# Network Serviceability

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## What is a Serviceable Area?

- A **Serviceable Area** is the geographic zone where a service provider, such as a mobile network operator or internet service provider, offers connectivity and coverage to its customers.

## Methods used by telecom companies like - Airtel, Jio, BSNL to determine which area is/should be SERVICEABLE

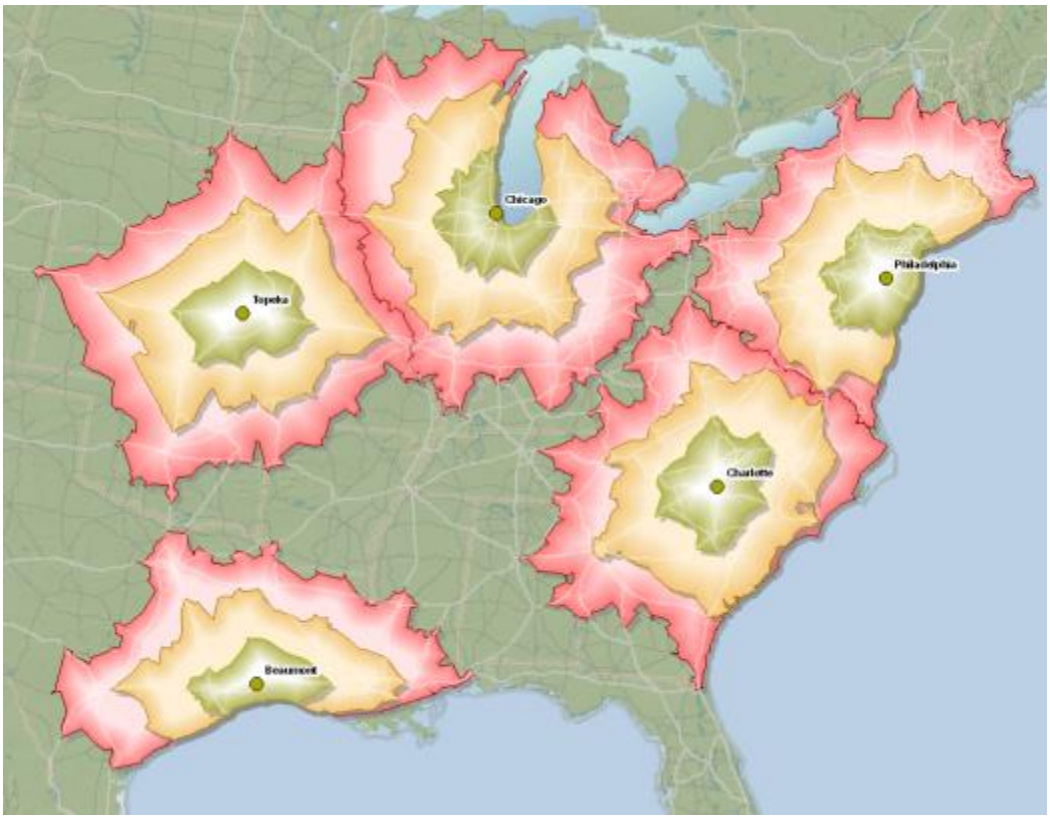
- **Network Infrastructure and Coverage Maps:**
  - **Base Stations and Cell Towers:** The companies have a network of base stations and cell towers that provide wireless coverage. They use geographic information systems (GIS) to map the coverage areas of these towers, helping them understand where they have service and where they don't.
  - **Fiber Optic Networks:** For broadband services, companies use maps of their fiber optic networks to determine which areas have wired connectivity.
- **Field Surveys and Drive Tests:**
  - **Drive Tests**: Technicians drive around specific areas with specialized equipment that measures signal strength and quality. This helps companies map the actual coverage and identify weak spots.
  - **Site Surveys:** Teams may visit potential locations to assess the feasibility of installing new infrastructure, such as towers or fiber lines.
- **Customer Data and Feedback:**
  - **User Reports:** Companies gather data from customer complaints and feedback about service quality in specific areas. This information helps them identify locations with poor or no service.
  - **Network Usage Data:** Analysis of call drop rates, data speeds, and other metrics from existing customers provides insights into network performance and helps identify areas needing improvement.
- **Regulatory Data and Licenses:**
  - **Spectrum Licenses:** The availability of licensed spectrum in a region determines whether a company can offer services there. Companies use this information to plan their network expansion.
- **Third-Party Data:**
  - **Market Research:** Companies may purchase data from third-party firms that analyze market conditions, demographic data, and consumer behavior, helping them identify areas with potential demand.
  - **Government and Regulatory Bodies:** Information from regulatory bodies regarding underserved areas can guide where to expand services.

- **Technological Tools and Analytics:**
    - **Predictive Analytics:** Companies use data analytics tools to predict demand and assess the viability of expanding services to new areas based on factors like population density, economic conditions, and competition.
- **Partnerships and Collaborations:**
    - **Infrastructure Sharing**: Companies sometimes collaborate to share infrastructure, like cell towers, to extend coverage more efficiently.

## Appropriate Softwares :-

### 1) GIS (Geographic Information System)

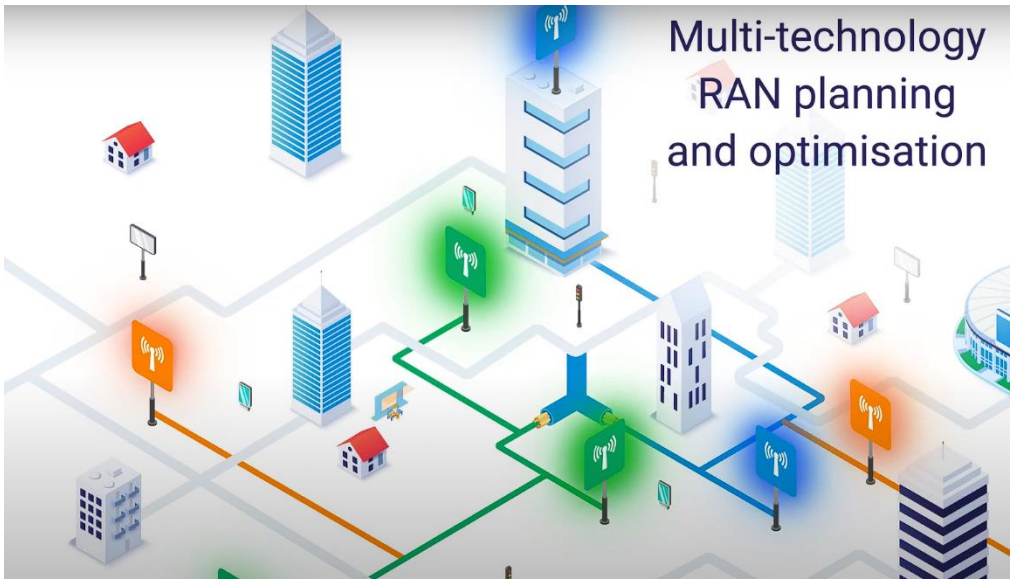
- **ArcGIS**
    - With the **ArcGIS Network Analyst extension**, you can find service areas around any location on a network. A network service area is a region that encompasses all accessible streets (that is, streets that are within a specified impedance).




    - **Impedance -** A measure of the amount of resistance, or cost, required to traverse a path in a network, or to move from one element in the network to another.
- **QGIS:**
    - An open-source GIS tool that offers many of the same functionalities as ArcGIS for mapping and spatial analysis.

## 2) Network Planning and Optimization Tool

- **Atoll**
  - Atoll is a comprehensive multi-technology radio planning and optimisation platform which includes unified multi-technology traffic models, Monte Carlo simulators, and automatic cell planning (ACP).
  - Atoll can model the traffic-related aspects of multi-technology networks and dynamically spread traffic across 2G, 3G, 4G and 5G network layers comprising macro, micro, small cells, and Wi-Fi hot spots.
  - **Multi – Technology RAN Planning (RAN – Radio Access Network)**
    - Multi-Technology RAN Planning is about designing and managing a telecom network that can handle different types of mobile technologies, like 2G, 3G, 4G, and 5G, all together



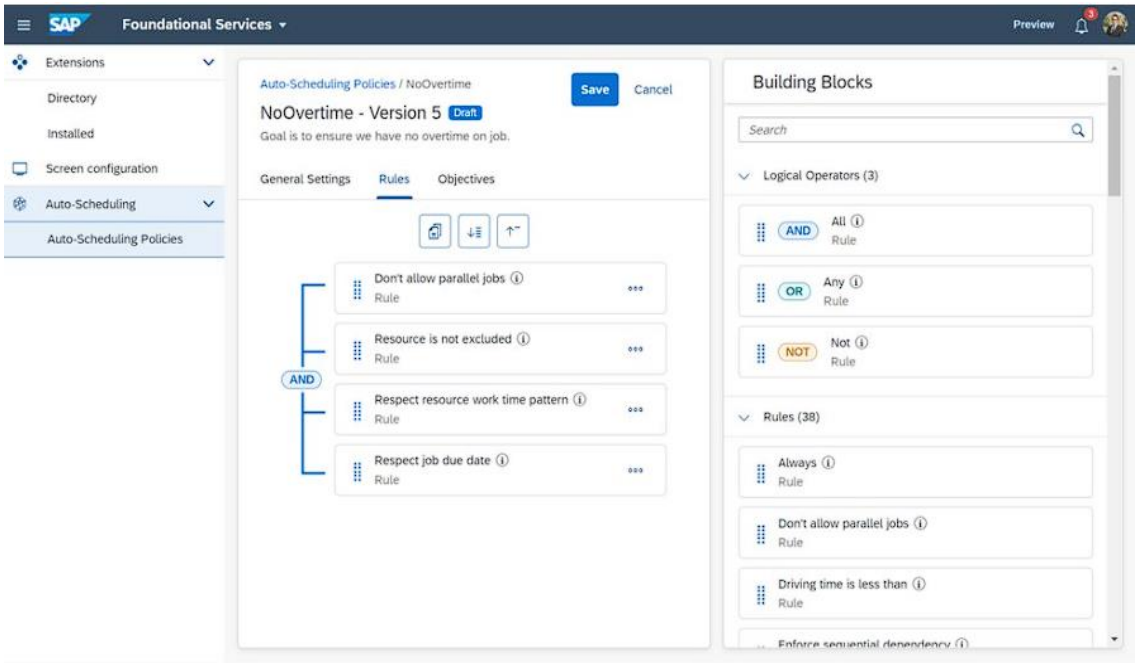

  - **In- Building Network Planning**
    - In-building network planning is the process of designing and setting up a network inside a building to ensure good coverage and strong signal for devices like smartphones, tablets, and computers.

## 3) Network Monitoring and Management Tool

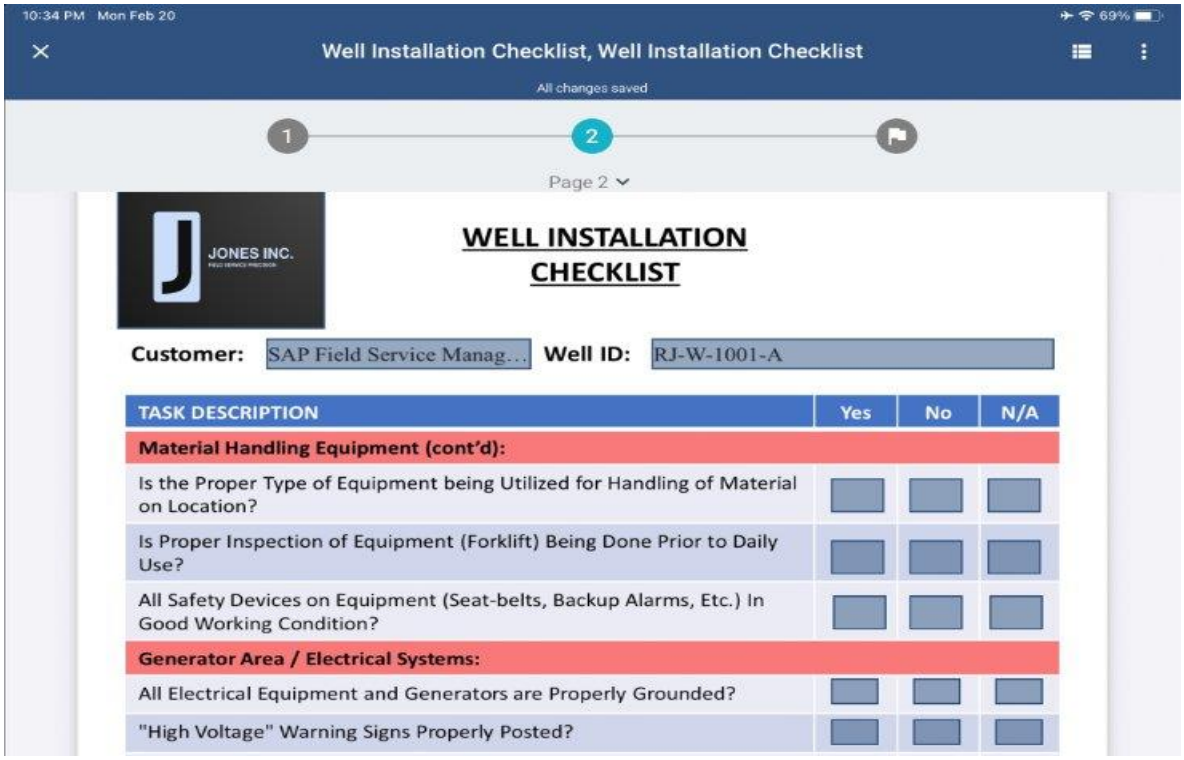
- **SolarWinds**
  - *SolarWinds Network Performance Monitor (NPM)* is a powerful and affordable network monitoring software enabling you to quickly detect, diagnose, and resolve network performance problems and outage


## 4) Field Service Management (FSM) Software

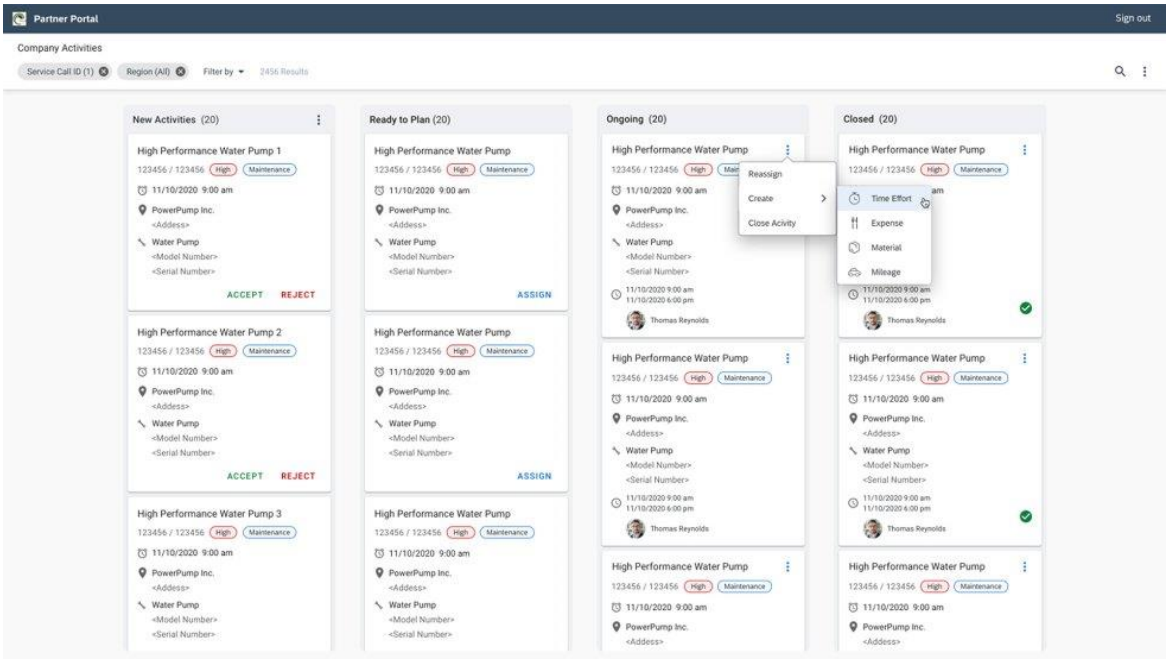
- **SAP Field Service Management**
  - **AI-based schedule optimisation**
    - Automated scheduling
    - Best matching technician
    - Policy designer
    - Appointment booking



- **Mobile workforce enablement**
  - Native offline-first applications
  - Guided workflow and smart forms
  - Location tracking
  - Service reporting




- **Crowd services**
  - Crowd marketplace
  - Partner portal
  - Optimised scheduling for the entire workforce
  - Integrated procurement



5) **Customer Relationship Management (CRM) Systems**

- **Salesforce**
  - Used to manage customer data, track service requests, and analyse customer feedback. It helps in identifying service demand and gaps.
- **Zoho CRM**:
  - Another CRM tool that helps manage customer interactions and data, useful for service area analysis based on customer feedback and issues.