

# Development of a Regional Transit GIS Portal with Transit Data

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## Purpose

To improve public transportation coordination of services, improve connectivity, and assist planning efforts. This case study illustrates how the New River Valley (NRV) is using Geographic Information Systems (GIS) in the development of a regional transit portal.

## Introduction

Efforts to coordinate transportation services in the NRV have taken place for decades through the NRV Metropolitan Planning Organization (MPO), along with the NRV Planning District Commission (PDC). A joint MPO-PDC Regional Transportation Coordinating Council (RTCC) recently recommended the development of a coordinated transportation plan along with a GIS mapping inventory. The project was funded to improve regional MPO connectivity.

Using ArcGIS Online, an interactive web map was created with route and stop layers for four fixed-route transit providers. The project provided an outlet for discussions between regional transit stakeholders and led to increased communication and collaboration. A regional transit GIS portal was created to share data, an FTP site, a web map, and project resources.

## Method

Phase I had stakeholder meetings emphasizing communication, collaboration, and to document transit services, data collection, and GIS requirements.

As illustrated by Figure 1, the region's transit operators include:

- Blacksburg Transit (BT)
- Radford Transit (RT)
- Pulaski Area Transit (PAT)
- Roanoke's Valley Metro (Smart Way Commuter & Connector)

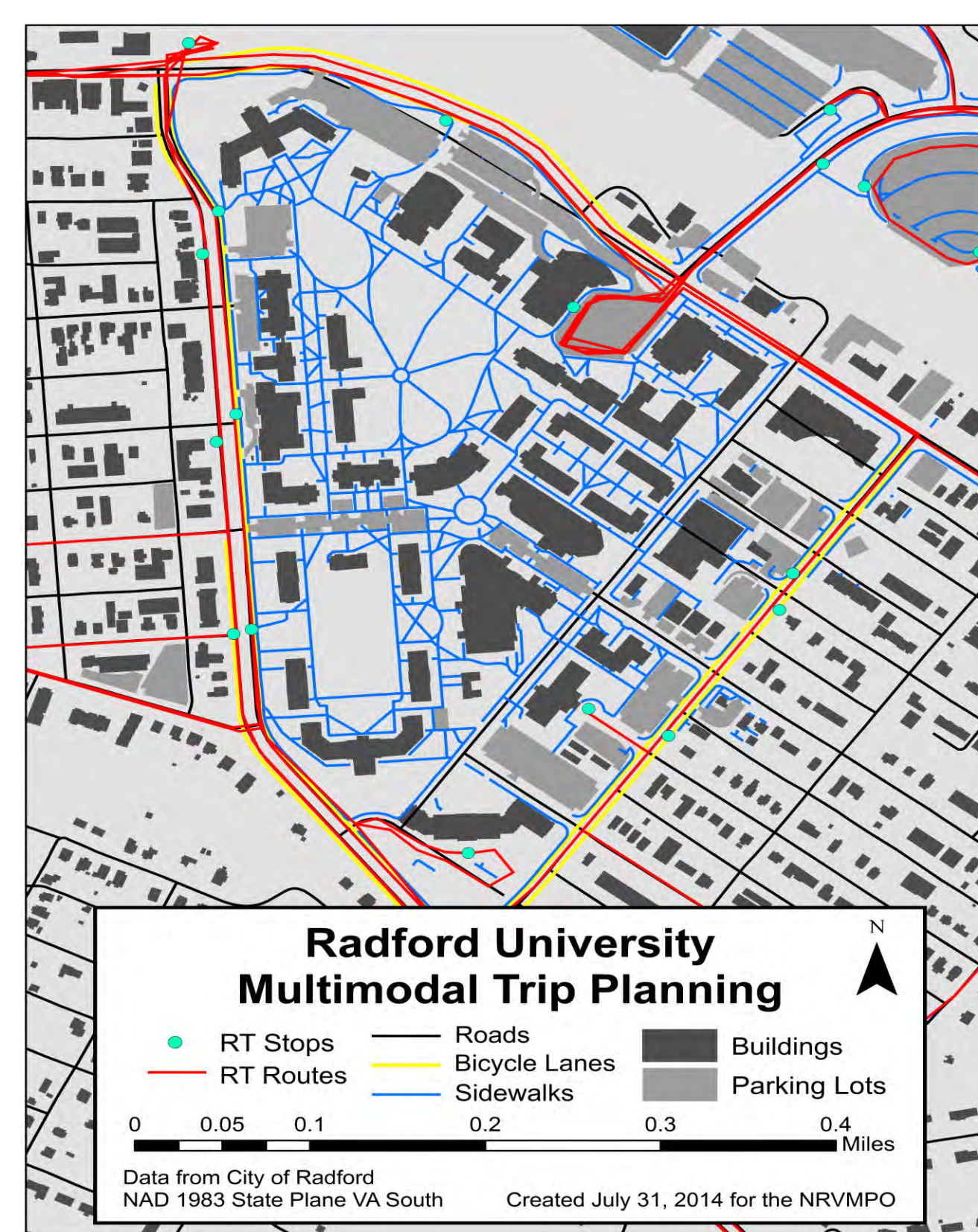


Figure 2: Radford University Area Multimodal Connections

General Transit Feed Specification (GTFS) was established as a minimum data reporting standard for web mapping applications. GTFS feeds were downloaded to create transit route and stop layers; 140 GIS shapefiles were collected. Data layers were projected to the WGS84 coordinate system, descriptive metadata was added, and GIS layers were converted to Keyhole Markup Language (KML). Geographic, building, and bicycle/pedestrian infrastructure layers were combined with transit layers for multimodal maps (Figure 2). A File Transfer Protocol (FTP) site was set up, with a goal to develop a map and web tools to share data, the focus of Phase 2.

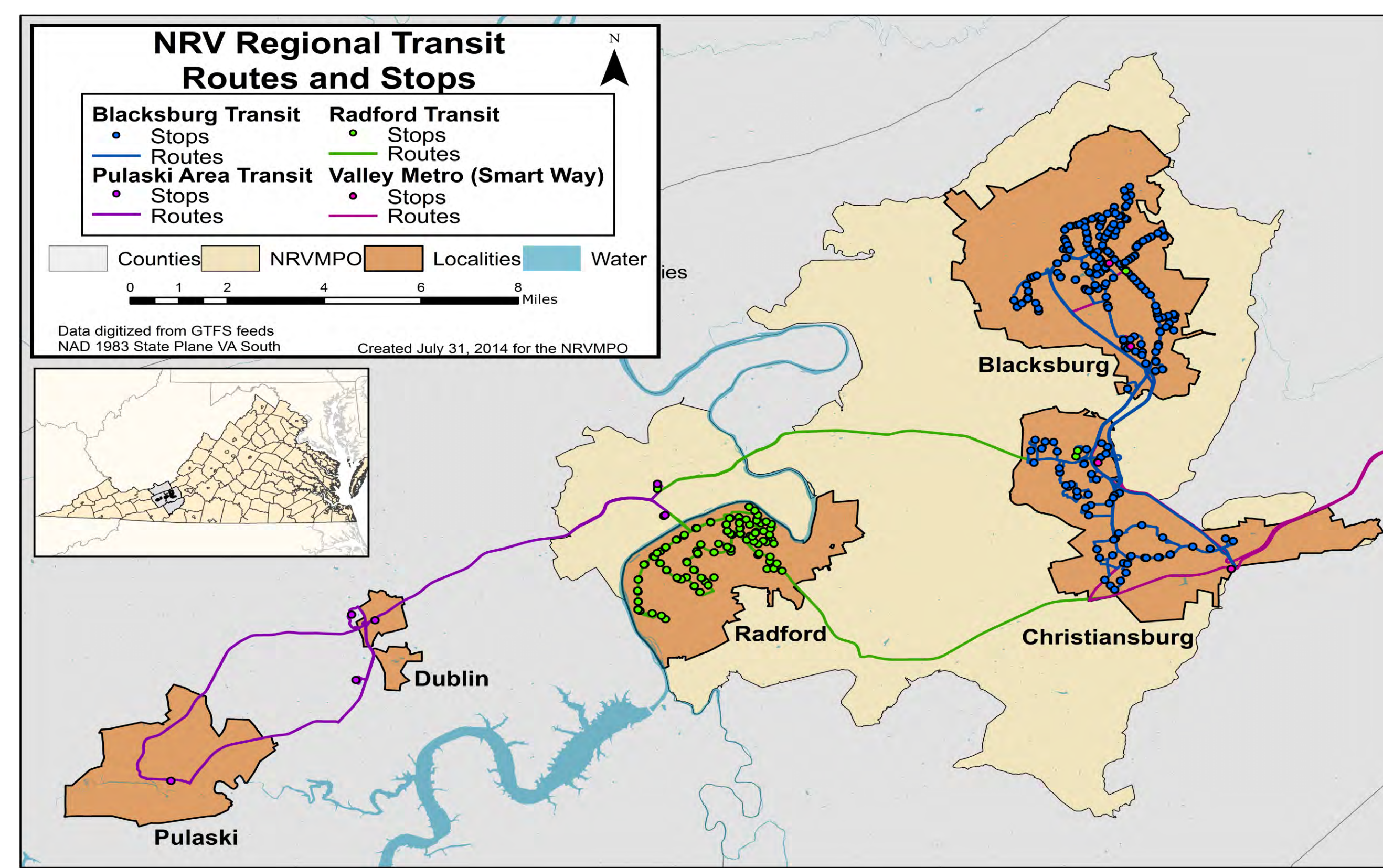


Figure 1: Map of Regional Transit Routes and Stops – New River Valley, VA

As an extension of the FTP site, Phase 2 was the development of a regional transit GIS portal, hosted by the PDC in agreement with the MPO. A web map featuring route and stop layers was created using ArcGIS Online. Data also include passenger rail, station, and freight data, as well as sidewalk and water layers. The interactive map allows users to toggle base maps, alter layer visibility, change viewing extent, and select layers.

The first version of the web map was adjusted based on feedback from RTCC and MPO members, and it was then made available to the public. A regional transit GIS portal was created to display the web map, list a link to the FTP site, and provide additional information about the project (<http://www.nrvpdc.org/nrvmpo/transit/>). Figure 3 is a web map showing stops and routes in Blacksburg and Christiansburg. Figure 4 is a web map highlighting a single stop in the Pulaski Area Transit system.

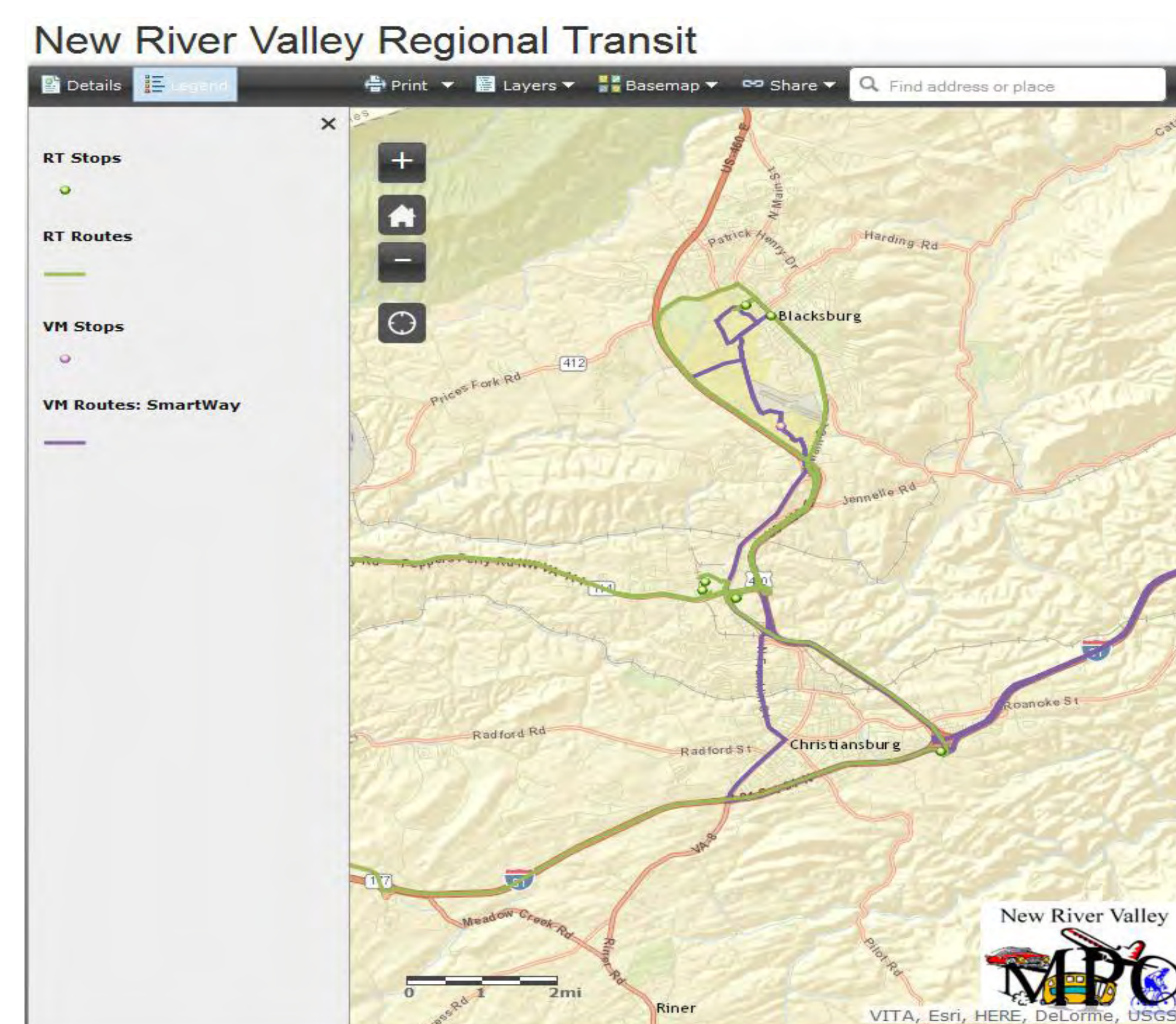


Figure 3: Web Map showing stops and routes

## Results

This effort has collected existing transit data that can be used to identify and improve transit connections among various transportation modes, and to assist with future transportation planning efforts within the region. This portal may also serve as the foundation for future web applications, and serves as a single location for transit files, for the public. An additional benefit from the project was that it served as a catalyst for in-depth discussions with stakeholders, including both staff and decision makers, about the need for continued collaboration in regional transit planning initiatives.

## Conclusions

Collecting GIS data from transit providers can have benefits:

- A single regional transit data web portal
- Improved communication and coordination
- Served as a catalyst for regional transit improvements

The project was completed with a relatively small budget; technical GIS work was completed by paid, part-time student employees.

Challenges include handling various data standards and schedules for data updates, duplication of data sources, the need to use a standardized coordinate system for (map) projections, minimal or missing descriptive metadata, data maintenance, and the need for good documentation to facilitate smooth hand-offs to new staff.

## Lessons for Other Regions

The NRV region contains urban fixed-route and deviated fixed-route service, and suburban and rural demand-response services. For this reason, this paper highlights lessons that can be applied to other regions: 1) Regions with rural transit operations that are experiencing increased demand and urbanization may benefit from performing a GIS inventory to consolidate and improve the efficiency of other (transportation) systems; 2) Areas with established urban, fixed-route systems may benefit by identifying route duplications and by sharing GIS and related data; 3) Conducting a GIS inventory may serve as a catalyst for more coordination, to improve services and increase efficiency and connectivity, and provide more public transportation options for citizens.

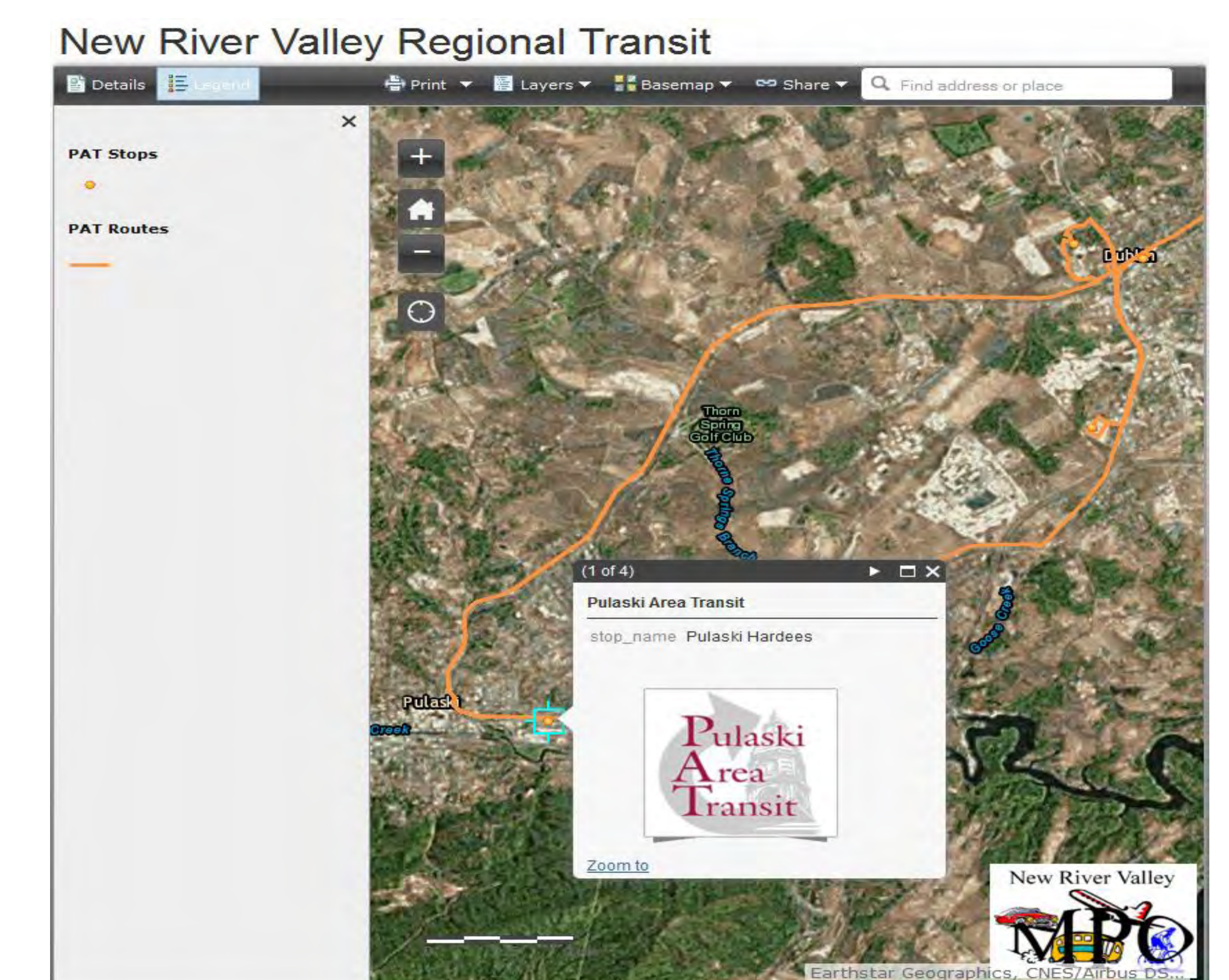


Figure 4. Example showing a Pulaski Area Transit Bus Stop

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