

Development of a Regional Transit GIS Portal

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Purpose

To distribute transit GIS data and improve regional connections.

Introduction

A GIS data portal was recently launched by the New River Valley Metropolitan Planning Organization (NRV-MPO) in support of transit planning efforts. The project seeks to improve coordination and regional connectivity among public transit service providers operating in the New River Valley (NRV). The distribution of GIS data can help facilitate connections between transit providers and additional modes of transportation, and also assist with on-going or future regional transportation planning. The project was conducted in two phases. Phase I began with an assessment of regional transportation needs and then the collection of GIS data from regional stakeholders. Phase II distributed the data publicly through the New River Valley Regional Transit GIS Portal featuring an interactive web map, a link to an FTP site and additional project resources. This work led by the NRV-MPO has helped increase communication and collaboration between NRV transit providers and made transit GIS data available to multiple stakeholders and the public. Lessons learned throughout this project can be applied to other regions with similar transit planning initiatives.

Methods

During Phase I, meetings were held with transit and GIS stakeholders to discuss transit planning processes, GIS technologies and existing data sources. Several stakeholder agencies collaborated to share transit-related data and a total of 140 shapefiles were collected. Datasets included geographic features and transportation layers such as road networks, bicycle lanes and sidewalks. General Transit Feed Specification (GTFS) files were used to create route and stop layers for the four fixed-route providers in the NRV: Blacksburg Transit (BT), Pulaski Area Transit (PAT), Radford Transit (RT) and Valley Metro. Metadata was created for each GIS dataset using ESRI's ArcGIS for Desktop. Data layers were projected to the same coordinate system (WGS84) and converted to KML for alternative viewing in Google applications.

Once the GIS data was edited, it was ready to be shared with transit stakeholders. Phase II began the the process of making regional transit data available to the public. An agreement was made with the New River Valley Planning District Commission (NRVPCD) to host the GIS data on their FTP site. The site contains separate folders for shapefiles and KMLs that are available for immediate download. The NRVPCD also authorized use of their ArcGIS Online subscription account and a regional transit web map was created. The web map features route and stop layers for BT, PAT, RT and Valley Metro. Lastly, a GIS data portal was designed as a place where users can go to view the web map and link to the FTP site. The NRV Regional Transit GIS Portal also features documents, static maps, transportation studies and links to partner agency websites.



Figure 1: Website Banner for NRV Regional Transit GIS Portal

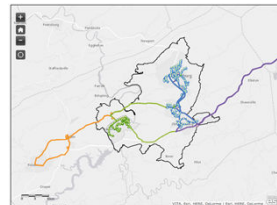


Figure 2: NRV Transit Web Map Default



Figure 3: RT Attribute Window

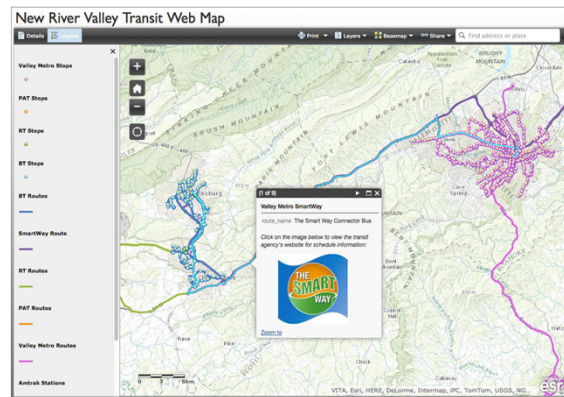


Figure 4: NRV Transit Web Map highlighting the Valley Metro's Smart Way Bus Routes

Acknowledgements

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Results

The website banner for the NRV Regional Transit GIS Portal is displayed in Figure 1. The GIS portal provides users direct access to transit data and supplemental NRV-MPO resources to learn more about transportation planning in the New River Valley. The web map opens to the default extent shown in Figure 2. This view shows the NRV-MPO region boundary with the four fixed-route providers operating in the NRV that connect the Pulaski area to places in Radford, Christiansburg, Blacksburg and even Roanoke. Amtrak stations and passenger rail layers were later added to the web map to display regional transit connections to the Amtrak station in Lynchburg via Valley Metro's Smart Way Commuter and Connector bus routes. The web map allows users to alter layer visibility in the legend, toggle between base maps, change viewing extents and select individual layers to display more details. An example of the pop-up information window is displayed for a RT stop in Figure 3. The web map helps users visualize regional connections and easily link to transit agency websites for scheduling information. An emphasis of the web map is to display regional transportation connections. Figure 4 highlights the Smart Way Commuter bus route, providing access from Roanoke to areas in Blacksburg and Christiansburg. Although the web map allows for some interactivity, users have little editing capabilities. For this reason, additional data is available on the transit FTP site where users can download data for their own GIS needs. A link to the transit portal has been distributed to stakeholders so that they may provide feedback and also collect data needed for other planning projects. The NRV Regional Transit GIS Portal is located at <http://www.nrvpcd.org/nrvmpo/transit/>.

Conclusions

The NRV-MPO regional GIS project has helped foster relationships between transit agencies and encouraged collaboration through partnerships with the NRVPCD and others. There were several challenges encountered while completing the regional GIS project. They were typical obstacles that occur when dealing with multiple agencies and varying data standards. Stakeholders provided their GIS data as-is and datasets required editing before being shared on the web. Data inconsistencies included different coordinate systems and metadata standards. Editing transit GIS layers was time-consuming and regional data standards should be agreed upon for the future of this project. There was also duplication of data between stakeholder agencies, which could be reduced by utilizing the new transit data portal.

As the project progressed it became clear that a timeline should be established for new data push-outs. Most importantly, GTFS updates must be regionally coordinated to ensure the most accurate route and stop information is displayed and made available. A data maintenance plan is in progress to keep the FTP site, web map and GIS portal up-to-date. Challenges, successes and lessons learned while creating the NRV Regional Transit GIS Portal can be applied to transit planning in other regions.