



**Greater Boston Breathes Better Initiative
(GB3)
&
MIT-Cambridge Clean Diesel Collaborative**

ADVANCING VOLUNTARY ACTION

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What is Greater Boston Breathes Better (GB3)?

- GB3 is a new **voluntary partnership** program to improve Boston's air quality by reducing air pollution and air toxics from **transportation sources** in the Boston area.
- It is a **collaborative** effort among government, the private sector, institutions and non-profit organizations.
- Seeks to engage participants in **creative projects** that reduce transportation related air pollution.
- Seeks to reduce air pollution from mobile sources primarily by increasing participation in **EPA and local voluntary transportation programs**.





Who Is Involved?

The core management team running the GB3 initiative is made up of representatives from:

- US EPA
- City of Boston
- Massachusetts Executive Office of Environmental Affairs
- Consensus Building Institute (CBI)





Who Is Involved?

Current Working Group Membership Includes:

- ABC Transportation Management Association
- Asthma Regional Council
- Boston Consortium
- Boston Foundation
- Burke Oil Company
- Campus Consortium for Environmental Excellence
- Consensus Building Institute
- Charles River TMA
- City of Boston
- City of Cambridge
- City of Medford
- City of Somerville
- CommuteWorks/MASCO
- Environment Northeast
- Environmental Defense
- EPA
- Gillette Company
- Harvard University
- ICLEI
- Kendall Foundation
- MA Bay Transit Authority (MBTA)
- MA Dept. of Environmental Protection
- MA Division of Capital Asset Management
- MA Exec. Office of Environmental Affairs
- MA Port Authority
- Mass. Institute of Technology (MIT)
- NESCAUM
- Paul Revere Transportation
- Skanska Construction
- Sprague Energy
- Tufts University



What Are GB3 Goals?

- **Reduce pollution** from transportation sources such as cars, trucks, buses, trains, boats, and construction equipment in the Boston area.
- **Improve public health** and quality of life in the region.
- **Keep Boston in attainment** of the health-based air quality standard for fine particles, and help the area attain the standard for ground-level ozone.
- **Reduce public exposure** to air toxics.
- **Build a network** of innovative leaders.
- **Share lessons learned** in Boston so that other communities can implement similar campaigns to reduce air pollution from transportation sources.
- **Increase benefits** of existing voluntary programs.



How Are They Achieving These Goals?

- **Highlighting the work** of Boston area organizations already implementing effective programs to reduce transportation related air pollution.
- **Increasing participation** in local, state, and federal voluntary transportation programs.
- **Convening events** to share information and inspire additional action.
- **Involving new partners** in projects to reduce air pollution and air toxics.
- **Sharing information** about available funds from government, private institutions, foundations and other sources to launch innovative projects.
- **Identifying resources** for technical assistance.
- **Providing recognition** and publicity for participants who achieve success.





What Types of Activities Do They Promote?

- **Reducing pollution from diesel trucks and buses**
 - Anti-idling outreach
 - Retrofit diesel engines with pollution controls
 - Use of cleaner fuels
- **Reducing pollution from construction equipment**
 - Developing policy language to encourage pollution reductions from construction equipment used in and around Boston
 - Identifying financial incentive structures to facilitate the use of retrofits and cleaner fuels
- **Reducing pollution from ports**
 - Encouraging pollution reductions from diesel equipment used at ports as well as marine vessels (through anti-idling, retrofits and cleaner fuels)
- **Reducing pollution from commuter vehicles**
 - Increasing the number of Boston area companies actively promoting the use of transit, vanpools, carpools, and other measures to reduce commuter trips





What Have They Achieved?

Organized Workshops for:

- Shuttle Bus Fleet Operators
- Construction Industry
- School Buses
- Colleges and Universities

Developed Outreach Materials

- GB3 Brochure
- Website - (<http://www.epa.gov/ne/eco/gb3>)
- Vehicle Stickers
- Shuttle Bus Fact Sheet
- Sample Construction Contract Language
- Anti-Idling Fact Sheet





Catalyzed New Projects:



Diesel Retrofits:

- MBTA Commuter Trains
- City of Cambridge/Massachusetts Institute of Technology Vehicles
- Massport Conley Container Terminal Vehicles
- Promoting marine engine retrofits and cleaner fuel use

Construction Bid Specifications:

- MA Highway Department requires retrofits on all construction projects statewide
- MA Bay Transportation Authority requires retrofits on all transit construction projects
- GB3 developed model bid-specs and is sharing with other institutions

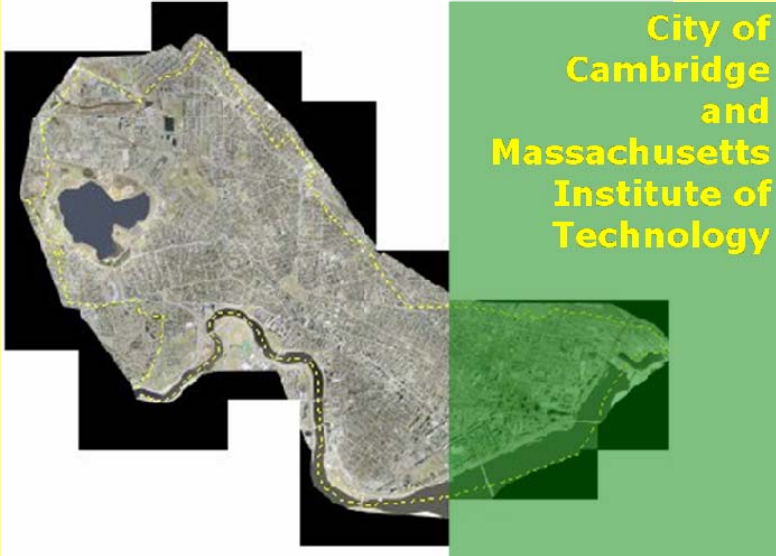
Model Cities:

- Model Cities encourages cities and towns to take additional steps to reduce transportation related emissions
- GB3 is working with Somerville and Cambridge to obtain commitments for one or more projects by fall 2005





MIT-Cambridge Clean Diesel Collaborative



City of
Cambridge
and
Massachusetts
Institute of
Technology



Clean Diesel
Collaborative
For A Healthier
Cambridge



Massachusetts
Institute of
Technology

- Made possible through a grant from the EPA Voluntary Diesel Retrofit Program
- Direct result of MIT's participation in Greater Boston Breathes Better
- GB3 provided leadership, information, sense of priority, networking opportunities, and technical assistance to drive action





A New Collaboration



The MIT – Cambridge Clean Diesel Collaborative for a Healthier Cambridge:

- A new partnership created by the Massachusetts Institute of Technology’s **Environmental Programs Office** and the **Department of Facilities**, and the City of Cambridge’s **Department of Public Works (DPW)**.
- Designed to take-on the challenge of reducing diesel engine pollution in diverse fleets through the application of advanced pollution control diesel retrofit equipment.
- It was designed specifically to mitigate the negative health impacts on the City’s most vulnerable populations: the elderly, children, chronically ill, and communities that are exposed to a disproportionate share of the environmental burden.
- Committed to sharing our lessons learned with others.





A Diverse Fleet

- The two-year project will retrofit approximately 34 diverse heavy- and medium-duty diesel vehicles within the Department of Public Works and MIT's fleets.
- In a two-phase implementation plan, our project intends to reduce per vehicle emissions 40 to nearly 70%, depending on the technologies selected. All of our vehicles operate in areas with a significant proportion of sensitive populations, including many environmental justice communities.



A Bundled Approach

- Demonstrating the use of individually verified technologies in an unverified suite of retrofit applications.
- This packaging of retrofit technologies seeks to leverage the individual benefits to achieve high levels of cost-effective emissions reductions. We are examining bundling oxidation catalysts or CCRT particulate filters, crankcase filters, and cetane enhancers with the use of biodiesel (B20).
- By designing packages of individually verified technologies, we are able to address the unique challenges and requirements posed by retrofitting diverse public and private diesel fleets.
- Emphasis on training of our fleet mechanics, communicating the lessons learned, and promoting community outreach to make retrofitting more common.



Retrofit Technologies

Retrofit Package	Verified Percent Pollutant Reduction				No. of Vehicles
	Particulate Matter	Carbon Monoxide	Nitrogen Oxides	Hydro Carbons	
1. Biodiesel	9.4%	9.4%	-2%	13.4%	33
Oxidation Catalyst and Crankcase Filter	32%	31%		14%	
Cetane Enhancer	+		5%		
Total Per Vehicle Percent Emission Reduction Using This Retrofit Package	41.4%	40.4%	3%	27.4%	
2. Ultra Low Sulfur Biodiesel	9.4%	9.4%	-2%	13.4%	1-2
CCRT Particulate Filter	60%	60%		60%	
Cetane Enhancer	+		5%		
Total Per Vehicle Percent Emission Reduction Using This Retrofit Package	69.4%	69.4%	3%	63.4%	

Retrofit Package 1.

- Use of biodiesel (B20) alternative fuel
- Installation of a diesel oxidation catalyst
- Installation of a crankcase emission filter
- Utilization of a cetane enhancer to reduce NOx emissions

Retrofit Package 2.

- Use of biodiesel (B20) alternative fuel (with ultra-low sulfur diesel)
- Installation of a catalyzing and continuously regenerating (CCRT) particulate matter filter
- Installation of a crankcase emission filter
- Use of a cetane enhancer to reduce NOx emissions



Vehicle Inventory

Fleet	Type of work	Make	Model	Year	Engine	Cyl	Type	Duty cycle	Retrofit Package
DPW	Sanitation Packer (Garbage)	International	4900	1991	DT-466	6	Turbo	8hrs/day	BD, DOC, CF, CE
	Sanitation Packer (Garbage)	International	4900	2002	DT-466E	6	Turbo	8hrs/day	BD, DOC, CF, CE
	Dump Truck, construction and salting	International	7400	2004	DT-466E	6	Turbo	8hrs/day	BD, DOC, CF, CE
	Dump Truck, construction	International	S-1600	1988	7-3Litre	8	Nonturbo	8hrs/day	BD, DOC, CF, CE
	Sewer Cleaning Vactor, Jetter	International	2654	2001	DT530	6	Turbo	8hrs/day	BD, DOC, CF, CE
	Construction Work	John Deere	410G Backhoe	2003	DT276CI	4	Turbo	8hrs/day	BD, DOC, CF, CE
MIT DOF	Dump Truck, Grounds	Mitsubishi	FE6	2003	4M50-1AT2	4	Turbo	3hrs/day	ULSBD, PM, CF, CE
	Bobcat, Landscaping, snow removal	Isuzu	853	1994	4JB1PK-03	4	Nonturbo	3hrs/day	ULSBD, DOC, CF, CE
	Front loader, Landscaping, snow removal	Ford New Holland	340B	1989		3	Nonturbo	3hrs/day	ULSBD, DOC, CF, CE
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Conclusions

- **Innovative EPA programs were a tremendous catalyst** for voluntary action (both GB3 and Voluntary Diesel Retrofit Program).
- **GB3 has been effective** because it targeted specific stakeholders, articulated a sense of priority, provided information, and created network opportunities.
- **By demonstrating success and challenging partner institutions FACE-TO-FACE** to do more, GB3 engendered a joint sense of ownership of the problems & solutions.

For retrofit projects:

- EPA grant programs clearly drive action.
- Diverse vehicle fleets can be a challenge to retrofit due to multiple configurations.
- Because many voluntary retrofit projects are developed by staff without specific knowledge in diesel technologies, choosing the most appropriate technology in a timely fashion can be a real challenge.
- While EPA grants offer tremendous opportunity, grant conditions can be complicated, particularly in procurement.
- Retrofit projects can energize diverse groups to work collaboratively within an organization – and across town!
- Can generate very positive community feedback and support.



For more information:

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