

Use Cases and Application Development using National Data Registry on Geospatial Cloud Platform

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DST, New Delhi

Organised by ORSAC, Bhubaneswar
At Hotel Marrion
Bhubaneswar
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NSDI – Vision and Objectives

Vision

- **National infrastructure for the availability of and access to organized spatial data**
- **Use of the infrastructure at Community, Local, State, Regional and National levels for sustaining economic growth**

Objectives

- **Develop and maintain standard digital collection of data**
- **Develop common solutions for Discovery, Access and Use of spatial data in response to the needs of diverse user groups**
- **Increase the awareness and understanding of the vision, concepts and benefits of the NSDI**

INDIAN GEOSPATIAL ECONOMY REPORT

MAY 2018

INDIAN GEOSPATIAL ECONOMY IN FY 2017-18


Geospatial Economy
INR 20,629 cr


Employment
2,51,300



Domestic Market
INR 7,679 cr


Government Sector
INR 6,218 cr
Private Sector
INR 1,461 cr

Export of Services
INR 6,659 cr


Government Expenditure
on National Geospatial
Agencies
INR 6,291 cr

Source: Geospatial Media
Analysis (GMA) of
Geospatial Media &
Communications

INDUSTRY PARTNERS



PRODUCED BY

GEOSPATIAL
media + communications

KNOWLEDGE PARTNER

NASSCOM®

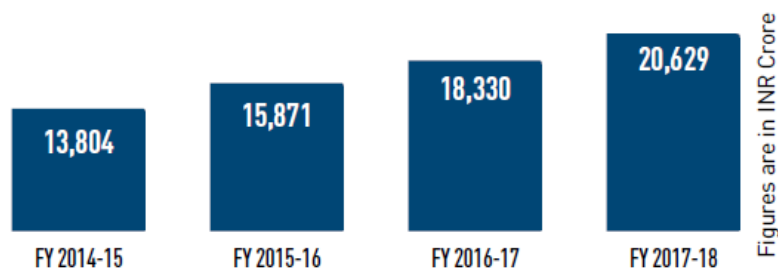
IN ASSOCIATION WITH



Geospatial Economy

A geospatial economy comprises of the following components:

- Market size through commercial procurement of equipment, software, data, and services
- Export of geospatial equipment, software, data and services
- Public expenditure on creation and maintenance of geospatial data, infrastructure and institutions



Employment

- At present, the Indian geospatial sector employs nearly 2,51,300 persons
- Of this total, nearly 67,000 are engaged in export

Key Highlights

- The domestic market comprises of the procurement of equipment, software and solutions, services and data by various government department, agencies, institutions, and private sector.
- India's geospatial market has grown from INR 5,338 crore in FY 2014-15 to an estimated INR 7,679 crore in FY 2017-18 at a CAGR of 12.9%.
- The domestic market is expected to grow at an estimated CAGR of 13.8% between FY2017-18 and FY2020-21.
- India relies heavily on imports for its geospatial hardware requirements. For FY 2017-18, it is estimated to be worth INR 1,274 crore
- The government spending on geospatial institutions responsible for supply and maintenance of geospatial data and infrastructure almost equals the government share in domestic market.
- At present, every 6 Rupee invested by the government creates market of nearly 7 Rupee. There is room for the government to shift from being a market competitor to

Source: Geospatial Media Analysis (GMA) of Geospatial Media & Communications, NOIDA, India

Key Application Areas of Geospatial Technologies

Transportation

- Spot the train (Rail Radar)
- Multi-modal route planning
- Intelligent Transportation System (ITS)

Power & Utilities

- Maintenance of Telecom Cables
- Identify shortest path for connecting habitations

Water Resources

- Locate water harvesting structures for groundwater recharge

Key Applications of Geospatial Technologies (Contd.)

Urban Development

- Smart energy management
- Managing pollution sources in a city

Disaster Management

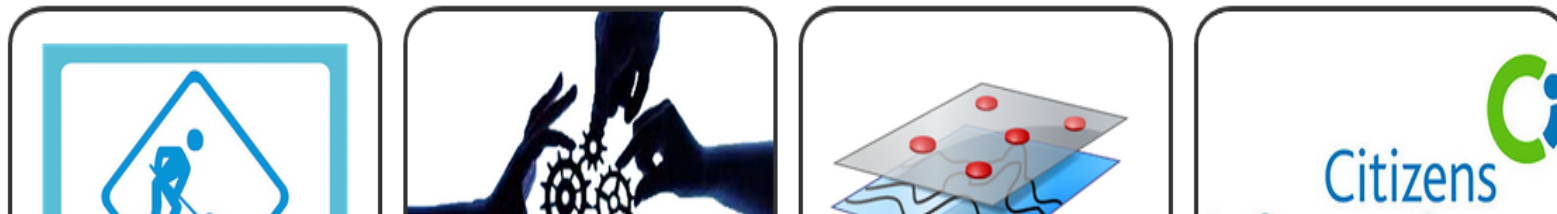
- Evacuation Planning
- Allocating an FPS amongst a group of villages during a flood event/ submergence

Oil & Gas

- Oil pipeline alignment to avoid forests and habitations



Application



APPLICATION

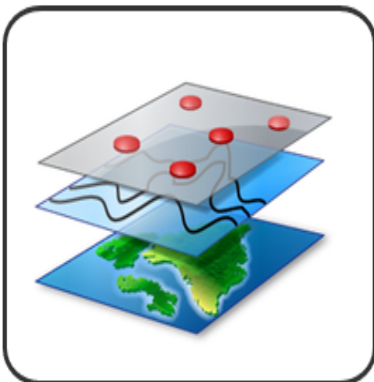
Application



Plan Dig Monitoring



EASE OF DOING BUSINESS
(CONSTRUCTION PERMITS)-CCZM



GIS Tool Planning



Citizen Geoportal



Education Geoportal



Delhi Jah Board



Forest Regulatory System



I&FC Geo-Portal



Delhi Development Authority



Property Survey Form



Revenue Planning Tool



NDMC Planning Tool



राष्ट्रीय स्वास्थ्य मिशन

Search Location

Map showing Andrews Ganj area with labels: ANDREWS GANJ POST OFFICE, HOTEL, PWD OFFICE, SHIV MANDIR, OFFICE OF EXECUTIVE ENGINEER, BSES OFFICE. Includes a search bar and navigation controls.

Map details: Aerial view of a residential and commercial area in Andrews Ganj. A large cyan-colored rectangular area is highlighted in the center. Buildings are labeled with numbers and names. A scale bar indicates 60ft. Coordinates are shown as 77.231 28.564 Degrees.

Directions

1 Find address or place

2 Find address or place

ADD DESTINATION

SHOW MORE OPTIONS

GET DIRECTIONS

Route service description was not reached or recognized. Please check service URL and/or user credentials, if specified.

Directions

- 1 andrewsg
- 2 Andrews Ganj Extension, Andrews Ganj, New Delhi, South, Delhi, IND

- Andrews Ganj Extension-A Block, Andrews Ganj, New Delhi, South, Delhi, IND
- Andrews Ganj Extension-B Block, Andrews Ganj, New Delhi, South, Delhi, IND
- Andrews Ganj Extension-Block A, Andrews Ganj, New Delhi, South, Delhi, IND
- Andrews Ganj Extension-Block B, Andrews Ganj, New Delhi, South, Delhi, IND
- Andrews Ganj Extension-Block C, Andrews Ganj, New Delhi, South, Delhi, IND

200ft 77.226 28.564 Degrees

Directions

1 Andrews Ganj Extension, Andrews Ganj, New Del

2 jawaharlal

- Jawaharlal Nehru Garden, Athwa, Surat, Gujarat, IND
- Jawaharlal Nehru Hospital Opd, Medical, Aligarh, Uttar Pradesh, IND
- Jawaharlal Nehru Market, Lahartara, Varanasi, Uttar Pradesh, IND
- Jawaharlal Nehru University, New Delhi, South West, Delhi, IND
- Jawaharlal College of Engineering &

Map labels: ANDREWS GANJ GBSS, ANDREWS GANJ GGSS, GIRI KALYAN KENDRA, ANDREWS GANJ POST OFFICE, HOTEL, PWD OFFICE, OFFICE OF EXECUTIVE ENGINEER, SHV, HT CITY RESTAURANT DE SEO, AXIS BANK ATM, THE ORIENTAL BLOOM, GOVT COLONY PINJIRA, ANDREWS GANJ, ANDREWS GANJ

Directions

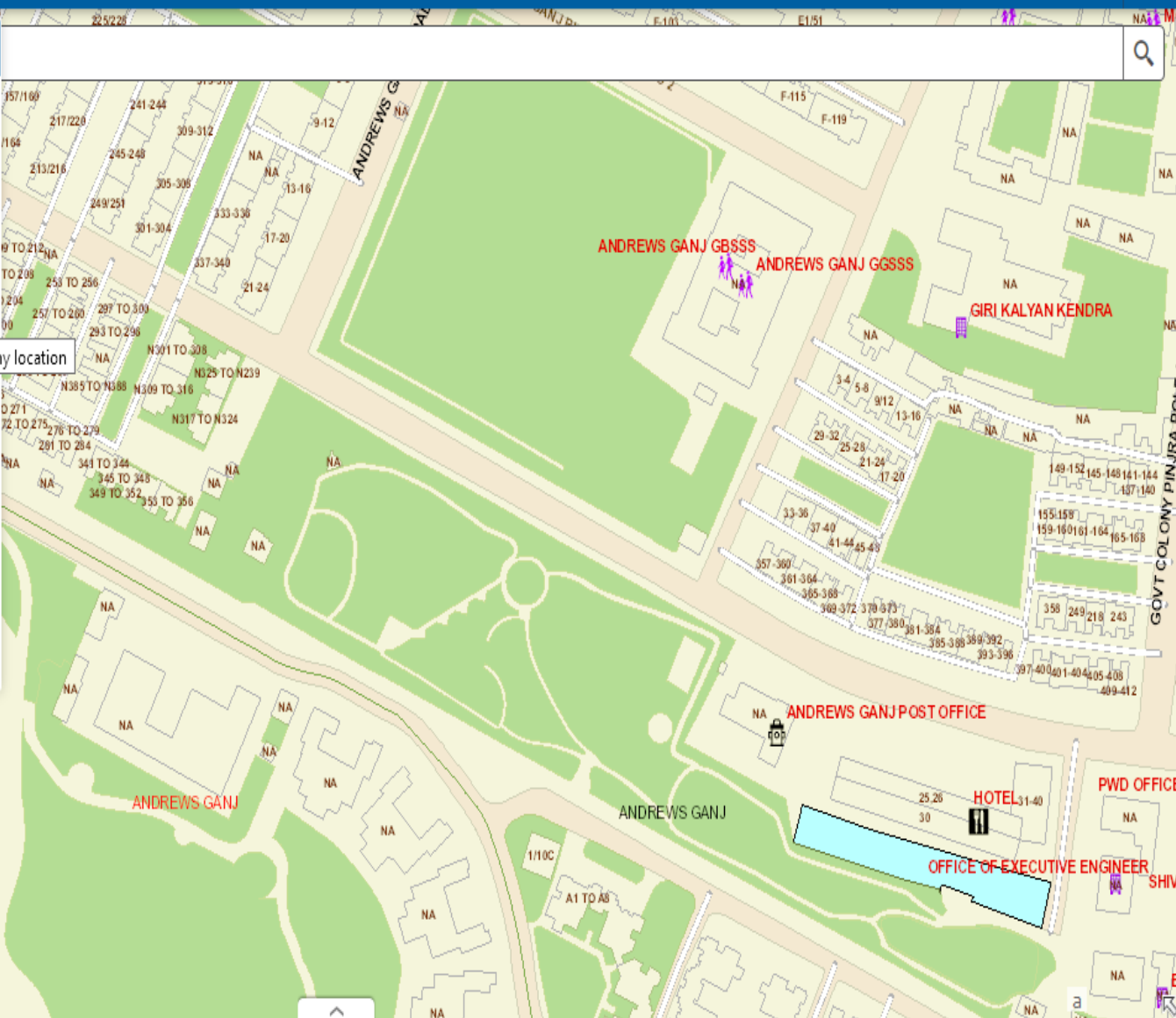
- 1 Andrews Ganj Extension, Andrews Ganj, New Delhi,
- 2 Jawaharlal Nehru University, New Delhi, South West
- 3 Find address or place

ADD DESTINATION Find my location

SHOW MORE OPTIONS

GET DIRECTIONS

Unable to route to these addresses.



Uttarakhand Geoportal – UKSDI (Implementation: UCoST, De'dun & KU, Nainital/ Almora)

UTTARAKHAND GEOPORTAL

About Uttarakhand Geo-portal

Uttarakhand Geoportal is an Internet based Directory of Geo-spatial Data, Metadata, and Services for the State that allows data providers and users to share and explore Geo-spatial Information related to boundaries, demography, agro & socio economy, resources, infrastructure facilities with attributes.

Geo-spatial datasets generated, maintained and provided by various concerned Departments of the State Government, Academia, Business/ Industry or Non-Governmental Organizations (NGOs) of Uttarakhand are proposed to be made accessible through a Clearinghouse mechanism.

The Geo-portal will essentially be used for the following objectives:

1. Bringing together geo-spatial knowledge and information under a common platform, which till date has existed as a disparate system and unknown to quite a wider section of the society, institutions, scientific community and government departments.

About UKSDI & Bodies

- [Genesis Of UK Geoportal](#)
- [State SDI Steering Committee](#)
- [State SDI Executive Committee](#)
- [District GIS Coordination Committee](#)
- [Nodal Officers For GIS Development](#)
- [District GIS Cells for GIS Updating](#)
- [Capacity Building in Development / Applications / Updation of GIS](#)
- [Background](#)

MANAGEMENT OF UK GEOPORTAL

For proper management and smooth functioning of the Uttarakhand Geoportal, Government of Uttarakhand has i) constituted a three tier management structure - State SDI Steering Committee , State SDI Executive Committee ; and a District Coordination Committee at each district of the State; ii) appointed State and District Level Nodal Officers; and has made provision of District GIS Cells to develop and update GIS as per the needs of the Line Departments and capacity building of the State in applications of GIS in planning/administration.

For Citizen Users

FREE Registration

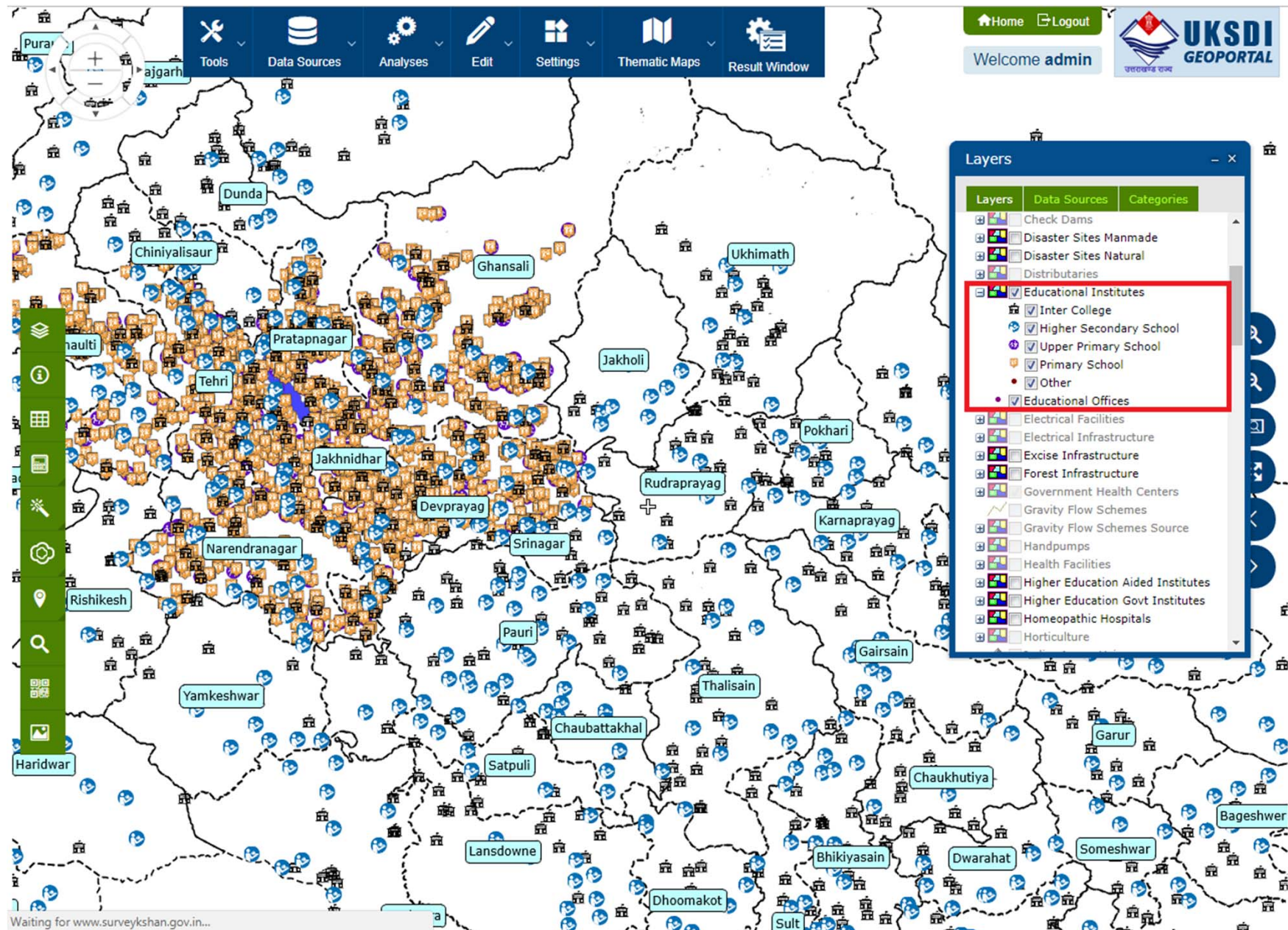
Legend:

A collaborative project of DST, GoI, DST, UCOST and COE NRDMs, Dept. Geography, Kumaun University.

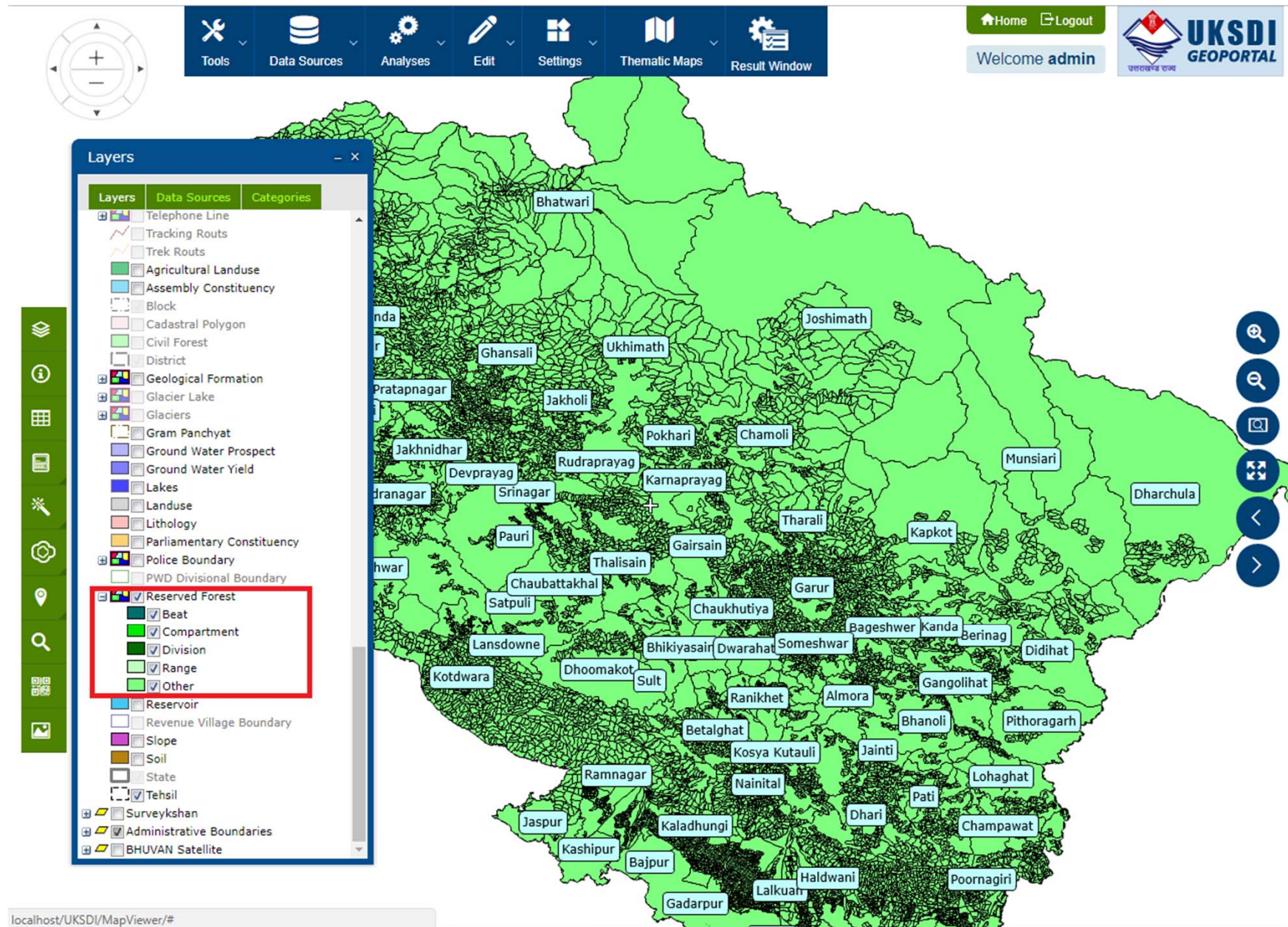
800-1000 (1.18% area)	2500-2800 (1.75% area)	5600-5800 (1.47% area)
1000-1200 (5.43% area)	2800-3000 (1.75% area)	5800-6000 (0.79% area)
1200-1400 (6.77% area)	3000-3200 (1.63% area)	6000-6200 (0.38% area)

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Educational Institutions



Reserved Forest



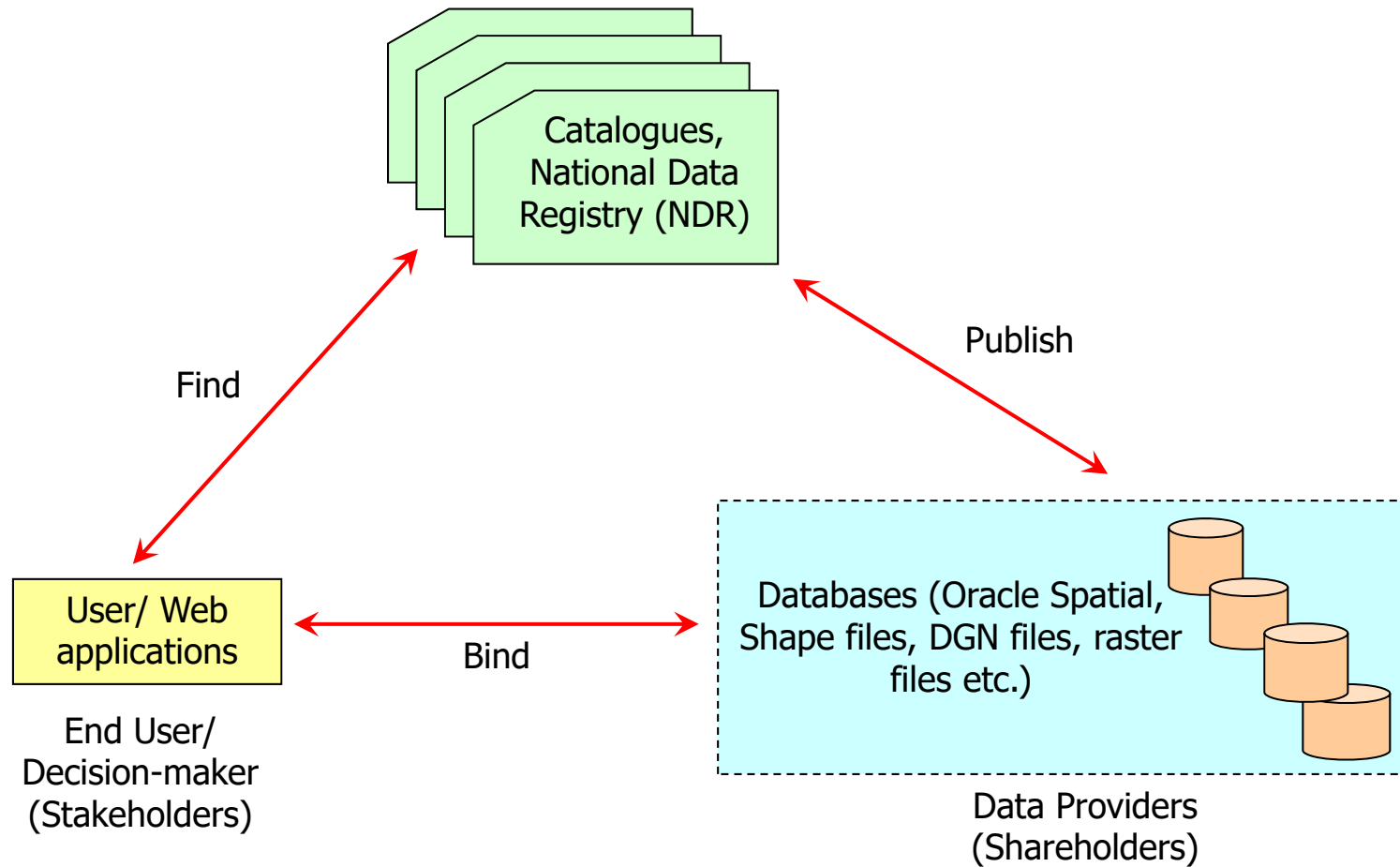
Applications suggested by Almora District under Uttarakhand SDI through Govt. Order

(OM No. 4876/S.P.A./G.P.S.Cell/2017-18 Dated- 22/01/2018)

1. Police Department
2. Primary Health Centre
3. Public Works Department
4. Tourism Department
5. District electoral Department
6. District Supply Department
7. Uttarakhand Renewable Energy Development Agency
8. Forest Department
9. Child development Department
10. Agriculture Department
11. Irrigation Department.
12. Panch Jal nizam
13. Rural Work Department
14. District industries centre
15. Jila Panchayat Department
16. Abkari Department

17. Dairy Development
18. Electricity Department
19. Swajal Vibhag-
20. District Employment Exchange office
21. **District Disaster Management Department**
22. District Sports Department
23. D.R.D.A.
24. Jila Yuva Kalyan And Prantiya Rakhshak Dal
25. Minor Saving Department
26. Education Department
27. Fisheries Department
28. Silk Department
29. Jal Sansthan
30. P.M.G.S.Y. Almora
31. Co-operative Department
32. Panch Sthaniya Almora

Service-oriented Architecture

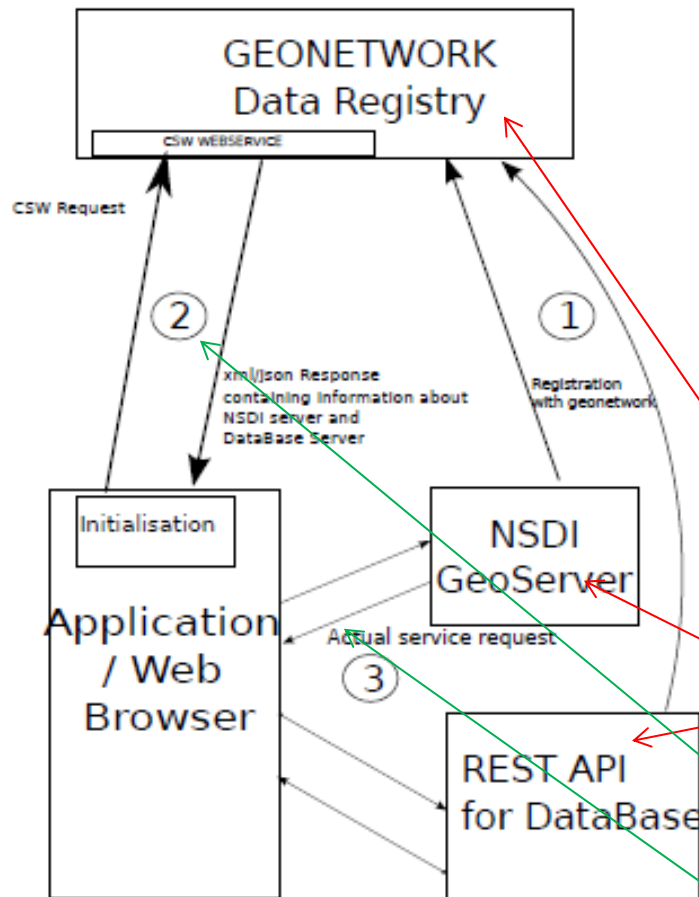


Case-study : Train Route/ Position Enquiry App

Source 1 : railway track data
- available as WMS from NSDI

Source 2 : train locations by time
- available in a DB at IRCTC/ IITB
- packaged as REST service

App : to show train position on map as it travels



Steps :

0. Create data registry using Geonetwork tool
1. Register the two sources

App actions:

2. Look up details of services in registry : where, what format, ...
3. Access data directly from sources

Applications and R & D (contd..)

The screenshot displays the Karnataka Geoportal interface in a Mozilla Firefox browser. The browser's address bar shows the URL `www.karnatakageoportal.in/KSSDI/MapView.aspx`. The application header includes the title "Karnataka Geoportal" and a navigation toolbar with icons for layers, zoom, pan, and search.

The main map area shows a satellite-style view of a region with a network of roads and railways. A specific route is highlighted with a blue line and red dots. A tooltip window is open over a station, displaying the following information:

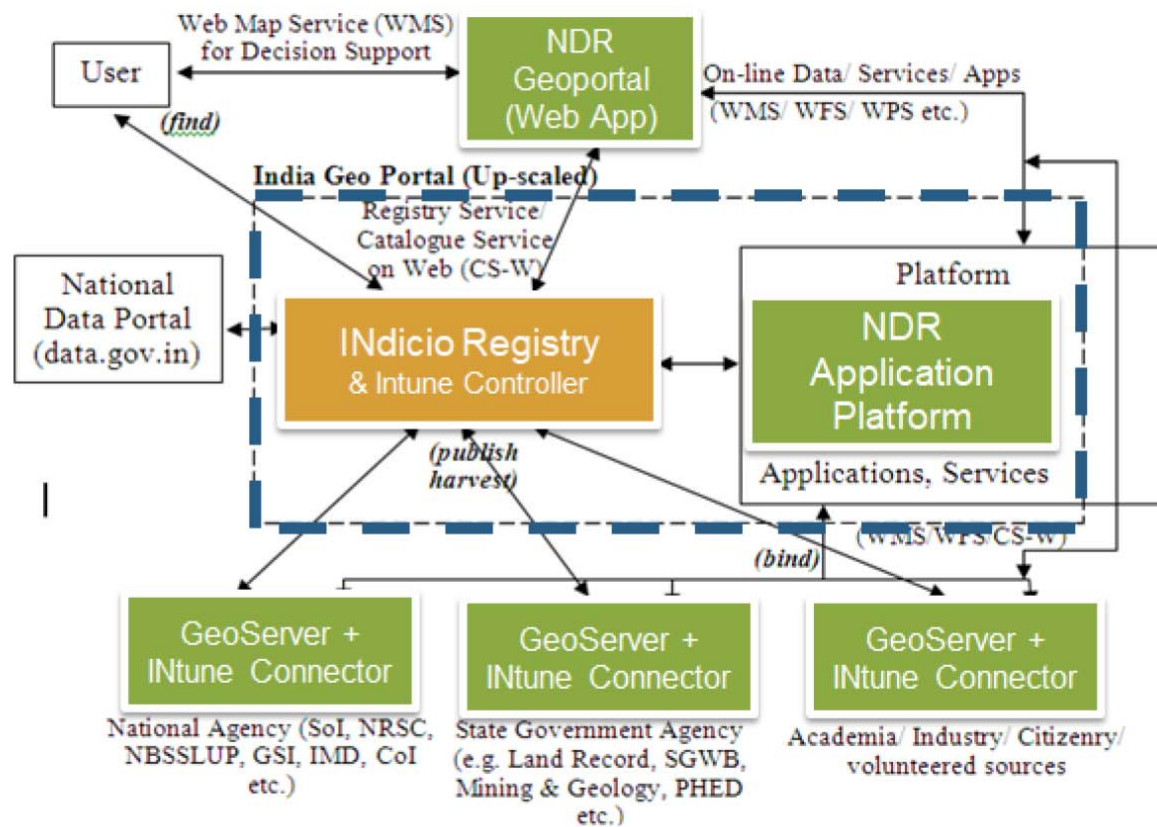
Station Name	SANDAL KALAN
Train Name	NDLS-KLK SHATABDI EXP
Train Number	12011

On the right side of the map, there are two panels:

- Layerlist:** A list of data layers with checkboxes. The checked layers are "Railways_PHC_GDC", "Roads_PHC_GDC", and "Railways_O_GDC".
- Train Query:** A section titled "Route Enquiry" with input fields for "Train Name" (set to "Ndls-klk Shatabdi") and "TrainNumber" (set to "12011").

The bottom of the browser window shows the Windows taskbar with the taskbar icon, "Downloads" folder, and open applications "Karnataka Geoportal..." and "Microsoft PowerPoi...". The system tray on the right shows the date and time as "17:48".

NDR Architecture in working



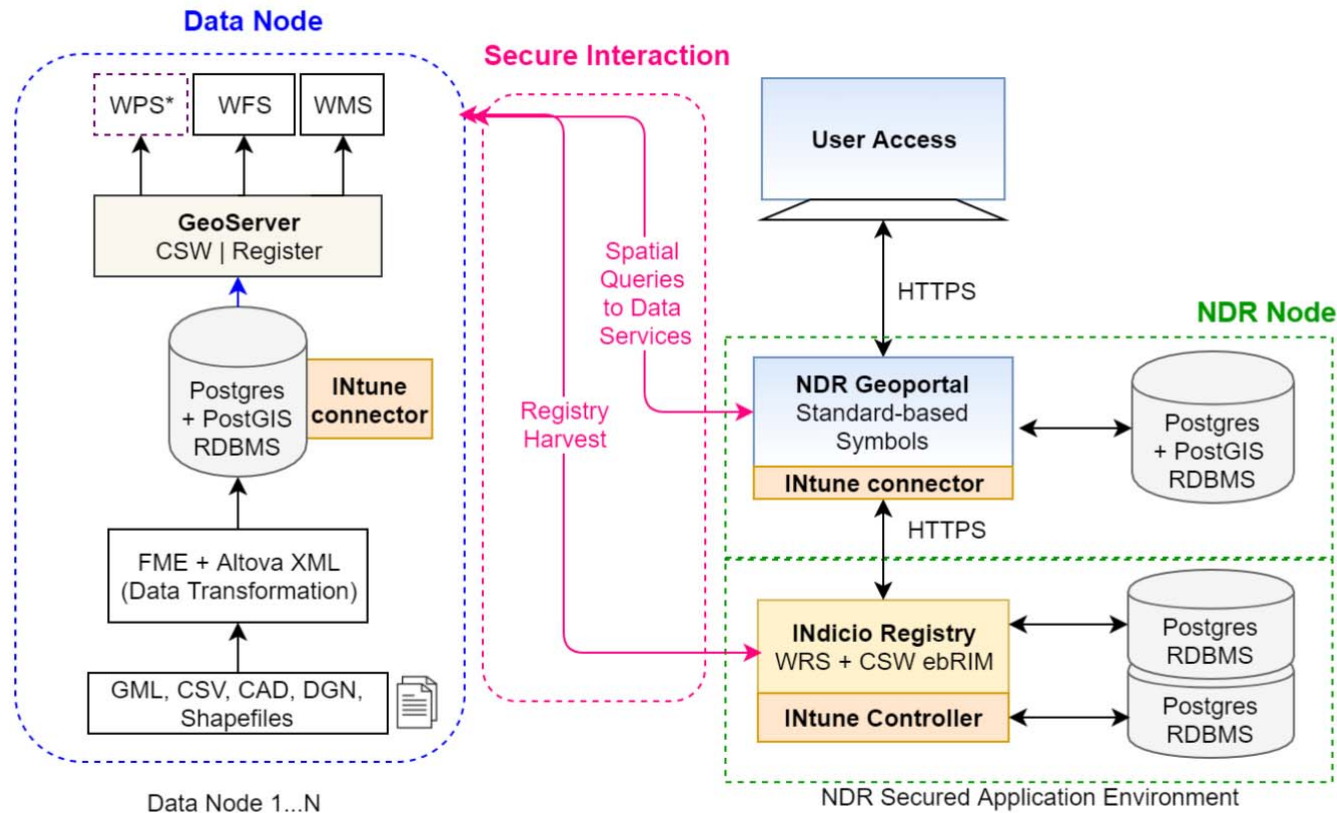
INDICIO: version 3.1.0-M5

INTune Controller: version 1.0

INTune Connector: version 1.0

GeoServer: version 2.12

NDR Complete Workflow



* WPS is not provided in POC. Requires extension to GeoServer (not in current scope)

ORACLE® Network Data Model

Mouse

Mouse x: 77.01476521999233

Mouse y: 29.131292886725856

Shortest Path Result

Compute time: 31 ms

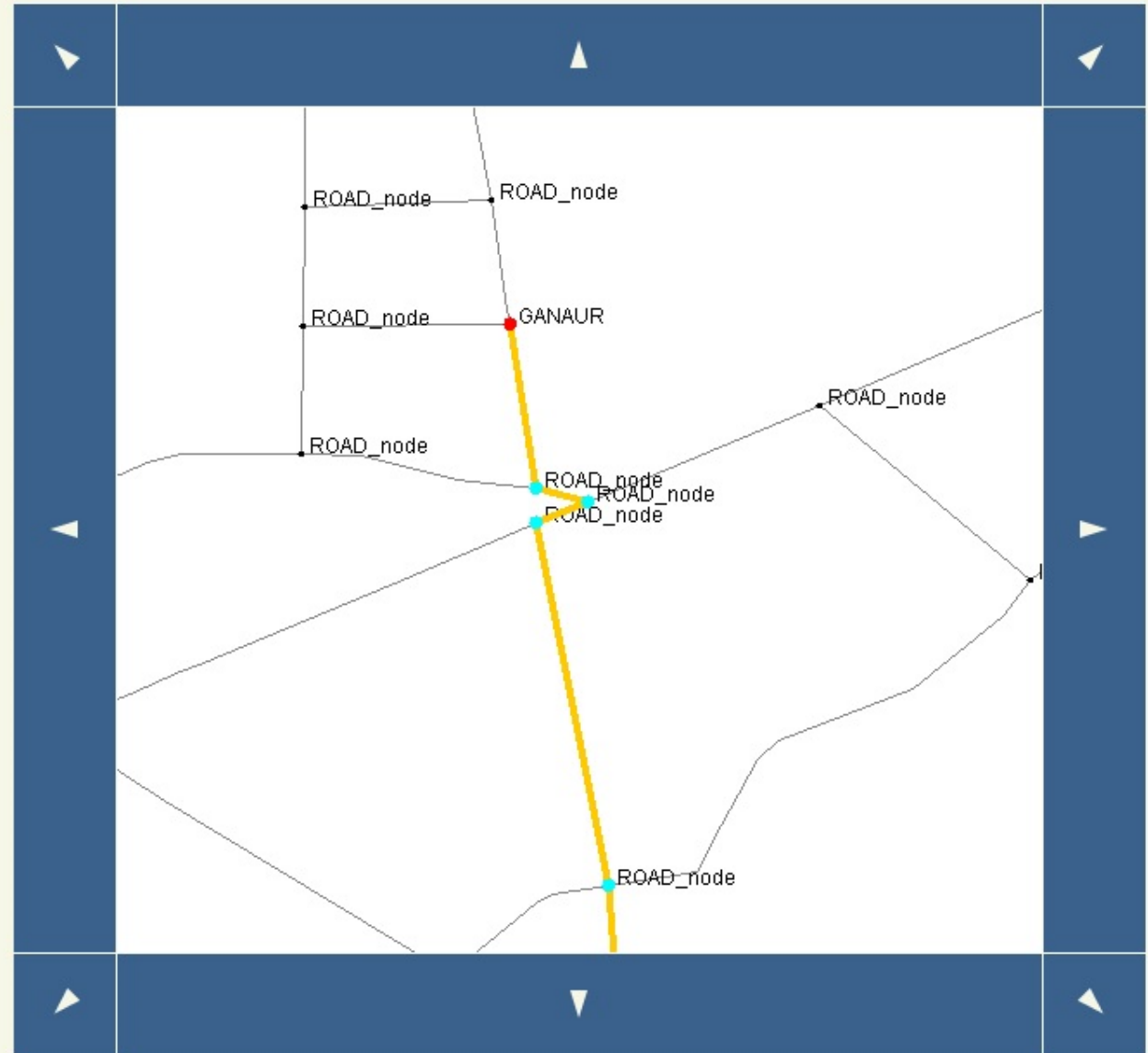
Start Node ID: 26988

End Node ID: 27547

Algorithm: A* Search

Path Cost: 0.0

Shortest Path: [CLICK TO SHOW PATH](#)



Zoom In Zoom Out Fit to Window



Mouse

Mouse x: 77.036252375816

Mouse y: 29.002246962540557

Shortest Path Result

Compute time: 31 ms

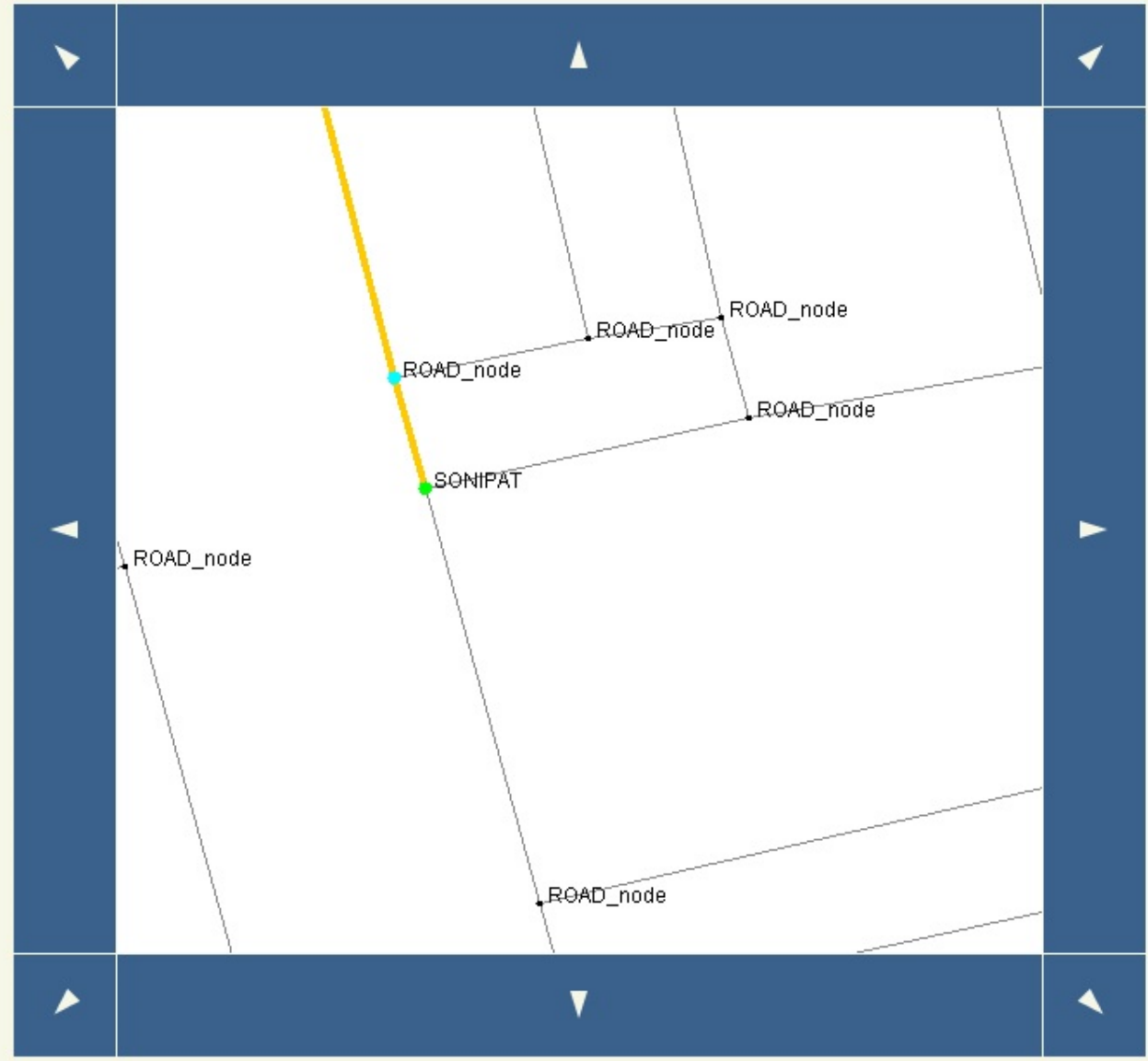
Start Node ID: 26988

End Node ID: 27547

Algorithm: A* Search

Path Cost: 0.0

Shortest Path: CLICK TO SHOW PATH



Zoom In Zoom Out Fit to Window

ORACLE® Network Data Model

Mouse

Mouse x: 75.5624636416227

Mouse y: 27.549418184665644

Shortest Path Result

Compute time: 31 ms

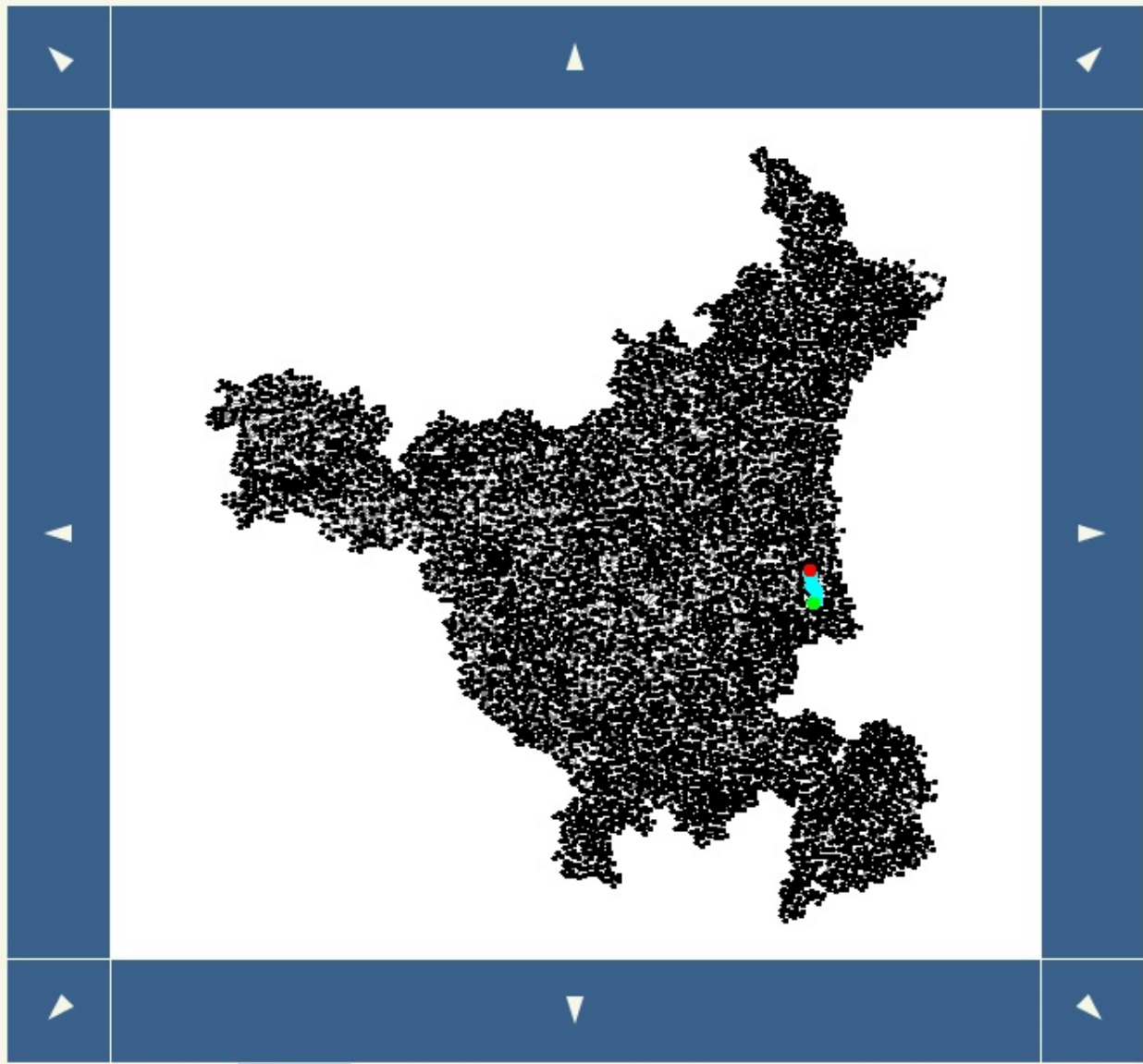
Start Node ID: 26988

End Node ID: 27547

Algorithm: A* Search

Path Cost: 0.0

Shortest Path: [CLICK TO SHOW PATH](#)



Pan Down

Zoom In

Zoom Out

Fit to Window

Front Page

NSDI Application Portal

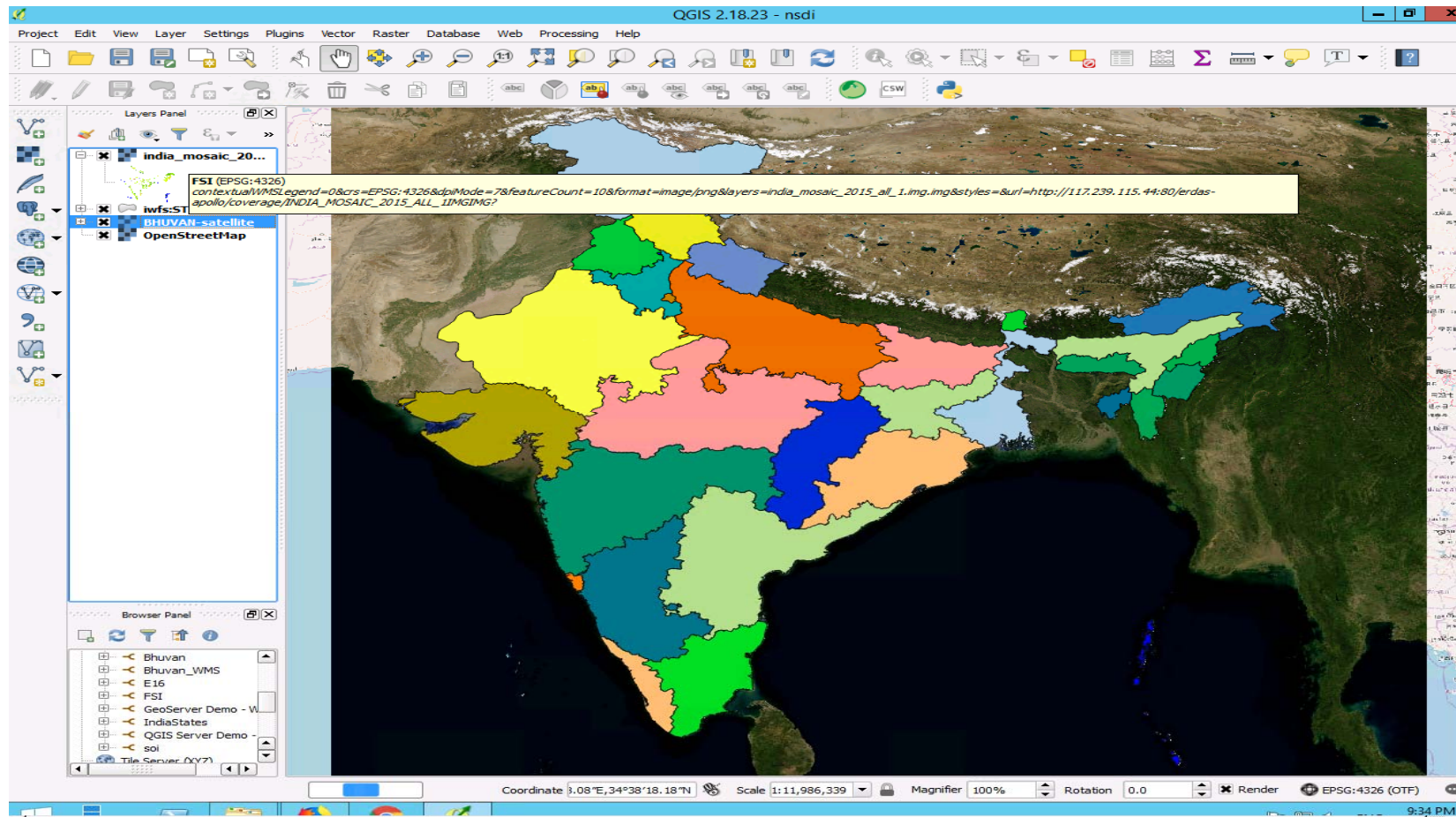
The NSDI Application portal provides shared and trusted geospatial data, services, and applications for use by the public and by government agencies and partners to meet their mission needs.

NSDI Application portal users have access to

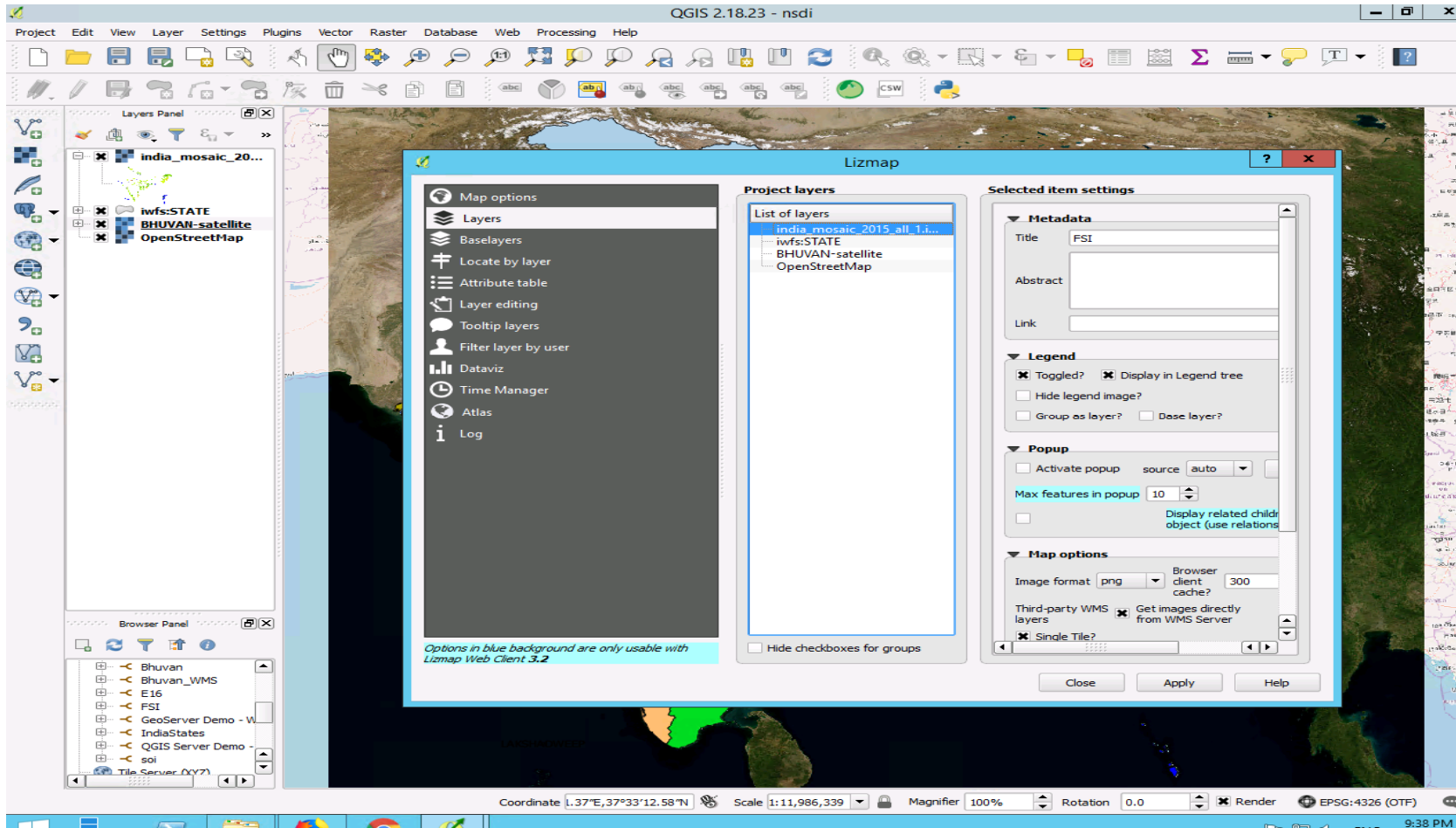
- Authoritative data to support informed decision making
- Reusable applications and services for governmental and nongovernmental use
- A shared infrastructure that can host Nodal Agencies data and applications
- A focal point where governmental, academic, private, and public data can be visualized together to inform national and regional issues

Project Creation on QGIS before publishing on the web

WMS and WFS Interoperable Services are consumed in QGIS, create the desired project and published on the web



Layers Settings of WMS and WFS consumed for publishing on the web



Map options settings for different map tools, scales, map extent etc.

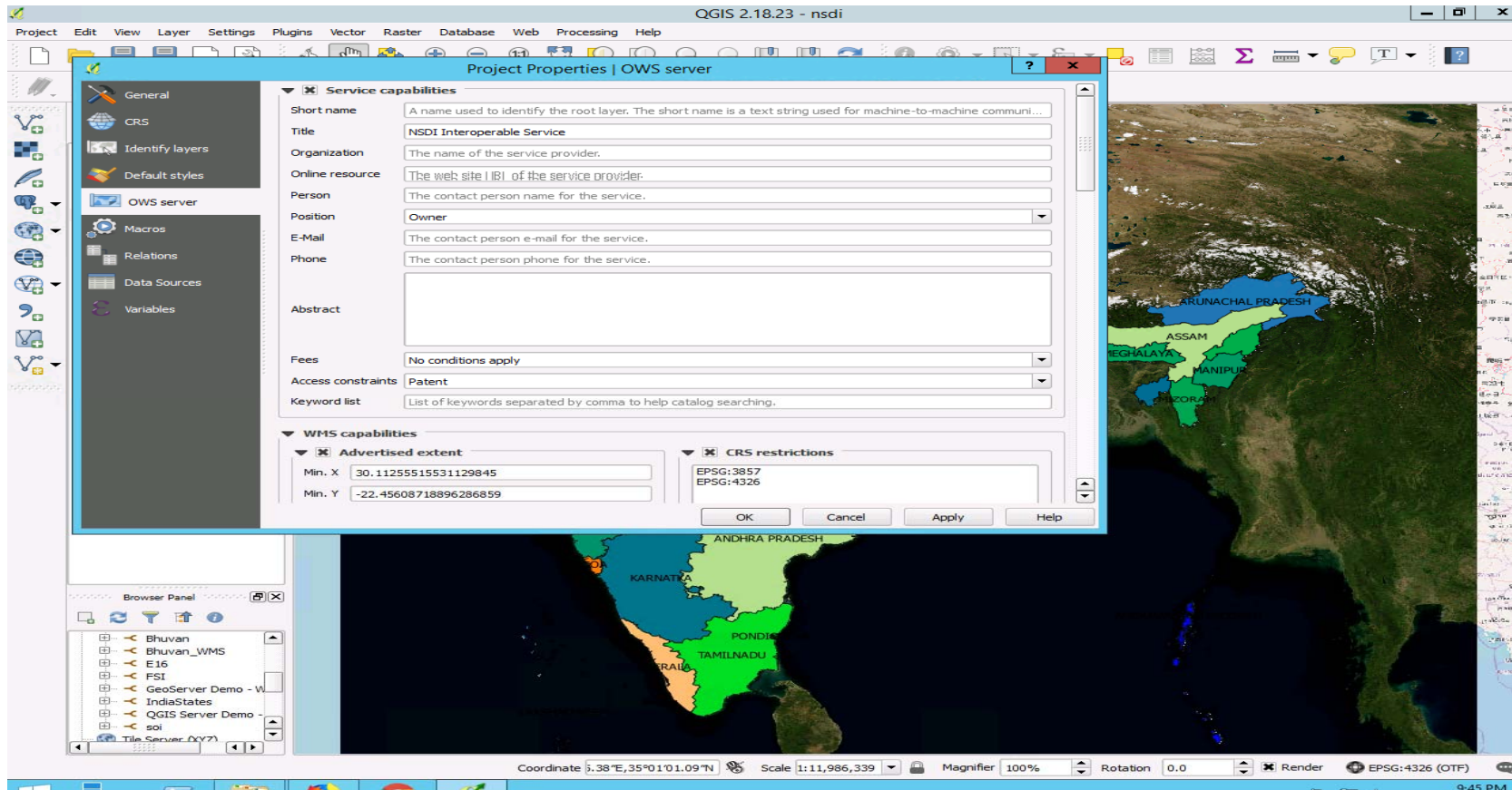
The screenshot displays the QGIS 2.18.23 interface with the Lizmap dialog box open. The dialog box is titled "Lizmap" and contains several sections of settings:

- Map options:** A list of options where "Map options" is highlighted in blue. Other options include Layers, Baselayers, Locate by layer, Attribute table, Layer editing, Tooltip layers, Filter layer by user, Dataviz, Time Manager, Atlas, and Log.
- Generic options:** Includes a checkbox for "Hide project in Lizmap Web Client" and a text field for "Restrict access to the following groups".
- Map tools:** Includes checkboxes for "Print", "Measure tools", "Zoom history", and "Automatic geolocation (Only available in HTTP)". It also features a dropdown for "Address search" set to "Google".
- Popup click tolerance (pixels):** Includes spinners for "Points" (25), "Lines" (10), and "Polygons" (5).
- Scales:** Includes a text field for "Map Scales" (000, 250000, 500000, 1000000) and spinners for "Min Scale" (10000) and "Max Scale" (100000000).
- Initial map extent:** Includes a text field for "Extent" (30.1125551553, -22.456087189, 131.279431082, 51.5684561718) and buttons for "Set from project properties" and "Set from map canvas".
- Map interface:** Includes checkboxes for "Hide header", "Hide menu bar", "Hide legend panel at startup", and "Hide scale and overview map".

At the bottom of the dialog box, a note states: "Options in blue background are only usable with Lizmap Web Client 3.2".

The background shows the QGIS interface with a map of India, a Layers Panel on the left, and a Browser Panel at the bottom left. The status bar at the bottom indicates the coordinate (5.98°E, 16°25'42.27"N), scale (1:1,986,339), magnifier (100%), rotation (0.0), and EPSG:4326 (OTF).

Project Properties Settings for publishing on the web



Project Properties Settings for different layer for publishing on the web and testing the configuration

The screenshot displays the QGIS 2.18.23 interface with the 'Project Properties | OWS server' dialog box open. The dialog is divided into several sections:

- General:** Includes options for CRS, Identify layers, and Default styles.
- OWS server:** Contains a table of layers and an 'Advertised URL' field.
- Test configuration:** Features a 'Launch' button and a text area providing feedback on the configuration.

Layer	Published
0 BHUVAN-satellite	<input checked="" type="checkbox"/>
1 OpenStreetMap	<input checked="" type="checkbox"/>
2 india_mosaic_20...	<input checked="" type="checkbox"/>

Advertised URL:

Test configuration

Launch

Start checking QGIS Server
All names and short names of layer and group are unique
Some layer short names have to be updated:

- Use short name for "wfs:STATE"

Some layer encodings are not set:

- Update layer "wfs:STATE" encoding

Start checking QGIS Server

OK Cancel Apply Help

The background map shows India with states highlighted in different colors: Karnataka (blue), Andhra Pradesh (green), Tamil Nadu (orange), and Pondicherry (yellow). The Browser Panel on the left shows a tree view of the project layers, including 'Bhuvan', 'Bhuvan_WMS', 'E16', 'FSI', 'GeoServer Demo - W...', 'IndiaStates', 'QGIS Server Demo -', 'sol', and 'Tile Server (XY?)'. The status bar at the bottom indicates the coordinate (5.38°E, 35°01'01.09"N), scale (1:11,986,339), magnifier (100%), rotation (0.0), and EPSG:4326 (OTF).

Login Page of the Portal

nsdi Login

login

password

Remember me

login

nsdi

Users Right Management

The screenshot shows a web browser window with the following tabs: NSDI Cadastre - Cadastre - NSDI A, NSDI Interoperable Service - Demo, Login - Administration, and Administration. The address bar shows the URL localhost/admin.php/jauthdb_admin/. The page title is "Administration" and the user is logged in as "admin".

The main content area is titled "Users List" and contains a search field for "Details of the user" with a "View" button. Below this is a table of users:

Login	View
admin	View
lizadmin	View
logintranet	View

At the bottom of the table is a button labeled "Create a new user".

The left sidebar contains a navigation menu with the following items:

- Dashboard
- SYSTEM
 - Users
 - Groups of users for rights
 - Rights of users
- LIZMAP
 - Lizmap configuration
 - Theme
 - Lizmap Logs

Creating Users and Managing Their Rights

The screenshot displays the 'nsdi Administration' web interface. At the top left is the 'nsdi' logo and the word 'Administration'. At the top right are navigation links for 'Projects' and a user profile for 'admin'. A left sidebar menu contains the following items: Dashboard, SYSTEM (Users, Groups of users for rights, Rights of users), LIZMAP (Lizmap configuration, Theme, Lizmap Logs). The main content area is titled 'Create a new user' and contains a form with the following fields: Nickname* (with a help icon), E-mail*, Password* (with a help icon), Re-type this password* (with a help icon), First name*, Last name*, Organization, Phone number, Street, Postcode, City, Country, and a large text area for Comments. The Windows taskbar at the bottom shows the time as 10:45 PM.

Map Configuration management by Administrator

The screenshot shows a web browser window displaying the NSDI Administration interface. The browser's address bar shows the URL `localhost/admin.php/admin/config/`. The page title is "Administration" and the user is logged in as "admin".

The interface is divided into a left sidebar and a main content area. The sidebar contains a navigation menu with the following items:

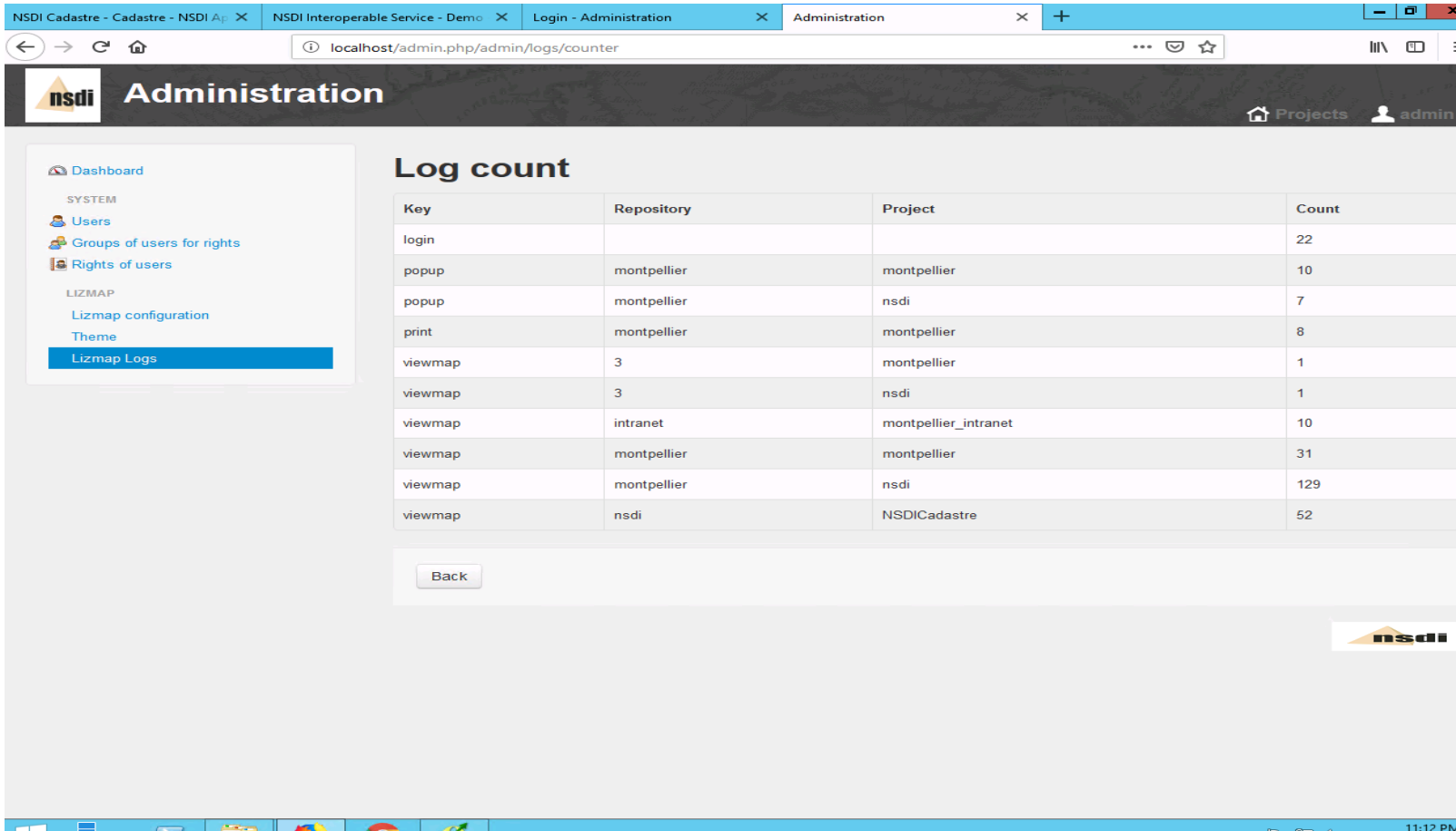
- Dashboard
- SYSTEM
 - Users
 - Groups of users for rights
 - Rights of users
- LIZMAP
 - Lizmap configuration** (highlighted)
 - Theme
 - Lizmap Logs

The main content area is titled "map configuration Generic" and shows the "Version number" as 3.1.11. Below this, there is a "Services" section with a table of configuration parameters:

Parameter	Value
Application name	NSDI Application
QGIS server version	≥ 2.18
WMS server URL	<code>http://127.0.0.1/qgis/qgis_mapserv.fcgi.exe</code>
WMS subdomain URLs list (optional)	
Default max. Width for GetMap request	3000
Default max. Height for GetMap request	3000
Only maps	Off
Default repository	Demo
Default project	
Server cache storage type	Files
Cache root directory	<code>C:\webserver\cache\prod\</code>
Redis host	localhost
Redis port	6379
Redis database index	

The system tray at the bottom right of the window shows the time as 9:12 PM.

Log monitoring for log count of different project access



The screenshot displays the NSDI Administration interface. The browser address bar shows the URL `localhost/admin.php/admin/logs/counter`. The page title is "Administration" and the user is logged in as "admin".

The main content area is titled "Log count" and contains a table with the following data:

Key	Repository	Project	Count
login			22
popup	montpellier	montpellier	10
popup	montpellier	nsdi	7
print	montpellier	montpellier	8
viewmap	3	montpellier	1
viewmap	3	nsdi	1
viewmap	intranet	montpellier_intranet	10
viewmap	montpellier	montpellier	31
viewmap	montpellier	nsdi	129
viewmap	nsdi	NSDICadastre	52

A "Back" button is located below the table. The NSDI logo is visible in the bottom right corner of the page.

Log details of different users, their access resources and project with time

The screenshot displays the NSDI Administration web interface. The browser's address bar shows the URL `localhost/admin.php/admin/logs/detail`. The page title is "Administration" and the user is logged in as "admin".

The main content area is titled "Log detail" and contains a table with the following columns: Key, Timestamp, User, Content, Repository, Project, and IP. The table lists 20 log entries, all performed by the "admin" user. The entries are sorted by timestamp, with the most recent at the top.

Key	Timestamp	User	Content	Repository	Project	IP
viewmap	11/17/2018 16:24:25	admin		nsdi	NSDICadastre	
viewmap	11/17/2018 15:50:10	admin		intranet	montpellier_intranet	
viewmap	11/17/2018 15:49:52			montpellier	montpellier	
viewmap	11/17/2018 15:48:46	admin		montpellier	montpellier	
viewmap	11/17/2018 15:13:12	admin		montpellier	nsdi	
viewmap	11/17/2018 15:08:41	admin		nsdi	NSDICadastre	
viewmap	11/13/2018 07:43:53	admin		montpellier	nsdi	
viewmap	11/13/2018 07:41:34	admin		montpellier	nsdi	
viewmap	11/12/2018 12:12:50	admin		montpellier	nsdi	
viewmap	11/12/2018 12:12:00	admin		montpellier	nsdi	
viewmap	11/12/2018 12:11:17	admin		montpellier	nsdi	
viewmap	11/12/2018 12:10:35	admin		montpellier	nsdi	
viewmap	11/12/2018 12:09:01	admin		montpellier	nsdi	
viewmap	11/12/2018 12:02:35	admin		montpellier	nsdi	
viewmap	11/12/2018 10:55:58	admin		montpellier	nsdi	
viewmap	11/12/2018 10:55:13	admin		montpellier	nsdi	
viewmap	11/12/2018 10:40:10	admin		montpellier	nsdi	
viewmap	11/12/2018 10:39:26	admin		montpellier	nsdi	
viewmap	11/12/2018 10:38:30	admin		montpellier	nsdi	

NSDI Applications

The screenshot shows a web browser window with two tabs: "SDI Interoperable Service - Demo" and "Projects - NSDI Application". The address bar shows "localhost". The application header includes the "nsdi" logo and the text "Projects - NSDI Application", with a user profile icon labeled "admin" on the right.

The main content area is divided into three sections:

- Demo:** Features a map of Montpellier with various transport routes highlighted in different colors (blue, orange, green, red). Below the map is the title "Montpellier - Transports" and two buttons: "Load the map" and "View metadata".
- Interoperable Service:** Displays a stylized map of France with green and blue areas. Below the map is the title "NSDI Interoperable Service" and two buttons: "Load the map" and "View metadata".
- Cadastre:** Shows a map of land parcels in shades of purple and red. Below the map is the title "NSDI Cadastre" and two buttons: "Load the map" and "View metadata".

The Windows taskbar at the bottom shows the system clock as 8:45 PM.

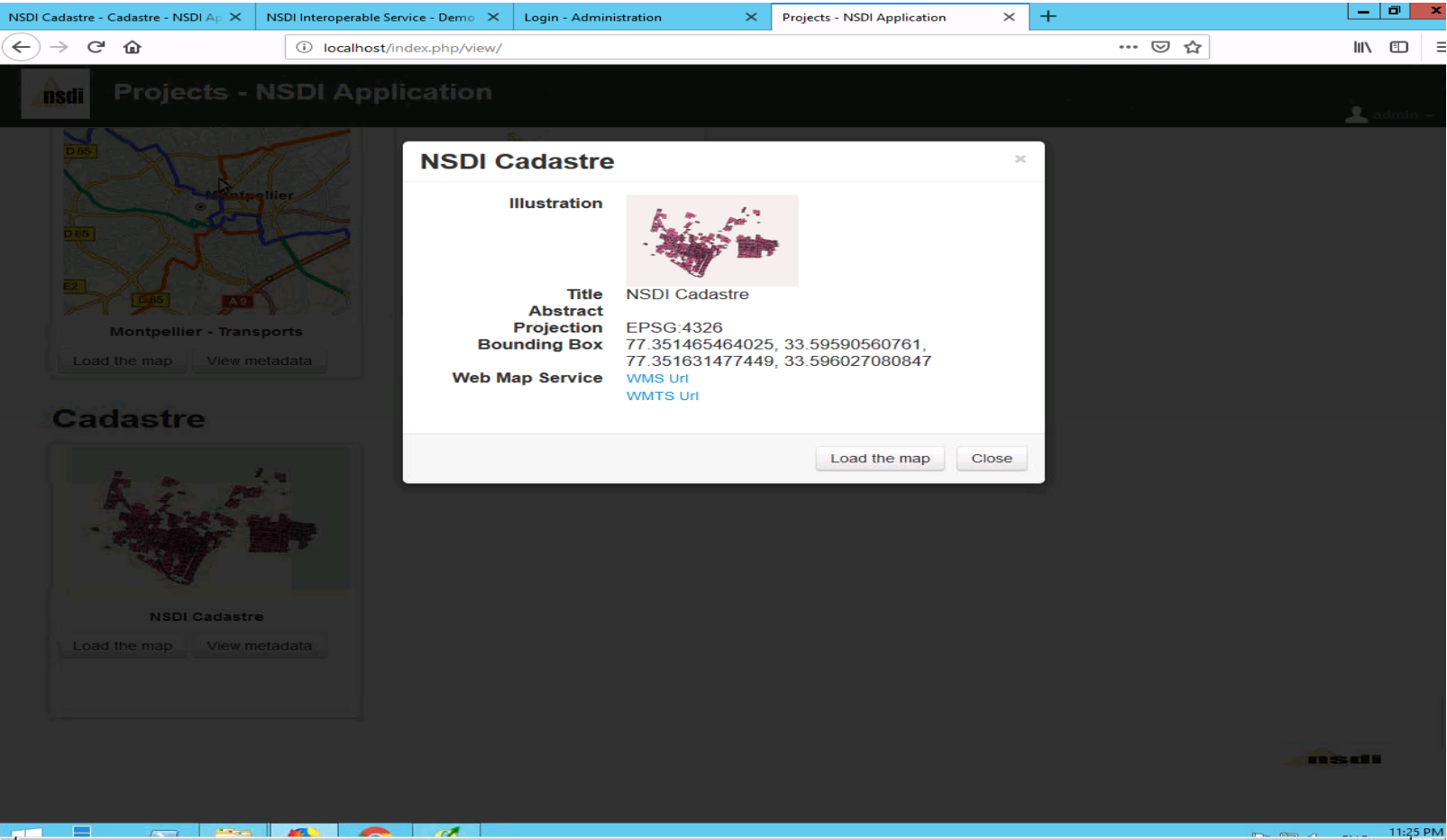
NSDI Application Metadata with Web Map Service URL and map

loading link

The screenshot shows a web browser window with the following elements:

- Browser Tabs:** NSDI Interoperable Service - Demo, Login - Administration, Projects - NSDI Application.
- Address Bar:** localhost/index.php/view/
- Page Header:** nsdi Projects - NSDI Application
- Main Content:**
 - Montpellier - Transports:** A map showing roads and transport routes in Montpellier. Below the map are buttons for "Load the map" and "View metadata".
 - Cadastre:** A section titled "NSDI Cadastre" with a map showing land parcels. Below the map are buttons for "Load the map" and "View metadata".
- Metadata Dialog Box:** A white dialog box titled "NSDI Interoperable Service" is open, displaying the following information:
 - Illustration:** A small map showing the service area.
 - Title:** NSDI Interoperable Service
 - Abstract:** (Empty)
 - Projection:** EPSG:4326
 - Bounding Box:** 30.112555155311, -22.456087188963, 131.27943108163, 51.568456171756
 - Web Map Service:** [WMS Uri](#) and [WMTS Uri](#)
 - Buttons:** "Load the map" and "Close"

Project loaded with different interoperable services on mapviewer



NSDI Cadastre - Cadastre - NSDI Ap x NSDI Interoperable Service - Demo x Login - Administration x +

localhost/index.php/view/map/?repository=nsdi&project=NSDICadastre

nsdi NSDI Cadastre Cadastre

Layers Close

Legend

- Cadastre
- lwfs:STATE

Print

Template	Scale	DPI	Format
Landscape A4	100,000	100	PDF

Description

Map's title

Print

100 m 200 ft 1 : 4,514

Mouse position Meters

© OpenStreetMap contributors

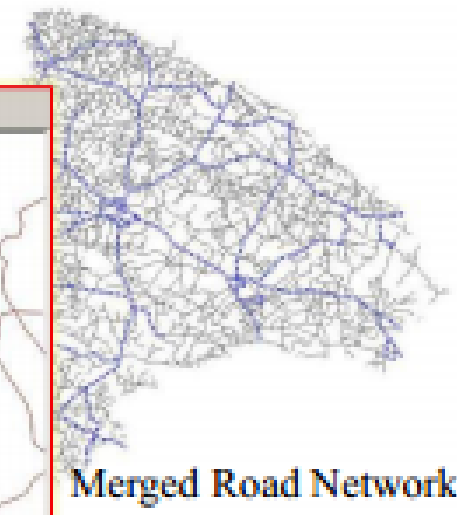
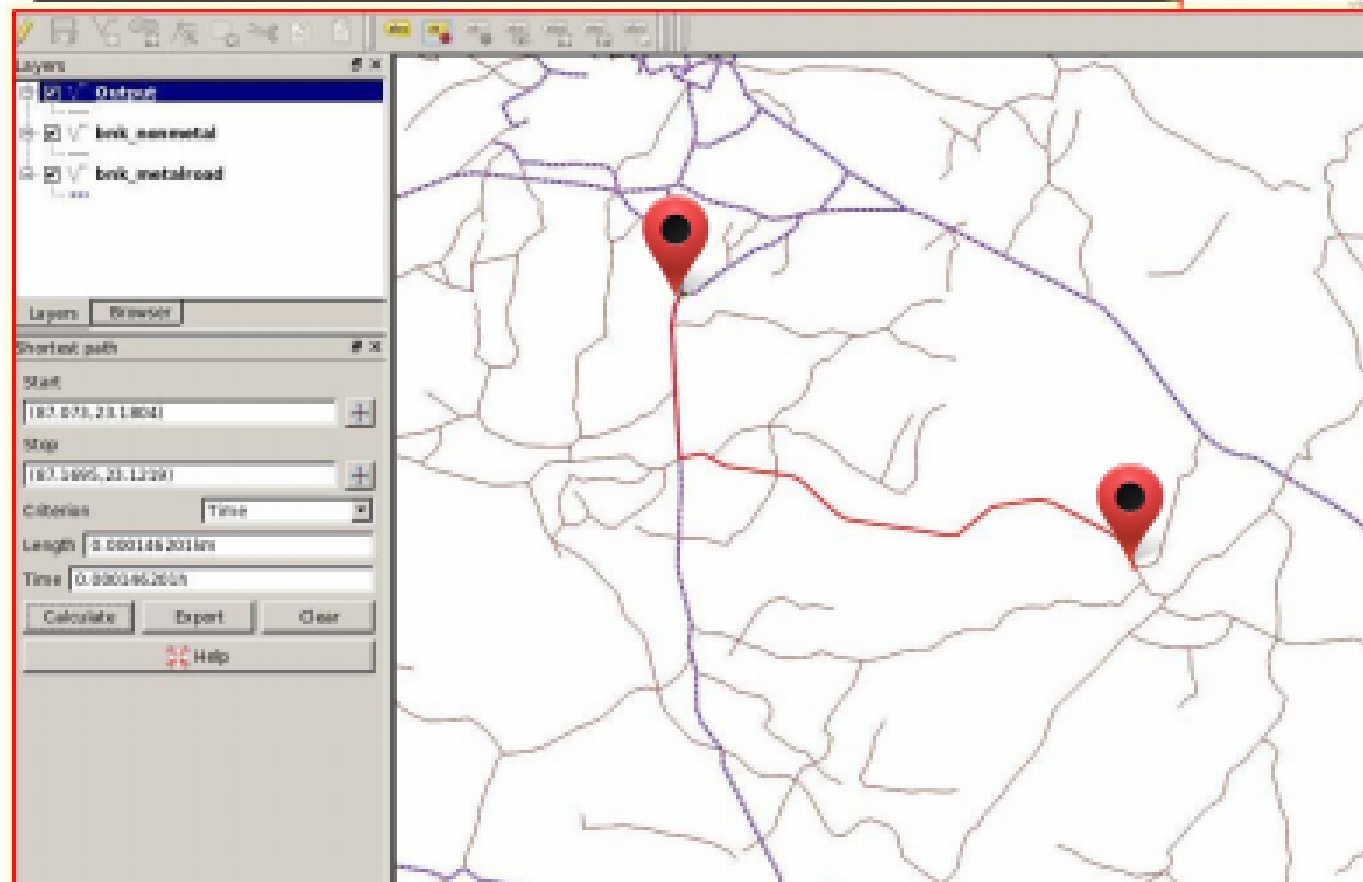
9:55 PM

IIT Kharagpur Geo-Service on MEGHAMALA Cloud

- Cloud: Meghamala, IIT Kharagpur Private Cloud Service
- VM1: Geo-spatial Registry Service
- VM2: Highway & Canal Service (WFS, WMS)
- VM3: Local Road & River Service (WFS, WMS)
- VM4: QGIS

- Different services from different VMs are considered
- Objective: Extract information from geospatial data and resolve spatial queries
 - Find shortest path between two points which includes both Highway and Local Roads

Service Integration for Query in Cloud



IIT Kgp Training Programme, July 2016

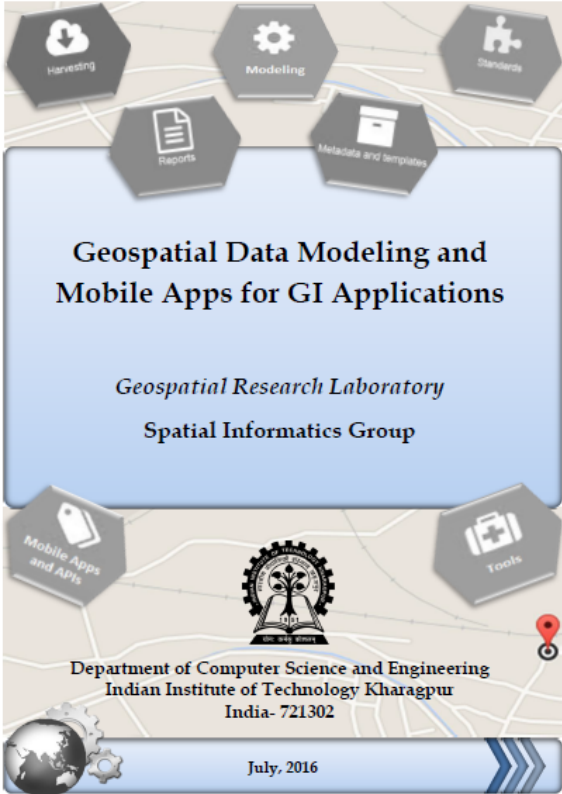
DST-WorkshopManual_IITKgp_Jul2016.pdf - Adobe Reader

File Edit View Window Help

Open | [Icons] | 1 / 198 | 52.8% | [Icons] | Tools | Fill & Sign | Comment

Bookmarks

- Introduction
- Spatial Data Modeling
- Integration of Geographic Data Models and Registry Service**
- API for Data access and Visualization
- Mobile Apps for GI Application
- Case Study: Accident Management System
 - Research Works in Geospatial Research Lab (GRL)



**Geospatial Data Modeling and
Mobile Apps for GI Applications**

Geospatial Research Laboratory
Spatial Informatics Group

Department of Computer Science and Engineering
Indian Institute of Technology Kharagpur
India- 721302

July, 2016

Type here to search | [Taskbar Icons] | ENG 08:48 | INTL 30-08-2018

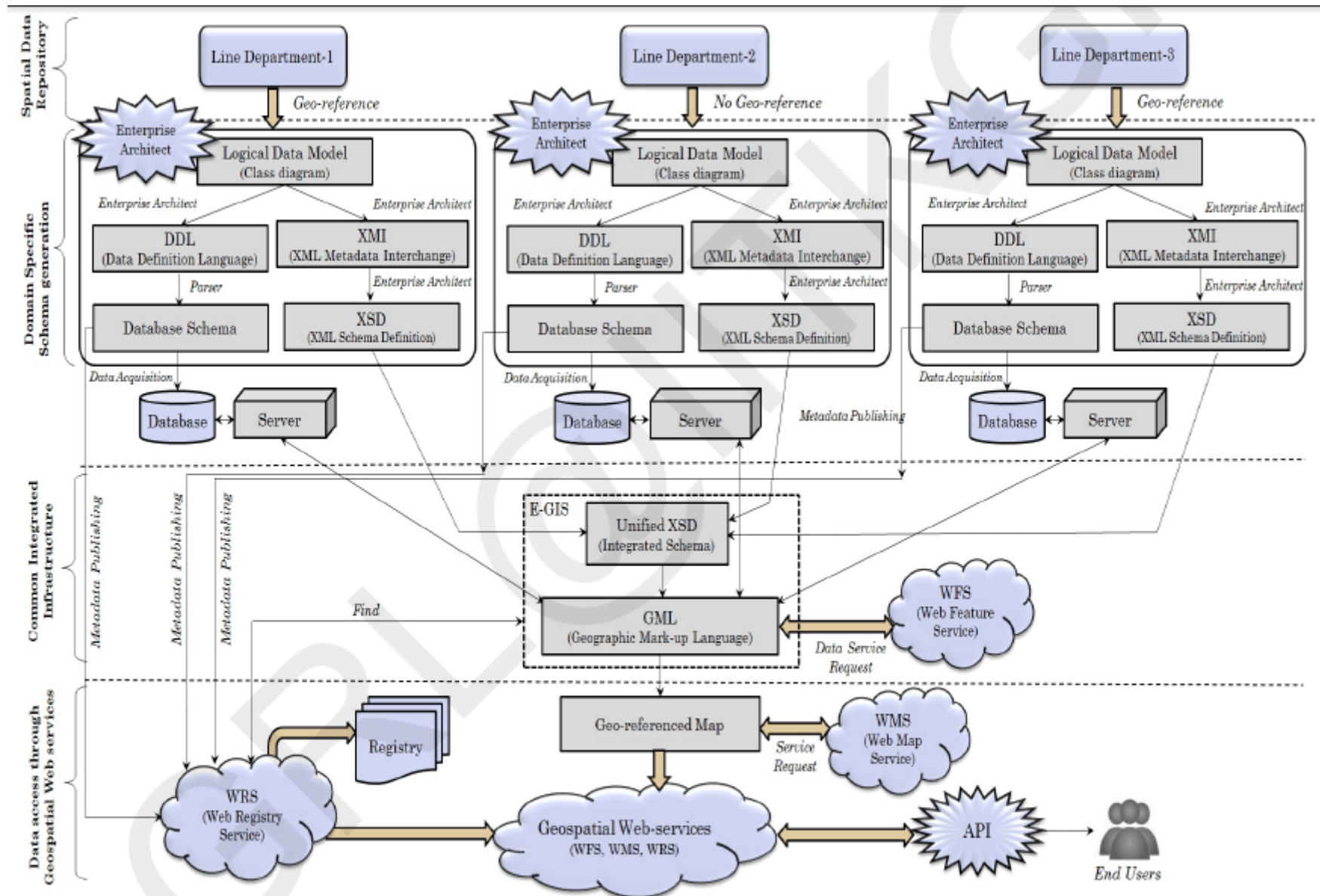


Figure 1.1: Process Flow of the Overall Framework

**Recommendations (Draft) of the
Workshop on “Coordinated Preparation of National
Foundation Spatial Data for Gram Panchayat and Ward
Level Mapping” held at
Bhubaneswar on
18-22 December 2018**

- i. Components of various high resolution foundation spatial data like plots, elevation, underlying geodetic reference network (derived from the national geodetic frame of Survey of India); transportation; physical assets; land use & land cover (levels IV and V) acquired by various Line Departments should be compiled and developed as authoritative, seamless; up-to-date; accurate; and standards-based state level foundation data and made accessible to governmental end users and applications.
- ii. Above data sets should also be made accessible to National Mapping Agencies/ NSDI Partnering Agencies for the development and maintenance of National Foundation Spatial Data (NFSD) for countrywide authorized use.
- iii. Above standards-based State Foundation Spatial Data Sets, once made sharable and accessible by the State Geoportal should be used as the foundation or base for adding other thematic geometric features, attributes; and other details for the preparation of Sample applications in sectors like Forests, Industry; Health; Physical Assets etc. have been demonstrated to the participants. High resolution foundation data like administrative boundary (panchayat/ ward along with MoPR's LGD codes for linking with attributes), plot boundary; land use & land cover (levels IV and V); transport network etc. have been used. These data sets should be maintained as data assets and shared with contributing participants and for governmental applications with standardized metadata.

Recommendations (Draft) Contd..

- iv. Since the NFSD data assets have to be developed once and used many times by several Line Departments and Survey Agencies, their life cycles should be determined and managed appropriately. To begin with, collaborative projects should be implemented between DST, Govt. of India and the State Governments, preferably in a 70:30 cost sharing mode.
- v. A state level geospatial data register/ catalogue covering meaning of each geometric feature and associated attributes, the feature data model; domain values for the attributes; underlying geodetic datum and projection for each feature etc. should be developed and made accessible to end users/ applications.
- vi. Data models prepared using standards-based Conceptual Schema Language (CSL) like Unified Modelling Language (UML) are essential for sharing the data for the coordinated preparation and Data Life Cycle Management of Foundation Spatial Data Sets from multiple sources/ Line Departments. Each Line Department should publish its spatial data model with the assistance of ORSAC or its own consultant using the CSL standard. For example, cadastral data of the DoR/ SSLR should be modeled for publishing the data model to facilitate data preparation and integration.

Recommendations (Draft) Contd..

- vii. Geospatial cloud should be deployed or adopted as a part of the State Data Centre (SDC) for hosting effective and efficient geospatial application or solution services using large volume data sets of State SDIs. Scaling versus performance issues need to be decided based on the total number of users and concurrent users.
- viii. Based on the deliberations on the utility of different approaches (e.g. drones (UAVs), aerial photos, and LIDAR etc.) to data capture for overcoming data gaps and their cost-effectiveness in the preparation/ maintenance of high resolution foundational spatial data sets, it was recommended that aerial LIDAR and photograph based approach should be adopted.
- ix. Each State SDI team should develop and host WMS/ WFS of a reliable and accurate village boundary data set created out of the available with it after harmonizing those with the plot boundaries and linked to respective Census and Local-Government Directory (LGD) codes.
- x. Taking into account the on-going application-related activities at ORSAC for the Forests, Revenue, and Industries (e.g. ORSAC's Go[i]-Plus application), and the data layers utilized in those applications, framing data content standards in

Recommendations (Draft) Contd..

forests, cadastres; geology and soils etc., inputs from the Odisha and other State SDIs should be taken up with the involvement of concerned scientists from ORSAC. The data content standards form the starting point for implementing the National Data Registry (NDR) of NSDI.

- xi. Airborne LIDAR with photo should be used for urban area (ward level) survey to produce the foundation data sets for features like elevation, land use land cover; physical assets etc. and made sharable as standards-based services (e.g. CityGML data service) from the State Geoportal with the concerned end user departments. Underlying activities should be coordinated by the respective State SDI Teams by securing high resolution precise GCPs from Survey of India, data sets from and participation/ involvement of the concerned Smart City Organisation/ Urban Development/ Property Tax or other Departments of the State; and a suitable vendor having competence in such survey activities.
- xii. For the purpose of immediate design, implementation and utilization of the foundational data sets/ outputs of the LIDAR Surveys for the State SDIs in GIS applications/ workflows in order for early return on investments, exact

Recommendations (Draft) Contd..

applications and workflows of the concerned participating end user departments should be captured and documented by the State SDI teams in consultation with them on a priority basis.

- xiii. A separate road map should be prepared for coordinated implementation of State SDIs in the North Eastern Region considering the present status of meagre availability of high resolution foundation spatial data sets in the respective State Governments. Towards this goal, an NSDI orientation workshop should be organized for officials and scientists from all the States in the Region in order to sensitize them on the benefits and relevance of SDI to decentralized planning and governance. High resolution foundation data sets should be prepared using aerial LIDAR and photograph-based approach in selected NE States on a pilot basis, to begin with, for demonstrating their usefulness in real-life GIS application development. Collaborative projects between DST, Govt. of India and the State Governments in the North East should be fully supported by the Central Government through the funding mechanisms of the Ministry of Development of North Eastern Region (DoNER) or the North Eastern Council (NEC).



Thank You
