ESRI DevSummit ABSTRACT

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Presentation Title: **FTTx Network Design in ArcGIS using clustering.**

Biography(https://www.linkedin.com/in/chandra-sekhar-reddy-s-12bb4b16/)

Has over 11 years of experience in the technology industry and specializes in developing web, desktop, and mobile GIS applications utilizing the ESRI Suite of Products, ESRI technology powered bespoke third party products like Ericsson Network Engineer and Schneider ArcFM and developer frameworks such as .Net, Python, Html, JavaScript, Arc Objects and ESRI SDK,

Has Designed & Developed various enterprise GIS Solutions for network rollout & customer acquisition initiatives at Tier 1&2 Telco's.

Adept at Integrating ESRI GIS implementations with a variety of 3rd party software and systems such as SAP, HP-SM, Clarity, Ericsson Granite Inventory, OnmSi Fault Trace System, TIBCO etc.

FTTx Network Design Using KMeans & Agnes clustering

Fiber to the Home (FTTH), Fiber to the Building (FTTB), Fiber to the Premises (FTTP) and Fiber to the Curb (FTTC), termed as FTTx are various technology and deployment options developed to enable communication service providers (CSPs) to deploy fiber as close to the user location as possible to provide high speed data and voice services.

The challenge remains in creating a low capex network for the CSPs that will allow maximum utilization and returns. Therefore, cost optimization, network scalability, long term reliability and traceability of the network elements becomes important.

ArcGIS out of the box does not provide tools to optimize demand based on the number of clusters, configure maximum demand per cluster and cluster tolerance (maximum distance between the demand points). These aspects are key for designing the FTTx network because proper clusters are required to design the active network including aspects like splitter locations and size. For example, a 1:16 splitter can serve a maximum of 16 customers, so the cluster should not have a demand requirement of more than 16.

Minimum spanning tree for the cluster serving points from the upstream OLT provide point is required to do the high-level design of the network. This is bit complex in ArcGIS as it requires knowledge of geometric network and network analyst knowledge.
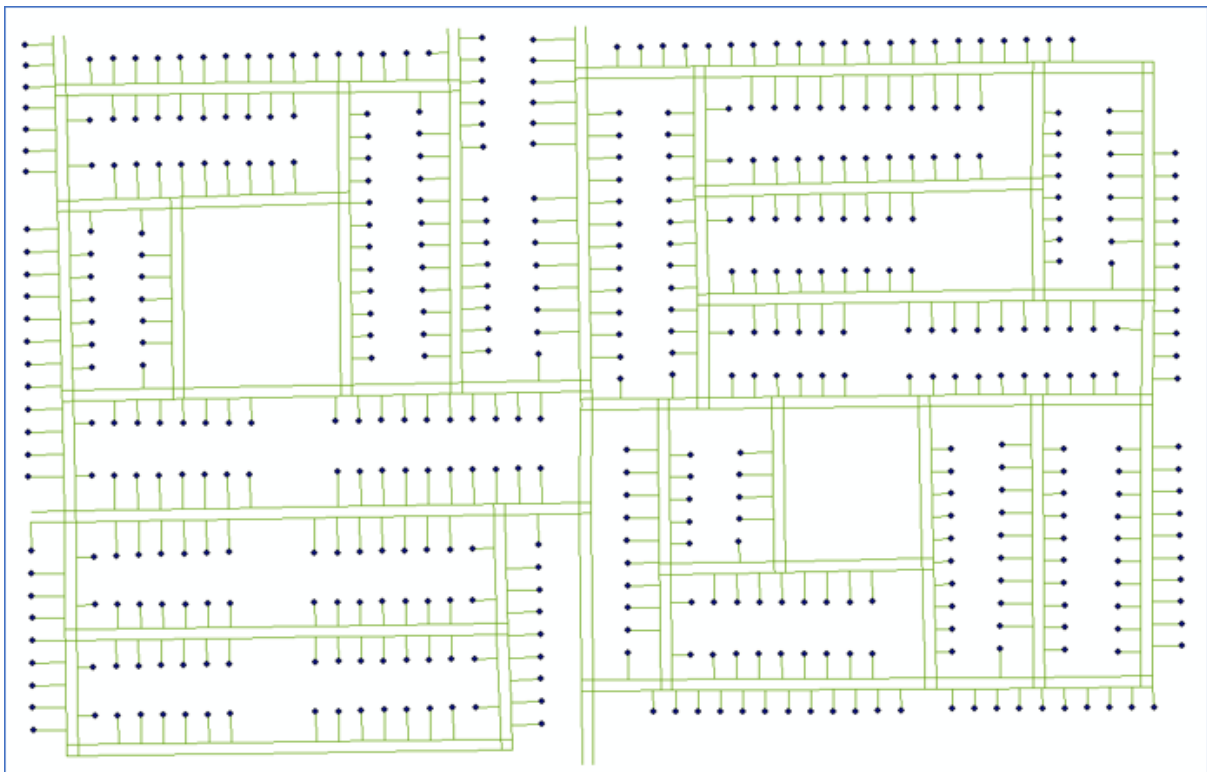
The solution being proposed consists of 4 modules:

- Cluster the customer demand and generate route lines based on the road network.
- Design Civil Network
- Design Active Network.
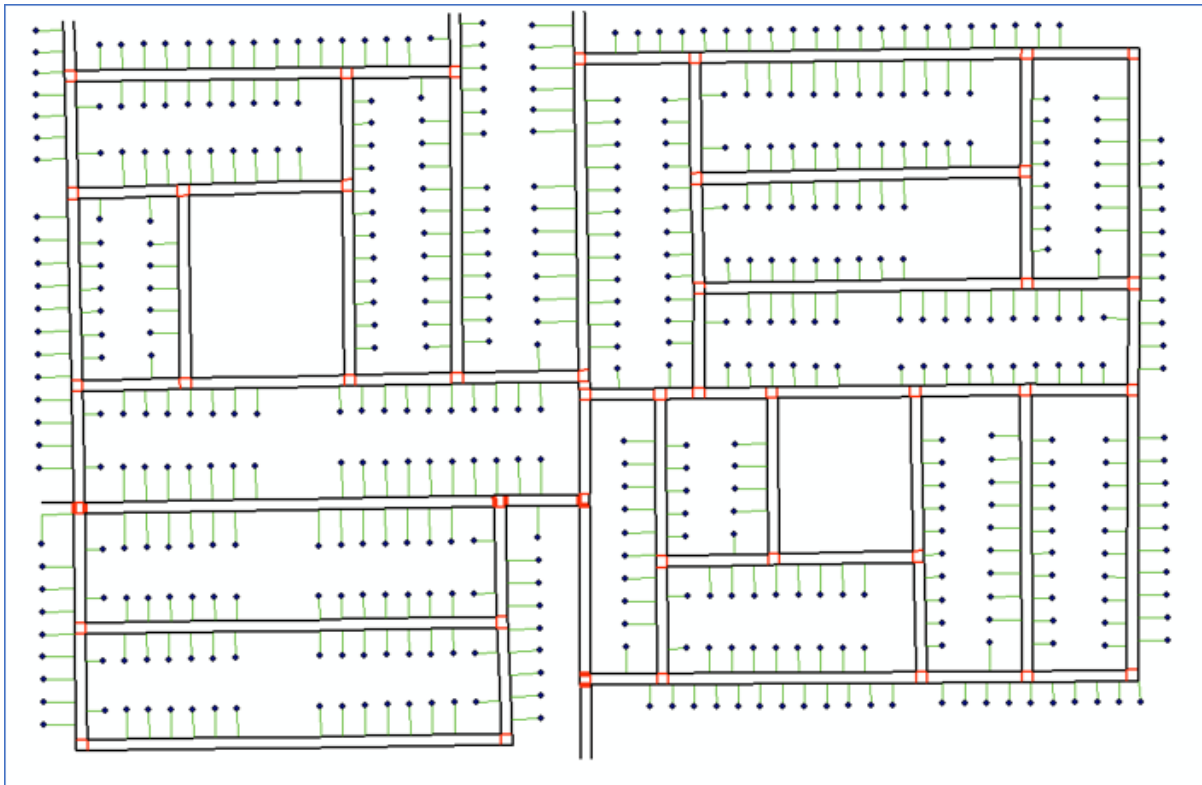- Generate Bill of material & Bill of Quantity

Input Demand & Road Network
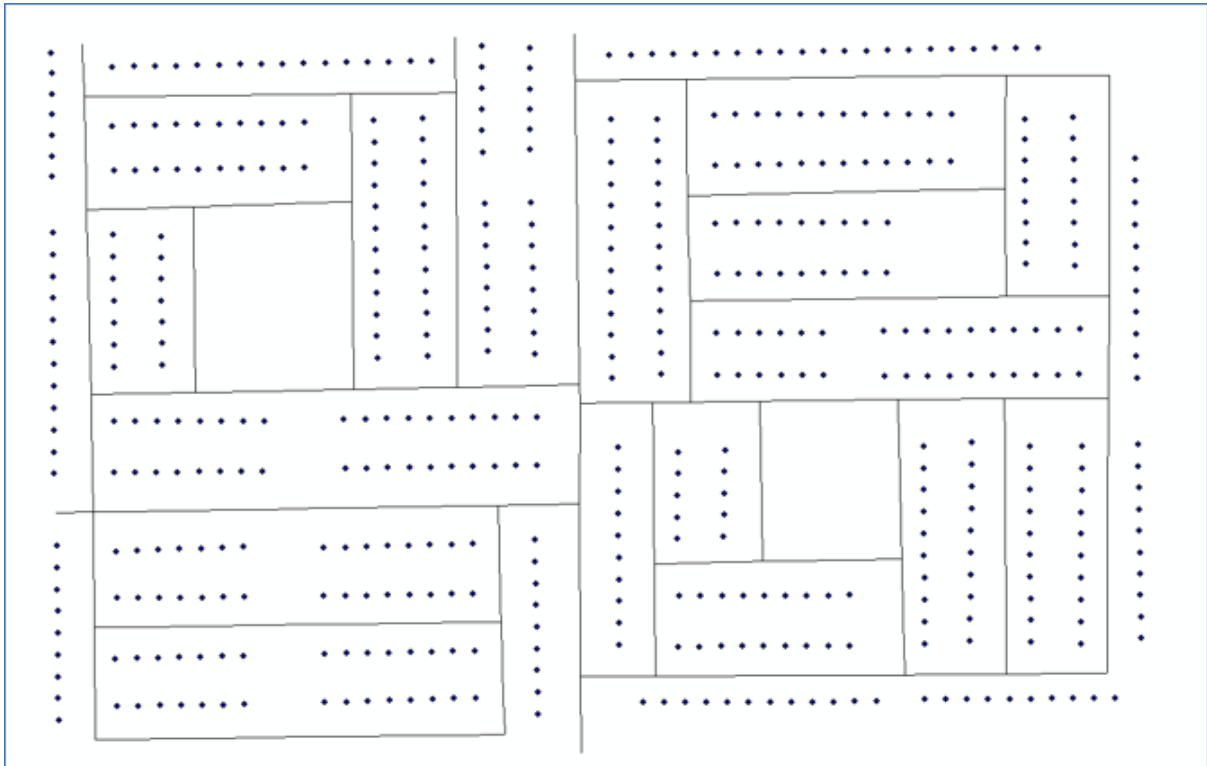
Generate Route Lines

Road Crossings Cost Factor Symbology

Generated Clusters