

**Electric Vehicle Parking**  
in the  
**Central City of Portland, Oregon**

**PROBLEM:** The Portland Bureau of Planning and Sustainability June 20, 2016 proposed draft Central City 2035 (CC2035) Plan does not address the urban benefits and future need for minimum parking for electric vehicles in new multi-dwelling residential buildings and overall is inconsistent with established city goals for the use of electric vehicles to help lessen pollution and mitigate climate change.

**BACKGROUND:** Since the arrival of affordable automobiles in great quantity, starting with the Model A Ford in 1903, American cities and urban planners have had to cope with traffic congestion, air pollution and where to park privately-owned vehicles. Over the decades, planning for and regulation of on-street curb parking, off-street parking and on-site parking for business and residential buildings have had serious, unintended consequences. Urban core business, vitality, livability and air quality often suffered, but city planners and regulators learned valuable lessons along the way. This critical aspect of city planning has been studied in great depth by many learned people since the Model A.

University urban planning curricula and the American Planning Association have focused on the problem of parking and the real cost to cities and their residents. A very comprehensive 763-page treatise was published in 2005 by the American Planning Association: Donald Shoup, *The High Cost of Free Parking*. The esteemed author holds a PhD in Economics from Yale and is a distinguished research professor in the Department of Urban Planning at UCLA. Professor Shoup supports and recommends that central cities have no minimum parking requirements. Among the bases for this position are: “Increased housing prices, unjust subsidies for cars, distorted transportation choices, sprawl, social inequity, and economic and environmental degradation,” the latter encompassing the hazardous and climate-changing side effects of gasoline and diesel engine-powered vehicles: Carbon Monoxide, Carbon Dioxide, other gaseous compounds and particulates.

Parking in Portland is managed by the Bureau of Transportation. Current policies and code are in agreement with those recommended in *The High Cost of Free Parking*, specifically, no minimum parking requirements for new development. The draft CC2035 Plan addresses parking in great detail within sub-categories of parking (Growth, Preservation and Visitor). However, *The High Cost of Free Parking* and the CC2035 Plan do not address the positive impact and need for eco-friendly electric vehicles, and minimum parking for electric vehicles to encourage diverse urban neighborhoods.

Electric vehicles have not been brought into the mainstream of transportation until recently for a number of reasons including cost, time-to-recharge, where to recharge and maximum range. That is changing rapidly. Essentially, all the major automobile manufacturers offer plug-in

rechargeable electric vehicle models: Basic Electric Vehicle (BEV – battery only) and Plug-in Hybrid Electric Vehicle (PHEV – battery powered electric motors with gasoline engine backup). In addition to being absolutely clean, emitting nothing, BEVs, and PHEVs when operating in electric drive mode, are much more efficient and much less polluting than conventional vehicles driven by the gasoline/diesel internal combustion engine.

The source of electric power is also undergoing a revolution. Sustainable, renewable energy, primarily from wind and sunlight, is becoming an ever-increasing proportion of the electric power produced in America and in the Pacific Northwest.

The City of Portland has adopted an Electric Vehicle Strategy (*Electric Vehicles: The Portland Way*) that calls for examination of the costs and benefits of requiring new apartments and mixed-use construction to be electric-vehicle ready with the capacity to support Level II (240V) charging stations. The Bureau of Planning and Sustainability updated Portland's *Climate Action Plan* in 2015. It suggests working with developers, building owners and managers and parking managers to add charging stations and consider electric-vehicle-ready guidelines and codes.

## **DISCUSSION:**

1. Currently, electric vehicle ownership is encouraged through Federal and State of Oregon tax credits. A Bloomberg New Energy Finance study estimates that within 5 years electric vehicles will become more economic than gasoline or diesel automobiles without government purchase incentives, due to the falling cost of batteries and production economies of scale. Improved batteries will enable faster recharging and longer vehicle range. The Bloomberg study projects that 25 percent of cars on the road will be electric vehicles by the end of the CC2035 planning period. This is consistent with other studies and reports, and may be even higher in the Portland Metro area fostered by Portland's policies and goals. Basically, the electric vehicle revolution is here to stay with accelerated growth.

2. The power to recharge electric vehicles comes from a variety of sources: coal-fired power plants, hydro-electric and other renewable energy systems (wind, solar, geothermal, etc.). While electric vehicles operating in the Central City (in lieu of gas/diesel vehicles) will substantially contribute to a cleaner and healthier urban environment, some electric power will come from fossil-fuel power plants, contributing to climate change through the so-called "long tailpipe" of electric vehicles (emissions produced at the source of electric power generation). However, traditional gasoline/diesel vehicles also have "long tailpipes" when considering the greenhouse gas emissions associated with the extraction, production and distribution of petroleum fuels. When a so-called "Well-to-Wheels" comparison analysis is done, electric vehicles produce significantly less Carbon Dioxide per mile driven than cars with internal combustion engines. This has been well-documented in a US Department of Energy May 10, 2013 report, "Well-to-Wheels Greenhouse Gas Emissions and Petroleum Use for Mid-Size Light Duty Vehicles."

3. Renewable energy is projected and planned to increase significantly over the next decades and the electric vehicle “long tailpipe” will become thinner. Oregon’s largest electricity generation is currently from renewable hydropower, and the share of other renewable energy resources (wind, solar, geothermal, etc.) is growing. In 2016, the Oregon Department of Energy Renewable Portfolio Standard was approved and established an expanded state standard that the largest utilities will provide 50 percent of their electricity through renewable resources by 2040. With this, there is an evolving beneficial synergy between the increased ownership of electric vehicles and the growth of renewable energy. The use of electric vehicles through planning, policies and code for their parking and supporting charging stations should support and take advantage of this synergy.

4. Portland building codes do not require multi-dwelling buildings to have charging stations for electric vehicles in their on-site garages, nor the electric transformer capacity to support the later installation of charging stations. Retrofitting existing multi-dwelling buildings to charge electric vehicles has proven to be complex, onerous and expensive. The CC2035 Plan should specify building codes that require sufficient extra electric power capacity to support a minimum number of on-site charging stations. Such planning would be consistent with Portland’s Electric Vehicle Strategy, “Adopt and update policies to facilitate the transition to the use of electric vehicles (EV) in Portland” with an important sub-objective, “Continue to research best practices regarding EV-friendly development regulations and policies.” A roadmap is readily available in a neighboring state. In 2013, California enacted legislation (Assembly Bill No. 1092) to establish “...mandatory building standards for the installation of future electric vehicle charging infrastructure for parking spaces in multifamily dwellings and non-residential development.”

5. On-site parking for multi-dwelling buildings in the Central City is currently market driven. In line with overall parking policies, minimum parking is not required with the objectives of keeping residential units affordable and reducing traffic and pollution. However, families with children, the disabled and the elderly will desire, or in some circumstances require, personal vehicle transportation in lieu of light rail, streetcar, bus, bicycle or walking. Some, even those living and working in the Central City, will desire to store a car for occasional, extended travel outside of the city. The CC2035 Plan now correctly encourages child-friendly play areas, neighborhood parks, and schools in the primarily residential areas of the Central City. If some minimum level of on-site parking is not required, the residential parts of the Central City will filter newcomers and skew the diversification as the city grows in population.

6. In the last decade, the minimum requirement for multi-dwelling building bicycle parking has increased 6-fold: one per four residential units to 1.5 for each residential unit. This mandate correctly encourages the use of this eco-friendly mode of transportation. Likewise, setting modest, minimum parking requirements in multi-dwelling buildings for electric vehicles encourages ownership and use of that eco-friendly mode of personal transportation.

7. Parallel to providing sufficient parking for electric vehicles is TriMet's electric bus conversion program to help reduce carbon emissions in the Central City and meet climate change goals. Portland also has a first-in-the-nation policy for streamlining the process for the deployment of publically available charging stations. As this policy is enacted, more and more curbside and public garage parking spaces will include charging stations for the exclusive use by electric vehicle owners. This infrastructure change will be done incrementally over the period of the CC2035 Plan as Bureau of Transportation budgets allow. The net effect will be the discouragement of gasoline/diesel cars and the encouragement of electric vehicles, one mode displacing the other. Minimum electric vehicle parking in new multi-dwelling buildings will have the same important effect.

**CONCLUSION:** The proposed draft CC2035 Plan is inconsistent with and does not consider the actual and forecast expansion of the use of electric vehicles and their benefit to the environment, the renewable energy sources to support them, and Portland's existing policies and plans for electric vehicles.

**RECOMMENDATION:** The CC2035 Plan must include parking and recharging provisions for electric vehicles and call for minimum parking exclusively for electric vehicles in new multi-dwelling buildings in the proposed Goose Hollow, Pearl and West End subdistricts of the Central City Plan District (proposed Map 510-1). New multi-dwelling buildings in these subdistricts should be required to have minimum parking exclusively for electric vehicles as a percentage of the number of residential units in the building. New multi-dwelling buildings that independently plan on-site parking in response to market conditions should be required to have a minimum number parking spaces planned exclusively for electric vehicles as a percentage of the number of residential units in the building, and the electric power capacity to support that number.

The CC2035 Zoning Code & Map Amendments should include appropriate language and be supported by the CC2035 Transportation System Plan policies. Suggested changes are attached.

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Suggested changes to the Proposed Draft Central City 2035 Plan, June 20, 2016  
Volume 2A Zoning Code & Map Amendments  
Part 1: Central City Plan District

Page 222, 2<sup>nd</sup> paragraph, line 10. After "... in transportation infrastructure (e.g., transit/rail and bike systems)." add, "Pollution-free electric vehicles have become an ever-increasing alternative mode of personal transportation. Use of electric vehicles, in lieu of gasoline/diesel cars, will be promoted through the installation of charging stations in all parking categories, and minimum electric vehicle parking requirements for new multi-dwelling buildings in subdistricts."

Page 223, Paragraph A. Purpose. 3<sup>rd</sup> Line, After, "...promote the use of alternative modes," add, "including privately-owned electric vehicles".

Page 224, Paragraph F, 1<sup>st</sup> Bullet, change to, "Except for electric vehicles, no minimum parking requirements in the Central City ..." Add 2<sup>nd</sup> Bullet, "Minimum parking requirements for electric vehicles will be as a percentage of total parking spaces, or as a percentage of the total number of multi-dwelling residential units for those spaces, whichever is less."

Page 225, Paragraph F.2., change to, "Minimum required parking. Except for electric vehicles, there are no minimum requirements for Growth Parking. Minimum Growth Parking requirements for electric vehicles will be 20 percent of the total parking spaces, or 20 percent of the total number of multi-dwelling residential units for those spaces, whichever is less."

Page 229, Paragraph G.3., change to, "Minimum required parking. Except for electric vehicles, there are no minimum requirements for Growth Parking. Minimum Growth Parking requirements for electric vehicles will be 20 percent of the total parking spaces, or 20 percent of the total number of multi-dwelling residential units for those spaces, whichever is less."

Page 232, Add 5<sup>th</sup> Bullet, after "...to guarantee that commuter uses are not being served and that spaces with electric vehicle charging are used only for that purpose.

Page 233, Paragraph H.2., change to, "Minimum required parking. Except for electric vehicles, there are no minimum requirements for Visitor Parking. Minimum Visitor Parking requirements for electric vehicles will be 20 percent of the total parking spaces."

Page 233, Paragraph I., add Paragraph I.3., "Signs must be posted indicating the spaces reserved only for electric vehicles."

Page 234, 1<sup>st</sup> Paragraph, add, "To discourage commutes with gasoline/diesel cars and encourage commutes with electric vehicles, 20 percent of the total number of parking spaces is proposed as an appropriate balance between gasoline/diesel cars and electric vehicles.

Page 239, add paragraph 5.b.(5)., “Number of spaces for electric vehicles and the percentage of those spaces used for electric vehicles, and the percentage used for gasoline/diesel cars.”

Page 250, 3<sup>rd</sup> Paragraph, 1<sup>st</sup> Sentence, add, “... and increase development-related electric vehicle trips and parking.”

Page 250, 3<sup>rd</sup> Paragraph, 2<sup>nd</sup> Sentence, change to, “These could include Transportation Demand Management, the demand for electric vehicle parking with charging stations, parking management or other strategies.

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Suggested changes to the Proposed Draft Central City 2035 Plan, June 20, 2016  
Volume 2B Transportation System Plan Amendments

Section 2, Policy Amendments, Page 3. After Policy 9.49, insert POLICY 9.XX, **Electric Vehicles.** Encourage and promote the use of electric vehicles and the electrical infrastructure to support electric vehicle recharging at on-street, off-street and residential on-site parking spaces.

Section 2, Policy Amendments, Page 3. After Policy 9.51, after “...walking, cycling,” insert, “electric vehicles.”

Section 2, Policy Amendments, Page 4. After Policy 9.53, insert POLICY 9.XX, **Electric Vehicle Parking.** Encourage the provision of electric vehicle parking to serve the expected increase in electric vehicle trips in the Central City, and electric vehicle parking in Central City residential buildings.