



Preliminary Report

Washington State Patrol Pursuit Vehicle Replacement

Legislative Auditor's Conclusion: WSP continues to use a vehicle life cycle cost model, but it is not following best practices. Vehicle replacement decisions should be based on a revised analysis and also consider other important factors.

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2019-21 transportation budget:
JLARC to update its 1999 study of
the Washington State Patrol's
pursuit vehicle life cycle cost model.



Two previous reports on WSP's pursuit vehicle replacement policy

1999 JLARC study developed a life cycle cost model to determine optimal replacement mileage for WSP's primary pursuit vehicle.

2004 WSP study resulted in a new life cycle cost model in order to extend the analysis beyond 110,000 miles.

Presentation outline

1

Fleet overview and current practices for life cycle cost analysis

2

Updated JLARC model and new replacement target

WSP Fleet Section manages over 1,500 vehicles

Fleet responsibilities include:

Policies and Procedures

Sets maintenance schedules and expenditure policies.

Procurement

Purchases vehicles and equipment on DES contracts.

Vehicle Upfitting

Installs and removes specialized equipment.

70% of WSP's pursuit vehicles are Ford Interceptor Utilities

Pursuit vehicles are standard vehicles that have been modified to perform under the rigors of police use.

- Primary pursuit vehicle since 2014.
- Other pursuit vehicles include the Chevy Tahoe, Dodge Charger, and a BMW motorcycle.
- WSP is transitioning to the Interceptor “EcoBoost.”



WSP planned to purchase 240 pursuit vehicles in 2019-21



240 vehicles covers replacements, total losses, and the cadet class.



Acquisition costs include purchase price and upfitting costs.



Pursuit vehicle budget includes capital and operating costs.

2019-21 Interceptor
EcoBoost Acquisition Cost:
\$55,000

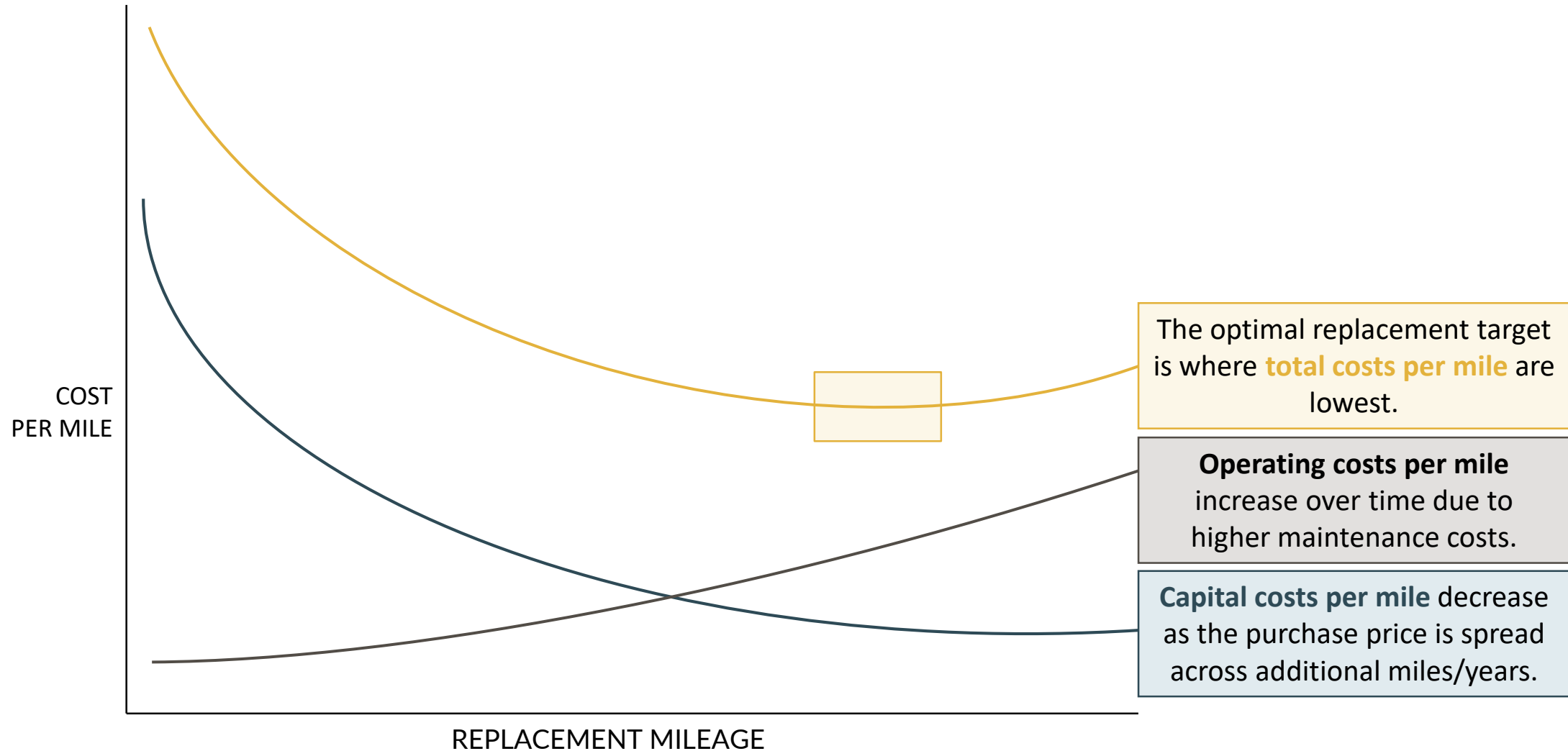
VEHICLE PURCHASES AND EQUIPMENT

\$13.3M

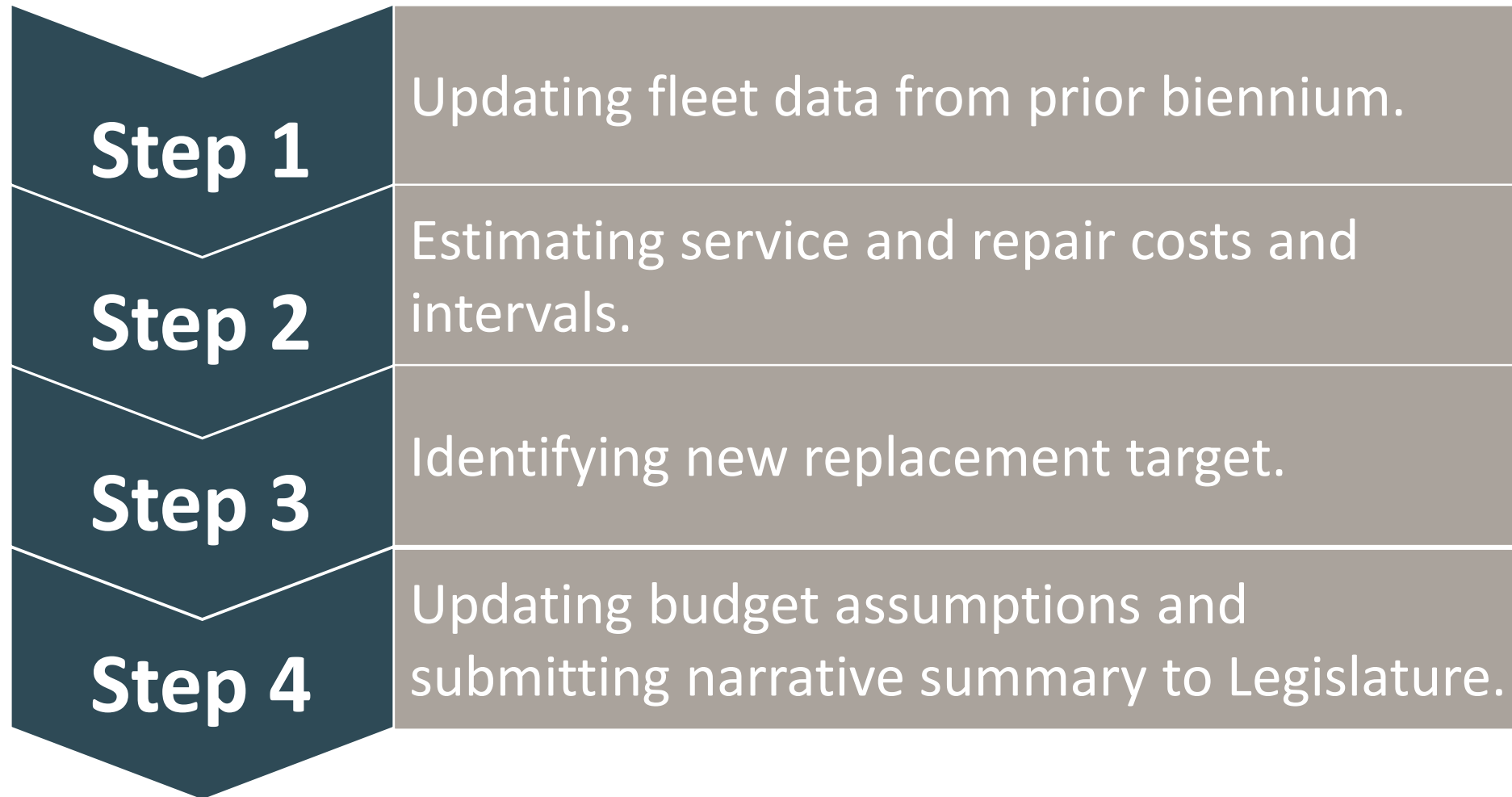
VEHICLE MAINTENANCE AND OPERATIONS

\$14.4M

WSP uses a life cycle cost model to set its replacement target



WSP updates the life cycle cost model each biennium



Vehicles replaced at higher mileages than the target over the last two years


WSP's replacement target for 2019-21 is 110,000 miles.

Pursuit vehicles were replaced at an average of 118,000 miles during each of the last two years.

Replacement targets for other vehicle types are not determined from life cycle cost analysis.

WSP is not following best practices for life cycle cost analysis

- Reviewed the last six iterations of the model.
- Identified four areas where WSP is not following GAO best practices:
 - Reliable fleet data.
 - Standard modeling guidelines.
 - Detailed documentation.
 - Clear communication.



WSP does not maintain complete and accurate data

WSP provides limited oversight of the maintenance data entered by its staff, resulting in unreliable information.

- Service and repair data includes 5 of the 16 categories in the 2019-21 model.
- 34% of data entries are listed as ‘other’ rather than specific services.

Impact of not following best practice:

JLARC staff were unable to independently calculate repair costs for the 16 maintenance categories.

| Legislative Auditor's Recommendation #1

WSP should improve the procedures and data systems it uses to collect and track vehicle maintenance data.




WSP is not following standard modeling guidelines

The 2019-21 life cycle cost model included:

- Inconsistent formulas.
- A policy constraint limiting the maximum replacement mileage to 110,000.
- Unadjusted future costs and cash flows.

Impact of not following best practice:

The optimal replacement target was not determined from standard formulas and parameters.



WSP does not document its assumptions and methods

WSP reported using a variety of methods to estimate cost inputs.

- Assumptions and calculations were not documented.
- Some of the documentation in the model was inaccurate.

Impact of not following best practice:

JLARC staff were unable to verify the cost inputs and methodology used in the 2019-21 model.

| Legislative Auditor's Recommendation #2

WSP should establish and document procedures for conducting life cycle cost analysis each biennium.



WSP does not simply and clearly communicate results

The narrative summary WSP submitted to the Legislature lacked detail and accuracy.

- List of variables out of date.
- Does not include costs beyond 110,000 miles.

WSP did not include the 2019-21 model in its budget submittal.

Impact of not following best practice:

Legislative staff were unable to review the analysis supporting the replacement target.

Legislative Auditor's Recommendation #3

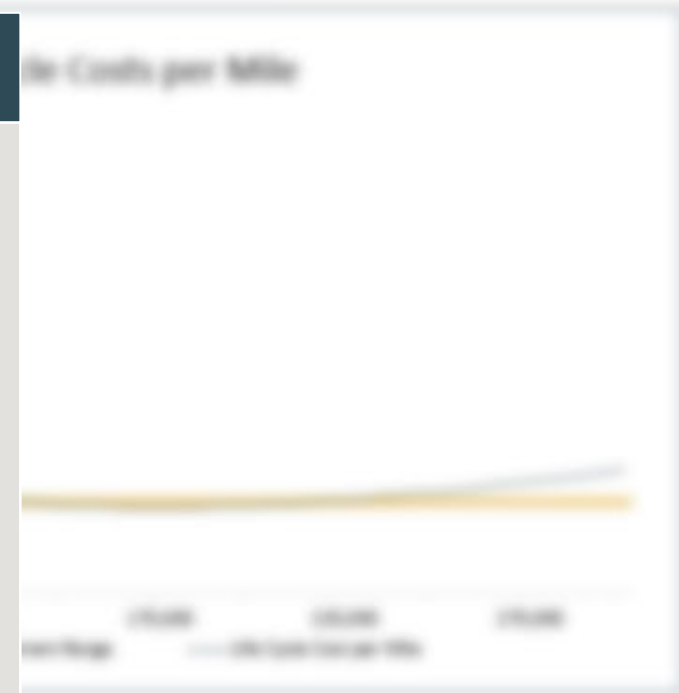
WSP should provide the Legislature with additional information on its life cycle cost analysis and pursuit vehicle budget when it submits its biennial budget requests.

Updated JLARC model and new replacement target

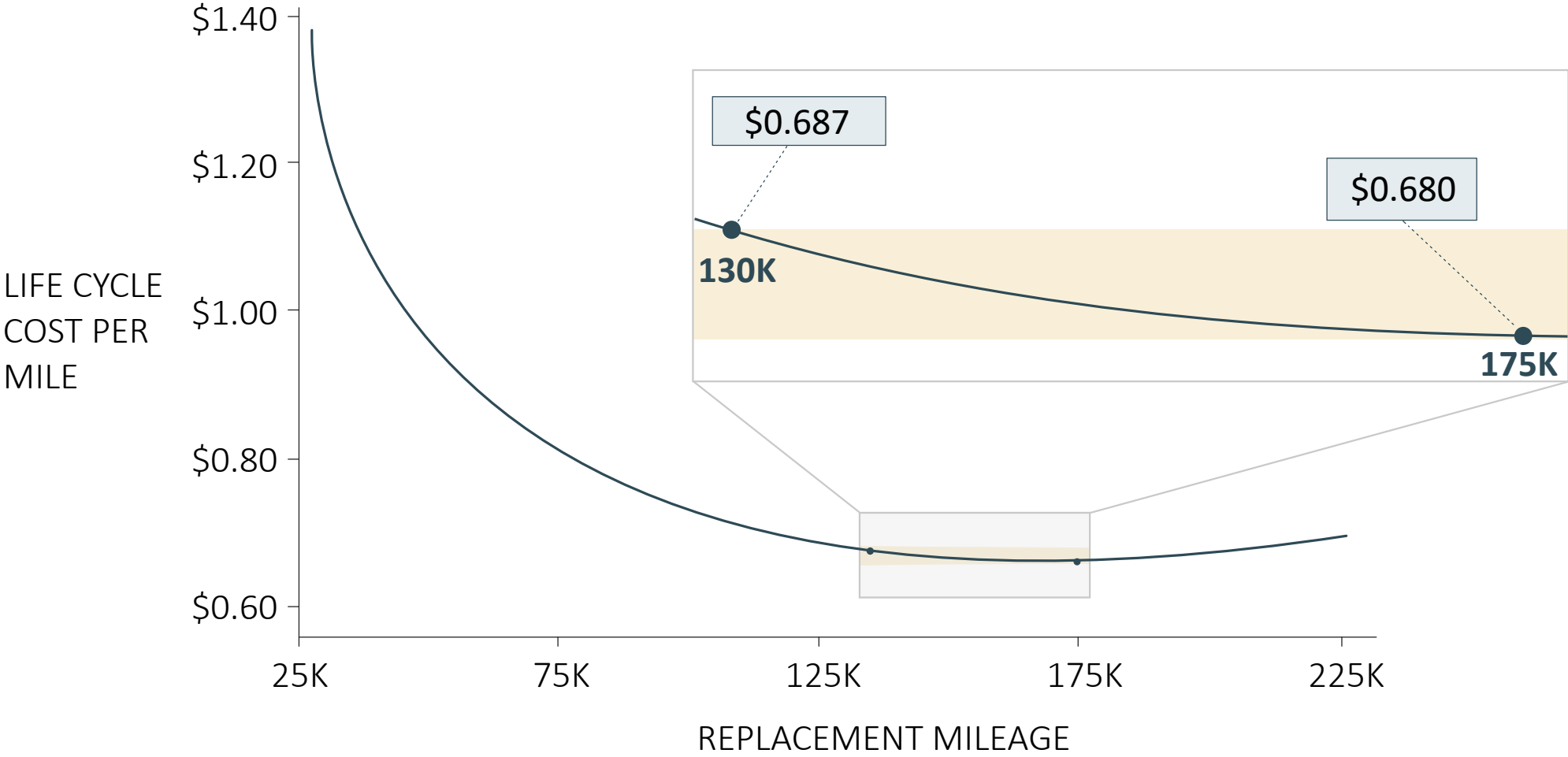
JLARC staff updated the model to align with available data and incorporate best practices

Updates to the model included:

- Aggregating maintenance cost per vehicle.
- Using statistical analysis to estimate costs at high-mileages.
- Estimating vehicle depreciation from DES resale data.
- Discounting future costs to their present value.
- Incorporating a margin of error into the analysis.



Replacing vehicles from 130,000 miles to 175,000 miles have statistically equivalent costs



Changes to replacement targets have modest impact on annual fleet costs

Replacement Mileage	Annual Fleet Costs
110,000	\$12.5 million
120,000	\$12.3 million
130,000	\$12.1 million
175,000	\$11.9 million



Additional cost and non-cost factors should be considered

Cost Factors

More pool vehicles

Extra staff due to trooper downtime

Unexpected maintenance needs

Non-Cost Factors

Safety and emissions

Reliability

Agency image

These factors favor a lower replacement target within the optimal range.

JLARC staff identified an optimal replacement target of

**130,000
miles**

This target is based on:

- Equivalent costs from 130,000 to 175,000 miles.
- Choosing the lowest mileage within the optimal range minimizes the risks and costs associated with factors not included in the model.

Future replacement targets are uncertain

Increasing acquisition costs.

Uncertain maintenance costs.

Data quality and assumptions will influence future replacement targets.

Future discount rates unknown.



Recap of Legislative Auditor's Recommendations

- 1** WSP should improve the procedures and data systems it uses to collect and track vehicle maintenance data.
- 2** WSP should establish and document procedures for conducting life cycle cost analysis each biennium.
- 3** WSP should provide the Legislature with additional information on its life cycle cost analysis and pursuit vehicle budget when it submits its biennial budget requests.



Next Steps

Proposed Final Report | September 2020

Full Report

leg.wa.gov/jlarc/AuditAndStudyReports

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