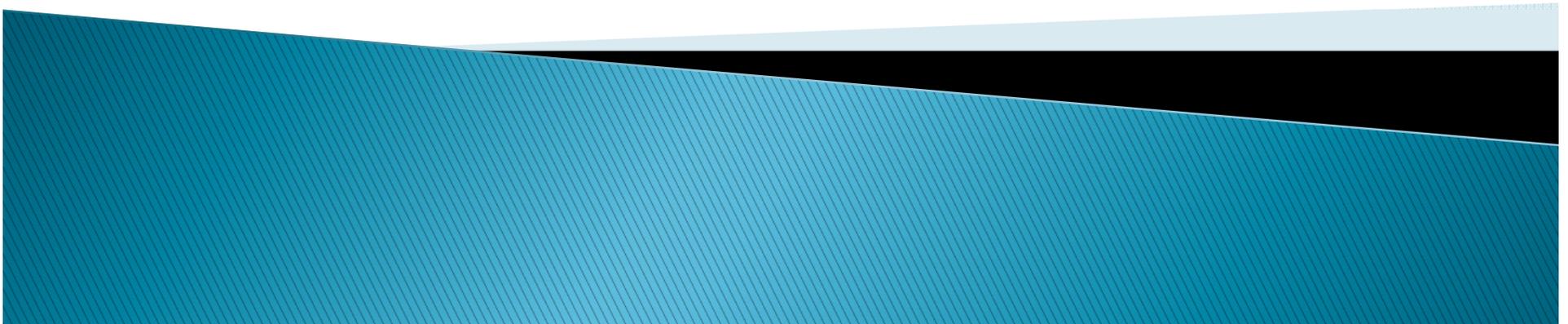


Charging Fees at Work: Why Free Charging May Decrease eVMT in California

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Answers First

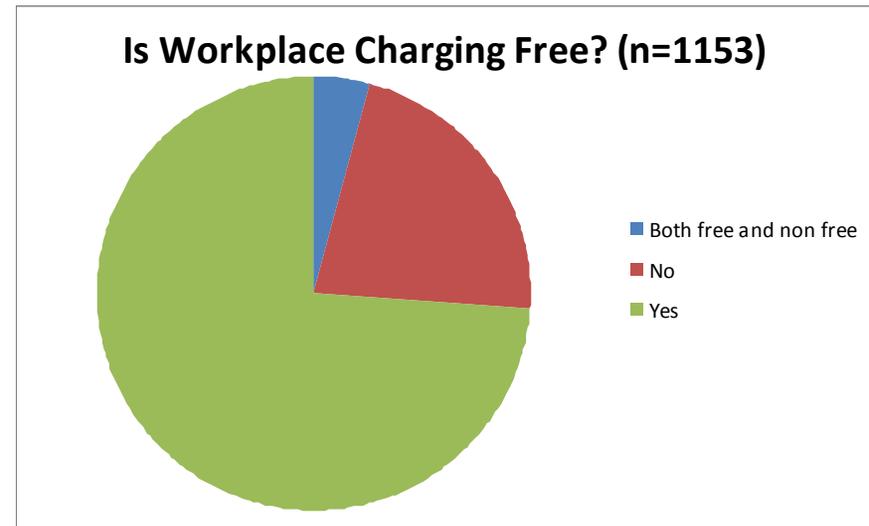
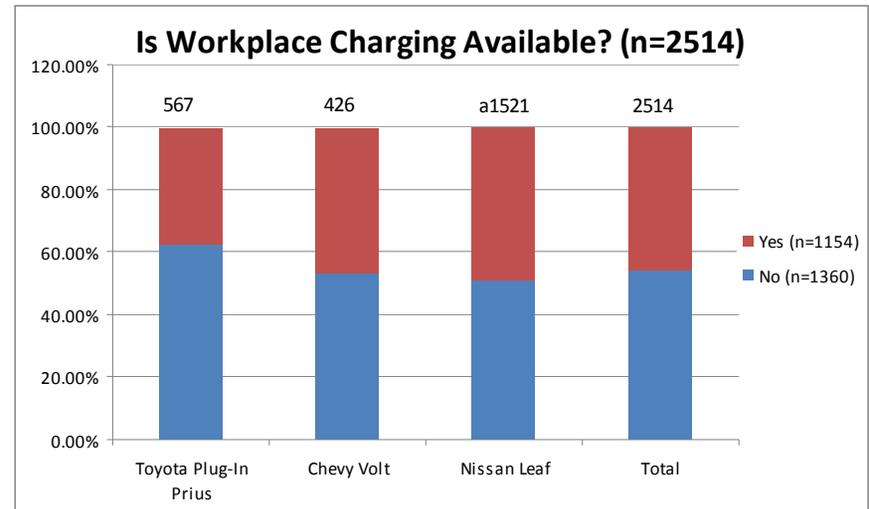
- ▶ Lack of dependability of finding a charger at work discourages BEV drivers from attempting to drive on certain days
 - ▶ 4 times as many chargers (2ch/10 vehicles vs 8ch/10 vehicles) are “needed” if workplace charging is free vs paid 2x price of home (Charging is still cheaper than gasoline at 2x)
 - ▶ Free charging may not increase eVMT, may only encourage the switch from home charging to work charging
 - ▶ At least 53% of people who don't need charging charged anyway with free uncongested charging.
 - ▶ Level 2 charging should be priced higher than level 1 charging to encourage efficient use of chargers and encourage only those who need level 2 to use it
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Policy Questions

- ▶ What is the purpose of workplace charging? eVMT or selling vehicles?
 - ▶ Free charging encourages sales of PEVs, but by how much?
 - ▶ Can a lower power EVSE provide the same incentive at lower cost? And lower employer exposure? What are the cost savings?
 - ▶ Is the cost of administering a fee system recovered by the fees and justified in terms of avoided infrastructure costs?
 - ▶ Is it feasible to build 4 times as many free chargers at work? What are the implications for panel capacity? Taxes? Motivation of potential employer installations?
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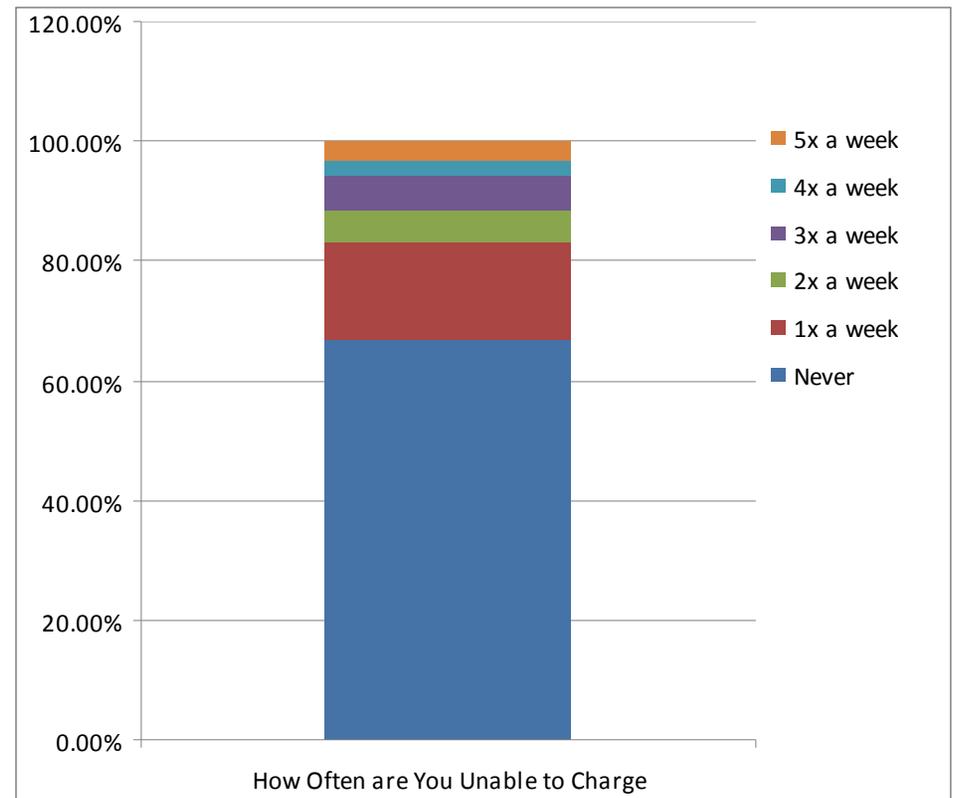
Most WP Charging is Free

- ▶ 46% have WP charging
- ▶ 74% of that 46% have free charging

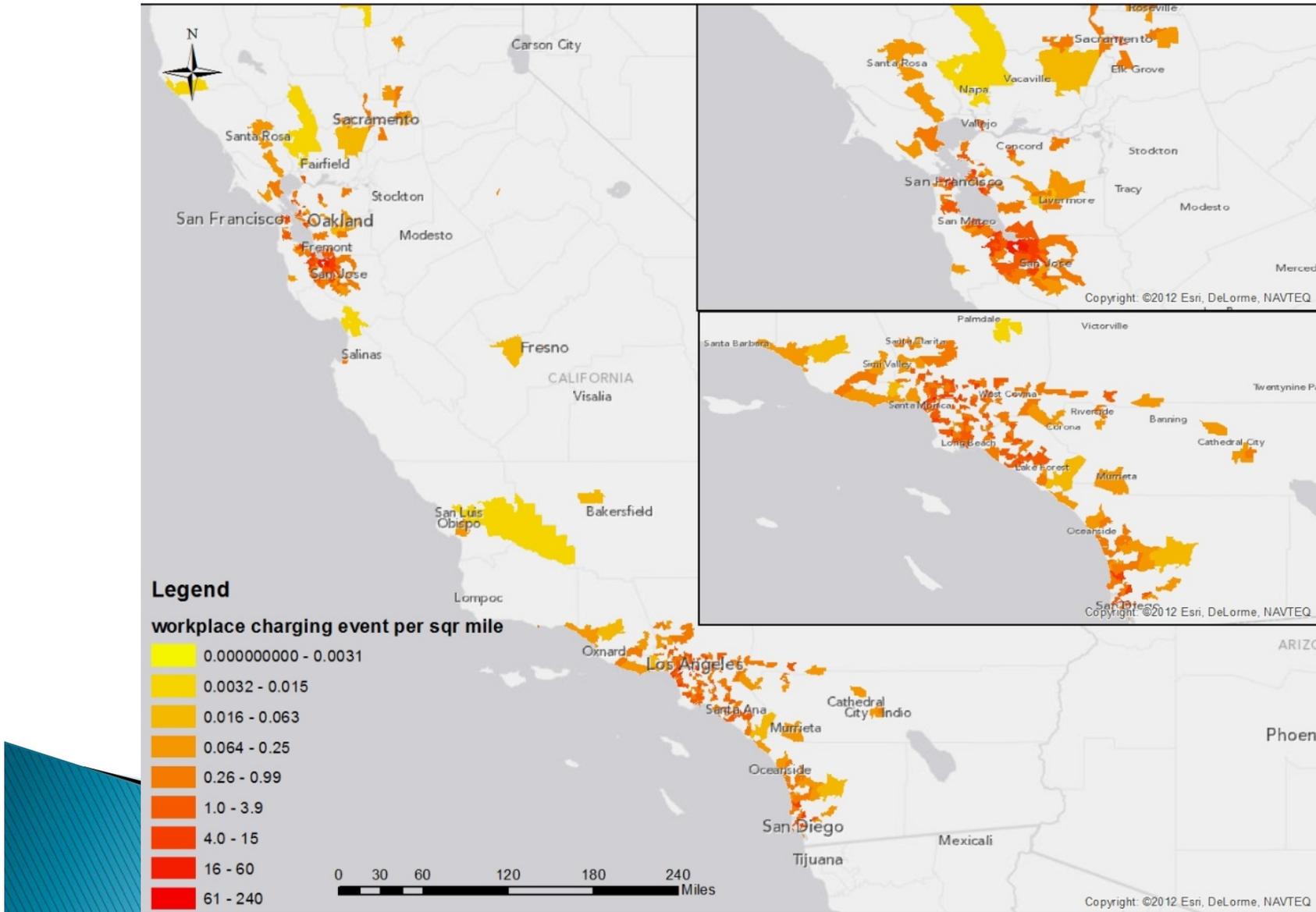


However, There is Congestion Happening Already

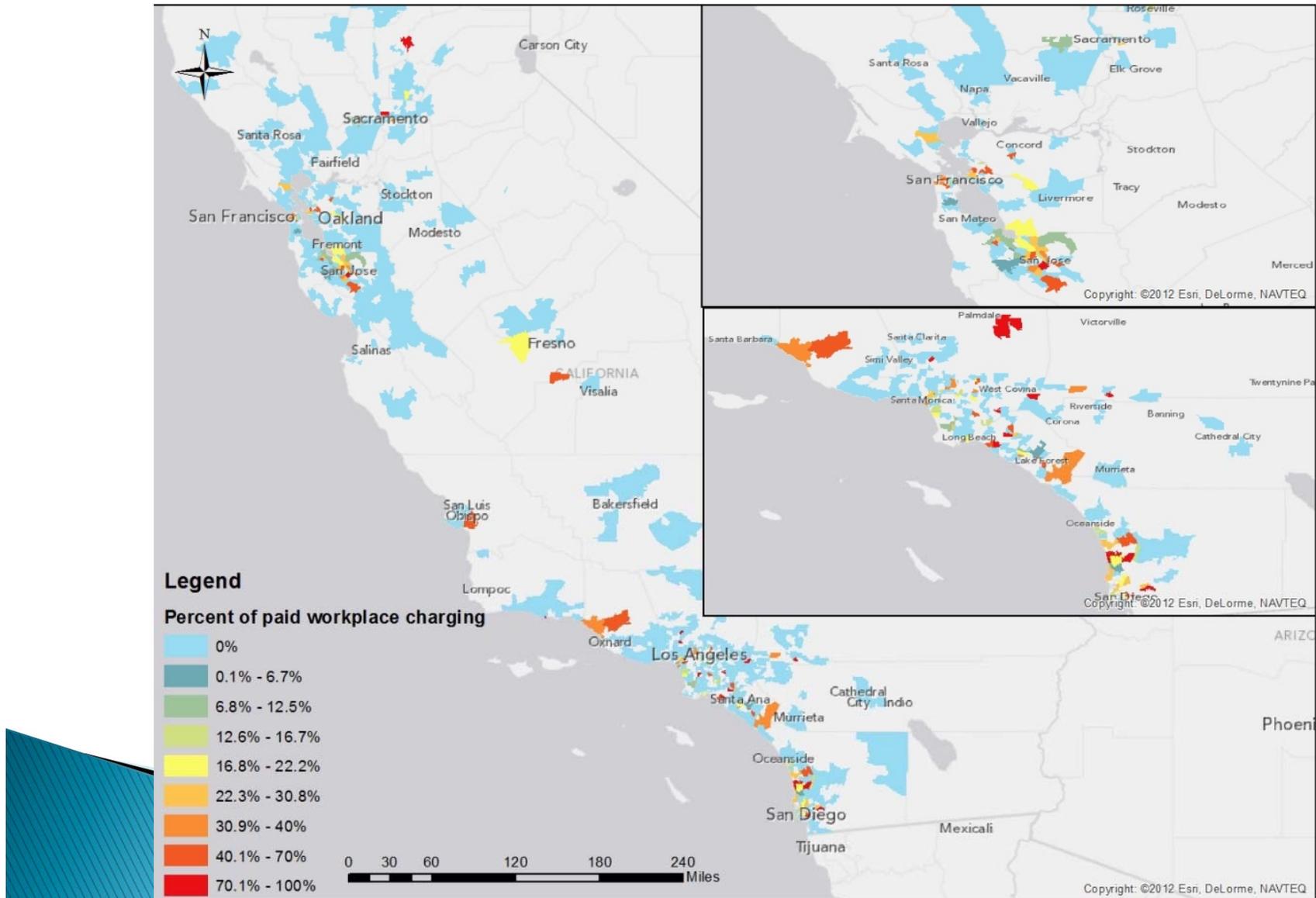
- ▶ Over 30% of drivers have congestion at work
- ▶ Pay systems exist in congested areas. Nevertheless paid chargers are 1.7 times less likely to experience congestion



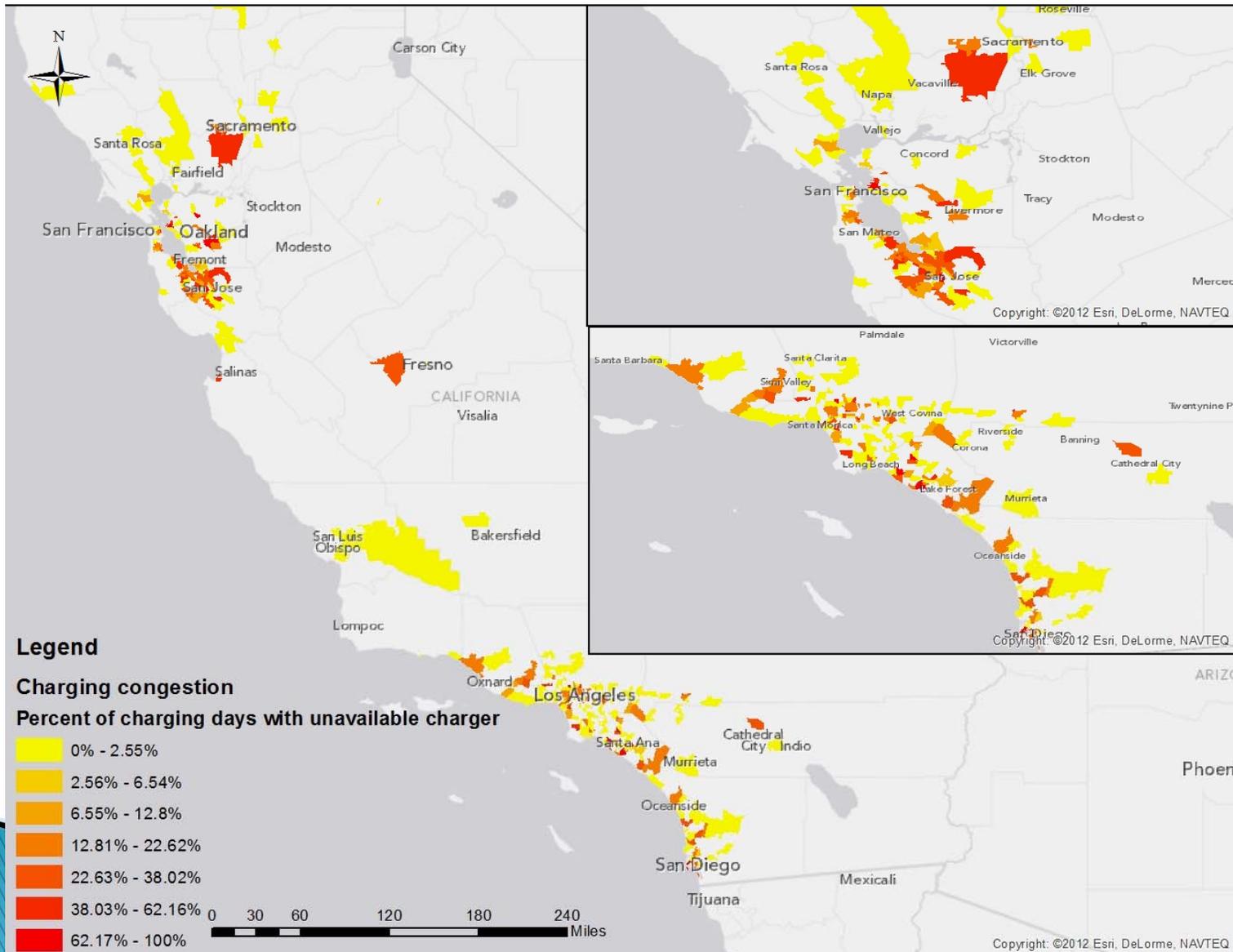
Workplace Charging



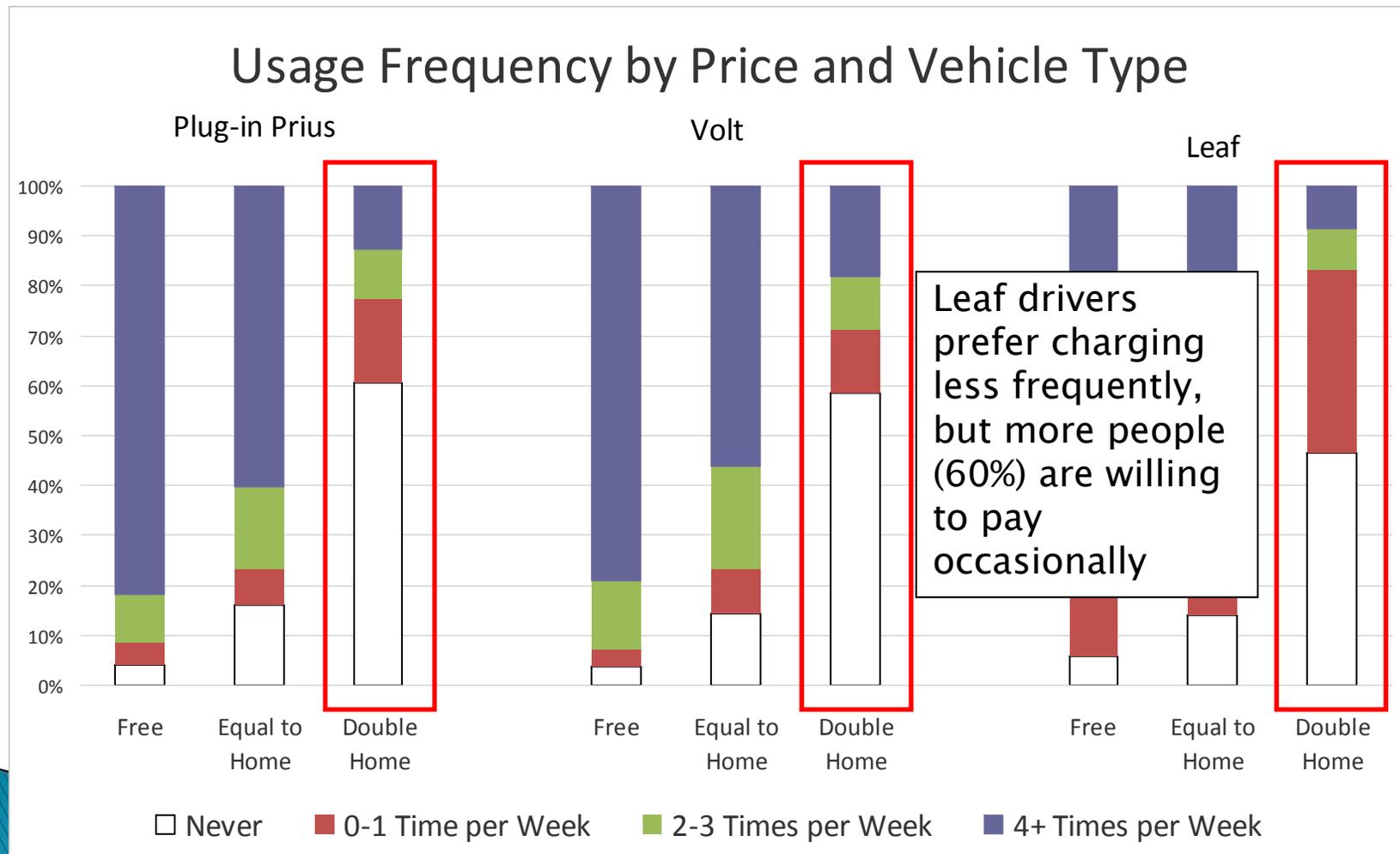
Free Charging



Congestion

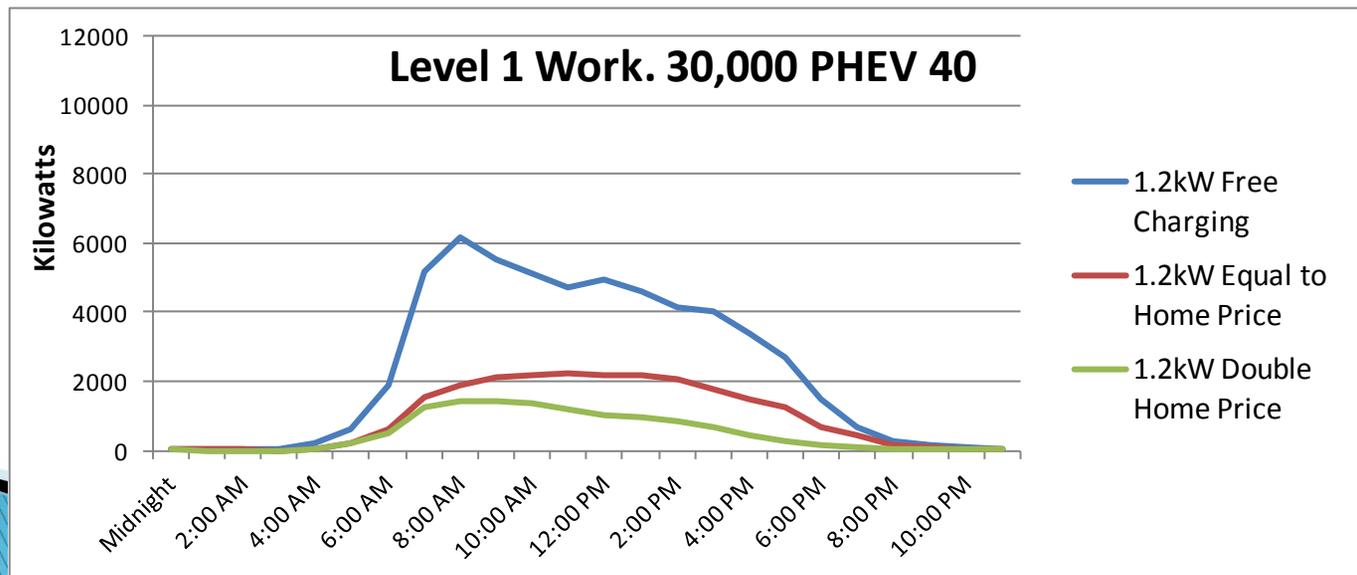


Free Charging Represents a Four-fold Increase in Charger Demand



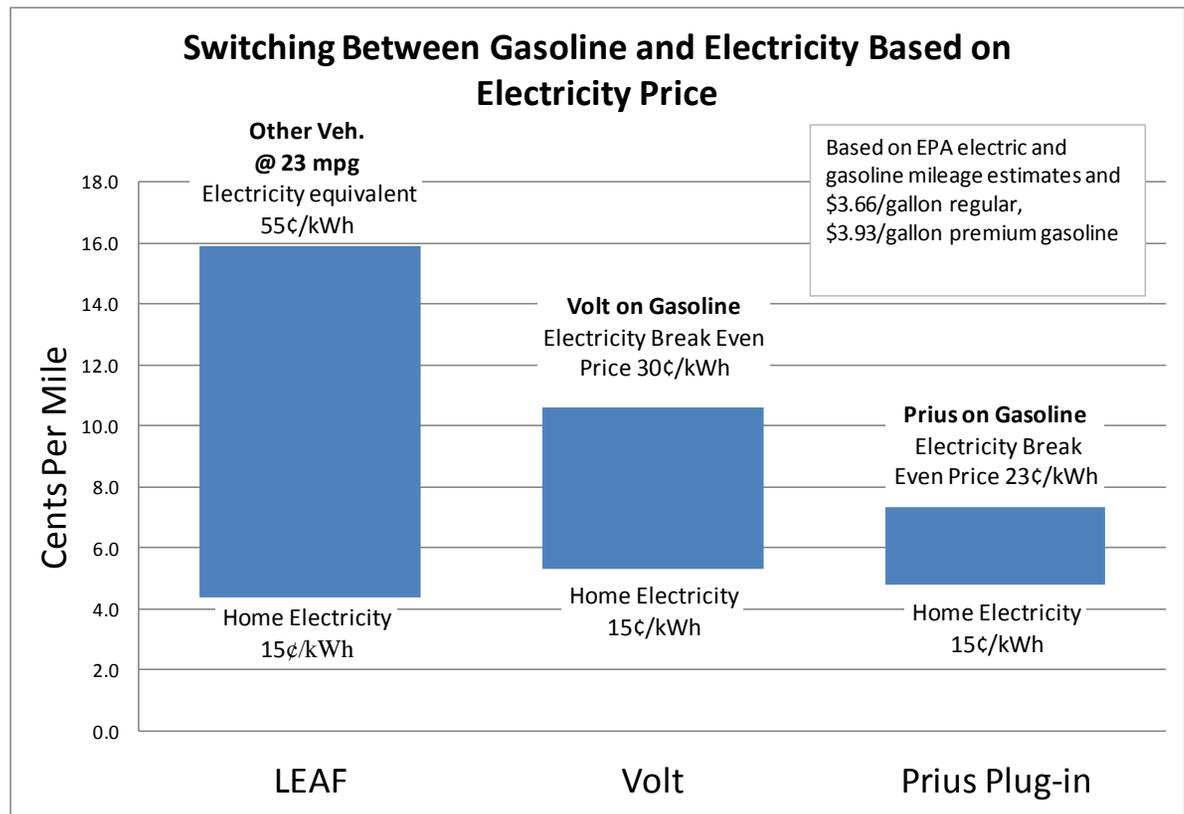
Modeling Suggests Free Charging May not Increase eVMT

- ▶ Little difference in marginal eVMT may exist between free and priced scenarios
- ▶ Value of time may alter this somewhat (eg Plug in Prius)
- ▶ 53% of people surveyed who had free charging who did not need charging to get home charged anyway

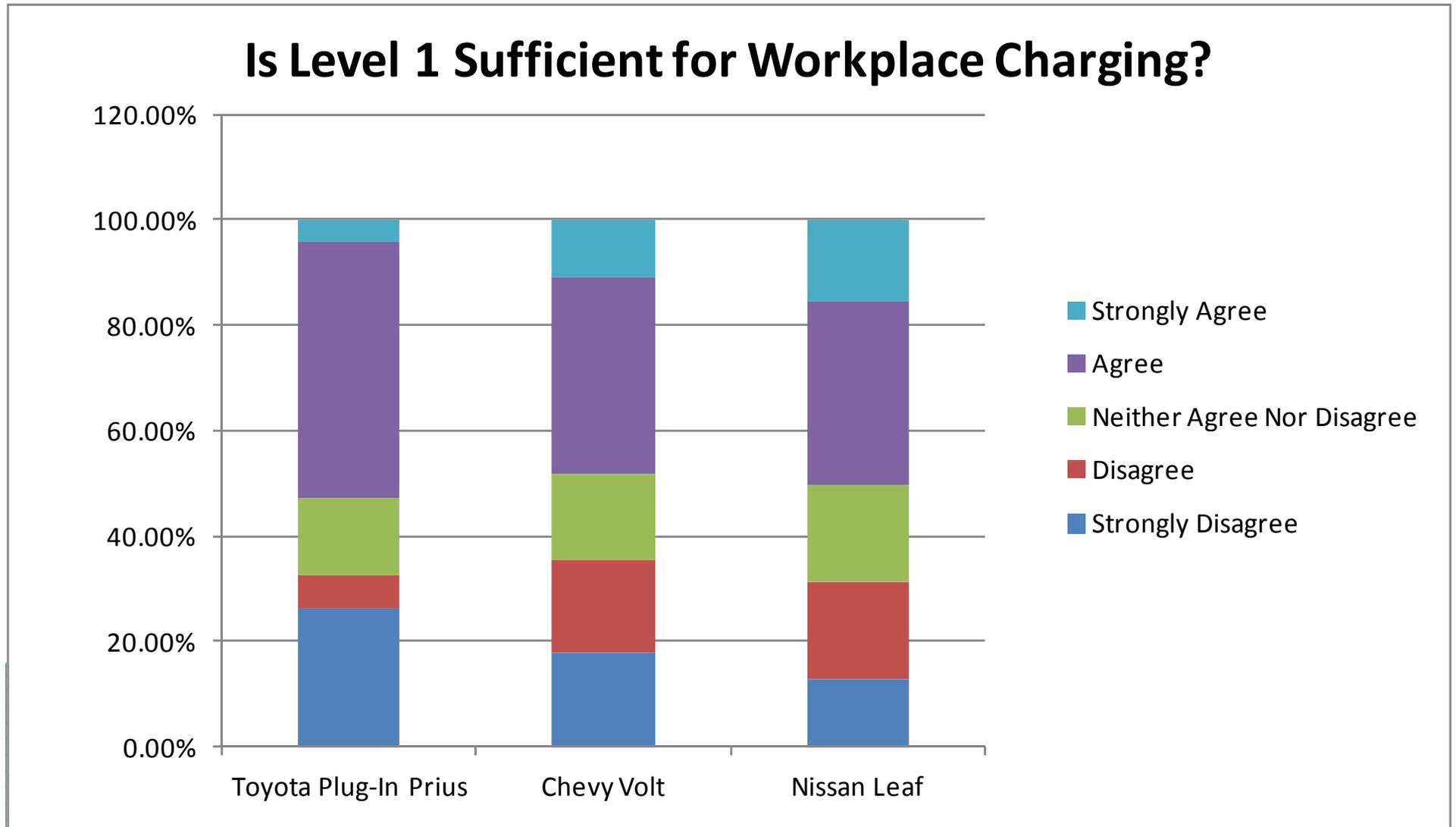


Trade off in Cents Per Mile

- Savings if free (full battery)
 - Plug-in Prius \$1.01
 - Volt \$3.90
 - Leaf \$13.20
- Savings if home price
 - Plug-in Prius \$0.35
 - Volt \$1.95
 - Leaf \$9.60



50%–80% of Customers Think Level 1 is Sufficient



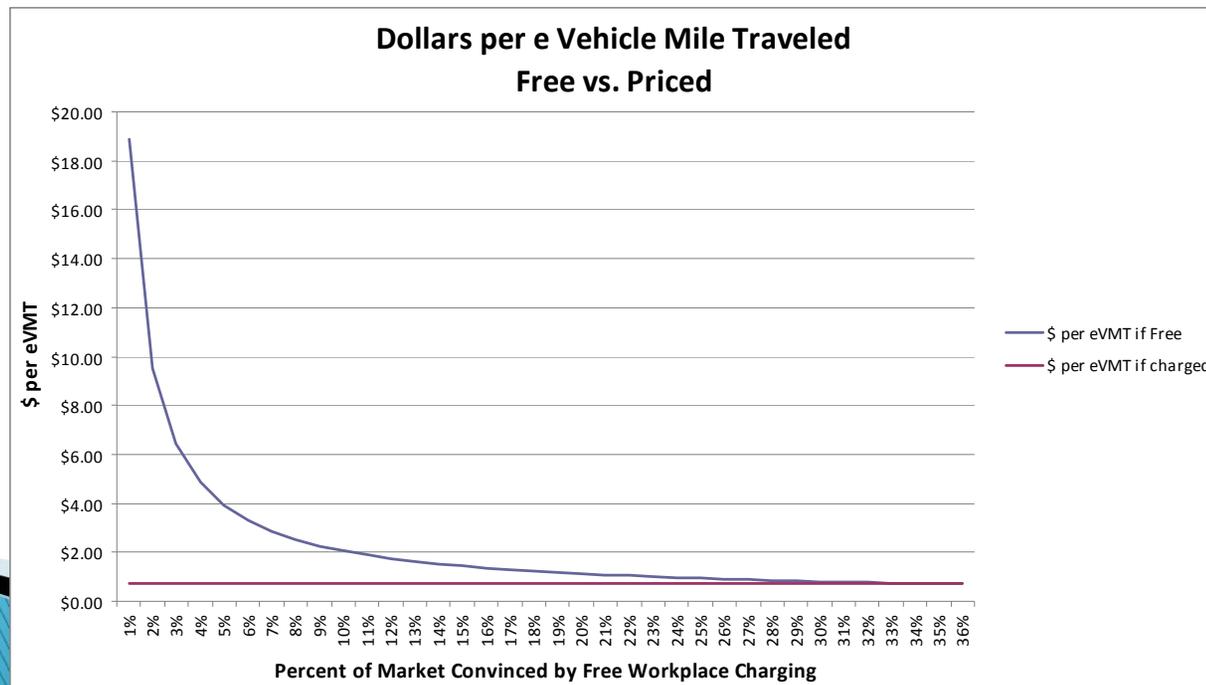
Potential Solutions

- ▶ Encourage pricing for Level 2 at work in the near term
- ▶ Allow path to price level 1 in the future, but keep free now to encourage sales
- ▶ Keep prices low similar to home pricing (eg 12 cents/kWh)
- ▶ Provide more workplace charging infrastructure



Policy Question: What is the Tradeoff Between Car Sales and Infrastructure Cost per eVMT?

- ▶ Preliminary sample calculations only
- ▶ 4x chargers will be needed for same eVMT benefit
- ▶ ~36% additional customers have to buy car because of free WP charging (eg 100,000 vehicles with paid and 136,000 if free. Extra charger cost is spread over 36,000 veh) 7% eVMT attributed to WP charging. 100% of miles of marginal additional vehicles attributable to free WP.



Thank You

For more information see: “Charging for Charging” on pubs.its.ucdavis.edu

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