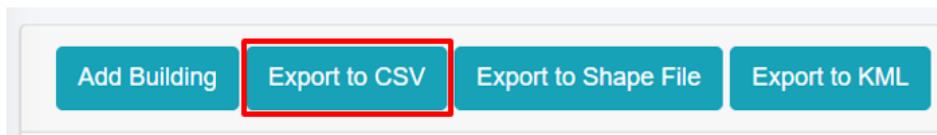
## **8. TOOLS**

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In each sub-module where records are listed, there are various tools available that allow the user to Export the records in various formats and add new records. Additional tools are present in certain sub-modules as per the functionalities. Depending on the access the user has with their credentials, different tools are visible. Data from each sub-module can be exported in three different file types: CSV, KML (if GIS information is maintained), and Shape File (if GIS information is maintained). It should be mentioned that the Export tool integrates perfectly with the Filter tool, enabling the user to filter out the necessary data and export it as well.

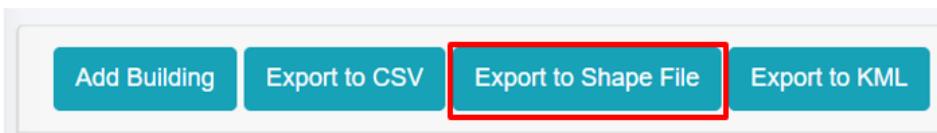
### **8.1 Export to CSV**

- Click the ***Export to CSV*** button to download the CSV file.



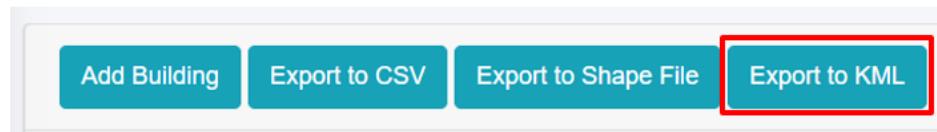
### **8.2 Export to Shape File**

- Click the ***Export to Shape File*** button to download the shape file.



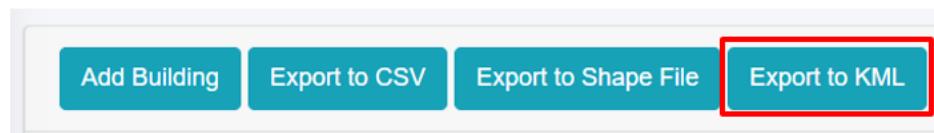
### **8.3 Export to KML**

- Click the ***Export to KML*** button to download the kml file.



## 8.4 Export Unmatched Records

- Click the ***Export Unmatched Records*** button to download the CSV file.
- It exports only the data that did not match during the import of the CSV file into the system and has been included in the export process.



Note:

- The "***Export Unmatched Records***" button is available only during data imports in the Property Tax Collection ISS, Solid Waste ISS, and Water Supply ISS modules.

## **9. BUILDING INFORMATION MANAGEMENT SYSTEM (BIMS)**

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The BIMS is a core module of the IMIS that serves as a comprehensive database of all buildings within a municipality. It encompasses detailed information about each building maintained by the Buildings sub-module, including: Physical attributes (structure type, number of floors, and year of construction); Location details (address and geographical coordinates with building footprints; Usage and ownership (Building usage, ownership status, and associated tax codes); Utilities and services (sources of water, solid waste management services, access to sanitation, access to roads, etc.); Demographics and classifications (basic demographic data and classifications for low-income community areas). Buildings are central to IMIS, functioning as the foundational entities that interconnect all other components essential for efficient municipal service delivery.

New buildings constructed post-IMIS implementation are recorded through the IMIS mobile application during the building permit process and updated for new constructions. The app, currently available for Android, captures building footprints and related data for new structures. Additional building attributes are updated during municipality's business process in delivering various services such as sanitation assessments, sanitation service delivery and other services. However, this needs to be incorporated into the municipality's service delivery policy.

BIMS provides an interactive dashboard dedicated to building related information. This dashboard provides visual insights into building data from multiple perspectives. BIMS provides comprehensive interfaces and tools for data entry, updates, queries, and analysis. The system has a map-based integration feature that provides geospatial visualization tools for location identification. The module has data extraction tools that have capability for generating data in various formats, including CSV, Shapefiles, and KML files.

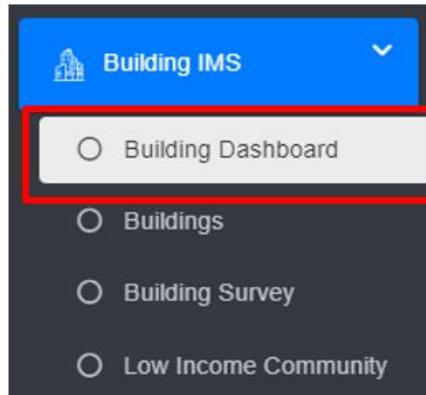
BIMS offers municipalities valuable insights into Building infrastructure status, utility and service access and the critical data for planning, management and monitoring and evaluation of sanitation system and services in CWIS approach.

The data maintained by BIMS helps municipality to monitor the CWIS indicators such as (i) % of LIC population with access to safe individual toilets / % of total population with access to safe individual toilets, (ii) Population with access to safe individual toilets, and (iii) Low-income community (LIC) population with access to safe individual toilets.

### **9.1 Building Information Dashboard**

#### **9.1.1 Navigating to Building Information Dashboard**

- Open the sidebar and click on ***Building IMS*** to expand.
- Select ***Building Dashboard***.



## Overview:

- The Building Information Dashboard provides a quick synopsis of the information maintained in this module. The count boxes provide a glance at the status of different buildings, and sanitation systems, and the charts provide a graphical representation of the information.
- The user can interact with the chart's tools (refer to Section 6.8).
- While hovering over the charts, it provides further information.



Figure 9- 1 Building Dashboard

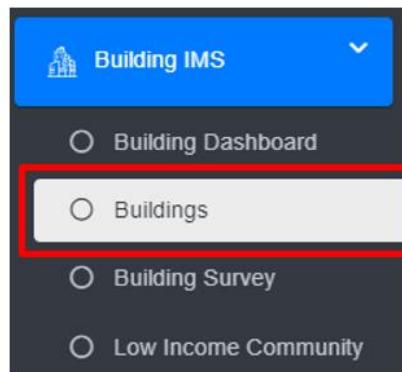
## 9.2 Buildings

The **buildings** sub-module maintains the detailed information about each building maintained by the Buildings sub-module, including: Physical attributes (structure type, number of floors, and year of construction); Location details (address and geographical coordinates with building footprints; Usage and ownership (Building usage, ownership status, and associated tax codes); Utilities and services (sources of water, solid waste management services, access to sanitation, access to roads, etc.); Demographics and classifications (basic demographic data and classifications for low-income community areas). Buildings are central to IMIS, functioning as

the foundational entities that interconnect all other components essential for efficient municipal service delivery.

### 9.2.1 Buildings Navigation

- Open the sidebar and click on the **Building IMS** to expand.
- Select **Buildings**.



#### Overview:

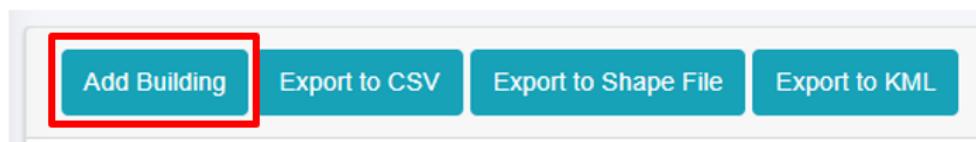
The Buildings Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on the Action buttons refer to Section 6.

BIN	House Number	Road Code	Ward	Structure Type	Number of Floors	Presence of Toilet	Sanitation Systems	Owner Name	Actions
B000026	R000006-2	R000006	4	Wooden/Mud	6	Yes	Pit/ Holding Tank	Person Name2	A set of small blue and red square icons representing various actions like edit, delete, etc.
B000025	R001563-01	R001563	5	CGI Sheet	10	Yes	Pit/ Holding Tank	Person Name1	
B000024	R000003-4	R000003	4	RCC framed	4	No	Community Toilet	Yogesh Bhattarai	
B000023	R000033-01	R000033	2	RCC framed	5	Yes	Septic Tank	Sarita Hamal	
B000022	R000006-01	R000006	8	RCC framed	5	Yes	Septic Tank	Sharif Shah	
B000021	R000078-01	R000078	3	RCC framed	4	Yes	Septic Tank	Gaurav Tamang	
B000020	R000372-01	R000372	1	RCC framed	3	Yes	Septic Tank	Suman Shrestha	
B000019	R000279-01	R000279	6	CGI Sheet	1	Yes	Pit/ Holding Tank	Anish Rana	

Figure 9- 2 List Buildings page

## 9.2.2 Add Building

- Click on the ‘*Add Building*’ button.



- User will be redirected to the following page:

A screenshot of the 'Add Building' form. The form is organized into two main sections: 'Owner Information' and 'Building Information'. Under 'Owner Information', there are fields for 'Owner Name\*', 'Owner Gender\*', and 'Owner Contact Number\*'. Under 'Building Information', there are fields for 'Main Building\*', 'Ward Number\*', 'Road Code\*', 'House Number', 'House Locality/Address', 'Tax Code/Holding ID\*', 'Structure Type\*', 'Surveyed Date', 'Construction Date\*', 'Number of Floors\*', 'Functional Use of Building\*', 'Office or Business Name', and 'Number of Households\*'. Most fields require a value, as indicated by the red asterisk (\*) next to the field label.

Figure 9- 3 Add Building Page

- After filling out the form, click *Save*, and make sure a green pop-up message is displayed, refer to Section 7.1 for more details.
- If a mandatory field is left out a red error message will be displayed, refer to Section 7.2 for more details.

### Overview:

Different attribute information maintained in this module is collected through this form. There are various skip logics built into the form that are triggered according to the information filled by the user. The form fields are explained below:

## **Owner information**

1. Owner Name - Full name of the building owner.
2. Owner Gender - Gender of the building owner.
3. Owner Contact Number - Contact number of the building owner, it takes numeric values only.

## **Building Information**

1. Main Building - Defines if the building is the main or auxiliary building. Select 'Yes' if it is a main building, and no if it is an auxiliary building. If 'No' is selected the Main Building House Number field is prompted.
  - Main Building House Number - Unique identifier for the associated main building if building is auxiliary.
2. Ward Number - Identifier for the local administrative unit.
3. Road Code - Identifier for the road that the building is connected to. The dropdown menu for selecting the Road Code only displays the codes that are maintained in the Road Network sub-module of the Utility IMIS module.
4. House Number – Unique address code of the building, automatically generated by the system when the user selects the Road Code. For example, if the Road Code is 'R00001' and it is the first building on that road, the House Number will be generated as a combination of the Road Code and building number, such as 'R00001-0001,' where the first part represents the Road Code and the second part represents the building number. The House Number field is editable, allowing city planner to make adjustments if needed.
5. House Locality / Address – Address of the building.
6. Tax Code / Holding ID - Identifier for the building's tax record.
7. Structure Type - Type of the building structure.
8. Surveyed Date - Specific date on which the data collection was completed.
9. Construction Date - The date on which the building was constructed.

10. Number of Floors - Number of floors of the building, it allows only numeric values.
11. Functional Use of Building - The functional use of the building. If the following Functional Use of Building is selected, the Use Category of Buildings field is prompted, with the following categories:

Functional Use of Building	Use Category of Buildings
Residential	Residential, Housing, Apartment, Orphanage, Old-aged Home, Hostel
Mixed (Residential, Commercial, Office uses)	Mixed
Educational	School, College, University, Training Center
Health Institution	Hospital, Clinic
Commercial	Shop, Restaurant, Hotel, Offices(Private), Shopping Mall, Party Palace/ Banquets
Industrial	Industry, Factory, Warehouse, Workshop
Agriculture and Livestock	Cowshed, Agriculture Farm, Animal Shed, Poultry Farm
Public Institution	City hall, Museum, Public Library and archive, Public transportation terminal, Parking, Post office, Community Toilet, Public Toilet
Government Institution	Municipal Office, Ward Office, Government Office, Police Office, Fire Station, Army barrack, Jail
Recreational Institution	Club, Stadium, Cinema/theatre, Sports complex, Fitness center, Recreational center
Social Institution	NGO, INGO, Political Party, Guthi house, Media
Cultural and Religious	Mosque, Church, Temple, Stupa, Hermitage (kuti), Mourning house,

	Bihar/Gumba, Bhajan Mandal, Cultural Centers
Financial Institution	Bank, Cooperative
Vacant/Under Construction	Vacant building, Building under construction

12. Office or Business Name - Name of the business or office in the building, only prompted if the selected Functional Use is not "Residential".
13. Number of Households - The total number of households served by the building.
14. Population of Building - Total number of individuals present within the building.
15. Male Population - Number of males living in a building.
16. Female Population - Number of females living in a building.
17. Other Population - Number of individuals of other gender living in a building.
18. Differently Abled Male Population – Total number of differently abled males living in a building.
19. Differently Abled Female Population – Total number of differently abled females living in a building.
20. Differently Abled Other Population – Total number of differently abled individuals of other genders living in a building.
21. Estimated Area (m2) – Estimated area(m2) based on the size of the building polygon. It is not visible in the Add Building form but it is visible in the view details of the record, and is automatically calculated based on the size of the polygon that is submitted.

### LIC Information

1. Is Low Income House – Indicate whether the household living in the building is a low -income household.
2. Located in LIC – Indicate whether the building is located in a low-income community area. If "Yes" is selected, the LIC Name field will be displayed.

3. LIC Name: Name of the LIC area if building is in LIC area. The dropdown menu for selecting the Road Code only displays the codes that are maintained in the Low Income Community sub-module of the Building IMS module.

## Water Source Information

1. Main Drinking Water Source – Main source of drinking water supply to the building, if the user selects the option "Municipal/Public Water Supply," the water supply customer ID and water supply pipeline code will be displayed.
  - Water Supply Customer ID - Unique identifier for the water supply customer record, if available.
  - Water Supply Pipe Line Code - Code of the water supply pipe line that is connected with the building. The dropdown menu for selecting the Water Supply Pipe Line Code only displays the codes that are maintained in the Water Supply Network sub-module of the Utility IMS module.
2. Well in Premises - Indication whether a well is present on the building premises.
  - If 'Yes' is selected, Distance of Well from Closest Containment (m) field is prompted.
  - Distance of Well from Closest Containment (m) - Distance from the well to the nearest containment, if applicable.

## Solid Waste Management Information

1. SWM Customer ID - Unique identifier for the solid waste management customer record, if available.

## Sanitation System Information

1. Presence of Toilet - Identifies whether the building has a proper space for toilet facilities.
2. If "No" is selected, 'Defecation Place' field is prompted.
  - Defecation Place - Indicates the designated area for an individual's defecation.
  - Open Defecation - Indicates the place for an individual's defecation in an outdoor environment (fields, forests, bushes)
  - Shared Toilet – Indicates the defecation place is used by multiple individuals.

- Community Toilet – Indicates that the household uses a shared toilet that is built for the community
  - If the option ‘Community Toilet’ is selected, the Community Toilet Name field is displayed.
    - i. Community Toilet Name – Name of the community toilet being used by the building’s residents.
3. If “Yes” is selected, following fields are prompted:
- Number of Toilets: Total number of toilets present in the building.
  - Households with Private Toilet - Number of households with private toilets.
  - Population that uses Private Toilets: Total number of individuals that use private toilets.
  - Toilet Connection: Connection of building’s sewage system.

Additional fields are prompted according to the options selected:

- i. Onsite Treatment (eg., Anaerobic Digestor /Biogas, DEWATS)
  - ii. Composting Toilet (eg.; Ecosan, UDDT, etc.)
  - iii. Shared Septic Tank: If the option ‘Shared Septic Tank’ is selected BIN of pre - connected building field is displayed
  - iv. BIN of Pre – Connected Building: The BIN/House number of the pre-registered building that has the containment already connected with it. The dropdown menu only displays the codes that are maintained in the Buildings sub-module of the Building IMS module.
- Sewer Network - When the option ‘Septic Network’ is selected Sewer Code field is displayed.
    - i. Sewer Code: Code of the Sewer line that is connected to the building. The dropdown menu for selecting the Sewer Code only displays the codes that are maintained in the Sewer Network sub-module of the Utility IMIS module.

- “Septic Tank or Pit / Holding tank”- Upon the selection of the septic tank or pit/ holding tank, the form fields differ slightly from those of other sanitation systems due to the inclusion of containment information.
    - i. Building Accessible to Desludging vehicle - Indicates that the building's location can be easily accessed by a desludging vehicle
4. Containment Information (Only shows up when selected Sanitation System is either Septic Tank or Pit/ Holding Tank)
- Containment Type - Type of the containment that is used by the building.
    - i. By selecting either Septic Tank or Pit/ Holding Tank, the containment information is also different according to the type of containment.
    - ii. If the user selects the Sanitation System / Toilet Connection as “Septic Tank”, the tank related fields are displayed:
      - Tank Length (m): Length of the containment.
      - Tank Width (m): Width of the containment.
      - Tank Depth (m): Depth of the containment.
    - iii. Additional field is displayed if the containment is related with the sewer connection. When the option “Septic Tank connected to Sewer Network” is selected “Sewer Code” field is displayed.
      - Sewer Code - Code of the Sewer line that is connected with the building. The dropdown menu for selecting the Sewer Code only displays the codes that are maintained in the Sewer Network sub-module of the Utility IMS module.
    - iv. If “Septic Tank connected to Drain Network” is selected “Drain Code” is displayed.
      - Drain Code - Code of the Drain line that is connected to the building. The dropdown menu for selecting the Drain Code only displays the codes that are maintained in the Drain Network sub-module of the Utility IMS module.

v. If the user selects the Sanitation System / Toilet Connection as “Pit/ Holding Tank” - different form fields are displayed:

- Based on the selection of the “Pit Shape”, corresponding dimensions for Tank Length, Tank Width, Tank Depth and Pit Diameter, Pit Depth fields are displayed:
- If Pit Shape “Cylindrical” is chosen Pit Diameter and Pit Depth is displayed.
  - a. Pit Diameter (m): Diameter of the pit.
  - b. Pit Depth (m): Depth of the pit.
- If Pit Shape “Rectangular” is chosen Tank Length, Tank Width and Tank Depth is displayed.
  - a. Tank Length (m): Length of the containment.
  - b. Tank Width (m): Width of the containment.
  - c. Tank Depth (m): Depth of the containment
- If ‘Lined Pit connected to Sewer Network’ is selected, “Sewer Code” field is displayed.
  - a. Sewer Code - Code of the Sewer line that is connected to the building.
- If “Lined Pit connected to Drain Network” is selected “Drain Code” field is displayed.
  - a. Drain Code - Code of the Drain line connected to the building.
- Drain Network – If “Drain Network” is selected Drain Code field is displayed.
  - i. Drain Code: Code of the Drain Line connected to the building.
- Water Body – Waste from the toilet directly discharged into a water body (river or lake).
- Open Ground - Disposal of waste in an open field.

- Containment Volume (m<sup>3</sup>) - The volume of the containment, automatically generated according to tank length, width, depth or pit diameter, pit depth in cubic meter. The user is allowed to overwrite the auto calculated volume.
- Containment Location - Location of the Containment.
- Septic Tank Standard Compliance – Compliance standard of the Septic tank.
- Containment Construction Date - The date on which the containment was construction.

### Containment Information

Containment Type*	Containment Type
Tank Length (m)	Length
Tank Width (m)	Width
Tank Depth (m)	Depth
Containment Volume (m <sup>3</sup> )*	Containment Volume (m <sup>3</sup> )(Enter Dimensions to auto calculate)
Containment Location	Location
Septic Tank Standard Compliance	Septic Tank Standard Compliance
Containment Construction Date	mm/dd/yyyy
Building Footprint (KML File)*	<input type="button" value="Choose File"/> No file chosen

*Figure 9- 4 Containment Information*

- Building Footprint (KML File): Geospatial coordinates of the building (represented as a polygon) in KML file format. This will be pre-filled if the building is being added from the Building Survey Page as the building footprint has already been collected via mobile application.

### 9.2.3 Add Containment to Building

When the user intends to make changes to the building details (edit), by clicking on *edit* button, user will be given an option to Add Containment to Building.

Containment Information					
<a href="#">Add Containment to Building</a>					
Show <input type="button" value="10"/> entries <input type="text"/> Search					
Containment ID	Containment Type	Containment Volume (m <sup>3</sup> )	Containment Location	Actions	
C000015	Lined Pit connected to Sewer Network	2	Inside the building footprint		

Showing 1 to 1 of 1 entries Previous  Next

- The user will then be allowed to add new containment information to existing buildings.

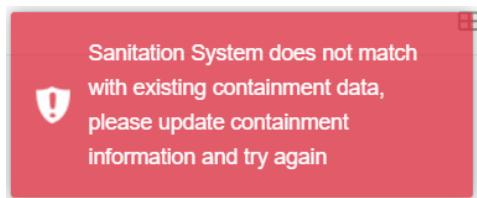
**Containment Information**

Containment Type*	Containment Type
Tank Length (m)	Length
Tank Width (m)	Width
Tank Depth (m)	Depth
Containment Volume (m³)*	Containment Volume (m³)(Enter Dimensions to auto calculate)
Containment Location	Location
Septic Tank Standard Compliance	Septic Tank Standard Compliance
Containment Construction Date	mm/dd/yyyy
Building Footprint (KML File)*	Choose File No file chosen

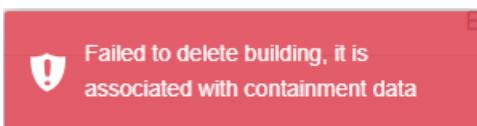
[Back to List](#) [Save](#)

- The form fields of the add containment are the same as the above-explained containment information in the form fields of the add building (refer to section 9.2.2).
- The user can also *edit* the containment information from the building edit page by simply clicking the edit button, which redirects to the edit containment page.
- If the user attempts to modify the sanitation system technology and the system encounters different containment information, the system will not allow the user to change the containment details directly. The user must update the appropriate containment information (delete containment connection, edit containment type), and then modify the sanitation system technology.
- When editing the building data, if a user attempts to delete the connection between the building and the containment, the following conditions must be met:
  - If the containment has application data with an "Emptying Status" of False, the connection to the building cannot be deleted.
  - If the application data is emptied, meaning the "Emptying Status" is True, the connection between the building and the containment can be deleted. In this case:
    - If the containment has a single connection to the building, it will be completely deleted.

- If the containment has multiple connections (for example, a Septic Tank connected to both a Sewer Network and a Drain Network), only the connection to the building will be removed, and the Sewer Code or Drain Code for that containment will be nullified if the containment has outlet connections.
- Additionally, new containment information/ connection can also be carried out as per the requirements. Example: If the user initially has the sanitation system set to Sewer network and needs to add containment information, the user should click the '**Add Containment to Buildings**' button, fill out the required fields, and click '**Save**'. This will dynamically update the Sanitation System and add the containment information. The error message below is displayed if the user attempts to add a different containment to the existing one:



- For the deletion of either building or containment data, If the building has no connection with the containment, user can easily delete the building data, if it has the connection with the containment user must follow the below steps:
  - Step1: To completely remove the building data, first user must remove the connection between the building and containment. This can be accomplished by clicking on the "**Containments Connected to Building**" button. Upon selecting the **details** button, the user will be redirected to the containment details where user can proceed to delete the specific containment associated with the same building.
  - Step 2: If the user attempts to delete building or containment data without removing the connection between the building and containment, the system will notify the user with an error message as:

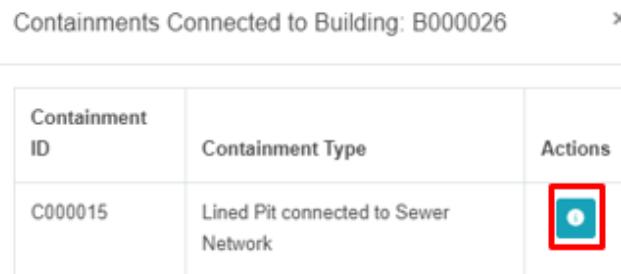


#### 9.2.4 View containments connected to the Building

- Click on the Building button in the Action Column.



- A pop-up with containments connected to the building will be displayed.



The pop-up window has a title bar 'Containments Connected to Building: B000026' and a close button 'x'. It contains a table with three columns: 'Containment ID', 'Containment Type', and 'Actions'. A single row is shown: C000015, Lined Pit connected to Sewer Network, and an information icon (i) which is highlighted with a red box.

Containment ID	Containment Type	Actions
C000015	Lined Pit connected to Sewer Network	

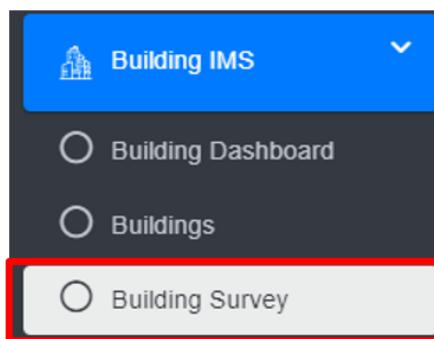
- The user can click on the information icon (i) to view the details of the containment.

### 9.3 Building Survey

The **Building Survey** sub-module is dedicated to maintaining information about field surveys conducted to identify and digitize both pre-existing and new buildings in the municipality via the Building Information Collection mobile application. This application captures the building footprint and stores it in the Building Survey list. Users can add the building footprints stored in this module by approving the building and adding the necessary attribute fields as explained in the Add Building section (refer to section 9.2.2). A separate detailed user manual is also available for the Building Information Collection mobile application.

#### 9.3.1 Navigation to Building Survey

- Open the sidebar and click on the **Building IMS** to expand.
- Select **Building Survey**.



- This redirects to the **Building Survey** page.

- The user can see the list of building survey data collected through the mobile application
- User can add a new building by clicking on the *Approve* button in the action column (refer to section 9.3.2).
- The user can preview the location of the Building (refer to section 9.3.3), download the building's KML File (refer to section 9.3.4), delete the building record (refer section 6.3), and filter the data.

Building Surveys			
<input type="button" value="Show Filter"/>			
Show <input type="button" value="10"/> entries			
House Number	Tax Code	Survey Date	Action
B000040	B000040	2024-05-23	   
B014874	B014874	2024-05-23	   
B000020	B000020	2024-05-23	   
B014267	B014267	2024-05-23	   
B002224	B002224	2024-05-23	   

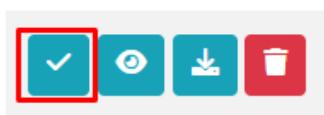
Showing 1 to 5 of 5 entries Previous  Next

Figure 9- 5 Building survey lists

Refer to **Building Containment Information Collection Mobile App User Manual** for detailed instructions for the building footprint survey/ collection process.

### 9.3.2 Add New Building

- Click on Add New Building Action Column.



- The Add New Building form is displayed, and the fields are similar to Add Building (refer to section 9.2.2), however, the Building Footprint (KML File) and the Surveyed Date are pre-filled (refer to below Overview section)
- The following marked fields are pre-filled through the mobile application and then the detail information on the building

# Approve Building Structure

Preview Building Footprint 

Surveyed Date

Building Footprint (KML File)\*

Figure 9- 6 Approve Building

### 9.3.3 Preview Building Location

- Click on the *Eye* button in the Action Column



- A Popup window as KML Viewer will appear that shows the location of a building under survey.

#### Overview:

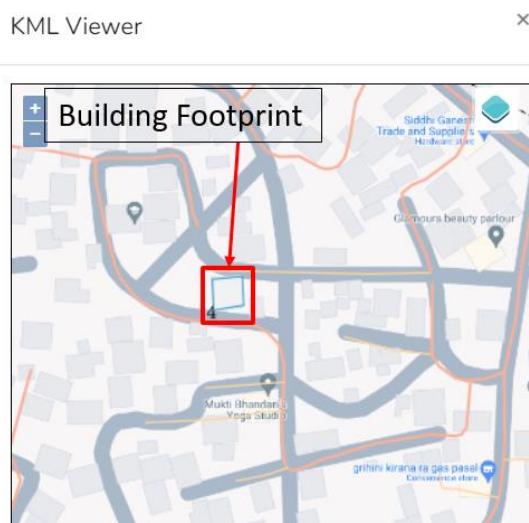
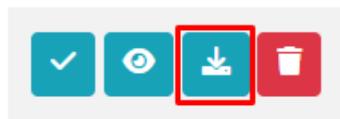


Figure 9- 7 Preview building location (KML viewer)

### 9.3.4 Download Building KML File

- Click on the **Download** button in the Action Column



#### Overview

- A KML file is downloaded, and the user can check and verify the downloaded KML footprint is valid via Google Earth/QGIS.



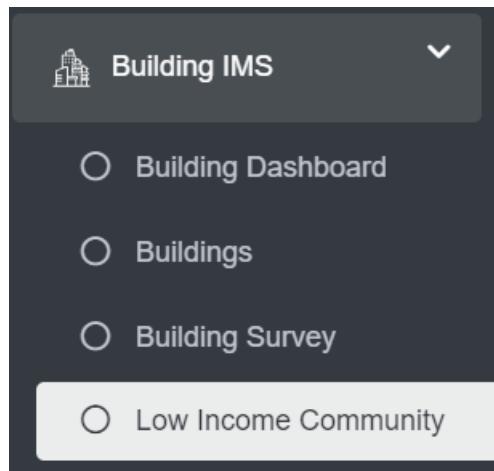
Figure 9- 8 Validating KML file in Google Earth

## 9.4 Low Income Community

The Low-Income Community sub-module is dedicated to maintaining information regarding the low-income communities in the city, along with the area they cover. This module enables the system to maintain individual buildings that are in LIC area along with their attribute information

### 9.4.1 Navigation to Low Income Community

- Open the sidebar and click on the **Building IMS** to expand.
- Select **Low Income Community**.



### Overview:

The Low Income Community Page lists all the attribute records of Low Income Communities stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements.

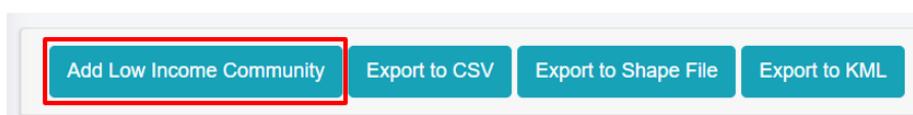
For more details on Action buttons, review Section 6.

Low Income Community					
<a href="#">Add Low Income Community</a> <a href="#">Export to CSV</a> <a href="#">Export to Shape File</a> <a href="#">Export to KML</a> <a href="#">Show Filter</a>					
Show <input type="text" value="10"/> entries					
ID	Community Name	No. of Buildings	Population	Actions	
1	Community 1	40	208		
2	Community 2	15	180		

Figure 9- 9 : List of Low Income Community

### 9.4.2 Add Low Income Community

- Click on '**Add Low Income Community**' button.



- User will be led to the following form:

## Add Low Income Community

Community Name*	<input type="text"/>
No. of Buildings*	<input type="text"/>
Population*	<input type="text"/>
No. of Households*	<input type="text"/>
Male Population	<input type="text"/>
Female Population	<input type="text"/>
Other Population	<input type="text"/>
No. of Septic Tanks	<input type="text"/>
No. Holding Tanks	<input type="text"/>
No. of Pits	<input type="text"/>
No. of Sewer Connections	<input type="text"/>
No. of Community Toilets	<input type="text"/>
Area*	

Figure 9- 10: Add Low Income Community

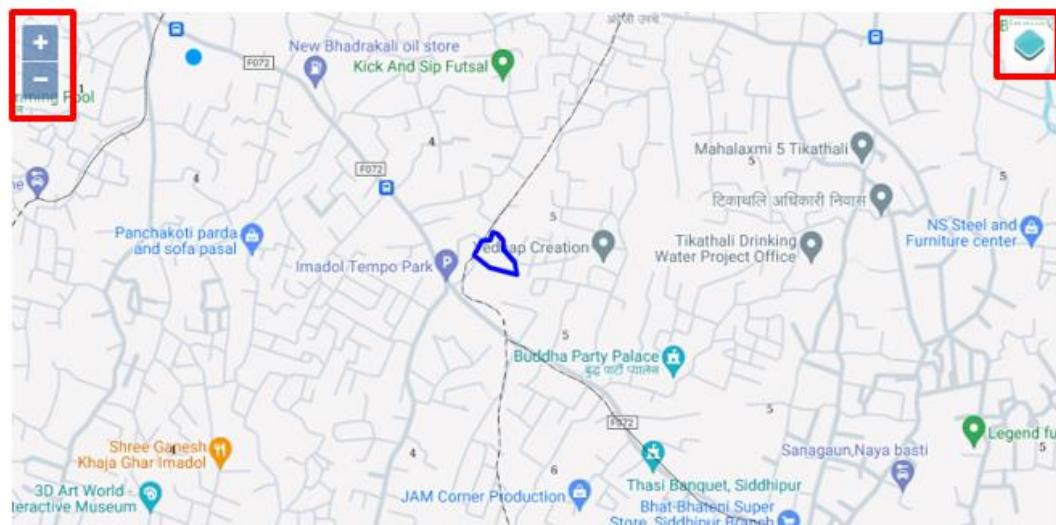
- After filling out the form, click **Save**, and make sure a green pop-up message is displayed, refer to Section 7.1 for more details.
- If a mandatory field is left out a red error message will be displayed, refer to Section 7.2 for more details.

### Overview:

The **Add Low-Income Community** page consists of information that is explained below:

- Community Name: Name of the community.
- No. of Buildings: Total number of buildings in the community.
- Population: Total number of people in the community.

- No. of Households: Total number of occupied households within the community.
- Male Population: Total number of males living in the building.
- Female Population: Total number of females living in the building.
- Other Population: Total number of individuals of other genders living in the building.
- No. of Septic Tanks: Total number of septic tanks used by the buildings within the community.
- No. of Holding Tanks: Total number of Holding Tanks in the community.
- No. of Sewer Connections: Total number of connections to the municipal sewer system within the community.
- No. of Community Toilets: Total number of communal toilet facilities available in the community.
- Area: Choose the location where the low-income community is located and draw the corresponding area on the map.
  - The top left corner displays the zoom-in and out button.
  - The top right corner tab displays the Layers and Base maps.



Note: All fields from Number of Buildings to Number of Community Toilets, only takes numeric values.

## **10. FECAL SLUDGE INFORMATION MANAGEMENT SYSTEM (FSIMS)**

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The FSIMS is another core and most important module CWIS. This module enables municipality to digitalize and manage all data related to sanitation systems and services. FSIMS digitalize the complete sanitation service chain from application request for emptying service to the safe disposal of faecal sludge at the treatment plant and the reuse of the treated waste.

The FSIMS is another core and most important module CWIS. This module enables municipality to digitalize and manage all data related to sanitation systems and services. FSIMS digitalize the complete sanitation service chain from application request for emptying service to the safe disposal of faecal sludge at the treatment plant and the reuse of the treated waste.

The FSIMS is further categorized into five sub-modules:

- i. **FSM Dashboard (FSMD):** The FSMD provides information related FSM services, overall, from containment emptying to transfer and disposal of waste in the FSTP. FSMD provides information about the number of containments; service providers; resources used for service delivery; applications received and responded; containments emptying status, volume of sludge collected, emptied and disposed; and the revenue generated,
- ii. **Containment Information Management System (CIMS):** The CIMS maintains the information about the containments in the city, with their location information and attribute information such as building identification number (in case of multiple building served one containment, BIN of main building responsible for taking care of the containment), sanitation system type, dimensions, volume, last emptying date, next emptying date, etc. If a building is connected to a sewer network, that information is maintained in the building database. However, this module does not include a separate feature for adding new containments, if new containment must be added, it has to be updated in corresponding building in building database, through BIMS. A containment may be shared by multiple buildings or vice versa.
- iii. **Service Provider Information Management System (SPIMS):** The SPIMS maintains the information related to the sanitation service providers registered with the city that provide emptying services within the city. This information is maintained by municipal authority whereas, two other functionalities employee information and desludging vehicles for service provider to maintain their information about their employees and the desludging vehicles. Only those service providers, employees and vehicles registered in this system are eligible to provide emptying, transporting and disposing faecal sludge in the FSTP or area designated by the municipality. This information helps municipality and service providers for efficient management of the resources and efficient service delivery. The information provided by SPIMS also helps monitoring KPIs set by municipality for service providers and tracking emptying vehicles to ensure that the waste emptied from the containment is transported and disposed in the area designated for disposing waste or FSTP allocated by the municipality.

- iv. Treatment Plant Information Management System (TPIMS): The TPIMS maintains the information related to the treatment plants that could be FSTP, Centralized Wastewater Treatment Plant, Decentralized Wastewater Treatment Plant or Co-treatment Plant, those used by the city to dispose and treat collected faecal sludge or wastewater. In addition to this, this sub-module also maintains water sample test data with the standard parameters used for monitoring the performance of the treatment plants in the city.

The information maintained by TPIMS along the information maintained by BIMS and the ESIMS, helps municipal to monitor the CWIS indicators such as (i) FS treatment capacity as a % of total FS generated from non-sewered connections, (ii) FS treatment capacity as a % of volume disposed at the treatment plant, (iii) WW treatment capacity as a % of total WW generated from sewer connections and greywater and supernatant generated from non-sewered connections, and (iv) Effectiveness of FS treatment in meeting prescribed standards for effluent discharge.

- v. Emptying Service Information Management System (ESIMS): The Emptying Service IMS digitalizes the sanitation service chain and enables the city to manage the entire sanitation service chain, starting from application requests for emptying service from the customer to the safe disposal of faecal sludge at the treatment plant. All the activities involved in this process can be monitored in real-time through ESIMS. The module is divided into four categories according to the different stages of the sanitation service chain i.e. application, emptying, sludge collection and feedback. The complete service chain is managed and maintained through the application section; however, the individual sections maintain further detailed information. There are several functional modules under this sub-module:

- Application – this functional module is accessible to helpdesk and FSTP operator. The helpdesk uses it for receiving and maintaining application for customer's emptying request and collecting and maintain feedback data. FSTP operators use it for updating sludge transferred from the emptied containment and disposed in the FSTP. There is a function to generate reports of emptying service under this functional module. Helpdesks generally are the part of the municipality's sanitation department, emptier are part of the service providers and FSTP operators can be part of the municipality or the private operator as of municipality's policy.
- Emptying – there is an easy-to-use native mobile application (android) that allows collection of the emptying information while providing the emptying service, such that the information can be updated in real-time. The mobile application is used by emptier to collect the information such as emptying start and end time, number of trips, total cost for emptying, and the payment receipt number. Emptying details can be viewed in real-time by the help desk and other municipal staff who have access to this module.
- Sludge collection – FSTP operator in FSTP updates the FS disposal record that includes date, time and volume of waste disposed in the FSTP through the functional module Application through the web app as the waste is transferred and

disposed in FSTP. Help desk can view these records in real-time through this functional module.

- Feedback – this functional module is accessible to the helpdesk, after completing sanitation service chain from emptying to disposal of the waste in the FSTP.
- Help desks – this functional module is used to create help desk and update their information. Help desks generally are under municipality itself, but the system has the capability of managing multiple help desks.

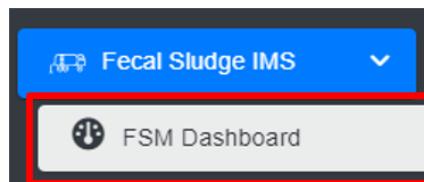
Data maintained by FSIMS along with the building data and LIC data enables CWIS Information Management System to generate CWIS indicators such as (i) IHHL onsite sanitation system that have been desludged, (ii) Collected FS disposed at the treatment plant or designated disposal site, (iii) Low income onsite sanitation systems that have been desludged, (iv) FS collected from LIC that is disposed at treatment plant or designated area, (v) Educational institutions where FS generated is safely transported to TP or safely disposed in situ, (vi) Healthcare facilities where FS generated is safely transported to TP or safely disposed in situ, and (vii) Desludging services completed mechanically or semi-mechanically.

The data export tools under FSIMS allow users to export data in CSV, Shape and KML format where applicable.

## 10.1 FSM Dashboard

### 10.1.1 Navigation to FSM Dashboard

- Open the sidebar and click on **Fecal Sludge IMS** to expand.
- Select the **FSM Dashboard**.



#### Overview:

- The FSM Dashboard provides a quick synopsis of the information maintained in this module. The bar charts and pie charts graphically represent various information related to the FSM sub-module.
- The user can interact with the chart's tools (refer to section 6.8).

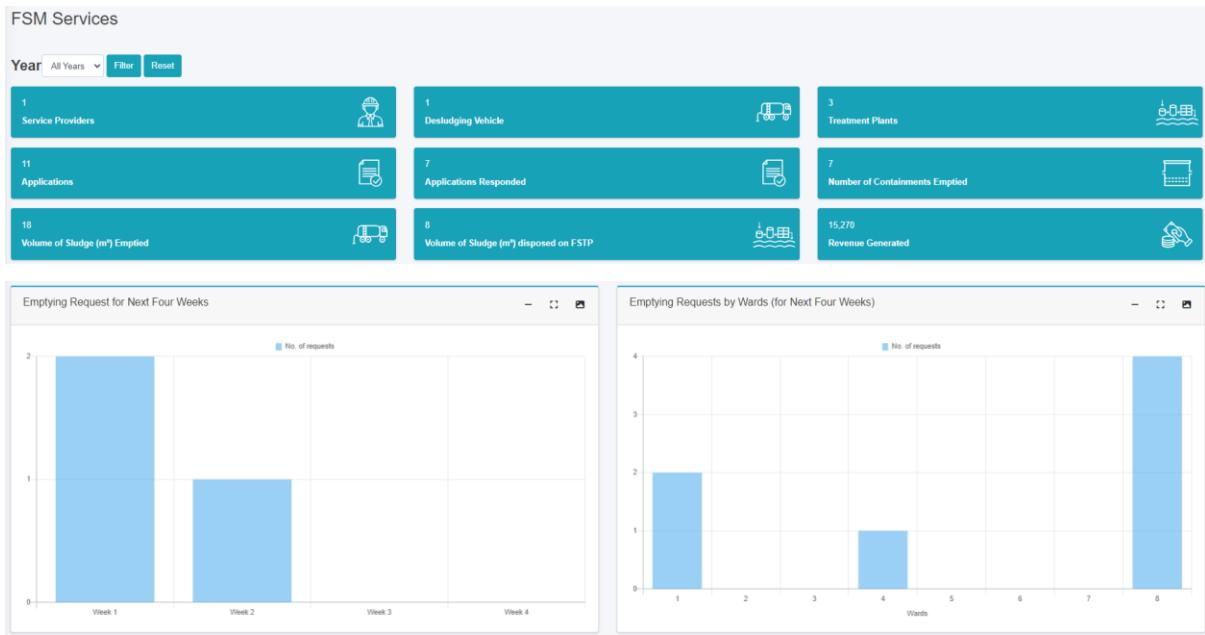


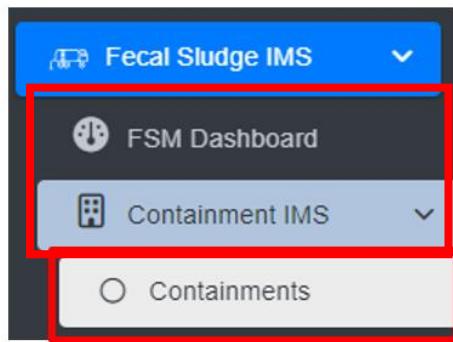
Figure 10- 1 FSM Dashboard

## 10.2 Containment IMS

The **Containment IMS** module stores information on containments, buildings connected to them, service history, and other associated data.

### 10.2.1 Navigation to Containments

- Open the sidebar and click on *Fecal Sludge IMS* to expand.
- Click on *Containment IMS* and select *Containments*.



#### Overview:

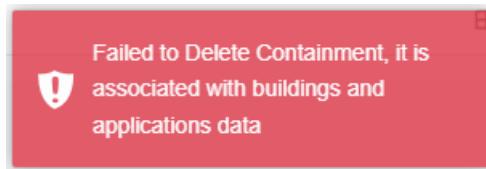
The Containments Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on Action buttons, review Section 6.

Containments					
<a href="#">Export to CSV</a> <a href="#">Export to Shape File</a> <a href="#">Export to KML</a> <a href="#">Show Filter</a>					
Containment ID	Containment Type	Containment Volume (m³)	Containment Location	Actions	
C000017	Lined Pit connected to Drain Network	3	Inside the building footprint		
C000015	Lined Pit connected to Sewer Network	2	Inside the building footprint		
C000013	Lined Pit connected to Drain Network	4	Inside the building footprint		
C000012	Septic Tank connected to Sewer Network	3	Outside the building footprint		
C000011	Septic Tank with Unknown Outlet Connection	1	Outside the building footprint		
C000010	Septic Tank with Unknown Outlet Connection	5	Inside the building footprint		
C000009	Septic Tank connected to Sewer Network	2	Outside the building footprint		
C000008	Permeable/ Unlined Pit/Holding Tank	1	Inside the building footprint		
C000007	Lined Pit connected to Drain Network	1	Inside the building footprint		
C000006	Septic Tank connected to Soak Pit	3	Outside the building footprint		

Figure 10- 2 List of Containment

#### Note:

- If the user attempts to delete the containment data, the system will notify the user with an error message as:



- If the user wants to delete the containment data, the user must first remove the connection between the containment and the building then delete the containment accordingly.

#### 10.2.2 View Building Connected to Containment

- Click on the **View Building Connected to Containment** which redirects to the building connected to the containment page.
- The Building Connected to Containment page will display the building information like BIN, Tax Code/ Holding ID, Structure Type, Estimated Area of the Building, and Functional Use of Building.

Building Connected to Containment: C000017					
<a href="#">Back to List</a>					
BIN	Tax Code/Holding ID	Structure Type	Estimated Area of the Building (m²)	Functional Use of Building	Actions
B000025	TR4500/41	CGI Sheet	32.11	Commercial	

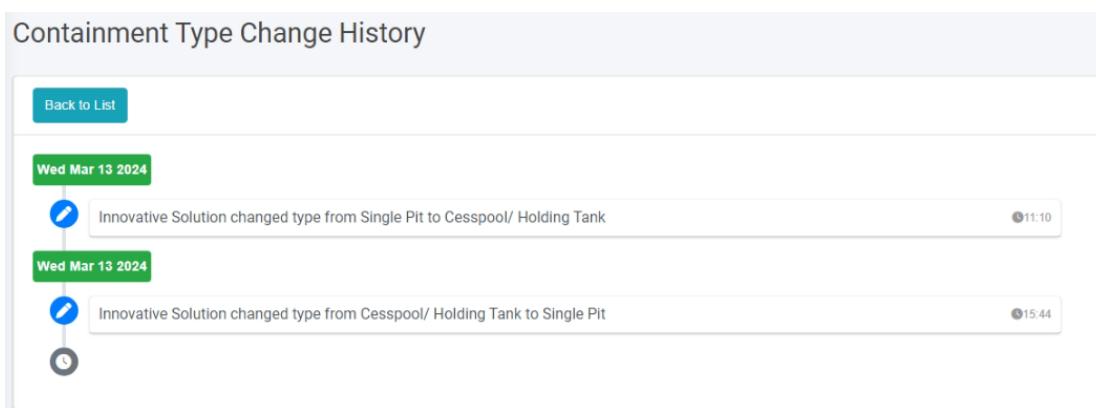
Figure 10- 3 List of Buildings Connected to Containment

## Overview:

- By clicking the delete button, the user can disconnect the building from the connected containment but the containment information will remain.

### 10.2.3 Type Change History

- Click on the **Type Change History**  button in the Action column.
- This will redirect to the **Type Change History** page. This page contains detailed information on the changes that have been made to the Containment Type.



The screenshot shows a web-based application interface titled "Containment Type Change History". At the top left is a "Back to List" button. Below it, there are two log entries, each with a timestamp, a user icon, a description of the change, and a timestamp for when the change was recorded.

Date	User	Action	Timestamp
Wed Mar 13 2024	Innovative Solution	changed type from Single Pit to Cesspool/ Holding Tank	11:10
Wed Mar 13 2024	Innovative Solution	changed type from Cesspool/ Holding Tank to Single Pit	15:44

Figure 10- 4 Record of Type Change History

## Overview:

- Users can view the changes made to the containment type of the record, the values that were edited, and the date when it was edited.
- Click on **Back to List** to go back.

### 10.2.4 Emptying Service History

- Click on the **Emptying Service History**  in the Action button to view the containment emptied history.

Emptying						
Actions		Emptying Details				
ID	Application ID	Sludge Volume (m³)	Emptied Date	Total Cost	Service Provider	Actions
666	669	1	Friday, April 23rd 2021	3500.00	Clean Desludging Pvt. Ltd	

Figure 10- 5 List of Emptying

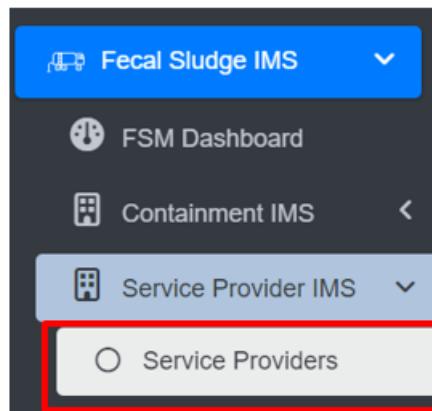
## 10.3 Service Provider IMS

The **Service Provider IMS** module maintains the information about the service providers, employee information, and desludging vehicles.

### 10.3.1 Service Providers

#### a) Navigate to Service Providers

- Open the sidebar and click on **Fecal Sludge IMS** to expand.
- Now, click on **Service Provider IMS** and select **Service Providers**.



#### Overview:

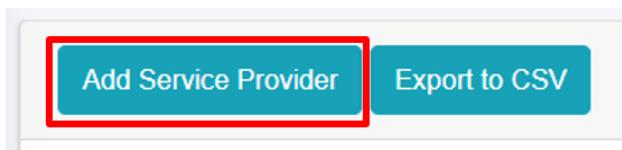
- The Service Providers Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on the Action buttons review section 6.

Service Providers							
Actions		Service Providers					
Company Name	Email	Ward Number	Address	Contact Person Name	Customer Feedback	Status	Actions
Sams Cleaning Service Pvt. Ltd.	sams@gmail.com	8	Imadole	Dewan Mahato	★★★★★	Operational	  
One Emptying Services Pvt. Ltd.	one_empty@gmail.com	4		Kabindra Shrestha	★★★★★	Operational	  
Manish Emptying Service	mani@gmail.com	3	dolakha	Ritesh shah		Not operational	  
Dhiren Services Pvt.Ltd	dhiren@gmail.com	3	Sanepa	Pritam Dev	★★★	Operational	  
Clean Desludging Pvt. Ltd	clean@gmail.com	2	Siddhipur	Hari Maharjan	★★★★★	Operational	  

Figure 10- 6 list of Service Providers

### b) Add Service Provider

- Click on the **Add Service Provider** button.



- This redirects to the **Add Service Provider** form page:

Add Service Provider

Company Name*	<input type="text" value="Company Name"/>
Email*	<input type="text" value="Email"/>
Ward Number*	<input type="text" value="Ward Number"/>
Address*	<input type="text" value="Address"/>
Contact Person Name*	<input type="text" value="Contact Person Name"/>
Contact Person Gender*	<input type="text" value="Contact Person Gender"/>
Contact Person Number*	<input type="text" value="Contact Person Number"/>
Status*	<input type="text" value="Status"/>
Create User?	<input checked="" type="checkbox"/>
Password	<input type="text" value="Password"/>
Confirm Password	<input type="text" value="Confirm Password"/>

Figure 10- 7 Add new Service Provider

- After filling out the form click *Save*, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

## Overview:

The **Add Service Provider** page consists of information that are explained below:

- Company Name –Name of the Service Provider Company.
- Email – Email address of the service provider.
- Ward Number – The ward number where the service provider is located in.
- Location – Location of the service provider.
- Contact Person Name – Name of the company head/ proprietor/ contact person of the service provider.

- Contact Person Gender – Gender of the contact person.
- Contact Person Number – Contact number of the contact person/ service provider office.
- Status - Indicating the operational status of the service provider active or inactive. If the status is set as 'Inactive', then the service provider is disabled.
- Create User - If the user chooses to create a new user for the service provider (with Service Provider Admin role), then the user needs to check the Create User option and fill in the "Password" & "Confirm Password" fields, which will allow the user to log in. However, if a user doesn't select the "Create User" option, the password fields won't be visible, and the service provider user will not be created.

**Create User?**



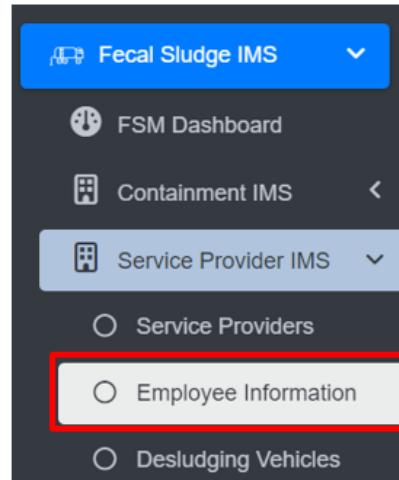
- Password: Password for the new service provider.
- Confirm Password: Confirm the password for the new service provider.

### 10.3.2 Employee Information

The Employee Information module maintains information related to the employees of the service providers.

#### a) Employee Information Navigation

- Open the sidebar and click on **Fecal Sludge IMS** to expand.
- Now, click on **Service Provider IMS** and select **Employee Information**.



### Overview:

The Employee Information Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on the Action buttons refer to Section 6).

Employee Information						
		Add Employee Information	Export to CSV	Show Filter		
Show 10 entries						
Employee ID	Employee Name	Designation	Address	Monthly Remuneration	Status	Actions
1	Basudev Sahani	Driver	Siddhipur	24000	Active	
2	Ishika Dahal	Cleaner/Emptier	Imadol	12000	Active	
3	Krishna Mali	Cleaner/Emptier	Lubhu	15000	Active	
4	Sameer Pun	Driver	Tokha	26000	Active	
5	Reshami Thakuri	Cleaner/Emptier	Swoyambhu	15000	Active	
6	Anand Jha	Cleaner/Emptier	Itahari	15000	Active	
7	Priyesh Singh	Driver	Lalitpur	26000	Active	

Figure 10- 8 List of Employee Information

### b) Add Employee Information

- Click on the '**Add Employee Information**' button.



Add Employee Information

Service Provider Name	<input type="text"/>
Employee Name*	<input type="text"/>
Employee Gender*	<input type="text"/>
Employee Contact Number*	<input type="text"/>
Date of Birth	<input type="text"/>
Address	<input type="text"/>
Designation*	<input type="text"/>
Working Experience (Years)	<input type="text"/>
Monthly Remuneration	<input type="text"/>
Training Received	<input type="text"/>
Job Start Date*	<input type="text"/>
Status*	<input type="text"/>

Figure 10- 9 Add Employee Information

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

## Overview:

The add employee information form fields are explained below:

- Service Provider Name: Name of the service provider selected from list of pre-registered service providers. The dropdown menu for selecting the Service Provider name displays the names that are maintained in the Service Providers sub-module of the Service Provider IMS module. If the Service Provider's Status is Non-operational in the Service Provider IMS module, they won't be included in the list.
- Employee Name: Name of the employee.
- Employee Gender: Gender of the employee.
- Employee Contact Number: Contact Number of the employee.
- Date of Birth: Date of birth of the employee.

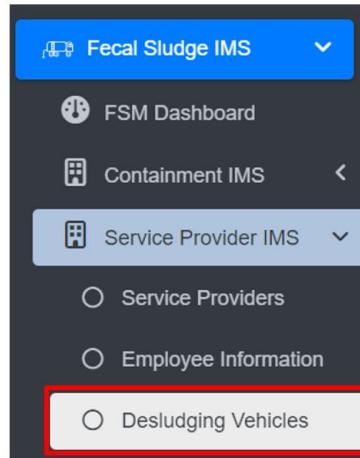
- Address: Address of the employee.
- Designation: Designation of employee.
- Working Experience (Years): Number of years of working experience of the employees.
- Monthly Remuneration: Monthly wage of the employee.
- Training Received: Any trainings the employee has completed.
- Job Start Date: Start date of the employee's employment.
- Status: Indicates the operational status of the employee, active or inactive. If the status is set as 'Inactive', then the employee's account is disabled.
- Job End Date: End date of the employee's employment. (The Job End Date field is displayed if the status is inactive.)

### **10.3.3 Desludging Vehicles**

A desludging vehicles sub-module maintains information related to a desludging vehicle also known as a sludge removal truck or a vacuum truck. It also maintains related information such as removing sludge and other waste materials from various sources.

#### **a) Navigation to Desludging Vehicles**

- Open the sidebar and click on **Fecal Sludge IMS** to expand.
- Now, click on **Service Provider IMS** and Select **Desludging Vehicles**.



### Overview:

The Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on the Action buttons please review section 6.

Service Provider	Vehicle License Plate Number	Capacity (m³)	Width (m)	Status	Actions
Shyam Desludging Services Pvt.Ltd	BA 444-003-8974	33000	8	Operational	

Figure 9- 10 List of Desludging Vehicles

### b) Add Desludging Vehicle

- Click on **Add Desludging Vehicle** button.



Add Desludging Vehicle

Service Provider\*

Vehicle License Plate Number\*

Capacity (m<sup>3</sup>)\*

Width (m)\*

Comply with Maintenance Standards\*

Status\*

Description

Service Provider

Vehicle License Plate Number

Capacity (m<sup>3</sup>)

Width (m)

Comply with Maintenance Standards

Status

Description

Back to List

Save

*Figure 10- 11 Add Desludging Vehicle*

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

## Overview:

The **Add Desludging Vehicle** page consists of information that are explained below:

- Service Provider - Name of the service provider selected from the list of pre-registered service providers. The dropdown menu for selecting the Service Provider name displays all the Operational Service Providers that are in the sub-module of the Service Provider IMS module. If the Service Provider's status is Non- Operational they won't be included in the list.
- Vehicle License Plate Number - The license plate number of the desludging vehicle.
- Capacity (m<sup>3</sup>) - The capacity of the desludging vehicle in cubic meters.
- Width (m) - The width of the desludging vehicle in meters.

- Comply with Maintenance Standards: Ensuring that the vehicles are regularly inspected, serviced, and repaired as needed to maintain their operational efficiency, safety, and compliance with regulatory requirements.
- Status - Indicating the operational status of the Desludging Vehicles. If the status is set as non-operational, then the desludging vehicles is disabled.
- Description- A description of the desludging vehicle.

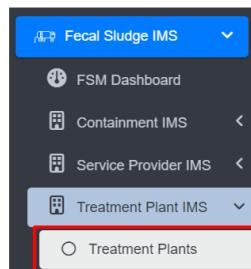
## 10.4 Treatment Plant IMS

### 10.4.1 Treatment Plants

**Treatment Plants** sub-module of Fecal Sludge IMS maintains information of different treatment plants that either treats wastewater collected and conveyed by sewer network or fecal sludge which are emptied and transported from containments mechanically.

#### a) *Navigation to Treatment Plants*

- Open the sidebar and click on **Fecal Sludge IMS** to expand.
- Now, click on **Treatment Plant IMS** and select **Treatment Plants**.



Treatment Plants						
<a href="#">Add Treatment Plant</a>		<a href="#">Export to CSV</a>		<a href="#">Export to Shape File</a>		<a href="#">Export to KML</a>
Name	Treatment Plant Type	Capacity Per Day (m³)	Caretaker Name	Caretaker Number	Status	Actions
Municipality WWTP	Centralized WWTP	30.00	Ganga Limbu	980100002	Operational	
Municipality FSTP	FSTP	20.00	Dinesh Dhungana	980100001	Operational	
Lubhu FSTP	Co-Treatment Plant	3.00	Anju Rai	9841526320	Operational	

Figure 10- 12 List of Treatment Plant

For more details on the Action buttons, review Section 6.

### b) Add Treatment Plant

- Click on ‘Add Treatment Plant’ button.

[Add Treatment Plant](#)    [Export to CSV](#)    [Export to Shape File](#)    [Export to KML](#)

**Add Treatment Plant**

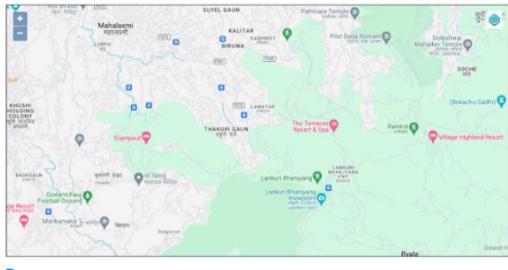
Name*	<input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/>
Location*	<input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/>
Capacity per Day (m³)*	<input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/>
Treatment Plant Type*	<input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/>
Caretaker Name*	<input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/>
Caretaker Gender	<input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/>
Caretaker Number*	<input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/>
Status*	<input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/>
Click to set Latitude and Longitude*	
	
<input checked="" type="checkbox"/> Create User? <input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/> Email* <input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/> Password <input style="width: 100%; height: 25px; border: 1px solid #ccc; padding: 5px;" type="text"/> Confirm Password	

Figure 10- 13 Add Treatment Plant

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

## Overview:

The add new treatment plants page consists of different form fields that capture different information which are explained below:

- Name- Name of the treatment plant.
- Location- Location of the treatment plant where it is situated.
- Capacity per Day (m<sup>3</sup>)- Total capacity per day of the treatment plant to treat sludge.
- Treatment Plant Type- The type of the treatment plant designed to treat either wastewater or fecal sludge.
  - FSTP – Fecal sludge treatment plant.
  - Centralized WWTP- Centralized waste water treatment plant.
  - Decentralized WWTP – Decentralized waste water treatment plant.
  - Co- Treatment Plant - Treatment plants where wastewater and fecal sludge are treated together by the sanitation expert.
- Caretaker Name- Name of the caretaker of the treatment plant.
- Caretaker Gender – Gender of the Caretaker.
- Caretaker Number- Contact number of the Caretaker (It takes numeric values only).
- Status- Status of the treatment plant that is operational or non-operational.
- Click to set Latitude and Longitude - Find the treatment plant location on the map and pin a marker on the map by clicking on that location. This will mark the spatial location of the treatment plant in the map with latitude and longitude.

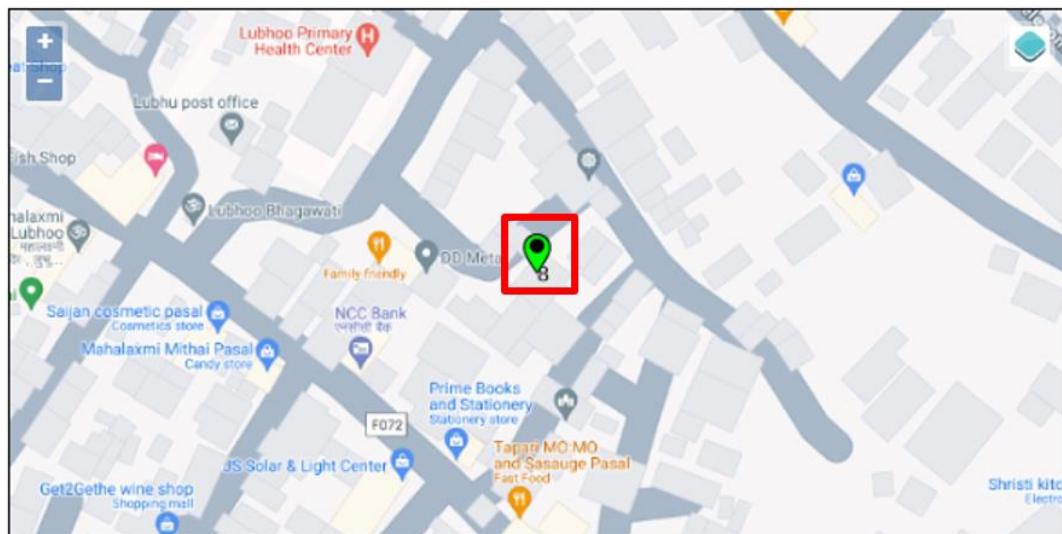


Figure 10- 14 Pinned Location of new treatment plant

- **Create user?** - If the user chooses to create a new user for the Treatment plant (with Treatment Plant Admin role), then the user needs to check the Create User option and fill in the "Password" & "Confirm Password" fields, which will allow the user to log in.

The image shows a user interface for creating a new user. At the top left is the text 'Create User?'. To its right is a checked checkbox. Below this are three input fields: 'Email\*' (with a red asterisk), 'Password', and 'Confirm Password' (both also with red asterisks). All fields are contained within a rectangular box with a red border.

*Figure 10 - 15 Create new user*

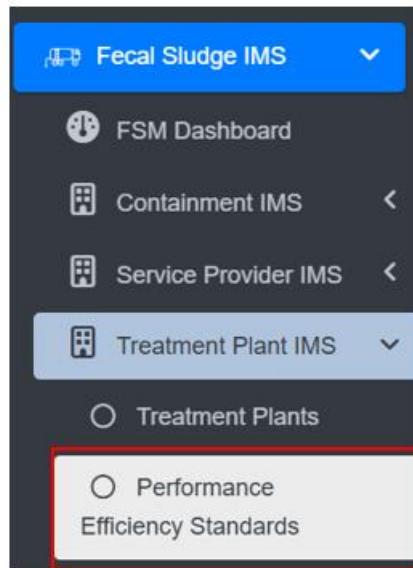
- Email- Email of the user to log into the system.
- Password- Password of the user to log into the system (The must contain one uppercase and one lowercase and must contain at least one symbol)
- Confirm Password: Enter the exact entered password again.

## 10.5 Performance Efficiency Standards

The Performance Efficiency Standards Sub-module basically set the parameters of standards for the module that is Performance Efficiency Test at the start when interacted with the web-application.

### 10.5.1 Navigation to Performance Efficiency Standards

- Open the sidebar and click on **Fecal Sludge IMS** to expand.
- Now, click on **Treatment Plant IMS** and select **Performance Efficiency Standards**.



## Overview:

This page displays the overall information maintained by the sub-module. The user can view the general information maintained by the sub-module and carry out different processes as required.

- The user can Edit the Performance Efficiency Standard, click on the *Edit* button

### Performance Efficiency Standards

TSS Standard (mg/l)	60
ECOLI Standard (CFU/100 mL)	1000
pH Minimum	0
pH Maximum	14
BOD Standard (mg/l)	50

**Save**

Figure 10- 16 Edit Performance Efficiency Standard Page

- After Editing is completed click **Save**, and make sure a green pop-up message is displayed. Refer to Section [7.1](#) for more details.

The fields that are displayed while editing the form are mentioned below:

- TSS Standard (mg/l) - Total suspended solids (TSS) Standard Value (mg/l).
- ECOLI Standard (CFU/100 mL) - ECOLI Standard (CFU/100 mL).
- PH Minimum - Minimum PH value.
- PH Maximum - Maximum PH value.
- BOD Standard (mg/l) - Biochemical oxygen demand (BOD) standard (mg/l).

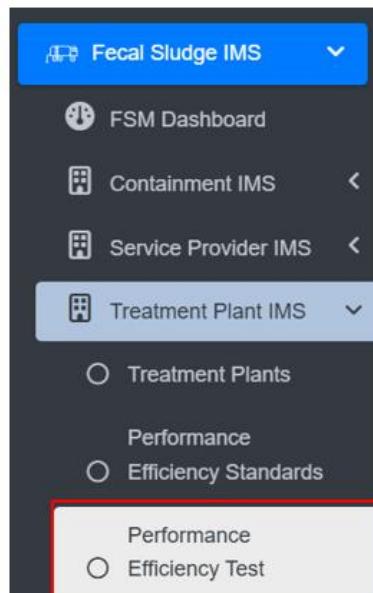
**Note:**

- The Above mentioned fields only takes the numeric values.

### 10.5.2 Performance Efficiency Test

**Performance Efficiency Test** sub-module involves a comprehensive evaluation of the treatment plant's operational effectiveness on removal of pollutants either from wastewater or fecal sludge.

- Open the sidebar and click on the '*Fecal Sludge IMS*'.
- Now, click on '**Treatment Plant IMS**' and select '*Performance Efficiency Test*'.



#### Overview:

- The user can see the lists of the performance efficiency test conducted on wastewater or fecal sludge treatment plants. For more details on the Action buttons refer to Section 6.

Performance Efficiency Test										
Actions		Performance Efficiency Test Data								
Treatment Plant	Sample Date	Temperature °C	pH	COD (mg/l)	BOD (mg/l)	TSS (mg/l)	Ecoli	Sample Location	Remark	Actions
Municipality WWTP	2024-09-08	12	13	14.5	56	45.11	56	Influent		
Municipality WWTP	2024-09-08	12	13	14.5	56	45.11	56	Influent		
Municipality FSTP	2024-09-14	24	6	56.778	78.98	98.65	112	Influent		
Municipality FSTP	2024-09-12	11	12	12	12	12	12	Influent		

Figure 10 - 17 List of Performance Efficiency Test

### a) Add Performance Efficiency Test

- Click on ‘Add Performance Efficiency Test’ button.

Add Performance Efficiency Test

Treatment Plant*	Treatment Plant
Date*	Choose Date
Temperature °C*	Temperature in °C
pH *	pH
COD (mg/l)*	COD (mg/l)
BOD (mg/l)*	BOD (mg/l)
Sample Location*	Sample Location
TSS (mg/l)*	TSS (mg/l)
Ecoli*	Ecoli
Remark	Remark

Figure 10- 18 Add performance Efficiency Test

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.

- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

### **Overview:**

The fields of the performance efficiency test form are explained below:

- Treatment Plant- Name of the treatment plant for which the test has been carried out.
- Date- The date on which the test is conducted (The date must be before or equal to the current date).
- Temperature °C- Temperature of the wastewater sample at the time of testing (It takes numeric values only).
- pH- The pH value of the sample. It reveals the acidity or basicity of the wastewater sample, expressed on a scale ranging from 0 (highly acidic) to 14 (highly basic), it takes numeric values only ranging between 0-14.
- COD (mg/l)- The Chemical Oxygen Demand (COD) value of the sample. Chemical oxygen demand indicates the amount of oxygen required to break down organic matter in the wastewater (It takes numeric values only).
- BOD (mg/l)- The Biochemical Oxygen Demand (BOD) value of the sample. Biochemical oxygen demand indicates the amount of oxygen consumed by microorganisms as they decompose organic matter in the wastewater (It takes numeric values only).
- Sample Location- Identifies the specific site within the wastewater treatment plant where the sample was collected.
- TSS (mg/l)- The Total Suspended Solids (TSS) value of the sample. Total Suspended Solids indicates the amount of solid material suspended in the wastewater sample (It takes numeric values only).
- Ecoli- Number of Ecoli present in the sample (It takes numeric values only).
- Remark- Additional notes or observations about the performance efficiency test.

## **10.6 Emptying Service IMS**

**Emptying Service IMS** includes the sub-modules which allows the management and monitoring of the sanitation value chain. This sub-module includes Applications, Emptying, Sludge Collection, Feedback, and Help Desk, which are the primary components of the sanitation value chain.

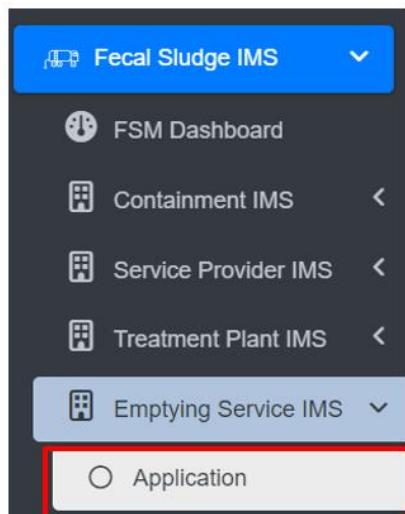
## 10.6.1 Application

The **Application** sub-module is responsible for managing information related to submitted Emptying Service Applications. It stores data of applications received through the help desk that require emptying, and applications that have already been serviced. The Applications page serves as a central hub for all service delivery processes, as it contains all components of the service delivery chain.

On the Applications page, user can access the status of an application through four different Status: Application, Emptying Status, Sludge Collection Status and Feedback Status. By clicking on the corresponding button next to the check mark, user can view the emptying information or sludge collection or feedback related to a particular application. They also can edit the emptying details, sludge collection details and feedback details at certain stages of the application process.

### a) Navigation to Application

- Open the sidebar and click on **Fecal Sludge IMS** to expand.
- Now, click on the **Emptying Service IMS** and select **Application**.



- On the application page, the data such as Employee information, Desludging vehicle, and Emptying Service IMS are only visible according to the assignment of the service provider and its disposal place, where service provider1 can only view the details related to the service provider1. For more details on the Action button, please refer to Section 6 and Section 10.2.4 (For Emptying Service Detail button).

Application

ID	BIN	House Number	Application Date	Proposed Emptying Date	Street Code	Emptying Status	Sludge Collection Status	Feedback Status	Owner Name	Ward Number	Contact	Service Provider Name	Actions
11	B000026	R000006-2	Thursday, September 19th 2024	Friday, September 27th 2024	R000006	✓	✖	✗	Person Name2	4	12345678	Shyam Desludging Services Pvt.Ltd	
10	B000025	R001563-01	Wednesday, September 18th 2024	Friday, October 25th 2024	R001563	✓	✖	✓	Person Name1	5	12345678	Shyam Desludging Services Pvt.Ltd	
9	B000027	R001770-01	Wednesday, September 18th 2024	Sunday, September 22nd 2024	R001770	✗	✖	✗	Person Name3	1	987654321	Shyam Desludging Services Pvt.Ltd	
8	B000011	R000004-01	Sunday, September 15th 2024	Tuesday, September 17th 2024	R000004	✓	✖	✓	Krishna Thapa	8	9841522220	Shyam Desludging Services Pvt.Ltd	

Figure 10- 19 List of Application

### b) Generate Report

Generate Report tool produces the report in a PDF format monthly. Here the reports consist of different information such as: Operator name from where the containments are emptied, number of containments that is cleaned, total volume of sludge collected, number of applications who received the service and the total cost that is incurred during the sludge collection process. It also consists of ward wise cumulative data that of selected month displaying the ward no, containments emptied, application received, sludge collection and total cost.

- Click on ‘**Generate Report**’.
- Select the month and year field from dropdown.
- Click on ‘**Export to PDF**’ button to get the data based on the desired selections.

Application

Add Application Export to CSV **Generate Report**

Month: January Year: Select a year Export to PDF

Figure 10- 20 Generate Report

## Overview:

- User can download a report in PDF format, as shown below:



### **MUNICIPALITY MONTHLY APPLICATION REPORT**

Month: January

Year: 2023

#### **Operator Name: Clean Desludging Pvt. Ltd**

Nos. Applications Received	146
Nos. Containments Emptied	133
Nos. Safe Disposals	133
Sludge Collected (m³)	170
Total Revenue	465,500

#### **Operator Name: One Emptying Services Pvt. Ltd.**

Nos. Applications Received	3
Nos. Containments Emptied	3
Nos. Safe Disposals	3
Sludge Collected (m³)	18
Total Revenue	22,500

#### **Operator Name: Sams Cleaning Service Pvt. Ltd**

Nos. Applications Received	30
Nos. Containments Emptied	25
Nos. Safe Disposals	25
Sludge Collected (m³)	80
Total Revenue	125,000

#### **Cumulative Data for 2023 upto January**

Nos. Applications Received	179
Nos. Containments Emptied	161
Nos. Safe Disposals	161
Sludge Collected (m³)	268
Total Revenue	613,000

#### **Ward Wise Cumulative Data upto January**

Ward No	Nos. Applications Received	Nos. Containments Emptied	Nos. Safe Disposals	Sludge Collected (m³)	Total Revenue
1	14	13	13	18	47,000
4	27	23	23	49	92,000
5	37	35	35	70	140,000

Figure 10- 21 Overview of Generated Report

### c) Add Application

- Click on the ‘Add Application’ button.

The screenshot shows a multi-step form titled 'Add Application'. It consists of five sections: 'Address', 'Owner Details', 'Applicant Details', 'Application Details', and 'Household Details'. Each section contains several input fields with dropdown menus for selecting values. Mandatory fields are marked with an asterisk (\*).

Address	
Street Name / Street Code*	Street Name / Street Code
House Number / BIN*	House Number / BIN
Ward Number	Ward Number

Owner Details	
Owner Name	Owner Name
Owner Gender	Owner Gender
Owner Contact (Phone)	Owner Contact (Phone)

Applicant Details	
Applicant Name*	Applicant Name
Applicant Gender*	Applicant Gender
Applicant Contact Number*	Applicant Contact Number

Application Details	
Proposed Emptying Date*	Proposed Emptying Date
Service Provider Name*	Service Provider Name
Emergency Desludging*	Emergency Desludging

Household Details	
Number of Households	Number of Households
Population of Building	Population of Building
Number of Toilets	Number of Toilets

Figure 10- 22 Add Application Form

- After filling out the form click *Save*, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

## **Overview:**

The form fields of the application are explained below and the user must fill all the required fields.

- Street Name: Identifier for the road the building is connected to. The unique identifier of the building where the septic tank is located. The dropdown menu only displays the codes that are maintained in the Road Network sub-module of the Utility IMS module.
- House Number/BIN: The unique identifier of the building where the septic tank is located. The dropdown menu only displays the codes that are maintained in the Buildings sub-module of the Building IMS module.
- Ward Number: Identifier for the local administrative unit the building/ containment is located.
- Owner Name: Name of the owner of the building where emptying service is required.
- Owner Gender: The gender of the owner
- Owner Contact (Phone): The contact number of the owner, it takes numeric values only.
- If the applicant is the same as the house owner, select **Same as Owner “Checkbox”** which will auto-fill the owner's details as the application details as well, indicating that the applicant is the house owner.
- Applicant Name: The name of the applicant who lodged the application for the emptying service, can be the same as owner.
- Applicant Gender: The gender of the applicant
- Applicant Contact Number: The contact number of the applicant, takes numeric values only.
- Proposed Emptying Date: The date when the septic tank is proposed to be emptied, only a future date is allowed to be selected.
- Service Provider Name: Identifier for the service provider assigned to provide the emptying service

- Emergency Desludging: Indicating whether the desludging has a high priority.
- Number of Households: The total number of households served; it takes numeric values only.
- Population of Building: The number of populations served; it takes numeric values only.
- Number of Toilets: The number of toilets, takes numeric values only.

#### *d) Actions*

The action buttons of emptying details, feedback details, and sludge collection details allow user to edit details at various application processing stages.

Once the emptying service form is filled, the “edit application” button is disabled. Similarly, after filling the sludge collection form, the “edit emptying details” button is disabled. Once all three forms (emptying, sludge collection and feedback details) have been filled completely, all the edit buttons will be disabled, indicating that the service has been provided successfully.

##### i. Add Emptying Service Details

- Click on the ‘**Add Emptying Service Details**’ button.



- This redirects to the **Add Emptying Service Details** page.

##### Overview:

- Emptying Information is collected from the mobile app which is updated in the web application in the application sub-module. This information can also be collected through the web application interface as well, but the use of the mobile application is recommended.
- Refer to the **Emptying Information Collection Mobile App User Manual** for collecting the emptying information.
- At first, only the emptying service details form is enabled, leaving the other two form that is sludge collection status and feedback status disabled. When the user fill in the first form (Emptying details) and submit it, only then the second-page sludge collection status page is enabled and the for the third form page, when the user fill the second form it will be enabled.

- The Edit form/ view details page is prompted only after emptying details are filled and the edit button is disabled after all forms that are emptying service details, sludge collection details, and feedback forms have been filled.

**Add Emptying**

Date	2021-10-01
Service Receiver Name*	Service Receiver Name
Service Receiver Gender*	Service Receiver Gender
Service Receiver Contact Number*	Service Receiver Contact Number
Reason for Emptying*	
Containment Construction Year	2021
Sludge Volume (m³)*	Sludge Volume (m³)
Distance to Closest Well (m)	Distance to Closest Well (m)
Desludging Vehicle Number Plate*	Desludging Vehicle Number Plate
Disposal Place*	Disposal Place
Driver Name*	Driver Name
Emptier 1 Name*	Emptier 1 Name
Emptier 2 Name	Emptier 2 Name
Start time*	--:-- -- <input type="button" value="⌚"/>
End time*	--:-- -- <input type="button" value="⌚"/>
No. of trips*	No. of trips
Receipt number*	Receipt number
Total cost*	Total cost
House Image*	Choose file <input type="button" value="Browse"/>
Receipt Image*	Choose file <input type="button" value="Browse"/>
Comments (if any)	

Figure 10- 23 Add Emptying Service Details Form

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 **for** more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

## **Overview:**

The emptying service details can be obtained from mobile as well as from the web. The form fields from the web are explained below:

- Date: The date is auto-filled.
- Service Receiver Name: Name of the person present at the time of emptying.
- Service Receiver Gender: Gender of the person present at the time of emptying.
- Service Receiver Contact Number: Contact Number of the person present at the time of emptying (This field only allows the numeric values).
- Reason for Emptying: The reason for emptying the containment.
- Containment Construction Year: The year the containment was constructed; this field is auto-filled.
- Sludge Volume(m3): The volume of sludge (m3) that has been emptied from the containment.
- Distance to Closest Well(m): Distance between the containment and the closest well.
- Desludging Vehicle Number Plate: The number plate of the desludging vehicle used for emptying. The dropdown menu for selecting the Vehicle Number Plate only displays number plates from the Desludging Vehicles sub-module of the Service Provider IMS module, and only if the vehicle's status is 'Operational.'
- Disposal Place: Name of the Treatment Plant where collected sludge will be disposed.
- Driver Name: Name of the desludging vehicle operator of the assigned service provider.
- Emptier 1 Name: Name of the cleaner/emptier employee.
- Emptier 2 Name: Name of the cleaner/emptier employee
- Start time: The start time of the emptying process.
- End Time: The end time of the emptying process (The End time must be after the Start time)

- No of Trips: The Number of trips required for the emptying process (This field only allows the numeric values).
- Receipt number: Receipt number that is generated after the emptying process is completed (This field only allows numeric values).
- Total Cost: The total cost of the emptying process (This field only allows numeric values).
- House Image: Image of the building from where the sludge was emptied.
- Receipt Image: Image of the receipt generated after the emptying process.
- Comments (if any): Comments from operation, if any.
- For House and Receipt Image: The user can select the image to fill the field (The image size should be less than 2 MB).

## ii. Add Sludge Collection Details

- Click on the '***Sludge Collection Details***' button.



- This redirects to the **Add Sludge Collection** page.
- The Sludge Collection button is only enabled after the emptying details is filled. The edit button is disabled after all three forms have been filled.

## Add Sludge Collection

The screenshot shows a web-based form titled "Add Sludge Collection". The form is contained within a red-bordered box. Inside the box, there are five mandatory fields, each marked with a red asterisk (\*).

- Treatment Plant\***: A dropdown menu showing "Municipality FSTP".
- Application ID\***: An input field containing "6275".
- Sludge Volume (m³)\***: An input field containing "2".
- Date\***: An input field labeled "Date (yyyy-mm-dd)" which is currently empty.
- Entry Time\***: An input field showing "--:-- --".
- Exit Time\***: An input field showing "--:-- --".

Figure 10- 24 Add Sludge Collection Details Form

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

### Overview:

The Sludge Collection details form fields are explained below:

- Treatment plant: Name of the treatment plant where the sludge is disposed and it is auto-filled. The value selected in emptying details: The disposal place field is pre-filled here.
- Application ID: A unique identifier for the application submitted by the customer.
- Sludge Volume (m³): Volume of sludge (m³) disposed.
- Date: Date of the sludge disposal (Selected date cannot be before the present date).
- Entry Time: Entry time of a vehicle to FSTP from the sludge collection.
- Exit Time: Exit time of a vehicle to FSTP from the sludge collection site (The exit time should be after the Entry Time).

## Add Sludge Collection

The screenshot shows a user interface for adding sludge collection details. At the top, the title 'Add Sludge Collection' is displayed. Below it, there are three input fields enclosed in a red rectangular border:

- Treatment Plant\***: A dropdown menu showing 'Lubhu FSTP'.
- Application Id\***: A text input field containing '6150'.
- Sludge Volume (m³)\***: A text input field containing '3'.

*Figure 10- 25 Edit Sludge Collection Details*

- The user cannot make any changes on the first three fields that is: Treatment Plant, Application Id and Sludge Volume. These values are pre-filled from the Emptying Details form.

### iii. Add Feedback Details

- Click on the '**Feedback details**' button.



- This redirects to the **Feedback Details** page.
- The feedback button is only enabled after filling the emptying service details. The view feedback is only enabled after the feedback details form are completely filled and the edit button is disabled after all the three forms have been filled.

Feedback Details

Application ID	6147
Applicant Name*	Pratap Shah
Applicant Gender*	M
Applicant Contact Number*	9849103727
Are you satisfied with the Service Quality?*	<input type="radio"/> Yes <input type="radio"/> No
Did the sanitation workers wear PPE during desludging?*	<input type="radio"/> Yes <input type="radio"/> No
Comments	

Figure 10- 26 Add Feedback Details Form

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

#### Overview:

The feedback form contains different fields which are explained below:

- Application ID: A unique identifier for the application submitted by the customer.
- Applicant Name: The name of the customer who submitted the feedback.
- Applicant Gender: The gender of the customer who submitted the feedback.

- Applicant Contact Number: The phone number of the customer who submitted the feedback.
- Are you satisfied with the Service Quality?: Indication of whether the customer is satisfied with the Service Quality.
- Did the sanitation workers wear PPE during desludging?: Indication of whether the service provider is wearing Personal Protective Equipment (PPE).
- Comments: Place for the customer to share their thoughts, opinions, or feedback on the service.

#### iv. Generate Report

Generate report button is activated once the emptying form is filled. Generated report button can be access in the Action Column of the Application page. Clicking on the Generate report button generates a PDF report reflecting the current status of the application p to the point it has reached.

- Click on the '***Generate Report***' button.



- This redirects to the **Report** page.

#### Overview:

The user can view the detailed report that has been generated for the selected application.

- After clicking the Generate Report, user is able to download the pdf report for each application.

## MUNICIPALITY APPLICATION REPORT

Application ID: 6135

Application Date: 2023-12-09

### **Building Details**



House Number	B002111
Structure Type	RCC framed
Ward	1
Floor Count	2
Owner/Applicant Name	Ramesh Rai
Owner/Applicant Contact	9865454348

### **Containment Details**



Containment ID	C001494
Containment Type	Septic Tank Connected to Soak Pit
Containment Location	Inside the building footprint

### **Emptying Details**



Service Provider	Clean Desludging Pvt. Ltd
Total Volume Sludge Volume (m <sup>3</sup> )	2
Emptied Date	2023-12-11
Emptied Time	15:11:00
Name of Driver	Basudev Sahani
Total Cost	3,500
Disposal Treatment Plant	Municipality FSTP

### **Sludge Collection Details**



Disposal Place	Municipality FSTP
Disposal Date	2023-12-01
Disposal Time	03:06 PM-05:06 PM

*Figure 10- 27 Report generated of a particular application*

- The top most part of the pdf contains the applicant's property details. This includes key details such as the house number, structure type, ward, floor count as well as the owner/ applicant name and contact information.
- The middle section contains the containment and emptying details. The containment details encompass the containment id, type and location. The emptying details include the service provider, total volume of sludge, emptied date, driver' name, total cost and the disposal treatment plant information.

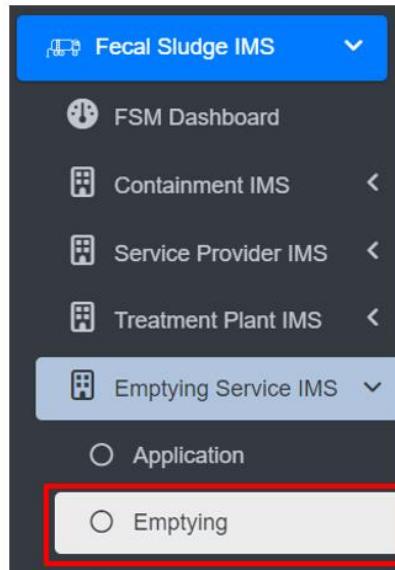
- The bottom section contains the specifics concerning the sludge collection. It includes disposal place, date and time.

## 10.6.2 Emptying

The **Emptying** sub-module maintains the information about the emptying history of the containments. It contains information regarding the emptying of the containment.

### a) Navigation to Emptying

- Open the sidebar and click on '**Fecal Sludge IMS**' to expand.
- Now, click on the '**Emptying Service IMS**' and select '**Emptying**'.



- This redirects to the **Emptying** page.

#### Overview:

- User can see the list of emptied containments after clicking the emptying.
- The Emptying page is to view and export the data that is updated through the application page.

Emptying						
<a href="#">Export to CSV</a> <span style="float: right;"><a href="#">Show Filter</a></span>						
ID	Application ID	Sludge Volume (m³)	Emptied Date	Total Cost	Service Provider Name	Actions
3	7	2	Wednesday, September 18th 2024	1050.00	Shyam Desludging Services Pvt.Ltd	<a href="#"></a> <a href="#"></a>
2	8	3	Wednesday, September 18th 2024	1850.00	Shyam Desludging Services Pvt.Ltd	<a href="#"></a> <a href="#"></a>
1	10	3	Wednesday, September 18th 2024	1500.00	Shyam Desludging Services Pvt.Ltd	<a href="#"></a> <a href="#"></a>

Figure 10- 28 List of Emptied Containments

- To add the **emptying service status**, navigate to the **Application** page and click on the **Emptying Service Details** button (refer to section 10.6.1d) i).
- View the detailed information on the Emptying (refer to section 6.5).

Check the history of the record (refer to section 6.2).

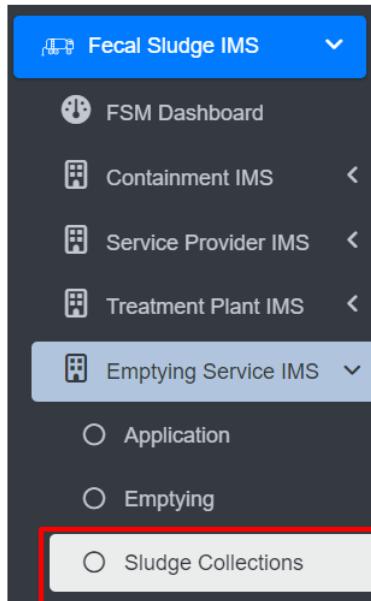
Export data (refer to chapter 0) and filter data (refer to chapter 5).

### 10.6.3 Sludge Collections

The **Sludge Collection** sub-module maintains the information related to the sludge collection at the treatment plant.

#### a) Navigation to Sludge Collection

- Open the sidebar and click on '**Fecal Sludge IMS**' to expand.
- Now, click on the '**Emptying Service IMS**' and select **Sludge Collections**.



- This redirects to the **Sludge Collections** page.

### Overview:

- User can view the lists of sludge collected from the treatment plant.
- The Sludge Collections page is to view and export the data that is updated through the application page.

Sludge Collections							
<a href="#">Export to CSV</a> <span style="float: right;"><a href="#">Show Filter</a></span>							
Show 10 entries <div style="float: right;"> <a href="#">Show More</a> </div>							
Application ID	Date	Treatment Plant Name	Service Provider Name	Desludging Vehicle Number Plate	Sludge Volume (m³)	Actions	
10	2024-09-18	Municipality FSTP	Shyam Desludging Services Pvt.Ltd	BA 444-003-8974	3	<a href="#"></a> <a href="#"></a>	
8	2024-10-11	Municipality WWTP	Shyam Desludging Services Pvt.Ltd	BA 444-003-8974	3	<a href="#"></a> <a href="#"></a>	
7	2024-09-27	Lubhu FSTP	Shyam Desludging Services Pvt.Ltd	BA 444-003-8974	2	<a href="#"></a> <a href="#"></a>	

Figure 10- 29 List of Sludge Collection

- To add the **Sludge Collection Status**, navigate to the **Application** page and click on the **Sludge Collection Details** button (refer to section 10.6.1d) ii).
- View the detailed information of the Sludge Collection (refer to section 6.5).

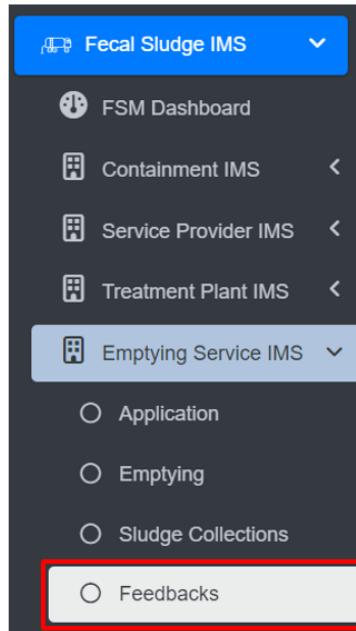
Check the history of the record (refer to section 6.2).

Export data (refer to chapter 0) and filter data (refer to chapter 5).

### 10.6.4 Feedbacks

The Feedback History sub-module maintains the information regarding a list of feedback collected.

- Open the sidebar and click on '**Fecal Sludge IMS**' to expand.
- Now, click on the **Emptying Service IMS** and select **Feedbacks**.



- To add the **Feedback**, navigate to the **Application** page and click on the **Feedback Details** button (refer to section 10.6.1d iii).
- View the detailed information of the Feedback (refer to section 6.5).
- Check the history of the record (refer to section 6.2).
- Export data (refer to Chapter 0) and filter data (refer to Chapter 5).

### Overview:

- User can view the lists of Feedback which is collected from the applicants.
- The Feedback page is to view and export the data that is updated through the application page.

Feedbacks			
<a href="#">Export to CSV</a> <span style="float: right;"><a href="#">Show Filter</a></span>			
<input type="button" value="Show 10 + entries"/>			
Application ID	Ward	Feedback Date	Actions
10	5	2024-09-18 15:49:00	
8	8	2024-09-18 16:03:34	
7	2	2024-09-18 16:05:16	

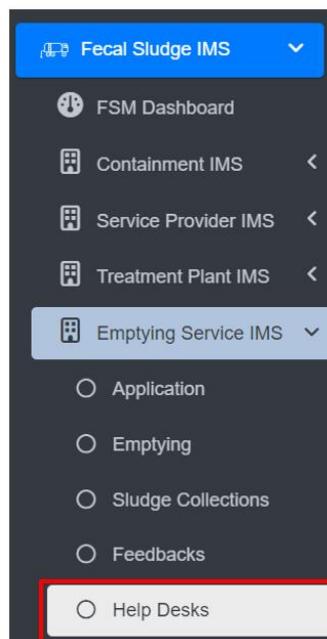
Figure 10- 30 List of Feedback

## 10.6.5 Help Desks

The **Help Desks** sub-module maintains information related to the help desk established within the city.

### a) Navigation to Help Desks

- Open the sidebar and click on the '**Fecal Sludge IMS**'.
- Now, click on the '**Emptying Service IMS**' and select **Help Desks**.



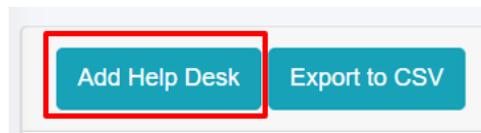
- This redirects to the **Help Desks** page. For more details on the Actions button refer to Section 6.

ID	Name	Contact Number	Service Provider	Actions
1	Municipality Help Desk	9841528963		

Figure 10- 31 List of Help Desk

## b) Add Help Desk

- Click on the ‘**Add Help Desks**’ button.



- This redirects to the **Add Help Desk** form page.

The form contains the following fields:

- Help Desk Name\***: A text input field.
- Description\***: A text area for additional information.
- Contact Number\***: A text input field.
- Email Address\***: A text input field.
- Create User?**: A checkbox.

Figure 10- 32 Add new Help Desk

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

### Overview:

The form fields of the help desks are explained below:

- **Help Desk Name**: Name of the help desk.
- **Description**: Additional information about the help desk
- **Contact Number**: Contact number of the help desk (It takes numeric values only).
- **Email Address**: Email address of the help desk

- If the "Create User" option is chosen, it is essential to fill in both the "**Password**" and "**Confirm Password**" fields, and then the access credentials will be created as well. However, for existing user who do not select the "Create User" option, the password-related fields will not be shown.

The screenshot shows a user creation interface. At the top left is a label "Create User?" followed by a checked checkbox. Below this are two input fields: "Password" and "Confirm Password". A red rectangular box highlights the "Create User?" section and the two input fields below it.

Create User?	<input checked="" type="checkbox"/>
Password	Password
Confirm Password	Confirm Password

- When the user selects “Create user”, a new help desk user will be created with the corresponding credentials.

## **11. SEWER CONNECTION INFORMATION SUPPORT SYSTEM (SCIMS)**

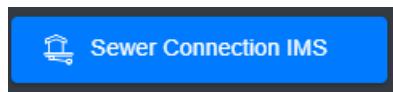
---

The SCIMS is a core module that enables the city to maintain information on new sewer connections established between a building and sewer network within the city. This module provides a native mobile application (android) that allows the collection of the unique ID of both the building and the corresponding sewer network through a field survey. The collected building ID as well as sewer ID are maintained by this module, and once approved it is reflected in the BIMS, which updates the sanitation system and utility information of the building.

### **11.1 Sewer Connection IMS**

#### **11.1.1 Navigation to Sewer Connection IMS**

- Open the sidebar and select ‘**Sewer Connection IMS**’.



#### **Overview:**

- The user can see the list of sewer connection data which is collected through mobile application.
- User can approve sewer connection by clicking on the *Approve* button in the action column (refer to section 11.1.2).
- Preview the location of the building (refer to section 11.1.3).
- Delete the record if necessary (refer to section 6.3).
- Filter the data (refer to section 5).

A screenshot of a web-based application interface titled "Sewer Connection". At the top, there is a header bar with a "Hide Filter" button. Below the header is a table with the following data:

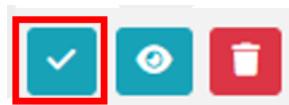
Sewer Connection		
Show 10 entries		
BIN	Sewer Code	Actions
B000010	S000010	
B000011	S000085	

*Figure 11-1 Sewer Connection Lists*

The Building Code (BIN) and Sewer Code are collected via mobile application; after submitting the sewer data from the mobile app, the data is then sent to the web which is displayed in the Sewer Connection module.

### 11.1.2 Approve Sewer Connection

- Click on the *Approve* button in the Action Column.



- Once you click the 'Yes' button in the confirmation dialog box, the existing sanitation of the building will be updated as a sewer network. If there is a corresponding containment connection, it will be removed. Click 'No' if you do not want to delete the record.

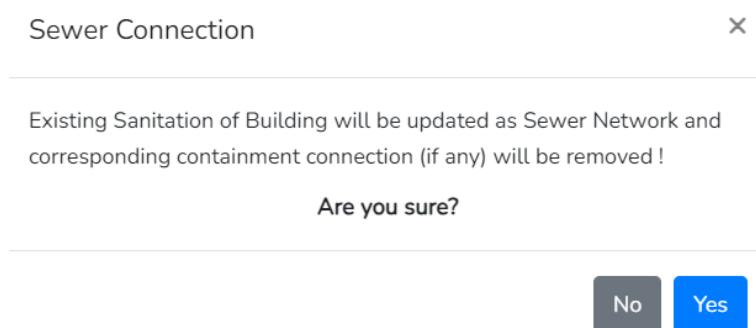


Figure 11- 2 Confirmation box for approving the sewer connection request

### 11.1.3 Preview Sewer Connected to Building Location

- To view the location of the building connected to the sewer click the **eye** button.



#### Overview:

## Sewer Connection

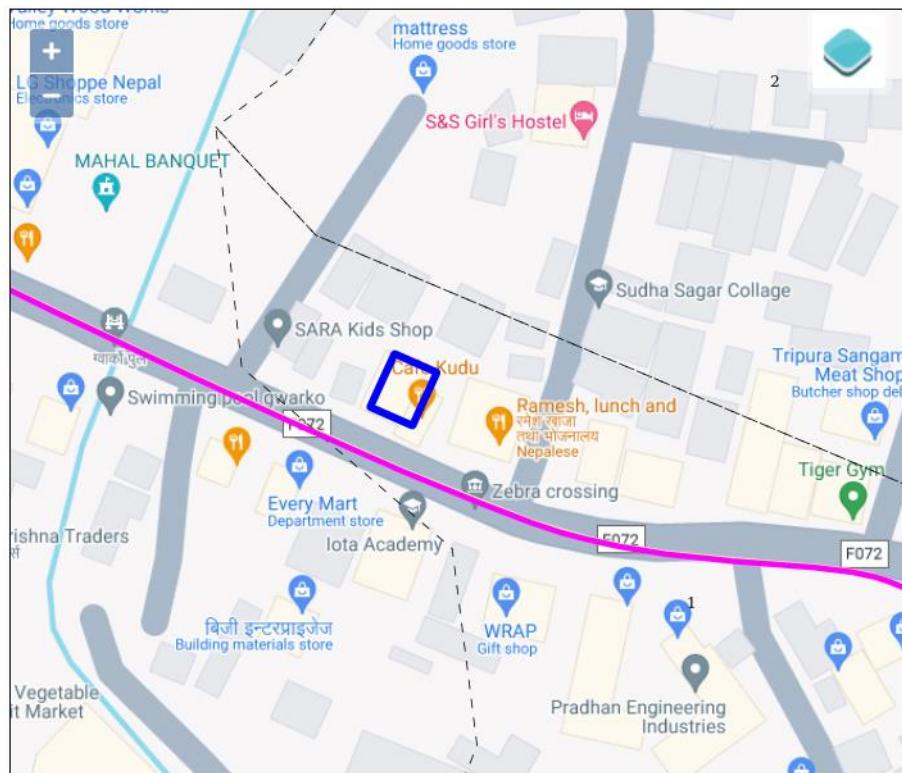


Figure 11- 3 Preview building location (KML viewer)

## **12. PT/CT IMS**

---

PHISS is another core module of the IMIS, designed to empower municipalities in monitoring and addressing public health and sanitation challenges. PHISS enables the collection and maintenance of water sample data from various sources, including groundwater, surface water, and treated wastewater, to ensure compliance with water contamination standards. This functionality directly aligns with the CWIS objective of monitoring environmental outcomes associated with sanitation systems. Additionally, PHISS records and tracks cases of waterborne diseases across the city, providing municipalities with crucial data to understand and mitigate public health risks.

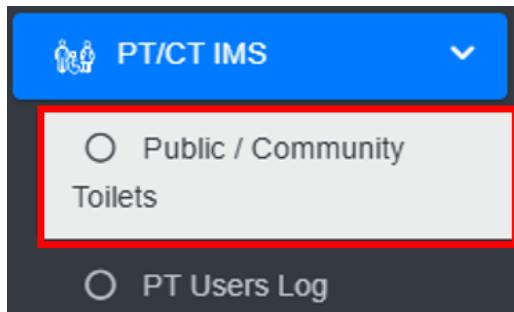
One of the standout features of PHISS is its ability to maintain spatial and attribute data related to hotspot areas where waterborne diseases, such as diarrhea, cholera, dysentery, and typhoid, have been detected. The system also tracks fatalities linked to these diseases, offering a comprehensive overview of the impact on affected households and populations. By integrating this information with the UDSS municipal authorities can conduct detailed analyses of disease prevalence and its underlying causes. This data-driven approach enables strategic planning, targeted interventions, and efficient allocation of resources to reduce health risks in vulnerable areas.

Water sample data and waterborne cases data maintained by PHISS helps municipality to monitor the CWIS indicators (i) Water contamination compliance of the water sources such as groundwater, surface water and treated wastewater, and (ii) Incidence of faecal-oral pathway diseases (e.g. diarrhea, cholera, dysentery and typhoid). With this information, municipalities can assess the effectiveness of sanitation systems in protecting public health and identify areas requiring urgent attention. By addressing these indicators, PHISS supports municipalities in achieving CWIS objectives, ensuring safe water quality and reducing the prevalence of sanitation-related diseases. The data export tools under PHISS allow users to export data in CSV, Shape and KML format where applicable.

### **12.1 Public / Community Toilets**

#### **12.1.1 Navigation to Public / Community Toilets**

- Open the sidebar and click on '**PT/CT IMS**' to expand.
- Select the **Public / Community Toilets**.



## Overview:

- This page displays the overall information maintained by the sub-module. The user can view the general information maintained by the sub-module and carry out different processes as required.
- The user can Add New Public/ Community Toilets (refer to section 12.2) that are constructed in the city.
- Refer to Section 6 for more details on the Action buttons.

Public / Community Toilets									
<a href="#">Add Public / Community Toilets</a> <a href="#">Export to CSV</a> <a href="#">Show Filter</a>									
Show <input type="text" value="10"/> entries									
ID	Toilet Name	BIN	House Number	Toilet Type	Ward Number	Caretaker Name	Sanitary Supplies Disposal Facility	Status	Actions
2	Godawari Community Toilet	B000001	R000042-01	Community Toilet	4	Hira Kaji Shrestha	Yes	Operational	
1	Community Toilet	B000002	R000001-01	Community Toilet	1	Radhe Shyam	—	Operational	

Figure 12- 1 List of Public/ Community Toilets

## 12.2 Add Public / Community Toilets

- Click on the ‘Add Public / Community Toilets’ button.



- Enter the relevant information that is prompted in the form.

Note: The form fields are changed dynamically according to the type of toilet selected, which is further elaborated in the Overview section below.

Add Public / Community Toilets

Toilet Type*	<input type="text"/>
Toilet Name	<input type="text"/>
Ward Number*	<input type="text"/>
Location	<input type="text"/>
House Number / BIN*	<input type="text"/>
Status*	<input type="text"/>
Caretaker Name*	<input type="text"/>
Caretaker Gender*	<input type="text"/>
Caretaker Contact *	<input type="text"/>
Owning Institution *	<input type="text"/>
Operate and Maintained by*	<input type="text"/>
Total Number of Seats	<input type="text"/>
Total Number of Urinals	<input type="text"/>
Separate Facility for Male and Female	<input type="text"/>
Separate Facility for People with Disability	<input type="text"/>
Separate Facility for Children	<input type="text"/>
Presence of Indicative Sign	<input type="text"/>
Sanitary Supplies and Disposal Facilities	<input type="text"/>
Adherence with Universal Design Principles	<input type="text"/>
Uses Fee Collection	<input type="text"/>

[Back to List](#) [Save](#)

Figure 12- 2 Add new Public / Community Toilets

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

### Overview:

The Add New Public / Community Toilet page consists of different form fields that capture different information, as explained below:

- Toilet Type: Type of toilet such as “Public Toilet” or “Community Toilet”.
  - Public Toilets (PT) is for the use of floating population/public in places such as markets, train stations, or other public areas and are used by mostly undefined users.

- Community Toilet (CT) are shared toilet facilities provided for a defined group of residents or an entire settlement/community. It is normally located in or near the community area and used by almost all community members.
- Toilet Name: Name given to the toilet.
- Ward Number: Ward number where the toilet is located.
- Location: Name of the location where the toilet is located.
- House Number/BIN: The house number of the building where the toilet is located in. The unique identifier of the building where the septic tank is located. The dropdown menu only displays the codes that are maintained in the Buildings sub-module of the Building IMS module.
- Status: Indicating the operational status of the toilet.
- Caretaker Name: Full name of the caretaker of the toilet.
- Caretaker Gender: The gender of the caretaker.
- Caretaker Contact: The contact number of the Caretaker of the toilet (This field only allows numeric values)
- Owning Institution: Owning institution of the toilet.
- Operate and maintained by: Name of the organization or individual doing operation and maintenance of the toilet.
- Total Number of Seats: The total number of toilet seats in the public toilet or the community toilet.
- Total Number of Urinals: The total number of urinals in the public toilet or the community toilet.
- When the user selects the Toilet Type, they have two available options i.e., “Community Toilet” and “Public Toilet”.
- The form’s input fields from “Toilet Type” to “Fee Collected” are common for both toilet types.
- When the user selects "Public toilet" as the toilet type, the form field differs from that of "community toilet."

**Distance from Nearest Road (m)**

Distance from Nearest Road (m)

- Distance from Nearest Road (m): Distance from the nearest road to where the public toilet is situated.

<b>Separate Facility for Male and Female</b>	Separate Facility for Male and Female
<b>Separate Facility for People with Disability</b>	Separate Facility for People with Disability
<b>Separate Facility for Children</b>	Separate Facility for Children

*Figure 12- 3 Public Toilet form fields*

- Separate Facility for Male and Female: Indicates whether or not the toilet has separate facilities for males and females.

- If “Yes” is selected, the form dynamically adds two new fields as shown below:

<b>Separate Facility for Male and Female</b>	Yes
<b>No. of Seats for Male Users</b>	No. of Seats for Male Users
<b>No. of Seats for Female Users</b>	No. of Seats for Female Users

- No. of seat for male users: Number of toilet seats available for male users of the public toilet. It takes numeric value only.
- No. of seat female users: Number of toilet seats available for female users of the public toilet. It takes numeric value only.

- Separate facility for People with Disability: Indicates whether or not the toilet has facilities for the differently abled people.

- If “Yes” is selected, the field shown below is added:

<b>Separate Facility for People with Disability</b>	Yes
<b>No. of Seats for People with Disability Users</b>	No. of Seats for People with Disability Users

- No. of seats for people with Disability users: Number of seats available for differently abled people in the public toilet. It takes numeric values only.
- Separate Facility for Children: Indicates whether or not the toilet has facilities for children.
- Presence of Indicative Sign: Indicates whether or not the toilet has an indicative sign.
- Sanitary Supplies and Disposal: Indicates whether or not the toilet has sanitary supplies and disposal facilities.
- Adherence with Universal Design Principles: Indicates whether the toilet adheres to the universal design principles.

- **Uses Fee Collection:** Indicates whether a fee is collected for using the toilet. If the user selects “Yes” the form adds two input labels as shown below:

<b>Uses Fee Collection</b>	<input type="text" value="Yes"/>
<b>Uses Fee Rate</b>	<input type="text" value="Uses Fee Rate"/>
<b>Frequency of Fee Collection</b>	<input type="text" value="Frequency of Fee Collection"/>

- **Amount of Fee Collected:** The amount of fee collected for using the toilet.
- **Frequency of Fee Collected:** The options for the frequency of the fee collected for public toilets is per use and for community toilets is weekly, half monthly, monthly, quarterly, and yearly.
- When the user chooses the "community toilet" option, the following field is added:

<b>No. of Households Served</b>	<input type="text" value="No. of Households Served"/>
<ul style="list-style-type: none"> <li>• No. of Households served: Number of households that use the community toilet.</li> </ul>	

<b>Separate Facility for Male and Female</b>	<input type="text" value="Separate Facility for Male and Female"/>				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><b>No. of Male Users</b></td> <td style="padding: 5px;"><input type="text" value="No. of Male Users"/></td> </tr> <tr> <td style="padding: 5px;"><b>No. of Female Users</b></td> <td style="padding: 5px;"><input type="text" value="No. of Female Users"/></td> </tr> </table>		<b>No. of Male Users</b>	<input type="text" value="No. of Male Users"/>	<b>No. of Female Users</b>	<input type="text" value="No. of Female Users"/>
<b>No. of Male Users</b>	<input type="text" value="No. of Male Users"/>				
<b>No. of Female Users</b>	<input type="text" value="No. of Female Users"/>				
<b>Separate Facility for People with Disability</b>	<input type="text" value="Separate Facility for People with Disability"/>				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><b>No. of People with Disability Users</b></td> <td style="padding: 5px;"><input type="text" value="No. of People with Disability Users"/></td> </tr> </table>		<b>No. of People with Disability Users</b>	<input type="text" value="No. of People with Disability Users"/>		
<b>No. of People with Disability Users</b>	<input type="text" value="No. of People with Disability Users"/>				
<b>Separate Facility for Children</b>	<input type="text" value="Separate Facility for Children"/>				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><b>No. of Children Users</b></td> <td style="padding: 5px;"><input type="text" value="No. of Children Users"/></td> </tr> </table>		<b>No. of Children Users</b>	<input type="text" value="No. of Children Users"/>		
<b>No. of Children Users</b>	<input type="text" value="No. of Children Users"/>				

*Figure 12- 4 Community Toilet form fields*

- **No. of Male Users:** Number of males using the community toilet. It takes numeric value only.
- **No. of Female Users:** Number of females using the community toilet. It takes numeric value only.

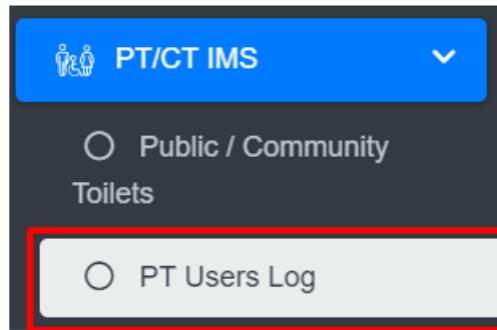
- No. of People with Disability Users: Number of differently abled people using the community toilet. It takes numeric value only.
- No. of Children Users: Number of children using the community toilet.

## 12.3 PT Users Log

The **PT Users Log** sub-module maintains the information regarding the total number of users of the toilets on a daily basis.

### 12.3.1 Navigation to PT Users Log

- Open the sidebar and click on '**PT IMS**' to expand.
- Select the **PT Users Log**.



#### Overview:

- The user can add a new PT Users Log (refer to section 12.3.2).
- For more details on the Action buttons view Section 6.

A screenshot of a web-based application titled 'PT Users Log'. At the top, there are three buttons: 'Add PT Users Log', 'Export to CSV', and 'Show Filter'. Below the buttons is a table with three rows of data. The table has columns for ID, Toilet Name, Date, No. of Male Users (daily), No. of Female Users (daily), and Action. Each row contains a set of four small blue icons for actions. A red box surrounds the entire table area.

ID	Toilet Name	Date	No. of Male Users (daily)	No. of Female Users (daily)	Action
7	3 - Imado Toilet	2022-06-14	18	14	
6	3 - Imado Toilet	2022-06-12	26	22	
5	3 - Imado Toilet	2022-05-20	12	8	

Figure 12- 5 List of PT Users Log

### 12.3.2 Add New PT Users Log

- Click on the ‘Add PT Users Log’ button.

The screenshot shows a web-based application interface for adding a new PT Users Log. At the top right, there are two buttons: 'Add PT Users Log' (highlighted with a red box) and 'Export to CSV'. Below these buttons is a large rectangular form area outlined with a red box. This form contains four input fields: 'Toilet Name\*' (dropdown menu), 'Date\*' (date input field), 'No. of Male Users (daily)\*' (text input field), and 'No. of Female Users (daily)\*' (text input field). At the bottom of the form are two buttons: 'Back to List' and 'Save'.

Figure 12- 6 Add new PT Users Log

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

#### Overview:

The Add New PT Users Log page consists of information as explained below:

- Toilet Name - Name of the Toilet.
- Date - The date this form is being filled (should be the present day).
- No. of Male Users(daily) - Total number of male users for that day. (Takes numeric values only)

- No. of Female Users(daily) - Total number of female users for that day. (Takes numeric values only)
- When the user Edits the information of the PT/CT Users Log the First two fields cannot be changed. If the user wants to make changes to the first two fields, the user will have to delete the information and add new records.

**Edit PT Users Log**

Toilet Name*	3 - Imado Toilet
Date*	06/14/2022
No. of Male Users (daily)*	18
No. of Female Users (daily)*	14

[Back to List](#) [Save](#)

Figure 12- 7 Edit User Information



## **13. CWIS INFORMATION MANAGEMENT SYSTEM (CWISIMS)**

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CWISIMS is a vital module of the IMIS that provides tools to generate CWIS indicators for the city and Key Performance Indicators (KPIs) to monitor the performance of sanitation service providers for a specified year. The CWISIMS is a part of the UMDSS which allows municipalities to set targets for each indicator in alignment with city policies and standards, and it includes a dashboard for the visualization of these indicators. The generated indicator data is maintained in a database, enabling easy access and review when needed, ensuring effective monitoring and planning.

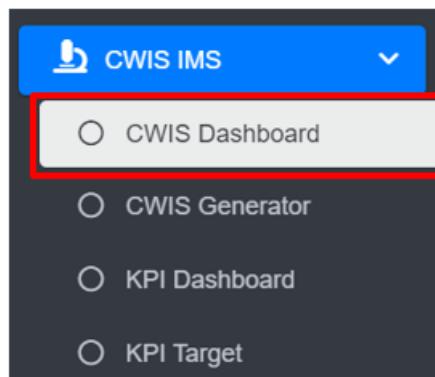
- i. CWIS Dashboard - The CWIS Dashboard tracks 22 sanitation indicators (Annex 1), which are generated annually. These indicators are informed by data maintained across various modules and sub-modules within IMIS, making them integral to understanding citywide sanitation performance. The indicators are based on the CWIS framework developed by Athena Informatics, ensuring consistency with globally recognized standards for inclusive sanitation monitoring. This dashboard provides municipalities with a centralized platform for tracking sanitation progress and assessing the effectiveness of implemented policies and services.
- ii. KPI Dashboard – The KPI Dashboard complements the CWIS Dashboard by focusing on the performance of sanitation service providers. It monitors seven critical KPIs (1. Application Response Efficiency, 2. Customer Satisfaction, 3. PPE Compliance, 4. Safe Desludging, 5. Faecal Sludge Collection Ration, 6. Response Time, 7. Inclusion), which are also generated annually, using sanitation service data related to faecal sludge management (FSM) service delivery. These KPIs are designed to evaluate the efficiency and quality of services provided by sanitation operators, based on metrics developed by SNV Bangladesh. By leveraging this dashboard, municipalities can benchmark service provider performance and identify areas for operational improvement within their sanitation systems.

CWISIMS, through its dual focus on CWIS indicators and KPIs, provides municipalities with robust tools for monitoring and improving their sanitation systems. By aligning indicator and KPI tracking with international standards and municipal goals, it ensures data-driven decision-making and continuous improvement in sanitation service delivery and management.

## 13.1 CWIS Dashboard

### 13.1.1 Navigation to CWIS Dashboard

- Open the sidebar and click on **CWIS IMS** to expand.
- Select the **CWIS Dashboard**.



#### Overview:

- The **CWIS Dashboard** provides the CWIS indicators of the city.

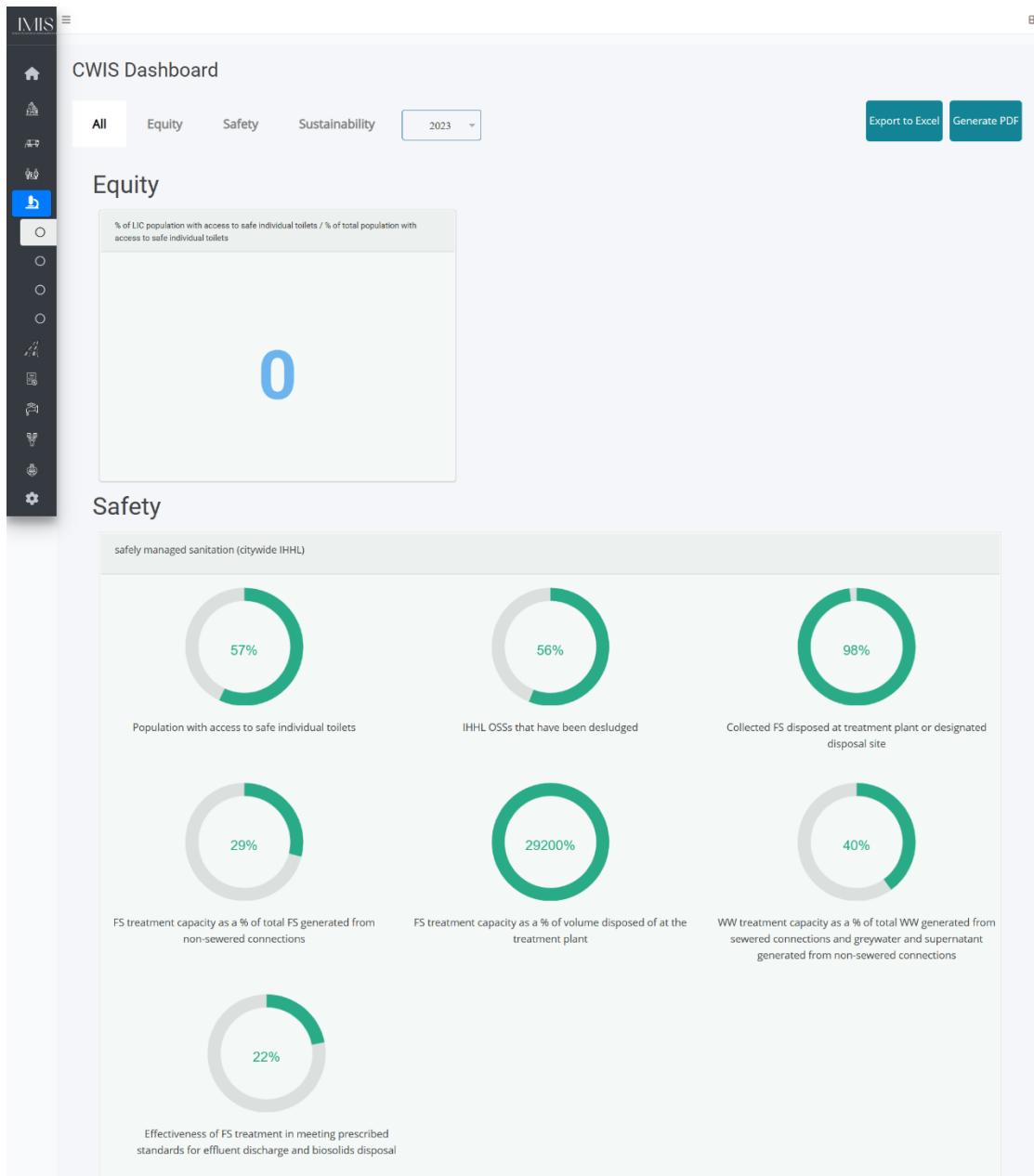


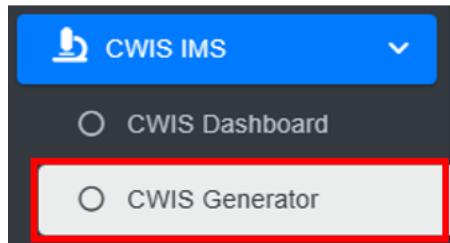
Figure 13-1 CWIS Dashboard

## 13.2 CWIS Generator

CWIS can be generated through the addition of data on a yearly basis. The system is also capable of generating and compiling the yearly data.

### 13.2.1 Navigation to CWIS Generator

- Open the sidebar and click on '**CWIS IMS**' to expand.
- Select the **CWIS Generator**.



## Overview:

- The **CWIS Generator** page lists all the attribute records stored in the module and provides Tools and Year filters that can be used according to the requirements.
- Add CWIS Data (refer to section **Error! Reference source not found.**)
- Export to Excel (refer to section 6 ) and the user can filter the data by Year.

CWIS Indicators Monitoring and Evaluation

Indicators				Outcome	Data Type	Data
% of LIC population with access to safe individual toilets / % of total population with access to safe individual toilets	equity	quantitative	0			

Safe management LIC/ safe management citywide (IHHL)			
Indicators			
Safe management LIC/% safe management citywide (IHHL)	equity	quantitative	Enter value in percent

Figure 13-2 CWIS Indicators Monitoring and Evaluation

## Note:

- The user must add the correct and accurate values in the CWIS Settings Page in order to display the accurate calculation of indicators. Refer to Section [13.2.2](#) for more details.

## 13.2.2 Add CWIS Data

- Click on the **Add CWIS Data** button to add new CWIS Data and it is also capable of generating the yearly data at the end of the year.

**Add CWIS Data**

**Export to Excel**

**Back to List**

- This redirects to the **Data Framework for Monitoring and Evaluation** form page.

CWIS Indicators Monitoring and Evaluation

Add CWIS Data	Export to Excel	Back to List	Year: 2024
% of LIC population with access to safe individual toilets / % of total population with access to safe individual toilets			
Indicators	Outcome	Data Type	Data
% of LIC population with access to safe individual toilets / % of total population with access to safe individual toilets ⓘ	equity	quantitative	<input type="text" value="0"/>
Safe management LIC/safe management citywide (IHL)			
Indicators	Outcome	Data Type	Data
Safe management LIC/% safe management citywide (IHL) ⓘ	equity	quantitative	<input type="text" value="Enter value in percent"/>
Subsidy amount paid to NSS/SS			
Indicators	Outcome	Data Type	Data
Subsidy amount paid to NSS/SS ( monetary unit) ⓘ	equity	quantitative	<input type="text" value="Enter value in percent"/>

Figure 13-3 Add CWIS Data

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.

## 13.3 CWIS Settings

CWIS Setting sub-module also set the standard parameter for the module that is [CWIS Generator](#), when interacted the web-application. CWIS Generator displays the data of the module whereas CWIS Settings is the standard values which is used according to CWIS Indicator(SF\_1g).

### 13.3.1 Navigation to CWIS Settings

- Open the sidebar and click on the ‘**Settings**’ to expand.
- Select the **CWIS Setting**.
- This redirects to the **CWIS Settings** page.

#### Overview:

- This page displays the overall information maintained by the sub-module. The user can view the general information maintained by the sub-module and carry out different processes as required.
- The user can Edit the CWIS Setting.

## CWIS Setting

Average Household Size (Average household size in building)	1.2
Total Population	143679
Fecal sludge Generation Rate for Septic Tank (m <sup>3</sup> /day)	0.077
Fecal sludge Generation Rate for Septic Pit (m <sup>3</sup> /day)	0.026
Waste Water Generated From Sewer Connection (liter/day)	80
Waste Water Generated From GreyWater (liter/day)	60
Waste Water Generated From Supernatant (liter/day)	35
Water Consumption (liter/day)	100

Save

Figure 13- 4 Edit CWIS Settings form page

- After Editing is completed click **Save**, and make sure a green pop-up message is displayed. Refer to Section [7.1](#) for more details.

The fields that are displayed while editing the form are mentioned below:

- Average Household Size (Average household size in building) – The Total Average Household Size of the population.
- Total Population – Total number of people served.
- Fecal sludge Generation Rate for Septic Tank (m<sup>3</sup>/day) - The daily amount of fecal sludge generated from a septic tank in cubic meter.
- Fecal sludge Generation Rate for Septic Pit (m<sup>3</sup>/day) - The daily amount of fecal sludge generated from a septic pit in cubic meter.
- Waste Water Generated From Sewer Connection (liter/day) - The volume of wastewater generated daily from sewer connection in cubic meter.
- Waste Water Generated From GreyWater (liter/day) - The daily amount of greywater produced in liters.
- Waste Water Generated From Supernatant (liter/day) - The daily volume of supernatant wastewater produced in liters.
- Water Consumption (liter/day) - The total water consumed daily in liters.

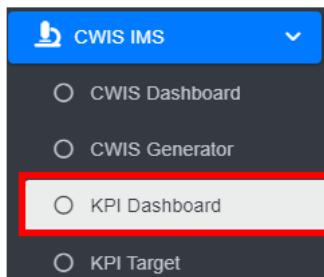
**Note:**

- The Above mentioned fields only takes the numeric values.

## 13.4 KPI Dashboard

### 13.4.1 Navigation to KPI Dashboard

- Open the sidebar and click on '**CWIS IMS**' to expand.
- Select the **KPI Dashboard**.



- This redirects to the **KPI Dashboard** page.

#### Overview:

- The **KPI Dashboard** provides the KPI indicators. The KPI dashboard contains different indicators under the KPI Target.
- Click the Generate Report to download data in the pdf file. Also, the user can filter the data and generate the report.
- The user can interact with the charts tools (refer to section 6.8).
- While hovering over the charts, it provides numeric data information.

## Key Performance Indicators (KPIs) Dashboard

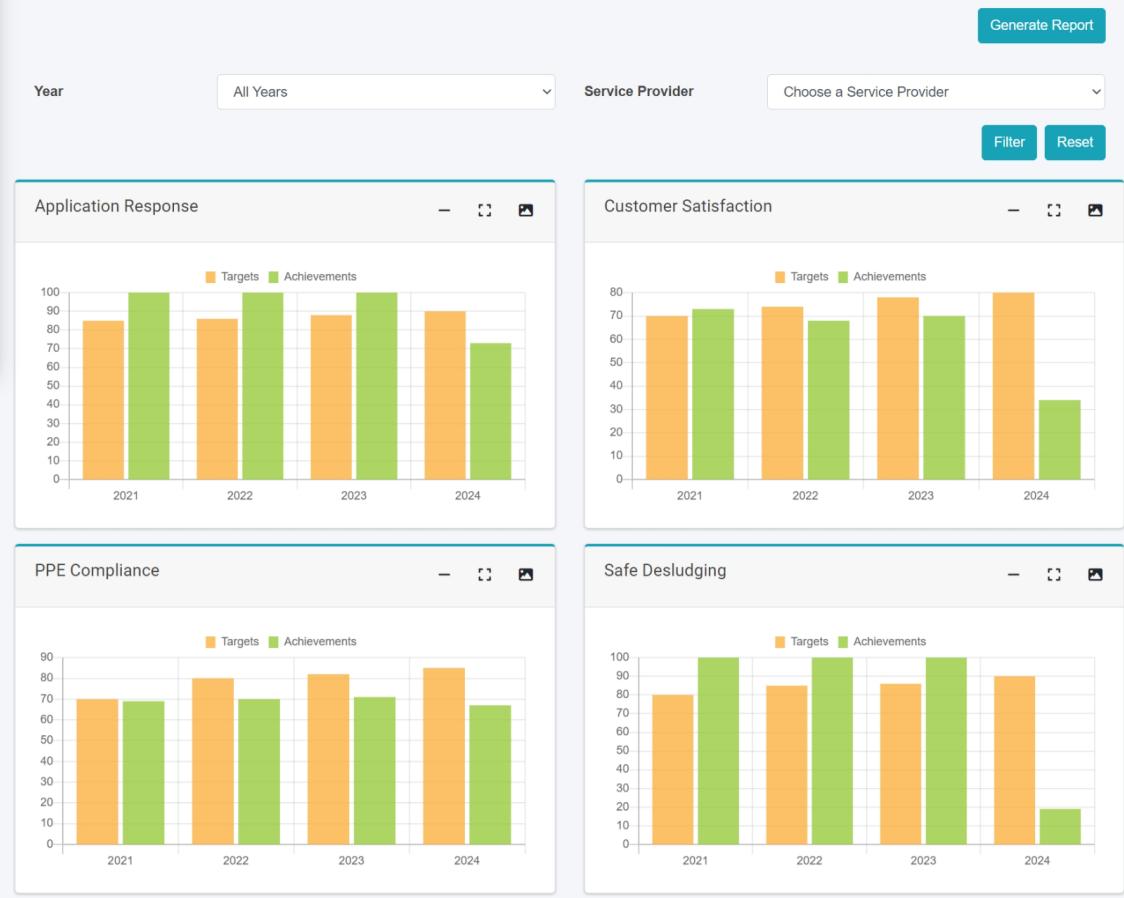


Figure 13- 5 KPI Dashboard

- When the user filters (refer to section 5) the year, the dashboard charts also update according to the selected year. The box chart displays the expected and achieved percentages, while the bar chart shows the targets and achievements.

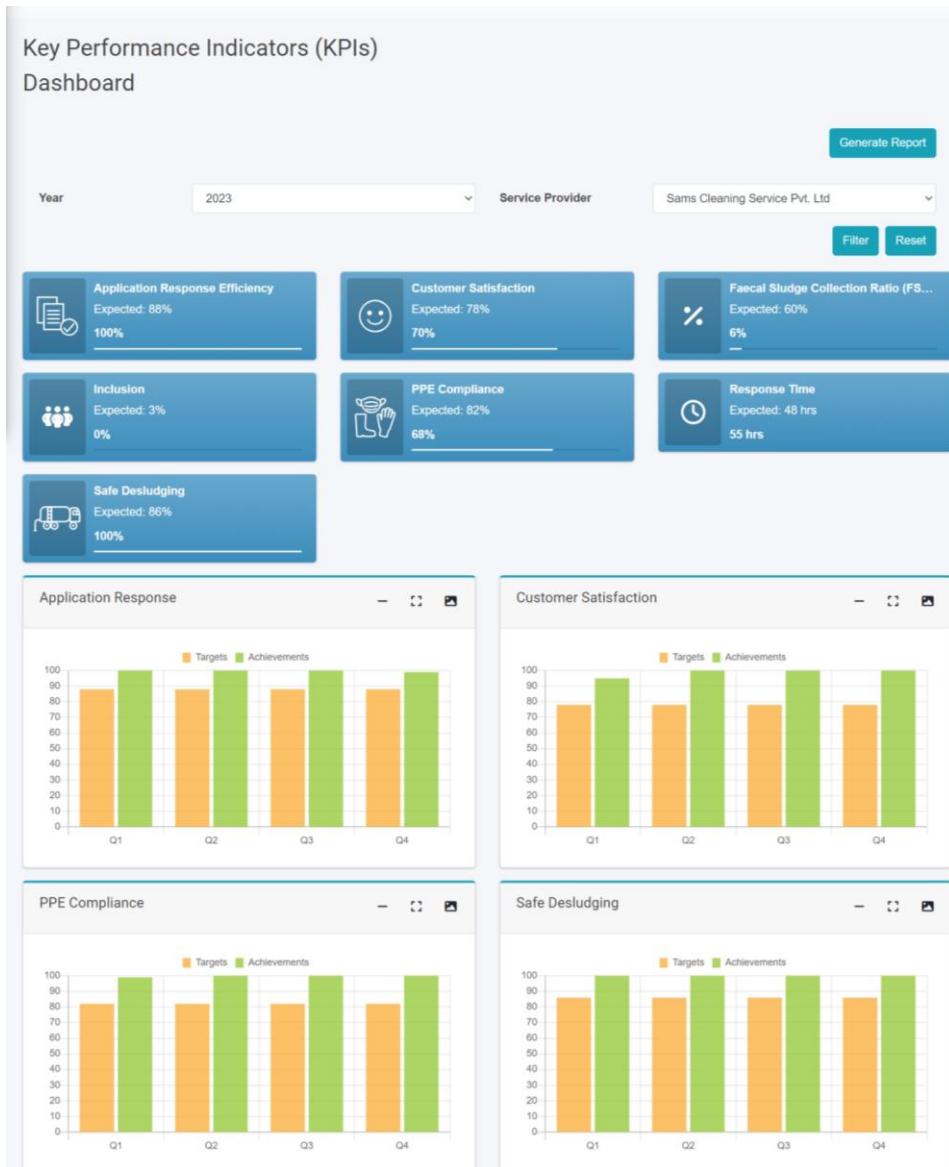
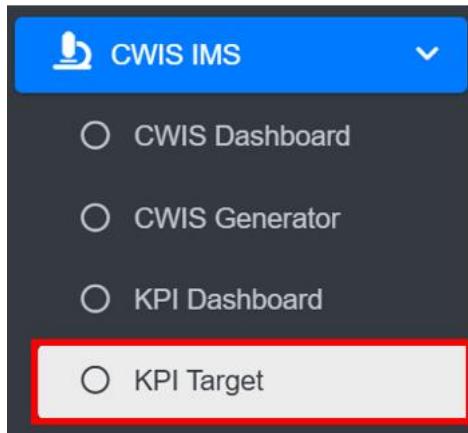


Figure 13- 6 KPI Dashboard (Filter Year)

## 13.5 KPI Target

### 13.5.1 Navigation to KPI Target

- Open the sidebar and click on '**CWIS IMS**' to expand.
- Select the **KPI Target**.



- This redirects to the **KPI Target** page.

### Overview:

- The KPI Target Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on the Action buttons refer to Section 6.

The image shows a table titled 'KPI Target' with a red border around its content area. The table has columns for 'ID', 'Indicator', 'Year', 'Target (%)', and 'Actions'. Each row contains a set of action icons. The data rows are as follows:

ID	Indicator	Year	Target (%)	Actions
28	Inclusion	2024	3	
27	Response Time	2024	48	
26	Faecal Sludge Collection Ratio (FSCR)	2024	65	
25	Safe Desludging	2024	90	
24	PPE Compliance	2024	85	
23	Customer Satisfaction	2024	80	
22	Application Response Efficiency	2024	90	
21	Inclusion	2023	3	
20	Response Time	2023	48	

Figure 13-7 List KPI Target

### 13.5.2 Add KPI Target

- Click on the 'Add KPI Target' button.



- Click on the ‘**Add KPI Target**’ button.



- This redirects to the **Add KPI Target** form page.
- The user must choose Indicator which is available in options from the dropdown, where the indicator for the year should not be repeated, and add the number of targets.

**Add KPI Target**

Indicator*	Application Response Efficiency ▾
Year*	Year
Target (%)*	Target (%)

[Back to List](#) [Save](#)

Figure 13-8 Add KPI Target

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.
- This redirects to the **Add KPI Target** form page.
- The user must choose Indicator which is available in options from the dropdown, where the indicator for the year should not be repeated, and add the number of targets.

**Add KPI Target**

Indicator*	Application Response Efficiency ▾
Year*	Year
Target (%)*	Target (%)

[Back to List](#) [Save](#)

Figure 13- 9 Add KPI Target

- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

## **Overview:**

- The Add KPI Target page consists of information that is explained below:
- Indicator – Name of the indicators.
- Year- Enter the year that indicator was used (Do not use the same year more than once for the same indicator)
- Target (%)- The number of the target of the chosen indicator.

## 14. UTILITY IMS

---

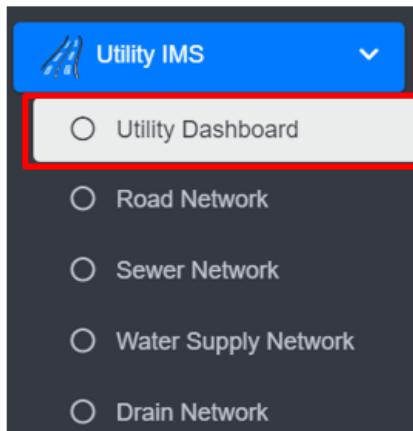
**UIMS**, a core module of the **IMIS**, is designed to manage detailed spatial and attribute data for municipal utilities such as roads, stormwater drains, water supply networks, and sewer systems. UIMS plays a critical role in achieving **CWIS** by enabling municipalities to monitor sanitation infrastructure, identify service gaps, and ensure equitable access to sanitation services, particularly for low-income community (LIC) areas. Through its integration with the **BIMS**, UIMS provides granular insights into utility connectivity for each building, including sewer and drainage links, and water supply access. This integration helps municipalities target underserved areas, plan infrastructure expansions, and prioritize investments in sanitation services.

A key feature of UIMS is its interactive dashboard, which delivers real-time visualizations on sanitation-related utilities. The system empowers municipalities to monitor sanitation coverage trends, identify gaps, and make data-driven decisions to address inequities in service delivery. UIMS also includes advanced map-based input tools integrated with the **UMDSS**, allowing municipalities to add or update utility infrastructure directly within the platform. Currently this tool is available for creating and updating roads only. In the case of other utilities, they need to be digitized and merged with existing data and import in corresponding utilities database of IMIS with the help of skilled GIS people. In the case of attribute data, they can be updated for all kinds of utilities directly from the user interface. UMDSS has provided tools to export data in flexible formats, such as CSV, SHP, and KML ensuring seamless sharing and integration with other municipal services.

### 14.1 Utility IMS

#### 14.1.1 Navigation to Utility Dashboard

- Open the sidebar and click on ‘**Utility IMS**’ to expand.
- Select the **Utility Dashboard**.



- The **Utility Dashboard** provides a synopsis of the information maintained in this module.

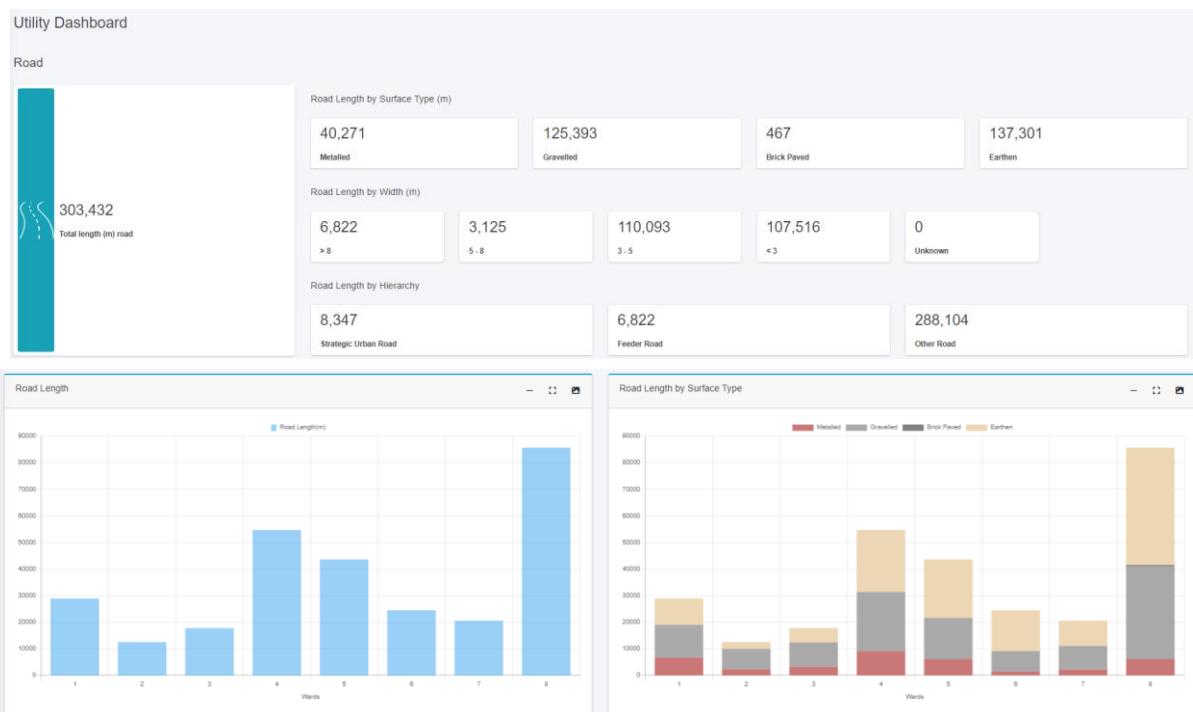


Figure 14-1 Utility Dashboard

The dashboard typically displays a visual representation of data using graphs, pie charts, etc.

In the **Utility Dashboard**, bar charts are used to visually present various utility-related information.

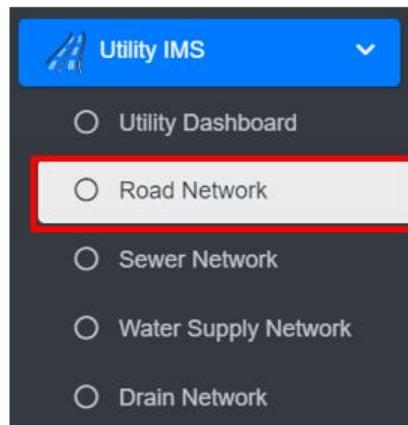
- Road Network: length, surface types, hierarchy, and length by width
- Sewer Network: length and length by diameter
- Drain Network: length types, length by type, length by size.
- Water Supply Network: length and length by diameter

## 14.2 Road Network

The Road Network Sub-Module maintains the information regarding the road networks of the city. The road network database maintains information on various attributes that define different aspects of a road such as a road code, surface type, and hierarchy.

## 14.2.1 Navigation to the Road Network

- Open the sidebar and click on ‘**Utility IMS**’ to expand.
- Select the **Road Network**



- This redirects to the **Road Network** page

### Overview:

The Road Network Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For details on Action buttons refer to Section 6.

A screenshot of the 'Road Network' page. At the top, there are three export buttons: 'Export to CSV', 'Export to Shape File', and 'Export to KML'. To the right is a 'Show Filter' button. Below these are two buttons: 'Show 10 entries' and a red-bordered search input field. The main area is a table with the following columns: Code, Road Name, Hierarchy, Right of Way (m), Carrying Width (m), Surface Type, Road Length (m), and Actions. The table contains eight rows of road data. Each row has a red-bordered 'Actions' column containing several small icons: a pencil, a magnifying glass, a circular arrow, a trash can, and a plus sign.

Code	Road Name	Hierarchy	Right of Way (m)	Carrying Width (m)	Surface Type	Road Length (m)	Actions
R002496	R002496	Other Road	-	3.00	Brick Paved	35.40	
R002495	R002495	Other Road	-	3.00	Gravelled	71.60	
R002494	R002494	Other Road	-	2.00	Gravelled	35.82	
R002493	R002493	Other Road	-	4.00	Gravelled	103.69	
R002492	R002492	Other Road	-	4.00	Gravelled	43.62	
R002491	R002491	Other Road	-	2.00	Gravelled	37.96	
R002490	R002490	Other Road	-	4.00	Gravelled	16.93	

Figure 14- 2 List of Road Network

- The **Actions: Edit** does not allow users to edit the road code field. The field’s road length, road width, and carrying width of the road only accepts numeric values.

## 14.2.2 Add roads

- Click on the map icon button in the Actions column

- Find and click on the ***add road*** button, this will turn on sub-tool features to add the road line and its other related information.



Figure 14- 3 Map Tools

- To add a new road, the user will need to locate the tentative location of the starting point and ending point of a new road constructed through the map feature interface.

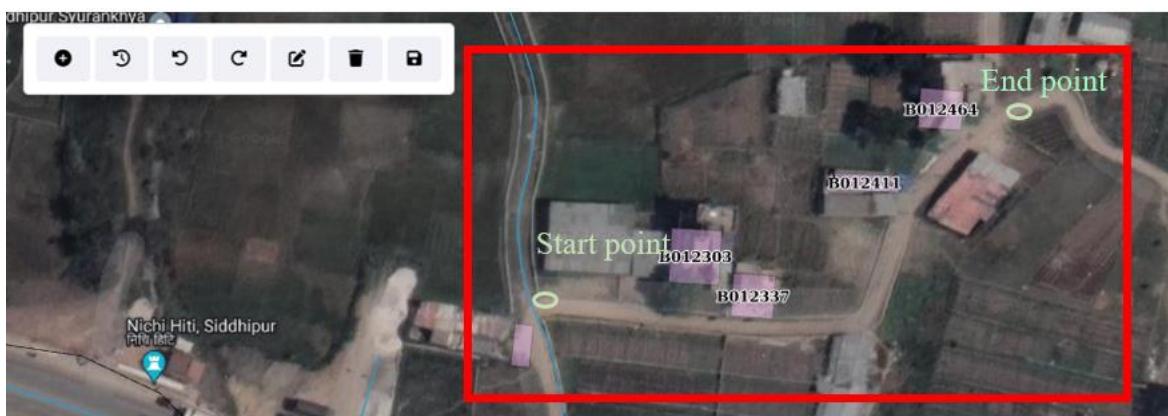


Figure 14- 4 Locating the new road section

- Once the new road section has been identified, the user must tentatively outline the new road on the map interface by creating a set of points.

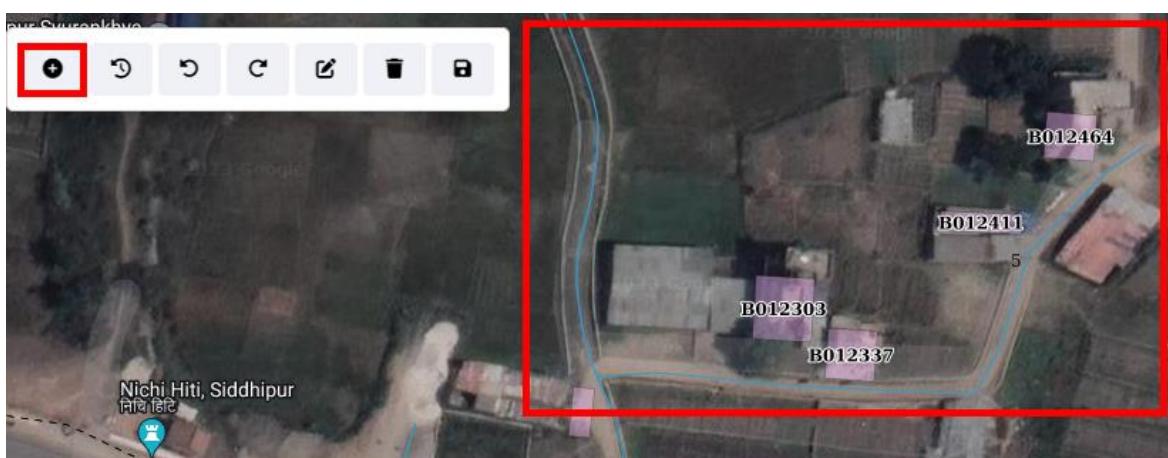


Figure 14- 5 Add new road section

- If the user is not satisfied with the drawn road line on the map, they may undo, redo, or remove it by clicking the corresponding button.



Figure 14- 6 Undo, Redo and Remove

- Upon generating an acceptable outline of the new road, the user must enter the attribute information of the new road and save the information.

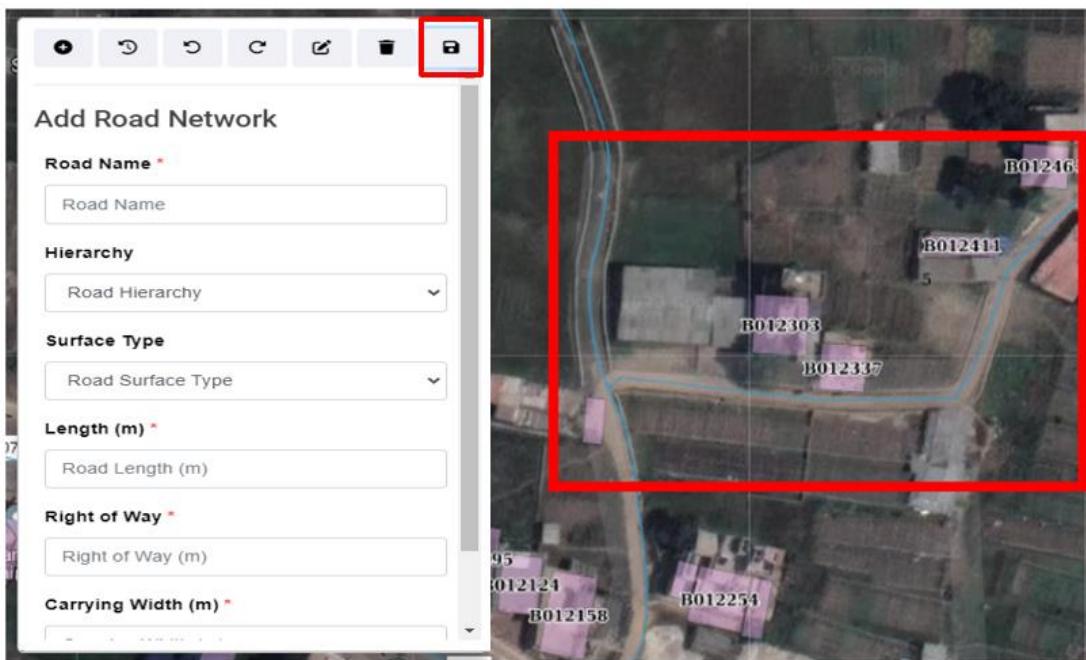


Figure 14- 7 Attribute Information of new road section

### Add Road Form

- Road Name: The name of the road.
- Road Hierarchy: The hierarchy of the road from the dropdown.
- Road Surface Type: The surface type of the road from the dropdown.
- Road Length (m): The length of the added road.
- Right of Way: The right of way of the road. (It must be greater than or equal to the carrying width)
- Carrying Width of the Road (m): The carrying width of the road.
- To save a road line drawing, users must complete required fields marked with red asterisks. Submitting without completing these fields will result in an error message:

The name field is required.  
The width field is required.  
The length field is required.  
The carrying width field is required.

### 14.2.3 Edit Road

- In addition to updating new road lines, the tool offers the capability to extend or modify existing road lines directly through the map interface, providing users with a means to update road information as urban infrastructure evolves.



Figure 14- 8 Spatial information of new road section

- To extend an existing road or change its route, users can activate the edit feature.
- First, select the desired road from the map interface, which is highlighted for easy identification (refer to Figure 13-8 ).
- Next, select a point along the road line that requires modification and dragging or moving the point to adjust its position as needed.
- This process enables precise edits to the road line's shape when necessary. Moreover, users can easily extend the road line by selecting the endpoint of the road and dragging it to reflect the actual road extension. This functionality allows users to accurately update and extend road networks directly through the map interface.



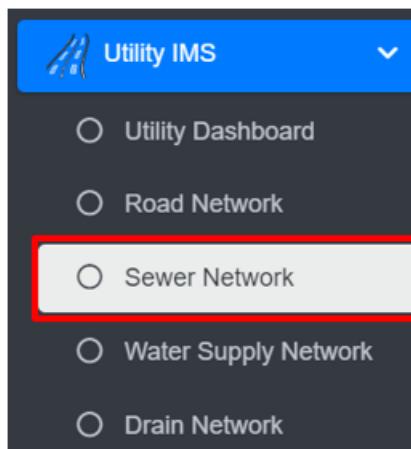
Figure 14- 9 Updated Road line

## 14.3 Sewer Network

The Sewer Network Sub-Module maintains the information regarding the sewer networks of the city. The Sewer network database maintains information on attributes that define aspects of a sewer network such as sewer identification code, location, and diameter of sewer pipes.

### 14.3.1 Navigation to Sewer Network

- Open the sidebar and click on ‘**Utility IMS**’ to expand.
- Select the **Sewer Network**



- This redirect to **Sewer Network**

#### Overview:

The Sewer Network Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on the Action button refer to Section 6.

A screenshot of the Sewer Network page. At the top, there are three export buttons: 'Export to CSV', 'Export to Shape File', and 'Export to KML'. On the right, there is a 'Show Filter' button. Below these are two input fields: 'Show' and 'entries', with '10' selected. A red box highlights the main content area, which is a table with the following columns: Code, Road Code, Location, Length (m), Diameter (mm), Treatment Plant, and Actions. The table contains six rows of data, each with a set of small blue and red action icons in the 'Actions' column.

Code	Road Code	Location	Length (m)	Diameter (mm)	Treatment Plant	Actions
S000136	R000663	side	200.6	200	Municipality WWTP	
S000135	R000662	middle	100.62	450	Municipality WWTP	
S000134	R000655	middle	101.5	300	Municipality WWTP	
S000133	R000650	middle	200.08	450	Municipality WWTP	
S000132	R000648	middle	102.49	300	Municipality WWTP	

Figure 14- 10 List of Sewer Network

- The **Actions: Edit** does not allow users to edit the sewer code field. The field’s sewer length and diameter only accepts numeric values and the location should be
  - Middle – if the sewer network is in the middle of the road width,

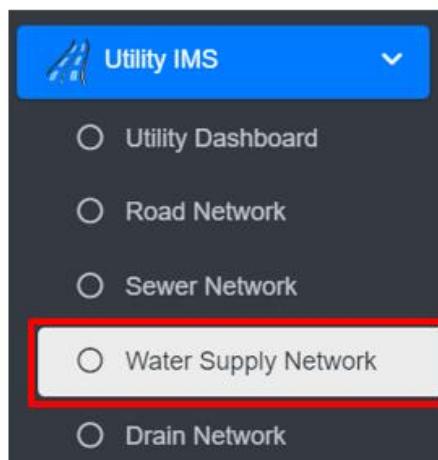
- Side - if the sewer network is on either the right or left side of the road width

## 14.4 Water Supply Network

The **Water Supply Network** Sub-Module maintains the information regarding the water supply networks of the city. The water supply database maintains information on various attributes that define aspects of a water supply scheme such as a water supply system identification code, length, etc.

### 14.4.1 Navigate to the Water Supply Network

- Open the sidebar and click on ‘**Utility IMS**’ to expand.
- Select the **Water Supply Network**



#### Overview:

The Water Supply Network Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. Refer to Section 6 for more details on the Action buttons.

A screenshot of the Water Supply Network list page. The page has a light grey header with buttons for 'Export to CSV', 'Export to Shape File', 'Export to KML', and 'Show Filter'. Below the header is a table with a red border. The table has a header row with columns for 'Code', 'Road Code', 'Project Name', 'Type', 'Material Type', 'Diameter (mm)', 'Length (m)', and 'Actions'. There are five data rows below the header, each with a unique code, road code, project name, type, material type, diameter, length, and a set of six small blue action icons. The table also includes a 'Show 10 entries' dropdown and a 'Show Filter' button at the bottom right.

Code	Road Code	Project Name	Type	Material Type	Diameter (mm)	Length (m)	Actions
WS000136	R000663	City Water Supply	Secondary	HDPE	100	100.6	
WS000135	R000662	City Water Supply	Secondary	HDPE	100	100.62	
WS000134	R000655	City Water Supply	Secondary	HDPE	100	101.5	
WS000133	R000650	City Water Supply	Secondary	HDPE	100	102.08	
WS000132	R000649	City Water Supply	Secondary	HDPE	100	102.49	

Figure 14- 11 List of Water Supply Network

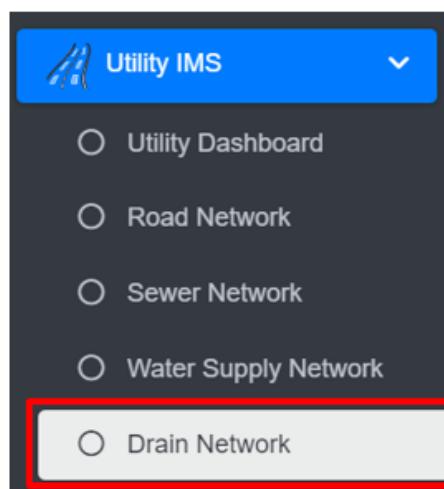
- The **Actions: Edit** does not allow users to edit the water supply code field. The field's water supply network length and pipe diameter only accepts numeric values.

## 14.5 Drain Network

The **Drain Network** Sub-Module maintains the information regarding the Drain networks of the city. The drain network database maintains information on various attributes that define different aspects of a drain network such as a Drain Identification Code, Cover Type, Length, etc.

### 14.5.1 Navigate to Drain Network

- Open the sidebar and click on '**Utility IMS**' to expand.
- Select the **Drain Network**



- This redirect to **Drain Network**

#### Overview:

The Drain Network Page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on Action buttons refer to Section 6.

Drain Network							
<a href="#">Export to CSV</a>		<a href="#">Export to Shape File</a>		<a href="#">Export to KML</a>		<a href="#">Show Filter</a>	
Show	10	entries					
Code	Road Code	Surface Type	Cover Type	Width (mm)	Length (m)	Treatment Plant	Actions
D000005	R000054	Unlined	Closed	100.00	288.37	Municipality FSTP	
D000004	R002108	Lined	Closed	300.00	301.62	Municipality FSTP	
D000003	R000383	Lined	Open	200.00	157.42	Municipality FSTP	
D000002	R000019	Unlined	Closed	200.00	473.96	Municipality FSTP	
D000001	R000054	Lined	Open	200.00	275.06	Municipality FSTP	

Figure 14- 12 List of Drain Network

- The **Actions: Edit** does not allow users to edit the drain code field. The field's drain length and diameter only accept numeric values.

## **15. SOLID WASTE INFORMATION SUPPORT SYSTEM (SWISS)**

---

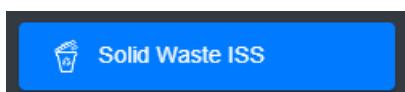
The SWISS module enhances the management of solid waste services and fee collection. The module includes a tool for importing a municipality's solid waste customer data, including their last solid waste management service fee payment date, in CSV format. Based on this imported data, the SWISS module generates and maintains solid waste management customer records in IMIS, along with their fee payment status. It also provides tools to export building data with their solid waste service fee payment status and identifies discrepancies by highlighting records that exist in the municipality's solid waste customer database but are missing from IMIS.

Using the imported data, UMDSS in IMIS helps municipal authorities map buildings with or without solid waste management services and their respective fee payment statuses. This mapping capability enables municipalities to monitor service coverage, assess the status of fee collections, and identify geographic trends in solid waste management service delivery. By integrating solid waste management customer data with building records in IMIS, the SWISS module equips municipal authorities with actionable insights to make informed decisions regarding solid waste services.

The visualized data provided by SWISS supports municipalities in formulating policies to enhance the solid waste management service and fee collection processes. It also aids in optimizing resource allocation and improving overall service delivery by identifying areas requiring attention or adjustments. This integration is currently carried out manually on a periodic basis to ensure the data in IMIS remains up to date. Like the PTCISS module, SWISS does not yet support real-time data integration through an API.

### **15.1 Solid Waste ISS**

The **Solid Waste Information Support System** sub-module imports data via CSV of the solid waste status of the buildings in the municipality.



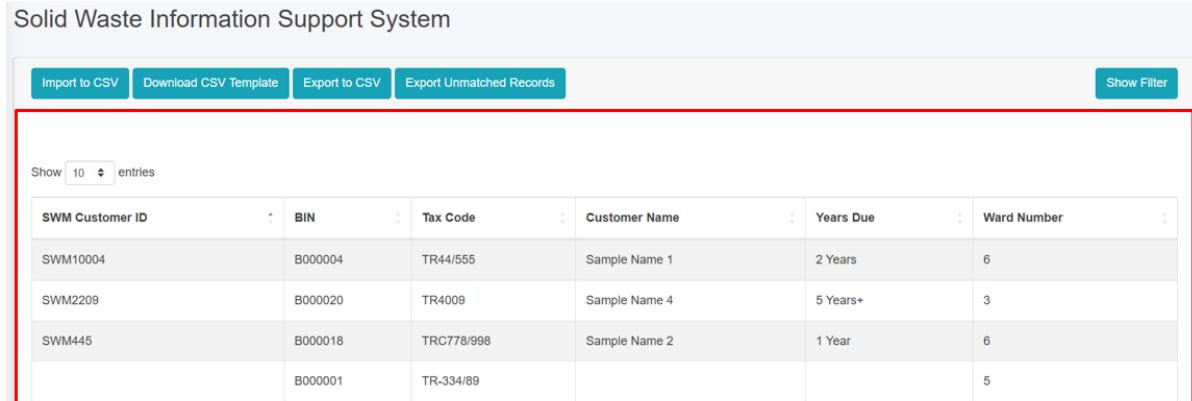
#### **15.1.1 Navigation to Solid Waste ISS**

- Open the Sidebar and select '**Solid Waste ISS**'.

##### **Overview:**

- The user can view the lists of applications for solid waste service data.
- User can import the data via CSV of water supply payment data by clicking on the '**Import from CSV** (refer to section 17.1.2 [15.1.2](#))

- The user can download the CSV Template to add the water supply data (refer to section [15.1.3](#)).
- Export the data (refer to section 8) and filter data (refer to chapter 5).



Solid Waste Information Support System

Solid Waste Information Support System					
<a href="#">Import to CSV</a> <a href="#">Download CSV Template</a> <a href="#">Export to CSV</a> <a href="#">Export Unmatched Records</a> <a href="#">Show Filter</a>					
Show 10 entries					
SWM Customer ID	BIN	Tax Code	Customer Name	Years Due	Ward Number
SWM10004	B000004	TR44/555	Sample Name 1	2 Years	6
SWM2209	B000020	TR4009	Sample Name 4	5 Years+	3
SWM445	B000018	TRC778/998	Sample Name 2	1 Year	6
	B000001	TR-334/89			5

*Figure 15- 1 List of Solid Waste*

### 15.1.2 Import Solid Waste ISS

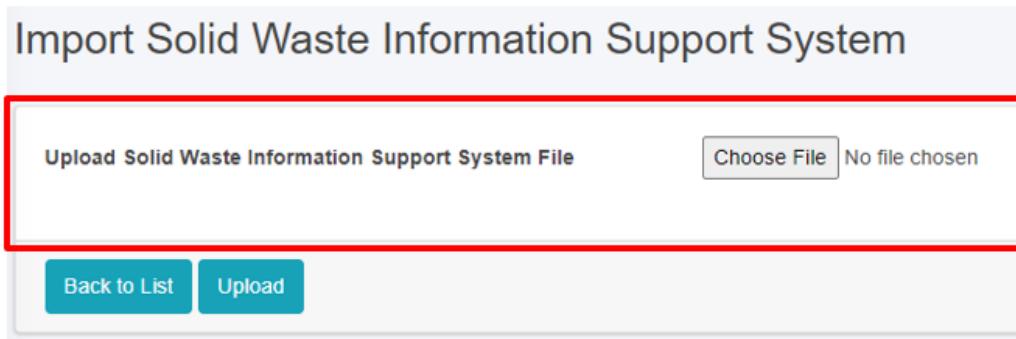
- Click on '**Import from CSV**' at the Top Left of Solid Waste Information Support System page.



- This will redirect the user to **Import Solid Waste Information Support System** page.

#### Overview:

- The user can upload the solid waste payment status of the building from this module.



Import Solid Waste Information Support System

Upload Solid Waste Information Support System File  No file chosen

[Back to List](#) [Upload](#)

*Figure 15- 2 Import Solid Waste ISS CSV File*

- Once the user selects the CSV file to be imported, they must click the ***Upload*** button to import the data. The user will then be notified with a green pop-up message indicating Successful import. Refer to Section 7.3 for more details.
- If the user attempts to import data in formats other than CSV (e.g., .docx, .jpeg), the system will notify the user with an error message, prompting them to review and correct the input format. Refer to Section 7.4 for more details.

**Note:**

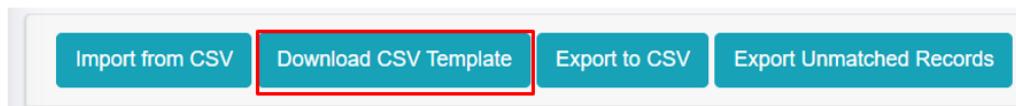
When entering data into the Solid Waste Information Support System CSV, user must adhere to the specified data structure for each field. The required structure for each field is outlined below:

	A	B	C	D	E
1	BIN	Owner Name	Owner Gender	Owner Contact	Last Payment Date
2	B000001	Person Name 1	Male	1234567892	6/16/2023
3	B000002	Person Name 2	Female	7894561235	1/29/2023
4	B000003	Person Name 3	Male	4561234562	7/25/2024
5					

Figure 15- 3 Data structure for each field in CSV

### 15.1.3 Download CSV Template

- Click on the '***Download CSV Template***' button at the top left of the Solid Waste Tax Collection ISS page.



**Overview:**

- A csv template file will be downloaded containing the sample data and required title which is also necessary during the import of the csv file.
- Download CSV Template is available only in the Property Tax Collection ISS, Water Supply ISS, and Solid Waste ISS modules.

	A	B	C	D
1	SWM customer ID	Customer Name	Customer Contact	Last Payment Date
2	SW000001	Sample Name	9898989898	2/8/2022
3				

Figure 15- 4 Downloaded Solid Waste ISS CSV Template



## **16. PROPERTY TAX COLLECTION INFORMATION SUPPORT SYSTEM (PTCISS)**

---

PTCISS is a value-added module integrated into the Integrated Municipal Information System (IMIS), designed to help municipalities monitor and manage property tax collection citywide through powerful map-based visualization tools. It enables city authorities to import property tax data maintained by the municipal property tax collection department into IMIS using a user-friendly data import tool supporting CSV formats. Once the data is integrated, property tax collection information is displayed in graphical formats on the IMIS dashboard and visualized on maps using tools provided by UMDSS. This facilitates quick and intuitive analysis of tax collection status across various parts of the city.

Mapping property tax data provides actionable insights by identifying high-default areas (regions with a significant number of defaulters) and efficient collection zones (areas with fewer defaulters or higher compliance rates). These insights enable the property tax department to focus on areas requiring attention, thereby improving efficiency and compliance. The information generated by PTCISS empowers city authorities to engage in strategic planning and evidence-based decision-making, allowing them to: (a) develop better tax collection strategies, (b) formulate effective policies to increase compliance, and (c) plan for equitable tax management across different city regions.

PTCISS also includes Data Export Tools, enabling municipal authorities to export building data along with their tax payment status. Additionally, it highlights mismatched tax records between the building data maintained in IMIS and the input tax data provided by the property tax department. This functionality helps identify and resolve discrepancies, ensuring data accuracy and transparency.

Currently, PTCISS relies on periodic manual updates using CSV-based imports to maintain data accuracy. However, the system is designed to be future-ready, with the capability to support real-time data integration through an API if the city's property tax collection system provides connectivity access. This upgrade would enable automated and efficient data synchronization as municipal technology evolves.

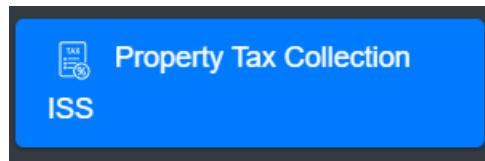
By leveraging the features and insights provided by PTCISS, municipalities can streamline property tax management, improve transparency, and enhance revenue collection efficiency. These improvements contribute significantly to better urban governance and equitable service delivery.

### **16.1 Property Tax Collection ISS**

The **Property Tax Collection Information Support System** sub-module imports data via CSV of the tax status of the buildings in the municipality.

## 16.1.1 Navigation to Property Tax Collection ISS

- Open the sidebar and select '**Property Tax Collection ISS**'.



### Overview:

- The user can view the lists of the application's building tax status.
- User can import the data via CSV of water supply payment data by clicking on the '**Import from CSV** (refer to section [16.1.2](#))
- The user can download the CSV Template to add the water supply data (refer to section [16.1.3](#)).
- Export the data (refer to section 8) and filter data (refer to chapter 5).

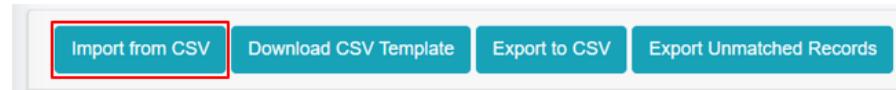
The screenshot shows a table with the following data:

Tax Code	BIN	Owner Name	Years Due	Ward
T000151	B000007		2 Years	8
T001501	B000006		2 Years	8
T004801	B000002		2 Years	1
T013201	B000013		2 Years	2
T018301	B000016		2 Years	7
TR-334/89	B000001	Sample Name	2 Years	5
TR4001-667	B000015		2 Years	3
TR4009	B000020		2 Years	3
TR4009/2234	B000014		2 Years	6
TR44/555	B000004		2 Years	6

Figure 16- 1 List of Property Tax Collection ISS

## 16.1.2 Import Property Tax Collection ISS

- Click on '**Import from CSV**' at the top left of the Property Tax Collection Information Support System page.



- This redirects to the **Import Property Tax Collection Information Support System** page.

### Overview:

- The user can upload the tax payment file in CSV format for the tax status of the building from this module.

The screenshot shows a web page titled "Import Property Tax Collection Information Support System". At the top, there are four buttons: "Import from CSV" (highlighted with a red box), "Download CSV Template", "Export to CSV", and "Export Unmatched Records". Below the title, there is a form for uploading a CSV file. The form includes a label "Upload Property Tax Collection Information Support System File", a file input field with the placeholder "Choose File No file chosen", and two buttons at the bottom: "Back to List" and "Upload". A red box highlights the entire file upload section.

Figure 16- 2 Import Property Tax Collection ISS CSV File

- Once the user selects the CSV file to be imported, they must click the **Upload** button to import the data. The user will then be notified with a green pop-up message indicating Successful import. Refer to Section 7.3 for more details.
- If the user attempts to import data in formats other than CSV (e.g., .docx, .jpeg), the system will notify the user with an error message, prompting them to review and correct the input format. Refer to Section 7.4 for more details.

### Note:

When entering data into the Property Tax Collection Information Support System CSV, user must adhere to the specified data structure for each field. The required structure for each field is outlined below:

A	B	C	D
1	Tax code	Owner Name	Owner Contact
2	T000001	Sample Name	9898989898
3			2/8/2022

Figure 16- 3 Data structure for each field in CSV

### 16.1.3 Download CSV Template

- Click on the '**Download CSV Template**' button at the top left of the Property Tax Collection Information Support System page.



#### Overview:

- A csv template file will be downloaded containing the sample data and the required title which is also necessary during the import of the csv file.
- Download CSV Template is available only in the Property Tax Collection ISS and Water Supply ISS Modules, and Solid Waste ISS module.

	A	B	C	D
1	Tax code	Owner Name	Owner Contact	Last Payment Date
2	T000001	Sample Name	9898989898	2/8/2022
3				
4				
5				

Figure 16- 4 Downloaded Property Tax Collection ISS CSV Template

## **17. WATER SUPPLY INFORMATION SUPPORT SYSTEM (WSISS)**

---

The WSISS is another value-added module within the IMIS, designed to enhance the management of water supply services and fee collection. The WSISS includes a data importing tool that allows municipalities to upload water supply customer data, including their last fee payment date, in CSV format. Based on this imported data, the WSISS module generates and maintains records of water supply customers along with their fee payment status. It also provides tools to export building data with their water supply service and fee payment statuses and highlights discrepancies by identifying records present in the municipality's water supply customer database but missing in IMIS.

Using the imported data, the UMDSS in IMIS enables municipal authorities to visualize the water supply fee payment status of buildings in maps of the City within IMIS. This capability allows municipalities to monitor fee collection statuses and assess geographic trends in water supply fee payments. By integrating water supply customer data with building information in IMIS, the WSISS module equips municipal authorities with actionable insights to make informed decisions regarding water supply services.

The visualized data provided by WSISS supports the development of policies aimed at improving water supply fee collection processes, optimizing resource allocation, and enhancing overall service delivery. This integration helps municipalities target areas requiring attention, ensuring more effective and equitable water supply service management.

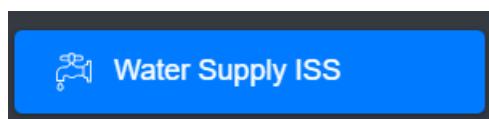
Currently, as with the PTCIIS and SWISS modules, the integration of data into WSISS must be carried out manually on a periodic basis to maintain accuracy.

### **17.1 Water Supply ISS**

The **Water Supply Information Support System** sub-module maintains information on Water Supply Bill Payment data.

#### **17.1.1 Navigation to Water Supply ISS**

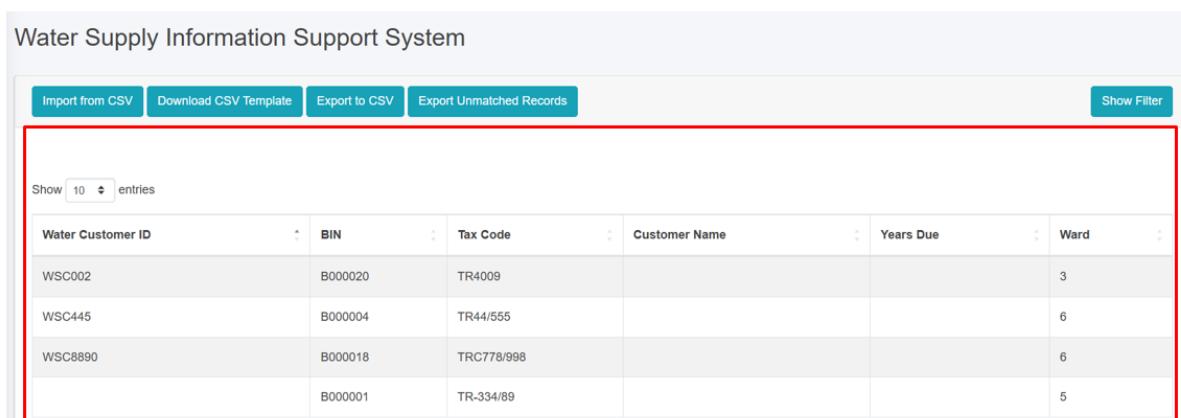
- Open the sidebar and select the *Water Supply ISS*.



#### **Overview:**

- The user can view the lists of applications for water supply payment data.

- User can import the data via CSV of water supply payment data by clicking on the '***Import from CSV*** (refer to section 17.1.2)
- The user can download the CSV Template to add the water supply data (refer to section 14.1.3).
- Export the data (refer to section 8) and filter data (refer to chapter 5).



Water Supply Information Support System

Water Customer ID	BIN	Tax Code	Customer Name	Years Due	Ward
WSC002	B000020	TR4009		3	
WSC445	B000004	TR44/555		6	
WSC8890	B000018	TRC778/998		6	
	B000001	TR-334/89		5	

Figure 17- 1 List of Water Supply ISS

### 17.1.2 Import Water Supply ISS

The Water Supply Information Support System List displays key attributes of the imported Water Supply Information Support System data. The Filter tools enable the user to filter out data as required. The Tools provide the user with the ability to import data from csv records and export them in CSV.

- Click on '***Import from CSV***' at the Top Left of the Water Supply Information Support System page.



#### Overview:

- The user can upload the Water supply data in CSV format to this module.

Import Water Supply Information Support System

Upload Water Supply Information Support System File

Choose File No file chosen

[Back to List](#) [Upload](#)

Figure 17- 2 Import Water Supply ISS CSV File

- Once the user selects the CSV file to be imported, they must click the **Upload** button to import the data. The user will then be notified with a green pop-up message indicating Successful import. Refer to Section 7.3 for more details.
- If the user attempts to import data in formats other than CSV (e.g., .docx, .jpeg), the system will notify the user with an error message, prompting them to review and correct the input format. Refer to Section 7.4 for more details.
- When entering data into the Water Supply Information Support System CSV, user must adhere to the specified data structure for each field. The required structure for each field is outlined below:

	A	B	C	D
1	Water customer ID	Customer Name	Customer Contact	Last Payment Date
2	WS000001	Sample Name	9898989898	2/8/2022
3				

Figure 17- 3 Data structure for each field in CSV

### 17.1.3 Download CSV Template

- Click on the '**Download CSV Template**' button at the top left of the Water Supply Information Support System page.



**Overview:**

- A csv template file will be downloaded containing the sample data and the required title which is also necessary during the import of the csv file.
- Download CSV Template is available only in the Property Tax Collection ISS and Water Supply ISS Modules, and Solid Waste ISS module.

	A	B	C	D
1	Water customer ID	Customer Name	Customer Contact	Last Payment Date
2	WS000001	Sample Name	9898989898	2/8/2022
3				

Figure 17- 4 Downloaded CSV Template

## Overview:

- The user can upload the Water supply data in CSV format to this module.

The screenshot shows a web-based application titled "Import Water Supply Information Support System". At the top, there is a red rectangular box highlighting the "Upload Water Supply Information Support System File" input field. To the right of this field is a "Choose File" button with the text "No file chosen". Below these elements are two blue rectangular buttons: "Back to List" on the left and "Upload" on the right.

Figure 17- 2 Import Water Supply ISS CSV File

- Once the user selects the CSV file to be imported, they must click the **Upload** button to import the data. The user will then be notified with a green pop-up message indicating Successful import. Refer to Section 7.3 for more details.
- If the user attempts to import data in formats other than CSV (e.g., .docx, .jpeg), the system will notify the user with an error message, prompting them to review and correct the input format. Refer to Section 7.4 for more details.

When entering data into the Water Supply Information Support System CSV, user must adhere to the specified data structure for each field. The required structure for each field is outlined below:

	A	B	C	D	E
1	Tax code	Owner Name	Owner Gender	Owner Contact	Last Payment Date
2	T000001	Person Name	Male	1234567890	6/16/2023
3	T000002	Person Name	Female	1234561230	1/29/2023
4	T000003	Person Name	Male	1234564561	7/25/2024

Figure 17- 3 Data structure for each field in CSV

### 17.1.4 Download CSV Template

- Click on the 'Download CSV Template' button at the top left of the Water Supply ISS page. (refer to section 16.1.3)

#### Note:

- For entering the data to Solid Waste Information Support System csv file, user must follow the specified data structure (refer figure [16-7](#))

## **18. URBAN MANAGEMENT DSS**

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The UMDSS is one of the core and powerful tools in IMIS, it provides advanced capabilities for spatial analysis, mapping, data export, and dashboard visualizations. These tools empower city authorities to engage in evidence-based planning, management, monitoring, and decision-making for planning, management and monitoring and evaluation of sanitation system and services as well as a broader municipal urban management activity. In addition to the UMDSS module, there are IMIS Dashboard, Building Dashboard under BIMS, FSM Dashboard under FSIMS, Utility Dashboard of IMIS, CWISIMS Module including CWIS and KPI dashboard under CWISIMS are also has been considered as the components of UMDSS.

The UMDSS provides Export Data and Map Feature Sub-modules.

Export Data:

- The Export Data sub-module enables users to export data layers in flexible formats such as SHP and KML. Users can customize exports by selecting specific ward(s) or combining layers to suit their needs.

Map Feature:

- The Map Feature is a powerful interactive map interface which provides a dynamic platform to visualize and analyze spatial data created by various modules and sub-modules in IMIS. It displays all spatial information with categorical styling based on attribute information, presenting summarized layers at city, ward and 0.5 km grid levels.
- The interface includes various spatial and complex tools that provide both basic and advanced functionalities, catering to a wide range of municipal operations. From navigation and visualization to sanitation-specific analyses and data updates, these features enhance decision-making by offering precise and actionable insights. These tools are – (i) Navigation and Map Interaction Tools (Zoom In & Zoom Out, Municipal Extent, Navigate, Info, Coordinate Information, Locate Point by Coordinate, (ii) Measurement Tools (Measure Distance, Measure Area), (iii) Printing and Support Tools (Print Map, Help), (iii) Sanitation-Specific Analysis Tools (Find Nearest Road, Find Building Connected to Containment, Find Containment Connected to Building, Find Associated Building, (iv) Editing Tools (Add Roads, Remove Markers).

The integration of tools like Find Nearest Road and Containment Analysis directly supports Citywide Inclusive Sanitation (CWIS) goals, while features like Measure Area, Print Map, and Add Roads contribute to broader urban management and planning efforts. By using these tools, municipal authorities can efficiently monitor sanitation systems, plan infrastructure upgrades, and ensure equitable service delivery across the city.

- UMDSS also offer some specialized tools – (i) Service Delivery Tools for tracking (Applications, Emptied Applications Not Reached to Treatment Plant, Containments

Proposed to Be Emptied, Feedback Chart (FSM Service Quality), (ii) General Tools for tracking (Buildings by Structure Type, Property Tax Collection, Water Supply), (iii) Data Export Tools (Filter by Wards, Export Data Set, Building Owner Information), (iv) Decision Tools (Tax Due Buildings, Sewers Potential Buildings, Buildings to Sewer, Buildings to Road, Hard to Reach Buildings, Building Close to Water Bodies, Buildings Using Community Toilets, Area Population), (V) Summary Information Tools (Summary Information Buffer Filter, Water Bodies Buffer Summary Information, Wards Summary Information, Road Buffer Summary Information, Point Buffer Summary Information).

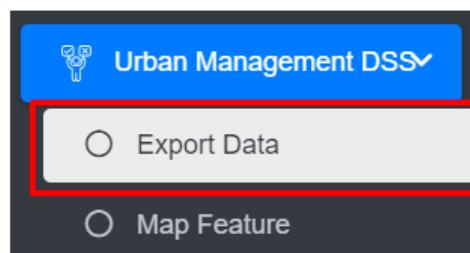
These tools enhance decision-making by providing targeted insights into property, utility, and demographic data. They allow municipalities to analyze specific areas, prioritize interventions, and support efficient planning, management and monitoring and evaluation of CWIS sanitation system and services, and overall urban management.

## 18.1 Export Data

All data layers stored in the IMIS system are available for export. There is an option to export layers within a specific ward. Layers can be exported in either a shape file or a KML file. This module supports further planning and analysis outside the IMIS system. Any GIS software can be used to view exported shape files. KML files can be easily viewed on Google Earth.

### 18.1.1 Navigation to Export Data

- Open the sidebar and click on '***Urban Management DSS***'.
- Select the ***Export Data***.



- This redirects to the ***Export to Shape File or Kml*** page.

## Overview:

- Fill out all the required fields.
- Enter a specific data layer that the user is interested in exporting. The checklist available in the Layers filter is not mutually exclusive, therefore the user has the option of selecting all layers, a specific data layer, or multiple data layers.
- Choose a desired spatial Filter between Wards. Depending upon the chosen spatial Filter, the user is provided with an option to select Wards. The checklist available in the Wards filter is not mutually exclusive, therefore the user can select more than one Wards if desired.
- Choose a desired export format between the Shape and KML files. A zipped file will be downloaded when the shape file is chosen.
- Click on the '**Download**' button.

Export to Shape File or KML

Layers	<input type="text"/>
Select Wards	<input type="text"/>
Export Format	<input type="text"/>
<b>Download</b>	

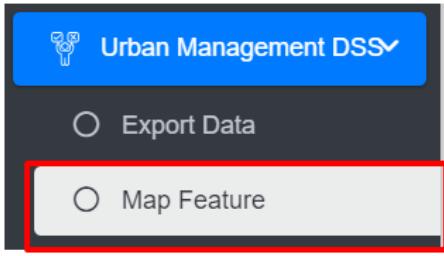
Figure 18- 1 Export to Shape File or KML file page

## 18.2 Map Feature

This is the main graphical web interface of IMIS where spatial visualization of data layers and other spatially assisted decision-making processes will be performed.

## 18.3 Navigation to Map Feature

- Open the sidebar and click on the **Urban Management DSS** to expand.
- Select the **Map Feature**.



- This redirects to the main section of Map Interface (refer Figure 18-2).
- The map has four main sections: General Tools, Map, Layers Tab, and Tools Tab.

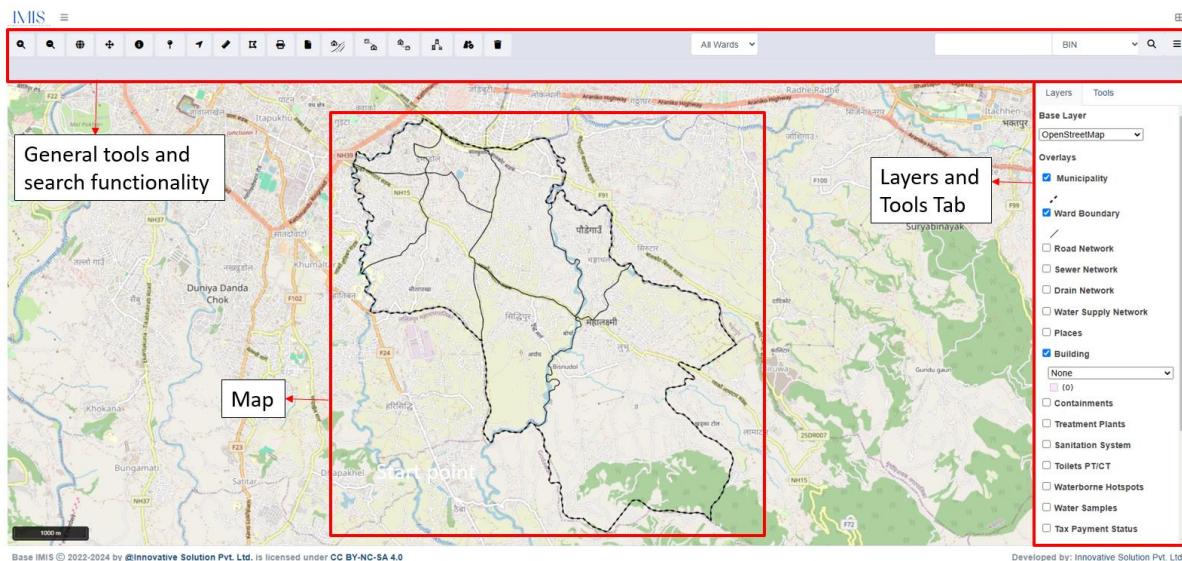


Figure 18- 2 Map

### 18.3.1 General Tools

General tools and search functionality are on the header (in the page's upper part). These tools are mainly for navigating around the map and performing basic operations e.g., measuring, printing, searching based on Ward No., BIN No., Point of Interest, etc.

Table 18- 1 General Tools Available on IMIS Web Map

**Zoom In**



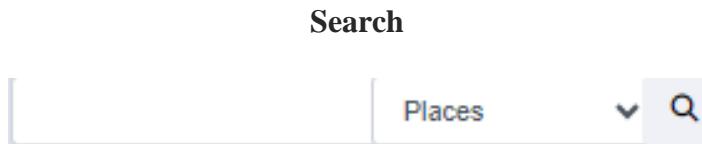
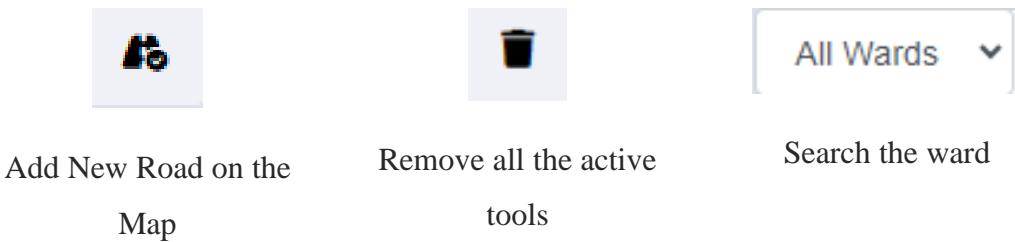
**Zoom Out**



**Municipality**



Allows to Zoom In within the map	Allows to Zoom Out within the map	Allow to zoom to Municipality
<b>Navigate</b>	<b>Info</b>	<b>Coordinate Information</b>
Allow to grab & navigate the map without zoom in/zoom out	Provides the info of the selected item	Shows the longitude and latitude of the selected location
<b>Locate Point by Coordinate</b>	<b>Measure Distance</b>	<b>Measure Area</b>
Shows the longitude and latitude of the searched location	Measure the distance of the line drawn	Measure the area of the polygon drawn
<b>Print</b>	<b>Help</b>	<b>Find Nearest Road</b>
Prints the visible area of the map	Displays the Help page	Finds the Nearest road from the marker
<b>Find Buildings to Containment</b>	<b>Find Containments to Building</b>	<b>Find Associated Buildings</b>
Displays Buildings Connected to Containments	Find Containments Connected to Buildings	Find Building associated with Other Building
<b>Add roads</b>	<b>Remove Markers</b>	<b>Ward Outline</b>



Search Point of Interest, BIN, or roads by name.

### a) Info

- Zoom to an area of interest using navigation tools such as Zoom In, Zoom Out & Navigate (Pan)
- Click on Info to activate it.
- A pop-up containing a list of layers is displayed.
- Select the desired layer and then click at the desired point location of interest.

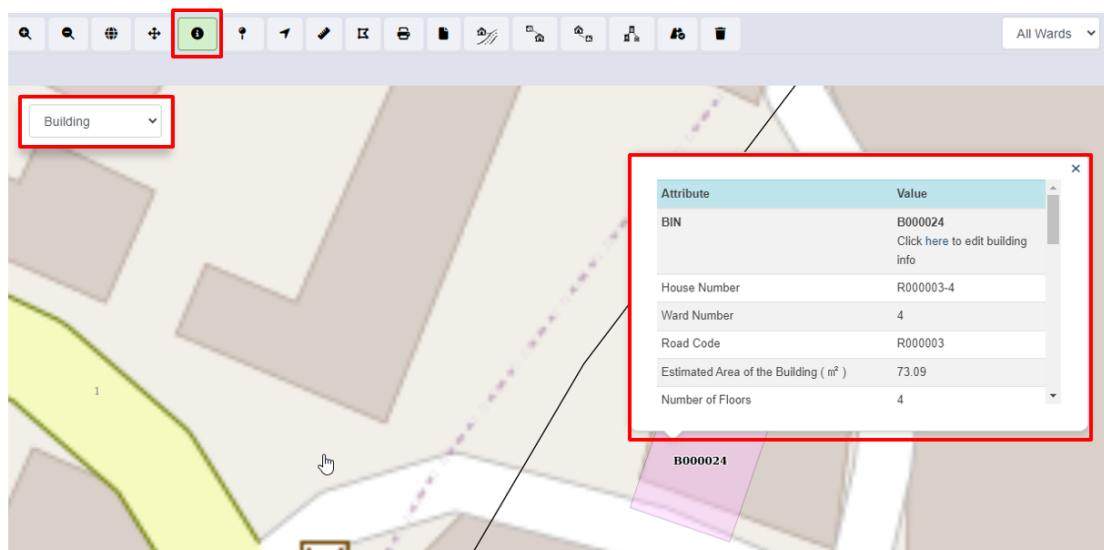


Figure 18- 3 Map Info

### Overview:

- Users can see the Attributes and Corresponding Values of the desired layer.
- This tool displays detailed attribute information of the selected layer at the point clicked on the Map. If there are no data layers at a clicked point, no information will be returned. Information will be displayed at the bottom of the map.

## b) Coordinate Information

- Zoom to an area of interest using navigation tools such as Zoom In, Zoom Out, and Navigate (Pan).
- Click on the ‘Coordinate Information’ tool to activate it.
- Click on the ‘Coordinate Information’ tool to deactivate it.
- Click on a location on the map to get coordinate information of that clicked point.

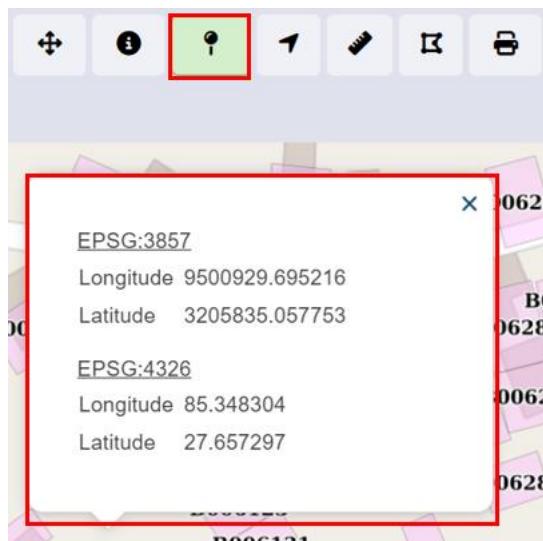


Figure 18- 4 Coordinate Information

### Overview:

- This tool will provide coordinate information of a clicked point on a map. Coordinates information is provided in two coordinate systems (EPSG: 3857 & EPSG: 4326).

## c) Locate Point by Coordinate

- Activate the tool by selecting it.
- Fill in the necessary longitude and latitude information on a point of interest.
- Click on the **Search** button and the point is located on the map.

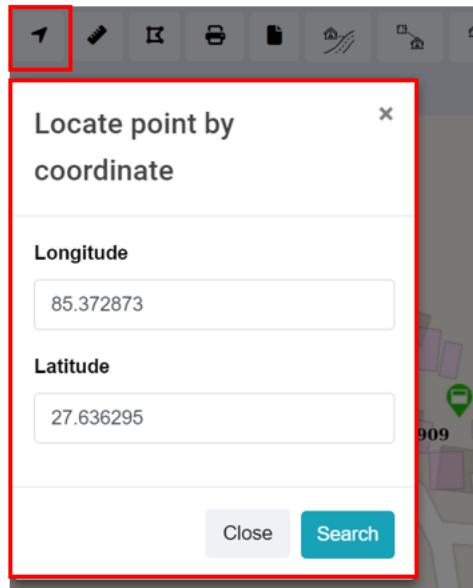


Figure 18- 5 Locate Coordinates by Point

#### d) Measure Distance

- Zoom to an area of interest using navigation tools such as Zoom In, Zoom Out, and Navigate (Pan).
- Click on the '**Measure Distance**' tool to activate it.
- Click on a location on the map (Start Point of a line) and drag the line appearing on the map to another location (End Point line). Distance information is provided in meters. Double Click to finish.
- Click on '**Measure Distance**' again to exit the tool.

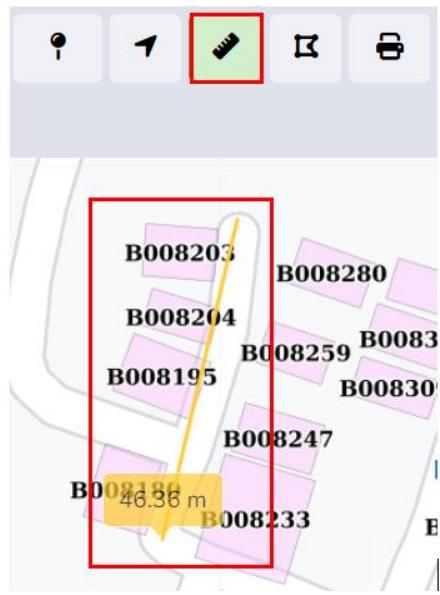


Figure 18- 6 Locate Coordinates by Point

### Overview:

- This tool is useful if the user wants to measure distances on the map. E.g., the user may want to measure how far a building is from a road.

### e) Measure Area

- Zoom to an area of interest with navigation tools such as Zoom In, Zoom Out, and Navigate (Pan).
- Click on the Measure Area tool to activate it.
- Click on a series of locations on the map that represent the boundary of an area. Area information is provided in square meters. Double Click to finish.
- Click on Measure Area again to exit the tool.

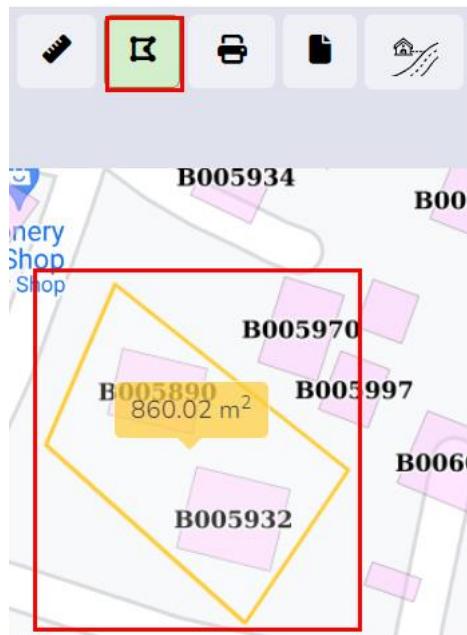


Figure 18- 7 Maps-Measure Area of Polygon

### **Overview:**

- This tool is useful if the user wants to measure an area in the map.

### **f) Print**

- Arrange a view on the map as desired and turn on/off data layers as desired.
- Activate the Print tool by clicking it.
- A pop-up will appear where the user needs to enter Title and Comments if any on the displayed output.
- The scale chosen determines the size of the bounding box which will encompass the map's print boundary. The bounding box can be dragged as required.
- The paper size, DPI, and orientation can also be set as desired, then Click Print.

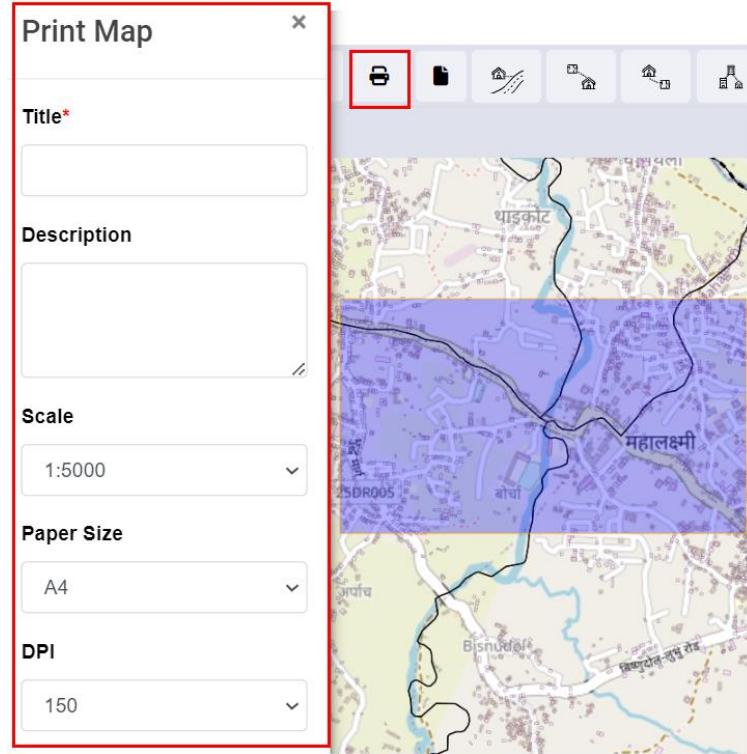


Figure 18- 8 Map Print

### g) Find Nearest Road

- Toggle on building, road, and containment layers with an underlying base layer.
- Activate the Find Nearest Road tool.
- Click any point on the map. The nearest Road will be shown with a Marker. Use the Info tool to get information about the Nearest Road, if needed. Use the Measure Distance tool to get distance information between clicked location and the nearest road, if needed.
- Click the **Remove Markers** tool to get rid of markers from the map.

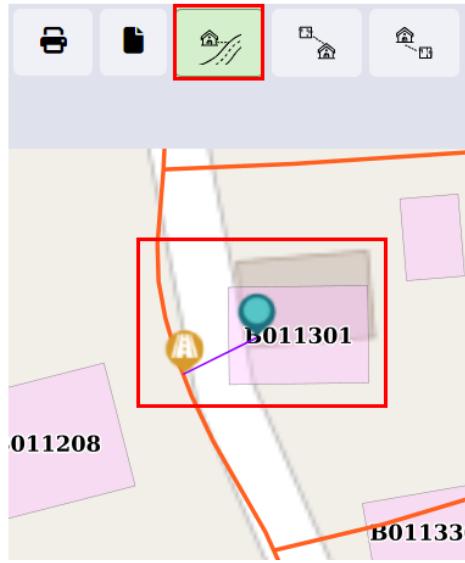


Figure 18- 9 Maps- Nearest Road

## Overview

- User can **find the nearest road** from the desired location.

### *h) Find Buildings Connected to Containment*

- Activate the tool.
- Select the containment for which you want to search the building for the building found is outlined.
- Click the ‘**Remove Markers**’ tool to get rid of markers from the map.

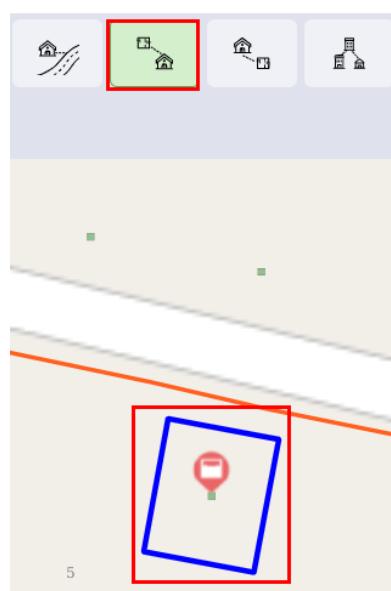


Figure 18- 10 Map- Find Buildings to Containments

## **Overview:**

- User can find the Buildings connected to Containment.

### *i) Find Containments Connected to Building*

- Activate the tool.
- Select the building you want to search for the containment.
- The containment is displayed via markers.
- Click the Remove Markers tool to get rid of markers from the map.

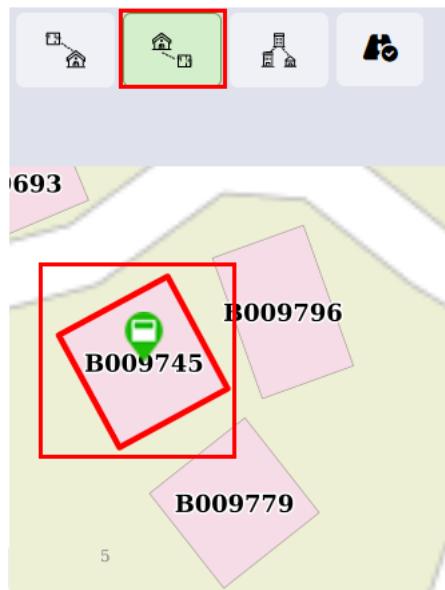


Figure 18- 11 Map- Find Containment to Building

## **Overview:**

- User can find Containments connected to a building.

### j) Find Associated Buildings

- Activate the tool.
- Select the main building of which you want to find associated buildings.
- The building is displayed via markers.
- Click the Remove Markers tool to get rid of markers from the map.



Figure 18- 12 Map- Find Associated Building

### Overview:

- Users can find the Associated Building.
- There can be situations where there are multiple small buildings that serve as auxiliary buildings to the main building. It can be a house-help quarter, guard quarters, or such.
- This tool allows the user to identify all associated buildings of the main building.

### k) Add roads

- Activate the add road tool.
- A navbar will pop up with tools under the tool row.



Figure 18- 13 Map- Add Roads

- For reference chapter 14.2.2

### *l) Remove Markers*

- Click on the **Remove Markers**.
- Markers are removed from the map.

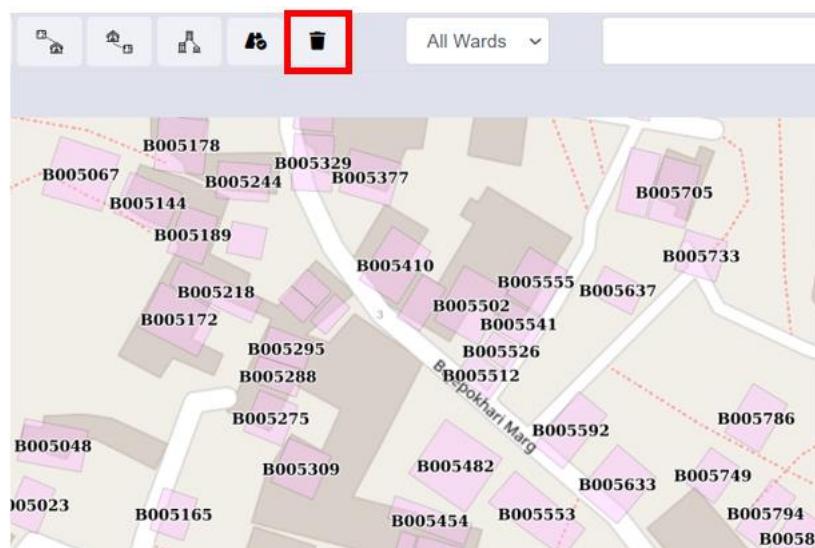


Figure 18- 14 Map- Remove Marker

### **Overview:**

- Users can remove markers from the map tools.
- Some of the tools in Tools TAB (e.g., Find Nearest Road) generate temporary Markers for visualization on the map. This tool is used for removing such Markers.

### *m) Search*

- Choose the desired criteria.

- Type a Code based on which building needs to be located on the map.
- Click the Search button.

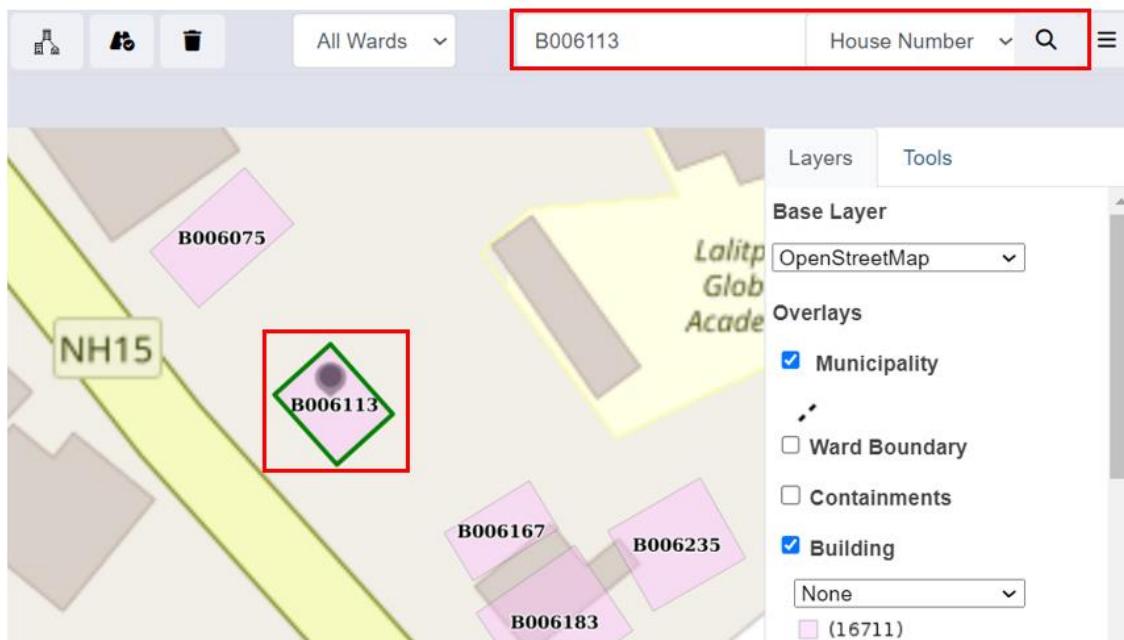


Figure 18- 15 Map- Search using BIN Code

### Overview:

- Users can search specific roads, buildings, and places.
- If the user wants to navigate to a specific location (E.g., specific road, specific building based on Holding No.) in the map, search tools are extremely beneficial.
- The search tool provides a criterion to search for a specific building based on criteria such as BIN, Holding No, Tax Code, Landmarks, or Road code.

### 18.3.2 Layers TAB

The Layers TAB in IMIS provides a map-based interface where users can visualize information from various modules and submodules. It also allows users to select their preferred base layer (e.g., Google, Bing, OSM) for viewing the map. In the 'Overlays' section of the Layers tab, users can choose specific layers to display on the map. These layers represent data maintained in the various submodules and modules of IMIS and the styles present in the individual dropdowns are based on the attribute information maintained in their respective sub modules. For example, if a user selects the '**Buildings**' layer, the attributes of the '**Buildings**' sub module will be listed in the dropdown, and the user can select the attribute they want to visualize in the

map. User can also select Summarized Grids layer (0.5 km grid) to view the spatial status of the Municipality based on specific criteria, e.g., No. of Buildings, Wards, etc.

**Note:** The list of data layers available to a user is governed by their login credentials.

- Click the nearby checkbox to toggle ON/OFF a specific data layer.

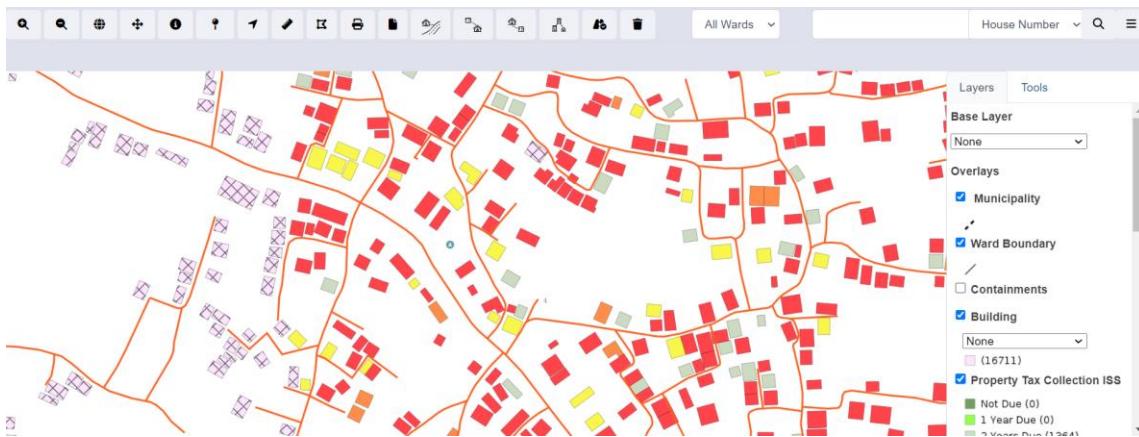


Figure 18- 16 Visualization of different Layers based on two different criteria

### Overview:

- If a data layer has multiple visualization options, a drop-down list will appear.
- Change the options in the list to change visualization based on different attributes of the data layer.

### 18.3.3 Tools TAB

Tools TAB enlists different specialized tools developed specifically to cater to the needs of various users of IMIS. There are altogether 20 different tools categorized under different headings such as Service Delivery Tools, General Tools, Data Export Tools, Decision Tools, and Summary Information. The availability of tools will be governed by the login credentials of the user.

Table 18- 2 Tools

Tools	Function
<b>Service Delivery Tools</b>	
 Applications +	Displays all the received applications for emptying services on a map, with markers color-coded according to the status of each application. User can filter the data according to the Year and Month or a specific date.

	Red Marker	Application Only
	Blue Marker	Application and Emptying Services
	Yellow Marker	Application, Emptying Services, and Feedback
	Green Marker	Application, Emptying Services, Sludge Collection, and Feedback collected

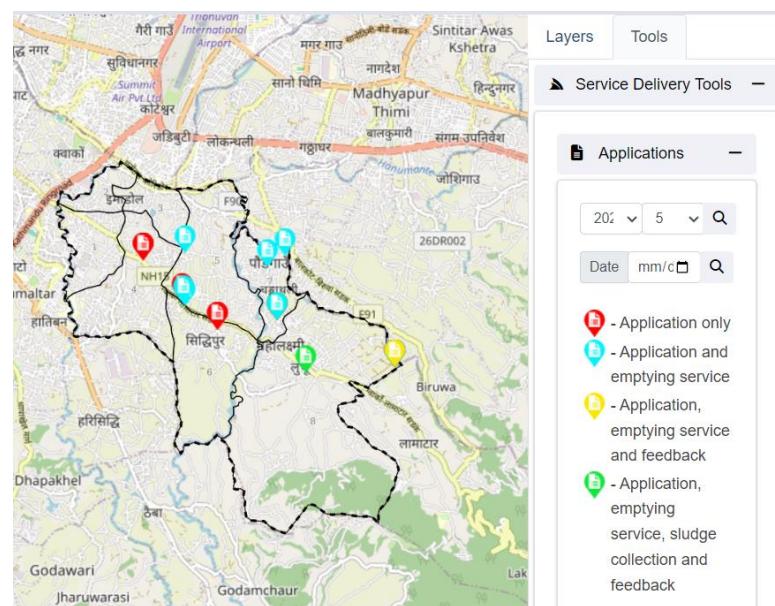


Figure 18- 17 Map Tool- Application

<input checked="" type="checkbox"/> Emptied Applications not reached to Treatment Plant	+ <span style="float: right;">Displays applications on the map where the containment has been emptied, but the collected fecal sludge has not yet reached the treatment plant. Markers are color-coded based on the Service Provider.</span>
---	--

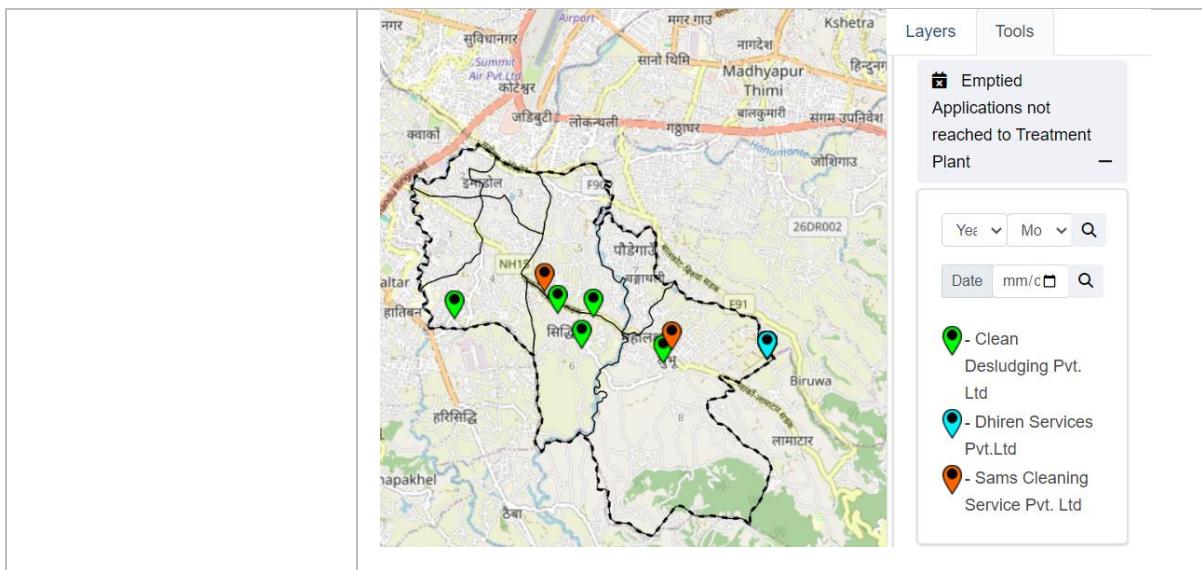


Figure 18- 18 Map Tools- Applications that have not reached the treatment plant

	<p>Displays containments proposed for emptying within the days or date selected by the user on the map.</p> <table border="1"> <tbody> <tr> <td>Next X days</td><td>If the user wants to find potential applications for emptying in the coming X days</td></tr> <tr> <td>Next Week</td><td>If the user wants to find applications for emptying in the Next Week</td></tr> <tr> <td>Date</td><td>If the user wants to find applications for emptying on a specific date</td></tr> </tbody> </table> <p><b>■ Containments proposed to be emptied</b> +</p>	Next X days	If the user wants to find potential applications for emptying in the coming X days	Next Week	If the user wants to find applications for emptying in the Next Week	Date	If the user wants to find applications for emptying on a specific date
Next X days	If the user wants to find potential applications for emptying in the coming X days						
Next Week	If the user wants to find applications for emptying in the Next Week						
Date	If the user wants to find applications for emptying on a specific date						

Figure 18- 19 Map Tools- Containments proposed to be emptied

This tool can be integral to the daily activities of the Service Provider by allowing them to view applications that need emptying within the selected time frame directly on the map, helping them plan routes for efficient service delivery.

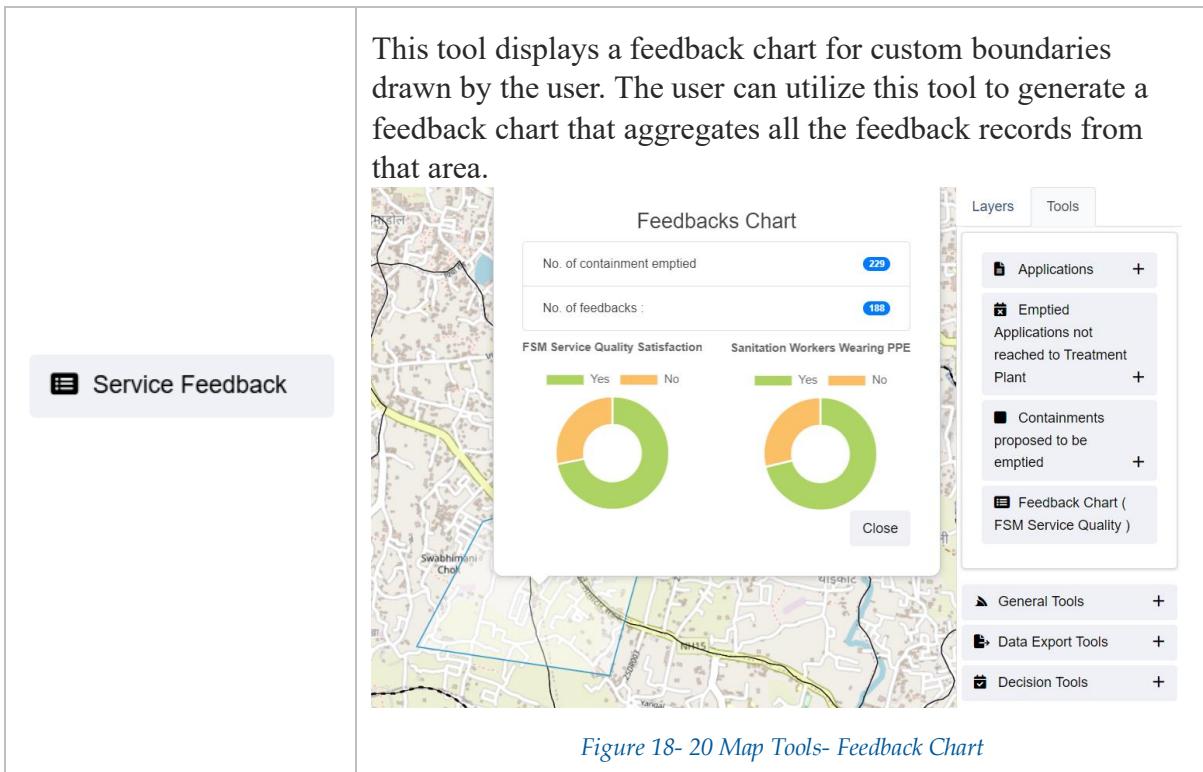


Figure 18- 20 Map Tools- Feedback Chart

## General Tools

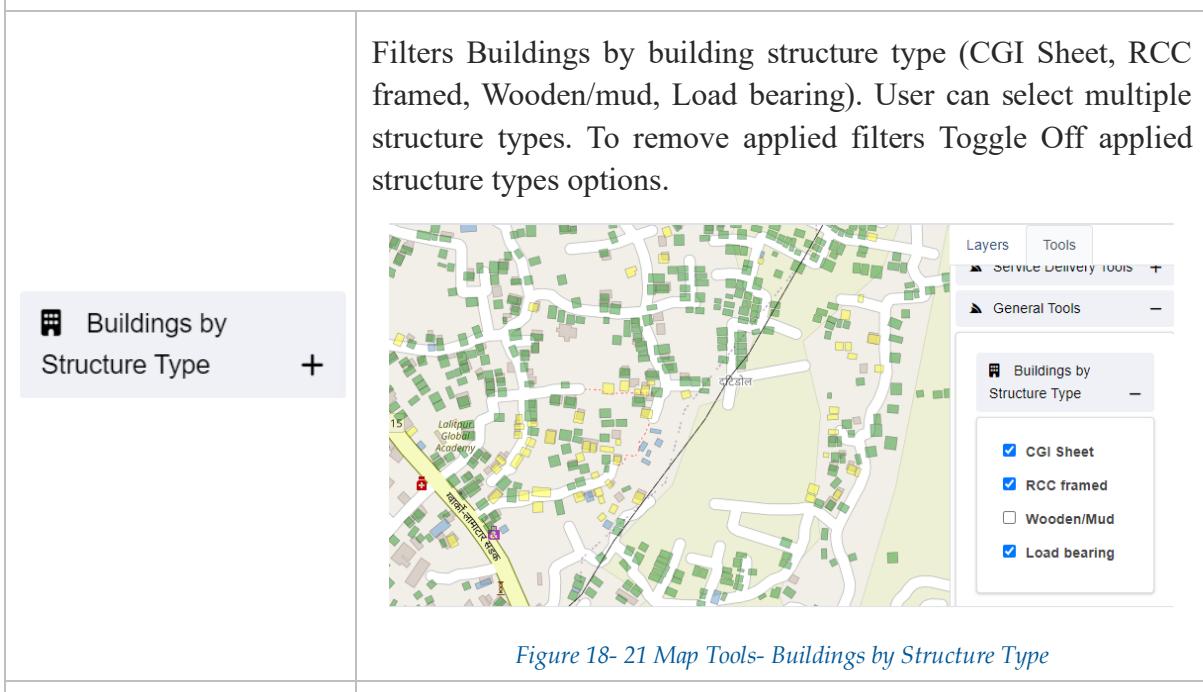
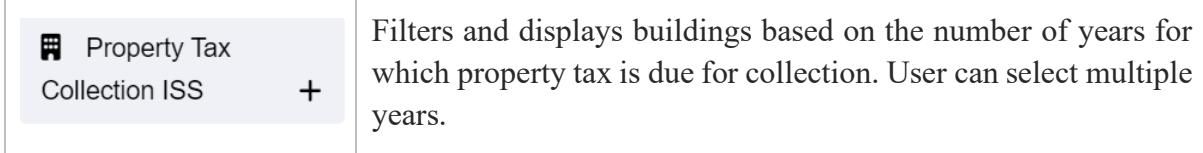


Figure 18- 21 Map Tools- Buildings by Structure Type



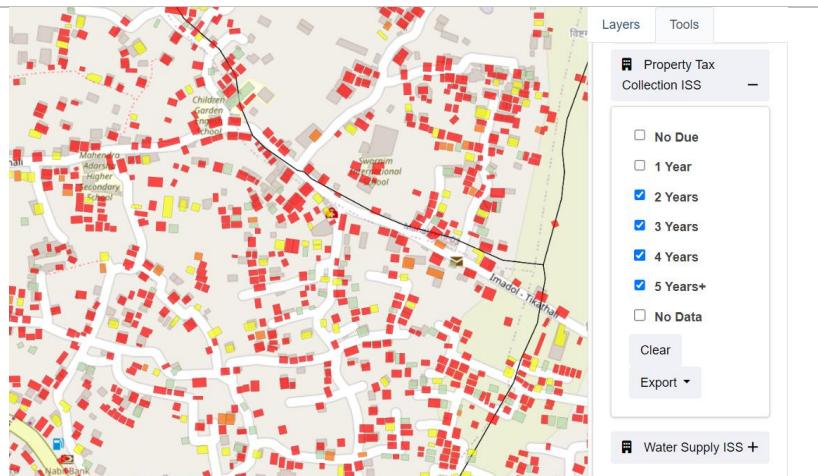


Figure 18- 22 Map Tools- Building by Tax Payment Status

Filters and displays buildings based on the number of years for which water supply payment is due for collection. User can select multiple years

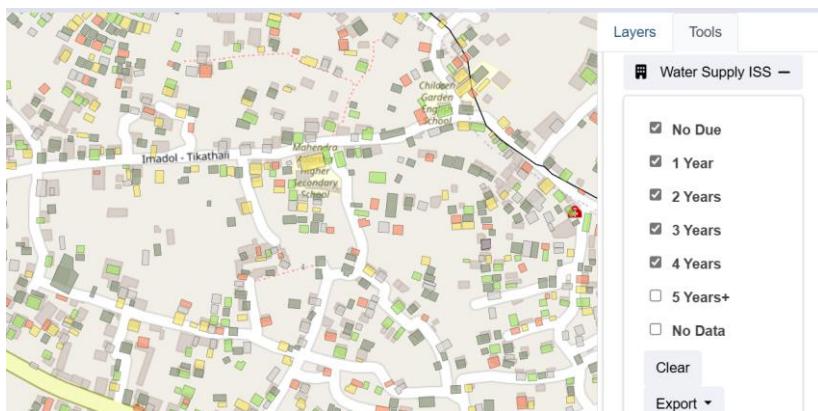


Figure 18- 23 Buildings by Water Supply Payment Status

## Data Export Tools

Filter by Wards +

Filter data layers according to selected wards. User can select multiple wards and multiple data layers desired for export and choose an export format (CSV, KML, Shape File) under the Export drop-down. Click the Clear button to remove the applied filter.

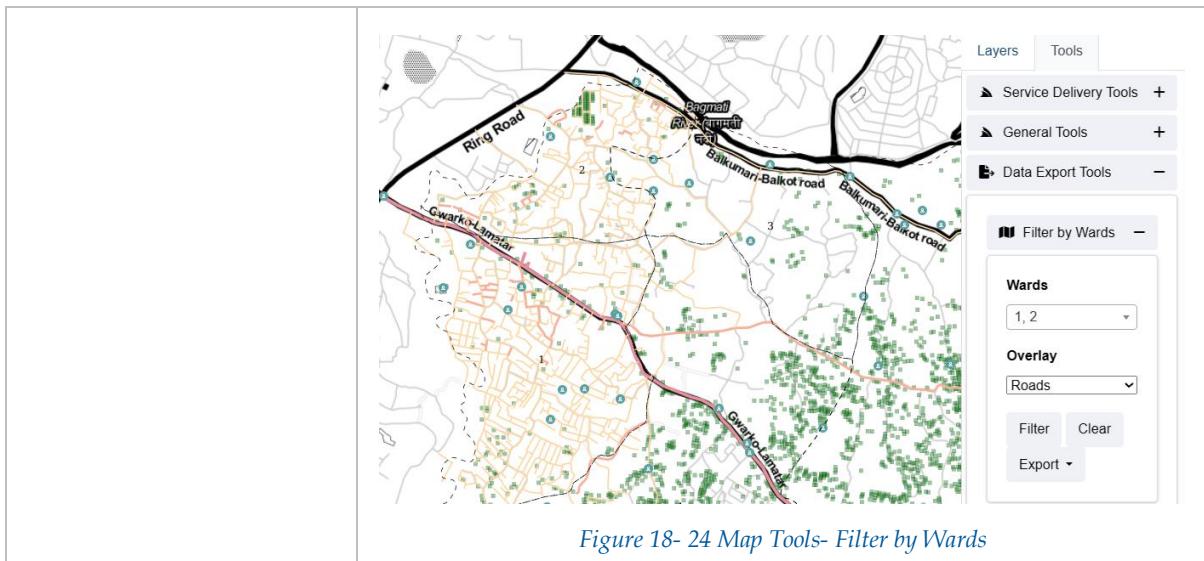


Figure 18- 24 Map Tools- Filter by Wards

Enables the user to select an area by drawing a polygon, choose the overlay, and select the export format for the dataset of the chosen area. Deactivate the Export Data Set tool by clicking it again.

Export Data Set

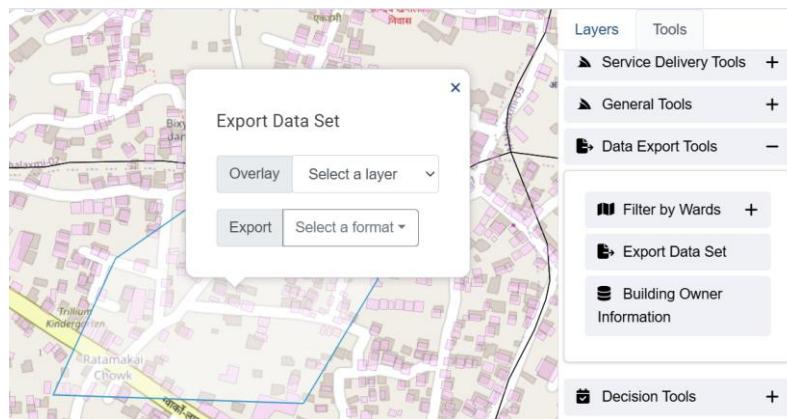


Figure 18- 25 Map Tools- Export Data Set

Building Owner Information

Allows the user to obtain information about buildings' owners maintained in the Building IMS module by selecting an area of interest

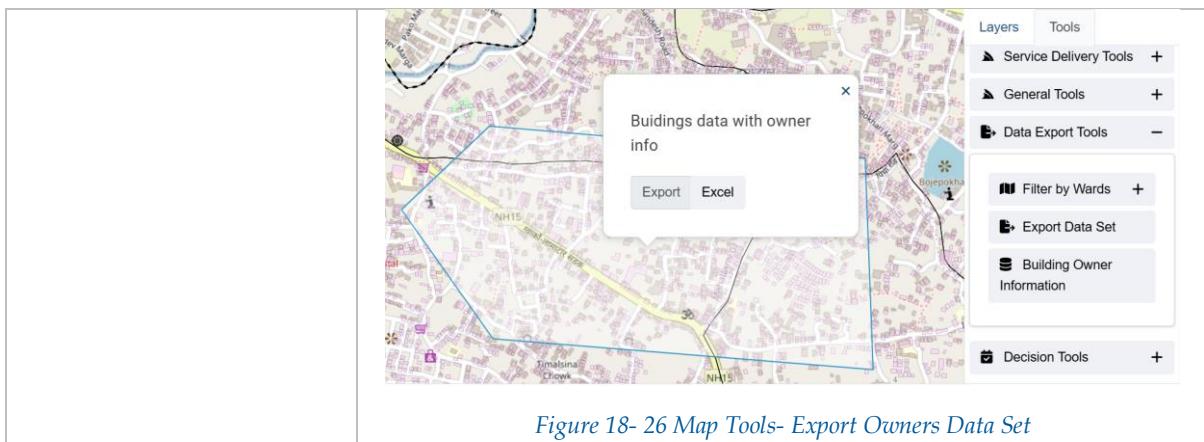


Figure 18- 26 Map Tools- Export Owners Data Set

## Decision Tools

	<p>Shows buildings that are due to pay taxes, the user can also filter according to the ward.</p> <p><b>Decision Tools</b></p> <p><b>Tax Due Buildings +</b></p>
<b>Sewers Potential Buildings</b>	<p>Highlights buildings that have the potential of being connected to the sewer line selected by the user. User must activate Sewer in the layer tab to select a sewer line.</p>

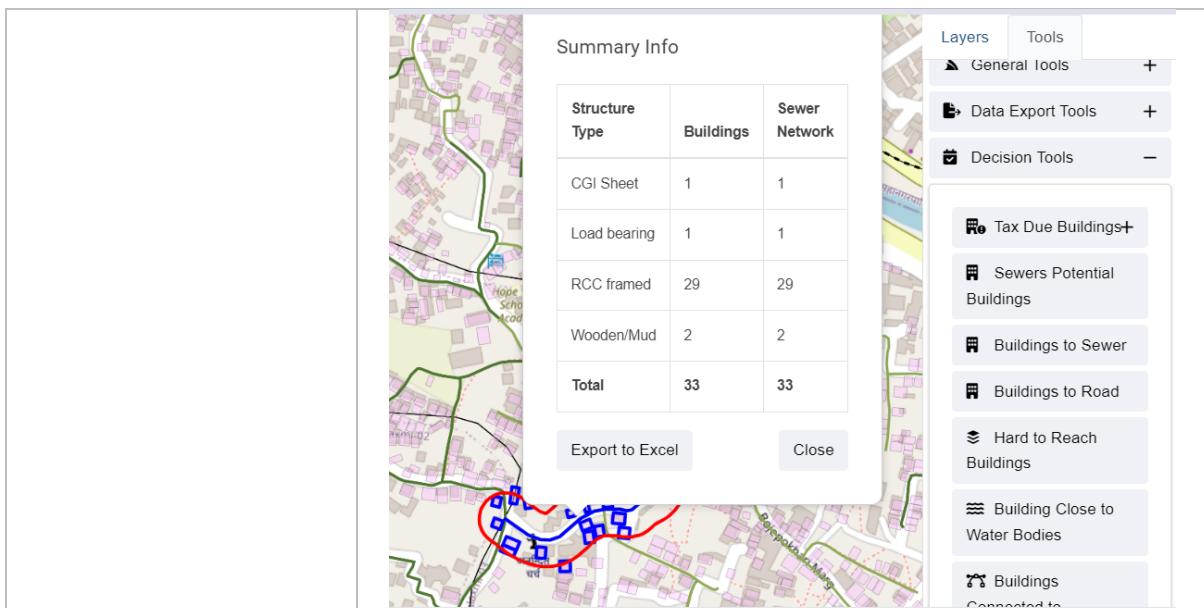


Figure 18- 28 Map Tools- Sewer Potential Buildings

Highlights buildings connected to the sewer line selected by the user. User must activate Sewer in the layer tab to select a sewer line.

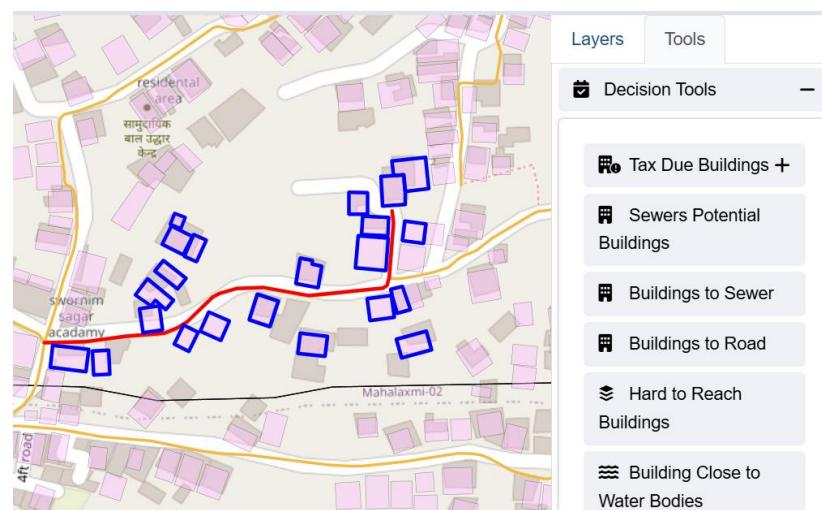


Figure 18- 29 Map Tools- Buildings Connected to Sewer

**Buildings to Road**

Highlights buildings connected to the road selected by the user. User must activate road in the layer tab to select a road.

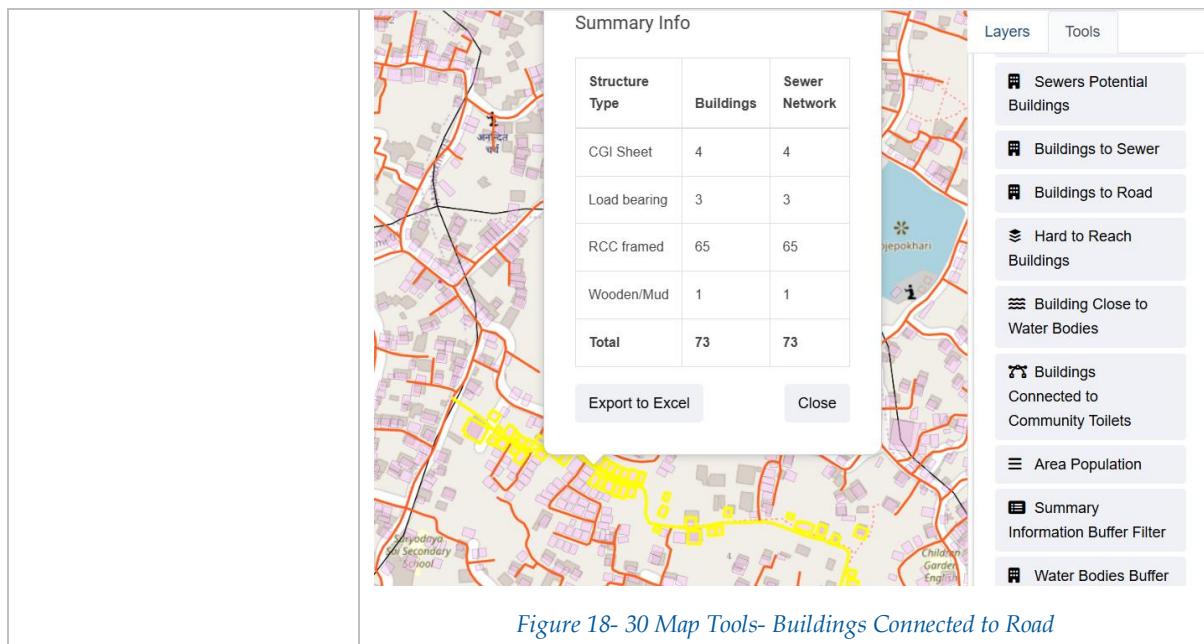


Figure 18- 30 Map Tools- Buildings Connected to Road

Highlights the buildings that are hard to reach by Vaccutugs. The user must fill out the Carrying width and the Hose Length of the Vaccutug.

#### Hard to Reach Buildings

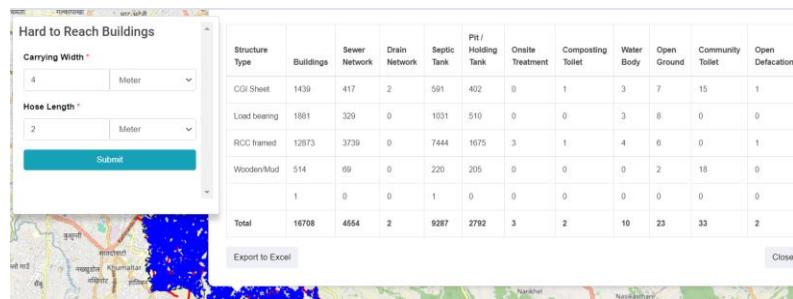


Figure 18-31 Map Tools- Hard to Reach Buildings

Highlights buildings that are within the user set buffer distance of the ponds and rivers.

#### Building Close to Water Bodies

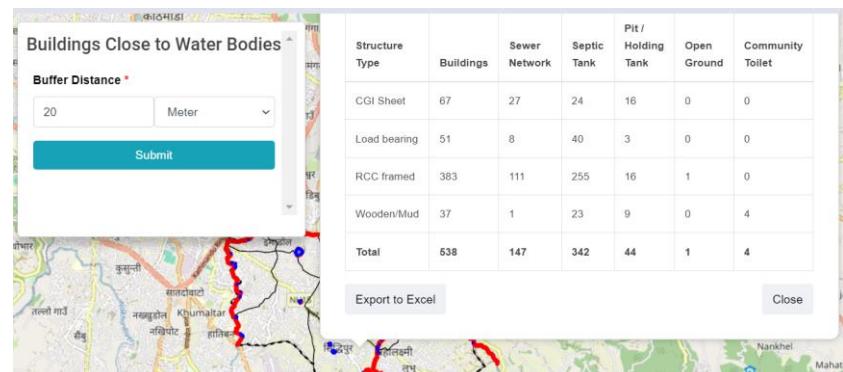


Figure 18-32 Map Tools- Buildings Close to Water Bodies

Shows the buildings that use the community toilet selected by the user. User must activate the Toilets PT/CT in the layer tab and select operational community toilet, in order for all the community toilets to be shown in the map.

#### Buildings using Community Toilets

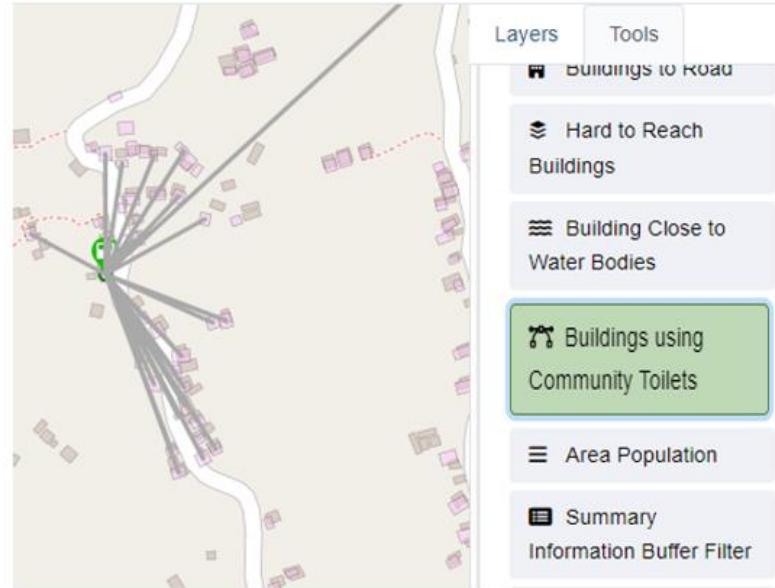


Figure 18-33 Map Tools Building Connected to Community Toilets

Calculates and displays the total population within the area drawn by the user.

#### Area Population

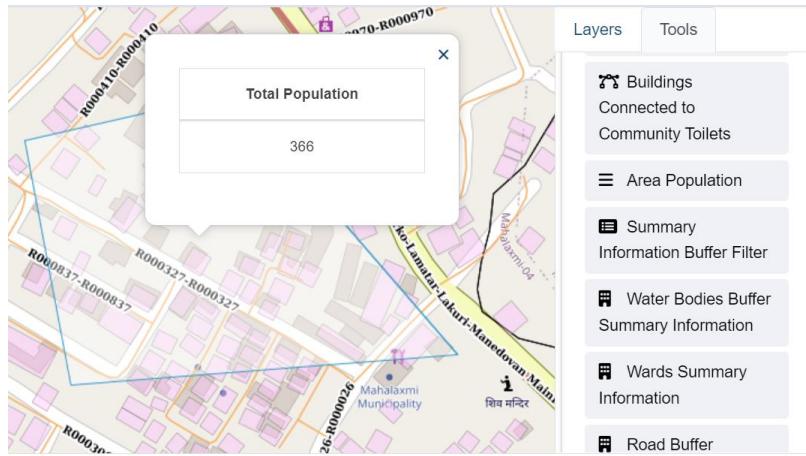


Figure 16- 34 Map Tools- Area Population

#### Summary Information Buffer Filter

Generates information on buildings and Sewer Network within the custom boundary set by the user in the range of the buffer value

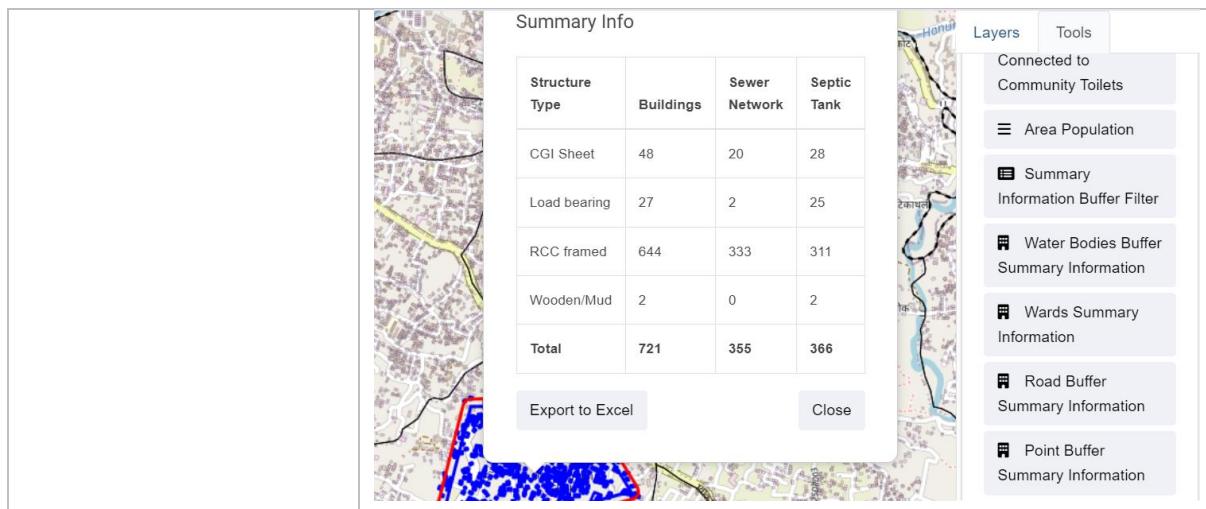


Figure 18- 35 Map Tools- Summary Information Buffer Filter

Generates information of buildings and Sewer Network that are in the buffer zone, set by the user, of the user selected water body. User must activate water bodies in the Layers tab to select the water body.

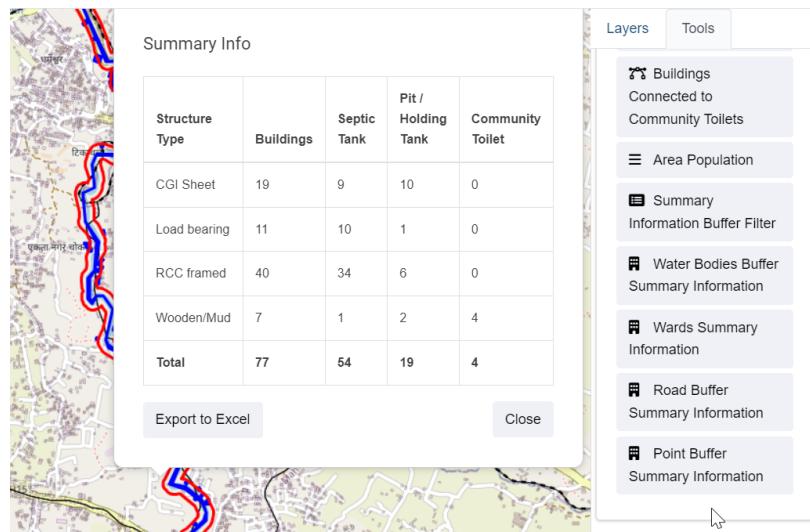


Figure 18- 36 Map Tools- Water Bodies Summary information

#### Water Bodies Buffer Summary Information

Generates information of buildings and Containments of the user selected ward. User can click any point within the ward to select the ward.

#### Wards Summary Information

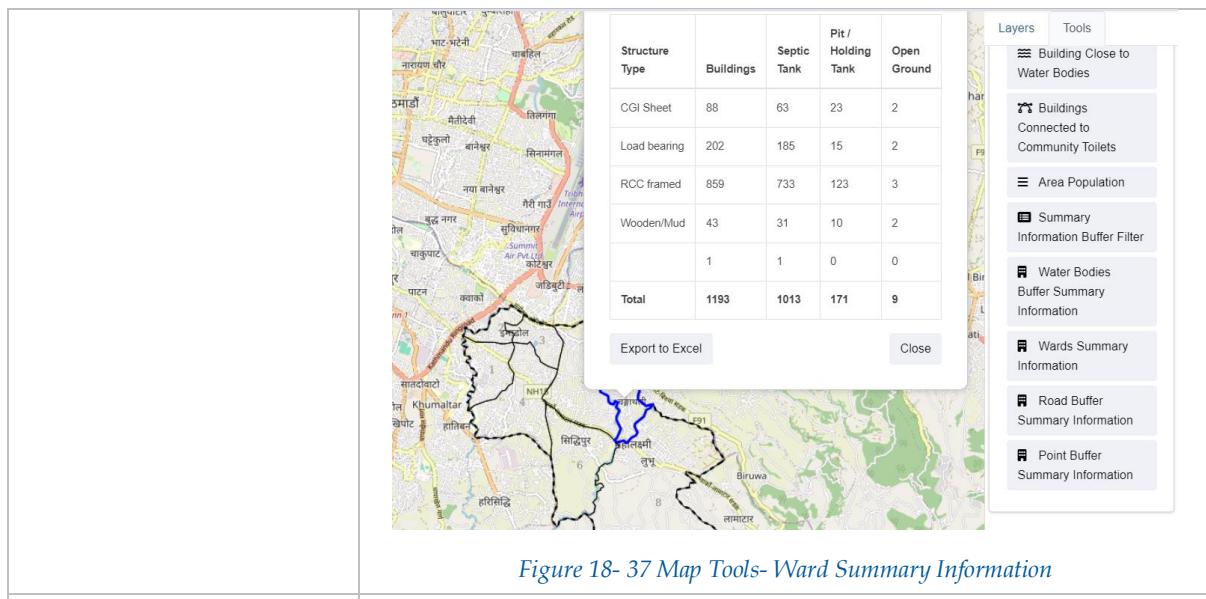


Figure 18- 37 Map Tools- Ward Summary Information

Generates information of buildings and containments that are in the buffer distance, set by the user, of the user selected road. User must activate road in the Layers tab to select a road.

#### Road Buffer Summary Information

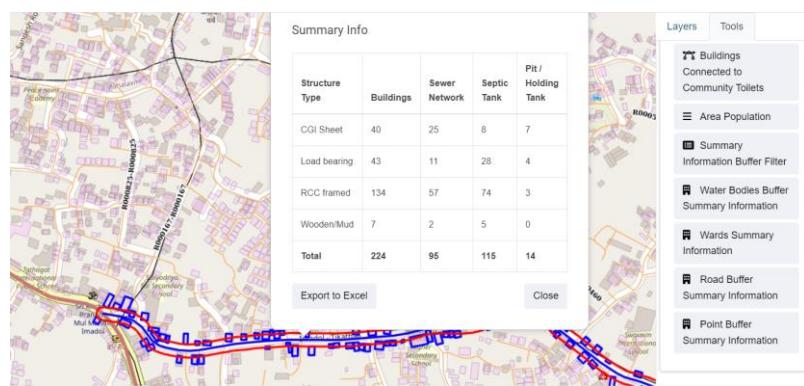


Figure 18- 38 Map Tools- Road Buffer Summary Information

Generate information on buildings and containments that are in the buffer zone, set by the user, of any point selected in the map.

 Point Buffer  
Summary Information

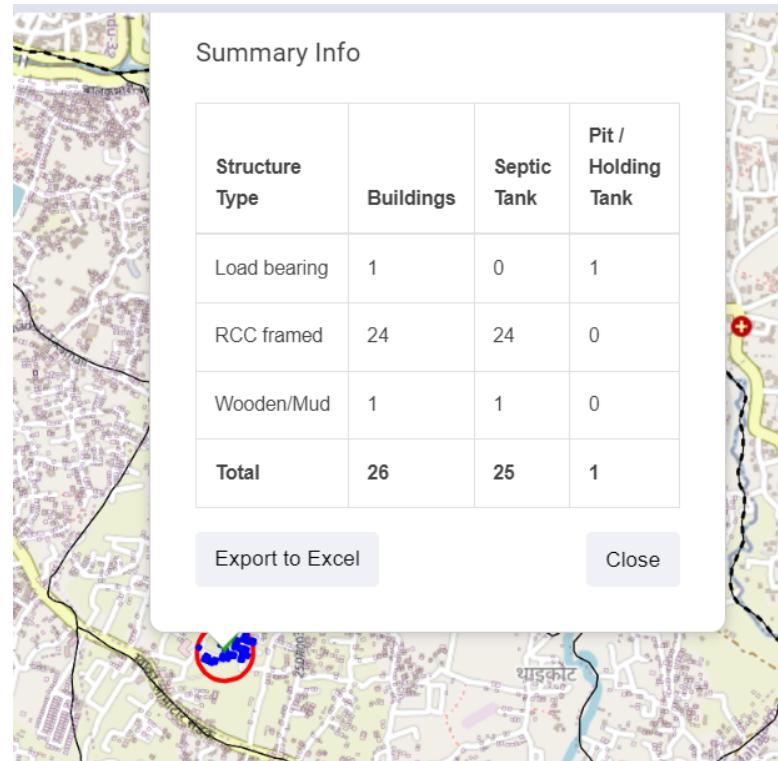


Figure 18- 39 Map Tools- Point Buffer Summary Information

## **19. PUBLIC HEALTH ISS**

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PHISS is another core module of the IMIS, designed to empower municipalities in monitoring and addressing public health and sanitation challenges. PHISS enables the collection and maintenance of water sample data from various sources, including groundwater, surface water, and treated wastewater, to ensure compliance with water contamination standards. This functionality directly aligns with the CWIS objective of monitoring environmental outcomes associated with sanitation systems. Additionally, PHISS records and tracks cases of waterborne diseases across the city, providing municipalities with crucial data to understand and mitigate public health risks.

One of the standout features of PHISS is its ability to maintain spatial and attribute data related to hotspot areas where waterborne diseases, such as diarrhea, cholera, dysentery, and typhoid, have been detected. The system also tracks fatalities linked to these diseases, offering a comprehensive overview of the impact on affected households and populations. By integrating this information with the UDSS municipal authorities can conduct detailed analyses of disease prevalence and its underlying causes. This data-driven approach enables strategic planning, targeted interventions, and efficient allocation of resources to reduce health risks in vulnerable areas.

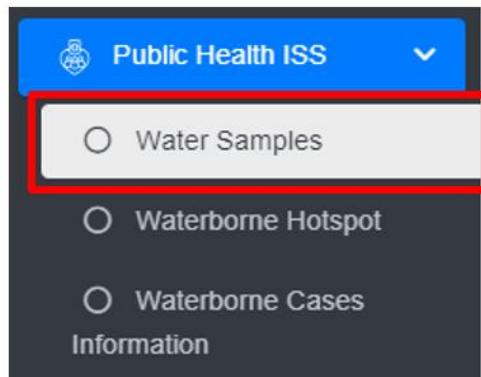
Water sample data and waterborne cases data maintained by PHISS helps municipality to monitor the CWIS indicators (i) Water contamination compliance of the water sources such as groundwater, surface water and treated wastewater, and (ii) Incidence of faecal-oral pathway diseases (e.g. diarrhea, cholera, dysentery and typhoid). With this information, municipalities can assess the effectiveness of sanitation systems in protecting public health and identify areas requiring urgent attention. By addressing these indicators, PHISS supports municipalities in achieving CWIS objectives, ensuring safe water quality and reducing the prevalence of sanitation-related diseases. The data export tools under PHISS allow users to export data in CSV, Shape and KML format where applicable.

### **19.1 Water Samples**

Water Samples sub-module maintains the information regarding the water quality testing with a focus on coliform bacteria levels as an initial indicator of potential water contamination. This module records the spatial location where the samples were taken.

#### **19.1.1 Navigation to Water Samples**

- Open the sidebar and click on ***Public health ISS*** to expand.
- Select the ***Water Samples***.



- This redirects to the **Water Samples** page.

### Overview:

The Water Samples page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. This page displays the overall sample data taken from the water quality testing. For more details on the Action buttons refer to Section 6.

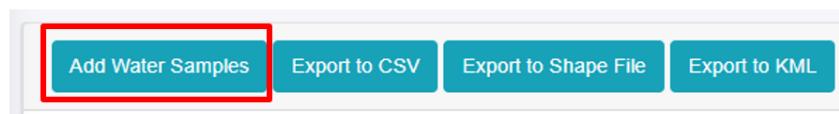
A screenshot of the "Water Samples" list page. The page has a header with buttons for "Add Water Samples", "Export to CSV", "Export to Shape File", "Export to KML", and "Show Filter". Below the header is a table with one row of data. The table has columns for ID, Sample Date, Sample Location, Water Coliform Test Result, and Actions. The data row shows ID 2, Sample Date 2024-05-29, Sample Location mahalaxmi, Water Coliform Test Result Positive, and a set of action icons.

ID	Sample Date	Sample Location	Water Coliform Test Result	Actions
2	2024-05-29	mahalaxmi	Positive	

Figure 19-1 List of Water Samples

### 19.1.2 Add Water Samples

- Click on the '**Add Water Samples**' button.



- This redirects to **Add Water Samples** form page.

## Add Water Samples

Sample Date\*

Sample Location\*

Water Coliform Test Result\*

Click to set Latitude and Longitude\*

Back to List Save

Figure 19-2 Add Water Samples

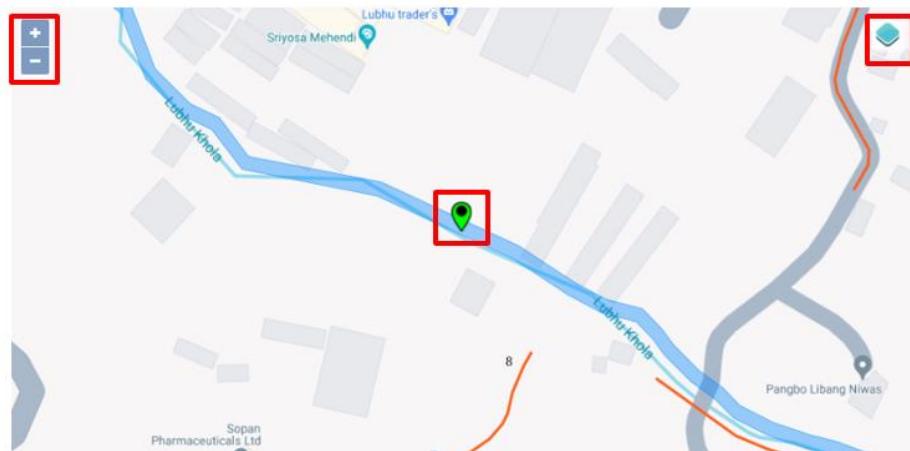
- After filling out the form click **Save**, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

### Overview:

The add water samples page consists of information that are explained below:

- Sample Date - The date on which the sample was taken. (It allows user to choose the current date or the previous date)
- Sample Location – Identifies the specific site within the water samples where the sample was collected.
- Water Coliform Test Result - Select the water coliform test result as: positive or negative.
- Click to set Latitude and Longitude - Find the water sample location on the map and pin a marker on the map by clicking on that location. This will mark the spatial location of the water sample in the map with latitude and longitude.
  - The top left corner displays the zoom-in and out button

- The top right corner tab displays the Layers and Base maps

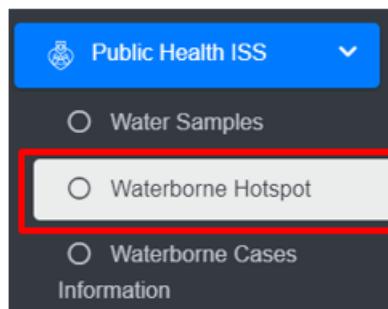


## 19.2 Waterborne Hotspot

The Waterborne Hotspot Sub Module is responsible for maintaining data relevant to hotspot identification in a city. Its primary objective is to retain knowledge of diseases spread through contaminated water.

### 19.2.1 Navigation to Waterborne Hotspot

- Open the sidebar and click on ***Public Health ISS***.
- Select the ***Waterborne Hotspot***.



- This redirects to the ***Waterborne Hotspot*** page.

## Overview:

The Waterborne Hotspot page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on Action buttons refer to section 6.

ID	Infected Disease	Hotspot Location	Date	No. of Cases	No. of Fatalities	Actions
42	Cholera	Dharachour	2023-07-04	60	9	
41	Typhoid	Imadol	2023-11-10	22	1	
40	Diarrhea	Namuna tole	2022-06-16	25	16	

Figure 19- 3 Waterborne Hotspot Page

### 19.2.2 Add New Waterborne Hotspot

- Click on the *Add Waterborne Hotspot* button.



### Add Waterborne Hotspot

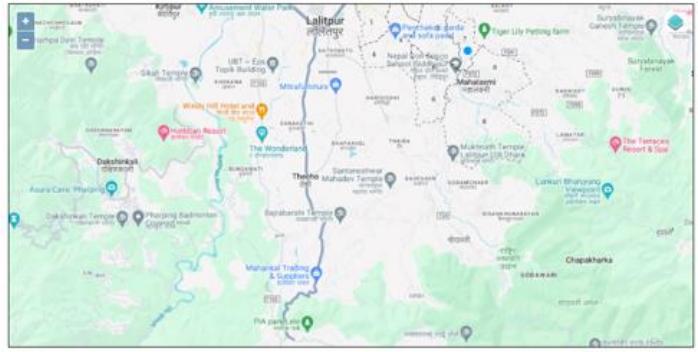
Hotspot Location*	<input type="text" value="Hotspot Location"/>
Date*	<input type="text" value="mm/dd/yyyy"/> <input type="button" value="..."/>
Infected Disease*	<input type="button" value="— Choose Infected Disease —"/>
No. of Cases *	
Male	<input type="text" value="Male Cases"/>
Female	<input type="text" value="Female Cases"/>
Other	<input type="text" value="Other Cases"/>
No. of Fatalities	
Male	<input type="text" value="Male Fatalities"/>
Female	<input type="text" value="Female Fatalities"/>
Other	<input type="text" value="Other Fatalities"/>
Hotspot Area*	
Notes	<input type="text" value="Notes"/>

Figure 19- 4 Waterborne Hotspot form

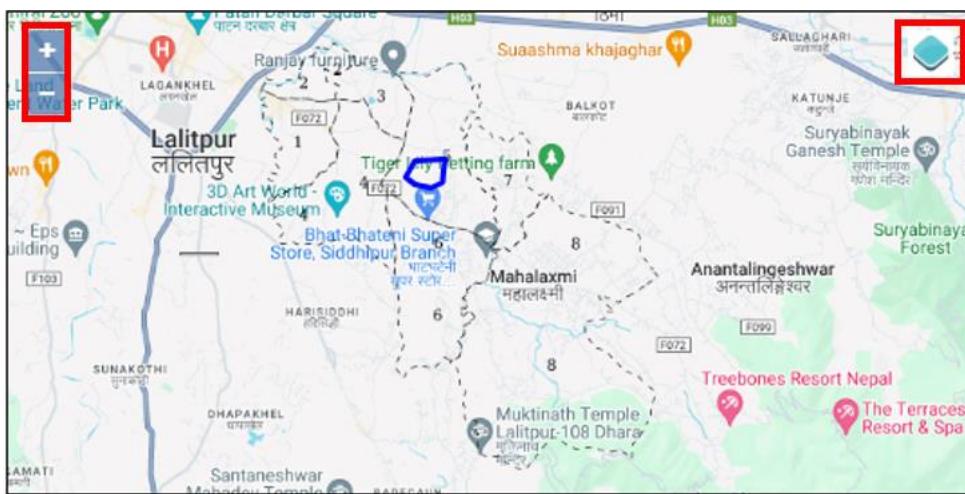
- After filling out the form click Save, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

## Overview

The **Add Waterborne Hotspot** page consists of different form fields that capture different information which are explained below:

- Hotspot Location: Name of hotspot Location information collected.
- Date: Date when the hotspot information was collected.
- Infected Disease: The infected disease.

- No of Cases: Number of cases (Male, Female, Other) reported.
- No of Fatalities: Number of fatalities (Male, Female, Other) reported.
- Hotspot Area: Choose the location where the hotspots of waterborne diseases are detected, and draw the corresponding area on the map.
  - The top left corner displays the zoom-in and out button
  - The top right corner tab displays the Layers and Base maps



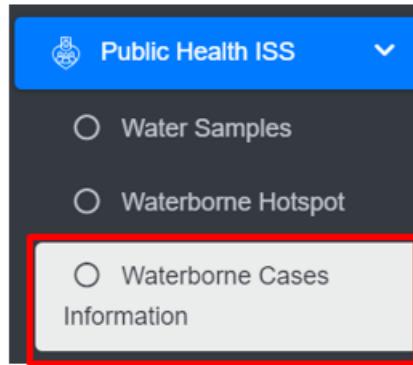
- Notes: Additional notes on information.
- Users can save the form by clicking the save button.

## 19.3 Waterborne Cases Information

The Waterborne Cases Information Sub Module maintains data relevant to Yearly Waterborne cases information. Its primary objective is to retain knowledge of diseases spread through contaminated water.

### 19.3.1 Navigation to Waterborne Cases Information

- Open the sidebar and click on ***Public Health ISS***.
- Select the ***Waterborne Cases Information***.



## Overview

The Waterborne Cases Information page lists all the attribute records stored in the module and provides different Tools, Actions, and Filters that can be used according to the requirements. For more details on the Action buttons refer to Section 6.

Waterborne Cases Information					
<a href="#">Add Waterborne Cases Information</a> <a href="#">Export to Excel</a> <a href="#">Show Filter</a>					
ID	Infected Disease	Year	Number of Cases	Number of Fatalities	Actions
54	Dysentery	2024	11	0	
50	Polio	2024	30	24	
46	Typhoid	2024	4	2	
42	Polio	2023	5	0	
18	Hepatitis A	2023	3	0	
17	Hepatitis A	2021	229	20	
14	Cholera	2020	103	0	

Figure 19- 5 Waterborne Cases Information Page

### 19.3.2 Add Waterborne Cases Information

- Click on **Add Waterborne Cases Information** button.



Add Waterborne Cases Information

Year*	<input type="text" value="2024"/>
Infected Disease*	<input type="text" value="--- Choose Infected Disease ---"/>
No. of Cases	
Male*	<input type="text" value="Male"/>
Female*	<input type="text" value="Female"/>
Other*	<input type="text" value="Other"/>
No. of Fatalities	
Male	<input type="text" value="Male"/>
Female	<input type="text" value="Female"/>
Other	<input type="text" value="Other"/>
Notes	<input type="text" value="Notes"/>

Figure 19- 6 Waterborne Cases Information form

- After filling out the form click Save, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details.

### Overview:

- Year: The year when the diseases' cases were identified.
- Infected Disease: The name of the infected disease.
- Number of Cases: Number of cases (Male, Female, Other) reported.
- Number of Fatalities: Number of fatalities (Male, Female, Other) reported.
- Notes: Additional notes on information.
- Users can save the form by clicking the save button.

## 20. SETTINGS

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This is a module to allows administrators to manage user access and control permissions within the system. Features include:

User Credentials - securely store and manage user authentication details, including usernames, passwords options.

Roles Management- Create and assign roles to users, defining their access level and responsibilities. Roles can be customized to reflect specific job functions.

Permissions Control - fine-tune access by assigning permissions to roles or individuals, ensuring users can only interact with data and features relevant to their role.

### 20.1 User Information Management

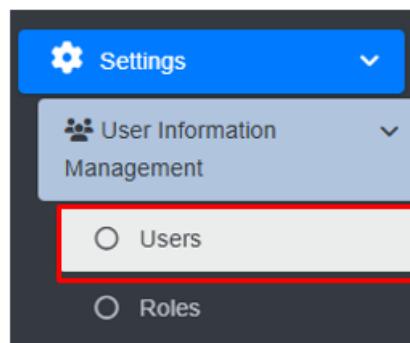
The **User Information Management** sub-module that provides information management capabilities related to user information management are grouped in this panel.

### 20.2 Users

The **Users** module is responsible for keeping track of system users. According to the user's defined roles, various users have access to the system at varying degrees. The municipality admin is responsible for creating and keeping up with user's data.

#### 20.2.1 Navigation to Users

- Open the sidebar and click on the *Settings* to expand.
- Now, click on the '**User Information Management**' and select **Users**.



- This redirects to the **Users** Page.

- The user can view the lists of existing users in the system and user can also add new user (refer to section [20.2.2](#) ).
- Export the data (refer to section 8).

Users								
Email	Name	Role	User Type	Status	Actions			
external@gmail.com	External	External	External	Active				
public_health@gmail.com	Municipality - Public Health	Municipality - Public Health Department	Municipality	Active				
building_permit@gmail.com	Building Permit Department	Municipality - Building Permit Department	Municipality	Active				
surveyor@gmail.com	Building Surveyor	Municipality - Building Surveyor (Ward)	Municipality	Active				
revenue@gmail.com	Revenue Department	Municipality - Revenue Department	Municipality	Active				
sanitation@gmail.com	Sanitation Department	Municipality - Sanitation Department	Municipality	Active				
infrastructure@gmail.com	Infrastructure Department	Municipality - Infrastructure Department	Municipality	Active				
admin@gmail.com	Municipality IT Admin	Municipality - IT Admin	Municipality - IT Admin	Active				
executive@gmail.com	Municipality Executive	Municipality - Executive	Municipality	Active				

Figure 20- 1 List of Users

- For more details on the Action buttons (refer to Section 6).

## 20.2.2 Create User

Create user tool which allows users with permission to create a new user.

- Click on *Create User* button.



- User will be redirected to the following page

The screenshot shows a 'Create User' form with the following fields:

- Full Name\*
- Gender\*
- Username\*
- Email\*
- Password\*
- Confirm Password
- User Type\*
- Roles\*
- Status\*

A red box highlights the first seven fields: Full Name, Gender, Username, Email, Password, User Type, and Roles.

*Figure 20- 2 Create new User*

- After filling out the form click Save, and make sure a green pop-up message is displayed. Refer to Section 7.1 for more details.
- If a mandatory field is left out, a red error message will be displayed. Refer to Section 7.2 for more details. After completely filling out the form, the user should click the **Save** button to save the filled data to the lists.

Users must fill in the required fields which are mentioned below:

- Full Name - Name of the user.
- Gender - Gender of the user.
- Username - Username of the user.
- Email - Email address of the user.
- Password - Encrypted Password of the user.
- Confirm password – Retype the same password again for which user entered for password field.
- User Type - Type of user, such as "Municipality" or "Service Provider"
- Roles - The role from which the user is involved to the specific user type.

- Status – Status of the user in order to access the related roles.

### User Form Submission:

The form is dynamically changed according to the User Type that is selected. The role assigned should be carefully selected to ensure the correct role and permissions are being provided to the user

### Overview:

- If a **Municipality User** is selected, the roles are limited to the Municipality Related Roles.
- If the **Treatment Plant User** is selected, the roles are limited to Treatment Plant-related roles and the corresponding treatment plant must be chosen as well.
- If the **Service Provider User** is selected, the roles are limited to Service Provider related roles and the corresponding service provider must be chosen as well.
- If a **Help Desk User** is selected, the roles are limited to Help Desk-related roles and the corresponding help desk must be chosen as well.
- Select predefined Roles as suitable and click Save button.
- Newly added new user record will be added at the end of the list and if selected, the access credentials will be created as well.

### Note:

- If predefined role is not suitable, the user can add a new role as required via the role page. However, the creator must be careful while creating new role.
- When the user successfully creates a new Role by following the naming convention, the newly created “Role” will be displayed in the **Roles Field** of Create User form.

The screenshot shows a user creation interface. On the left, there are fields for 'User Type\*' (set to 'Municipality'), 'Roles\*', and 'Status\*'. Below these are 'Back to List' and 'Save' buttons. To the right is a dropdown menu titled 'Municipality' which lists several roles: 'Municipality - Revenue Department', 'Municipality - Sanitation Department', 'Municipality - IT Admin', 'Municipality - Public Health Department', 'Municipality - Help Desk', and a newly added role, 'Municipality - Testing', which is highlighted with a red box. At the bottom of the page, a footer note reads: 'Base IMIS © 2022-2024 by Innovative Solution Pvt. Ltd. is licensed'.

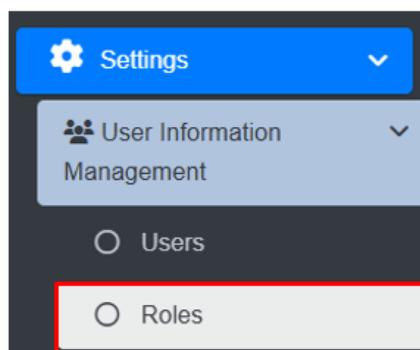
Figure 20- 3 New Role displaying in the User Create form

## 20.3 Roles

The **Roles** module is responsible for maintaining system roles and the level of access to those roles. According to the established structure, different responsibilities have access to the system at varying degrees. Only users with access or permission can view the Roles page. The administrator can specify the permissions and authority depending on a certain role on this page. For instance, a predefined role designed for service providers has been set up so that any person assigned to that job will have access to the necessary features and tools for managing service delivery effectively. For specific jobs, more than 200 functionalities can be used. The roles can be sorted by the associated categories.

### 20.3.1 Navigation to Roles

- Open the sidebar and click on the **Settings** to expand.
- Now, click on the **User Information Management** and select **Roles**.



- This redirects to the **Roles** page. For more details on the Action buttons refer to Section 6.

- User can view the list of existing roles in the system and can create a new role (refer section [20.3.2](#))

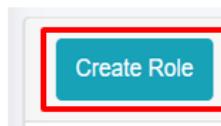
Roles	
Name	Actions
Municipality - Executive	
Municipality - Building Permit Department	
Municipality - Building Surveyor (Ward)	
Municipality - Infrastructure Department	
Municipality - Revenue Department	
Municipality - Sanitation Department	
Municipality - IT Admin	

*Figure 20- 4 List of Roles*

### 20.3.2 Create Role

**Create Role** tool is used to add new Role. This tool is to be used when the list of predefined roles does not meet the requirements, or any new role needs to be defined.

- Click on the **Create Role** button.



Create Role							
Name*	<input type="text"/>						
Permissions :	<input type="text" value="Search:"/> <table border="1"> <thead> <tr> <th>Permission</th> </tr> </thead> <tbody> <tr> <td>API</td> </tr> <tr> <td><input type="checkbox"/> Access Building Survey API</td> </tr> <tr> <td><input type="checkbox"/> Access Emptying Service API</td> </tr> <tr> <td><input type="checkbox"/> Access Sewer Connection API</td> </tr> <tr> <td><input type="checkbox"/> Access Supervisor API</td> </tr> </tbody> </table>	Permission	API	<input type="checkbox"/> Access Building Survey API	<input type="checkbox"/> Access Emptying Service API	<input type="checkbox"/> Access Sewer Connection API	<input type="checkbox"/> Access Supervisor API
Permission							
API							
<input type="checkbox"/> Access Building Survey API							
<input type="checkbox"/> Access Emptying Service API							
<input type="checkbox"/> Access Sewer Connection API							
<input type="checkbox"/> Access Supervisor API							

*Figure 20- 5 Create new Role*

- Provide a suitable name for the new role.
- Then fill the required data, check the boxes of permissions to be provided to that role.

- There is a search field that can be used for efficient and easier navigation through the list of permissions.
- The user should always follow the **Zero Trust Policy** while assigning permissions to any particular role. The role should have only the permissions that are required by that role. No more, no less.
- Newly added Role will be added at the end of list in Role List.
- The input fields expand when the particular category is selected.
- Fill all the required data and click **Save** button.
- When the user assigns a role to the designated user, the system notifies the user with the pop-up message as:



- If the user attempts to assign a role to a user who already has the role assigned, the system notifies the user with an error message as:

The screenshot shows a 'Create Role' interface. A red box highlights the 'Name\*' input field, which contains the text 'Municipality - IT Admin'. Below the input field, a red error message box displays the text 'The name has already been taken.' An exclamation mark icon is also present in the error message box.

Figure 20- 6 Name validation for role creation

**Note:**

- To create a new role, the user must follow the naming convention: User Type – Role Name.
  - For example, creating a role as a municipality admin should follow this format: Municipality – IT Admin.

- Refer Section [20.4](#) for more details on which role should be created. This section provides insights into the appropriate role naming conventions and criteria for creating roles based on specific user requirements.

## 20.4 Predefined Roles and Permissions for IMIS

The IMIS is equipped with pre-defined roles and permissions within the system that govern the extent to which the modules and their functionalities can be accessed. This role-based approach ensures visibility of modules, tools and features according to the responsibilities assigned to the role. The pre-defined roles can be easily updated and modified as per the requirements of the city through the Settings section of IMIS, and new roles beyond the pre-defined ones can be added as well.

The pre-defined roles and permissions are categorized according to the type of role. There are five categories for user type i.e. Municipality, Service Provider, Treatment Plant, Help Desk, and External. The user types and their corresponding roles and permissions are elaborated below:

[Note: The naming convention for assigning Roles is as follows: User Type – Role Name]

1. Municipality: This type of user is intended for officials working in the municipality and ward offices of the city. This user consists of the following roles:
  - a. Municipality - Executive

The Municipality - Executive role is defined for high-level city officials such as the Mayor, Deputy Mayor, Chief Executive Officer, Chief Administrative Officer, Executive Engineers, Ward Chairmans, and so on. This role allows for the following features and functionalities:

- All Modules: View and Export Access.
- Urban Management Decision Support System: Full Access.

- b. Municipality - Building Permit Department

The Municipality – Building Permit Department role is defined for the officials that oversees the building permit process. The primary responsibility of this role is to update the Building Information Management System and Containment Information Management System modules; thus, the role allows the following features and functions:

- Building Information Management System: Full Access
- Containments Information Management System: Full Access
- Utility Information Management System: View and Export Only Access
- Urban Management Decision Support System:

- a. Export Data – Full Access
- b. Layers - Access to Building Information Management System, Containment Information Management System, and Utility Information Management System layers, corresponding export features & spatial analysis tools according to access level of each module mentioned above.
- c. Municipality - Building Surveyor

The Municipality - Building Surveyor role is defined for the officials that will be collecting the building footprint through the native mobile application of the Building Information Management System; thus, the role allows the following features and functions:

- Building Information Collection (BIC) Mobile App: Full Access
- c. Municipality - Infrastructure Department

The Municipality - Infrastructure Department role is defined for the officials that oversee the utility and infrastructure management of the city. The primary responsibility of this role is to update the Utility Information Management System module; thus, the role allows the following features and functions:

- Building Information Management System: View Only Access
- Containment Information Management System: View Only Access
- Utility Information Management System: Full Access
- Sewer Connection Information Support System: Full Access
- Urban Management Decision Support System: Access to Building Information Management System, Containment Information Management System, Utility Information Management System and Sewer Connection Information Support System layers, corresponding export features & spatial analysis tools according to access level of each module mentioned above.

#### d. Municipality - Tax Department

The Municipality - Tax Department role is defined for the officials that oversee the property tax and/or water supply tariff collection of the city. The primary responsibility of this role is to update the Property Tax Information Support System; thus, the role allows the following features and functions:

- Building Information Management System: View only access
- Containment Information Management System: View only access
- Property Tax Information Support System: Full Access
- Urban Management Decision Support System: Access to Building Information Management System, Containment Information Support System, Property Tax

Information Support System layers, corresponding export features & spatial analysis tools according to access level of each module mentioned above.

e. Municipality –Water Billing Unit

The Municipality - Water Billing Unit role is defined for the officials that oversee the water supply tariff collection of the city. The primary responsibility of this role is to update the Water Supply Information Support System; thus, the role allows the following features and functions:

- Building Information Management System: View only access
- Containment Information Management System: View only access
- Water Supply Information Support System: Full Access
- Urban Management Decision Support System: Access to Building Information Management System, Containment Information Support System, Water Supply Information Support System layers, corresponding export features & spatial analysis tools according to access level of each module mentioned above.

f. Municipality – Solid Waste Management Department

The Municipality - Solid Waste Management Department role is defined for the officials that oversee the solid waste management tariff collection of the city. The primary responsibility of this role is to update the Solid Waste Information Support System; thus, the role allows the following features and functions:

- Building Information Management System: View only access
- Containment Information Management System: View only access
- Solid Waste Information Support System: Full Access
- Urban Management Decision Support System: Access to Solid Waste Management Information Support System layers, corresponding export features & spatial analysis tools according to access level of each module mentioned above.

g. Municipality - Sanitation Department

The Municipality - Sanitation Department role is defined for the officials that oversee the sanitation services being provided by the city. The primary responsibility of this role is to supervise and monitor the sanitation service delivery; thus, the role allows the following features and functions:

- i. Building Information Management System: View Access
  - ii. Fecal Sludge Information Management System: Limited Access
- Containment Information Management System: Full Access
  - Service Provider Information Management System: Full Access

- Treatment Plant Information Management System: Full Access
- Emptying Service Access: View and Export Access
- iii. CWIS Information Management System: Full Access
- iv. CT PT Information Management System: Full Access
- v. Performance Efficiency Standard: Full Access
- vi. Urban Management Decision Support System: Access to Building Information Management System, Fecal Sludge Information Management System, CWIS Information Management System, CT PT Information Management System, Performance Efficiency Standard layers, corresponding export features & spatial analysis tools according to access level of each module mentioned above.

h. Municipality - IT Admin

The Municipality - IT Admin role is defined for the officials that oversees the IT related issues and activities. The primary responsibility of this role is to provide user credentials to the officials and provide additional support for the whole system. As the IT admin may require to provide support in all modules of the system, they are provided with full access to the modules; thus, the role allows the following features and functions:

- All Modules - Full Access

i. Municipality - Public Health Department

The Municipality - Public Health Department role is defined for the officials that oversees the public health related services and activities of the city. The primary responsibility of this role is to update the Public Health Information Management System; thus, the role allows the following features and functions:

- Building Information Management System: View only access
- Containment Information Management System: View only access
- Public Health Information Management System: View and Export Access
- Urban Management Decision Support System: Access to Building Information Management System, Containment Information Management System, Public Health Information Management System layers, corresponding export features & spatial analysis tools according to access level of each module mentioned above.

2. Service Provider: This type of user is intended for private entities providing sanitation services in the city, who are already registered in the Service Provider Information Management System. This user consists of the following roles:

a. Service Provider – Admin

The Service Provider – Admin role is defined for the person responsible for the overall management of the services being provided by the service provider. The primary

responsibility of this role is to maintain the Help Desk Information (if distributed approach), Employee Information, and Desludging Vehicle Information. Additionally, the role also maintains credentials for their corresponding staff to access the system through the user's interface; thus, the role allows the following features and functions:

- Help Desk: Full Access of information that is linked with the service provider
- Employee Information: Full Access of information that is linked with the service provider
- Desludging Vehicle Information: Full Access of information that is linked with the service provider
- Emptying Service Information Management System: View only access for Emptying, Sludge Collection and Feedback that is linked with the service provider, View and Edit access for Applications that is linked with the service provider.
- Building Information Management System: View only access
- Containment Information Management System: View only access
- KPI Information Management System: View only access of information that is linked with the service provider
- Users: Full Access of information that is linked with the service provider
- Urban Management Decision Support System: Access to FSM Information Management System layers, corresponding export features & spatial analysis tools according to access level of each module mentioned above that is linked with the service provider.

b. Service Provider – Emptying Operator

The Service Provider – Emptying Operator role is defined for the staff of the service provider that is deployed in the field to provide emptying services. The primary responsibility of this role is to update the emptying information through the native mobile application (Emptying Information Collection Mobile App); thus, the role allows the following features and functions:

- Emptying Information Collection (EIC) Mobile App: Full Access
3. Help Desk: This type of user is intended for those entities register/lodge new application requests for emptying service. The Help desk can either be a part of the municipality itself (Municipality – Help Desk) or can be a part of the private service provider (Service Provider – Help Desk). This user consists of the following roles:
- a. Service Provider – Help Desk

The Service Provider – Help Desk role is defined for the staff of the service provider that receives application requests for emptying service. The primary responsibility of this role

is to register new application requests and collect feedback after the service has been provided; thus, the role allows the following features and functions:

- Building Information Management System: View only access
- Containment Information Management System: View only access
- Applications: Full Access of information that is linked with the service provider
- Feedback: Full Access of information that is linked with the service provider
- Emptying: View Access of information that is linked with the service provider
- Sludge Collection: View Access of information that is linked with the service provider
- Urban Management Decision Support System: Access to Building Information Management System, Containment Information Management System, Applications, Feedback, Emptying, Sludge Collection, FSM Information Management System layers, & corresponding spatial analysis tools with limited information that is linked with the service provider.

b. Municipality – Help Desk

The Municipality – Help Desk role is defined for the staff of the city that receives application requests for emptying service. The primary responsibility of this role is to register new application requests and assign the service provider that will provide the emptying service, and collect feedback after the service has been provided; thus, the role allows the following features and functions:

- Building Information Management System: View only access
- Containment Information Management System: View only access
- Applications: Full Access
- Feedback: Full Access
- Emptying: View Access
- Sludge Collection: View Access
- Urban Management Decision Support System: Access to Building Information Management System, Containment Information Management System, FSM Information Management System layers, & corresponding spatial analysis tools with limited information that is linked with the service provider.

4. Treatment Plant: This type of user is intended for the entities managing the overall operation of the treatment plant which is already registered in the Treatment Plant Information Management System. This user consists of the following roles:

c. Treatment Plant – Admin

The Treatment Plant – Admin role is defined for the staff of the treatment plant that oversees the day-to-day activities of the Treatment Plant. The primary responsibility of this role updates the sludge collection form that indicates the particular application's sludge has been safely disposed in the treatment plant and updates the Performance Efficiency Test information; thus, the role allows the following features and functions:

- Building Information Management System: View only access
- Containment Information Management System: View only access
- Sludge Collection: Full Access
- Performance Efficiency Test: Full Access
- Urban Management Decision Support System: Access to Building Information Management System, Containment Information Management System, Treatment Plant Information Management System layers, & corresponding spatial analysis tools

## 5. External

The External user type is for such entities that require view only access to the entire system. This user consists of the following roles:

### a. External

The External role is defined for such users that require complete view only access of the entire system and its features; thus, the role allows the following features and functions:

- View and Export only access to all modules and their corresponding data