



Transportation and Climate Change Resource Center

REAL SOLUTIONS FOR CLIMATE CHANGE

Reducing GHG Through Traffic Operations, Construction, Maintenance and Agency Operations

APRIL 19, 2010

CYNTHIA BURBANK, Parsons Brinckerhoff

GARY MCVOY, NYSDOT

JOHN ZAMURS, NYSDOT

PETER KOONCE, City of Portland, Oregon



Questions for the Presenters

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During the webinar, please e-mail your questions to
melvinj@pbworld.com.





Transportation and Climate Change Resource Center

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**GHG Reductions Potential:
System Operating Efficiencies, Eco-Driving,
Construction, Maintenance, & Agency Operations**

APRIL 19, 2010

Presented by:

Cynthia Burbank
Parsons Brinckerhoff



60-80% GHG Reductions will Require Full Panoply of Transportation Strategies

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- No silver bullet achieves 60-80% GHG cuts
- Efficient technology/clean fuels will be the bedrock for transportation GHG reductions
- But many other strategies will be required

Five GHG Reduction “Legs”

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Transportation GHG reduction has 5 legs:

1. Vehicle efficiency
2. Low-carbon fuels
3. VMT (including land use)

- 4. Vehicle/System Operations**
- 5. Construction, Maintenance, and Agency Operations**

Examples:

- Higher CAFE standards
- CA’s low carbon fuel standard
- Pricing, higher density
- Signalization, ITS, eco-driving, roundabouts
- Materials, maintenance practices, LED lights

State DOTs can Influence all 5 Legs – Greatest Influence over #4 and #5

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Many Advantages & Co-Benefits

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Efficient Operations

- >15% GHG reduction potential – more than many other strategies
- Near-term payoff
- Saves energy and money for the public
- Many co-benefits (esp safety)
- More efficient transportation system
- DOT influence is significant
- Little opposition
- Modest costs
- Benefits rural and urban areas

Construction/Maintenance /Agency Operations

- Saves energy use
- Can reduce agency costs
- Often reduces other emissions
- DOT influence significant
- Not politically controversial
- Taps engineering skills
- Engages wide swath of DOT workforce
- Benefits rural and urban areas

GHG Leg 4: Efficient Operations

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Individual driver behavior

- “Eco driving”

System management

- Managing speed (35-55 MPH is optimal)
- Speed limits/enforcement (could reduce fuel use 2-4%)
- Eliminating bottlenecks
- Rapid removal of traffic incidents
- “Active” traffic management to smooth traffic flow
- Improving signal timing (could reduce 1.315 MMT CO₂/yr)
- Roundabouts (multiple benefits)
- Reducing car and truck idling
- Work zone management to smooth flow

Efficient Operations: Eco-Driving

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- Drive fuel-efficiently
- Inflate tires optimally
- Avoid rapid accel/decel
- Avoid very high speeds
- Avoid congestion
- Avoid extra weight in car
- Not rocket science.....

Eco Driving – 10-15% GHG Reduction Potential

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- Eco drivers can reduce fuel and CO₂ by 10-15%
- If 50% of drivers practiced eco driving, CO₂ would drop by 100 million tons annually
- Pilot in Denver with 400 drivers achieved 10% fuel reduction and similar GHG reduction
- Useful for HDV, MDV, and LDV drivers
- Major push in Europe as GHG strategy
- Aided by dashboard displays of real-time MPG

Eco-Driving Ranks Higher than Other Strategies

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“Moving Cooler” estimates of GHG reduction, cumulatively 2010-2050, compared to on-road baseline, for maximum intensity implementation

- 1,815 mmt – eco-driving by **20%** of drivers
- 1,445 mmt – at least **90%** of new urban development is compact, with high quality transit
- 575 mmt - **\$1.2 trillion** transit expansion

www.EcoDrivingUSA.com

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- EcoDrivingUSA™ is a partnership to increase vehicle fuel economy and preserve the environment
 - [Be an EcoDriver](#)
 - [EcoDriving Quiz](#)
 - Community EcoDriving
 - [EcoCalculator](#)
 - [Virtual Road Test](#)
 - [Educational Tools](#)
- EcoDriving partners: Environmental Defense, Auto Manufacturers, Governors of AL, CA, CO, GA, ID, KY, MI, MS, MO, MD, NC, OK, PR, SC, UT, VA, WV



State DOT Role in Eco-Driving

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- Public education
 - PSAs
 - Highlight cost savings, petroleum savings, etc.
- Planning process, scenarios, etc.
 - Include eco-driving in scenario planning
 - Compare to other strategies
- Training programs
 - Driver education programs
 - Programs for public employees
 - Partnership with major employers
- Pilot programs



Efficient Operations: System Management

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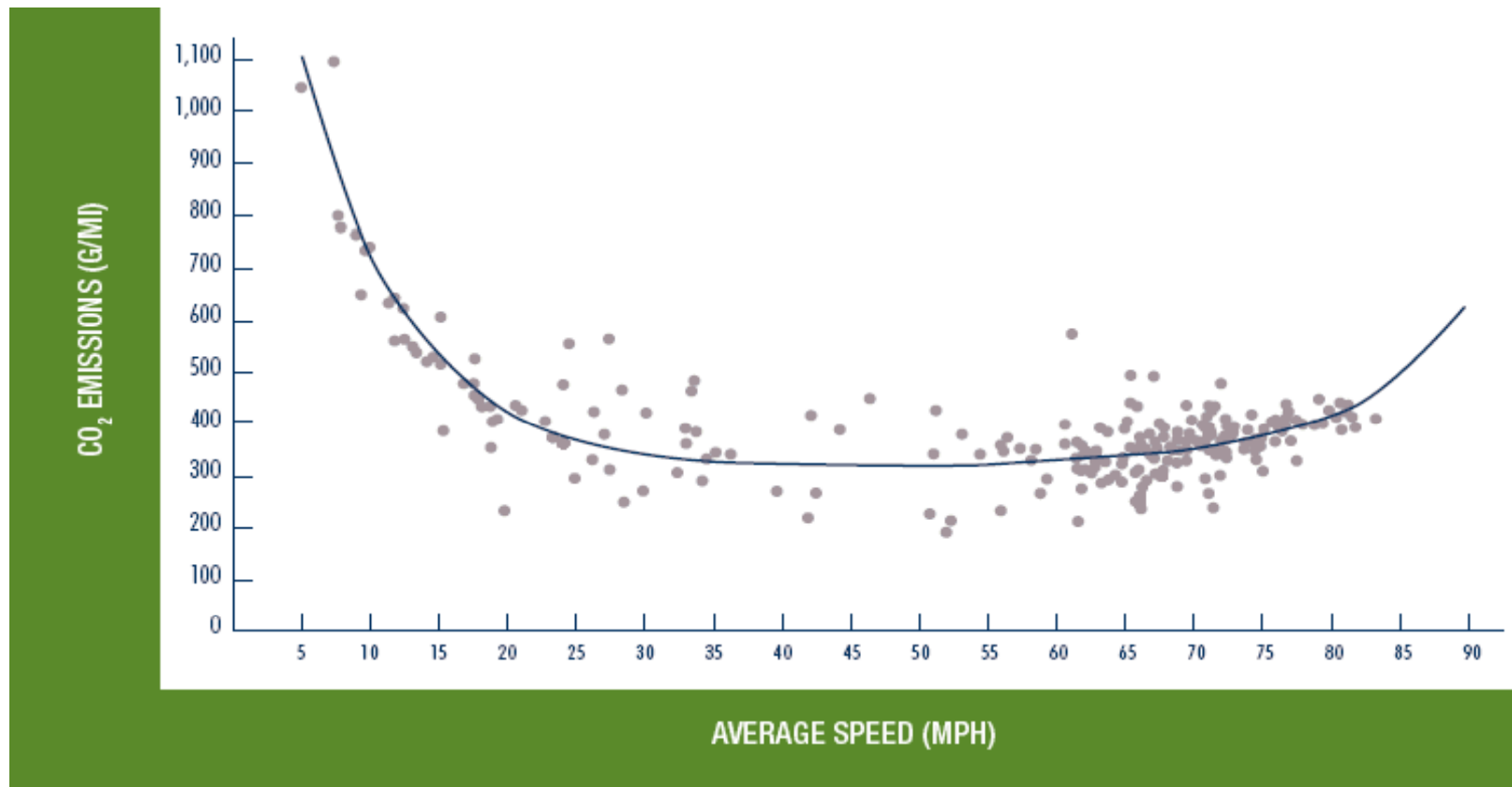
Facility owner/manager (state DOT, city DOT, toll authority, etc.)

Reinforces and magnifies eco-driving:

- Optimize signal timing
- Synchronize signal timing
- Adaptive signalization (in real time)
- Major event management
- Traffic management centers
- Corridor operations management
- Managing speed (35-55 MPH is optimal)
- Speed limits/enforcement
- Eliminating bottlenecks
- Rapid removal of traffic incidents
- “Active” traffic management to smooth traffic flow
- Roundabouts (multiple benefits)
- Reducing car and truck idling
- Work zone management to smooth flow

Effect of Speed on GHG: 35-55 MPH is optimal

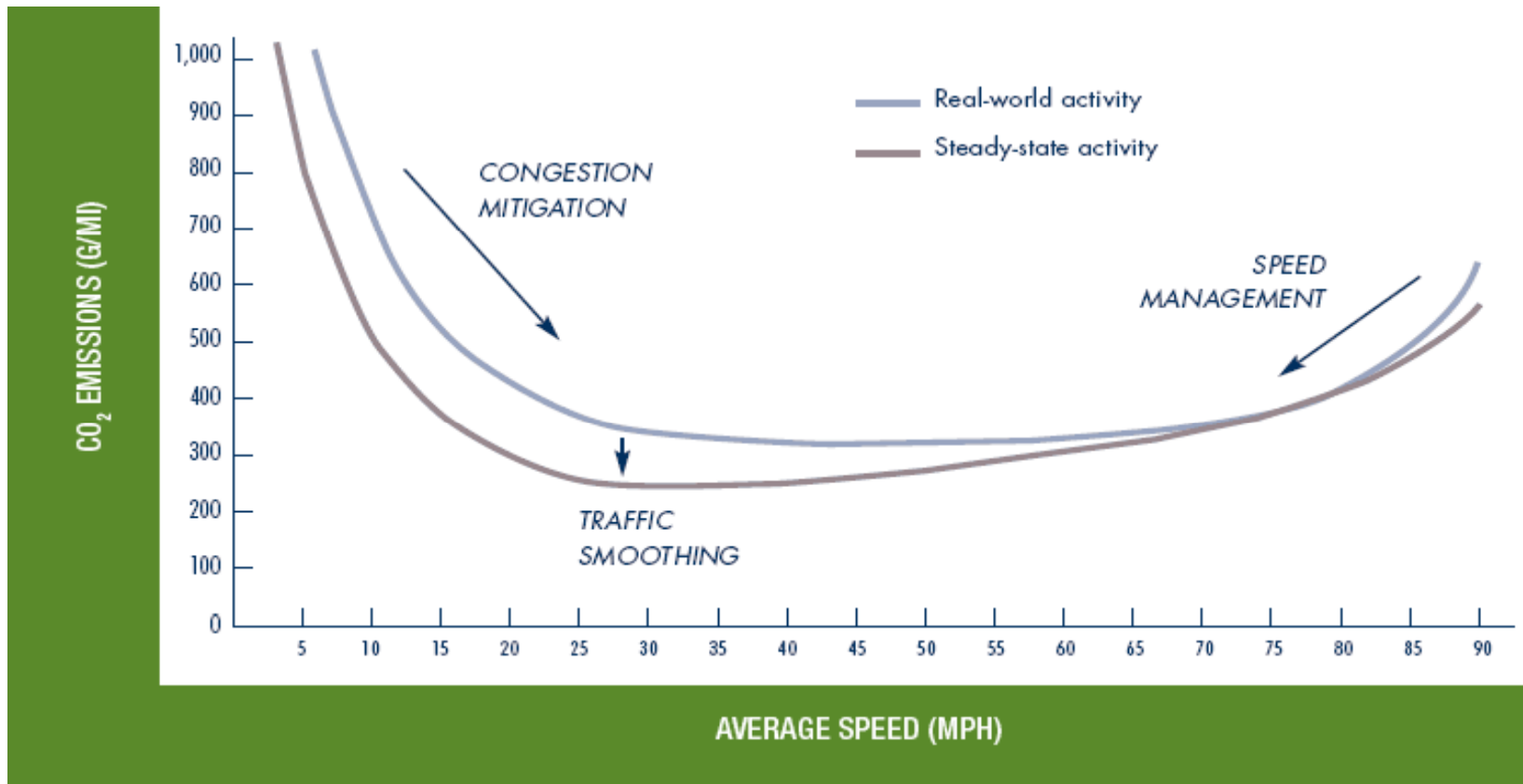
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Source: Matthew Barth and Kanok Boriboonsomsin, "Traffic Congestion and Greenhouse Gases," *Access* magazine, Fall 2009.

Traffic Operation Strategies To Reduce CO₂

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Source: Matthew Barth and Kanok Boriboonsomsin, "Traffic Congestion and Greenhouse Gases," *Access* magazine, Fall 2009.

Speed Management Ranks High in GHG Reductions

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GHG reduction potential from individual strategies, cumulatively 2010-2050, compared to on-road baseline

- 15,186 mmt - carbon pricing equiv to \$2.71/gallon
- 3,361 mmt – VMT fees equiv to \$2.53/gallon
- **2,428 mmt – speed limit reductions**
- 2,233 mmt – PAYD auto insurance (100%)
- 1,445 mmt – at least 90% of new urban development is compact, with high quality transit
- 1,241 mmt – congestion pricing fully implemented in 120 metro areas at 65 cents/mile
- 575 mmt - \$1.2 trillion transit expansion
- 352 mmt – combination of 10 freight strategies

Speed Management Can Take Various Forms

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For high speeds:

- Design new/reconstructed highways for 35-55 MPH
- Consider “road diets” for existing high-speed roads
- Install speed feedback signs for motorists
- Enforce existing speed limits
- Public education
- Speed limits, where politically feasible

For low speeds:

- Remove bottlenecks
- Improve signalization and flow
- Provide special event management
- Rapid incident removal
- Install roundabouts

Roundabouts Reduce Fuel, GHG, etc.

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- Many countries and U.S. states are installing roundabouts for improved safety, reduced emissions, and better traffic flow



Roundabouts Can Reduce GHG at Intersections

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- One study for Kansas estimated 55-61% GHG reduction at controlled intersections replaced with roundabouts
- Study for Vermont estimated 8% reduction in state motor fuel use from replacing signals with roundabouts at 100 busy intersections
- Burlington VT could meet 20% of its GHG reduction goal with 25 roundabouts replacing traffic signals
- Study for Hamilton Ontario found average GHG reduction of 60% for roundabouts replacing traffic signals

Optimized Traffic Signals ~ 3-11% Highway GHG Reduction

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- “The National Traffic Signal Report Card indicates that at a cost of less than 1% of the total national expenditure on highway transportation, traffic signal operations could...achieve an excellent rating in traffic signal management, with annual savings of almost 17 billion gallons of fuel nationwide.”
- This is nearly 150 MMT of CO2 saved per year
- Which is **11.5 % of highway GHG**
- Portland OR achieved 50 metric tons of CO2 reduction per year per traffic signal (which is ~ **3% of Portland highway GHG**)

--Jim Peters, et al., in “Reducing Carbon Emissions and Congestion by Coordinating Traffic Signals,” ITE Journal, April 2009 – with conversions to GHG reduction percentages by Cindy Burbank



Will “Induced” Demand Cancel out GHG Reductions from Efficient Traffic Flow?

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“Freeing capacity through traffic management will induce additional traffic in many circumstances but even when overall travel increases emissions may still be less than before if operating speeds are more efficient.” -- International Transport Forum, 2010

Where congestion is deterring travel, smoother flowing traffic may enable pent-up demand for auto travel to increase

- Need to estimate this effect and adjust GHG effects accordingly
- But only deduct for new VMT (not VMT that shifts in time or facility location)
- Can be controlled with pricing
- Analysis and results must be case specific
- Example: DEIS for Columbia River Crossing finds lowest GHG for options with more new bridge capacity, less transit, and lower tolls

Where congestion is not an issue, smoother flowing traffic is win-win-win-win for travel time benefits, fuel economy, GHG reductions, less wear on vehicles.

Operational Strategies are Prominent among Options to Reduce Freight GHG

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- More fuel-efficient vehicles
 - Low carbon fuels
 - **Anti-idling programs***
 - Truck stop electrification
 - **Speed limit enforcement***
 - Freight villages/consolidation centers
 - Feeder barge container service
 - **Traffic flow improvements***
 - Pre-clearances at scale houses
 - **Truck driver eco-training***
 - EPA SmartWay up-grade kits & loans
 - Incentives to retire older trucks
 - Freight logistics improvements
 - Shifting freight from truck to rail
- Hybrid power trucks
 - Low-viscosity lubricants
 - Single wide-base tires
 - **Automatic tire inflation systems***
 - “Black carbon” control technologies
- * Operational efficiency strategy**
- Detailed info available in NCHRP 20-24(59), Appendix C, on AASHTO “Real Solutions” website

Idling Reduction – Significant GHG Reduction

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Michigan Climate Action Plan – GHG Reductions, 2009-2025:

- 7.0 MMT = Truck/bus idling policies
- 3.2 MMT = Land use planning and incentives
- 2.0 MMT = Increase rail capacity and address rail system bottlenecks

Michigan anti-idling strategies:

- Increase availability of electrification at private truck stops
- Provide financial assistance for equipment purchase
- Educate truck, bus, and truck-stop owners/operators
- Adopt Michigan law based on EPA Model State Idling Law
- Encourage adoption of local ordinances to reduce idling by buses/trucks

Cost effectiveness = savings of \$85/ton of GHG reduced

California Comparison: Congestion GHG vs. SB 375 GHG Reductions

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2.0 MMT GHG/year = CARB's initial estimate for 2020 from implementing SB 375 provisions on land use/transportation statewide **

3.4 MMT CO₂/year = GHG from traffic congestion in Los Angeles alone*

5 MMT GHG/year = CARB's upgraded estimate (interim) for 2020 from implementing SB 375 provisions on land use/transportation statewide**

* UCLA Center for Regional Policy Studies, based on TTI data

** California AB 32 Scoping Plan



State Climate Plans – Most Failed to Focus on Operational Strategies

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State	Year	Vehicle	Low Carbon Fuels	Smart Growth and Transit	Other
MN	2025	15%	35%	25%	25%
NC	2020	35%	12%	38%	15%
SC	2020	14%	55%	29%	1%
CT	2020	51%	38%	8%	2%
ME	2020	53%	25%	21%	1%
MD	2025	24%	12%	45%	20%
NY	2020	59%	11%	27%	4%
PA	2025	45%	36%	18%	0%
RI	2020	46%	10%	31%	14%
VT	2028	21%	14%	49%	17%

Operations - Important but Invisible as GHG Strategy

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- Operational strategies can be a significant GHG reduction strategy
- And they have other important benefits (safety, reduced congestion, lower fuel costs, less expensive than many other strategies, etc.)
- **But they are getting little attention (sparse research, no Hill briefings, little public awareness, little media coverage, little attention in legislation)**
- **Not mentioned in 1,428 pages of House climate change legislation**

GHG Leg 5: Construction/ Maintenance/Agency Operations

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- Virtually ignored in state and Federal climate policy and plans
- But there is significant GHG and energy associated with construction, maintenance, and agency operations
- UC Berkeley study found “life cycle” emissions are significantly higher than just operational emissions (1.6x for autos, 1.4x for buses, 2.6x for light rail, etc.)

GHG Leg 5: Construction

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- Low-carbon pavement mixes (warm-mix rather than hot-mix; use of fly ash)
- Retrofit of construction engines
- More durable pavements (less repaving)
- Construction work zones to minimize congestion and idling
- Low-energy construction practices

GHG Leg 5: Maintenance & Agency Operations

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- Reduced roadside mowing
- LED traffic lights
- Low-energy highway lighting
- Solar panels for lighting and other energy
- Roadside vegetation to sequester CO₂
- DOT building energy audits/LEED design
- DOT fleets – alt fuels, retrofits, etc.
- Train DOT employees in eco-driving

CONCLUSION:

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Efficient Operations and Construction/Maintenance/ Agency Operations are Key Strategies

- Can be strongly influenced by state DOTs
- Face little or no political opposition
- Achieve immediate and/or near-term results
- Often save money for DOTs and the public
- Have significant co-benefits
- Generate higher GHG reductions than other strategies that are receiving more policy attention

Need More Emphasis in Legislation, Policy, & Research



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NYSDOT 's Climate Change Initiative Approach, Successes and Lessons Learned

APRIL 19, 2010

Presented by:

Gary McVoy, Ph.D.

NYSDOT Director of Operations Division; Executive Sponsor, Climate Change and Energy Efficiency (CC & EE) Steering Committee

John Zamurs, Ph.D.

Section Head, Air Quality, Climate Change and Energy Section, Office of Environment; CC & EE Steering Committee member



NYS Multi-Modal Transportation System

Diverse, Complex and Vital

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7,632 State Bridges
9,800 Local Bridges



40,000 State lane miles
200,000 local lane miles



NYSDOT's Climate Change & Energy Efficiency Initiative

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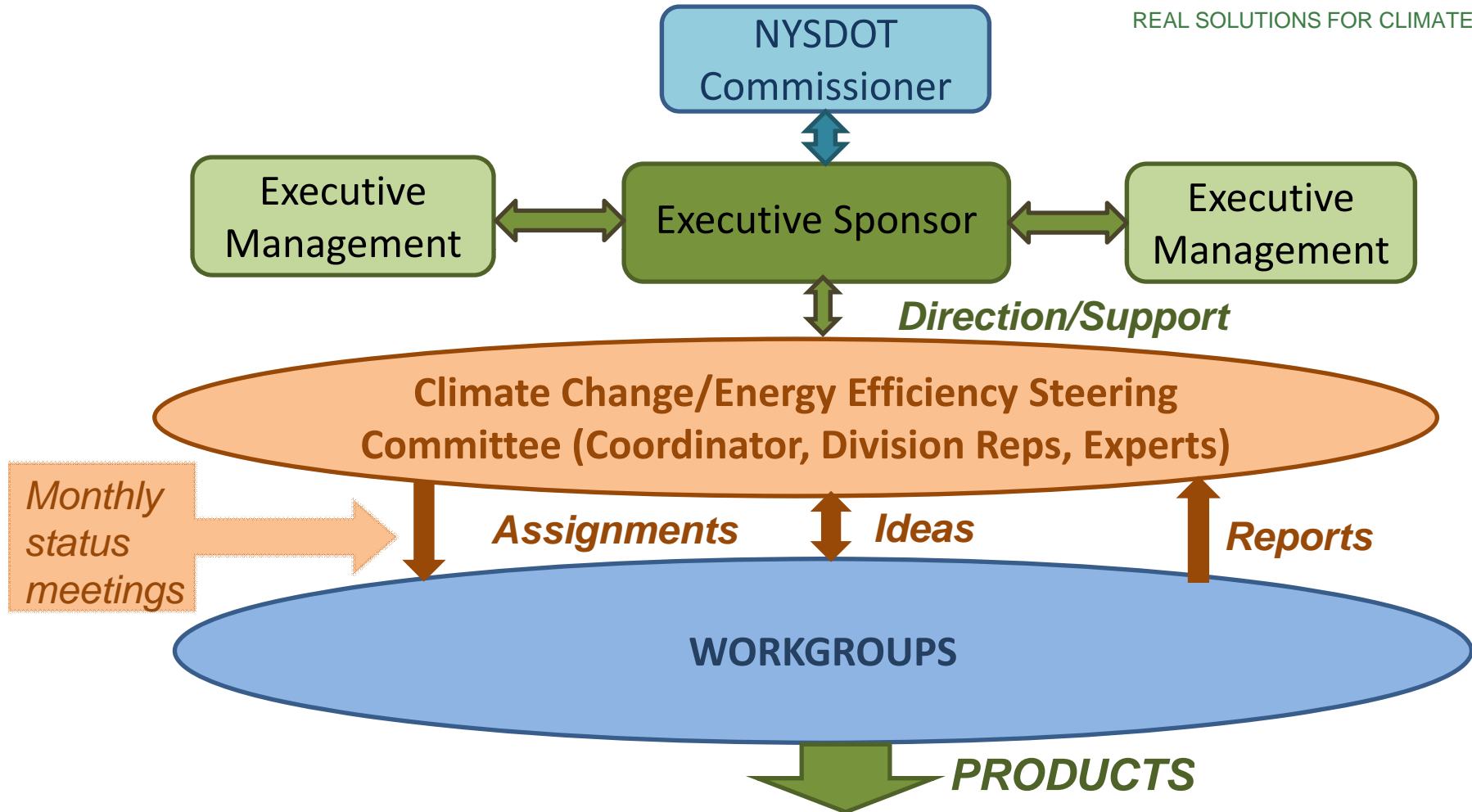
Climate Change/Energy Efficiency Team Mission:

"To have the Department and the State's transportation sector reduce its emissions of greenhouse gases and its reliance on petroleum."



Getting It Done: NYSDOT's CC/EE Team Approach

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Task List

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	Direct influence?	Rep	Office	Baseline	Potential Deliverable	SEP/CAP	Mandates	Qual info	Updates	Etc.
STRATEGIES										

NYSDOT “Top 11” List of Actions

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- 1) Mass transit
- 2) Emissions reporting
- 3) Traffic signals
- 4) Freight management
- 5) **Managed lanes**
- 6) Smart growth/land use
- 7) Idle reduction
- 8) Commuter Choice
- 9) **Air quality education**
- 10) **Alternative fuels**
- 11) Research



Mass Transit

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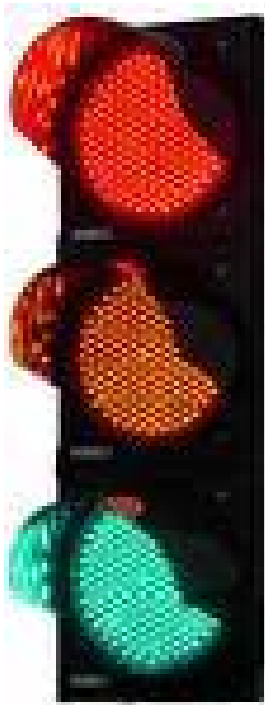
- Funding
- Park and Ride Lots
- 511NY
- Greenhouse Gas Reduction

The image displays two screenshots of the 511NY website. The top screenshot shows the 'TransLinks' page, which provides public transportation information in New York. It features a navigation bar with the 511 logo and 'GETCONNECTEDTOGO' text. Below the navigation bar, there is a welcome message and a search bar. The main content area includes a map of the 511 Region and Counties, a dropdown menu for 'Travel Type' (set to 'Public Transportation'), and a dropdown menu for 'Category' (set to 'Paratransit Services'). The bottom screenshot shows a detailed traffic map of the New York City area, with various traffic conditions and incidents displayed. The map includes a legend for incidents, weather alerts, special events, bridges and tunnels, construction, and cameras. It also shows speed limits and a search bar.

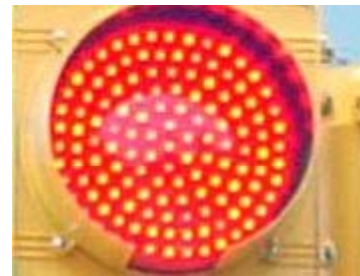


Traffic Signals

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- 6000 NYSDOT owned signals
- LED replacements
- Decrease CO₂ emissions over 4M kg/year



Alternative Fuel Fleet

- > 700 light-duty CNG/hybrid/biofuel vehicles
- 25 medium and heavy-duty alternative fuel vehicles
- Dispensed >8.3 M gals CNG, saving \$8.3 M
- Built 60 CNG stations
 - 11 open to public
 - Collaborate with NYS OGS

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Managed Lanes

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New York's Clean Pass Program

- Innovative, multi-agency (NYSDOT, NY DMV, NYSDEC) program
- Allow eligible low-emission, energy-efficient vehicles to use the 40-mile Long Island Expressway High Occupancy Vehicle (LIE/HOV) lanes regardless of the number of occupants in the vehicle.
- The program will result in an estimated reduction of 6,000 tons of greenhouse gas emissions and savings in excess of 500,000 gallons of gasoline.

<https://www.nysdot.gov/programs/clean-pass>



Air Quality Education

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- AQAD (Air Quality Action Day) Alerts
 - Ozone
 - GHG



Air Quality Education

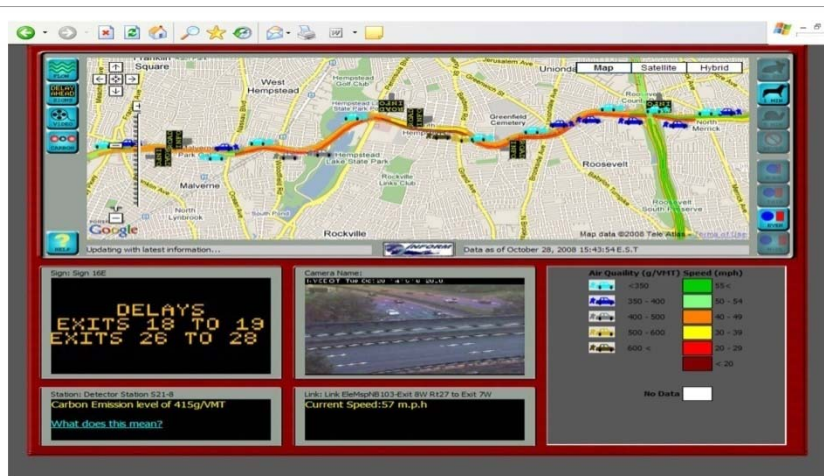
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- INFORM (INformation FOR Motorists) - one of the nation's largest and most advanced traffic information systems for motorists covering Long Island's 50-mile central corridor.



New York State Department of Transportation

www.informny.com



<http://www.informny.com/>



Importance of Partnerships

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- Network w/ various professions due to overlapping authority of potential strategies
- Increase credibility of chosen strategies
- Increase potential funding opportunities



- Examples:



- Columbia University: *"Mainstreaming Climate Change Adaptation into NYSDOT's Operations"*



- NYSERDA: *ClimAID*
 - NYPA Solar Initiative
 - 511NY



Quantifying NYSDOT GHG Emissions

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- “*Assessment of NYSDOT Joining the Climate Registry*” recommendations:
 - Conduct an annual inventory of its GHG emissions, following the CR protocol to the maximum extent practicable.
 - Prepare an annual GHG emissions inventory report.
 - Do not join the CR at this time of constrained resources.
 - Saved resources applied to CO₂ mitigation strategies

CC & EE Parameters for Project Selection

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- Consideration of GHG emissions as part of project development.
- GHGs reported for TIPs and Plans.
- Exploring mechanisms to incorporate climate and energy considerations and guidance into program update progress.

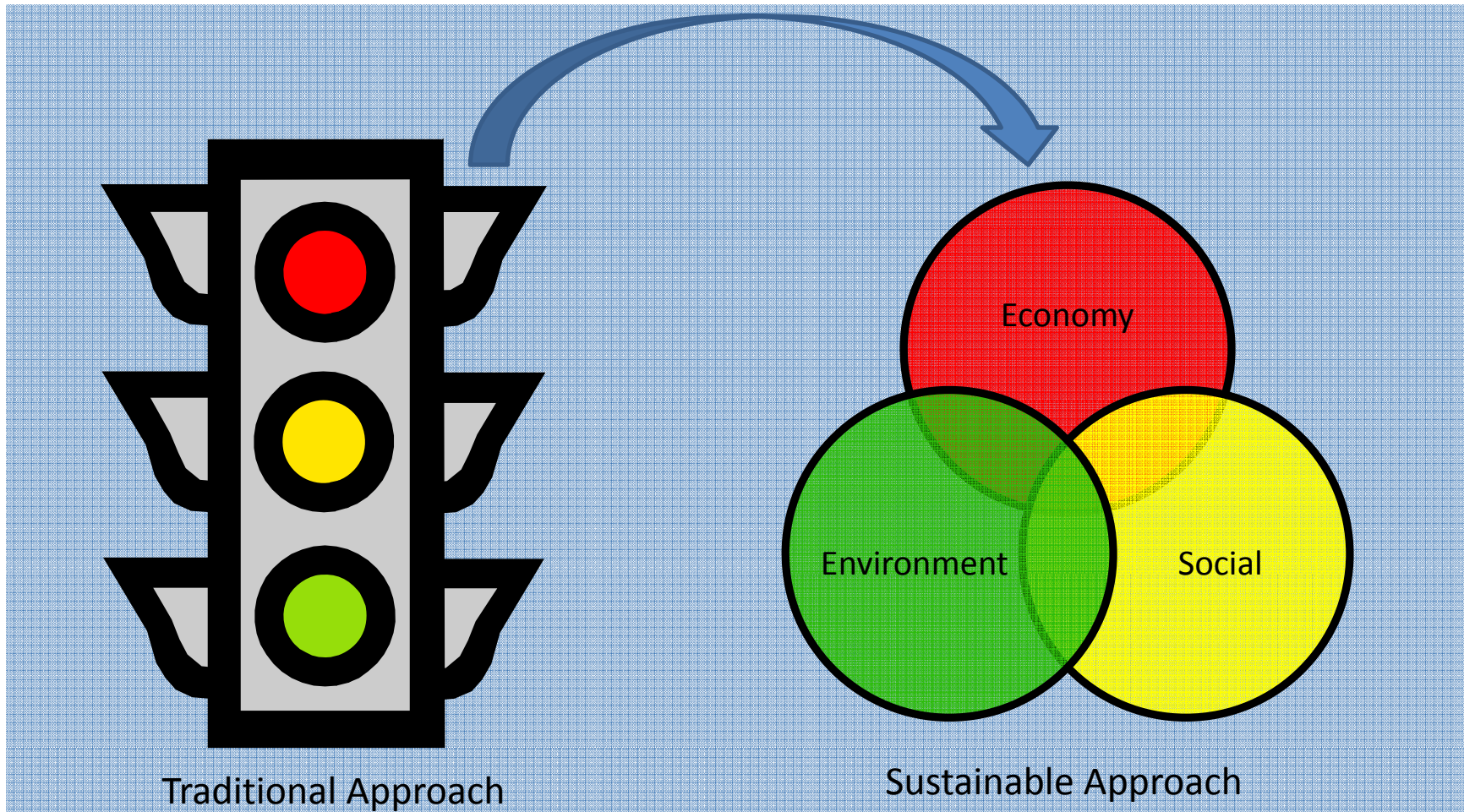
Related Efforts

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- SEP (State Energy Plan)
 - Expand/promote green transportation choices
 - Increase use of alt fuels
 - Investigate ROW for renewable energy development
 - Develop/test sustainable transportation tech & systems
- CAP (Climate Action Plan)
 - 80 X 50 economy wide goal
 - Catalog of transportation/land use potential actions
 - Operations, infrastructure, financing, land use, all modes

Prioritization

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Next Steps/NYSDOT Sustainability

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Consistent with 1987 United Nations Brundtland Commission, NYSDOT defines a sustainable society as one that:

“manages resources in a way that fulfills the community/social, economic and environmental needs of the present without compromising the needs and opportunities of future generations.”



“A society grows great when old men plant trees in whose shade they will not sit.” – Ancient Greek Proverb

NYSDOT Sustainability Policy (Working Draft)

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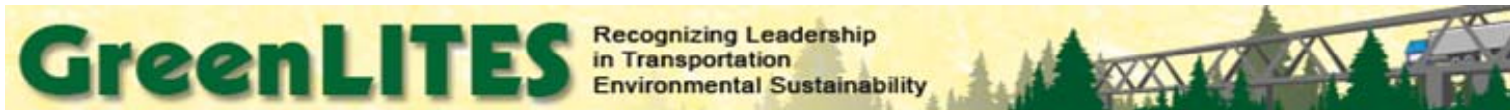
NYSDOT will advance sustainability by:

- Advocating and promoting its vision of sustainability to appropriate stakeholders and communities in the transportation decision making process.
- Incorporating sustainability concepts into the Department's procedures, investments, policies, manuals, specifications, programs, projects and best practices.
- Evaluating the costs and benefits (societal, environmental, and economic) of transportation investments over life-cycles as well as fiscal cycles.
- Recognizing the transportation system's significant contribution as an integral part of a sustainable society.



GreenLITES – Measuring Sustainability

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Program used to:

- Measure our sustainability performance
- Recognize and promote sustainability best practices
- Identify areas where we need to improve our sustainability practices



- GreenLITES Design is modeled after:
 - Building industry LEED program
 - University of Washington Greenroads initiative
- GreenLITES is a self certification program as a way to demonstrate to public officials and the public how NYSDOT is advancing sustainable practices.
- Includes Design, Operations, Local Projects, Regional Assessment Tool



“What Gets Measured Gets Done”

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GreenLITES Design

Example:

GreenLITES Project Environmental Sustainability				
Sustainable Sites Category			Points	
	ID	Description	Available	Scored
S-1 <i>Alignment Selection</i>	S-1a	Avoidance of previously undeveloped lands (open space or greenfield)	2	
	S-1b	Select an alignment which establishes a 100' buffer between highway & natural water course.	2	
	S-1c	Alignments which minimize overall construction “footprint”. Examples: use of retaining walls, selecting design option with minimal footprint.	1	
	S-1d	Design vertical alignments which minimize total earthwork.	1	

<https://www.nysdot.gov/programs/greenlites/project-design-cert>

“What Gets Measured Gets Done”

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GreenLITES Operations

Example:

Microsoft Excel - Green MOP TEMPLATE C 04 24 2009.XLS

File Edit View Insert Format Tools Data Window Help Adobe PDF

Type a question for help

Reply with Changes... Epd Review...

Z175

1 **Maintenance and Operations Plan for Program Update** Region: _____
 2 State Fiscal Years 09/10 through 14/15 Prepared by: _____
 3 **Blue Rows are for M.O. Programs** Generated on: _____
 4 **Red rows are Capital Improvements intended to achieve SOGR or SOHO**
 5 (version 1/21/08) GreenLITES 04242009 Submitted by Residency/Reg'l Bridge Maint. /Other: _____

Program	Line	Asset Type	Activity	Cycle (yrs)	Unit of Accomplishment	Total Units	Ideal \$ per gr	Target Treated \$ per gr	% on Cycle	Total \$ Treated	\$ Treated by S.F.	Centr Mater (\$K)
Bridges	1	Bridges	Bridge Cleaning	1	Each Span							
	2	Bridges	Bridge Painting	12	Each Bridge							
	3	Bridges	Deck Sealing	4	Each Bridge							
	4	Bridges	Deck Treatment	12	Each Bridge							
	5	Bridges	Joints	MOF pg. 9	Each Joint							
	6	Bridges	Bearing Restoration	As Needed	Each Bearing							
	7	Bridges	Corrective Repairs (Includes 5-7 & Vert Down)	As Needed	Each Bridge							
	8	Bridges	Demand Repairs	N/A	Each Bridge							
	9	Bridges	Deck Rehab/Replate	N/A	Each Bridge							
	10	Bridges	Rehabilitations & Replacements	N/A	Each Bridge							
	11	Bridges	New Bridges/New Locations	N/A	Each Bridge							
	12	MO Program	MO Variable BM	N/A	\$							
	12A	GreenLITES	Use Environmental Protection during Bridge Repair		5	Each Bridge						
	12B	GreenLITES	Environmental Training		3	Each Employee						
	12C	GreenLITES	Survey for Public Access to Stream		3	Each Bridge						
12D	GreenLITES	Construct Public Access		2	Each Access							
12E	GreenLITES	Ped/Bike Gate Replacements		4	Each Gate							
12F	GreenLITES	Improve or Retain Bridge Aesthetics		5	Each Bridge							
12G	GreenLITES	Innovative and/or Unlisted Activities		1	Each Bridge							
12H	Bridges	Regulatory Cost (Fines)		1	Each Region							
13	Pavement	Crack Sealing		4	Lane-Miles							
14	Pavement	Single-Course Overlays		12	Lane-Miles							
15	Pavement	Liquid Asphalt Treatments		7	Lane-Miles							

<https://www.nysdot.gov/programs/greenlites/operations-cert>



Accountability

Regional Assessment Tool

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Example:

Economy	Current State / Metric?	Desired State
Access to jobs and labor		
Transportation Preservation (Maintenance backlog)		
Transit passenger miles		
Environment		
Petroleum consumption reduction		
Air Quality - CO2 emissions		
Water Quality		
Habitat Quality		
Social Equity (Includes Livability & Safety)		
Fatality and Injury reductions per VMT		
Improved mobility for all including the disadvantaged and disabled		
Generational Equity		
Access to affordable transportation		

<https://www.nysdot.gov/programs/greenlites/regions>



Transportation – supporting a sustainable society

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The sustainability framework will help integrate climate change into our ongoing public service mission.





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Transportation Operations Efforts to Reduce GHG Innovative Partnerships and Concepts

APRIL 19, 2010

Presented by:

Peter Koonce, PE

Division Manager, City of Portland Signals, Street Lighting, & ITS



Overview

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- Relationships between Operations and GHG
- Policy Directives in Portland
- Example Projects

Relationships between Operations and GHG

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- TRB Special Report 290
 - Climate change will affect every mode of transportation
 - Need to change how we design, maintain, and operate our transportation system
- Metro (Portland's Regional Planning Agency)
 - Transportation accounts for 25% of all GHG, over half is local passenger transport

Policy Directive

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- Regional Transportation Plan, Metro
- Climate Action Plan
- City Transportation System Plan
 - Bicycle Master Plan
 - Freight Master Plan
- Transit Investment Plan, TriMet

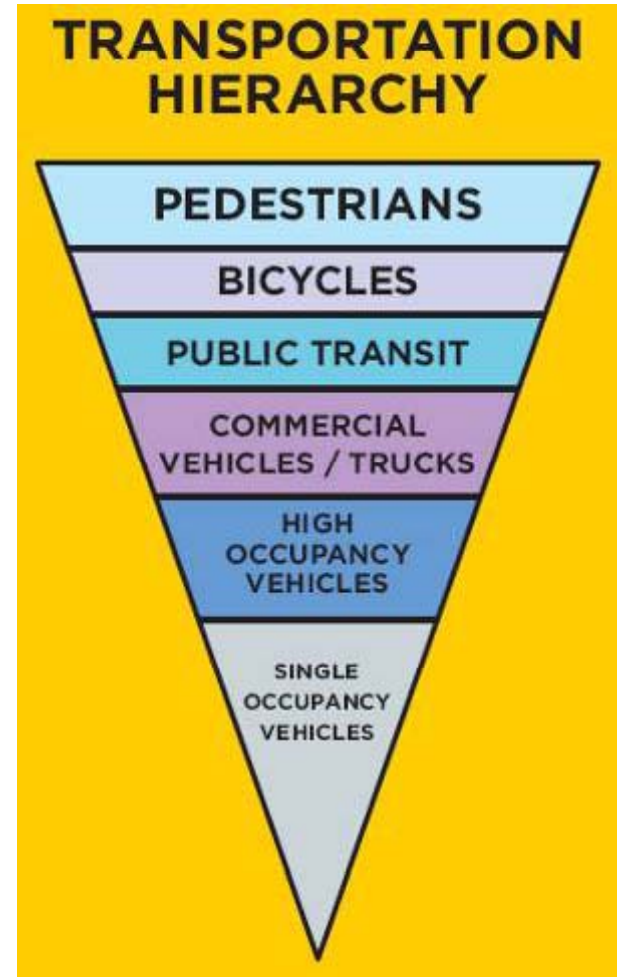
Portland Climate Action Plan

REAL SOLUTIONS FOR CLIMATE CHANGE

- Urban Form and Mobility
 - Create vibrant 20-minute neighborhoods (90%)
 - Reduce VMT by 30% from 2008 levels
 - Improve efficiency of freight movement
 - Other non-transportation operations objectives

Transportation Hierarchy

REAL SOLUTIONS FOR CLIMATE CHANGE



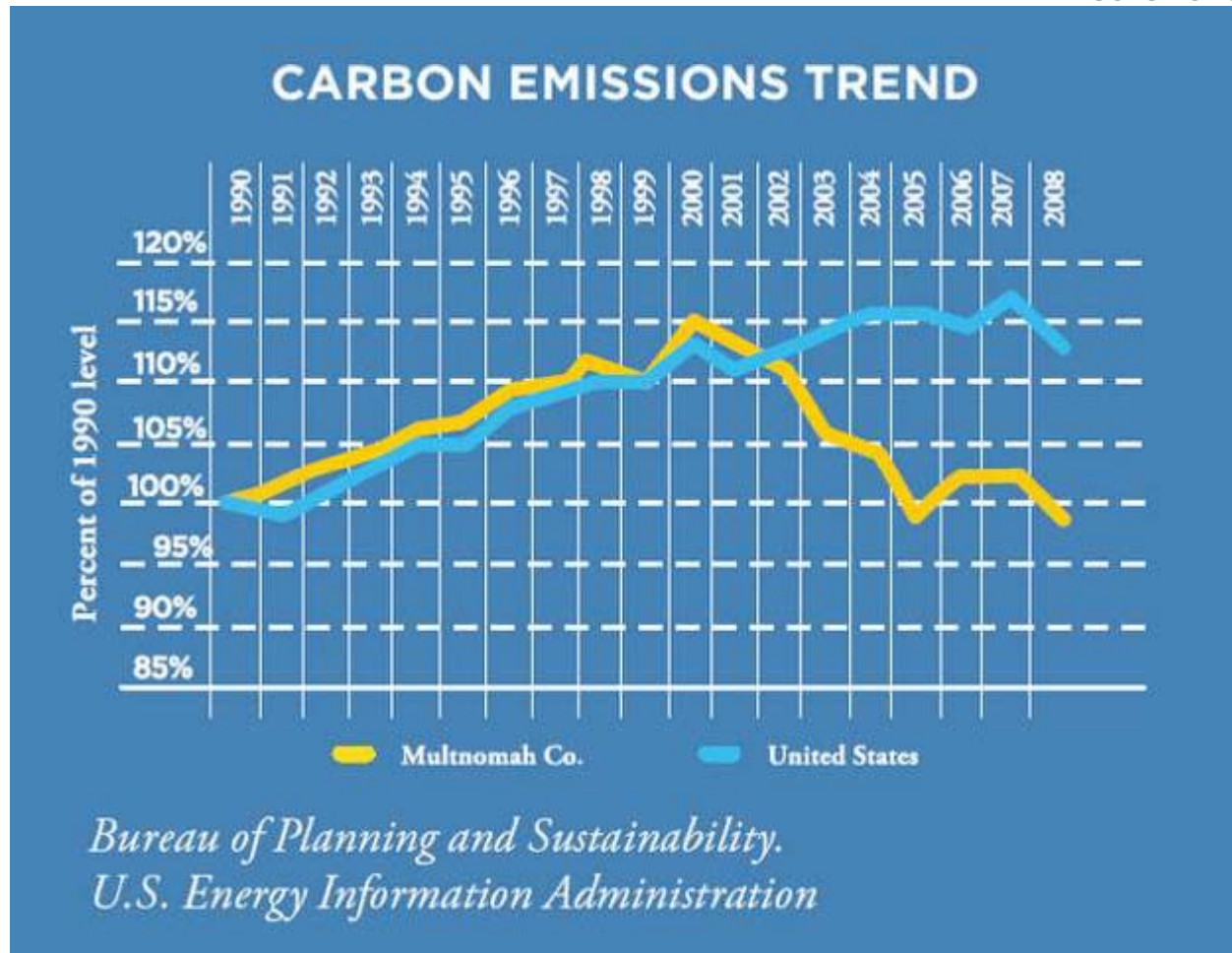
Portland's Green Reputation

REAL SOLUTIONS FOR CLIMATE CHANGE

- Transit ridership has doubled since 1990
- Bicycle commute rate is eight times the national average.
- Diesel sold in the city includes at least five percent biodiesel and gas is 10% ethanol.
- Hybrid car penetration rate is highest in the nation.

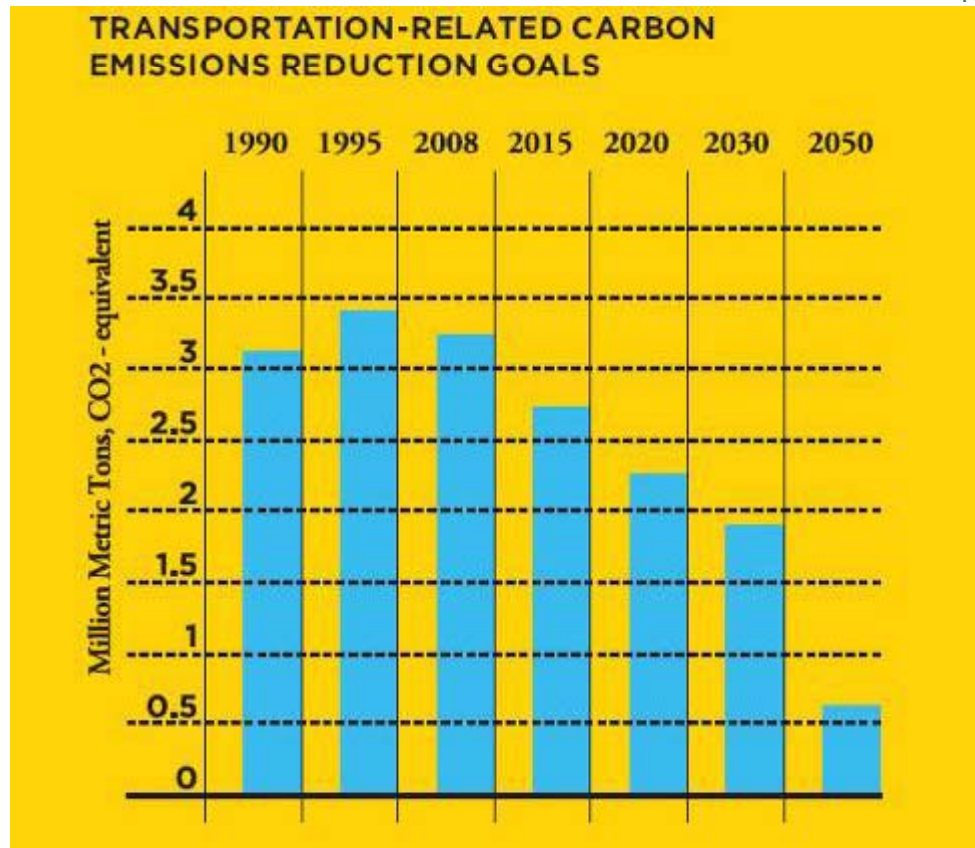
Our Region's Efforts

REAL SOLUTIONS FOR CLIMATE CHANGE



Emissions Reduction Goals

REAL SOLUTIONS FOR CLIMATE CHANGE



Source: Climate Action Plan, City of Portland,
<http://www.portlandonline.com/bps/index.cfm?c=49989&a=268612>

Example Projects

REAL SOLUTIONS FOR CLIMATE CHANGE

- Pedestrian/Bicycle Prioritization
- Signal Priority
 - Light rail
 - Buses
 - Trucks
- Signal Retiming with focus on GHG reduction
 - Climate Trust Partnership

Pedestrian/Bicycle Prioritization

REAL SOLUTIONS FOR CLIMATE CHANGE

- Leading pedestrian intervals (LPIs) seek to elevate pedestrians to the top of the triangle



Innovations in Ped/Bike Control

REAL SOLUTIONS FOR CLIMATE CHANGE

- Improved information for peds at signals
- Bicycle only signals
- Innovative facility design



Transit Signal Priority

REAL SOLUTIONS FOR CLIMATE CHANGE

- Smart Bus knows status related to schedule
- Traffic signals accept calls, allows early green and/or green extension as necessary
- Signal priority settings accept delay to motorists
 - Policies support an aggressive stance for reducing bus delay
- Project has yielded faster transit travel times and improved on-time performance

Freight Signal Priority

REAL SOLUTIONS FOR CLIMATE CHANGE

- Detection system identifies length of vehicle to distinguish “truck”
- Traffic signals accept calls
- Priority settings extend green for approaching trucks
- Benefits include reduced pavement wear and red light running

Signal Retiming for GHG

REAL SOLUTIONS FOR CLIMATE CHANGE

- Relationship to retire carbon offsets resulted from retiming signals



Signal Retiming for GHG

REAL SOLUTIONS FOR CLIMATE CHANGE

- Goal: eliminate 151,000 metric tons of CO₂
 - Equivalent to taking 27,600 vehicles off the road for a year
 - Projected CO₂ savings were based on previous retiming projects
 - Number of traffic signals
 - Average daily traffic (ADT)
 - Corridor length
 - Fuel savings (reported by Synchro)

Next Steps

REAL SOLUTIONS FOR CLIMATE CHANGE

- Make connections between transportation operations actions and GHG emissions
- Use GHG to guide transportation project selection using policies derived in Climate Action Plan

For copies of these slides and webinar recording, go to AASHTO's website:
http://environment.transportation.org/center/products_programs/climate_change_webinars.aspx

For more information on climate change, go to AASHTO's website:
<http://realsolutions.transportation.org/Pages/default.aspx>

Thank you!