

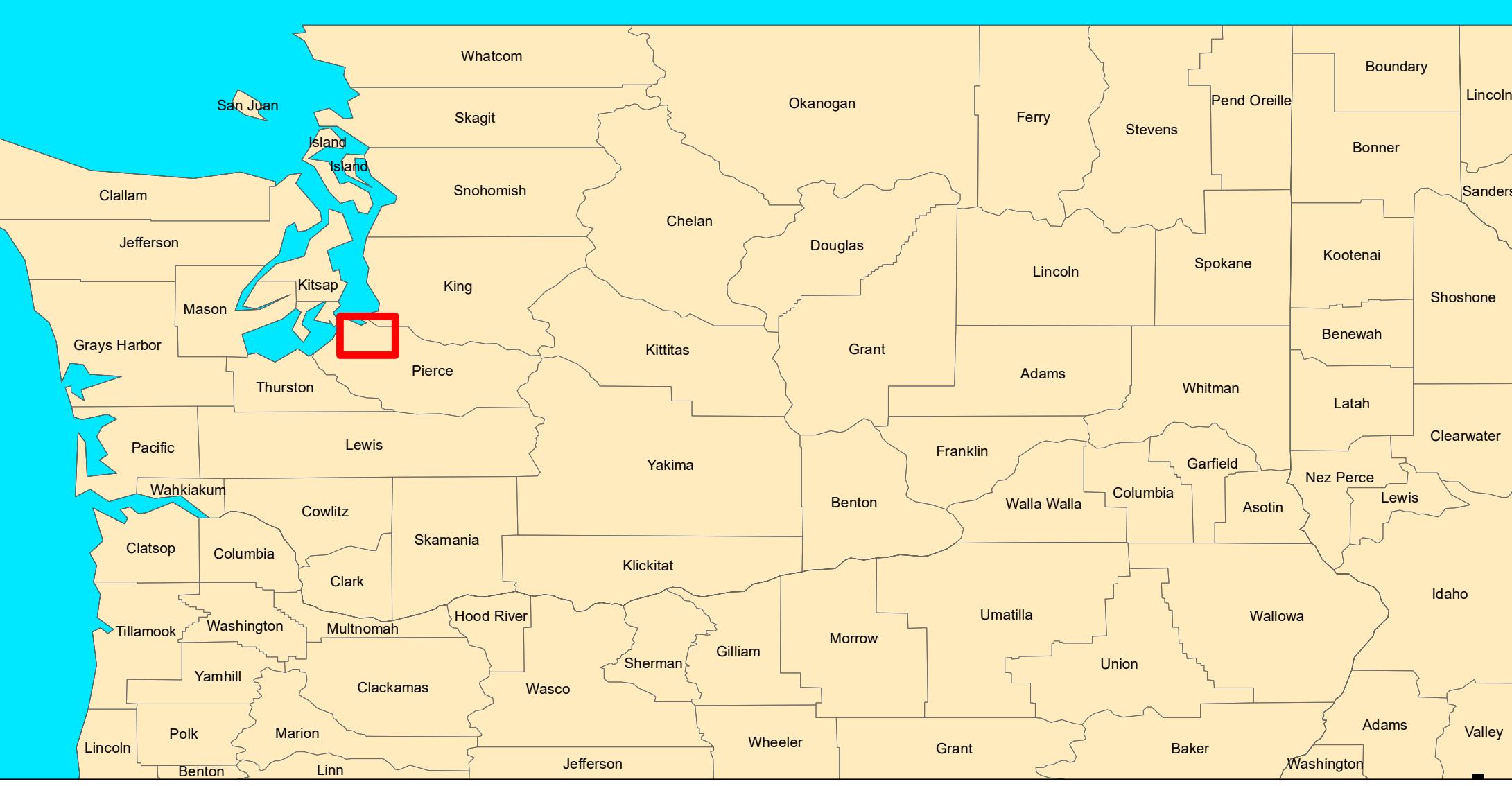
## RELIABLE MAIL SERVICE ROUTES

### INTRODUCTION

Our nation is heavily dependent on our delivery platform today. The United States Postal Service was the first parcel business that helped improve the unreliable services that was called, "private package delivery." They were the first to invent the "over night delivery" option and the expedited parcels of our mail throughout the world today. For a long time, the U.S Postal Service within Tacoma, Washington was struggling with the process of delivery. Especially having only one notorious highway, I-5, and traffic being incredibly slow. In the city of Tacoma, a place where the education is essentially falling below the states level, our libraries are heavily dependent upon. USPS delivers hundreds of books every single day to the local and public libraries throughout town. Since the majority of the libraries are essentially scattered around the entire city, it is a challenge for USPS drivers to reach from one portion of the city to another in a timely manner. This presentation breaks down what our USPS could use through ArcGIS to better enhance cost efficiency, time, and distance.

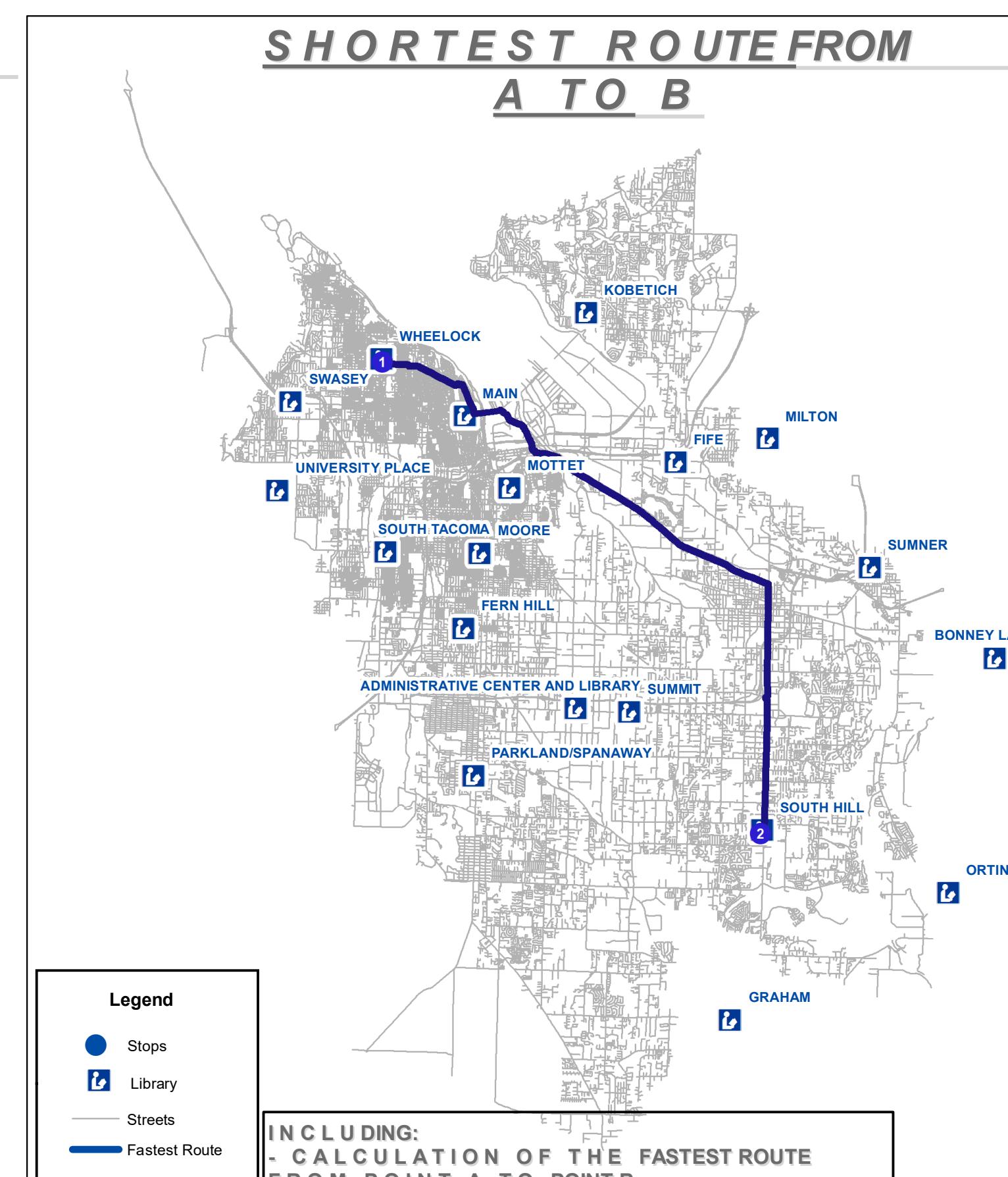
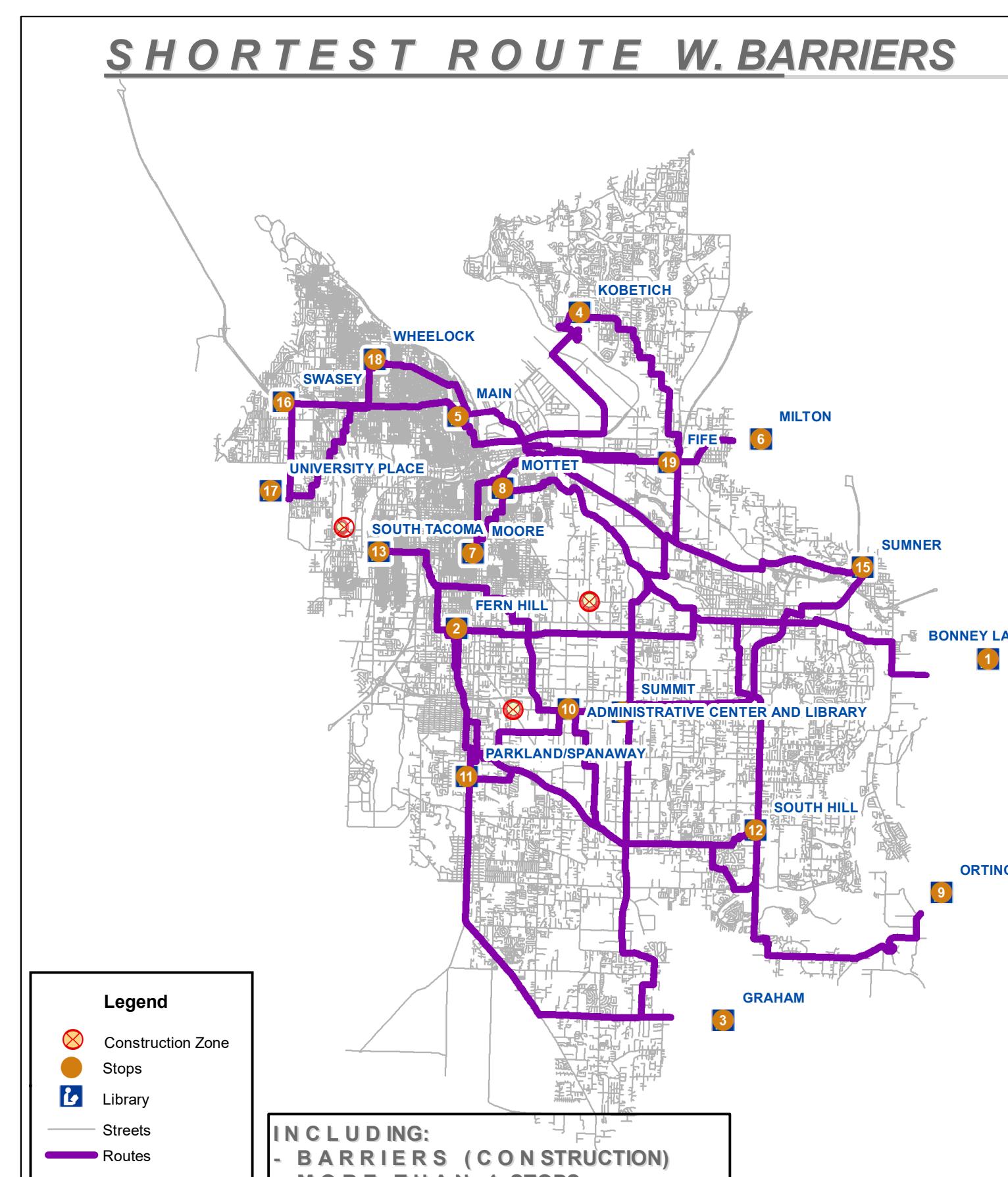
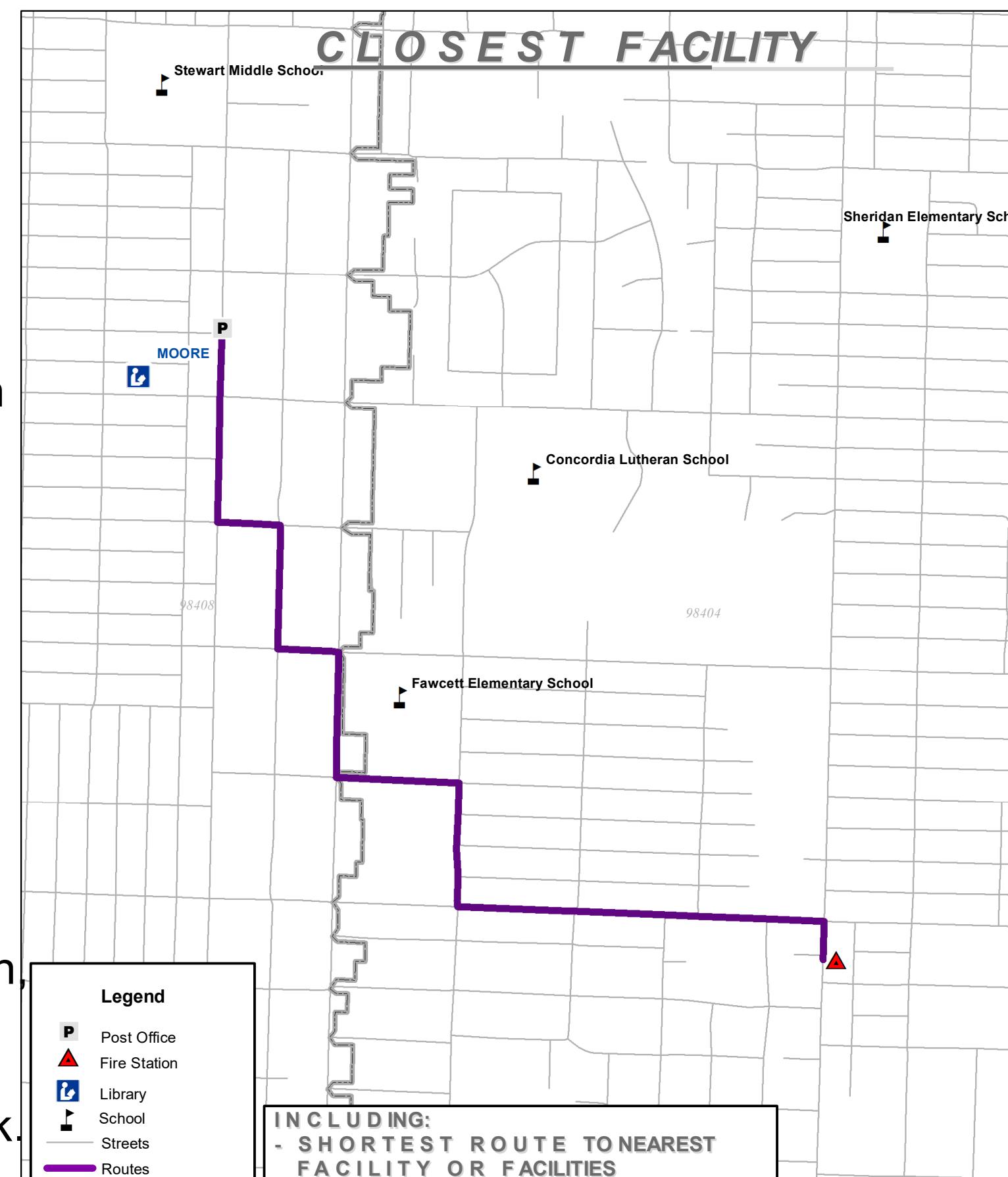


### WASHINGTON



### METHODOLOGY

To create faster services for USPS, the essential plan for a faster and cost efficient network route is to be created. With the ArcGIS Network Analysis toolset, the user is able to build a network dataset and perform analysis on a single or multiple network. From what we are all aware of, the longer it takes to hit from point A to point B will use a lot more fuel and waste even more time. With an area that is so very clogged up due to a population of over 1 million citizens, you'd expect trafficability to be pretty tight. Network analysis allows the user to input real world problems that could hinder maneuverability that would include traffic, accidents, construction, etc. ArcGIS Network Analysis will benefit USPS through running processes of route creation from a specified place to another. Closest Facility is used in Network Analysis by finding the closest specified facility from a place. The user is allotted to change the amount of finds or if they want to drive towards or away from it. USPS is suppose to deliver a certain amount of mail during their duty day, but due to natural incidents like traffic, this is utilized by determining the route away from an accident to the next facility of delivery. Routes with barriers are implemented to drive around construction traffic, or one-way routes. This toolset allows USPS to add in any barriers in real time for accurate rerouting processes. Accessibility is measured in terms of travel, distance, and any other impediments within a route network. This is why barriers are a true avoidance, and can help the driver easily access a direct route. Best Route according to a specified impedance will help USPS with travel throughout the city to each designated library by determining the best algorithm to each location which is also known as the "traveling salesman problem". Network Analysis allows the user to determine the impedance of either creating the quickest path in time or the shortest path in between the two stops. The best route is essentially many meanings depending on the driver. This could mean cost efficiency or even just shortest distance. Network analysis could determine the best route by what the user is looking for.



### CONCLUSION

USPS has spent millions of dollars in investment to better improve their organization as a whole. For a long time, Libraries within the Tacoma area were struggling with the lack of updated material that needs to be delivered in a timely manner. These algorithms can be installed in USPS vehicles for better enhancement and cost efficient routes for their drivers. Implementing GIS data for USPS has saved the company over 100 million miles per year and a reduction of 10 million gallons of fuel consumed. This also helps our atmosphere with the reduction of carbon dioxide emissions by about 100,000 metric tons. The real problem is the reliability of these programs. In 2008, USPS adapted the ORION program to run these backgrounds in a matter of seconds for drivers. Today, many USPS drivers that were interviewed (who wished to remain anonymous) were lacking the reliability of the devices. Problems such as route development and speed of the system was simply too slow or "not working" the majority of the time. The odd finds was that 2 in every 7 interviewed drivers were not utilizing these systems. ArcGIS is great for a homebase workshop, therefore, creating your route prior to your delivery venture could solve this problem. If you'd wish to utilize real world barriers by the vehicle routing problem with time windows to honor these real world constraints. This would abide by vehicle capacities, USPS My Choice Services, and even driver specialties. In conclusion, Network Analysis is a reliable source of finding the quickest, most cost efficient route for USPS drivers in the Tacoma area.

### SOURCES

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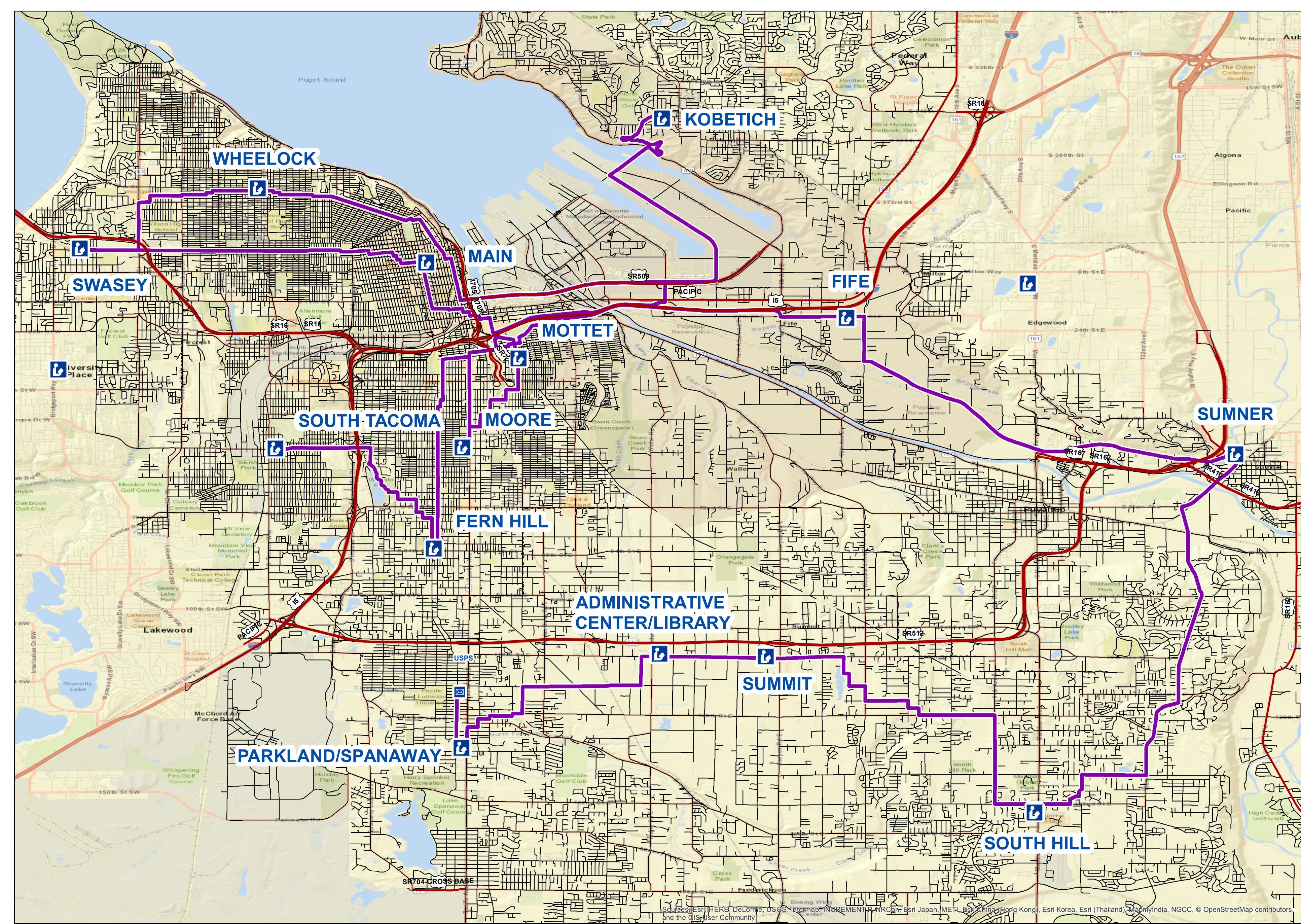
Anagnostopoulos, K., & Vavatsikos, A., Ph.D. (2012). Site Suitability Analysis for Natural Systems for usps route Treatment with Spatial Analytic Hierarchy Process. JOURNAL OF WATER RESOURCES PLANNING AND MANAGEMENT, 125-134.

#### Notes:

This route is produced for start at the USPS location at 320 Garfield Dr. Tacoma, WA 98499. Doing so, the driver will be on the "best" route, while delivering to each of the libraries within the city.

Coordinate System: GCS North American 1983  
Datum: North American 1983  
Units: Degree

Produced by:  
Cathy Trinh  
GIS II  
Professor David Cox  
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Core Assessment Project



#### LEGEND

■ Library — Highways — Routes — Streets