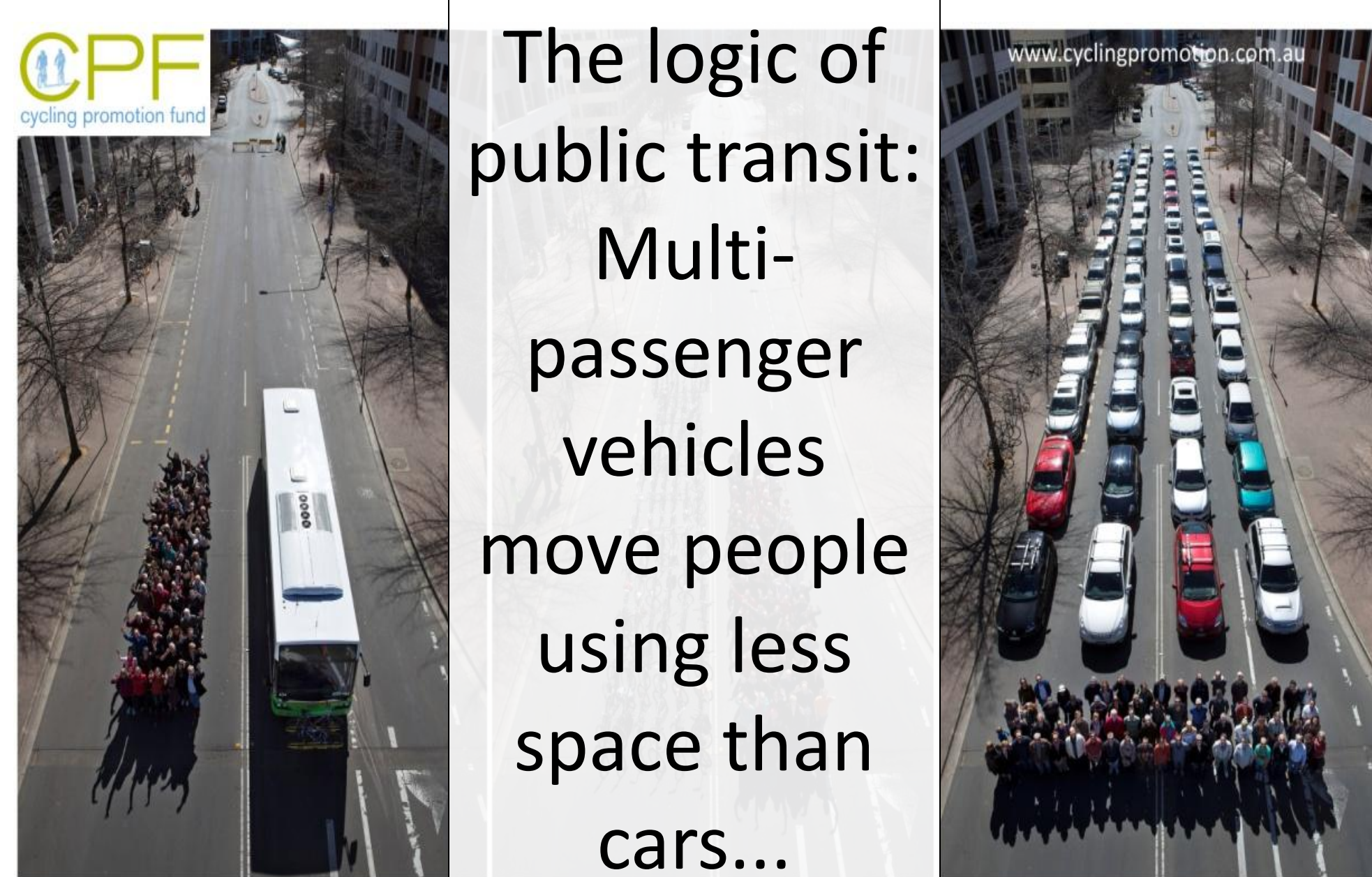


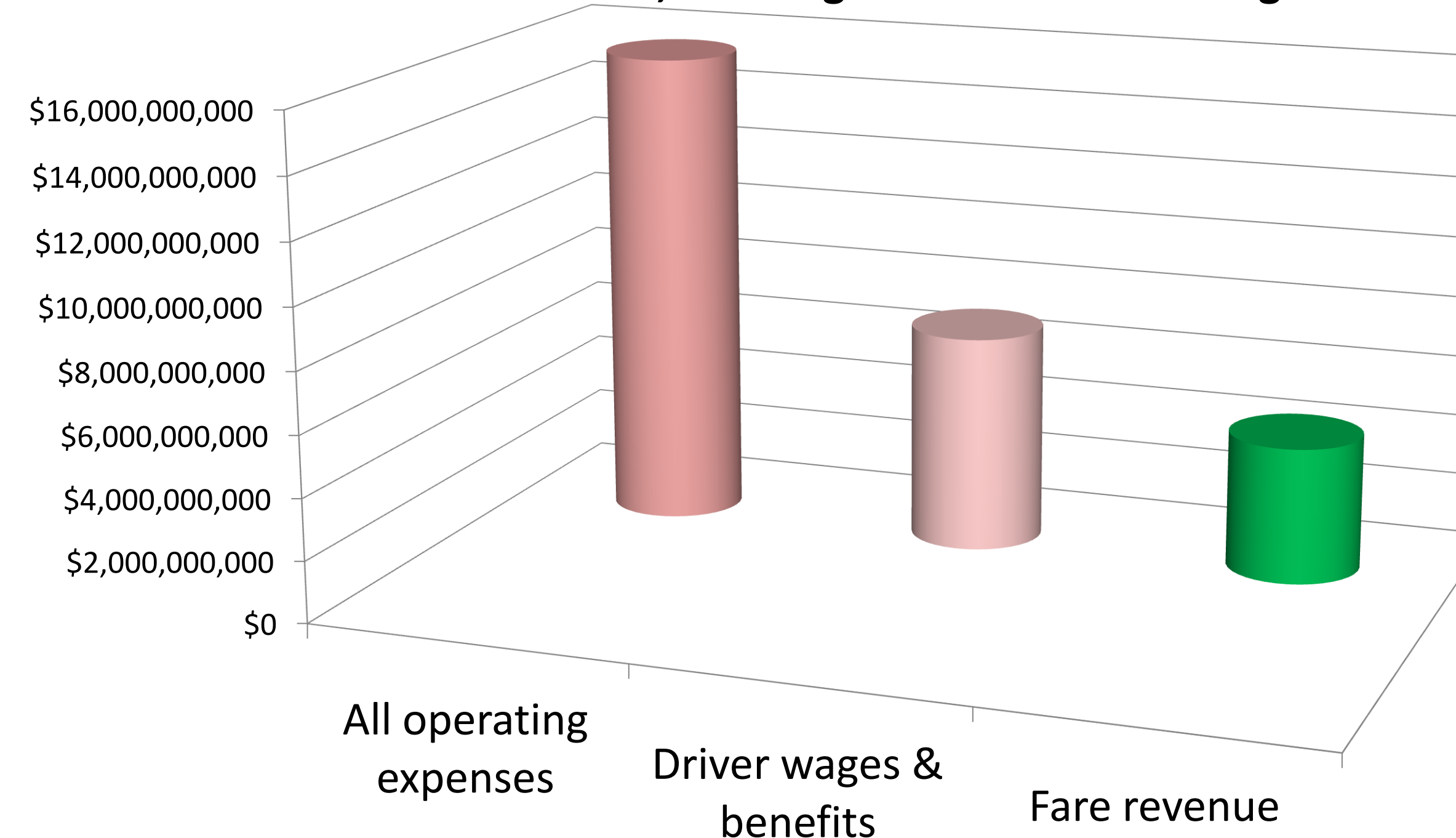
Working Toward Financially Sustainable Public Transit by Reducing Vehicle Operating Costs

By John S. Niles, Research Director, CATES | Seattle, WA | www.aboutcates.org

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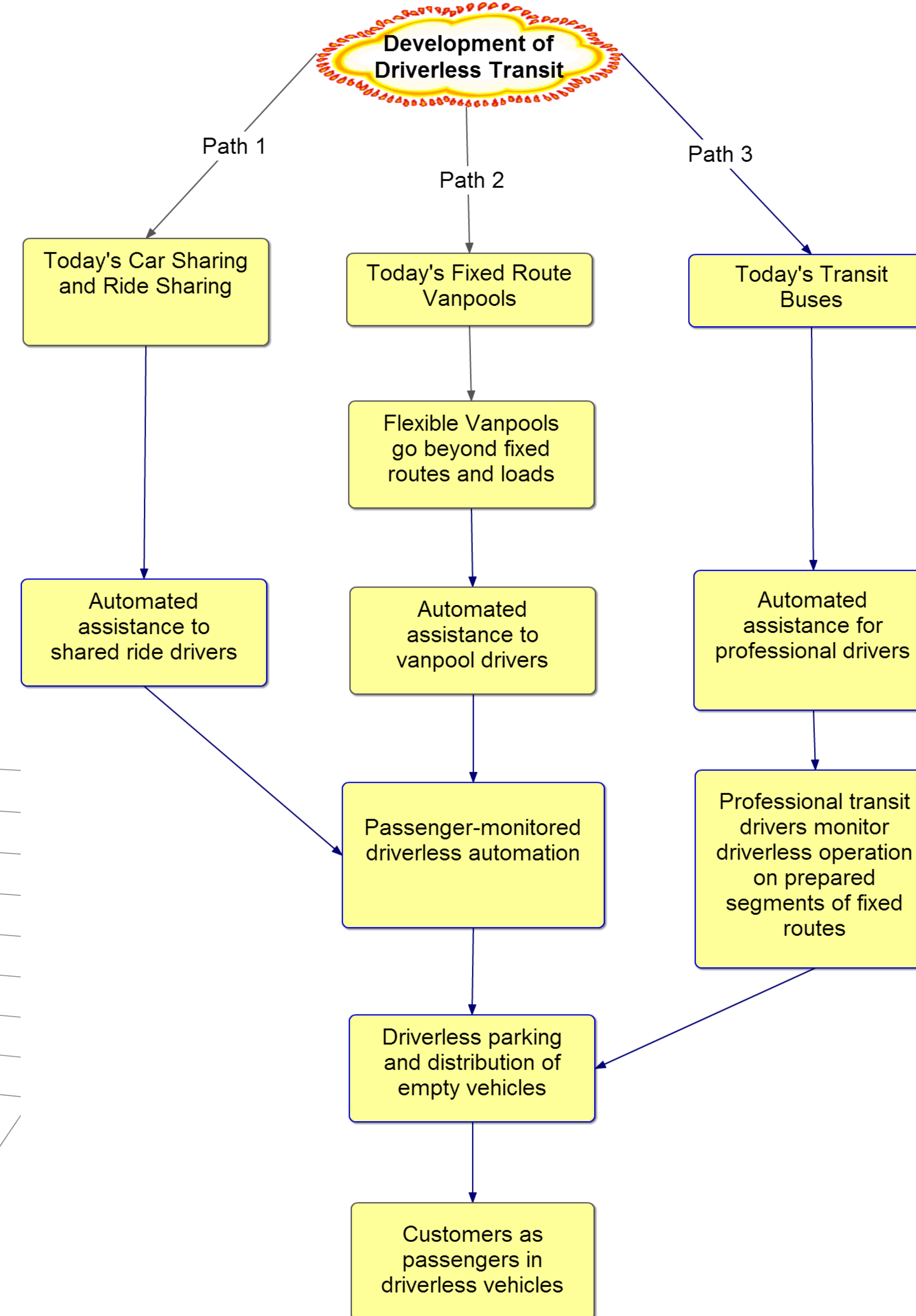


Annual Dollar Amounts, 155 Largest U.S. Transit Bus Agencies

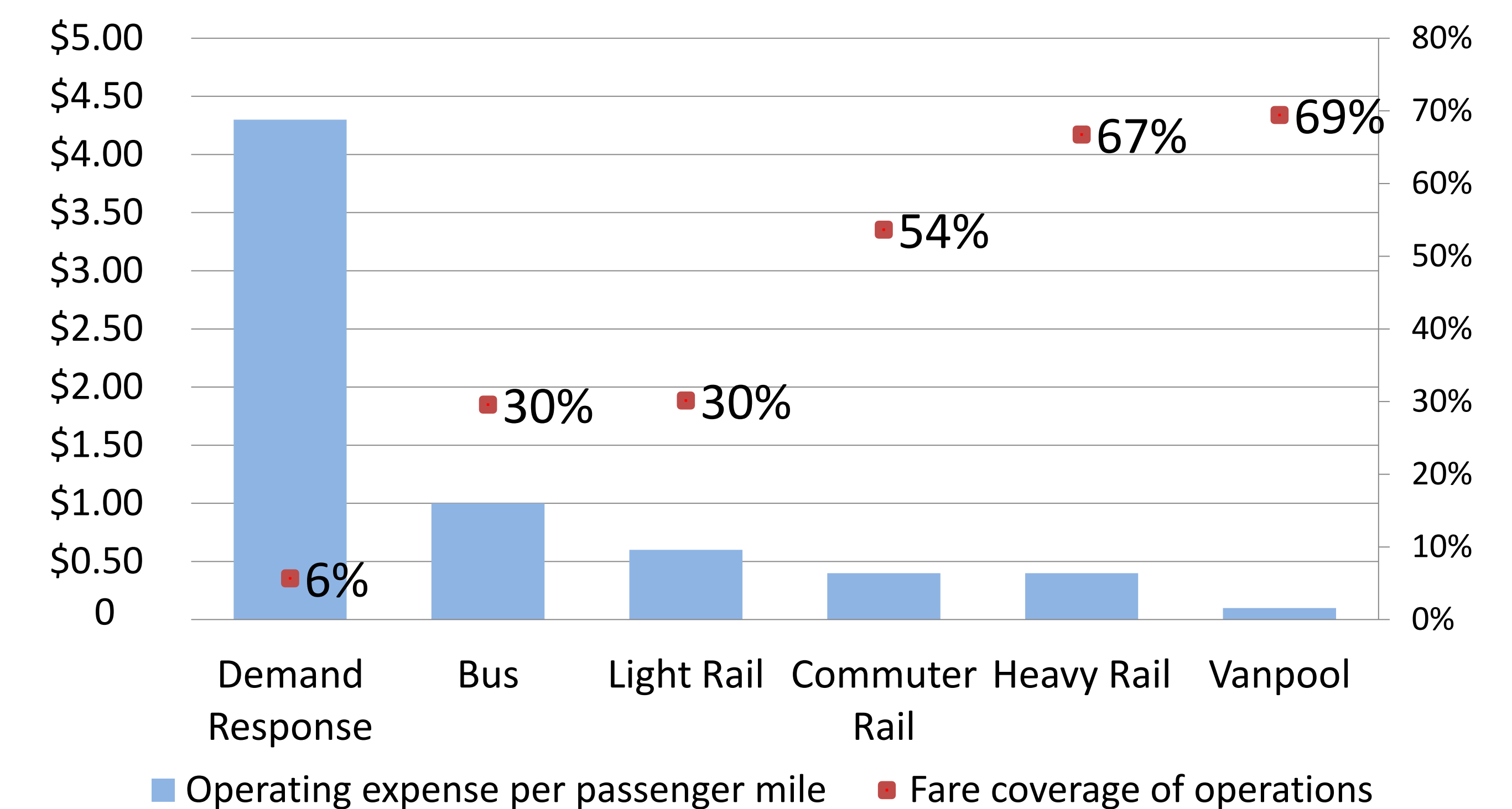


Nissan Leaf electric vanpool vehicles deployed by King County Metro (Seattle region of Washington State)

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Effect of Paid Drivers on Cost per Passenger Mile by Mode



U.S. public transit faces a growing financial sustainability problem.

The National Transit Database reveals that the 155 largest U.S. bus transit systems expended \$16 billion for operations in 2011 but only collected \$4.5 billion in fares. Transit funding comes mostly from taxes that are also needed to cover other critical public services such as health and education.

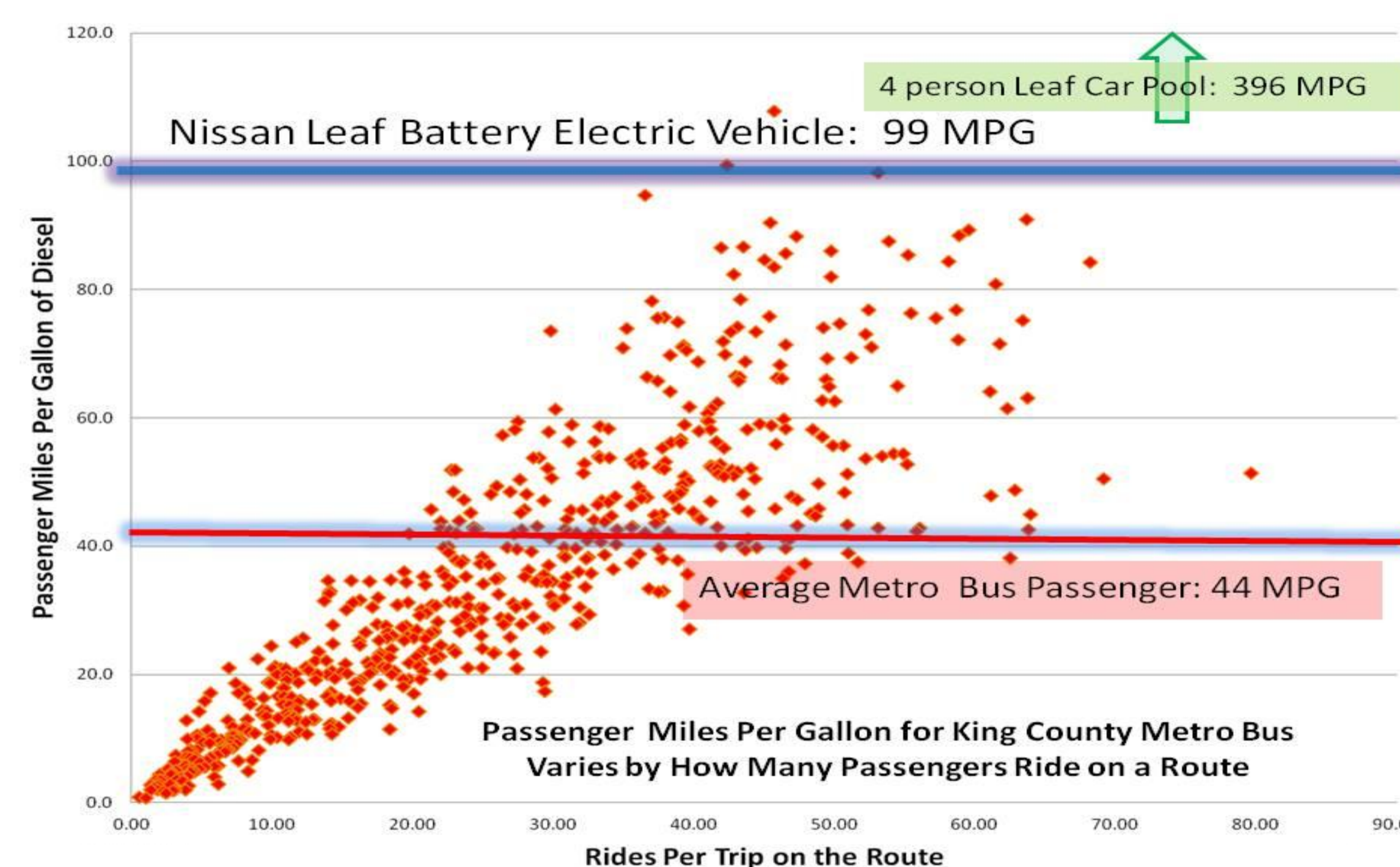
Road-vehicle automation could enhance the financial sustainability of transit by reducing the cost of professional vehicle operators. This cost component is about one dollar per passenger mile for buses as shown in the bar chart above, amounting to 45% of direct operating costs in 2011, as shown on the far left three-bar chart. But with driver salaries not needed, that same cost for vanpools with eight paying passengers and one doing the driving is only 10 cents.

These cost-of-driving numbers should motivate the transit industry to examine several options. A first possibility is to use road-vehicle automation applications to reduce the skill, training investment, and compensation needed for transit operators. Later, the need for paid drivers could perhaps be eliminated entirely.

Starting with today's fixed-route van pools, organized ride sharing and car sharing, CATES envisions a step-by-step evolutionary potential for vastly expanded small-vehicle, electric transit, where in effect, passengers do the "driving." Three paths of evolution for three road modes are shown on the flow chart at left.

Small EVs with 50% or greater load factors also provide an opportunity to vastly reduce energy consumption and greenhouse gas emissions per passenger mile, as shown in the lower left by the result of using Nissan Leaf electric vehicles for four-passenger van pools in the Seattle area.

Automation facilitates a step-by-step movement toward more sustainable public transit across all the dimensions of sustainability -- environment, economics, and equity.



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