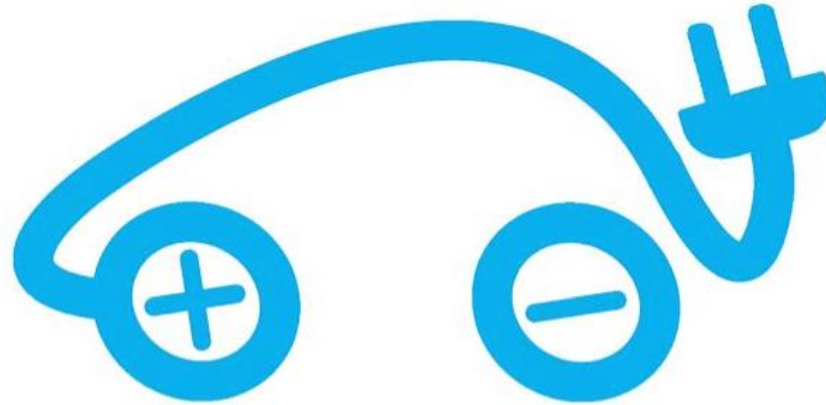


DRIVING THE FUTURE

Making the South Bay Sustainable



Battery Electric Vehicle Project
South Bay Cities Council of Governments
Board of Directors, September, 2015



SBCCOG

Research & Demonstration Program

- Neighborhood research project, 2004-2009
(funded by SCAG)
- Sustainable South Bay Strategy (SSBS), 2010
(funded by Metro)
- SSBS adopted by SBCCOG Board, 2010
- SSBS “proof of concept” 2011(SCAG)
- SSBS “limits of concept” 2013 (SCAG)





SBCCOG R&D Program

- **Neighborhood Electric Vehicle Demonstration, 2010 – 2013**
(funded by AQMD)
- **Battery Electric Vehicle Demonstration, 2012 – 2015** (funded by AQMD)
- **Going forward**
 - Multi-family EVCS demonstration, 2014-2016 (funded by CEC)
 - Land Use and Transportation chapters of city and sub-regional CAP, 2014 – 2017 (funded by SGC)





BEV Demonstration

- AQMD invested in both this and the NEV demonstration to **accelerate ZEV markets** and reduce pollutants from burning fossil fuels
- 2015 remains part of the **Pioneer Days**
- 49 households selected from several hundred applicants
 - Geographic and income balance
 - Data collected from GPS on all HH vehicles, interviews, surveys and focus groups

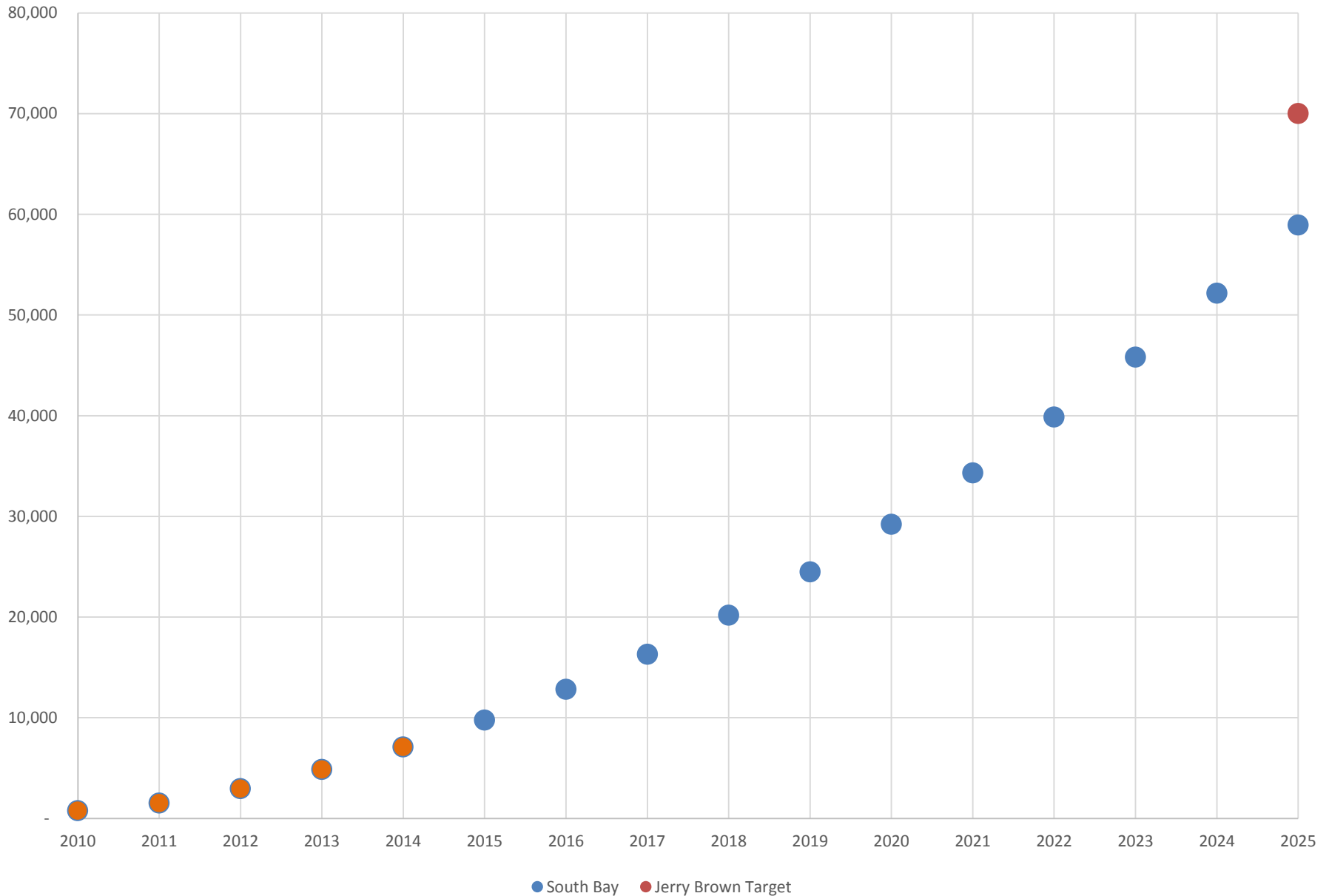




Is reducing petroleum consumption relevant to South Bay cities? – **YES!**

- **Carrots**
 - \$1 billion annual gasoline cost to consumers
 - Cap and trade pool of money available to reduce carbon emissions; plus regional funds for “sustainable” projects
- **Sticks**
 - Federal and state EV mandates
 - State could require General Plans to conform to the regional SCS

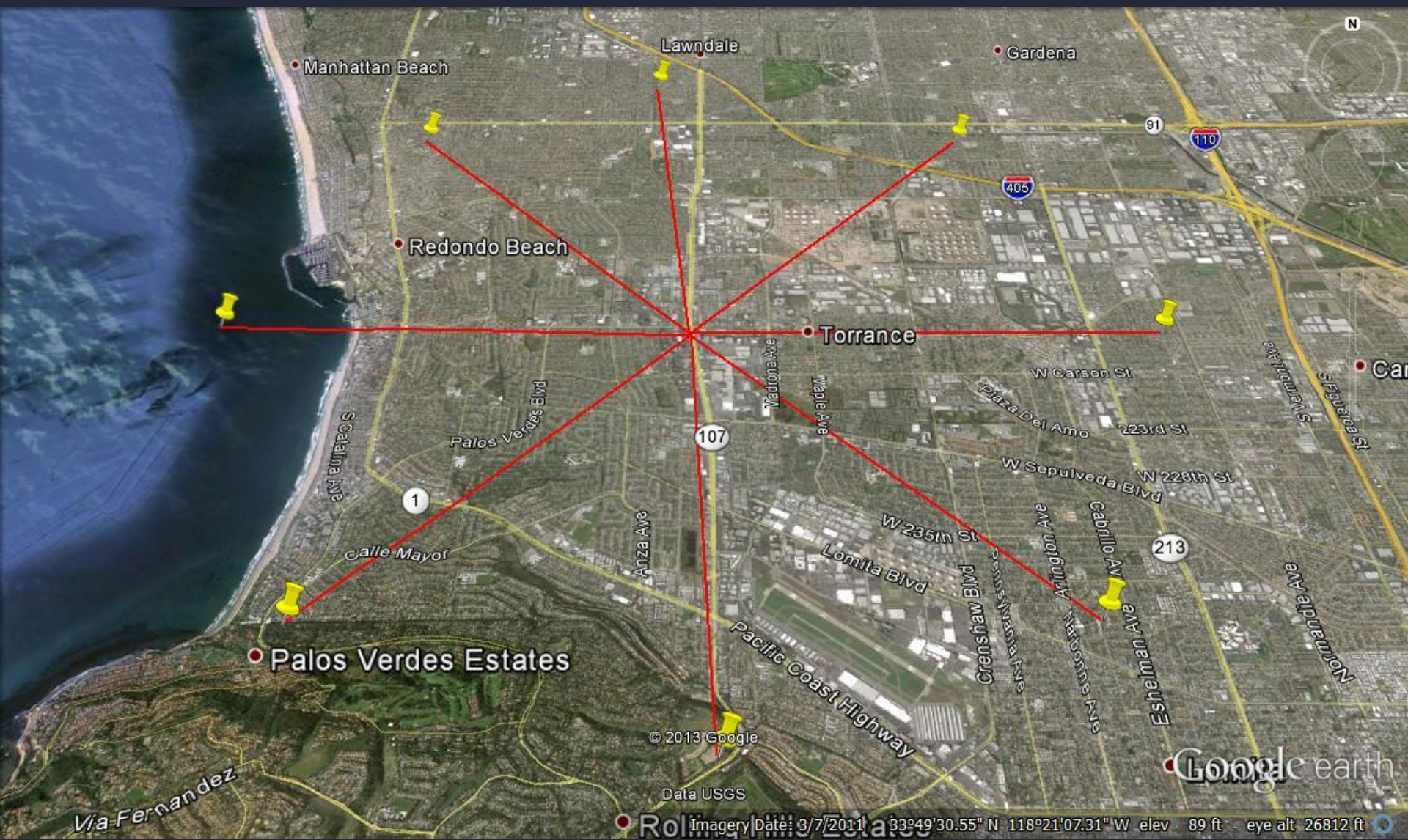
Where we are VS the 1.5 million vehicle target





Data collected and analyzed

- Ping every 30 seconds = over 1 million data points
- Destinations by fuel type, distance from home
- Routes, speeds, dwell times
- Charging locations and times
- VMT per HH before and after BEV, by building type and driver age
- Hot spots
- BEV vs NEV vs ICE
- Emissions reductions
- New vehicle registrations by ZIP
- OEM price and performance data

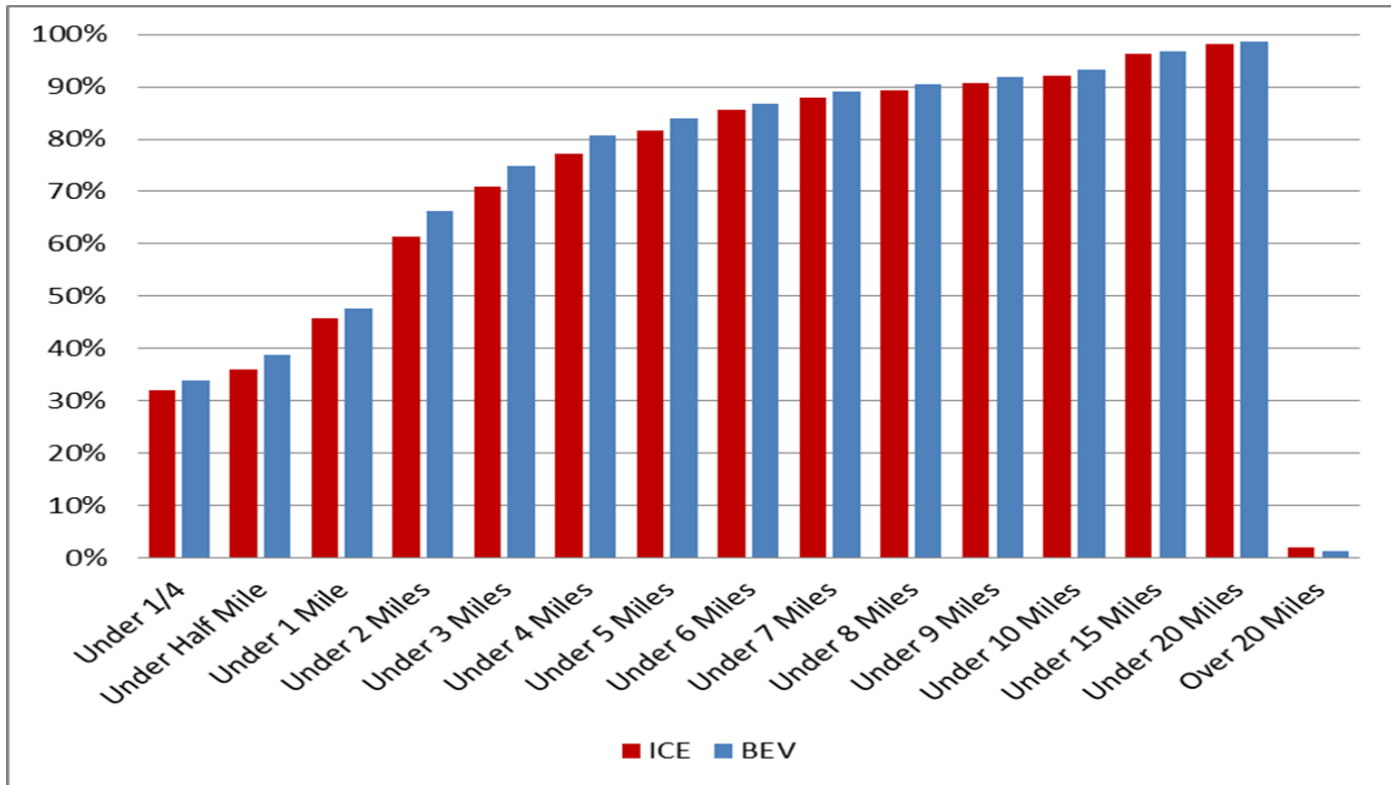


Via Fernandez

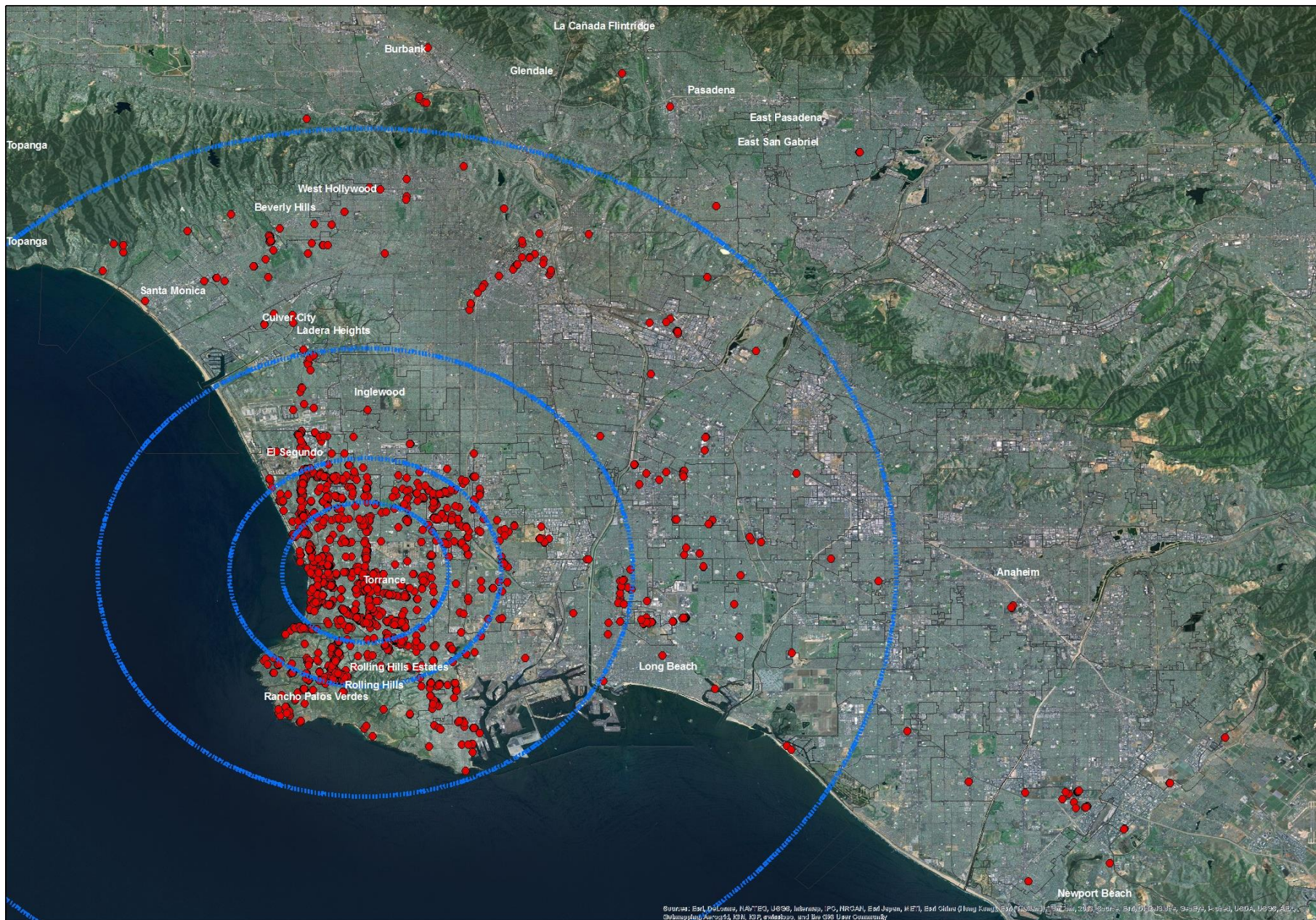


The Good

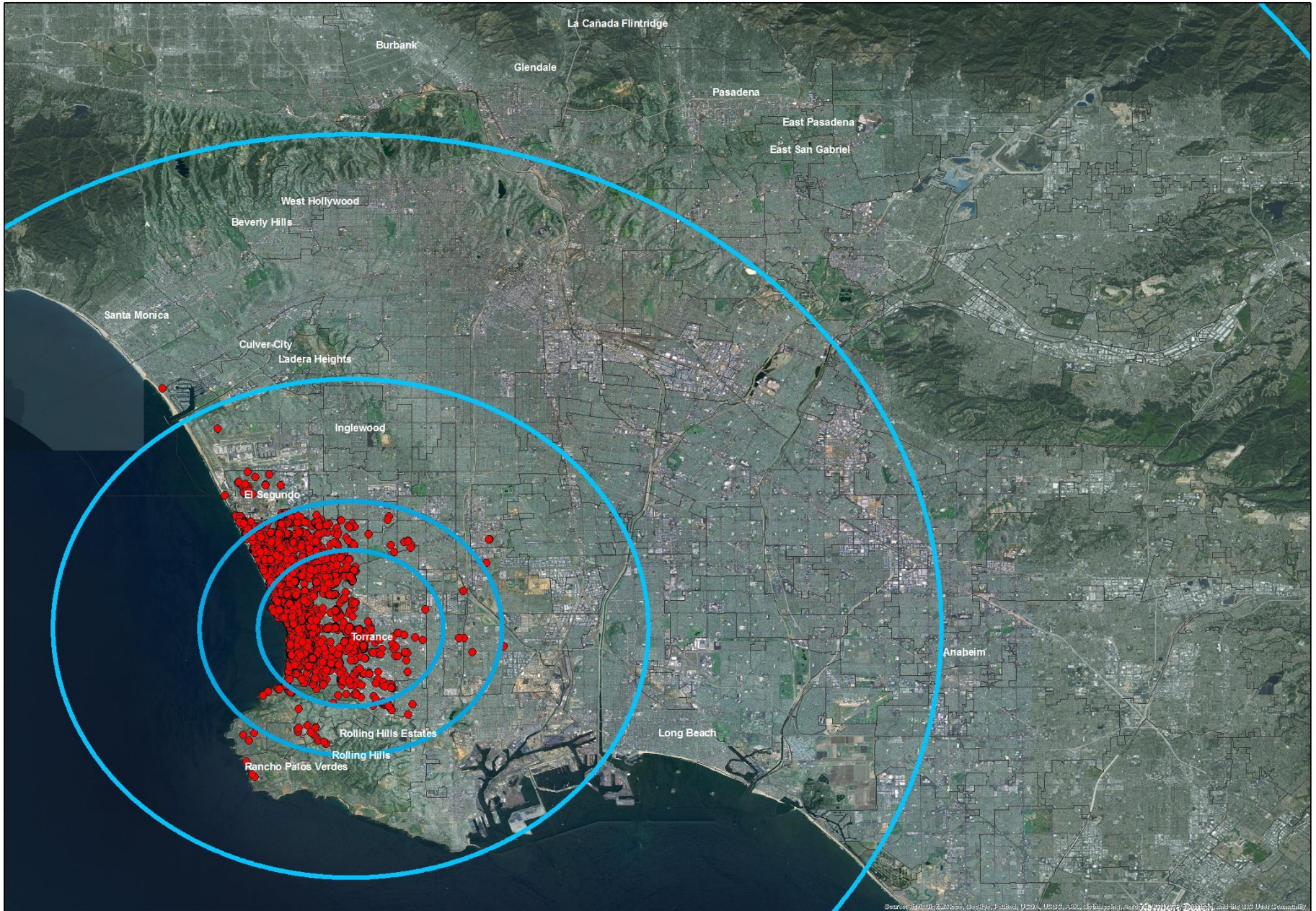
- BEVs were used as a complete substitute for ICE



BEV Destinations at 3, 5, 10, 20 and 40-Mile Radii



NEV Destinations at 3, 5, 10, 20 and 40-Mile Radii



Source: EVL, The Roadless, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 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4007, 4008, 4009, 4010, 4011, 4012, 4013, 4014, 4015, 4016, 4017, 4018, 4019, 4020, 4021, 4022, 4023, 4024, 402



Emissions Reductions

Emission Type	Average % of HH Reductions	Total Reductions
Carbon Monoxide	40%	175Kg
Nitrogen Oxide	40%	17.9Kg
Particulate Matter 10	44%	1.8Kg
Particulate Matter 2.5	40%	.9Kg
Sodium Oxide	46%	.2Kg
Carbon Dioxide	40%	18.5 Tons
Total Organic Gases (TOGs)	40%	10Kg
Methane	40%	1.3Kg
GHG (CO ₂ equivalent)	40%	18.5 Tons
Gasoline Consumption	38%	2,181 Gallons



More Good

- **Average HH VMT around 42, almost 20 VMT driven in a BEV**
- **Charging – Level 1 (110v) at home is adequate**
- **Public charging with a mix of L1 and L2 at work sites and schools; some at malls and entertainment centers**



The Bad

- **Relatively expensive**, even with the state subsidy and federal rebate
- **Range and speed conflict**
 - Travelling on freeways without congestion will reduce the range by 20% to 25%
- **“Fuel gauge”** (remaining charge) **not always accurate**
 - anxiety on way home, especially PVP



The Ugly

- **Expectations were a problem – for both NEV and BEV**
- **The GEM looks different and generated lower expectations with resulting greater satisfaction**





More Ugly (& really difficult)

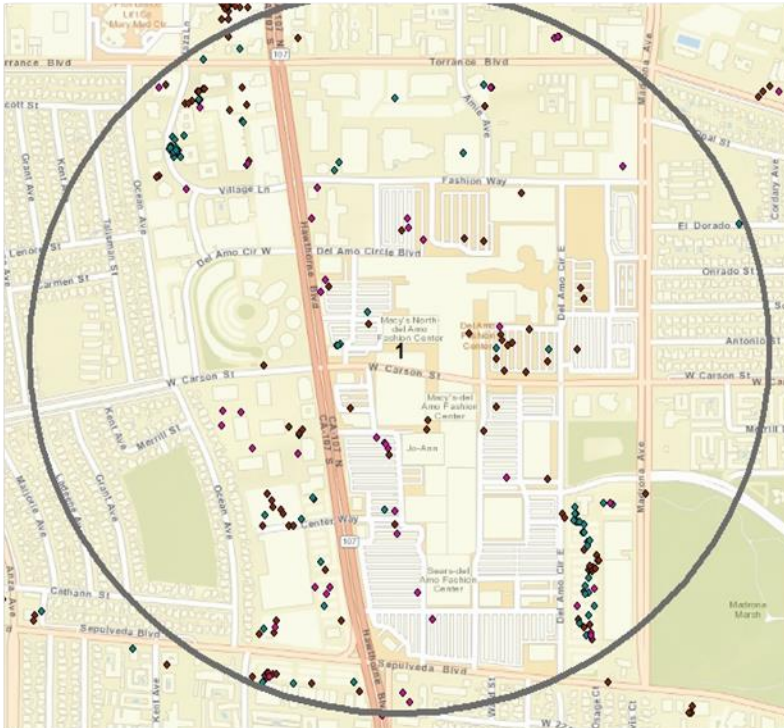
- **Household averages but no average households**
- **No patterns in driving volumes – not age or location**
- **Driver personality matters**
 - equivocate
 - engage
 - Embrace
- **No one understands what they need**



One cause of congestion - Dispersed destinations

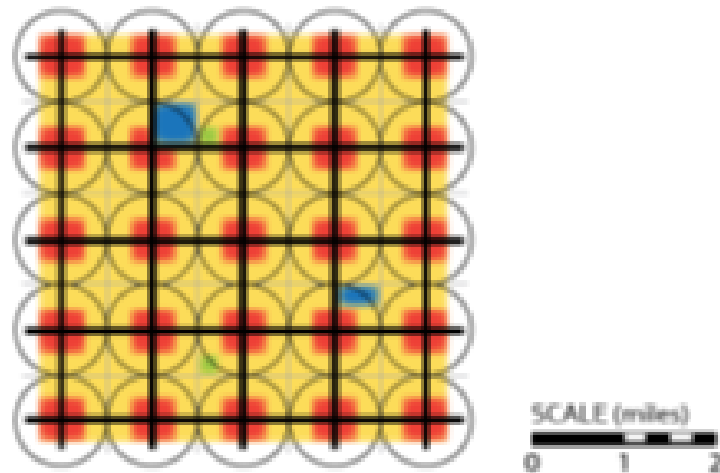
- Walking requires large number of businesses and broad range of business types at one compact location

PVP, Beach and Inland 1 and 2





Neighborhood Development Model



LEGEND

	Mixed-Use		Major Arterial
	Commercial		Minor Arterial
	Residential		Major / Major Intersection
	Parks / Open Space		Major / Minor Intersection
	Civic / Institutional		Minor / Minor Intersection
	1/2 Mile Walking Radius		TOD Corridor (Bus, Light Rail, Other)

- ▶ Intersections serve the commercial needs of their neighborhoods
- ▶ Commercial along corridors converts to residential further supporting intersections
- ▶ Potential to achieve 25 walking neighborhoods
- ▶ Investment focused throughout grid as opposed to along one corridor
- ▶ Supportive of local use vehicles (LUV) – destinations within 4 miles



What South Bay Cities Can Do

- **Success is related to the private market, but cities can play a significant support role**
 - Disseminate PEV information
 - Strategically deploy public charging stations
 - Become PEV ready – electric permits, policies on remodels and new construction
 - Electrify municipal fleets



More for cities...

- Use parking policies to support PEVs
- Facilitate network transportation services
- Promote multi-modal options, for example develop multi-modal routes for slow speed vehicles
- Adopt and implement the land use and transportation chapters of the Climate Action Plans (LUTCAP) when completed



Role for SBCCOG

- Provide information and other resources to South Bay cities; in general, help facilitate city roles
- Continue to acquire and analyze PEV market data
- Continue to pursue grants for projects of strategic importance to South Bay cities
- Adopt and implement the land use and transportation chapters of the sub-regional CAP



Role for SCAG

- Continue to purchase PEV market data
- Recognize the SSBS on same basis as transit- density strategy
 - Incorporate PEVs into the SCS since land use must be compact enough to support range-limited vehicles
- Support PEV projects through the sustainability grant programs
- Share the NEV and BEV findings with policy committees



R1 Fund strategic initiatives

- Develop and demonstrate an **online decision tool**.
 - Help households assess their actual mobility needs
 - guide them through a set of scenarios by which those needs could be met
 - connect them with vendors who can deliver the vehicles and services identified in the chosen scenario
- Conduct increasingly more high profile demonstration projects
 - 1,000 NEVs, MSEV, neighborhood oriented development



R2 Improve the value proposition of BEVs – real and perceived

- **Industry** -- OEMs are working to increase range; reducing cost may be better idea (7 Honda Civics less than \$20,000)
- **State** -- Increase subsidies offered through the Clean Vehicle Rebate Program (\$2,500 for largest batteries today)
- **Industry and State** -- Characterize home fueling as a significant convenience and a benefit by reducing dependence on gasoline and its price instability. It's not a burden.



R3 Expand markets for BEVs

- Provide subsidies for used BEVs
- Provide subsidies to middle and low income consumers
- Develop new types of consumers – community based organizations can purchase and share vehicles; large apartment complexes can do the same



R4 Increase BEV Options

- Is the current vehicle the right product?
- OEMs and consumers alike want a PEV to replicate the ICE to avoid change
 - This attitude fails to take advantage of compact development pattern of a mature suburban region
- Add medium speed electric vehicles (MSEV) to mix of vehicle options



Take-Aways

- **Environmental and economic future is in the hands of consumers**
- **South Bay Trips are too long to walk, too short for transit and perfect for NEVs and range-limited BEVs**
- **Existing land use and travel patterns mean that the SB vehicle fleet can be 100% electric with minimal changes in travel behavior**



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Post-Participation Thoughts

