GIS Analysis: Re-routing Metro Parks service vehicles

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ABSTRACT

The purpose of this research was to create the most efficient driving routes for Metro Parks service vehicles using ESRI’s ARC GIS software. Currently the Metro Parks service vehicles do not have predeterminated routes, or any sort of tracking devices like GPS. The results of new efficient driving routes include reduced drive time, reduced fuel costs, and more accountability for drivers.

Scenarios Created

Three different mower scenarios were created, one for each mower that Metro Parks uses to maintain the parks throughout Tacoma.

Results

Using ARC GIS the routes created will increase productivity, and reduce drive time and costs. The total miles driven for all routes will be 172. If the vehicle used gets 12 miles per gallon (and using $3 per gallon for the cost of gasoline), then the total cost for fuel for all routes combined will be $43 dollars.

Another way that travel costs could be lowered would be through overtime. Particularly on the scenario 3 routes, if the drivers were able to do 21 minutes of overtime on Monday, and 17 minutes of overtime on Tuesday, then the Wednesday route could be eliminated all together. This could raise issues with drivers not willing to do the overtime, or the cost of the overtime pay outweighing the benefits gained by not routing a vehicle on the Wednesday route.

Conclusion

Using the new routes will allow for more accountability, less drive time, and lower fuel costs. One recommendation would be to install GPS transponders on all of the service vehicles. Using the GPS results would help to verify the routes effectiveness, and may show areas for route improvement over time. GPS transponders would also help to ensure that drivers stick to the routes and that any deviations are reported on the log sheets.

References


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