

# A Framework for Funding Sustainable Transportation using Electric Drive

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# Introduction

- Surrounding the technical challenges
- A full sustainable transportation and energy model
- A high level open framework
- Allocating gains to produce a full suite of benefits

## A New Game

- A cultural shift
- Social, environmental and financial opportunities
- Integrating the transportation system and the electricity grid.
- A new “game” needs new policies, regulations and social marketing



## High market penetration

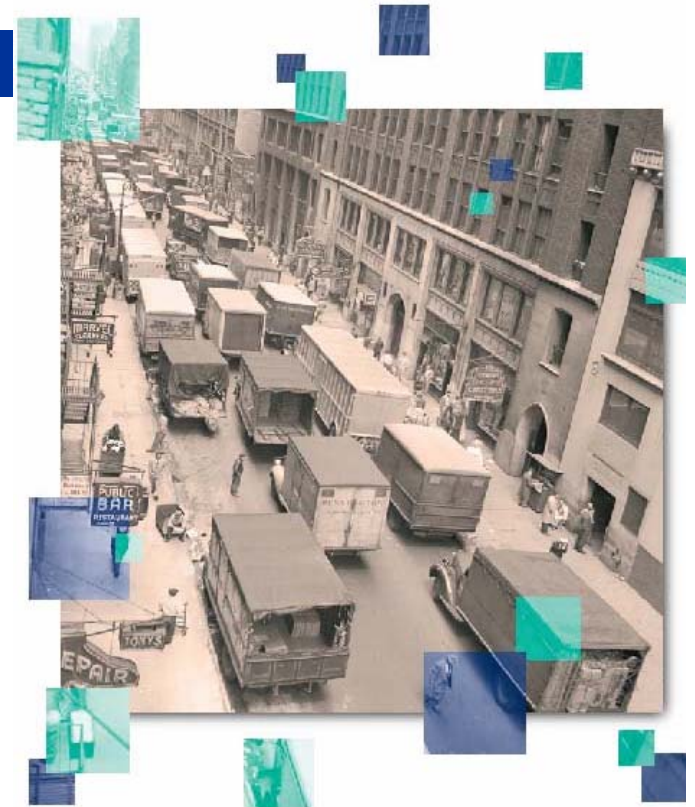
- Use all means:
  - Research to Commercialization support
  - New vehicles subsidies
  - Subsidize and regulate conversions and retrofits
  - Social marketing programs

# Savings and Revenue Streams

- Optimizing the energy supply chain – large savings
- Clean energy: resilient, multi-scalar, distributed and intelligent grids – net savings
- Right pricing electricity to maximize efficiency and minimize costs and emissions
- PEV lifecycle operational savings.

# Contextualizing PEVs

- Fuller market penetration of PEVs
- “Motordom” – the physical and psychological domination of our cities
- The other modes



## Defining the problem / defining the criteria and metrics

- Climate Change
- Emissions and wastes harming human and ecosystem health
- Energy supply impacts and security
- Resource use impacts and security
- Land use
- Maintaining and improving social systems, development, access, equity and quality of life factors

# Hierarchy of Modes

- No travel or E-work
- Active transportation (Cycling, Walking etc.)
- Transit
- Carpool
- PEV
- Conventional vehicles



# The Opportunity

Two opposing financial processes

- New costs for grids and transportation
- New opportunities from efficiency gains:
  - Gains in full supply utilization
  - Systems resilience and efficiency
  - Reduction of fuel supply risk
  - Health, social and other benefits



## Continuing opportunities

- Generating net utility revenues for renewable and clean energy systems and resilient and intelligent grids.
- Capturing surplus PEV dividends for high quality transit and AT infrastructure



## Costs and Revenues

- Costs of building the transportation electrification infrastructure and a fully sustainable transportation system.
- Costs of building resilient, multi-scalar, distributed and intelligent grids.
- Revenue from transportation savings.
- Revenue from optimized utilization of grid assets

## Infrastructure revenue from PEVs

- Revenue Mechanisms
- First we give Manhattan...
- Conditions for a new game
- Proactive and open policies and pricing mechanisms

## Some pricing mechanisms

- Road
- Vehicle
- Insurance
- Parking
- Electricity



## Targeted allocation

- Allocating revenue streams to sector
- Future revenues from utilities targeted to the costs
- Ultimately a political decisions
  - Social capacity
  - Compensate new charges with new assets
  - Coordination cost and revenue streams
  - Use innovative financial and policy tools

# Summary

- Utilize a metrics based policy framework
- Deploy innovative social and economic instruments
- Initiate a range of pricing and regulatory mechanisms
- Maximize market penetration
- Connect revenue and cost streams
- Funding sustainable transportation modes will in turn lower vehicle infrastructure costs.
- Fund towards a fully diversified resilient, distributed and intelligent integrated energy system that includes transportation.
- Engage political leaders and publics to understand that with new responsibilities and opportunities come new benefits



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Thank you