

Memorandum



CITY OF DALLAS

DATE January 6, 2012

TO Members of the Transportation and Environment Committee:
Linda L. Koop (Chair), Sheffie Kadane (Vice Chair), Sandy Greyson,
Delia Jasso, Vonciel Jones Hill, Pauline Medrano

SUBJECT **Electric Vehicle Initiatives**

You are scheduled to receive a briefing on Electric Vehicle Initiatives at your January 9, 2012 meeting. Attached is a copy of the briefing for your review.

Please let me know if you have any questions.

A handwritten signature in black ink, appearing to read 'Jill Jordan'.

Jill A. Jordan, P.E.
Assistant City Manager

Attachment

c: The Honorable Mayor and Members of the City Council
Mary K. Suhm, City Manager
Thomas P. Perkins, Jr. City Attorney
Rosa Rios, Acting City Secretary
Craig Kinton, City Auditor
Judge C. Victor Lander, Administrative Judge
A.C. Gonzalez, First Assistant City Manager
Ryan S. Evans, Assistant City Manager
Forest Turner, Assistant City Manager
Joey Zapata, Assistant City Manager
Jeanne Chipperfield, Chief Financial Officer
Edward Scott, Director, Controller's Office
Frank Libro, Public Information Office
Theresa O'Donnell, Director, Sustainable Development and Construction
Errick Thompson, P.E., Director, Equipment and Building Services
Mark Duebner, Director, Aviation
Paul Dyer, Director, Park and Recreation
Corrine Hill, Interim Director, Library
Stephanie Cooper, Assistant to the City Manager – Council Office



Electric Vehicle Initiatives

Transportation and Environment Committee
January 9, 2012





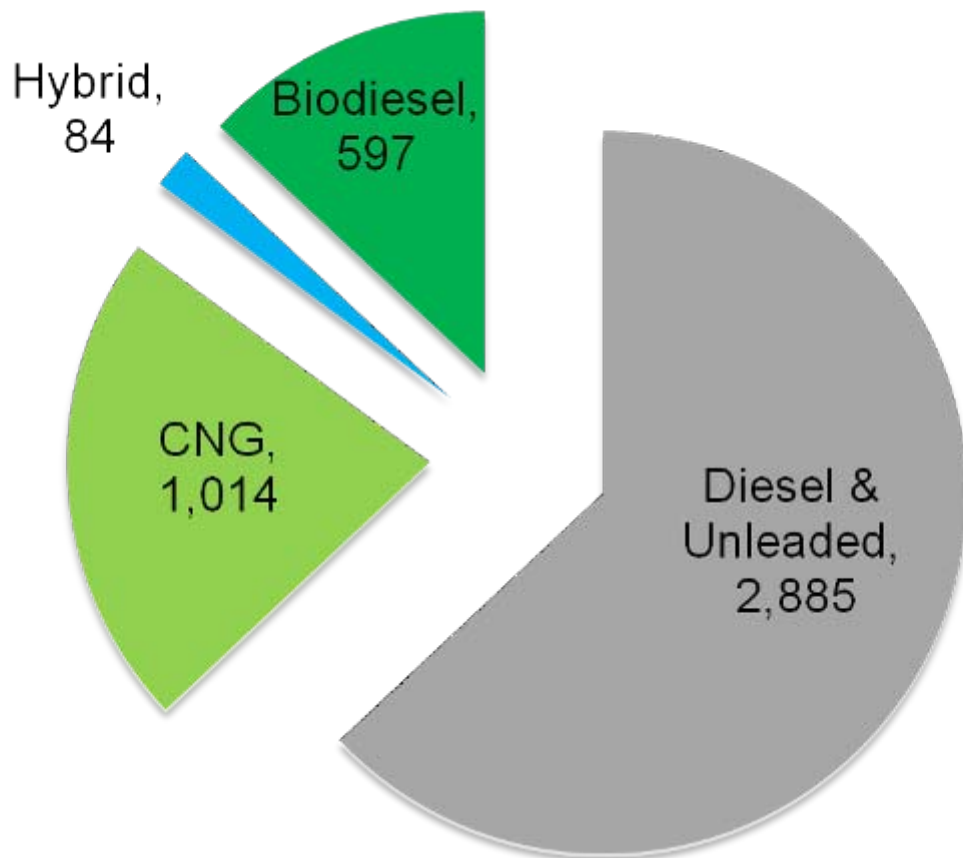
Discuss

- City Alternative fuel vehicles (AFVs) and supporting infrastructure
- Evolving technologies
- Policy Issues
- Three opportunities
- Recommendation and next steps

City AFVs and Infrastructure



Dallas has one of the largest municipal alternative-fuel fleets in the country



EBS maintains:

- 4,580 vehicles (excluding trailers and heavy equipment)
- 1,695 vehicles are alternative fuel vehicles (approximately 37%)



Alternative fuel vehicle technology and options continue to evolve as does our fleet

○ CNG

- 24 CNGs purchased or retrofitted in mid-90s
- 1,014 CNG vehicles in active inventory
- Two City-owned CNG fueling stations near construction completion

○ Biodiesel

- Use of biodiesel began in 2007
- 597 biodiesel units in active inventory

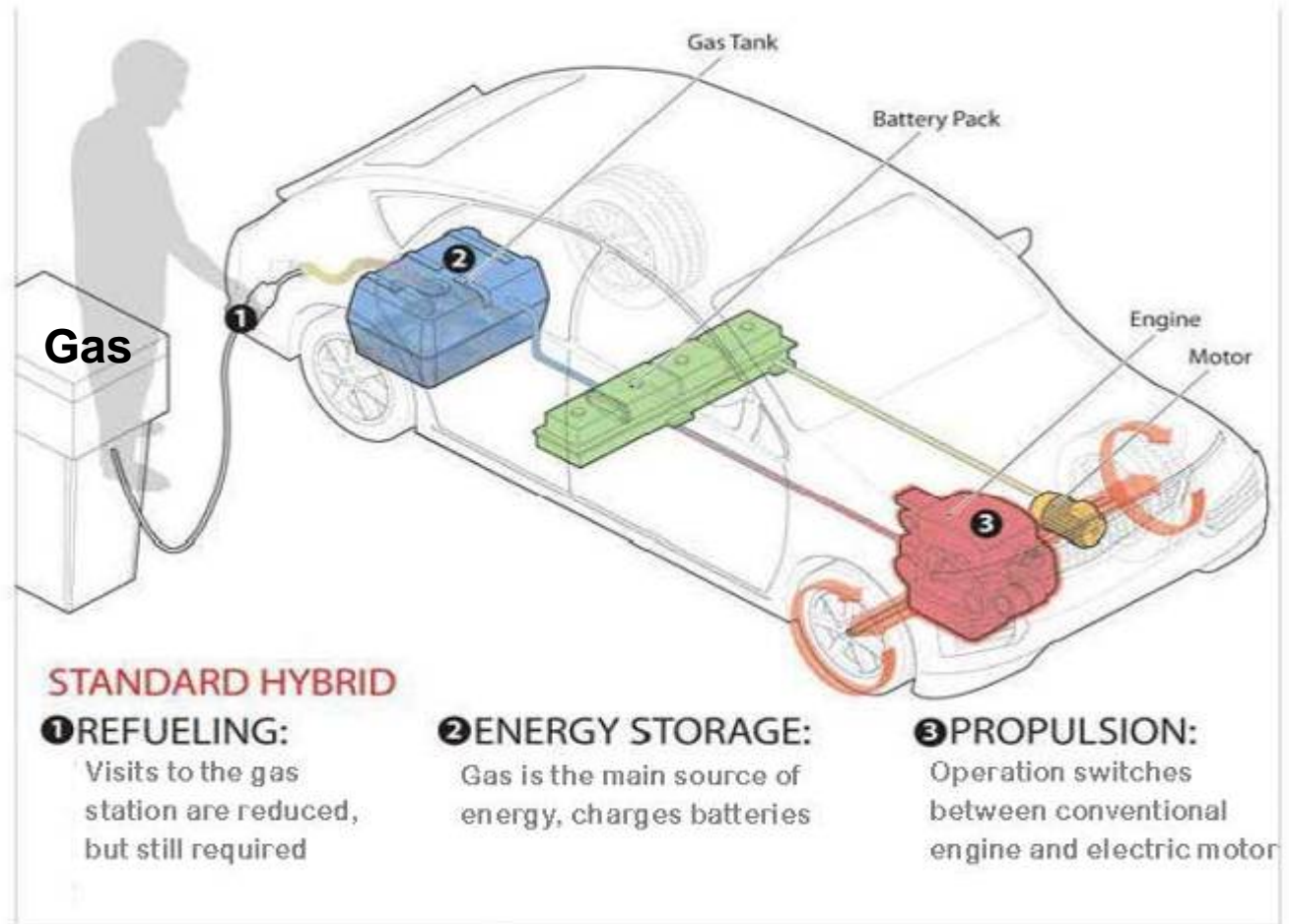
○ Hybrids

- 10 hybrid-electrics purchased in 2001, now have 84
- 25 plug-in electrics placed in-service in 2011

Evolving Technologies: Standard Hybrid



- Vehicle has both electric and conventional gas powered components
- Electricity extends range and increases mpg
- Example: Conventional Honda Civic 39 mpg, **Civic Hybrid 44 mpg**

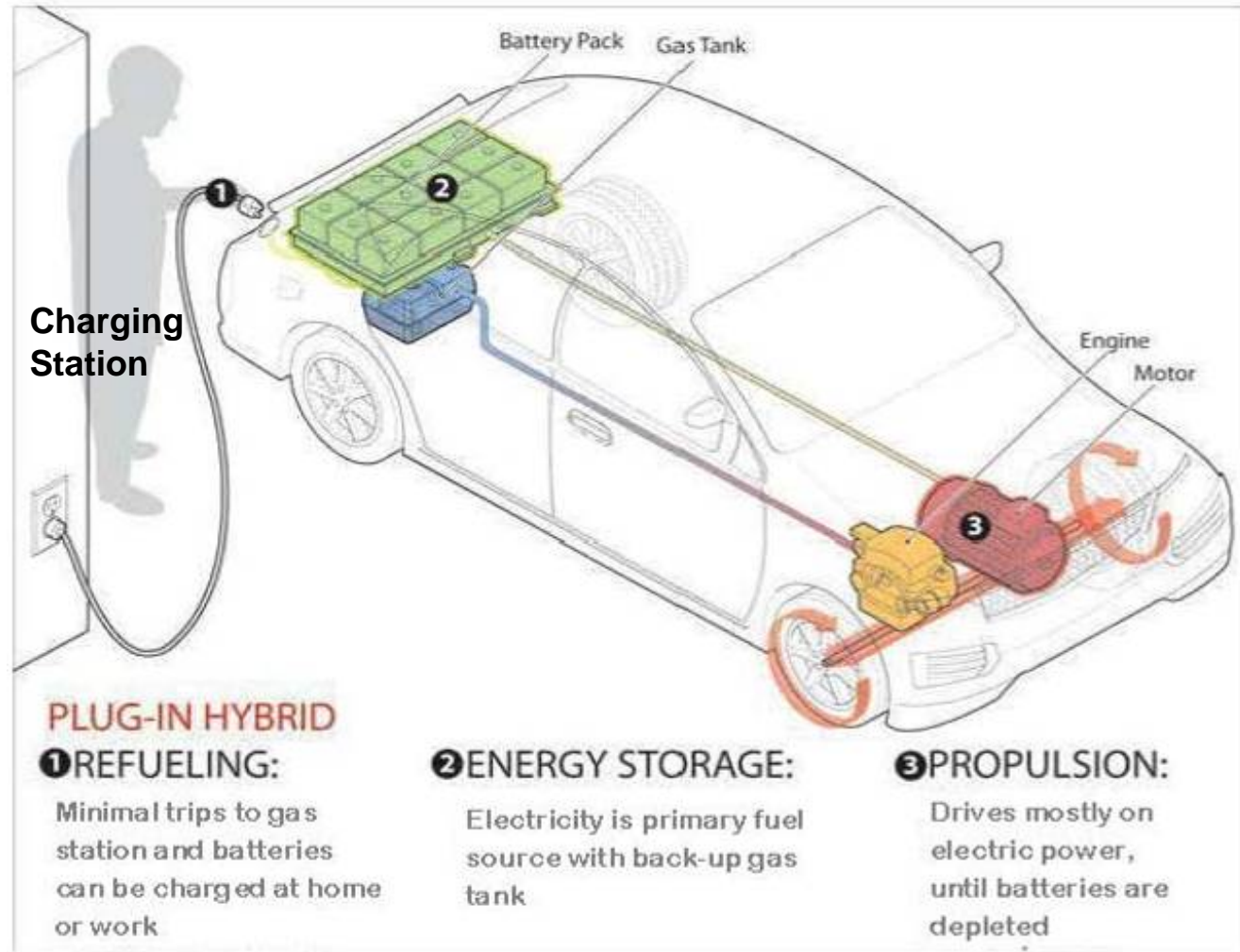


Adapted from <http://www.hybridcars.com/plug-in-hybrid-cars>

Evolving Technologies: Plug-In Hybrid



- Generally have an all electric range of 15 - 30 miles
- Conventional gas engine can increase range to 300 to 350 miles
- Example: Hybrid Prius 49 mpg, **Prius Plug-in 87 mpg**



Driver behavior determines fuel efficiency gains

Adapted from <http://www.hybridcars.com/plug-in-hybrid-cars>

Evolving Technologies: Plug-In Hybrids and Electric Vehicles (EVs)



- Major benefits
 - Potential for significant positive impact on air quality (significantly less CO₂ emissions)
 - Potential for significant reductions in gasoline/diesel consumption
- Cost considerations
 - Vehicle costs
 - Infrastructure costs (charging stations & administration)
 - Electricity costs

Today there are approximately 33 wide ranging hybrid /electric models as compared to over 200 total vehicle models available

Evolving Technologies: Estimated vehicle fuel costs and emissions



Over the course of a 125,000 mile useful life...

Vehicle	Fuel Cost	Greenhouse Gas Emissions (CO ₂)
Gasoline	\$14,744	102,273 lbs
Hybrid	\$12,224	84,788 lbs
Plug-in Hybrid	\$9,640	74,220 lbs
Electric	\$4,960	71,100 lbs

Evolving Technologies: Currently Available Hybrids/Electric Vehicles



BMW	3 models
Boulder Electric	3 models
Chevrolet / GMC	6 models
EV Autos	4 models
Ford	3 models
Honda	4 models
Hyundai	1 model
KIA	1 model
Lexus	5 models
Mitsubishi	1 model
Nissan	1 model
SMART	1 model
Toyota	5 models

Nissan Leaf vehicle is scheduled to be mass produced beginning in 2012



- Charging plugs were not standard until recently
- Charging plugs provide an interface between the vehicle and the electrical grid
- Standard charging levels
 - Level 1, 2 and 3

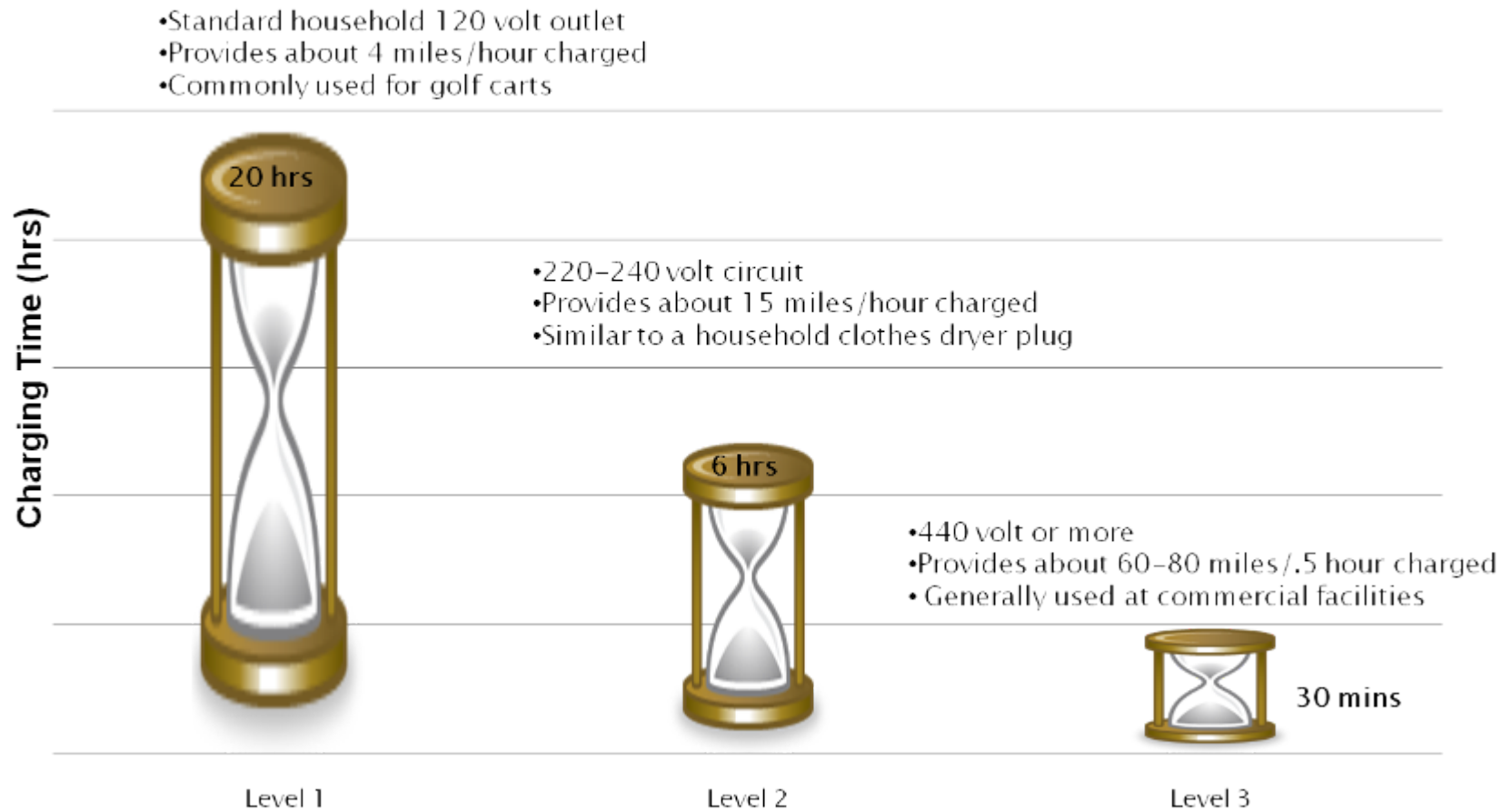


Standard J1772 plug

Evolving Technologies: Charging Stations



How long to charge for 80 miles of travel?





- Charging costs vary based on:
 - Electricity provider
 - Operation and maintenance cost
 - Back office service fee
- Charging stations are generally accessed with Radio Frequency Identification (RFID) cards obtained from station operator
- Electric vehicles and charging technology continues to evolve
 - In 1910, [more EVs were sold](#) than gas-powered cars
 - For 21st century deployments, charging is typically home-based
 - Today, charging networks are being deployed by third party providers at numerous commercial establishments and may include monthly charging plans to charge anywhere for a flat fee

Charging Stations



Charging Stations in use



San Francisco City Hall public charging stations



- Successful deployment of EVs and associated infrastructure requires data and planning
 - Compatible/suitable uses – which City services and operations?
 - Charging infrastructure demand – how many, where, how often?
 - Grid impacts
 - Economics – cost of ownership/operation

Policy Issues



Complex and wide-ranging issues are involved, so convening a staff work group to develop EV policy recommendations for Council consideration late 2012



Policy Issues: Examples



- Does the public pay the energy? If so, it can only be bought from a retail electric provider (REP).
- Does the City contract with third party to service charging stations at public sites?
- What is the pricing model?
- What standards will be used for locating, signage, pavement marking, etc.?
- Will parking spaces at charging stations be designated solely for EVs or for vehicles being charged?
- What permitting, inspection, and insurance requirements should we consider?
- What are best practices?

Policy Issues: Signage



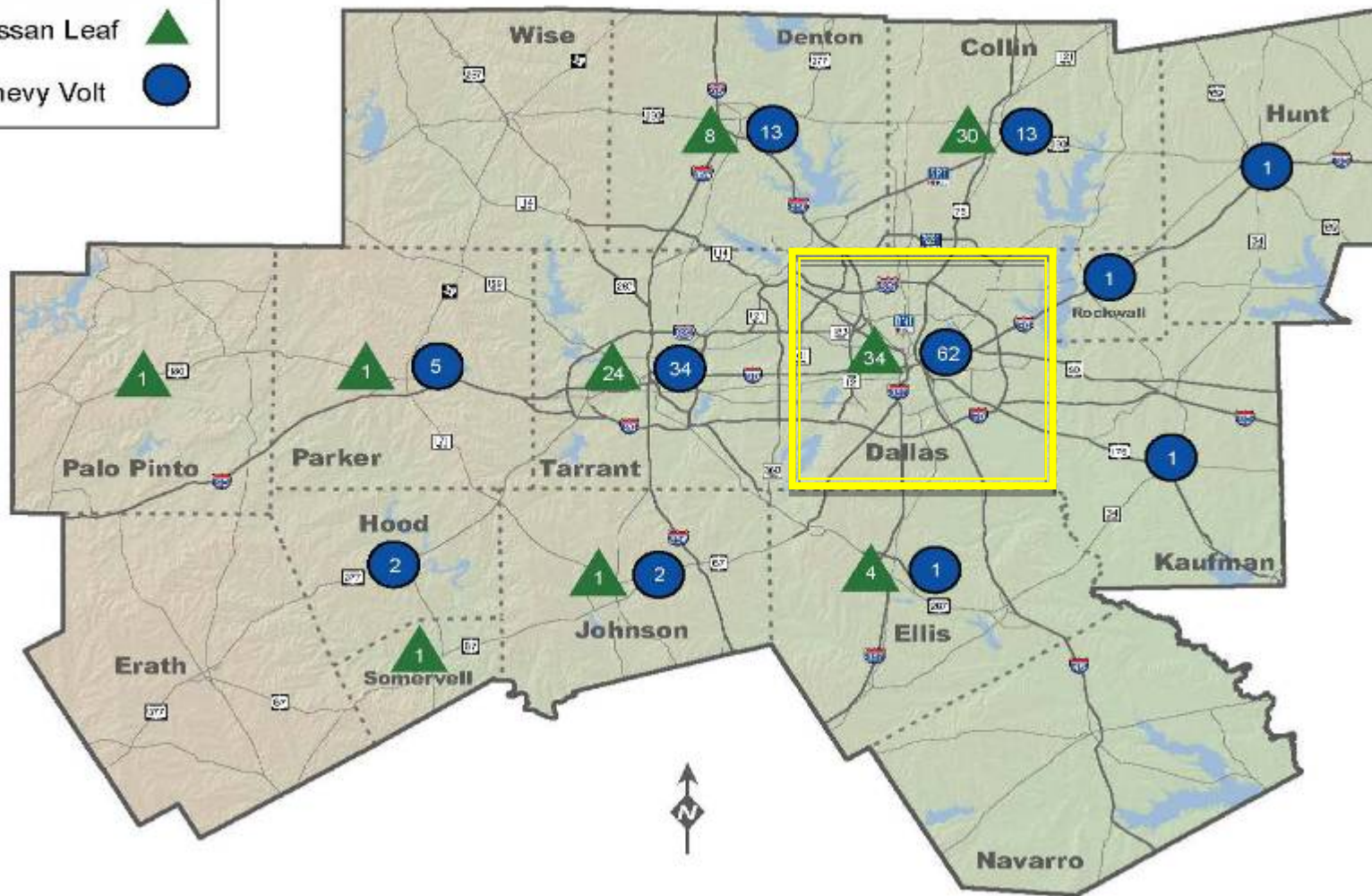
Other signs



Public-domain
European charge
station sign



Number of Electric Vehicles in North Texas by County



Given relatively small market penetration of EVs and policy considerations, a measured approach to developing EV infrastructure is recommended

Three Opportunities



There are three pilot initiatives for plug-in electric vehicles offered

- Boulder Electric Partnership
- ECOtality Partnership
- TXU Partnership

Pilot Initiative #1- Boulder Electric Partnership

Boulder Electric, Inc. and TCEQ received a DOE grant and selected Dallas as a partner.

General terms

- Boulder provides (for a period of three years):
 - Three medium-duty electric trucks
 - Charging station hardware
 - Vehicle maintenance training
- City provides:
 - Installation of charging stations
 - Electricity
 - Vehicle maintenance
 - Use data
- Anticipated uses: Code Compliance (two vehicles for nuisance abatement and removal of illegal dumping) and Equipment and Building Services (one truck for mobile service calls)



Pilot Initiative #2 - ECOTality Partnership



ECOTality received a DOE grant and has selected the City as a partner.

General terms

- ECOTality provides:
 - Installation of 10 charging stations including hardware
 - Maintenance until grant expiration (currently April 30, 2013)
- City provides electricity
- Charging station locations
 - Dallas Love Field (6 stations)
 - Dallas Executive Airport (2 stations)
 - Fair Park (2 stations)
- City and public access through Blink network using radio frequency identification card obtained on-line



Pilot Initiative #3 – TXU Partnership



- TXU would like to present the City with a gift of EV charging stations
 - Installation and maintenance are included for 3 years
 - Electricity is reimbursed by TXU for 1 year for public vehicles and 3 years for City vehicles
- Charging station locations
 - City Hall (2 stations)
 - Central Library (1 station)
- City and public access through AVINC network (AeroVironment) using a radio frequency identification (RFID) card



Pilot Initiatives - Summary



Project Features	#1 - Boulder EV	#2 - ECOtality	#3 - TXU
Vehicles provided	3	0	0
Stations provided	3	10	3
City vehicle charging	City expense	City expense	3 years – TXU reimbursed
Free charging for the public	N/A	Up to one year (City expense*)	1 year – TXU reimbursed
City start up costs	None	None	None
Installation	City installs	Vendor installs	Vendor installs
Maintenance	Vendor trains, City maintains	Vendor maintains until April 2013	Vendor maintains for 3 years
End of contract provisions	City may keep 2 of the 3 vehicles and all charging stations	City keeps charging stations	City keeps stations

* We propose allowing public to charge at no expense for up to a year while we collect data and determine pricing models. Providing access to electricity in these public places is similar to charging your cell phone or laptop in City Hall or at the airport.

Projected Costs



- Station electricity costs \$0.25 - \$0.35 per charging hour
- Maximum annual electricity cost approximately \$3,100 per station (at today's electricity rates)
- City responsible for electricity on 13 stations (ECOtality and Boulder)
- Potential annual revenue lost at City Hall horseshoe up to \$250 per parking space



- Expanding the use of EVs by both the City and the general public is consistent with our environmental goals
- Controlled and limited deployment of vehicles and infrastructure is prudent and cost effective
- Pilot initiative results will inform decisions on expanded deployment

Recommendation and Next Steps

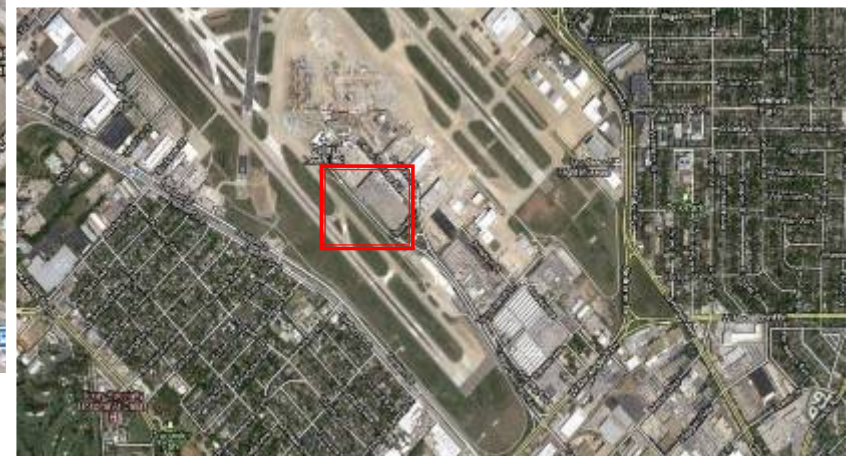
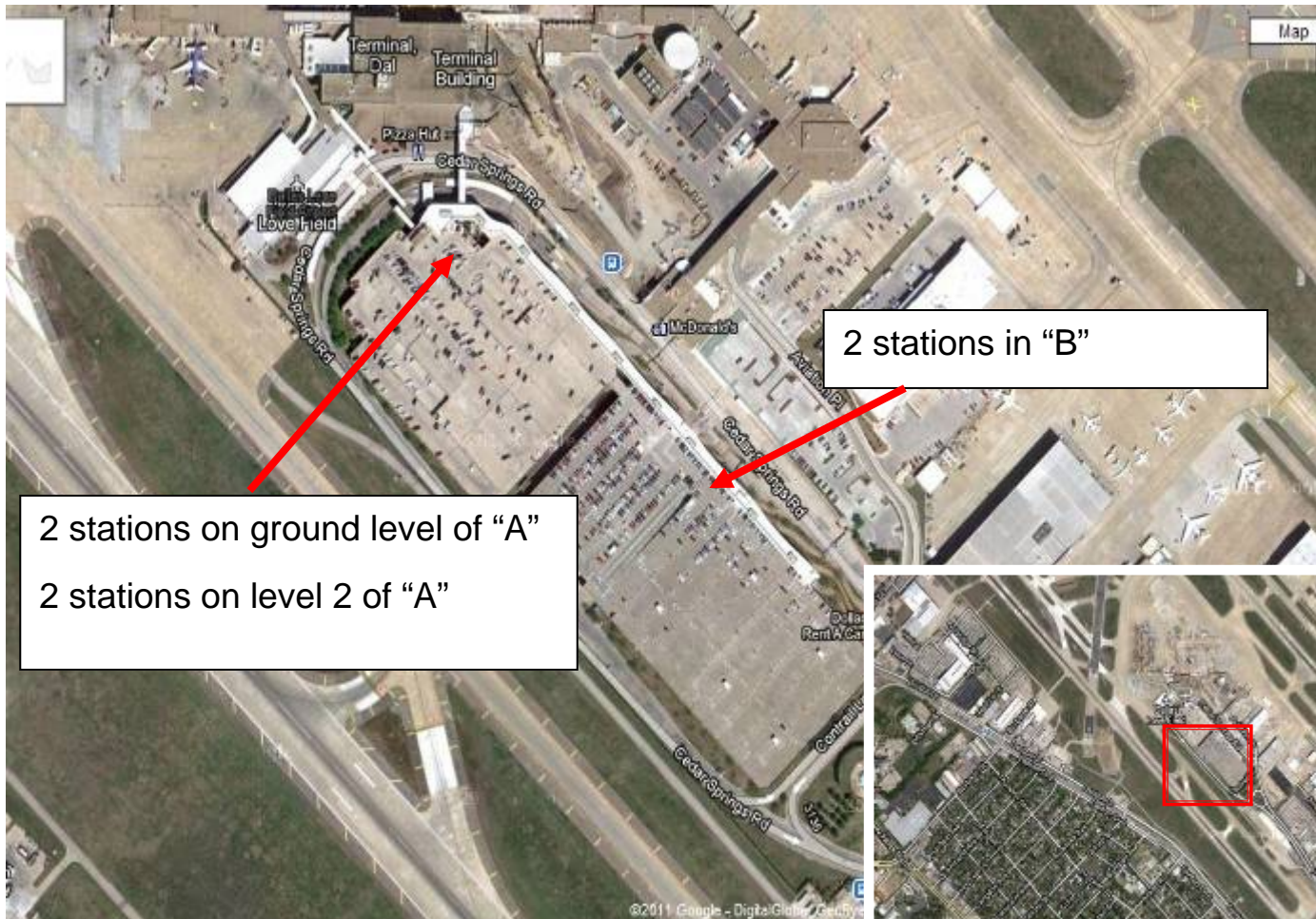


- Recommendation – Approval of each of the following three items on the January 11, 2012 Council Agenda
 - Agenda item 11 – Bailment agreement with Boulder Electric for use of 3 EVs
 - Agenda item 12 – License agreement with ECOtality North America for installation of charging stations at Fair Park, Dallas Love Field, and Dallas Executive Airport
 - Agenda item 13 – Acceptance of charging stations and associated energy from TXU Retail Energy Company, LLC for installation at City Hall and Central Library
- Development of policy recommendations over the next year



Questions?

Appendix – ECOfality, Love Field



Appendix – ECOfality, Fair Park



Appendix – TXU, City Hall





- Free Blink “InCards” are available by signing up at: <https://blinknetwork.com/membership.html>
- Station maps can be viewed on the internet:
 - <https://blinknetwork.com/locator.html> or www.plugshare.com
- **Interactive map gives details on each location:**
 - Number of EVSE (electric vehicle supply equipment) available and in use
 - Address with directions
 - Coming in 2012—reservation system
- Free mobile apps are available for iPhone, iPad and Android Smartphones and tablets
- Blink Network Support can be reached 24 hours/day at 888-998-BLINK (2546)



- AVINC will set up a website where customers can set up an account for service
 - Customers will be able to tie their account to a credit card and will be provided an RFID card
 - RFID card will be used to activate charging station and to bill credit card
- The website will contain locations on the network
 - The stations that are part of their network
 - RFID cards can be used at any station within the network
 - Charging stations will not accept a card from other providers
- Applications will be available to download on smart phones