## REVISED STAFF REPORT

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| **Agenda Item:** | 8 | **Name:** | Mike Reed |
| **Proposed No**.: | 2013-0345 | **Date:** | September 17, 2013 |
| **Invited:** |  |

**COMMITTEE ACTION**

On September 17, 2013, the Transportation, Economy and Environment Committee approved Proposed Ordinance 2013-0345, as amended, with a “do pass” recommendation.

**SUBJECT**

Proposed Ordinance 2013-0345 provides for monitoring and reporting on the repair and maintenance history of electric vehicles in the county fleet, and if justified, revision of the vehicle replacement cycle of these electric vehicles.

**SUMMARY**

The technology embodied by battery-powered electric vehicles represents a significant departure from conventional vehicle technology. Early reports indicate that this alternative vehicle technology may not require the maintenance levels of other vehicles, and may have the potential for a differing period of lifetime usage. This measure provides for review of the repair and maintenance experience of electric vehicles, and as appropriate, revision to the vehicle replacement cycle for electric vehicles to the extent supported by available data.

**SUPPORT OF THE STRATEGIC CLIMATE ACTION PLAN**

Although Proposed Ordinance 2013-0345 was not identified as a specific action in the Strategic Climate Action Plan (SCAP), by encouraging the use of alternative vehicle technologies, it supports the following objectives and strategies in the Transportation and Land Use goal area of the SCAP:

GOAL S.1: King County will reduce the need for driving and provide and encourage the use of sustainable transportation choices such as public transit, alternative technology vehicles, ridesharing, walking and bicycling.

Objective S.1.2: Increase the use of alternative transportation vehicles and technologies

**BACKGROUND**

King County has taken a leadership position in seeking to “green” its vehicle fleet, to minimize the county’s generation of greenhouse gasses as a means of lessening the impact of county operations on climate change. The county has moved forward with the purchase of electric vehicles, both for use by agencies in county business, and as part of the Ride Share commuter program.

**Electric Vehicle Mechanics**

Electric vehicles represent a significant departure from the mechanics of a vehicle driven by the internal combustion engine. Power is stored in on-board batteries, and is delivered through a controller to the electric motor, which converts electrical energy to mechanical energy. From there, power is delivered to turn the wheels.

Maintenance needs for these vehicles are also less complex. The all-electric Nissan Leaf, for example, is described as having no need for:

* Oil changes;
* Spark plugs
* Air filters
* Transmission fluid
* Mufflers
* Radiator hoses or flushes.

The county currently has six non-revenue electric vehicles in its fleet for use by county agencies, as well as twenty-five electric vehicles in the county Ride Share commuter program. Fleet Management provides maintenance and repair services for these vehicles, which are used by a number of agencies for light-duty transportation purposes.

In balancing anticipated costs of repair against replacement costs, Fleet Management has established a light-duty vehicle replacement mileage threshold of 100,000 miles.

The lesser maintenance demands of electric vehicles have the potential to both reduce maintenance expenditures for those vehicles, and to limit the number of systems that will require repair or replacement, potentially extending the usable life cycle of the vehicles, as compared to vehicles powered by internal combustion engines.

**Battery Replacement Consideration**

On-board battery systems are potentially a major maintenance expense. Depending on the size of the vehicle and power of the engine, battery replacement costs can be in the range of several thousand dollars. The life of the battery also can vary, according to the vehicle and driver usage patterns. Nissan is indicating that the battery for the Leaf, for example, is expected to retain 80% of its original charging capacity after five years of use, assuming normal usage. The need for battery replacement is another cost element that should be included in an analysis of potential vehicle useful life.

**Proposed Ordinance 2013-0345**

Proposed Ordinance 2013-0345 directs Fleet Management to undertake a review of the maintenance and repair experience of battery-powered electric vehicles in the county fleet, and to the extent justified by that experience, to establish vehicle replacement cycles for electric vehicles that reflect that maintenance and repair experience.

**ANALYSIS**

The commitment by the county to minimize its contribution to the emissions of greenhouse gasses through the introduction of vehicles utilizing alternative fuel technologies, including electric vehicles, presents the need for potential review of the application to electric vehicles of operational and service parameters that have been developed for vehicles with traditional mechanics. The greater simplicity of electric vehicles, and the absence of certain mechanical systems, raises the potential that the usable lifetime of these vehicles may differ from that of internal combustion engine-driven vehicles. While simpler, these electric vehicles are likely to require battery replacement, at significant expense, after a period which operational experience will define.

In sum, the distinct mechanical profile of electric vehicles, and the county’s incorporation of those vehicles into the county fleet, presents a policy question to the Council: Should the county give particular attention to the emerging maintenance and repair experience of electric vehicles in the county fleet, in comparison to other vehicles—with an eye towards eventual consideration of a revised replacement cycle? Should the county report this experience to the Council as part of its regular reporting process?