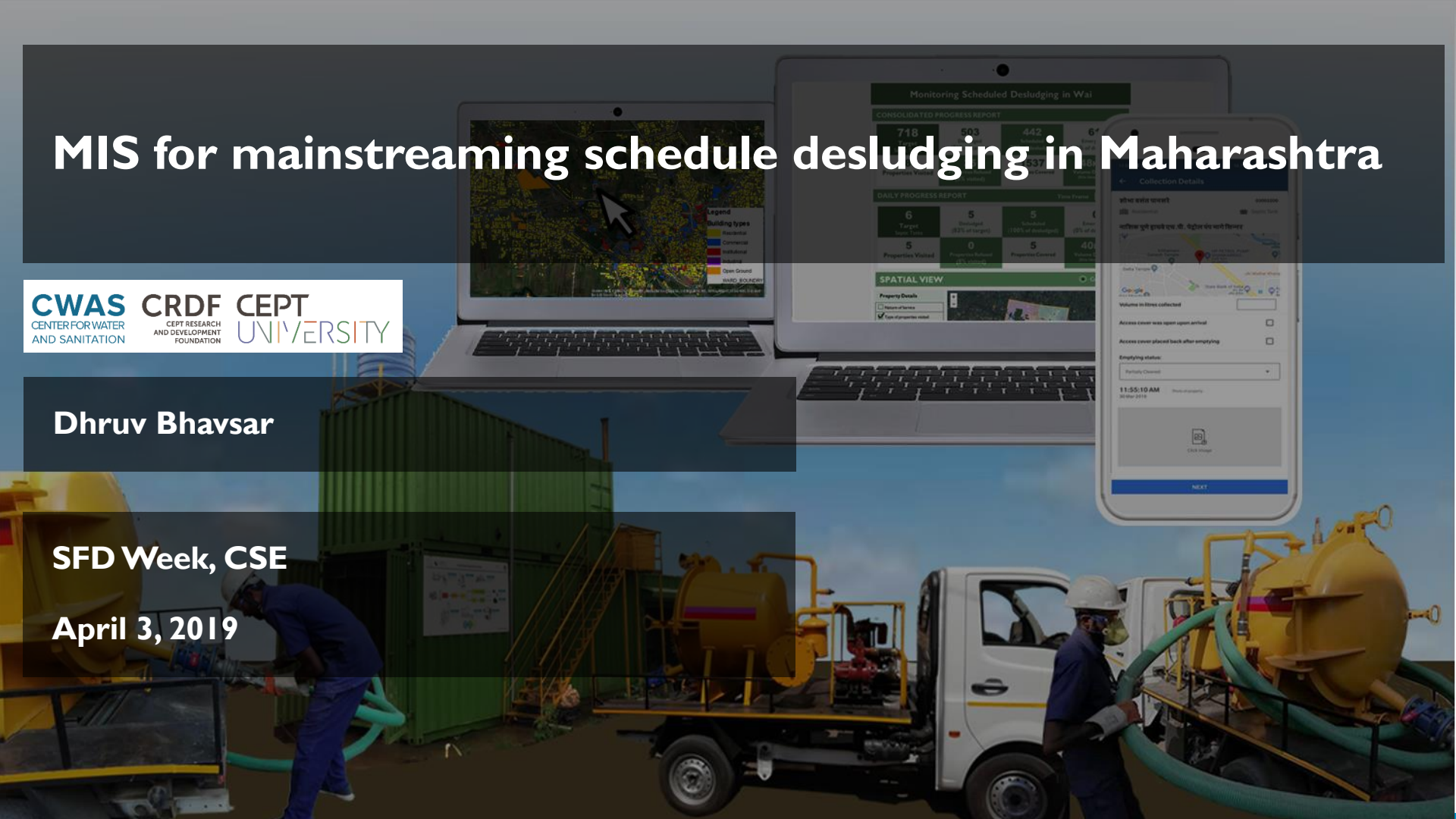
MIS for mainstreaming schedule desludging in Maharashtra



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CEPT UNIVERSITY

Dhruv Bhavsar

SFD Week, CSE

April 3, 2019

Wai & Sinnar: *1st cities to implement scheduled desludging services in India*

- **Wai & Sinnar – Located near Mumbai**
  - Population - Sinnar ~70,000

    Wai ~40,000
- **Pioneer Indian cities in FSM**
  - **1st city** - Performance linked annuity model for scheduled desludging in India
  - **1st city** - Levying a sanitation tax for FSM
  - **1st city (Sinnar)**- Setting up FSTP on DBO model (Fully funded by local government)

Challenges in FSSM

Demand Desludging v/s Scheduled Desludging

- Desludging is done on-call basis
  Desludging frequency – 8-10 Years
- Desludging services treated as a complaint redressal system
- Not all HHs receives services and often pay very high charges
- Low frequency of desludging leads to increase pollutant load
- Difficult to monitor private informal providers.

- Septic tanks desludged once in three years on scheduled basis
- Service provision + regulations to ensure scheduled desludging
- Equitable and affordable: Citywide coverage and levied sanitation tax
- Likely reduction in pollutant loads and coliform in septic tank effluent
- Regulated and monitored by ULB through service contract

SaniTab

- Android-based tool for sanitation survey
- Citywide digital data collection tool
- Capture household / property level data
- Creating onsite sanitation database

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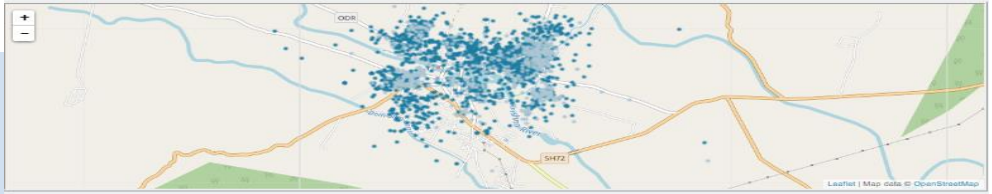
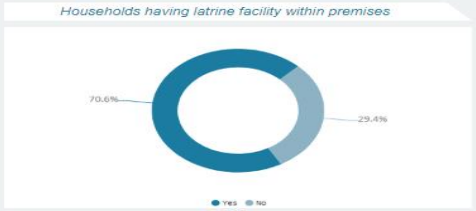
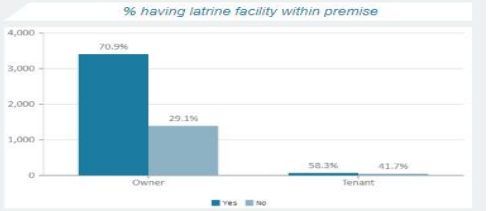
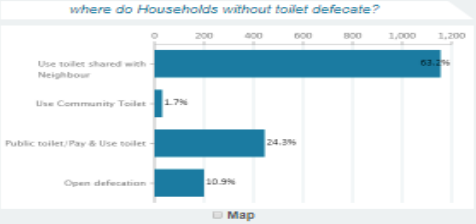
Wai Municipal Council: Baseline Sanitation System Assessment

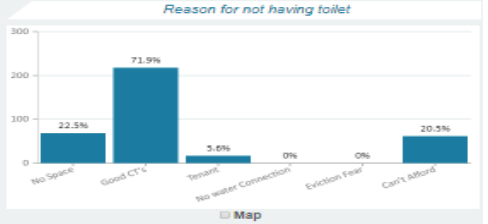


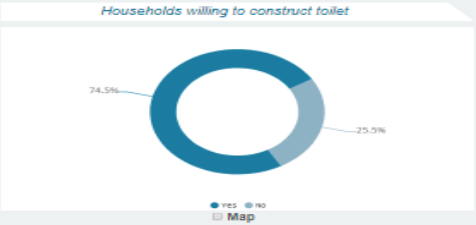


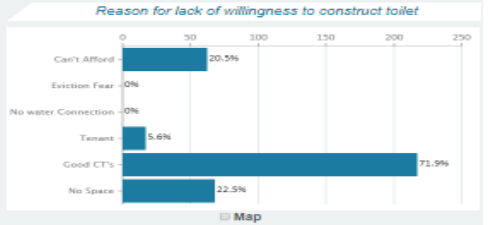


Households without toilets

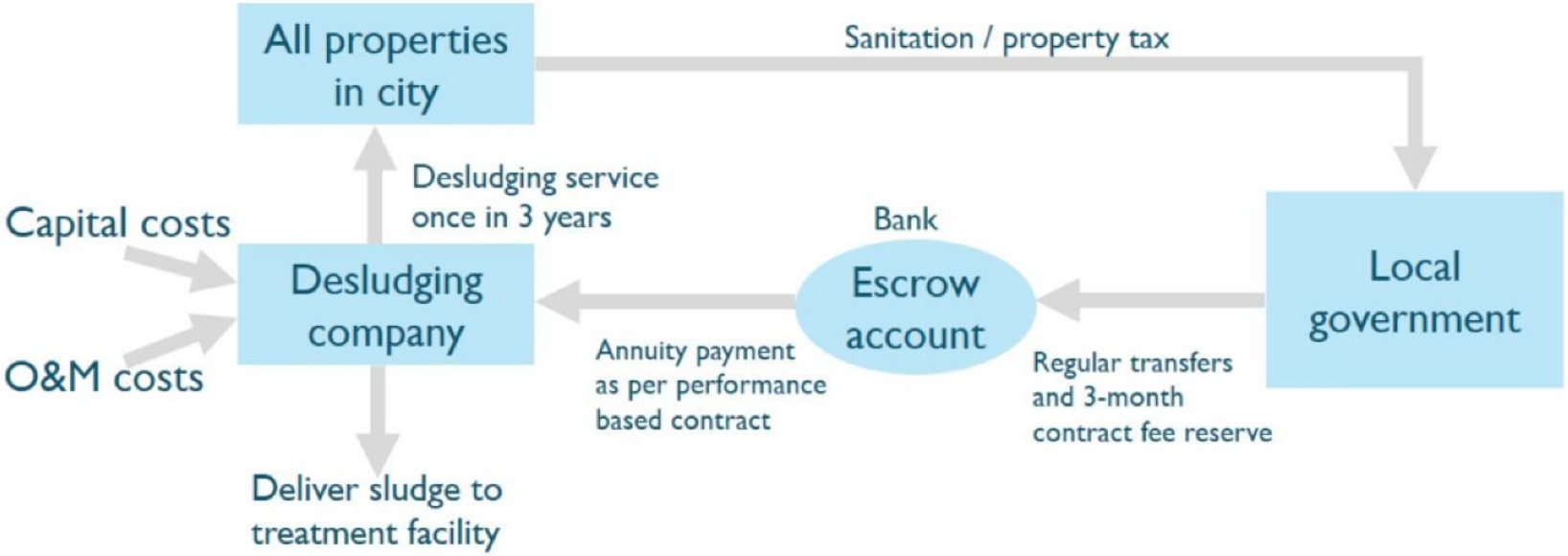








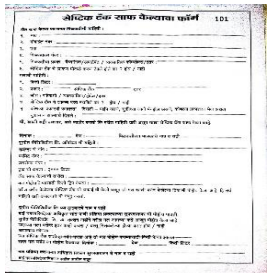
Performance linked annuity model for scheduled desludging . . .



Scheduled septic tank desludging services started from June, 2018

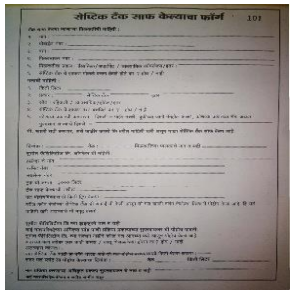
Performance linked Monitoring Mechanism of desludging service

Existing paper based monitoring system to **Online Monitoring System**

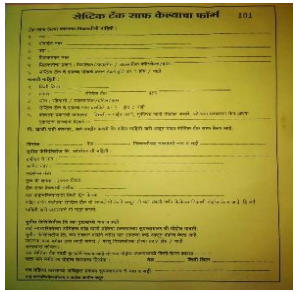


LG's copy

Property holder's copy



Treatment plant's copy



Private operator's copy

Collection and transport record form Serial No: _____

i. **Details of Waste Generator**

a) Name :
b) Phone Number:
c) Address :
d) Property Tax Number :
e) Type of building : Individual house / Apartment / Commercial complex / Other (specify)____
f) Was the Septic tank cover open (Yes / No)

ii. **Identification of Waste:**

a) Volume _____ liters
b) Type : _____ Septic Tank _____ Others
c) Source : Residential/Commercial/Restaurant/Others _____
d) Septic tank cover placed back on Septic tank : Yes / No
e) Septic tank emptied : Yes / No
f) Any kind of deficiencies, missing pipes or fittings, improper manholes or access covers, any other cracks or damage observed : _____

The undersigned being duly authorized does hereby certify to the accuracy of the source and type of Fecal Sludge and septage collected and transported.

Date: _____, Time: _____, Name and Signature – Property owner: _____

iii) **Details of Sumeet Facilities Operator**

a) Name of Driver :
b) Permit :
c) Vehicle License no :
d) Truck Capacity :
e) Pump Out Date :
f) No. of trips taken to empty the septic tank:

The above described wastewater was picked up and hauled by me to the disposal facility named below and was discharged. I certify that the foregoing is true and correct:

Name and Signature of authorized transport agent and title: _____

iv) **Acceptance by Wai Municipality's authorized FSTP**

The above transporter delivered the described Fecal sludge and Septage to this treatment facility and it was accepted.

The waste was contaminated with solid waste or other kinds of waste: YES / No

Details (If yes): _____

No of trips received at the FSTP for this form: ____

Septage received at treatment plant: Date: _____, Time : _____, Volume : _____ liters

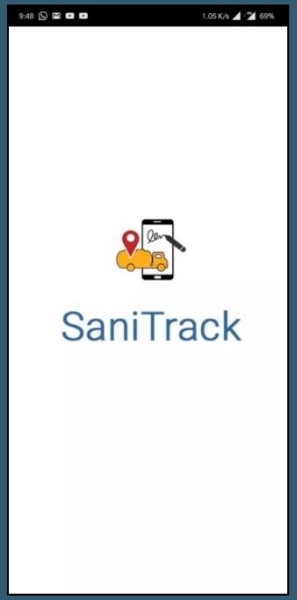
Name and Signature of authorized treatment plant operator signatory and title:

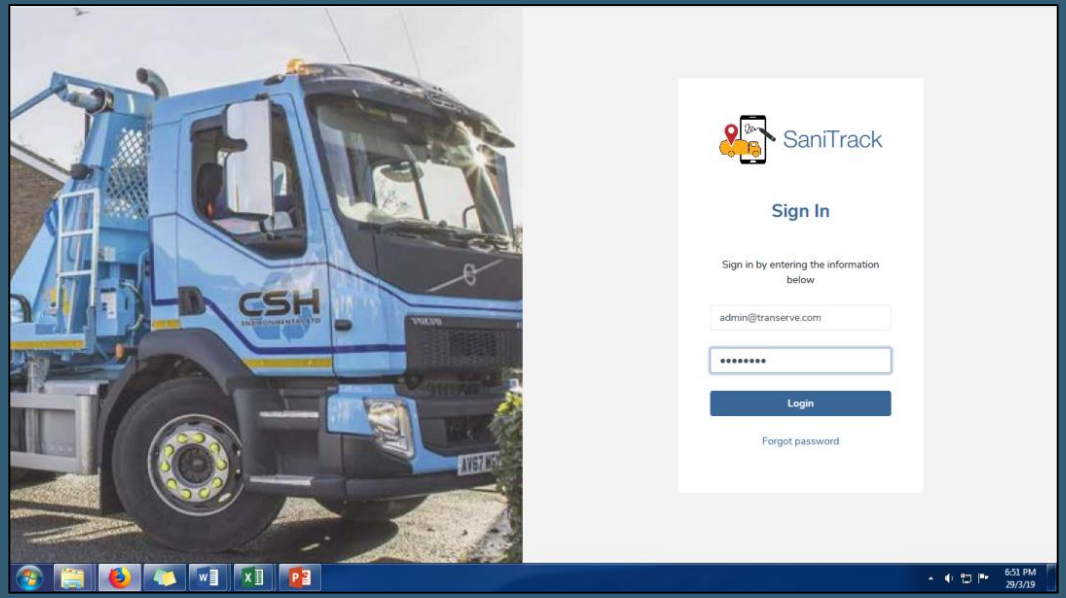
_____

NOTE: SUBJECT TO THE TERMS AND CONDITIONS OF WAI MUNICIPALITY

DRAFT REPORT FORMAT 1+3 COPIES

SaniTrack


SaniTrack


CSH
SaniTrack
Sign In
Sign in by entering the information below
admin@transerve.com
Login
Forgot password
6:51 PM
29/3/19

SaniTrack - IT enabled systems

Online monitoring system for scheduled desludging

Scheduling

Recording desludging operations

Recording treatment operations

Dashboard

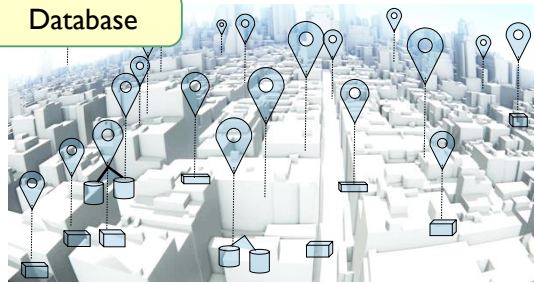
User management

Monitoring and database creation system

SaniTab app

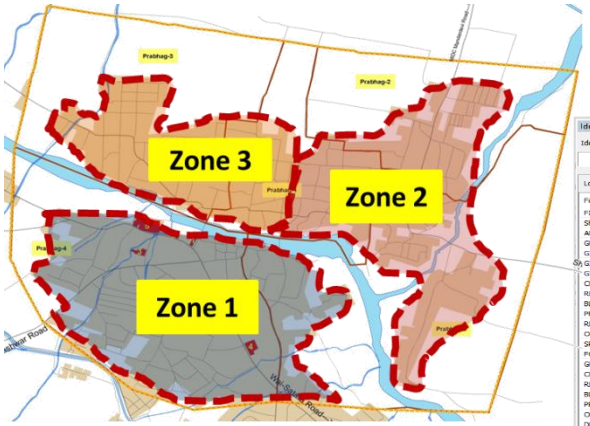
Dashboard

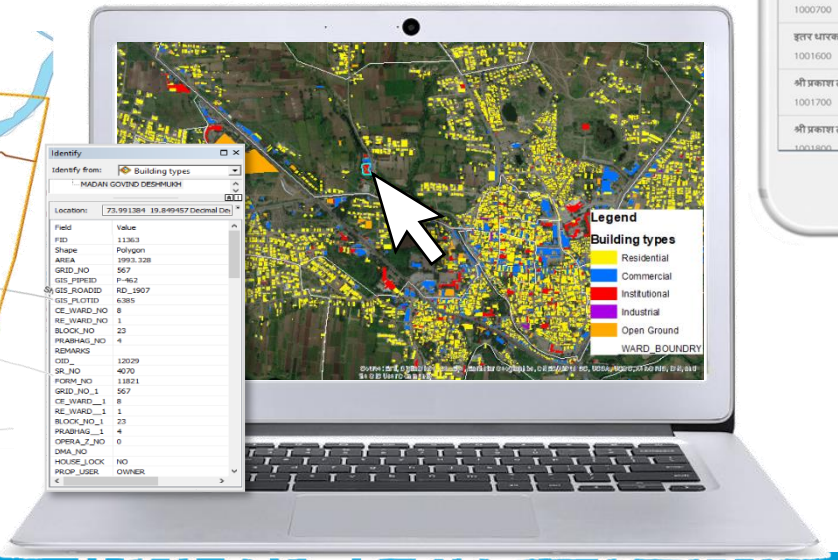
Database



Module for desludging schedule

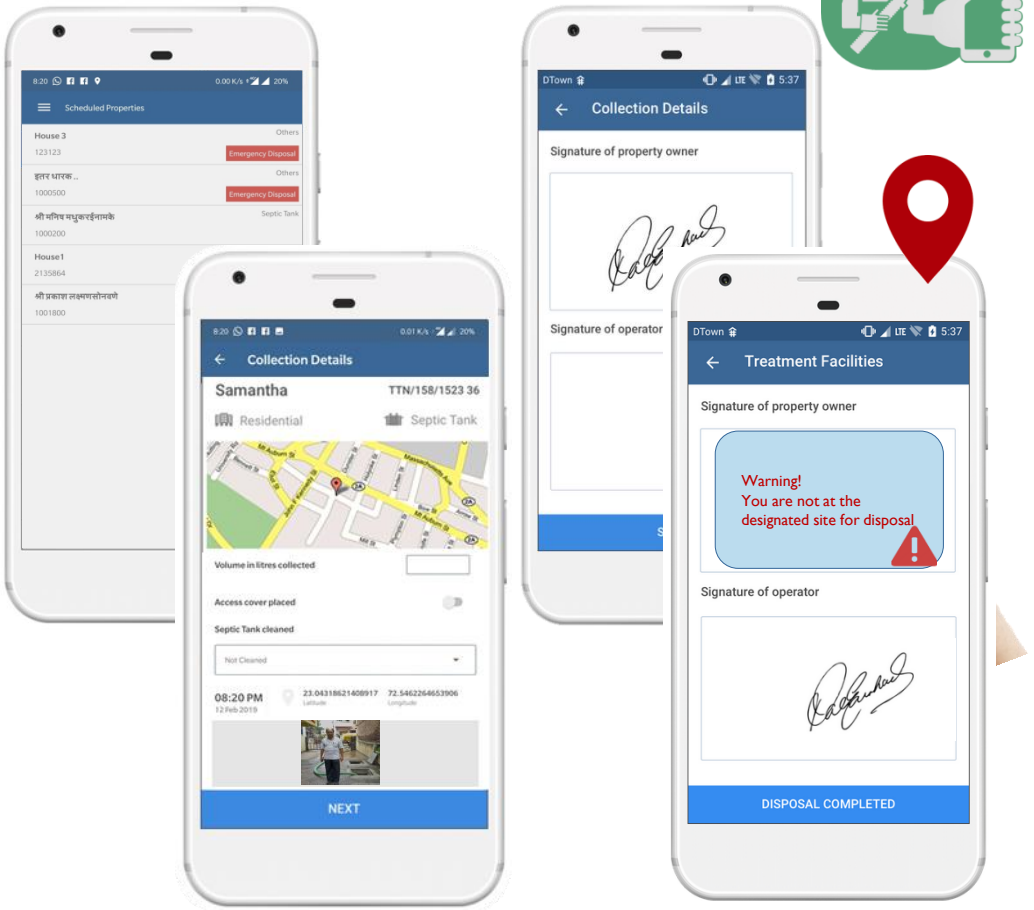
- City divided into 3 zones to be covered each year
- GIS linked property tax data - Basis for desludging scheduling / route mapping
- Prepare septic tank desludging schedule





Amazon delivery like app for desludging service operations

- Selects from ‘scheduled’ list
- Displays key property information
- Records desludging volume, status of access cover, photo of property
- Customer’s & operator’s signature – like Amazon delivery app
- Looping to collect from multiple properties in one trip or multiple trips for one property
- FSTP operator signature at disposal
- In-built validation checks



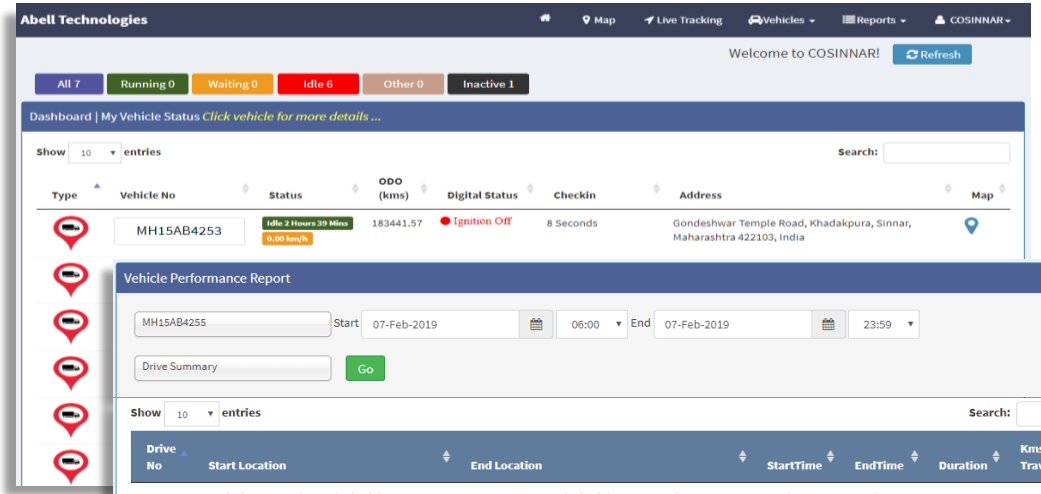
GPS enabled live desludging vehicle tracking system

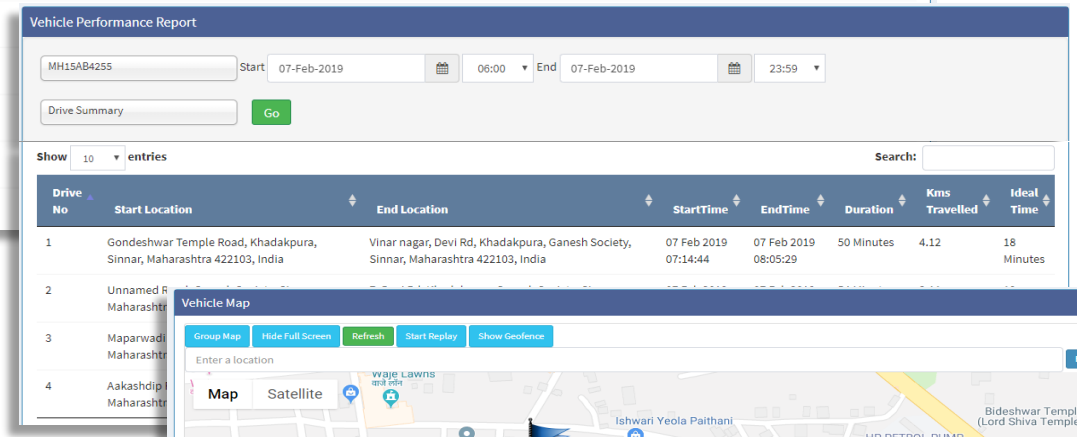
Live vehicle tracking

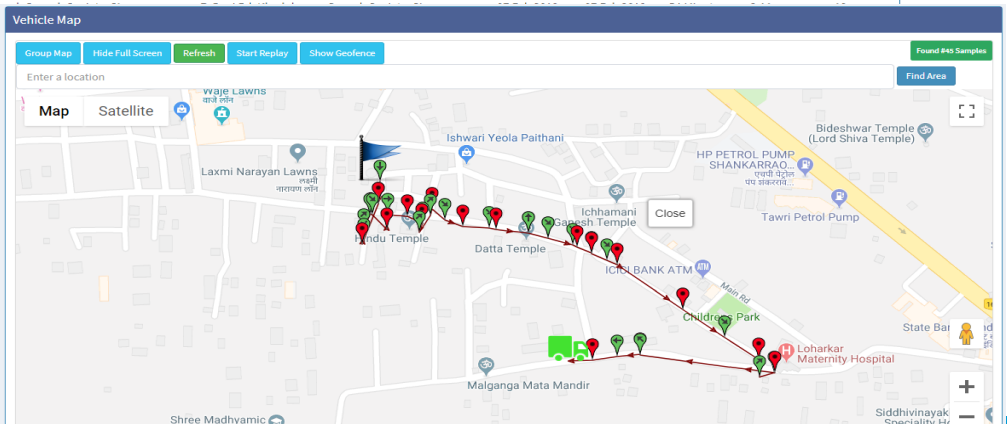
- Route tracking
- Speed tracking
- Odometer tracking
- Engine on-off tracking

Dashboard

- Vehicle status report
- Vehicle performance report
- Drive summary report
- Spatial view





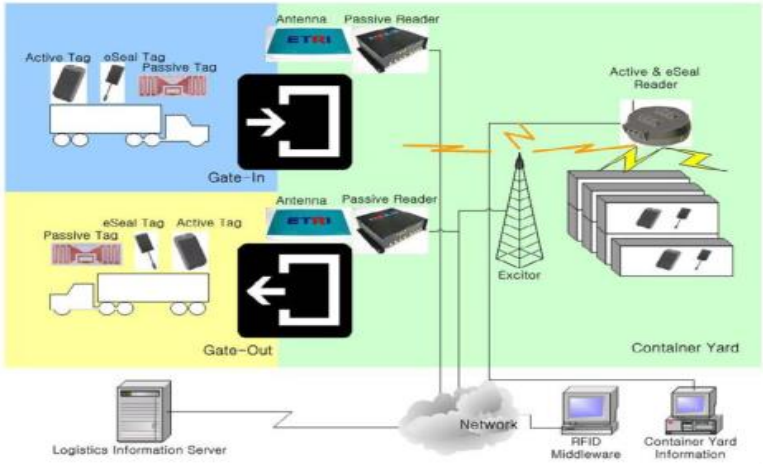


Integrated with existing system on SWM

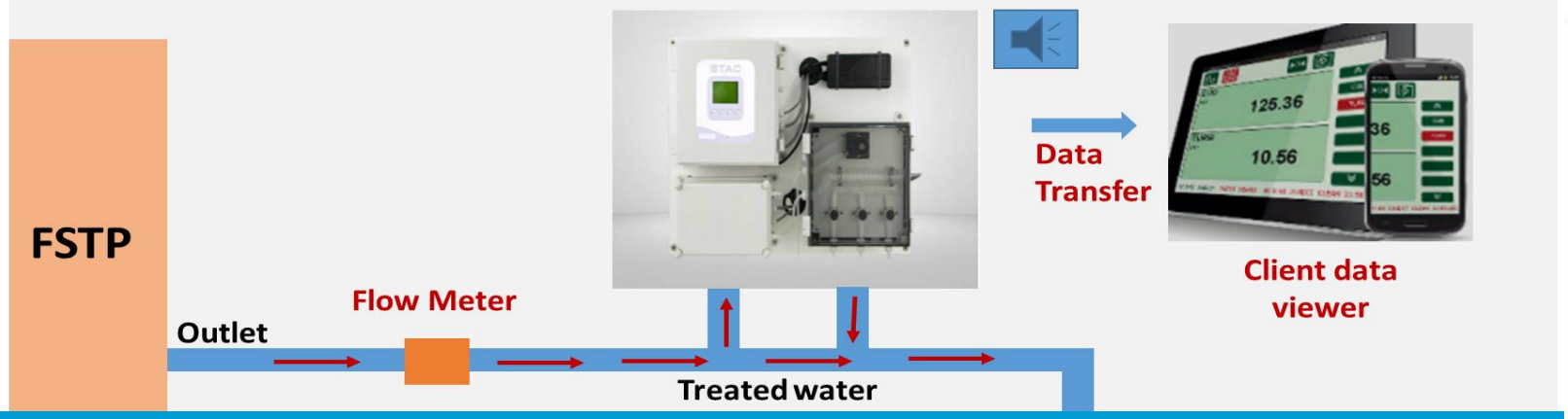
Module on FSTP operations

- Captures safe unloading of collected sludge
- Interface to capture daily volume treated, quality testing results
- Alerts on web dashboard if results exceed permitted water quality levels

Radio-Frequency Identification (RFID) System @ FSTP

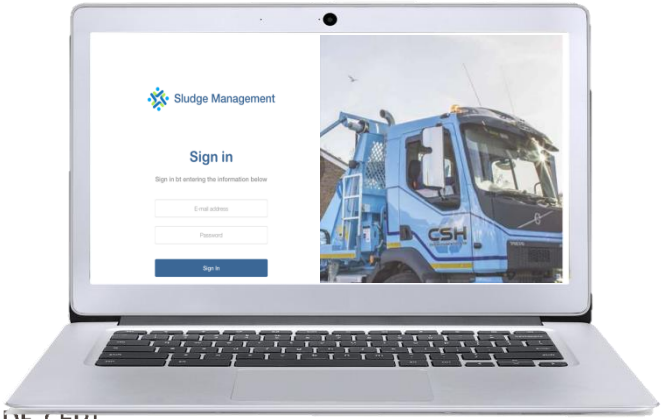


Online real time monitoring: Treated water quality discharge (multi parameter)



Web module – Dashboard

- Login for different user types
- Dashboard to show real time progress
- Enables spatial information view
- Dashboard captures CWIS principles



Monitoring Scheduled Desludging in Wai

CONSOLIDATED PROGRESS REPORT

718 Target Septic Tanks	**503** Desludged (71% of target)	**442** Scheduled (89% of desludged)	**61** Emergency (11% of desludged)
487 Properties Visited	**35** Properties Refused (8% visited)	**1537** Properties Covered	**48KLD** Volume Desludged (Kilo litres per day)

DAILY PROGRESS REPORT

Time Frame 11.02.2019

6 Target Septic Tanks	**5** Desludged (83% of target)	**5** Scheduled (100% of desludged)	**0** Emergency (0% of desludged)
5 Properties Visited	**0** Properties Refused (8% visited)	**5** Properties Covered	**40KLD** Volume Desludged (Kilo litres per day)

SPATIAL VIEW

Cumulative

Property Details

- ☐ Nature of Service
- ☑ Type of properties visited
- ☐ Vulnerable areas covered

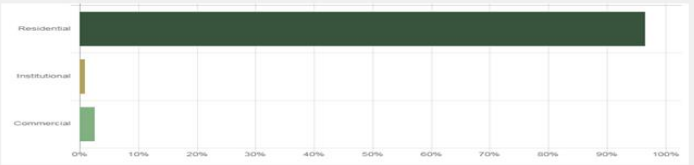
Desludging Details

- ☐ Last time ST was emptied
- ☐ Opened covers for service
- ☐ Problems faced during emptying
- ☐ Household's plan to reseal ST

Performance Metric

- ☐ PPE usage
- ☐ Two-inch septage left
- ☐ Septage Spill

Charts: Type of properties visited



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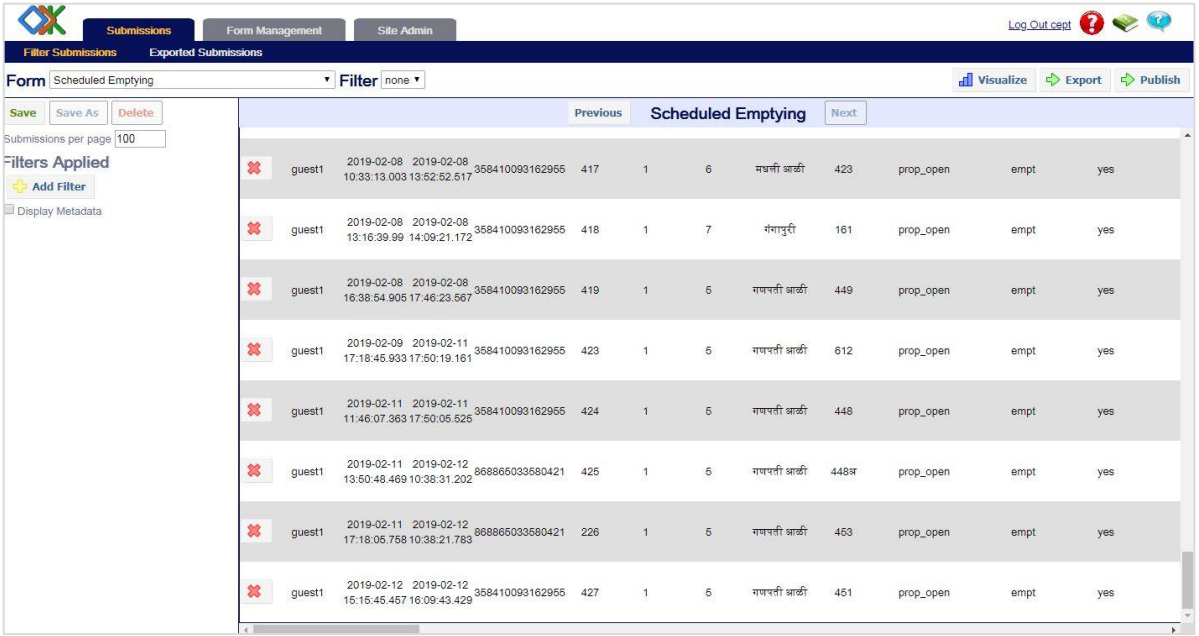
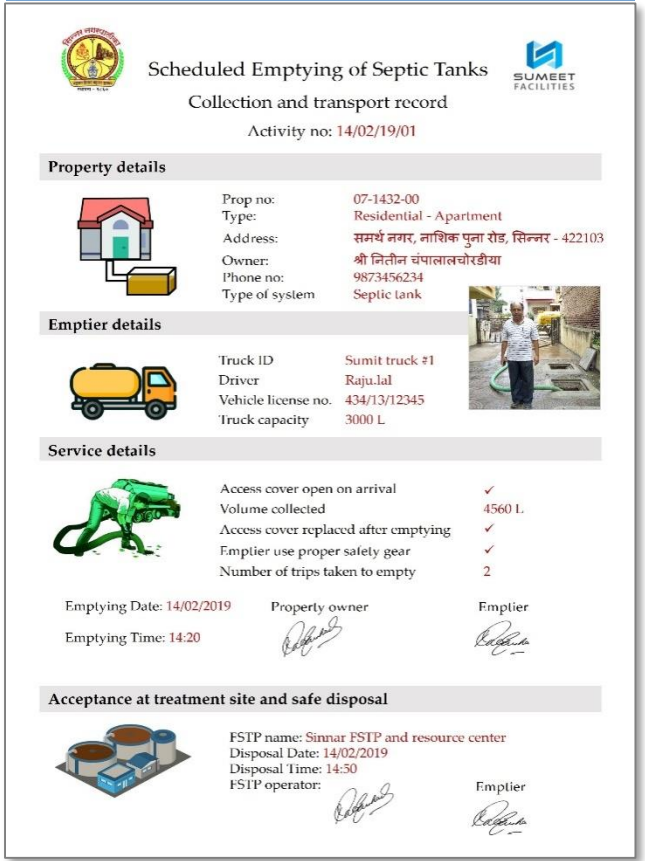
Downloadable MIS Results

Download: Reports, Database and Media files



Payment for desludger linked to submission of the septic tank desludging report

Septic Tank Desludging Report



Key Salient features

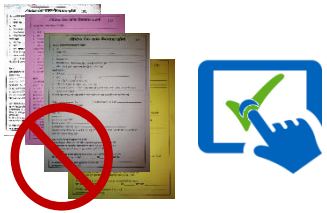
- Real time monitoring of schedule emptying service performance
- Online signature – like Amazon delivery app
- Real time stamping – start and end of operation
- Photo stamping – Capture property/ septic tank details
- Ensure safe disposal at FSTP through multiple checks
    - Online – Real time water quality monitoring
    - Installation of RFID tag @ trucks and @ FSTP
    - Real time truck running monitoring (GPS enabled trucks)
    - In-build validation checks in mobile application

Key Benefits - Program efficiency for FSM services

Integrated monitoring system – Across FSM service chain

"Real time" monitoring
No need to process data for results

Easy to Operate,
Reduce paper work,
Minimize human error



Can view progress easily and process payments

Citizen awareness about emptying procedures

Inclusive – supports vernacular language

Points to remember….

- A simple, user friendly integrated online FSM monitoring system
- Robust and integrated MIS/ Dashboard to track the real time progress
- Payment to be linked to online monitoring system (with multiple checks)
- SaniTab – Database creation of onsite sanitation for 85,000+ properties
- User guides and training modules are available for use of SaniTab tool

Partnerships and Collaboration

BILL & MELINDA GATES foundation

Government of Maharashtra

HSBC

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ALL INDIA INSTITUTE OF LOCAL SELF-GOVERNMENT

SUMEET FACILITIES

TECH enable empower

Transerve

Thank you

cwas@cept.ac.in
cwas.org.in

About us

The Center for Water and Sanitation (C-WAS) at CEPT University carries out various activities – action research, training, advocacy to enable state and local governments to improve delivery of services.

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