

FOIA MARKER

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Collection/Record Group: Clinton Presidential Records
Subgroup/Office of Origin: Office of Environmental Initiatives
Series/Staff Member: Roger Ballentine
Subseries:

OA/ID Number: 19512
FolderID:

Folder Title:
Climate Change Other 21st Century Trucks [1]

Stack:	Row:	Section:	Shelf:	Position:
S	62	1	1	3

Henry Page

2:30

888 437 8290

703-528-6388

4572

Morty has

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phone - he'll

call you right back

21st Century Truck

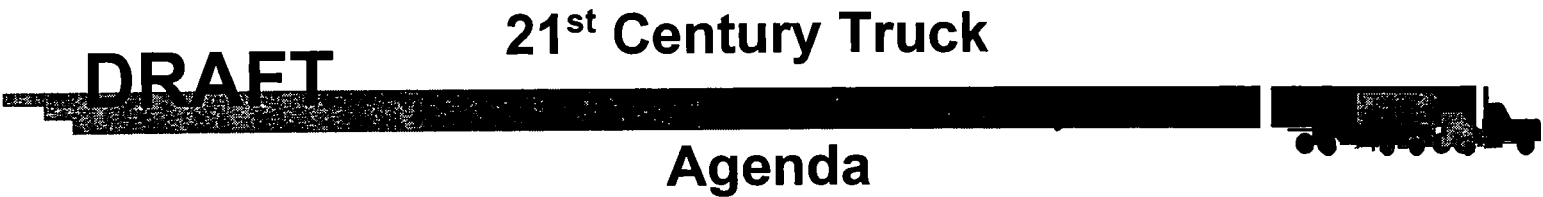


Meeting Purposes

- ☐ **Reach consensus agreement on the membership for the Partnership Coordinating Committee (PCC).**
- ☐ **Reach consensus on the technical direction of the 21st Century Truck Program.**
- ☐ **Agree in principle with organizational approach and assign team to develop details.**

DRAFT 21st Century Truck Agenda

DRAFT 21st Century Truck Agenda



DRAFT 21st Century Truck Agenda

- # DRAFT 21st Century Truck Agenda

DRAFT

21st Century Truck



Agenda (cont'd)

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Industry Tom Vach

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Government

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Tom Gross

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21st Century Truck

**An Industry-Government Research Partnership
PROGRAM STATUS AND HIGHLIGHTS**

**T.J. Glauthier
Deputy Secretary
U.S. Department of Energy**

**Partnership Coordinating Committee
October 25, 2000**

21st Century Truck Activities



Date	Purpose
April 21	Vice President Gore Announces 21CT, Romulus, MI
May 23	Government Organizational Meeting
May 31	2 nd Government Organizational Meeting
June 9	1 st Government/Industry Meeting
June 14	1 st Industry Only Meeting
June 14	Government/Industry Meeting
June 27	Tech. Review of Vehicle Efficiency Goals, Chicago, IL
July 6	1 st Gov't/Industry Roadmap Meeting, Chicago, IL
July 12	Industry Only Meeting, Southfield, MI
Aug. 2	2 nd Technology Roadmap Meeting, Seattle, WA
Aug. 8	Industry Only Meeting
Aug. 9	Government/Industry Organizational Meeting
Aug. 25	3 rd Technology Roadmap Meeting, San Diego, CA
Sept. 12	Industry Only Meeting
Sept. 13	4 th Technology Roadmap Meeting
Oct. 10	Industry Only Meeting
Oct. 11	5 th Technology Roadmap Meeting

21st Century Truck



Government Participants in Technology Roadmap

- **Department of Energy**
- **Department of Transportation**
 - **Department of Defense**
- **Environmental Protection Agency**
- **Office of Science and Technology Policy**
 - **Office of Management and Budget**

21st Century Truck



Excellent Support from Industry

Industry Participants in 21CT Technology Roadmap Development

Allison

BAE SYSTEMS Controls

Caterpillar

Cummins

DaimlerChrysler

Detroit Diesel

Eaton

Freightliner

GM

Honeywell

International

ISE Research

Mack

NovaBUS

Oshkosh

Paccar

Volvo

Western Star

TMA

EMA

DRAFT

21st Century Truck



Federal Resources for Truck R&D

(\$ in millions)

	FY2000	FY2001
DOE	59.5	70.7
DOT	28.1	23.1
DOD/Army	18.3	37.2
EPA	0	TBD*
TOTAL	105.9	131.0*

*FY2001 Appropriations Bill unresolved

21st Century Truck



21CT Return on Investment Considerations

- ❑ **A Unique Convening Forum for Industry Stakeholders**
- ❑ **A Mechanism to Coordinate support by Government**
- ❑ **A New Partnership Model**
- ❑ **Technology Roadmap Accomplished by Industry/Government Working Group**
- ❑ **Leveraging of Public/Private R&D Expenditures**
 - Cost Effective
 - “Leap Frog” Effect

21st Century Truck



Technical Accomplishments *21CT Technology Roadmap*

- ❑ **Excellent contributions – good technical information**
- ❑ **Contributions received from most SubTeams**
- ❑ **Initial draft mailed October 6th**
- ❑ **Review process underway**

21st Century Truck



Technology Roadmap Major Elements

- ❑ Large Truck: Tractor-Trailer – Vehicle Efficiency, Emissions, Truck-Related Safety, Alternative Fuels, DOD Specific Needs
- ❑ Large Vehicle: Transit Bus (same subsections as above)
- ❑ Medium Truck: Enclosed, Single Axle Delivery Truck (same subsections as above)
- ❑ Small Truck: Delivery Van or “Working Pickup” >8500 lbs. (same subsections as above)
- ❑ Crosscutting Technologies: Aftertreatment, Auxiliary Power, Fuel Cells, Hybrid Electric Powertrains, Internal Combustion Engine, etc.

21st Century Truck



Technical Challenges *21CT Technology Roadmap*

- ❑ **Some disparity between goals and technical targets.**
- ❑ **Technical targets for medium truck platform section are still in process.**
- ❑ **Progress is slower than anticipated in the small truck platform section.**

21st Century Truck



Organizational Accomplishments

- ☐ **Proposal for composition of the Industry side of the PCC**
- ☐ **Proposal for composition of the Government side of the PCC**
- ☐ **The Industry Working Group has self-organized and meets on a regular basis**
- ☐ **Designated a Program Coordination Office (PCO) Executive Director**

21st Century Truck



Organizational Challenges

- ☐ **Defining and implementing a new organizational model**
- ☐ **Enhance coordination/cooperation among the stakeholders**
- ☐ **Early involvement of non-governmental organizations promoting environmental/ safety issues.**

21st Century Truck

An Industry-Government Research Partnership
Partnership Coordinating Committee

Roger Ballentine

Deputy Assistant to the President

Environmental Initiatives

Declaration of Intent

October 25, 2000



Declaration of Intent

Joint Vision

*Importance of this Industry
to economy to national security*

A productive, innovative U.S. trucking and supporting industry is essential for economic prosperity of every American business.



Declaration of Intent

Public Policy Imperative/Private Sector Demand

Trucking industry's future depends on ability to produce affordable, high quality, safe, environmentally sensitive products.

- ❑ **Innovation needed** for U.S. truck manufacturers and suppliers to remain competitive worldwide;
- ❑ New truck and bus technologies will help truck owners and operators, and their customers **cut fuel and operating costs and increase safety**;
- ❑ DOD would share gains and benefit from **reduced logistic costs** of transporting fuel during operations.

Why a partnership?
- good for industry
- governmental
societal benefits

Declaration of Intent



Mutual Agreement

The trucking industry and the Federal government declare their separate, but coordinated plans toward the achievement of specific goals to meet the nation's need and desire for tomorrow's cleaner, safer, and more efficient trucks.

Declaration of Intent

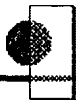


Research Objectives

Develop production prototype vehicles that:

- ❑ Improve fuel efficiency, specifically, by 2010;
 - ⌚ double the Class 8 long-haul truck fuel efficiency*;
 - ⌚ triple the Class 2b and 6 truck (delivery van) fuel efficiency*; and
 - ⌚ triple the Class 8 transit bus fuel efficiency*;
- ❑ Exceed expected emissions standards for 2010;
- ❑ Meet or exceed motor carrier safety goal of reducing truck fatalities by half in ten years; and
- ❑ Enhance affordability, and maintain or enhance performance.

* on a ton-mile per gallon basis



Angela C. Mizeur

10/24/2000 01:37:04 PM

Record Type: Record

To: Pat.Flaherty@ee.doe.gov
cc: Roger S. Ballentine/WHO/EOP@EOP
bcc:

Subject: Re: A draft of a presentation to be made by Roger Ballentine to the October 25th PCC--URGENT RESPONSE REQUIRED Roger and Angela, As you know I've sent several e-mails, copies appended, and called a number of times regarding Roger's presentation to the October 25th PCC Meeting. It is not that I want to bother you in any way, and I am certain that both of you have very busy schedules. I do, however, want to make sure that Roger is appropriately represented and staffed at this meeting, given that we will have 16 Vice Presidents and additional 17+ senior level representatives of the light, medium, and heavy duty truck and buss manufacturers and their top tier suppliers in attendance at this meeting. The turn out has been nothing less than fantastic, and no doubt you will be pleased to see both the organizational and technical progress that has been made since the Vice President announced the program on April 21st. All of the other presentations that will incorporate overheads have been received. These include Morley Winograd's, T.J. Glauthier's, Paul Hoepfer's Tom Vachon's, Tom Gross/Ron York's, and Ron Bradley. The only lingering question is whether the proposed overheads regarding the Declaration of Intent are ones that Rodger would like to use. Currently we are finalizing an extensive briefing book which will be bound and given to each of the meeting participants. If you would like to use these overheads and have them incorporated in the book, we need to know by no later than 2:00PM today. Thank you for your consideration in this matter. Regards, Pat Angela, Any status on whether or not Roger would like to use the prepared presentation ? Any changes ? Status of schedule. Please let me know at your earliest convenience. Thanks, Pat _

Angela, Appended are the following: a copy of T.J. Glauthier's presentation for the October 25th PCC meeting (note: it also contains the purpose of the meeting and a meeting agenda) and a copy of proposed overheads for Roger Ballentine's presentation. As I verbally indicated to you nearly all of the presentors will have overheads that compliment one another. Please let me know if you are in agreement with them. Once they are approved, per the request of industry they will be distributed in advance of the meeting. If you have questions I can be reached on 734-604-1346.
Regards, Pat Flaherty 

I think it is ok with him-but per my voice mail message, he is double checking . I will call you as soon as I know.

Pat.Flaherty@ee.doe.gov



Pat.Flaherty@ee.doe.gov

10/24/2000 01:13:25 PM

Record Type: Record

To: Angela C. Mizeur/WHO/EOP, Roger S. Ballentine/WHO/EOP
cc: T.J.Glauthier%HQMAIL%HQDOE@ee.doe.gov, Dan.Reicher@ee.doe.gov, Tom.Gross@ee.doe.gov, James.Eberhardt@ee.doe.gov

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----- Forwarded by Pat Flaherty/EE/DOE on 10/24/2000 12:53 PM

(Embedded image moved to file: pic28619.pcx)
Pat Flaherty
(Embedded image moved to file: pic24787.pcx)
10/22/2000 04:55 PM

To: angela_c._mizeur@who.eop.gov
cc: roger_s._ballentine@who.eop.gov

Subject: A draft of a presentation to be made by Roger Ballentine to the
October 25th PCC

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----- Forwarded by Pat Flaherty/EE/DOE on 10/22/2000 04:52 PM

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Pat Flaherty

(Embedded image moved to file: pic20537.pcx)

10/20/2000 01:50 PM

To: angela_c._mizeur@who.eop.gov

cc: roger_s._ballentine@who.eop.gov

Subject: A draft of a presentation to be made by Roger Ballentine to the
October 25th PCC

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Regards,

Pat Flaherty

(See attached file: TJ PCC Presentation revised 10-19-00.ppt)(See attached file:
Roger Ballentine Presentation to PCC 10-25-00.ppt)



- pic28619.pcx



- pic24787.pcx



- pic07892.pcx



- pic20537.pcx



- TJ PCC Presentation revised 10-19-00.ppt



- Roger Ballentine Presentation to PCC 10-25-00.ppt

Fax
GT734

United States Senate

COMMITTEE ON ARMED SERVICES

WASHINGTON, DC 20510-6060

October 20, 2000

Received
10/30/00
OSTP

The Honorable Bill Richardson
Secretary of Energy
1000 Independence Ave., S.W.
Washington, DC 20585

Dear Secretary Richardson:

I understand that the Administration is currently considering the inter-agency organizational structure for the 21st Century Truck Initiative announced by Vice President Gore on April 21, 2000. I know the Defense Department, particularly the Army, created the initiative and has had an instrumental role in defining and designing it in a manner that is intended to optimize the benefits to our military and civilian sectors.

Given this important role, I believe it is essential that the Department of Defense continue to play a leading role in the inter-agency organization for the 21st Century Truck Initiative, especially to preserve the security benefits to our military from improving the Army's tactical truck fleet. As you know, the Army has the largest truck fleet in the US government, with over 250,000 vehicles in service, and the Army has nearly \$3 billion in annual truck-related procurement and operating expenses.

Modernizing these trucks in partnership with commercial industry will help the Army in its transformation to a future force able to protect US security into the 21st Century. This effort will also contribute to the modernization of the commercial truck fleet in the US, leading to significant economic, fuel-efficiency, environmental and safety benefits for the nation.

Given the Army's requirements, I feel very strongly that the Defense Department should, at a minimum, lead the Program Coordination Office for the 21st Century Truck Initiative, and should designate a representative to direct that office. I believe this will help ensure that the 21st Century Truck Initiative can best achieve its objectives and provide a crucial improvement in military and commercial vehicles alike.

I appreciate your leadership on this initiative and look forward to working with you to make the 21st Century Truck Initiative a success. I am sending a similar letter to Secretary Cohen.

Sincerely,



Carl Levin
Ranking Minority Member

cc: Honorable William S. Cohen
Neal Lane, OSTP

*Bill -
this is an
important
subject to talk
about with you about*

16:08

SASC-MINORITY

TEL: 202 228 1387

P. 003

JOHN MARNEY, MINORITA, CHAIRMAN

SEN. SOUTH CAROLINA

SEN. MISSISSIPPI

SEN. ALABAMA

SEN. MISSOURI

SEN. CALIFORNIA

SEN. PENNSYLVANIA

SEN. MAINE

SEN. KANSAS

SEN. OREGON

SEN. ARIZONA

SEN. ALABAMA

CARL LEVIN, MINORITA

SEN. MASSACHUSETTS

SEN. NEW JERSEY

SEN. NEW YORK

SEN. VIRGINIA

SEN. CONNECTICUT

SEN. GEORGIA

SEN. LOUISIANA

SEN. MISSISSIPPI

LEE BROWNE, STAFF DIRECTOR
AND S. (V) STAFF DIRECTOR FOR THE MINORITY**United States Senate**

COMMITTEE ON ARMED SERVICES

WASHINGTON, DC 20510-6050

October 30, 2000

The Honorable William S. Cohen
Secretary of Defense
1000 Defense Pentagon
Washington, DC 20301-1000

Dear Secretary Cohen:

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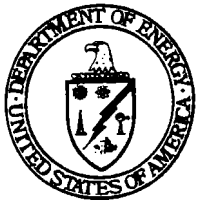
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Sincerely,



Carl Levin
Ranking Member

cc: Honorable Bill Richardson
Neal Lane, OSTP



Department of Energy

Washington, DC 20585

July 28, 2000

Mr. William Leasure
Truck Manufacturers Association
21st Century Truck Industry Working Group
1225 New York Avenue NW, Suite 300
Washington, DC 20005-6156

Dear Mr. Leasure:

Thank you for your letter of July 21, 2000, regarding the status of the 21st Century Truck Initiative. We are pleased that industry is supportive of the initiative and that there have been several industry-only meetings held for the purpose of discussing the industry organizational structure. We understand that the companies participating are quite diverse; this, combined with the different truck types and buses to be addressed, does provide a range of issues to be resolved. Arriving at consensus will certainly be a challenging but ultimately a highly beneficial process.

We agree that it is important to have adequate advance notice of meetings, and our intent as the initiative matures will be to provide as much notice as possible. Ideally, government and industry participants will soon be jointly planning all activities. However, we feel, from experience with other government-industry partnerships, that early interactions at the executive level are essential to establishing a firm foundation for sustaining the program. In many cases, extensive executive-level interaction occurred prior to announcement of the joint effort. We believe, therefore, that it is important to continue with the August 9th meeting as announced.

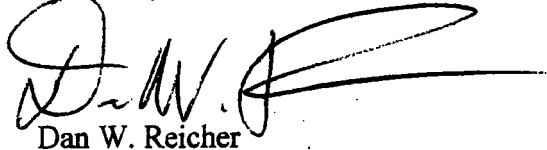
An issue which we have included on the agenda, and which needs to be addressed by senior level executives, is the consolidation that is occurring in the trucking industry. This consolidation needs to be accurately and fairly reflected in the makeup of the 21st Century Truck participating companies.



Printed with soy ink on recycled paper

For these and other reasons, we are hopeful that executives from your companies will choose to participate in the meeting.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Dan W. Reicher', with a long horizontal flourish extending to the right.

Dan W. Reicher
Assistant Secretary
Energy Efficiency and Renewable Energy

cc: M. Winograd, The White House
R. Ballentine, The White House
T. Gross, Department of Energy

THE WHITE HOUSE

Office of the Vice President

For Immediate Release
Friday, April 21, 2000

Contact:
(202) 456-7035

VICE PRESIDENT GORE ANNOUNCES AGREEMENT WITH MAJOR TRUCK MANUFACTURERS TO DEVELOP SUPER FUEL-EFFICIENT TRUCKS AND BUSES

Detroit, MI -- Vice President Gore announced today a new research partnership with many of the nation's largest heavy-duty engine and truck companies to develop super fuel-efficient vehicles that will dramatically improve America's fuel economy while cutting greenhouse gases and other air pollution. *and create jobs.*

"This new technology will reduce our consumption of foreign oil, clean our air and ultimately make our roads safer," Vice President Gore said. "The heavy truck manufacturing industry deserves great credit for pledging to work with this Administration to create trucks and buses that are cleaner, safer and more economical. We have learned that a strong economy and a safe environment go hand in hand."

The goal of the 21st Century Truck Initiative is to develop revolutionary technologies for increasing the fuel economy and safety of four specific classes of commercial trucks and buses, which account for more than 90% of all fuel used by all such vehicles in the U.S. This partnership to develop advanced technologies is designed to lead, within 10 years, to "production prototypes" that:

- Triple the fuel economy of heavy pickups, large delivery vans, and full-sized passenger buses;
- Double fuel economy for 18-wheeler long-haul trucks;
- Improve safety ;
- Achieve superior operational performance and lower costs for truckers;
- Exceed expected emission requirements for 2010 by making major reductions in NOx, particulates, and other local air pollutants.

The initiative will also strengthen our national security by dramatically cutting operational support costs and increasing combat effectiveness. As the U.S. Army transforms itself to be a lighter, more mobile force (70% of the bulk tonnage needed to sustain the Army during a conflict is fuel), the rapid integration of advanced commercially viable technologies into trucks is vital.

The Administration's FY2001 budget proposes to increase spending in areas supporting 21st Century truck research by \$47 Million to a total of \$142 Million--a 48% increase. Research priorities, which will be developed in cooperation with industry partners, will include

advanced engines, fuel cells, lightweight materials, advanced propulsion technologies, vehicle design, and advanced emission control and vehicle safety systems.

" Now is the time to lead the world in the emerging market for more fuel-efficient vehicles of all kinds, " the Vice President said.

The new partnership links many of the nation's largest manufacturers of heavy trucks and truck components with research teams in four federal agencies: the Departments of Defense (represented by the U.S. Army), Energy, Transportation, and the Environmental Protection Agency. Industry participants are: Mack Trucks, Oshkosh Trucks, Paccar, Volvo Trucks North America, Cummins Engine Company, Caterpillar, Detroit Diesel Corporation, Eaton Corporation, and Lockheed Martin Control Systems.

###

**A Declaration of Intent
Twenty-First Century Trucks
Final Version – 22 March 2000**

SUMMARY

The United States trucking and supporting industries, are pleased to join with the President on behalf of the Federal government and the Departments of Defense, Energy, and Transportation, and the Environmental Protection Agency in this Declaration of Intent to form a research and development partnership. This partnership will seek to develop and demonstrate commercially viable truck and propulsion systems technology that will dramatically cut the fuel use and emissions of medium and heavy trucks and buses, while enhancing their safety and affordability and maintaining or enhancing performance. These innovations will ensure safe and affordable freight and bus transportation for the nation's economy, ensure the competitiveness of U.S. truck and bus manufacturing facilities, improve our nation's air quality, and reduce U.S. dependence on petroleum fuel.

SHARED VISION

A productive, innovative U.S. trucking and supporting industry is essential for the economic prosperity of every American business. Innovation is also needed to ensure trucking manufacturers and suppliers located in the U.S. remain competitive in world markets and continue to provide rewarding employment opportunities for large numbers of Americans. U.S. manufacturing facilities face stiff worldwide competition. New truck and bus technologies will help truck owners and operators and their customers cut fuel and other operating costs, and increase safety. The Department of Defense, a major owner and operator of trucks, would share these gains and also benefit from reduced logistics costs associated with transporting fuel during operations. The trucking and supporting industries face a range of new challenges: increasingly stringent emissions standards, new concerns about the threat of global warming, concerns about U.S. fuel supplies, increased expectations about safety, and more. The trucking industry's future depends on its ability to produce affordable, high-quality, safe, environmentally sensitive products.

The new challenges can be best met if government, industry, and universities work together to develop an improved generation of commercial trucks for our nation's commercial and military truck fleet. Given adequate support, major advances can be expected in advanced engine designs, stronger, lighter-weight materials, regenerative braking, more efficient power transmission, and alternative fuels.

By this document, the trucking industry and the Federal government declare their separate, but coordinated plans toward the achievement of specific goals to meet the nation's need and desire for tomorrow's cleaner, safer, and more efficient trucks.

PROGRAM GOALS

The program strategy creates a balanced portfolio of research and development to pursue a number of goals simultaneously, while avoiding duplication. The program will develop and demonstrate commercially viable technologies to:

- Improve fuel efficiency,
- Reduce emissions,
- Enhance safety,
- Reduce total owning and operating costs, and
- Maintain or enhance performance.

Making progress in each of these goals simultaneously is a major challenge. The Federal government and the trucking and supporting industries will work actively together to develop a balanced portfolio of research aimed at achieving all of these goals, coordinate their research activities as appropriate, and make effective use of the nation's research universities and national laboratories. Proprietary research agreements between individual companies and federal agencies, which cannot be shared with industrial competitors, will continue to be appropriately funded.

The Federal agencies will build on existing research and assign a high priority to major new research in this area and seek increased funding commensurate with the research required to meet the aggressive goals of the Initiative. Industry will move research achievements into production vehicles rapidly when their commercial viability has been demonstrated. The partnership will work closely with fuel producers to accelerate the development and production of any new fuels required by new engine designs to meet the program goals.

RESEARCH OBJECTIVES

This research partnership will support research aimed at developing production prototype vehicles that achieve all of the following objectives:

(a) Improve Fuel Efficiency of Heavy-Duty Trucks and Buses, specifically:

- Double the Class 8 line haul truck fuel efficiency by 2010 on a ton/miles per gallon basis.
- Triple the Class 2b and 6 truck (delivery van) fuel efficiency by 2010 on a ton/miles per gallon basis.
- Triple the Class 8 transit bus fuel efficiency by 2010 on a ton (passenger)/miles per gallon basis.

(b) Reduce Emissions:

- Exceed standards for oxides of nitrogen, particulate matter, carbon monoxide and hydrocarbons for the year 2010.

(c) Enhance Safety:

- Meet or exceed the motor carrier safety goal of reducing fatalities by half in ten years.
- Improve the crash friendliness of trucks for other road users
- Conduct operation road tests of truck safety improvement components
- Ensure linkages to the Intelligent Vehicle Initiative and the Intelligent Highway System and Infrastructure.

(d) Enhance affordability, Maintain or Enhance performance.

A central goal of this initiative is to develop cost-effective, heavy-duty vehicles for truck operators that are fully competitive in prevailing markets. The program will document vehicle life-cycle-costs through extensive on-road testing and surveys of user responses. Costs considered will include initial vehicle cost, as well as all operating and maintenance expenses – including fuel costs and the value of high reliability.

These program goals and research objectives are aggressive and there is no certainty that they can be achieved. Achieving the goal may also depend on successful introduction of a new fuel and fuel delivery infrastructure compatible with improved truck and bus designs. Fully aware of the magnitude of the challenge and the importance of meeting the partnership's objectives, the parties commit their best efforts to the achievement of the goals of this Declaration of Intent. Industry also commits to the rapid introduction of commercially viable technology developed under the program.

Government and industry will coordinate research and development efforts and share the costs. Federal agencies are likely to cover a larger fraction of research expenses when the work involves longer-term, high-risk research, while the share of industry funding will be greater for research likely to be converted relatively quickly to commercial products.

The Federal government will promote the introduction of innovative truck technologies developed in the initiative through its own purchases of these trucks and buses, and encourage state government and other purchasers to take similar actions.

NEXT STEPS

Within 30 days, a Partnership Coordinating Committee will be formed which will be responsible for coordinating the Partnership's work. It will include senior representatives of the participating industries, and the Departments of Defense, Energy, Transportation, the Environmental Protection Agency, the Office of Science and Technology Policy, the Council on Environmental Quality, the National Partnership for Reinventing Government, and the Office of Management and Budget. Within 120 days, this Committee will:

1. Develop a strategic research and development plan detailing specific program goals and timetables for the ten-year duration of the Initiative.
2. Coordinate and support research and development teams organized around specific research objectives needed to achieve the programs' goals (such as technologies for improving power-trains, reducing aerodynamic and rolling resistance losses, and reducing vehicle weight). Each team will include both government and industry partners. University participation is encouraged. Competing teams championing different technical approaches to the same program objective will be encouraged when they are appropriate. As technologies move to commercial readiness, some of these partnerships will become research partnerships between individual participating industries and agencies that are not able to share research results with all participants. Provisions will be made to add or remove research projects as needed.

3. Create an overall Cooperative Research and Development Agreement (CRADA) for the partnership and guidelines that will facilitate development and use of CRADAs and other procurement mechanisms such as other transaction agreements involving individual federal agencies and their laboratories.
4. Create an External Advisory Board, acceptable to both industry and the government, consisting of individuals with appropriate expertise in industry, universities, state and local governments, and public interest groups.
5. Establish a peer review process, acceptable to both industry and the government, that assesses technical and program progress.

THE WHITE HOUSE

Office of the Vice President

For Immediate Release
Friday, April 21, 2000

Contact:
(202) 456-7035

VICE PRESIDENT GORE ANNOUNCES AGREEMENT WITH MAJOR TRUCK MANUFACTURERS TO DEVELOP SUPER FUEL-EFFICIENT TRUCKS AND BUSES

Detroit, MI -- Vice President Gore announced today a new research partnership with many of the nation's largest heavy-duty engine and truck companies to develop super fuel-efficient vehicles that will dramatically improve America's fuel economy while cutting greenhouse gases and other air pollution.

"This new technology will reduce our consumption of foreign oil, clean our air and ultimately make our roads safer," Vice President Gore said. "The heavy truck manufacturing industry deserves great credit for pledging to work with this Administration to create trucks and buses that are cleaner, safer and more economical. We have learned that a strong economy and a safe environment go hand in hand."

The goal of the 21st Century Truck Initiative is to develop revolutionary technologies for increasing the fuel economy and safety of four specific classes of commercial trucks and buses, which account for more than 90% of all fuel used by all such vehicles in the U.S. This partnership to develop advanced technologies is designed to lead, within 10 years, to "production prototypes" that:

- Triple the fuel economy of heavy pickups, large delivery vans, and full-sized passenger buses;
- Double fuel economy for 18-wheeler long-haul trucks;
- Improve safety ;
- Achieve superior operational performance and lower costs for truckers;
- Exceed expected emission requirements for 2010 by making major reductions in NOx, particulates, and other local air pollutants.

The initiative will also strengthen our national security by dramatically cutting operational support costs and increasing combat effectiveness. As the U.S. Army transforms itself to be a lighter, more mobile force (70% of the bulk tonnage needed to sustain the Army during a conflict is fuel), the rapid integration of advanced commercially viable technologies into trucks is vital.

The Administration's FY2001 budget proposes to increase spending in areas supporting 21st Century truck research by \$47 Million to a total of \$142 Million--a 48% increase. Research priorities, which will be developed in cooperation with industry partners, will include

advanced engines, fuel cells, lightweight materials, advanced propulsion technologies, vehicle design, and advanced emission control and vehicle safety systems.

" Now is the time to lead the world in the emerging market for more fuel-efficient vehicles of all kinds, " the Vice President said.

The new partnership links many of the nation's largest manufacturers of heavy trucks and truck components with research teams in four federal agencies: the Departments of Defense (represented by the U.S. Army), Energy, Transportation, and the Environmental Protection Agency. Industry participants are: Mack Trucks, Oshkosh Trucks, Paccar, Volvo Trucks North America, Cummins Engine Company, Caterpillar, Detroit Diesel Corporation, Eaton Corporation, and Lockheed Martin Control Systems.

###

As Sent

April 19, 2000

MEMORANDUM FOR THE VICE PRESIDENT

FROM: ROGER BALLENTINE
Deputy Assistant to the President
For Environmental Initiatives

RE: 21st CENTURY TRUCKS INITIATIVE

The 21st Century Trucks Initiative (the "Partnership") is a public-private partnership that could help save the military, businesses, truckers and taxpayers billions of dollars a year in reduced fuel costs, while cleaning the air and reducing greenhouse gas emissions. Modeled after PNGV, 21st Century Trucks aims to create a research and development partnership between the federal government and the medium and heavy truck industry. Its goal is, by 2010, to develop and demonstrate commercially viable technologies to improve fuel efficiency, reduce emissions, enhance safety, reduce total owning and operating costs, and maintain (or enhance) performance.

BACKGROUND

This Partnership is the product of an interagency effort, coordinated by the White House, and involving the Department of the Army, DOE, DOT and EPA. Our interagency team has worked closely with the industry to develop the initiative, including numerous both meetings in Washington and visits to the companies. The Army has been central in developing this Partnership, as they have much at stake. The Army owns about 250,000 trucks, and also buys trucks for the other services. In addition to saving significant expense (the Army fleet logs more than 800 million miles per year), increased fuel efficiency has significant tactical benefits. The Army's single largest force deployment support challenge and expense is moving and storing fuel for its motorized forces.

Thus, the Partnership promises multiple benefits: fiscal; military; economic (reduced operating costs for truckers and a more competitive industry); health (improved air quality and safety enhancements); and, of course, environmental.

PARTNERSHIP GOALS

The Partnership does not involve any binding commitments of any sort by the companies or the government. Instead, the Partnership reflects an understanding between the federal government and a group of creative companies to work together in good faith to develop production prototype vehicles that achieve all of the following objectives:

A. Improve Fuel Efficiency of Heavy-Duty Trucks and Buses:

- Double the fuel economy of 18 wheeler, line-haul trucks (Class 8 trucks) by 2010 on a ton-miles per gallon basis.
- Triple the fuel economy of heavy pickups and large delivery vans (Class 2b and Class 6 trucks) by 2010 on a ton-miles per gallon basis.
- Triple the fuel efficiency of full-sized transit/passenger buses (Class 8) by 2010 on a ton (passenger)-miles per gallon basis.¹

B. Reduce Emissions:

- Exceed standards for oxides of nitrogen, particulate matter, carbon monoxide and hydrocarbons for the year 2010.

C. Enhance Safety:

- Meet or exceed the motor carrier safety goal of reducing fatalities by half in ten years.
- Improve the crash friendliness of trucks for other road users
- Conduct operation road tests of truck safety improvement components
- Ensure linkages to the Intelligent Vehicle Initiative and the Intelligent Highway System and Infrastructure.

D. Enhance Affordability; Maintain or Enhance Performance.

FEDERAL INVESTMENT

The Clinton-Gore FY2001 Budget already provides the funding needed to make this Partnership a reality. The budget calls on Congress to appropriate funding for this initiatives as follows: \$67 million for DOE; \$26 million for DOD; \$11 million for DOT; and \$7 million for EPA (\$111 million total). Overall, this request represents a \$38 million dollar increase in the existing programs that will fund the interagency contribution to the Partnership.

¹ The target is higher for buses and delivery vehicles because their operation allows for efficiency benefits from regenerative technologies. Long-haul trucks present a greater challenge because of their infrequent braking.

THE COMPANIES

We have worked with eleven of the nation's largest manufacturers of trucks and truck components in setting up the Partnership:

- Freightliner Corporation (Portland, OR)
- Mack Trucks (Allentown, PA)
- Oshkosh Trucks (Oshkosh, WI)
- Paccar/Peterbilt (Bellevue, WA)
- Volvo Trucks North America (Greensboro, NC)
- Cummins Engine Company (Columbus, IN)
- Caterpillar (Peoria, IL)
- Detroit Diesel Corporation (Detroit, MI)
- Navistar International (Chicago, IL)
- Allison Transmission Division – General Motors (Indianapolis, IN)
- Lockheed Martin Control Systems (Johnson City, NY)

POLITICAL AND POLICY ISSUES

It took considerable effort to get these companies to agree to the specific goals outlined above. Several aspects of this process merit your attention. We originally proposed a specific and advanced target for truck emissions, largely at the request of EPA. As several companies named this issue as a deal-breaker, we moved simply to language that the vehicles will “exceed” relevant emissions requirements. We were ultimately comfortable with this formulation, since the central goal of the Partnership always was efficiency, and not emissions.

Second, we expect labor to be supportive of this Partnership and have confirmed the support of the Teamsters and will invite them to the announcement. Your staff is working to finalize the role of the UAW, and we expect them to be supportive.

Ford was originally one of the companies consulted in forming the Partnership. They have decided not to participate. Their public line on this decision is that very little of their product is heavy truck-related. However, in private conversations, Ford expressed concern that the smaller vehicles covered by the Partnership are very close in size to some of their larger SUVs, and they are very concerned that the Partnership will be interpreted as a “3X PNGV for SUVs”. Their concern is misplaced because the vast majority of SUVs are not large enough to fit within the parameters of the Partnership. Also, the efficiency goals in the Partnership are measured in “ton-miles per gallon” and not simply miles per gallon. “Ton-miles per gallon” is a measure of the efficiency by which a vehicle moves freight (if a vehicle gets one ton-mile per gallon, it uses one gallon of fuel to carry one ton of payload one mile). Since a ton-miles per gallon metric is therefore significantly different than a simply miles per gallon measure, and because consumer-type SUVs are not evaluated by their freight-carrying efficiency (under CAFÉ or otherwise), the company's concern that we are applying CAFÉ-like measurements on SUVs is unjustified.

On a policy scale, this initiative is not as big as PNGV, since PNGV dealt with vehicles that an average American family could own. On the other hand, it may be seen more favorably by the environmental community than PNGV, because some saw PNGV as “cover” for a lack of action on CAFÉ. Because there is no alternative regulatory provisions for heavy trucks, we will not receive that criticism. A clear positive aspect of the timing of this announcement is the recent concern about fuel prices in general and diesel prices in particular. A truck that gets twice fuel efficiency is the equivalent of cutting fuel costs in half.

cc: Charles Burson
Monica Dixon
George Frampton
Morley Winograd

Trucks 5/3/00

- 1st Planning Mtg - by May 19. w/ C&H center.
- who's invited
 - agencies
 - VP level CO's
 - include Allison + [Freightliner]
- 2b's - off-line discussions w/ GM, D-C.

21st Century Truck Initiative

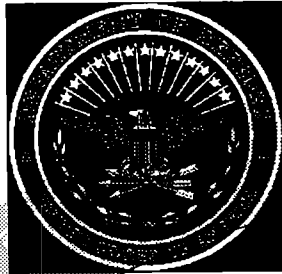
Update to Industry

21ST Century Truck Initiative

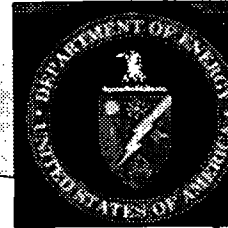
Purpose

- **Provide Background on Initiative**
 - **Present Approach**
 - **Solicit Comments and Upfront Agreement on Goals, Timeline and Structure Based upon “Competition for Success”**
-

21ST Century Truck Initiative



**Department of
Defense**



**Department of
Energy**



**Department of
Transportation**

21st Century Truck Initiative

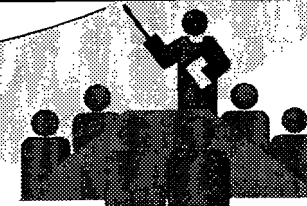
**Government Agencies and Industry collaborating
to improve fuel efficiency, reduce emissions,
increase safety, and reduce the cost of ownership
for the nation's commercial and military trucks.**



Industry



**Environmental Protection
Agency**



Academia

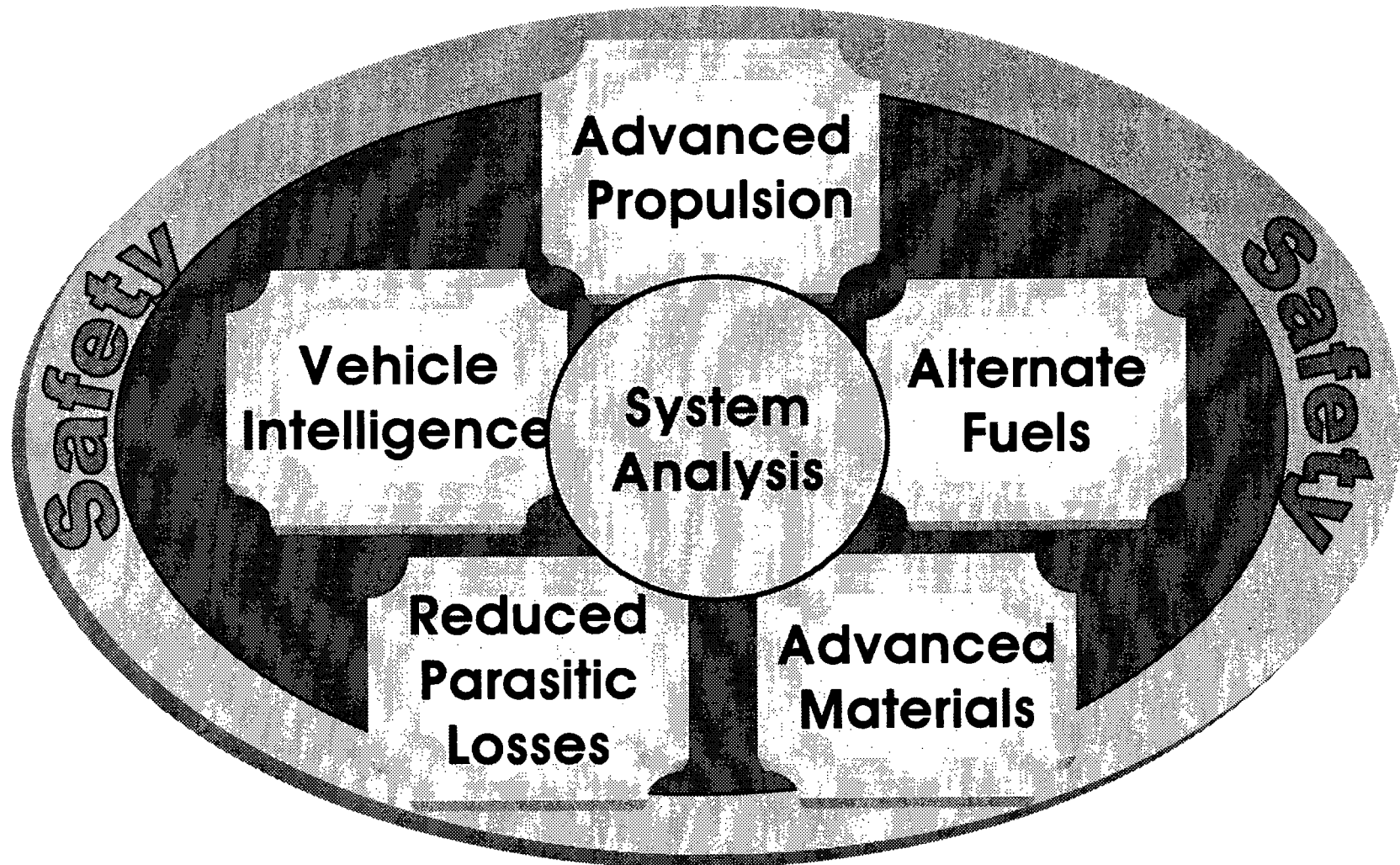
21ST Century Truck Initiative Background

- **Inter-Agency Technical Working Group Established**
- **Preliminary Consultations with Industry to Obtain Government-Industry Agreement on Goals**
- **Possible Initiative Announcement**

Feb 00

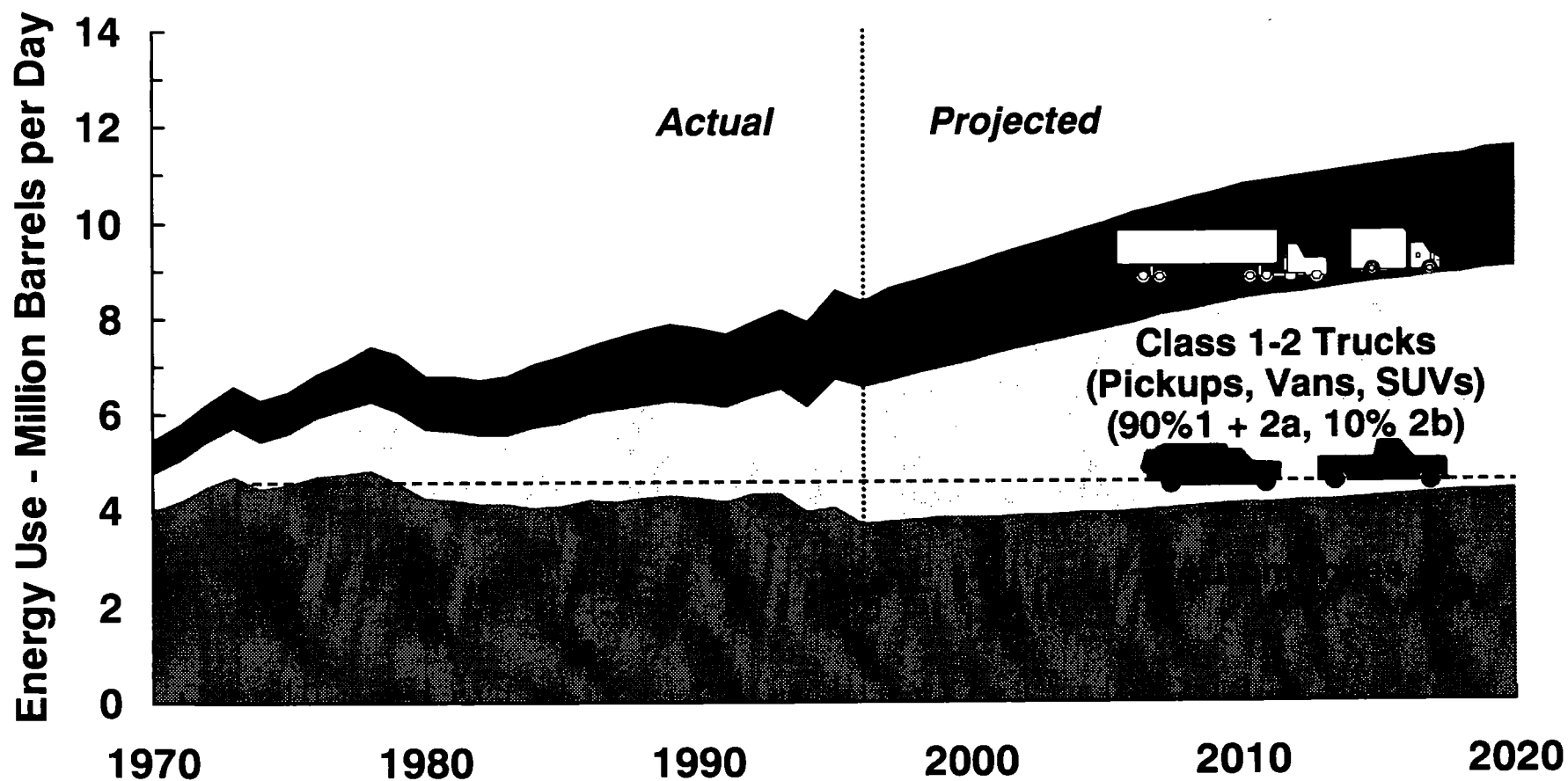


21ST Century Truck Initiative
Research Focus



21ST Century Truck Initiative

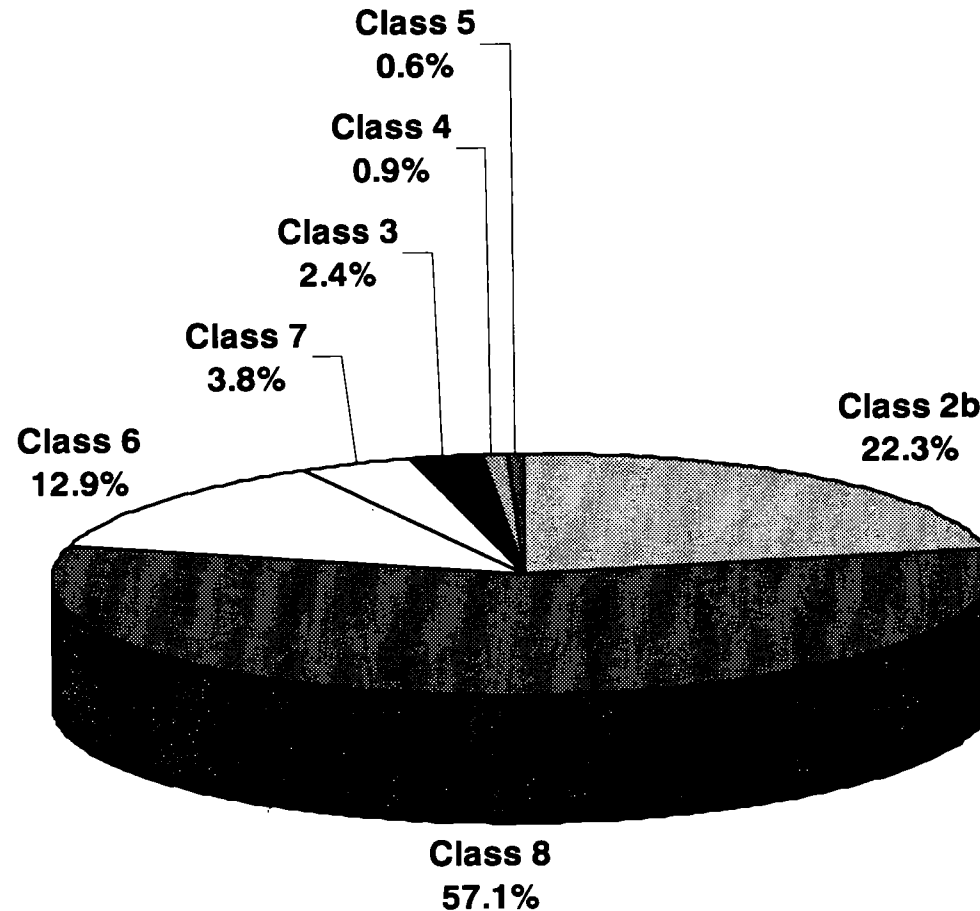
Since the 1973 Oil Embargo Essentially All of the Increase in U.S. Highway Fuel Consumption has been due to Trucks



source: EIA Annual Energy Outlook, 1998
Federal Highway Administration, Highway Statistics

21ST Century Truck Initiative

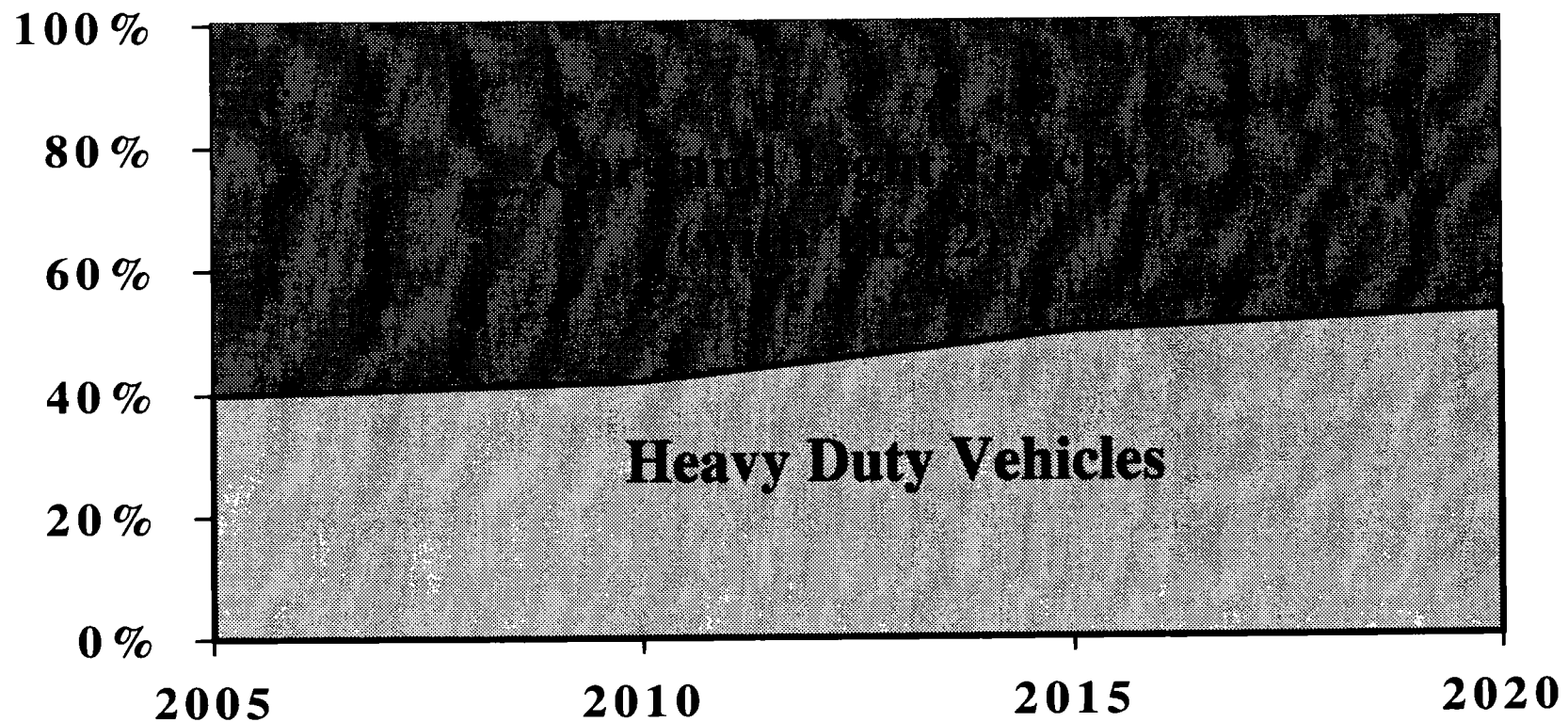
Class 2b - 8 Truck Fuel Use (% of energy used for Class 2b - 8 trucks)



Source: ORNL Transportation Energy Data Book: Edition 18 Data from 199

21ST Century Truck Initiative

Highway Vehicle NO_x Emissions



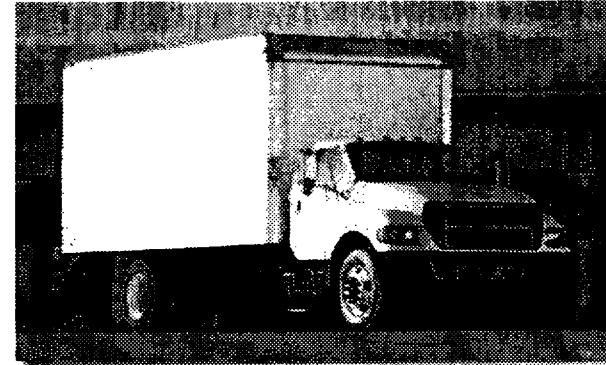
Source: EPA Tier 2 Regulatory Impact Analysis, March 1999

21ST Century Truck Initiative

Representative Commercial Trucks



**Class 8 Line Haul Rig
(Kenworth T-2000)
430hp Diesel, 80,000 lbs GVW
67,500 lbs simulated**



**Class 6 Enclosed Delivery Truck
(Ford F-650)
190hp Diesel, 26,000 lbs GVW
22,000 lbs simulated**



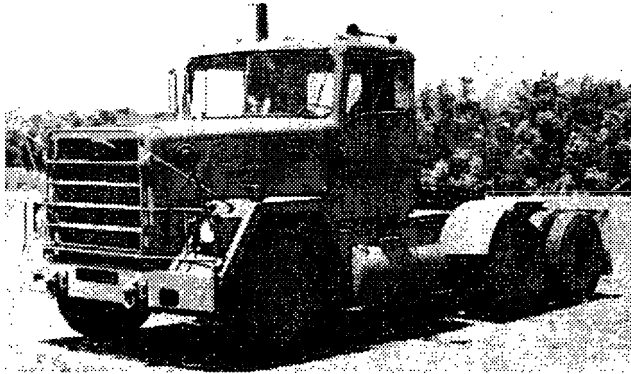
**Class 8 Transit Bus
(Nova RTS)
275hp Diesel, 40,000 lbs GVW
36,500 lbs simulated**



**Class 2B Utility Truc
(Ford F-350)
235hp Diesel, 10,000 lbs GVW
8,500 lbs simulated**

21ST Century Truck Initiative

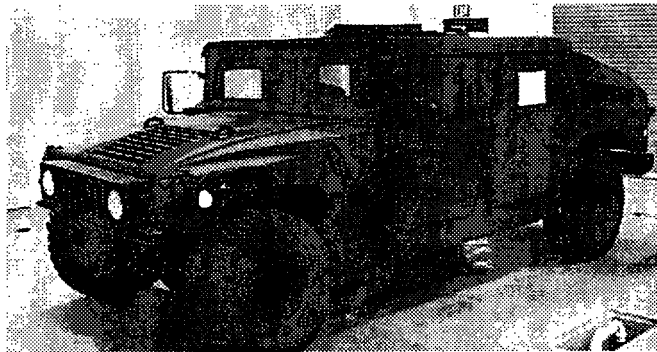
Representative Military Trucks



Class 8 - M915 Line Haul Rig
430hp Diesel, 105,000 lbs GVW
67,500 lbs simulated



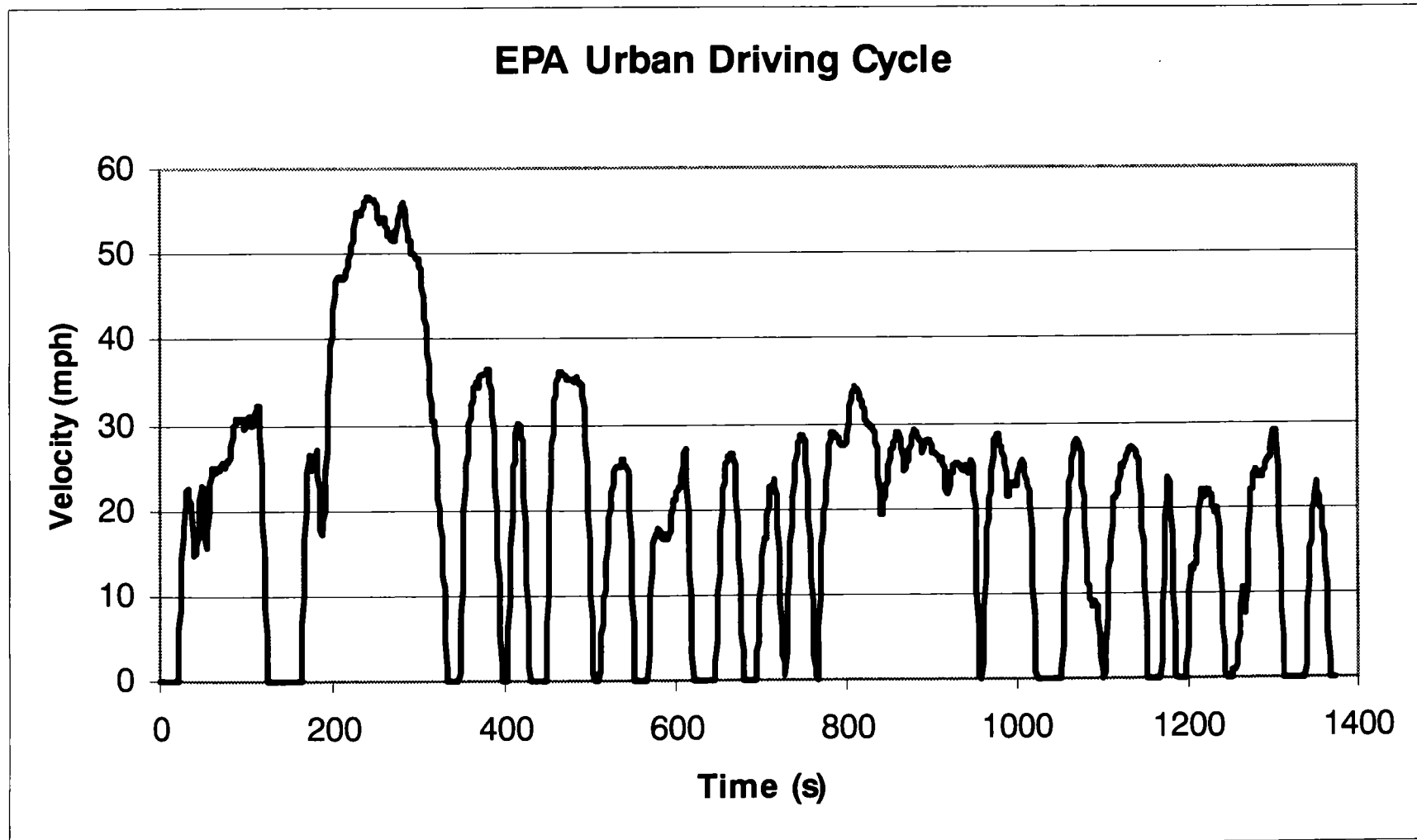
Class 6 - FMTV Tactical Truck
225hp Diesel, 26,000 lb GVW
21,100 lbs simulated



Class 2B - HMMWV M998 Utility Vehicle
190hp Diesel, 10,000 lbs GVW
8,500 lbs simulated

21ST Century Truck Initiative

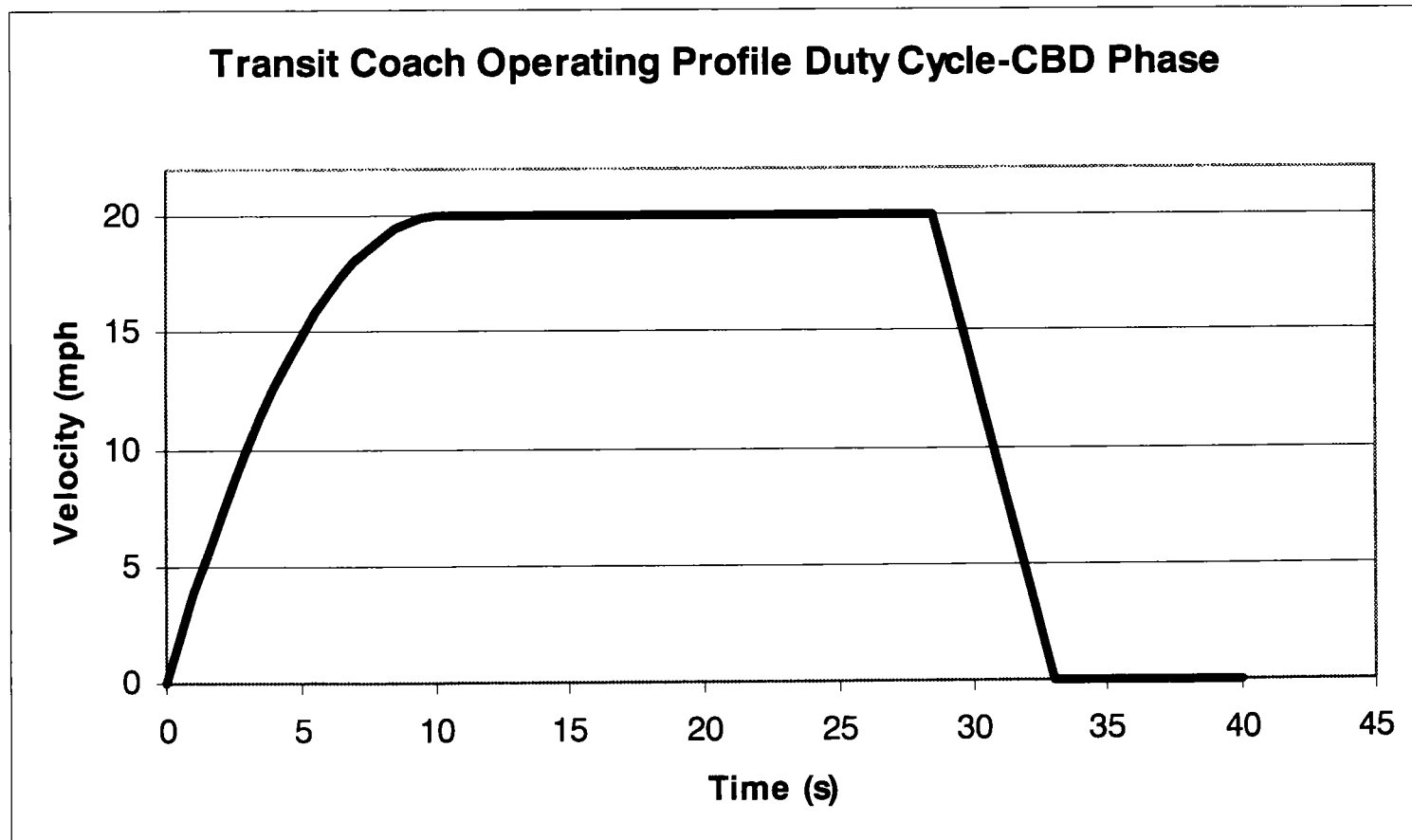
EPA Urban Drive Schedule for LD Vehicles Used for Class 2B and Class



21ST Century Truck Initiative

Heavy Duty Urban Drive Cycle (Central Business District Portion)

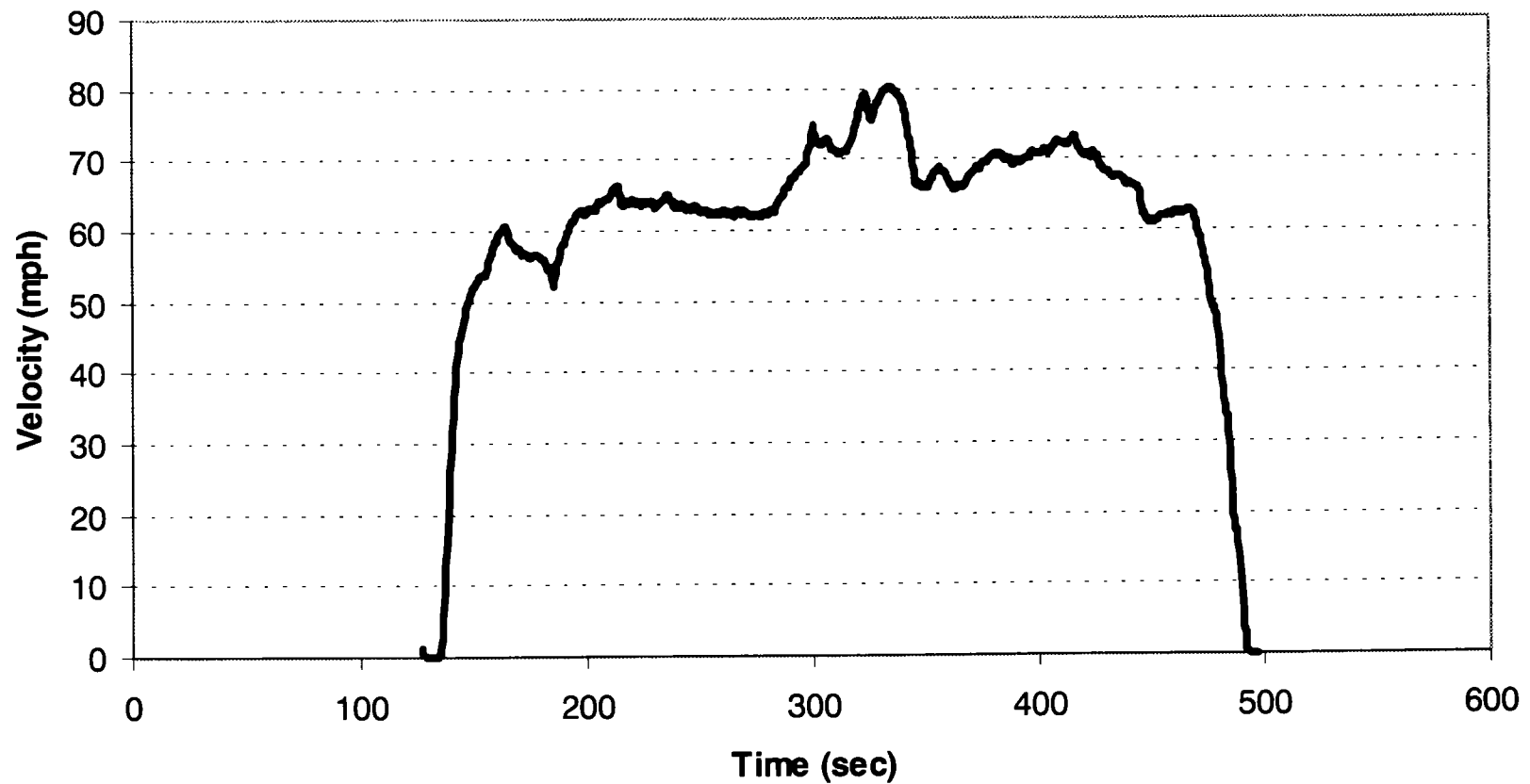
Used for Class 8 Transit Bus



21ST Century Truck Initiative

Highway Cycle Used for Class 8

US06 Driving Cycle (Seconds 127-497)



21ST Century Truck Initiative

Modeling Tools

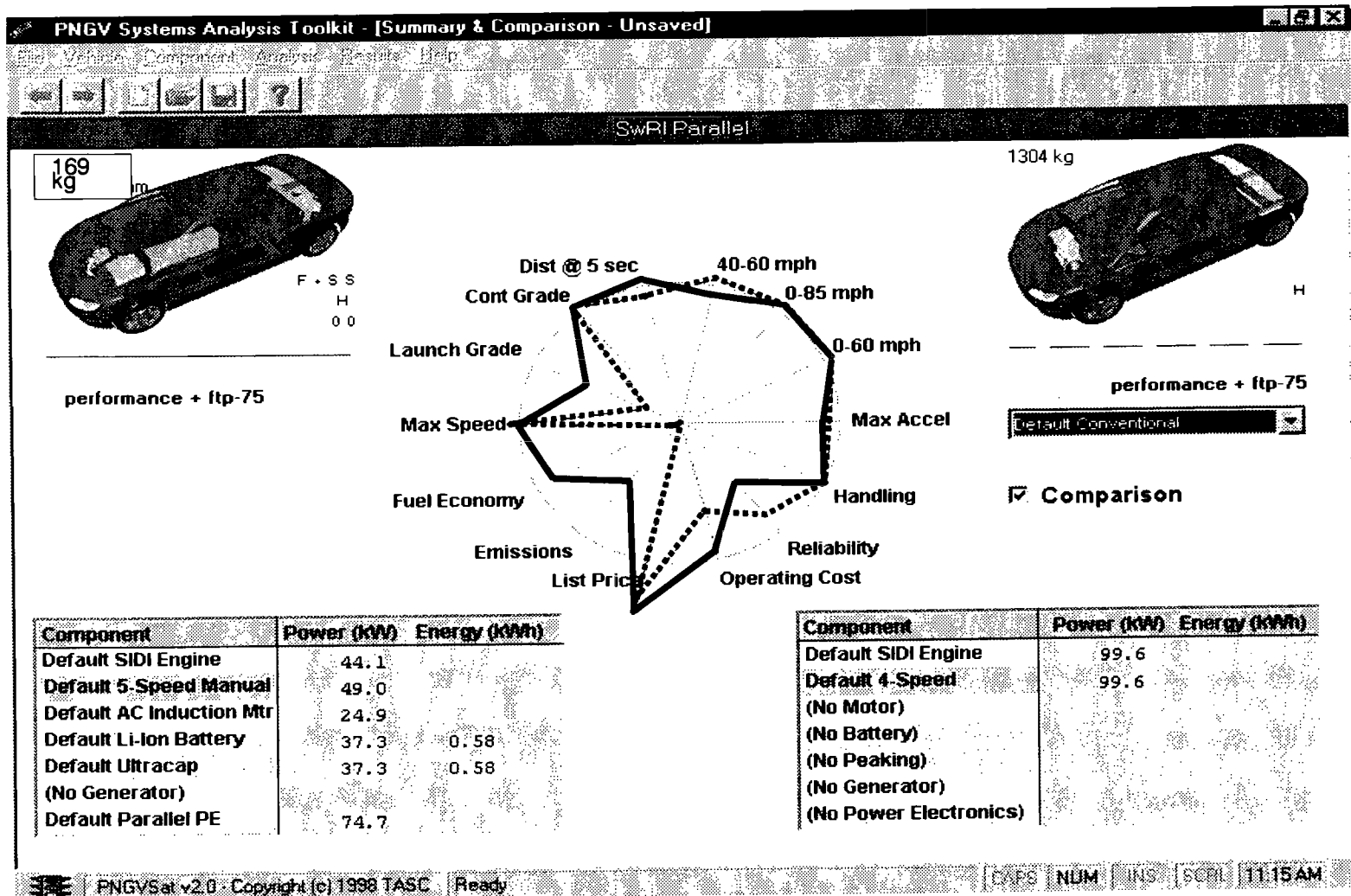
Modifications Required From Passenger Vehicles To Commercial Vehicles

- Incorporation of New Engine, Transmission, and Vehicle Models.
 - Upgrade of the Torque Converter and Clutch Models.
 - Incorporation of New Driving Cycles.
 - Continual Refinement of the Control Algorithms Used For Powertrain Control.
-

21ST Century Truck Initiative

Example of a Specific Modeling Tool: Using The PNGV Systems Analysis Toolkit

Performance Summary



21ST Century Truck Initiative

Baseline Vehicle Parameters

Vehicle Class/Type	Engine Power	Transmission Type
2B/Utility Truck	175 Kw (235 hp)	Auto 4 Speed
6/Delivery Truck	140 Kw (190 hp)	Auto 4 Speed
8/Transit Bus	206 Kw (275 hp)	Auto 4 Speed
8/Line Haul	321 Kw (430 hp)	Manual 10 Speed

21ST Century Truck Initiative

Baseline Vehicle Parameters

Vehicle Class/Type	Empty Vehicle Weight Kg (lb)	Maximum Payload Kg (lb)	Test/Simulated Vehicle Weight Kg (lb)	Cargo Volume M ³ (ft³)
2B/Utility Truck	2,100 (4,600)	2,445 (5,400)	3,864 (8,500)	N/A
6/Delivery Truck	5,730 (12,600)	6,090 (13,400)	10,000 (22,000)	42.9 (1,514)
8/Transit Bus	13,600 (30,000)	4,500 (10,000)	16,600 (36,500)	67 Passengers
8/Line Haul Rig	13,200 (29,000)	23,200 (51,000)	30,680 (67,500)	111.9 (3,953)

21ST Century Truck Initiative

Baseline Vehicle Parameters

Vehicle Class/Type	Frontal Area ² (ft²)	Drag Coefficient	Coefficient of Rolling Resistance
2B/Utility Truck	3.67 (39.5)	0.45	0.013
6/Delivery Truck	7.06 (76.0)	0.70	0.008
8/Transit Bus	6.93 (74.6)	0.65	0.010
8/Line Haul Rig	8.66 (93.22)	0.60	0.008

21ST Century Truck Initiative

Program Goals

- **Maintain or Enhance Vehicle Performance**
 - **Maintain or Reduce Operating Costs**
 - **Maintain or Enhance Safety**
 - **Efficiency (details to follow)**
 - **Emissions (details to follow)**
-

21ST Century Truck Initiative

Fuel Efficiency Goals (mpg)

- **3X - Class 2B & 6**
 - **3X - Class 8 Bus**
 - **2X - Class 8 Line Haul**
-

21ST Century Truck Initiative

Aggressive Technology Input Areas

- **Improved Engine Efficiency.**
 - **Advanced Diesels**
 - **Hybrid**
 - **Fuel Cells**
 - **Improve Drivetrain Efficiency.**
 - **Reduced Aerodynamic Drag.**
 - **Reduced Rolling Resistance.**
 - **Reduced Weight.**
-

21ST Century Truck Initiative

Improvements to Achieve Fuel Efficiency Goals

- **50 - 55 % Maximum Engine Efficiency.**
(current maximum engine efficiency is 44-46%)
 - **60 - 65% Maximum Engine Efficiency with Bottoming Cycle.**
 - **86 - 90 % Overall Drivetrain Efficiency (e.g. Continuously Variable Transmissions).**
(current overall drivetrain efficiency is 77-82% automatic for Class II, VI, and VIII Bus and 84-87% manual for class 8 Line-haul)
-

21ST Century Truck Initiative

Improvements to Achieve Fuel Efficiency Goals

- **55 % Recovery of Vehicle Energy Normally Lost to Braking.**
(Current Recovery of Vehicle Kinetic Energy in Research Vehicles is 30 % for Recovered and Re-applied)
 - **21 - 35 % Reduction in Aerodynamic Drag and Rolling Resistance** (e.g. Streamlining Vehicles and Reducing Tire and Wheel Bearing Friction).
 - **21 - 45+ % Reduction in Empty Vehicle Weight** (e.g. Composite Materials). *Note: These savings would translate into increased payload per truck.*
-

21ST Century Truck Initiative
Emissions Goals (g/hp*hr)

	2010 Goal	2002/2004 Decree/Reg	Current Regulation
NO_x	0.10	2.0 *	4.0
Particulate Matter	0.01	0.1	0.1
Carbon Monoxide	2.00	15.5	15.5
Hydrocarbons	0.05	0.5 *	1.3

Carbon Dioxide Scales with Fuel Efficiency

***These emissions regulations are additive requirements for non-methane hydrocarbons plus NO_x**

21ST Century Truck Initiative Technologies to Achieve Emissions Goals

- Use of EGR for Near-Term NO_x Reduction.
 - Decreases Combustion Temperatures.
 - Selective Catalytic Reduction (SCR) for Mid-Term NO_x Reduction.
 - Requires Use of Urea as Catalytic Agent.
 - NO_x Absorber for Far-Term NO_x Reduction.
 - Requires Ultra - Low Sulfur Fuel.
 - Trap Required to Capture Particulates.
 - Oxidation Catalyst Required for Class 2B Vehicles.
-

21ST Century Truck Initiative

Next Steps



Agreement with Goal



Commitment to Cost Share

21ST Century Truck Initiative

Partnering Mechanisms

- **“Master” Cooperative Research and Development Agreement (CRADA):** covers all of the organizations in the partnership and would allow the sharing of pre-competitive information and data throughout the partnership.
 - **Multiple, individual mechanisms such as CRADAs, cooperative agreements and other transactions would cover proprietary and/or confidential work on specific technical projects or teams.**
-

21ST Century Truck Initiative

Commitment to Cost Share

- **In general, a 50/50 cost share**
 - **For longer term, higher risk advanced technologies (e.g., advanced bottoming cycles, advanced diesel-cycle engines), cost share be 80% government/20% industry**
 - **For near-to-medium term, lower risk technologies (e.g., NO_x adsorbers, improved fuel injection, better conventional diesel engines), cost share would be 20-40% government/60-80% industry**
-

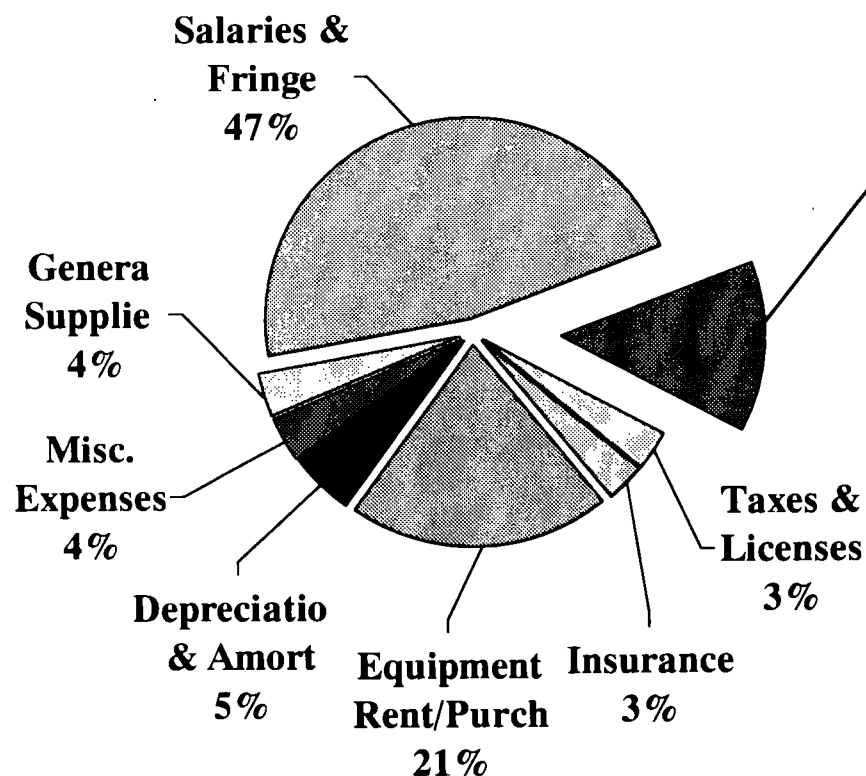
21st Century Truck Initiative

**Update to Industry
Backups**

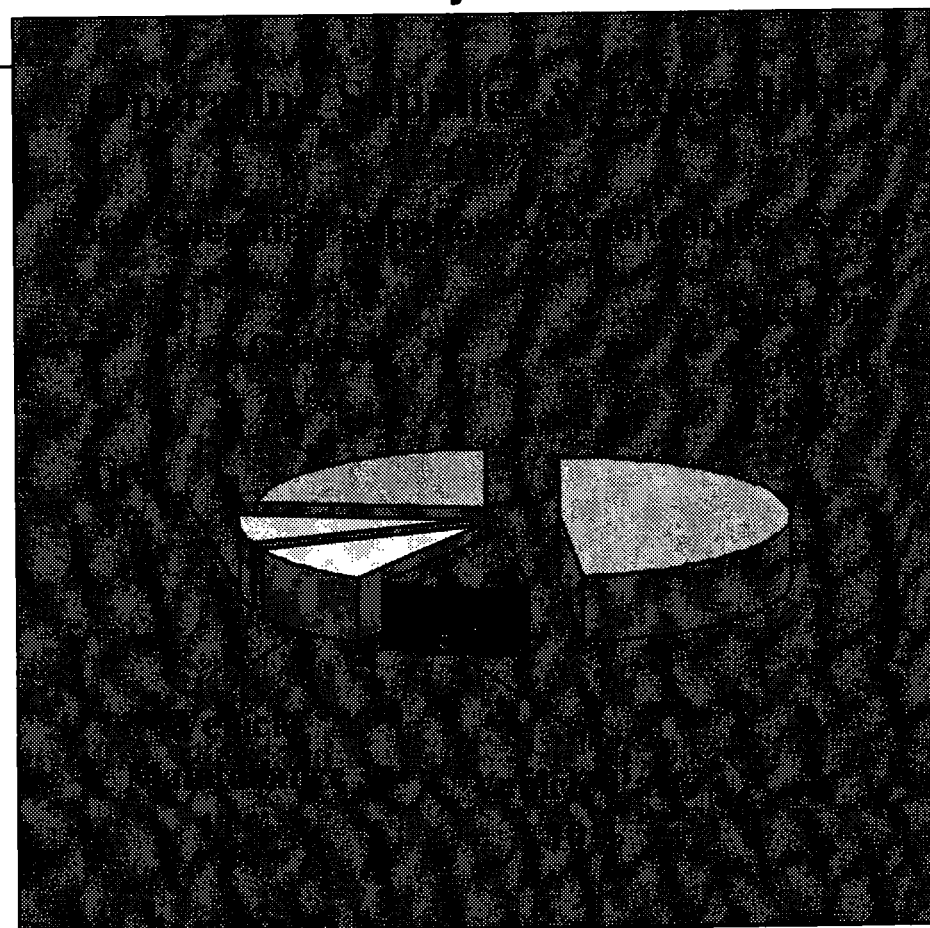
21ST Century Truck Initiative

Trucking Industry Operating Expenses

Total All Carriers (Except Household Goods)



42.5 billion gallons of fuel were consumed by trucks in 1997.



Source: F&OS Motor Carrier Annual Report, ATA 199

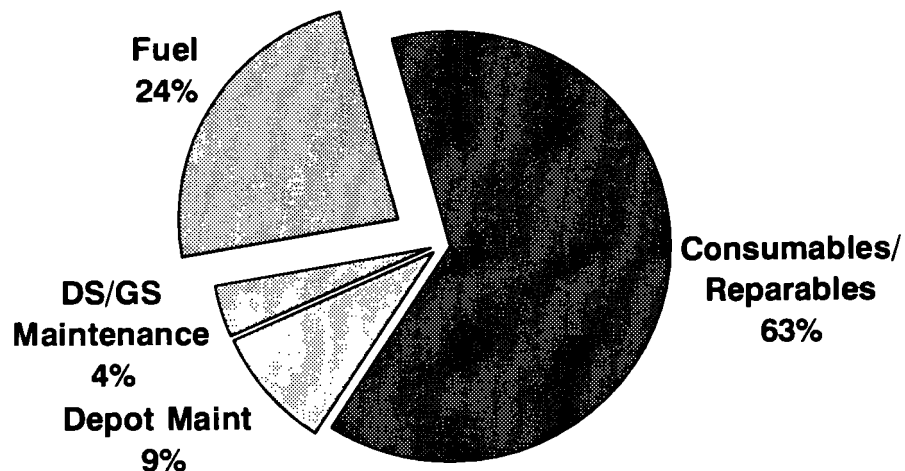
21ST Century Truck Initiative

Military Operating & Support Costs

M915 Line Haul Truck

1990-1996 O&S Costs: \$285M

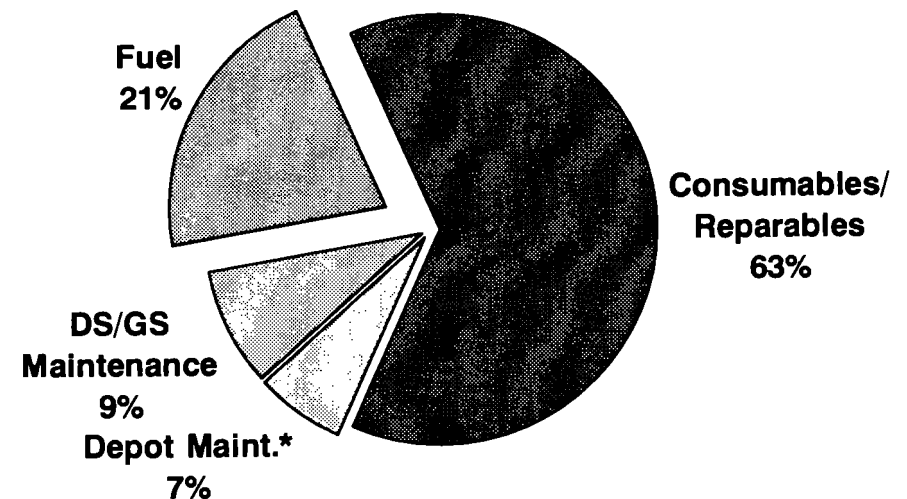
Avg. # of Vehicles: 6,400



HMMWV

1996 O&S Costs: \$112.6M

Avg. # of Vehicles: 75,15



* Depot Maintenance number is based on 1994 data

Source: Army's Operating & Support Management Information System (OSMIS), October, 1997

21ST Century Truck Initiative

Technologies to Achieve Engine Efficiency Targets

- Higher Combustion Pressures
 - To Increase Output Work Without Proportional Increases in Friction and Heat Losses
 - Variable Geometry Turbochargers
 - To Better Match Engine Speed and Load Conditions
 - Reduced Friction
 - In Piston Ring-Liner Interface and Valve Train Improves Overall Efficiency
-

21ST Century Truck Initiative

Technologies to Achieve Engine Efficiency Targets

- Higher Fuel Injection Pressures
 - For Reduced Emissions by Improving Combustion
 - Turbocompounding and Other Bottoming Cycles
 - To Recover More of the Engine Exhaust Energy
-

21ST Century Truck Initiative

Technologies to Achieve Drivetrain Efficiency Targets

- Incorporation of Continuously Variable Transmissions to Optimize Engine Efficiency
 - Allows the Engine to Operate Near its Maximum Efficiency Condition.
 - Incorporation of Hybrid Drivetrain Components
 - To Downsize the Engine.
 - To Provide Acceleration Assistance.
 - To Recover Vehicle Kinetic Energy Normally Lost to Brakes.
-

21ST Century Truck Initiative

Technologies to Achieve Aerodynamic Drag Reduction

- Tractor Aerodynamic Drag Improvements
 - Reduce Losses of Base Tractor.
 - Tractor-to-Trailer Bridging
 - Reduce Turbulance of Discontinuous Surfaces.
 - Tractor / Trailer Underbody Panels
 - Reduce Turbulance of Discontinuous Surfaces.
 - Trailer Rear Contoured Panels
 - Streamline Airflow From Trailer.
-

21ST Century Truck Initiative

Technologies to Achieve Rolling Resistance Reductio

- Tire Rolling Resistance Reduction
 - Reduce Losses of Tire / Pavement Interface.
 - Wheel Bearing Friction Reduction
 - Reduce Losses to Bearings.
 - Axle Friction Reduction
 - Reduce Parasitic Losses Associated With Axle.
-

***21ST Century Truck Initiative
Technologies to Achieve
Weight Reduction***

- Use of High Strength Steels
 - Mostly in Highly Stressed Areas.
 - Use of Composite Materials for Frame / Body
 - Where the Volume of the Part Can Increase and where the Manufacturing Cost is Justified.
 - Use of Aluminum for Powertrain Components
 - Most Typical Material Replacement Technique for Weight Reduction.
 - Selective Use of Plastics
 - Where Stress Levels are Low.
-

21ST Century Truck Initiative

Verification of Developed Technologies

- Validate Baseline Vehicle Performance.
 - Laboratory Evaluation of Components.
 - Field Testing of Vehicles.
 - Performance
 - Efficiency
 - Emissions
 - Demonstration Testing.
-

FOR IMMEDIATE RELEASE
February 10, 2000

Contact: Tara Andringa 202-224-1471
Tara_Andringa@levin.senate.gov

MEDIA ADVISORY *** MEDIA ADVISORY *** MEDIA ADVISORY

**Levin to Announce New Funds for Army
Truck Initiative at TACOM in Warren**

WASHINGTON – Sen. Carl Levin, D-Mich., will join Under Secretary of Defense Rudy de Leon at the Tank-automotive and Armaments Command (TACOM) in Warren on Monday to announce the first funding for a new initiative to improve truck technology that will benefit both the military and the commercial sector.

The new funding, which was included in the President's budget request submitted to Congress earlier this week, is the first installment in a program to make dramatic improvements in American truck technology. The program is a partnership between government and industry with the Army taking the Defense Department lead. Both government and industry will share the cost of developing the new technology.

The improved truck technology will help the Army and U.S. industry to improve fuel economy, reduce emissions and reduce the cost of ownership of large numbers of trucks. The Army is the largest truck operator and greatest consumer of vehicle fuel in the U.S. government. The new program will help the Army save significant funding for their truck operations.

At TACOM, Levin and de Leon will be briefed on the new program and hear how TACOM is supporting the Army's transformation to a 21st Century force.

FULL DETAILS FOLLOW:

WHERE: Tank-automotive and Armaments Command (TACOM)
Building 200 - R&D Building

WHEN: Monday, February 14, 2000
1:00 p.m.

U.S. Army Tank-automotive and Armaments Command
Public Affairs Office
Warren, Mich. 48397-5000

MEDIA ADVISORY

CONTACT: Rae Higgins, (810) 574-8820

FOR IMMEDIATE RELEASE

Levin, defense undersecretary to visit TACOM Feb. 14

Senator, undersecretary to announce funding for Army/industry truck program

WARREN, Mich. (Feb. 11, 2000) — Sen. Carl Levin, (D-Mich.) and Undersecretary of Defense for Personnel and Readiness Rudy de Leon are slated to visit the Tank-automotive and Armaments Command here Monday. They will announce funding for a new initiative to improve truck technology that will benefit both the military and the commercial sector.

The media is invited to attend. Please enter TACOM's Mound Road Gate and arrive by 12:45 p.m. Press time is slated for 1 p.m. in TACOM's building 200.

The funding was included in the president's budget request submitted to Congress earlier this week. It is the first installment in a program designed to make significant improvements in American truck technology. The Army-led effort is a partnership between government and industry. Both government and industry will share the cost of developing the new technology.

The enhanced truck technology will help the Army and U.S. industry to improve fuel economy, reduce emissions and reduce the cost of ownership of large numbers of trucks. The Army is the largest truck operator and greatest consumer of vehicle fuel in the U.S. government.

Biography of Senator Carl Levin

Senator Levin was elected to Senate in 1978 and has served on the Armed Services Committee from the beginning of his Senate career. From 1986 until 1996 he served as the Chairman or Ranking Minority Member of the subcommittee responsible for conventional forces (now AirLand Forces), with primary responsibility for Army and Air Force modernization programs. In 1997 he became the Ranking Minority Member of the full Committee.

His tenure on the Armed Services Committee has been marked by an emphasis on improving the conventional combat capability of the U.S. military, by supporting the readiness and modernization of U.S. forces. He has also worked to make the military more efficient, tackling waste and fraud, and helping reform the defense acquisition system and increasing competition to save billions of taxpayer dollars.

Senator Levin has been a strong advocate of collaborative government-industry partnerships and joint research and development. He brought the Army's Tank-Automotive Research, Development and Engineering Center (TARDEC) together with the R&D centers of the "Big Three" U.S. automotive manufacturers to carry out collaborative research and development projects. That effort resulted in a series of Cooperative Research and Development Agreements (CRADAs) governing a broad program of collaboration.

In 1992 Sen. Levin helped establish the National Automotive Center at the Army's Tank-automotive and Armaments Command (TACOM), which has been the military's leader in collaborative automotive R&D with industry and academia. The objective of their efforts is to get affordable commercial technology into military vehicles, and to produce better, cheaper and faster products with advanced manufacturing and technology. This will help the military improve the performance of its ground vehicles and reduce its operating costs. It will also help ensure that the commercial industrial base can respond to the needs of the U.S. military.

Senator Levin has also encouraged the Defense Department to work closely with industry to take advantage of advanced manufacturing technologies which permit the commercial sector to be able to meet defense demands. To that end, he helped establish the Center for Advanced Technologies at Detroit's Focus:HOPE. This Center, which trains young Americans to be world-class machinists, is demonstrating that commercial suppliers can use flexible manufacturing to produce military products faster and cheaper than with traditional methods. Focus:HOPE recently established a partnership with the Army to demonstrate these advanced techniques.

Senator Levin also has devoted his efforts to reducing threats to America's security, including the Cooperative Threat Reduction program and other non-proliferation efforts. These programs have helped eliminate thousands of nuclear weapons once aimed at the U.S. by the former Soviet Union.

**Minutes of the
21st Century Truck Initiative Working Group Meeting**

January 13-14, 2000

Location: RAND – Washington, D.C. Office

Introduction:

A 21st Century Truck Initiative Working Group Meeting, chaired by Paul Skalny, was held at RAND's Washington D.C. office 13 - 14 January 2000. A great dialogue between the key industry partners and the Agencies took place. Many issues were raised and discussed. It appears that all that were present believe that a 21st Century Truck Initiative is good; however key issues need to be addressed immediately prior to "full" commitments. In most cases, the key issues were the same identified in face-to-face meetings with the industry partners in November and December 1999. Key issues are identified after the **Revised Agenda**, followed by **Action Items**.

Attendees:

See Enclosure 1 for a list of attendees by affiliation.

See Enclosure 2 for a list of attendees with contact information.

Original Agenda

See Enclosure 3 for Original Agenda

Revised Agenda

January 13, 2000

8:00 AM	Welcome and Introductions	P. Skalny
	An overview of the initiative, covering the initiative's background, goals, approach, next steps, partnering mechanisms, competition, and cost sharing.	
8:45 AM	Automotive Research Center	J. Overholt
	An overview of the ARC's mission, partnership strategy, research thrust areas, target cascading, and modeling.	
9:30 AM	Modeling Efforts to Date	S. McBroom
	An overview of the modeling efforts completed, with a special emphasis on fuel efficiency and the development of goals.	
12:15 PM	Lunch	
1:10 PM	Advanced Propulsion	R. Crow and L. Dodge
	An overview of the Advanced Propulsion Focus area, to include the scope and technology plan. The potential technologies under consideration for meeting the	

initiative's goals were emphasized, for both the near term (2-3 years) and the far term (>3 years).

1:55 PM **Alternative Fuels Research** **D. Schmidt**
An overview of fuel research undertaken by MIT, U. of Alaska – Fairbanks, and ICRC.
The focus was on clean diesel fuel technologies, and the understanding of engine and fuel interactions.

2:40 PM	Vehicle Intelligence	Bill Knée
An overview of the definition, scope, and plan for the Vehicle Intelligence focus area. Special emphasis was placed on how intelligent vehicle technologies will assist in obtaining the goals of the initiative, and the work currently underway at the US Department of Transportation.		

4:00 PM Meeting Adjourned

January 14, 2000

8:00 AM Meeting Reconvened

8:15 AM RAND Arroyo Center Presentation
An overview of the RAND Arroyo Center. The Center is a think tank for the United States Army.

9:35 AM	DOE-OHVT Roadmap	G. Singh
Presentation of the second iteration of the technology roadmap developed by the Department of Energy's Office of Heavy Vehicle Technology. The presentation focused on the development process, and the use of extensive industry input.		

9:00 AM	Industry/Government Discussion of Issues	P. Skalny
	A discussion of the major issues addressed by industry. For Details see Key Issues .	

10:45 AM 21st Century Vehicular Software Technology M. Saboe
An overview of the Vehicular Advanced Software Technology Consortium (VAST-C).
The briefing highlighted the relationship, emerging dependence, and opportunities for the
vehicular sector and advanced software technologies; and the opportunities that exist for
leveraging the VAST-C's technology efforts with the 21st Century Truck Initiative.

11:15 AM Army Strategy for J. Bartiss
Global Climate Change & Energy Management
Presentation of the results from the study titled, "Army Strategy for Global Climate Change & Energy Management." The study concluded that due to infrastructure costs the military pays between \$5 and \$15 a gallon for fuel. This conclusion reinforces the benefit to be gained to the military by increasing the fuel efficiency of its truck fleet.

12:00 PM Lunch – Fuel Efficiency Issues in Army After Next H. Dobbs
Presentation of the fuel efficiency issues that are within Army After Next (now Army after 2010). Special emphasis was placed upon reducing the military's logistical burden through the reduction of fuel consumption of tactical wheeled vehicles.

1:00 PM
Meeting Adjourned

Key Issues:

Issue #1: Funding for the Initiative to come via the Highway Trust Fund (HTF).

Discussion: The Chairperson addressed this issue by explaining that the HTF was initially viewed by the Department of Army as a potential funding source for the government's total cost share; however, this is no longer an option being considered. The Chairperson also explained that the Army would most likely continue to try to get the Army's tactical vehicles, to include trailers, exempt from FRET taxes that go into the HTF.

Issue #2: Initiative Solely Funded by a Re-allocation or Re-shuffling of Existing Programs

Discussion: The Chairman responded by saying that from day one, additional government dollars, and not just a re-shuffling or re-allocation, was required to meet the aggressive goals of the Initiative. The Chairperson also stated that the intent of the Initiative was not to jeopardize, from a management or funding perspective, excellent programs within any of the Agencies. The Chairperson also stressed that all of the Agencies involved will need to make sure that any duplication in programs is addressed, and eliminated.

Issue #3: Inventory of Existing Research Programs Required

Discussion: The Chairperson responded by saying that the presentations given during the meeting showed that a start had been made on the technology inventory, however, additional funding was required to complete a detailed inventory, and to begin the development of the technology roadmaps.

Issue #4: Aggressive Goal (0.1 g/bhp*hr) for NO_x Emissions

The Chairperson responded by stating that he would reiterate industry concerns (potential showstopper) with regards to the 0.1 g/bhp*hr emission research target immediately to the focal points within the Office of Science & Technology Policy, and to the White House/Agency Principals.

Issue #5: No Specific Goal for Safety

The Chairperson responded that the Initiative originally discussed having a specific safety goal for the Initiative, potentially mirroring the goal espoused by Department of Transportation Secretary Rodney Slater, and separately corroborated by meetings with the Army Safety Center. The Chairperson agreed with an industry partner suggestion that it would make sense for the Initiative to support the safety goal (50% reduction in truck related fatalities by 2010) expressed by Secretary Slater.

Issue #6: Fuel Efficiency Goals in both Ton*Miles per Gallon and Miles per Gallon

The Chairperson responded that in addition to developing an efficiency goal in miles per gallon, the Initiative had also developed goals in ton-miles per gallon. The Chairperson agreed that ton-miles per gallon more fully captures the impact of significant weight savings, and that it may be best to describe the fuel efficiency goals in both mpg and ton-mpg.

Issue #7: Additional Sessions between Industry and Government

Discussion: The Chairperson addressed this issue by stating that this is consistent with the plan, and that the next Working group meeting would be held in late February. The Chairperson also stated that he would inform the OSTP focal points of industry's desire to meet with the White House/Agency Principals soon. Key points of discussion would include management structure and any issues that have already been raised.

Action Items (Current Status):

- 1. Chairperson will immediately inform the OSTP focal points of the issues identified and discussed at the meeting.** (Action immediately taken via phone message and with a follow-up memo to OSTP on 17 January 2000)
- 2. Chairperson agreed to recommend that efficiency goals be stated in both ton-mpg and mpg.** (Action immediately taken via memo to OSTP on 17 January 2000)
- 3. National Automotive Center to identify percent of fuel consumed by vehicle class for both wartime and peacetime scenarios.** (In progress)
- 4. Southwest Research Institute to address and justify Class 6 Aerodynamic improvement of approximately 30%.** (In progress)

21st Century Truck Initiative Research Partnership Event

When: *Friday April 21, 2000, 10:15am*

Where: *Detroit, MI specific site TBD*

Who: *VP, Secretary Richardson, Secretary Slater, Administrator Browner, Army TBD*

CONFIRMED

Mr. Marc Gustafson (Gus tough son) Pres and CEO, Volvo (336) 393-2200 (Judy)

+Keith Brandis, Vice President Business Offer Development

Ms. Tina Vojavich [voy (like boy) uh vitch] VP, Cummins (812) 377-9504 (Joyce Larrison)

+none

Denyse LeFever (Denise) Director, Power and Drive Systems, Lockheed Martin 508- 3400 (Jan Powell)
+(will try to get President James Scanlon) ????

Ms. Sherril West, VP Caterpillar Inc. (Rita Castle) (309) 675-4487

+ Rita Castle Issues Analysis Manager, Corporate Public Affairs

Guy Rini (Ree nee), Director of Group Electronics, Mack Trucks (610) 709-3241 (Dianna)

(for Mr. Steve Homcha Exec VP, Mack Trucks)

Bill Gouse (rhymes with house), Title TBD, Freightliner (503) 735-8577 (Juliana)

(for Mr. Michael von Mayenburg Senior VP, Freightliner)

Ken Stinger Chief of Washington Office, Paccar (202) 296-9158

PENDING

Mr. David Hovind [ho (long o) vind (short i)], President, Paccar (425) 468-7388 (Nancy)

Mr. Robert Bohn Pres and CEO, Oshkosh Truck (920) 235-9151 x2303 (Connie)

NOT ATTEND, SUB PENDING

Mr. Roger Penske Chairman of the Board, Detroit Diesel (313) 592-5890 (Marilyn)
Sub Nabil Hakim

NOT ATTEND, NO SUB

Use as Founding Partner

YES

Volvo

Cummins

Oshkosh

Detroit Diesel

Caterpillar

Freightliner

Lockheed Martin

PENDING

Mack Trucks

Paccar

**SUGGESTED REVISIONS TO "NEXT STEPS" SECTION
OF THE DECLARATION OF INTENT**

2. Create a set **framework for the establishment** of research and development teams organized around specific research objectives (such as improving powertrains or reducing vehicle weight) ~~and appoint government and industry researchers who will identify and coordinate research and development projects to meet these objectives.~~ Each team would involve a combination of Federal and industry researchers ~~with partners that have agreed to work together to champion and fund a specific technical approach.~~ During the initial stages of the project, it will be desirable to establish competing teams working toward the same objective ~~but with different technical approaches each team believes have the greatest opportunity for success.~~ Provisions would be made to add or remove teams, as needed.

21st Century Truck R&D Budget Authority (\$ Millions)

	FY99 Appr	Pres Bud	FY 00 Enacted	FY 01 Request	FY 01 Passback	Final
DOE	39.9	64.6	61.0	64.7	64.7	67.4
1. Engines	18.200	26.1	27.5	31.0	31.0	30.0
Combustion Engines	18.200	26.1	27.5	31.0	31.0	30.0
2. Fuel-cell R&D	0.000	0.0	0.0	0.0	0.0	0.0
	0.000	0.0	0.0			
3. Materials	9.500	11.9	11.9	10.0	10.0	11.9
Propulsion Materials	5.300	6.0	6.0	7.0	7.0	7.0
Lightweight Materials	4.200	5.9	5.9	3.0	3.0	4.9
4. Fuels	10.670	14.5	14.6	15.2	15.2	16.5
Adv. Petroleum-Based	2.700	4.0	4.0	5.0	5.0	5.0
Alternative	7.970	10.6	10.6	10.2	10.2	11.5
5. Drivetrain & Systems	1.500	12.0	7.0	8.5	8.5	9.0
Systems R&D	1.500	4.0	3.0	5.0	8.5	9.0
Heavy Hybrid Prop Sys		8.0	4.0	3.5		
DOT	32.8	37.7	0.0	10.8	10.8	10.8
1. Engines	0.000	0.0	0.0	0.0	0.0	0.0
Lt. Veh propuls & subsys	0.000	0.0		0.0		
High-power storage	0.000	0.0		0.0		
Adv power electronics	0.000	0.0		0.0		
2. Fuel-cell R&D	2.425	3.6	0.0	5.8	5.8	5.8
FTA - Fuel-cell Bus	2.425	3.6		5.8	5.8	5.8
3. Materials	0.000	0.3	0.0	0.5	0.5	0.5
FTA/TCRP - Materials	0.000	0.3		0.5	0.5	0.5
4. Fuels	0.000	0.0	0.0	0.0	0.0	0.0
	0.000	0.0		0.0		
5. Drivetrain & Systems	30.381	33.8	0.0	4.5	4.5	4.5
Energy Storage	1.435	0.8				
Other Technology	22.226	24.6		4.5	4.5	4.5
Safety	6.721	8.3				

21st Century Truck R&D Budget Authority (\$ Millions)

	FY99 Appr	Pres Bud	FY 00 Enacted	FY 01 Request	FY 01 Passback	Final
EPA	0.0	7.0	0.0	7.0	7.0	7.0
1. Engines	0.000	4.0	0.0	5.5	5.5	5.5
Diesel Engine R&D	0.000	4.0		5.5	5.5	5.5
2. Fuel-cell R&D	0.000	0.0	0.0	0.0	0.0	0.0
	0.000	0.0		0.0	0.0	0.0
3. Materials	0.000	0.0	0.0	0.0	0.0	0.0
	0.000	0.0		0.0	0.0	0.0
4. Fuels	0.000	2.0	0.0	0.0	0.0	0.0
Alternative Fuels	0.000	2.0		0.0	0.0	0.0
5. Drivetrain & Systems	0.000	1.0	0.0	1.5	1.5	1.5
Hydraulic Powertrain	0.000	1.0		1.5	1.5	1.5
DOD - NAC/TACOM	5.5	15.6	18.3	15.2	30.2	30.2
1. Engines	2.030	8.3	8.3	15.2	30.2	30.2
Engines	1.030	2.3		15.2	30.2	30.2
Electric/Hybrid Drive	1.000	6.0				
2. Fuel-cell R&D	1.200	1.6	5.8			
Diesel-fuel Reformer	1.200	0.0				
FC Hybrid Vehicle	0.000	1.6				
3. Materials	1.340	0.9	0.5	0.0	0.0	0.0
Propulsion Materials	0.840	0.2				
Lightweight Materials	0.500	0.7				
4. Fuels	0.000	3.0	0.7	0.0	0.0	0.0
Alt Fuels	0.000	3.0	0.7			
5. Drivetrain & Systems	0.950	1.8	3.0	0.0	0.0	0.0
Controls	0.000	0.2	0.2			
Storage	0.500	0.4	0.4			
Efficiency	0.450	1.3	2.4			
TOTAL - ALL AGENCIES	78.196	124.833	79.3	97.7	112.7	115.4

"Tier" Definitions

Tier 1: Work is **directly** relevant to PNGV and **is** coordinated with PNGV technical teams.

Tier 2: Work is **directly** relevant to PNGV but **is not** coordinated with PNGV technical teams.

Tier 3: Work is **indirectly** related to PNGV or is **supporting** long-term research.

21st Century Truck Initiative

White House/Agency Principals' Meeting Update of Industry Meetings

February 2000

Lael is
running 10
minutes late

Industry Consultations

Completed Visits

☒ Cummins	19 Oct 99
☒ ATA	1 Nov 99
☒ Allison (GM)	4 Nov 99
☒ Volvo	12 Nov 99
☒ Peterbilt (PACCAR)	29 Nov 99
☒ Freightliner	30 Nov 99
☒ MACK	2 Dec 99
☒ Caterpillar	3 Dec 99
☒ Detroit Diesel	17 Dec 99
☒ Lockheed-Martin	13 Jan 00
☒ USCAR (PNGV Directors)	27 Jan 00

Future Visits

☐ Navistar (4 Feb)
☐ Nova Bus (9 Feb)
☐ Eaton
☐ Gillig
☐ Meritor
☐ WABASH

Issues

- Highway Trust Fund used to fund Initiative? NO
- Initiative Solely Funded by a Re-allocation or Re-shuffling of Existing Programs
- Inventory of Existing Research Programs Required
- Aggressive Goal (0.1 g/bhp*hr) for NOx Emissions
- No Specific Goal for safety
- Fuel Efficiency Goals in both Ton*Miles per Gallon and Miles per Gallon
- Additional Sessions between Industry and Government required

Fuel Efficiency Goals (mpg)

- ***3X - Class 2B & 6***
- ***3X - Class 8 Bus***
- ***2X - Class 8 Line Haul***

Emissions Goals (g/hp*hr)

	2010 Goal	2002/2004 Decree/Reg	Current Regulation
NO_x	0.10	2.0 *	4.0
Particulate Matter	0.01	0.1	0.1
Carbon Monoxide	2.00	15.5	15.5
Hydrocarbons	0.05	0.5 *	1.3

Carbon Dioxide Scales with Fuel Efficiency

***These emissions regulations are additive requirements for non-methane hydrocarbons plus NO_x**

A Declaration of Intent Twenty First Century Trucks

SUMMARY

The United States trucking industry is pleased to join with the President, on behalf of the Federal government and the Departments of Defense, Energy, and Transportation, and the Environmental Protection Agency, in this Declaration of Intent to form a research and development partnership. This partnership will develop advanced truck and engine technology to enhance transportation services throughout our economy while further reducing the impact of trucks on the environment and the Nation's dependence on imported petroleum. Trucks that meet higher safety and emission standards and that provide the performance, efficiency, and affordability required by American vehicles can help assure world leadership for the U.S. trucking industry.

SHARED VISION

A productive, innovative U.S. trucking industry is essential for the economic prosperity of every American business. Innovation is also needed to ensure that engine and trucking manufacturers and suppliers located in the U.S. remain competitive in world markets and continue to provide rewarding employment opportunities for large numbers of Americans. U.S. manufacturing facilities face stiff worldwide competition. New truck technologies will help truck owners and operators and their customers cut fuel and other operating costs and increase safety. The Department of Defense, a major owner and operator of trucks, would share these gains and also benefit from reduced logistics costs associated with transporting fuel during operations. But the trucking industry faces a range of new challenges: increasingly stringent emissions goals, new concerns about the threat of global warming, concerns about U.S. fuel supplies, increased expectations about safety, and more. The trucking industry's future depends on its ability to produce affordable, high-quality, safe, environmentally sensitive products.

The new challenges can be best met if government, industry, and universities work together to develop an improved generation of commercial trucks for our nation's commercial and military truck fleet. Given adequate support, major advances can be expected in advanced engine designs, stronger, lighter-weight materials, regenerative braking, more efficient power transmission, and alternative fuels.

By this document, the trucking industry and the Federal government declare their separate, but coordinated plans toward the achievement of specific goals to meet the nation's need and desire for tomorrow's cleaner, safer, and more efficient trucks.

PROGRAM GOALS

The program strategy creates a balanced research portfolio to pursue a number of goals simultaneously, while avoiding duplication. The program will develop technologies to:

- Improve fuel efficiency,
- Reduce emissions,
- Enhance safety,
- Maintain or reduce capital outlay and operating costs, and
- Maintain or enhance vehicle performance.

Making progress in each of these goals simultaneously is a significant challenge. The Federal government and the trucking industry will work actively together to develop a balanced research portfolio aimed at achieving all of these goals, coordinate their research activities as appropriate, and make effective use of the nation's research universities and national laboratories. The Federal agencies will assign a high priority to research in this area and seek increased funding, as appropriate, to support research activities identified through this Initiative. Industry will move research achievements into production vehicles rapidly when their commercial viability has been demonstrated. The partnership will work closely with fuel producers to accelerate the development and production of any new fuels required by new engine designs required to meet the program goals

RESEARCH OBJECTIVES

This research partnership will support research aimed at developing production prototype vehicles that achieve all of the following objectives:

(a) Improve Fuel Efficiency of Heavy-Duty Trucks and Buses, specifically:

- Double the Class 8 line haul truck fuel efficiency by 2010.
- Triple the Class 2b and 6 truck (delivery van) fuel efficiency by 2010.
- Triple the Class 8 transit bus fuel efficiency by 2010.

(b) Reduce Emissions, specifically:

- Decrease the pollutants from heavy-duty trucks and buses.
 - ⇒ NO_x 0.10 g/hp*hr.
 - ⇒ PM 0.01 g/hp*hr.
 - ⇒ CO 2.00 g/hp*hr.
 - ⇒ HC 0.05 g/hp*hr.

(c) Increase Safety:

- Meet or exceed the motor carrier safety goal of reducing fatalities by half in ten years.
- Improve the crash friendliness of trucks for other road users.
- Conduct operation road tests of truck safety improvement components.
- Ensure linkages to the Intelligent Vehicle Initiative and the Intelligent Highway System and Infrastructure.

(d) Maintain or enhance affordability and performance.

A central goal of this initiative is to develop cost-effective, heavy-duty vehicles for truck operators that are fully competitive in prevailing markets. The program will document vehicle life-cycle costs through extensive on-road testing and surveys of user responses. Costs considered will include initial vehicle cost, as well as all operating and maintenance expenses – including fuel costs and the value of high reliability.

These program goals and research objectives are aggressive and there is no certainty that they can be achieved. Achieving the goal may also depend on successful introduction of a new fuel and fuel delivery infrastructure compatible with improved truck and bus designs. Fully aware of the magnitude of the challenge and the importance of meeting the partnership's objectives, the parties commit their best efforts to the achievement of the goals of this Declaration of Intent and to the rapid introduction of innovations developed under the program that prove to be commercially viable technologies.

Government and industry will coordinate research and development efforts and share the costs. Federal agencies are likely to cover a larger fraction of research expenses when the work involves longer-term, high-risk research, while the share of industry funding will be greater for research likely to be converted relatively quickly to commercial products.

The Federal government will promote the introduction of innovative truck technologies developed in the initiative through its own purchases of these trucks and buses, and encourage state government and other purchasers to take similar actions.

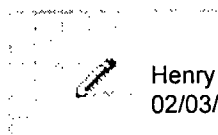
NEXT STEPS

Within 30 days, a Partnership Coordinating Committee will be formed which will be responsible for coordinating the Partnership's work. It will include senior representatives of the participating industries, universities, and the Departments of Defense, Energy, Transportation, the Environmental Protection Agency, the Office of Science and Technology Policy, the Council on Environmental Quality, the National Partnership for Reinventing Government, and the Office of Management and Budget. Within 120 days, this Committee will:

1. Develop a strategic research and development plan detailing specific program goals and timetables for the ten-year duration of the Initiative.
2. Create a set of research and development teams organized around specific research objectives (such as improving powertrains or reducing vehicle weight) and appoint government and industry researchers who will identify and coordinate research and development projects to meet these objectives. Each team would involve a combination of Federal and industry researchers. During the initial stages of the project, it will be desirable to establish competing teams working toward the same objective. Provisions would be made to add or remove teams, as needed.
3. Create an overall Cooperative Research and Development Agreement (CRADA) for the partnership and guidelines that will facilitate development and use of CRADAs and other

procurement mechanisms such as other transaction agreements involving individual federal agencies and their laboratories.

4. Create an External Advisory Board consisting of individuals with appropriate expertise in industry, universities, state and local governments, and public interest groups. This Board would provide an annual review of the program to the Partnership Coordinating Committee and publish their findings.



Henry C. Kelly
02/03/2000 01:38:36 PM

Record Type: Record

To: See the distribution list at the bottom of this message
cc: See the distribution list at the bottom of this message
Subject: Background information on 21st Century Trucks

Kelly Kirkpatrick has worked with the participating agencies to prepare the two attached documents: (1) a draft statement of intent for the partnership which, if approved at our Feb 5 meeting, will be used to complete our negotiations with industry partners, and (2) background information on Foreign Participation in foreign participation in federal research. This will be an important issue for 21st century truck research since many of the principal firms are foreign owned or considering mergers. Thanks again to Kelly Kirkpatrick, Paul Skalny and the folks in the agencies who helped with this material!

P.S. Since many of the issues covered in the foreign participation attachment are quite sensitive, please do not share the document with people outside the government.



DeclarationofIntent(version6Foreign Participation.

Message Sent To:

Neal Lane/OSTP/EOP@EOP
Betty J. Fountain/OSTP/EOP@EOP
Morley A. Winograd/OVP@OVP
Ronald Minsk/OPD/EOP@EOP
Roger S. Ballentine/WHO/EOP@EOP
Linda Lance/CEQ/EOP@EOP
Randolph J. Steer/OMB/EOP@EOP
Elwood Holstein/OMB/EOP@EOP
Robert J. Tuccillo/OMB/EOP@EOP
David Gardiner/CEQ/EOP

Message Copied To:

A Declaration of Intent Twenty First Century Trucks

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The new challenges can be best met if government, industry, and universities work together to develop an improved generation of commercial trucks for our nation's commercial and military truck fleet. Given adequate support, major advances can be expected in advanced engine designs, stronger, lighter-weight materials, regenerative braking, more efficient power transmission, and alternative fuels.

By this document, the trucking industry and the Federal government declare their separate, but coordinated plans toward the achievement of specific goals to meet the nation's need and desire for tomorrow's cleaner, safer, and more efficient trucks.

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The program strategy creates a balanced research portfolio to pursue a number of goals simultaneously, while avoiding duplication. The program will develop technologies to:

- Improve fuel efficiency,
- Reduce emissions,
- Enhance safety,
- Maintain or reduce capital outlay and operating costs, and
- Maintain or enhance vehicle performance.

Making progress in each of these goals simultaneously is a significant challenge. The Federal government and the trucking industry will work actively together to develop a balanced research portfolio aimed at achieving all of these goals, coordinate their research activities as appropriate, and make effective use of the nation's research universities and national laboratories. The Federal agencies will assign a high priority to research in this area and seek increased funding, as appropriate, to support research activities identified through this Initiative. Industry will move research achievements into production vehicles rapidly when their commercial viability has been demonstrated. The partnership will work closely with fuel producers to accelerate the development and production of any new fuels required by new engine designs required to meet the program goals

Research Objectives

This research partnership will support research aimed at developing production prototype vehicles that achieve all of the following objectives:

(a) Improve Fuel Efficiency of Heavy-Duty Trucks and Buses, specifically:

- Double the Class 8 line haul truck fuel efficiency by 2010.
- Triple the Class 2b and 6 truck (delivery van) fuel efficiency by 2010.
- Triple the Class 8 transit bus fuel efficiency by 2010.

(b) Reduce Emissions, specifically:

- Decrease the pollutants from heavy-duty trucks and buses.
- NO_x 0.10 g/hp*hr.
- PM 0.01 g/hp*hr.
- CO 2.00 g/hp*hr.
- HC 0.05 g/hp*hr.

(c) Increase Safety:

- Meet or exceed the motor carrier safety goal of reducing fatalities by half in ten years.
-
- Improve the crash friendliness of trucks for other road users
- Conduct operation road tests of truck safety improvement components
- Ensure linkages to the Intelligent Vehicle Initiative and the Intelligent Highway System and Infrastructure.

(d) Maintain or enhance affordability and performance.

A central goal of this initiative is to develop cost-effective, heavy-duty vehicles for truck operators that are fully competitive in prevailing markets. The program will document vehicle life-cycle costs through extensive on-road testing and surveys of user responses. Costs considered will include initial vehicle cost, as well as all operating and maintenance expenses – including fuel costs and the value of high reliability.

These program goals and research objectives are aggressive and there is no certainty that they can be achieved. Achieving the goal may also depend on successful introduction of a new fuel and fuel delivery infrastructure compatible with improved truck and bus designs. Fully aware of the magnitude of the challenge and the importance of meeting the partnership's objectives, the parties commit their best efforts to the achievement of the goals of this Declaration of Intent and to the rapid introduction of innovations developed under the program that prove to be commercially viable technologies.

Government and industry will coordinate research and development efforts and share the costs. Federal agencies are likely to cover a larger fraction of research expenses when the work involves longer-term, high-risk research, while the share of industry funding will be greater for research likely to be converted relatively quickly to commercial products.

The Federal government will promote the introduction of innovative truck technologies developed in the initiative through its own purchases of these trucks and buses, and encourage state government and other purchasers to take similar actions.

NEXT STEPS

Within 30 days, a Partnership Coordinating Committee will be formed which will be responsible for coordinating the Partnership's work. It will include senior representatives of the participating industries, universities, and the Departments of Defense, Energy, Transportation, the Environmental Protection Agency, the Office of Science and Technology Policy, the Council on Environmental Quality, the National Partnership for Reinventing Government, and the Office of Management and Budget. Within 120 days, this Committee will:

1. Develop a strategic research and development plan detailing specific program goals and timetables for the ten-year duration of the Initiative.
2. Create a set of research and development teams organized around specific research objectives (such as improving powertrains or reducing vehicle weight) and appoint government and industry researchers who will identify and coordinate research and development projects to meet these objectives. Each team would involve a combination of Federal and industry researchers. During the initial stages of the project, it will be desirable to establish competing teams working toward the same objective. Provisions would be made to add or remove teams, as needed.
3. Create an overall Cooperative Research and Development Agreement (CRADA) for the

partnership and guidelines that will facilitate development and use of CRADAs and other procurement mechanisms such as other transaction agreements involving individual federal agencies and their laboratories.

4. Create an External Advisory Board consisting of individuals with appropriate expertise in industry, universities, state and local governments, and public interest groups. This Board would provide an annual review of the program to the Partnership Coordinating Committee and publish their findings.

Foreign Participation in Federal R&D
A Compilation of Materials for the 21st Century Truck Initiative
February 3, 2000

At least four statutes govern foreign participation in federal research – Stevenson-Wydler, National Space Act, National Energy Act, and DoD Authorization. Developing a level of consistency would require legislative changes, which would be extraordinarily challenging. In PNGV we have elected to let each agency handle the issue for its own research contracts and not to attempt to reconcile the inconsistencies that exist in the underlying authorities. PNGV's answer to the question "how do you handle foreign participation" is that "each agency is governed by its own law and will abide by the rules established in their authorization".

We asked the agencies participating in the 21st century truck initiative to send us their most recent agency policy. The responses are assembled below. They include:

- I. ***International Aspects of Federal Laboratory Technology Transfer:*** This is a draft decision paper being prepared for the NSTC Committee on National Security. It provides a good overview of the issues.
- II. ***DoE's "Competitiveness Worksheet" used to resolve issues of U.S. Competitiveness in agreements with DoE laboratories.***
- III. ***A review of the DoD/U.S. Army Tank Automotive Command policies in foreign participation.***

The *Department of Transportation* does not have an formal agency policy at this time.

The Office of General Counsel of the *Environmental Protection Agency* reports that the agency has no hard and fast policy regarding R&D with foreign-owned companies. They do have preferences. EPA's preference is to conduct R&D partnerships with domestic companies, wholly owned and operated in the U.S. If it is not a U.S.-owned company, the EPA CRADA review board prefers that the company is a U.S.-based subsidiary, with both management and production facilities in the U.S. -- e.g., not just a plant in the U.S. The more independence this U.S.-based subsidiary has from the foreign-owned corporation, the better.

I. Draft International Aspects of Federal Laboratory Technology Transfer Prepared by the Technology Administration in the Department of Commerce

1. Scope:

This review covers two types of technology transfer from federal agencies (and their laboratories) to public and private organizations. The first type involves the formal licensing of third parties to use agency-owned intellectual property. The second type involves Cooperative Research and Development Agreements (CRADAs). CRADAs are intended to permit federal laboratories to engage in cooperative research with other federal agencies or nonfederal parties and, as a part of that cooperative effort, intellectual property arising from agency research may be transferred to the private sector for commercial development and application. As noted below, these two types of interactions represent only a small part of federal technology transfers and the portion of those transfers with international aspects is an even smaller portion of the total.

2. Putting Intellectual Property Licensing and CRADAs into Context

Federal research and development accounts for only a small share of the technology transfer occurring in the United States. In today's global economy, the private sector funds the major share of research and development and transfers significantly more technology than the government, not only within the U.S., but throughout the world. In addition, the portion of the transfer of federal technologies that occurs under formal agreements like CRADAs and patent licenses represents only a small fraction of the knowledge transferred by the federal government. The majority of technology transfers occur as a result of normal contract activity and of normal knowledge dissemination practices. Finally, the portion of Federal technology that is directly transferred to foreign entities through such formal agreements is believed to be relatively small.

Most of the information resulting from the research work performed and supported by the federal government is made available to the public. The mechanisms to release the information include formal agency publications, articles published by the researchers in professional journals, and presentations made at seminars by those researchers. Technology transfer also occurs informally as a result of personal contacts between federal researchers and others, from throughout the world, who may be interested in their work.

The federal government also uses formal mechanisms to transfer knowledge to the private sector for commercial development and exploitation. These transfers can occur through the licensing of intellectual property¹, cooperative research efforts (using the CRADA mechanism or, for NASA, through Space Act Agreements), privately funded work to be performed by federal researchers (often called "Work for Others"), private use of unique

¹ The term "intellectual property" is generally defined as the legal rights conferred in intellectual work product. Those rights generally encompass patents, copyrights, trademarks, trade secrets and other rights in technical data. In the present context, "intellectual property" refers to the property rights held by the Federal government under the patent and copyright laws.

federal research facilities, and personnel exchanges. The transfer of technology through licensing of intellectual property and cooperative research under CRADAs is still relatively new and less frequently used than other mechanisms such as the contracting process.

The balance of this section describes the legal and regulatory context for intellectual property licensing and CRADAs and reviews the specific provisions governing the international aspects of such transactions.

3. Legal Provisions Relating to International Aspects of CRADAs and Licensing

The legal authorities for agency licensing and for CRADAs reflect a Congressional purpose to make the fruits of federal research more readily available to the U.S. private sector as a source of potential advantage in international competition. Consistent with this purpose, the laws embody provisions designed to ensure domestic advantage from the development of the transferred technology and to ensure fair treatment for domestic firms in foreign countries. Both licensing of federally-generated intellectual property and CRADAs encourage the domestic manufacture of products embodying the invention when sold for domestic consumption. Additional requirements relating to access to research collaborations by non-domestic firms, foreign protection of intellectual property and export controls are also imposed for both types of transactions.

The precise application of these requirements is made more complicated by the differences in treatment of Government-owned, Government-operated (GOGO) laboratories and Government-owned, Contractor-operated (GOCO) laboratories. Many of the large DOE laboratories, such as Los Alamos, Sandia and Livermore, along with Federally Funded Research and Development Centers (FFRDC) such as NASA's Jet Propulsion Laboratory, fall into the GOCO category. In addition, some special statutory requirements are applicable to the GOCOs operated by DOE.

a. Congress Intended These Mechanisms to Enhance Domestic Industrial Competitiveness

The laws authorizing federal technology transfer activities were enacted beginning in the 1980's, when U.S. industry was beginning to feel the full force of foreign competition. The objective was to provide additional sources of new technologies for U.S. industry, thus increasing the return on the federal government's investment in research. In passing the first of these laws, the Bayh-Dole Act, Congress observed:

Ultimately, it is believed that these improvements in Government patent policy will lead to greater productivity in the United States, provide new jobs for our citizens, create economic growth, foster increased competition, make Government research and development contracting more competitive, and stimulate a greater return on the billions of dollars spent each year by the Government on its research and development programs. S. Rep. No. 96-517, 96th Congress, 1st Session, (1979).

In passing the later Federal Technology Transfer Act, Senator Hollings, one of the bill's sponsors, expressed similar objectives, stating, "At a time when the U.S. economy faces unprecedented foreign competition, the Federal Technology Transfer Act will help government, industry and academia work together to maintain America's technological leadership." Cong. Rec., 99th Congress, 2nd Session, S-15131 (Oct. 3, 1986)

b. Intellectual Property Licensing with International Aspects

The only statutory provisions explicitly relating to the international aspects of licensing concern the place of manufacture of goods produced with the licensed technology. These provisions differ slightly depending on whether the intellectual property originated directly from the work of GOGO laboratories or from federally funded work performed by others—a category that includes the contractors operating all GOCO laboratories². Finally, additional requirements relating to intellectual property protection, access to cooperative research and export controls are imposed by Executive Order where a foreign party is involved.

(1). Domestic Manufacture Preference for GOGO Laboratories

If the intellectual property is owned by a federal agency, as in the case of inventions arising in the GOGO laboratories, that agency is authorized to grant exclusive or nonexclusive licenses to others. 35 U.S.C. §§ 207-209; 37 CFR 404. Because Congress intended the knowledge licensed in this way to provide a competitive boost to domestic industries, it required that an agency:

shall normally grant the right to use or sell any federally owned invention in the United States only to a licensee that agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States. 35 U.S.C. § 209(b).

This provision ensures that, when an agency licensed a party to use or sell an invention in the United States, resulting products would "normally" be "manufactured substantially" in the United States.

The law and implementing regulations include several other provisions that may be important in the international context. They provide a preference for small business licensees and, in fact, the majority of licenses entered into by the agencies are with small businesses. They also require the giving of public notice when an agency is contemplating the granting of an exclusive license, thus affording interested parties an opportunity to seek a license for themselves or to oppose the proposed grant of exclusivity. In the agencies experience, the notice procedure has been extremely useful in helping them to discharge their licensing responsibilities and in some instances has helped them to identify small domestic firms better able to commercialize the technology

² This category of licensing also includes the licensing of federally funded inventions by universities and others receiving grants and other financial awards from federal agencies. However, that category of licensing activities is not within the scope of this review.

than other larger domestic and foreign applicants.

(2) Domestic Manufacture Preference for GOCO Laboratories

Domestic manufacture requirements are also imposed on the licensing activities of entities operating GOCO laboratories. However, there are some differences between the preferences as applied to GOGO and GOCO laboratories. In addition, there are some minor differences in the treatment of licensing by laboratories operated by nonprofit organizations (universities) and the licensing of those operated by other entities.

If the operator of the laboratory is a nonprofit organization (university), it is able to claim rights to its inventions under the Bayh Dole Act and license those rights as provided for by that law. The domestic manufacture provisions of the Bayh-Dole Act applicable to nonprofit organizations (universities) provides that neither such entities, nor their assignees:

shall grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency under whose funding agreement the invention was made upon a showing by the small business firm, nonprofit organization, or assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. 35 U.S.C. §204.

This language contains a clearer recognition than the law governing agency licensing that the domestic manufacture preference may need to be waived in certain circumstances and also provides a clearer statement of the basis and procedure for such waivers (as opposed to the GOGO language of 3.b.(1) above).

Most of the GOCO laboratories are owned by the Government and operated for DOE by their contractors under slightly different procedures. DOE provides that non-profit organizations that operate DOE's laboratories under Management and Operating (M&O) contracts can claim inventions under the Bayh-Dole Act if they agree to fund the cost of patent licensing and patent prosecution from their own institutional funds. If an organization charges such costs to its M&O contract, it must conduct its laboratory program on the same basis as DOE's "large business" contractors. In the case of such "large business" GOCO contractors, DOE provides rights similar to those granted under Bayh-Dole but on the basis of patent waivers granted by DOE. However, these waivers impose requirements of substantial manufacture in the United States consistent with the requirements applicable to other federal laboratory operators.

(2). Other Considerations: R&D Access, IP Protection and Export Controls

A second set of procedural requirements applicable to licensing transactions is contained in Executive Order 12591.³ That order, based on the Federal Technology Transfer Act

and the Bayh-Dole Act and other executive orders implementing those laws, directs agency heads to delegate the necessary authorities to their laboratories to make the technology transfer mechanisms effective. It also contains special provisions designed "to ensure that the United States benefits from and fully exploits scientific research and technology developed abroad" in instances where CRADAs or licensing arrangements are negotiated with foreign persons or industrial organizations. Agencies are directed, to "give appropriate consideration" "in consultation with the United States Trade Representative" to several different factors:

whether such foreign companies or governments permit U.S. participation in comparable cooperative research and licensing arrangements,
whether the foreign governments "have policies to protect the United States intellectual property rights", and
whether the foreign governments have "adequate measures" to prevent unauthorized transfers of technologies subject to U.S. national security export controls.

C. CRADAs with International Aspects

A second set of laws governs the use of Cooperative Research and Development Agreements (CRADAs) by the federal GOGO and GOCO laboratories. The Federal Technology Transfer Act of 1986 made these agreements available for use by GOGO laboratories. The National Competitiveness Technology Transfer Act of 1989 later extended the use of these agreements to GOCO laboratories as well. Once again, there are differences in the standards and procedures for the two categories of laboratories and some special procedural requirements for DOE laboratories.

(1). Preference for Domestic Business Units and for Domestic Manufacture

The domestic preference language applicable to CRADAs differs from that applicable to licensing agreements. In both GOGOs and GOCOs, the laboratories are obligated to give preference to U.S. based business entities when selecting private sector parties to participate under these agreements. These preferred entities are also expected to agree that resulting products are to be substantially manufactured in the United States.

More specifically, the laboratories are required to:

give preference to business units located in the United States which agree that products embodying inventions made under the cooperative research and development agreement or produced through the use of such inventions will be manufactured substantially in the United States and, in the case of any industrial organization or other person subject to the control of a foreign company or government, as appropriate, to take into consideration whether or not such foreign government permits United States agencies, organizations, or other persons to enter into cooperative research and development agreements and licensing agreements. 15 U.S.C. § 3710a(c)(4)(B) (emphasis supplied).

Once a CRADA is entered into, the laboratories are authorized to "negotiate licensing

agreements” pursuant to the authorities of the Stevenson-Wydler Act for CRADA generated intellectual property. 4 These licensing agreements trigger the “substantial manufacturing” requirements and other procedural requirements relating to agency licensing of intellectual property discussed in the preceding section.

(2). Other Considerations: R&D Access, IP Protection and Export Controls

As noted in the discussion of agency licensing, a second set of procedural requirements is imposed on CRADAs by Executive Order 12591. 5 That order directs the agencies to “give appropriate consideration” “in consultation with the United States Trade Representative” to several different factors:

whether such foreign companies or governments permit U.S. participation in comparable cooperative research and licensing arrangements,

whether the foreign governments “have policies to protect the United States intellectual property rights”, and

where cooperative research will involve data subject to national security export controls, whether the foreign governments have “adequate measures” to prevent unauthorized transfers of technologies subject to U.S. national security export controls, either through participation in the Wassenaar Arrangement or other international agreements.

Although these requirements are applicable to both intellectual property licensing and CRADA activities, it appears that they are more often used in connection with CRADAs, possibly because of the infrequent licensing of intellectual property to foreign parties.

The third requirement makes both intellectual property licensing and CRADA activities subject to the requirements of the three national security export control systems. The Arms Export Control Act authorizes the Department of State to administer the International Traffic in Arms Regulations (ITAR), which control the export of munitions and related items with military uses, and list all weapons and related items whose international sales are restricted. The Nuclear Regulatory Commission controls exports of nuclear reactors, nuclear explosive devices and nuclear fuels under the authority of both the Nuclear Non-Proliferation Act and the Atomic Energy Act. The Commerce Department imposes technology restrictions on U.S. exports of items considered dual-use (having the potential for both a civilian and military application) pursuant to the Export

4 More specifically, the laboratory is obligated “to grant, or agree to grant in advance, to a collaborating party patent licenses or assignments, or options thereto, in any invention made in whole or in part by a laboratory employee under the agreement, for reasonable compensation when appropriate.” 15 U.S.C. §3710a(a)(2) and (b)(1).

5 52 Fed. Reg. 13414 (April 10, 1987)

6 As continued under the International Emergency Economic Powers Act (IEEPA), 50 U.S.C. 1703(b). The Export Administration Act itself expired on August 20, 1994, but its provisions have been carried forward by a succession of Executive Orders since then, using the authority of the IEEPA. The Arms Export Control Act, the Nuclear Non-Proliferation Act, and the Atomic Energy Act have no expiration.

Administration Act 6, under which the Department has the authority to control and restrict all exports from the United States. The Commerce restrictions are codified in the Commodity Control List (CCL). The Department of Commerce provides information concerning its controls over the Internet. It provides a reference of export control offices, frequently asked questions, fact sheets and other information at www.bxa.doc.gov. The Department's export control regulations can also be obtained free of charge by linking to the Government Printing Office website at www.gpo.gov/bxa.

The Department of Defense also plays an important role in export controls, maintaining the Military Critical Technologies List (MCTL) to provide a listing of items that Defense is concerned about transferring without further scrutiny. The MCTL serves as an input to the ITAR list of weapons and related items administered by State and the CCL of dual-use technologies administered by Commerce.

(3). Special Procedural Requirements for DOE GOCO Laboratories

The CRADA process has several special requirements applicable to GOCO labs. First, as noted in the discussion of patent licensing, the specific language defining the preference for domestic manufacturing where intellectual property is licensed is somewhat different from that applicable to GOGOs. Second, time limits are set for the approval of GOCO CRADAs (and the related joint work statements used by the DOE laboratories as a preliminary step to CRADAs). The joint work statement, which must clearly identify foreign entities formally involved in a CRADA, must be submitted to the DOE for approval, prior to the execution of the CRADA. The joint work statement must be approved or rejected for cause by the DOE within 90 days. The resulting CRADA must be reviewed by the DOE and, if fully compliant with the joint work statement and approved terms and conditions, be approved for signature by the laboratory director within an additional 30 days after being submitted to the DOE by the laboratory.

In addition, because of the complexity of the process when GOCO laboratories are involved, agencies with GOCO laboratories are required to develop "one or more model cooperative research and development agreements, for the purpose of standardizing practices and procedures, resolving common legal issues, and enabling review of cooperative research and development agreements to be carried out in a routine and prompt manner." 15 U.S.C. §3710a(c)(5)(C)(iii). Pursuant to this requirement, DOE has developed and given broad circulation to a model CRADA which has optional clauses designed to meet the different types of cooperative activities and/or needs of the private sector participants.

4. Federal Laboratory Technology Transfer: Implementing Statutory Processes

6 As continued under the International Emergency Economic Powers Act (IEEPA), 50 U.S.C. 1703(b). The Export Administration Act itself expired on August 20, 1994, but its provisions have been carried forward by a succession of Executive Orders since then, using the authority of the IEEPA. The Arms Export Control Act, the Nuclear Non-Proliferation Act, and the Atomic Energy Act have no expiration.

The decentralized nature of federal laboratory research (with hundreds of laboratories involved in many different departments and agencies), and the decentralized decision-making deemed essential to the success of technology transfer efforts within that system of federal laboratories, make it difficult to ensure that issues relating to foreign participation or export control considerations in formal licensing and research collaborations are interpreted in a uniform manner. What is needed is a method for producing more uniform decisions within the current framework of decentralized decision-making.

Recommendation:

After considering issues raised by the current statutory and regulatory framework, a proposed procedure will be outlined for use by the agencies and their laboratories for the controlled dissemination of information, including information generated under CRADAs involving foreign parties and associated with intellectual property licenses to foreign parties.

The Challenges:

National Security: Export Control Issues

The authority for export control determinations rests with the Departments of Commerce and State, and the Nuclear Regulatory Commission. However, in practice, it is the laboratories, like other exporters, that make the first assessment of whether the technologies involved are subject to export controls. As a result, the export control agencies may not be aware of export control issues relating to a proposed transaction until an application for an export license has been submitted, although requests for advisory opinions and telephone calls for advice may precede the submission of a license application. The export control agencies believe that the laboratories must have a thorough understanding of the export control requirements and a knowledge of the parties to their transactions in order to make accurate assessments of the control status of specific technologies and to submit license applications in appropriate cases. To help the laboratories achieve and maintain the necessary expertise, the export control agencies have offered to provide training to laboratory personnel on export control requirements and have taken other steps to strengthen the laboratories' export control.

The Department of Commerce has also established an International Cooperative License (ICL) to facilitate export of dual-use items required to fulfill the U.S. partnership role in international cooperative efforts. The Commerce Department is authorized to establish these licenses, which "assist in the effective and efficient implementation of the EAA " under Section 4(a)(4) of the Export Administration Act. All ICL's have U.S. Government agencies as the license holders responsible for oversight of the use of the license and for implementation and maintenance of an Internal Control Program. Three such licenses currently exist at NASA, DOD and DOE.⁷

⁷ NASA's license supports the U.S. partnership role in building the International Space Station. Defense's Threat Reduction Agency's license facilitates exports needed to dismantle weapons of

The DOC works with the requesting agency to customize a license that will meet the unique export control requirements of each international project. The ICL provides flexibility, yet control, and streamlines the application process as much as possible. ICL's are approved within an interagency referral process and are reviewed for activities, consignees, end-uses and items that will be exported under the ICL, i.e., restrictions on federal technologies that are to be transferred to foreign entities through CRADA agreements and agency-owned intellectual property.

The export control restrictions are intended to limit the military capability of other nations and to preserve our national security. They seek to achieve these goals without impairing the federal laboratories' ability to enhance the competitiveness of U.S. industry in the global marketplace. The United States is unique in the scale of its research enterprise and the federal laboratories play an important role in helping U.S. companies compete internationally but their participation in such efforts must reflect the changing security environment incorporated into the nation's export control laws.

Recommendation:

The research agencies should work with the U.S. export control agencies to ensure that the federal laboratories are in compliance with national security export controls applicable to CRADAs and intellectual property licensing and have adequate access to guidance on these controls.

First, the laboratories engaged in technology transfer should work with the export control agencies to develop training programs providing laboratory personnel with a thorough understanding of U.S. export control requirements. This objective could be accomplished by offering interagency workshops through the Federal Laboratory Consortium or other organizations or by holding export control training sessions at the larger laboratories. Moreover, once the decision process for export control issues is worked out and training materials developed, the procedures and training materials should be made available to all laboratory employees through laboratory intranet or other means.

Second, the research agencies should establish export control contacts within each of the laboratories participating in CRADAs and intellectual property licensing. These contacts would advise their laboratories on the export control aspects of their CRADA and licensing transactions and would coordinate export control activities with the appropriate export control agency. The export control agencies should also establish contacts within their organizations and these contacts (and backup personnel) should be designated as the only personnel authorized to respond to the laboratories on export control issues relating to CRADAs and intellectual property licensing. This system of

mass destruction in Russia, the Ukraine, Belarus, and Kazakhstan. DoE's license supports its obligations for materials protection control and accountability in the newly Independent and Baltic States.

contacts in the research and export control agencies would help ensure that all necessary information concerning laboratory transactions is communicated to the export control agencies and the agencies' responses are accurately and appropriately distributed..

Third, the Department of Commerce should consider the possibility of enhancing the flexibility of the International Cooperative License as a means of dealing with international technology transfers from the agencies. The Department is willing to consider how this license might be expanded to meet the unique export control requirements of certain type of CRADAs and intellectual property licenses.

Fourth, the system of export controls applicable to CRADAs and intellectual property licensing is not fully addressed in Executive Order 12591. To the extent necessary, the Executive Order should be modified to reflect the authority for export control determinations that rests with the Departments of Commerce and State and the Nuclear Regulatory Commission. In addition, the Order should require that CRADAs or licensing agreements involving foreign participation require all parties to comply with the export control laws.

Foreign Participant Criteria: Intellectual Property

The procedures followed by the laboratories when licensing intellectual property or entering into a cooperative arrangement with a foreign entity were formulated at the outset of the federal laboratory technology transfer effort and are in need of reexamination and refinement in light of the accumulated experience of the last decade. The goal of uniformity in agency and laboratory implementation of these procedures would be more readily attained if the processes could be simplified and clarified. With respect to intellectual property regimes, the development of a single country list maintained by USTR, the PTO or other appropriate agencies, and possibly posted on the web, would provide a convenient reference point for the agencies and laboratories, and eliminate the need for most personal contacts with USTR and other designated agencies.

Recommendation:

The research agencies should work with USTR, PTO and other interested agencies to develop a reference list and/or single point of contact to advise the laboratories of the acceptability of a particular country's intellectual property regime for purposes of the technology transfer laws' standards. To the extent necessary, Executive Order 12591 should be modified to reflect this new process.

Foreign Participant Criteria: Cooperative Research Issues

A more complicated problem is presented by the need to determine the practices of a foreign government with respect to cooperative research. It does not appear that information concerning such foreign practices is gathered on a routine basis by any federal agency, although some information may be available from State, Commerce, OSTP and other agencies. Further, it does not appear that any of these agencies currently possess the resources needed to collect such information on a routine basis. If a laboratory or agency does not have sufficient information to make an appropriate

determination, the agency should contact the United States Trade Representative (USTR) as set forth in paragraph 3.c.(2) above. After the agency contacts the USTR, it will provide the information received to the laboratory so that it may make its own decision based on its best judgment. In the past, some laboratories have sought additional information on their own to aid in their decision making process. (One example from outside the CRADA and licensing field is provided by the Advanced Technology Program, which collects information on foreign government practices through cables to the embassies, the experiences of other federal agencies and other sources.) Absent the resources needed to assemble such information on a routine basis, it may be necessary to arrange for the research agencies and their laboratories to continue to address these issues on a case by case basis but to encourage the sharing of the information across agency boundaries.

Recommendation:

The Departments of State and Commerce should be encouraged to collect and to make available to the research agencies information concerning the practices of foreign governments with respect to cooperative research. Research agencies should be encouraged to share any such information available to them through the Interagency Committee on Technology Transfer⁸ or a similar interagency mechanism. To the extent necessary, Executive Order 12591 should be modified to reflect the new process(es).

Transactional Criterion: Substantial Domestic Manufacture

The laws provide little guidance as to the meaning of the "substantial manufacture" requirement or the circumstances in which such requirements can be waived. In practice, the laboratories and agencies have generally used the rule that if a product or process embodying government funded intellectual property is to be used or sold in the U.S., then it must be manufactured in the U.S. Since there have been few cases where the licensee wished to do otherwise, the agencies have generally followed this conservative practice, thus avoiding the need to define the meaning of "substantial". As a result, there has been little interagency information exchange.

Recommendation:

⁸ The Department of Commerce has played an important role in the development and evolution of federal technology transfer laws and that role is the basis for the work of the Interagency Committee and Working Group on Technology Transfer. The Interagency group was created following passage of Federal Technology Transfer Act in 1986. Secretary Baldrige invited other agencies involved in research to become members of the Interagency Committee for Technology Transfer, a group created to carry out the Department's responsibilities under that law. The Committee is formed of Assistant Secretary-level representatives from the various agencies and departments and chaired by the Technology Administration's Assistant Secretary for Technology Policy. The work of the committee is generally done through the Interagency Working Group on Technology Transfer, which is composed of senior managers from the agencies and departments who are responsible for technology transfer.

Research agencies should be encouraged to share information concerning their application of the substantial domestic manufacture criterion to specific licensing and cooperative research transactions through the Interagency Committee on Technology Transfer and its Working Group or a similar interagency mechanism. The agencies must also work together, through such a mechanism, to explore the feasibility of developing uniform definitions of these criteria and guidelines that can be used to make appropriate decisions.

5. A Proposed Procedure for Identifying and Managing Issues Involving Foreign Participation in CRADAs and Licensing

Currently, there is no formal interagency coordination on the issue of determining the economic security effects of a technology transfer. There is only a national security process, which is driven by different concerns, primarily export control issues. Evaluating America's economic security requires a sustained, coordinated effort within our government. Based upon a survey of agency practices in the handling of foreign participation issues, the following process is recommended as an appropriate one and the Interagency Committee on Technology Transfer is recommended as the appropriate mechanism for managing the process. The CNS Working Group should work with the Interagency Working Group on Technology Transfer to develop these procedures in greater detail so that they can be applied by the research agencies and their laboratories.

Additional Reporting on Foreign Participation in CRADAs and Licenses

While the agencies are currently supplying data to the Interagency Working Group on Technology Transfer and OMB on some aspects of their technology transfer activities, this data does not include information concerning the number of foreign participants in these activities. The research agencies should be asked to identify, in each fiscal year, the number of CRADAs and licenses entered into with foreign parties and provide information concerning the size and significance of such transactions.

Check Lists for Identification and Assessment of Foreign Involvement in CRADAs and Licensing Transactions

A checklist should be developed on an inter-agency basis for use by individual laboratories in assessing the foreign participation issue. The first item on the checklist should ask whether a formal, cooperative project is likely to include one or more foreign parties. In addition, there are likely to be cases where the laboratory anticipates that although there are no foreign parties who are CRADA participants, the work and resulting technologies may require the "involvement" of one or more foreign parties, who in turn could become licensees in order to commercialize the technologies. On the one hand, it would clearly be desirable to identify such situations in advance and take some steps to alert the appropriate management. A competitive loss may occur when a foreign party acquires federally-funded technology and it is important to identify foreign involvement in CRADAs and licensing at an early stage so that competitive issues can be considered. On the other hand, there are very real limits to a laboratory's ability to

predict the likely competitive consequences of a proposed cooperative research agreement. This matter should be explored by the Interagency Working Group on Technology Transfer with the objective of developing a formal set of guidelines to be followed by the laboratories.

Currently Required Interagency Consultations

Once the laboratory has identified the transaction as one that involves or is likely to involve a foreign party and addressed the preceding issues, the checklist must provide for it to address the questions of the practices of the foreign party's government defined in the applicable laws and regulations. The resolution of these questions currently requires that the laboratory consult with one or more agencies (e.g., USTR, State, Commerce) on the subject of the foreign government's intellectual property protection, its export control capabilities (where controlled technologies are involved) and its openness to foreign participation in research ventures. Suggestions for improving these interagency consultations have already been discussed.

Description of Additional Interagency Consultations

The question of whether an additional level of interagency consultation is needed, beyond those mandated by current law and regulation, has been a subject of some disagreement. While advocates of tighter controls on foreign participation believe such a consultation process is necessary to ensure uniformity in agency decision-making, managers of the technology transfer programs have expressed strong concerns about making such a process mandatory. As to the manner in which any such consultation process (whether voluntary or required) would work, a recent review of CRADA practices involving foreign parties prepared for the Departments of Defense, Energy and Commerce suggested a "default to decision" process that was attractive to many of the agencies.

II. The "default to decision" process is premised on: (1) observance of a time limit for interagency consultations; and (2) the preservation of the proposing agency's ultimate authority to decide whether or not to enter into an agreement. Under this procedure, information concerning proposed transactions submitted for interagency consultations would be disseminated (electronically or in some other manner) by an interagency group (e.g., the Interagency Committee on Technology Transfer described previously) to all participants in the process. Within the prescribed time limits, the participating agencies would have the opportunity to review the proposed transaction and submit their comments and concerns. Comments and discussion among the participating agencies would take place initially at the working group (staff) level. If any concerns could not be resolved at that level, the matter would be elevated to the Assistant Secretary-level Interagency Committee for its consideration subject to the agreed time limits. While the agency submitting the transaction would retain authority to decide whether to go forward, it would receive the comments and concerns of the consultative group in a timely fashion before making that decision.

Department of Energy: U. S. COMPETITIVENESS WORKSHEET: For Use in

Resolving Issues of U.S. Competitiveness Regarding Prospective Technology Transfer Agreements and Partners at DOE Laboratories

The Government, in funding CRADAs, is seeking to transfer technology to companies with significant manufacturing and research facilities in the United States in a way which will provide short and long term benefits to the U.S. economy and the industrial competitiveness of such companies.

The preferred benefit to the U.S. economy is the creation and maintenance of manufacturing capabilities and jobs within the U.S.

1. Will the Participant(s) agree, as part of the CRADA, to substantially manufacture any products or use any processes or perform any services in the United States incorporating or resulting from inventions, copyrights, mask works or protectable data arising from the CRADA work in which the Participant(s) has some commercial rights? Yes ___ No ___
2. If no, Participant(s) must furnish sufficient information to justify that substantial U.S. manufacture of the resulting CRADA technology is not feasible.
3. If no, Participant(s) must furnish a description of specific economic or other benefits to the U.S. economy which are related to the commercial use by Participant(s) of the technology being funded under the CRADA and which are commensurate with the Government's contribution to the proposed work.
4. The above-described agreement and/or description of benefits will be provided by the laboratory to the Field Office before submission of the Joint Work Statement by the laboratory to the Field Office.

Appropriate recognition of U.S. taxpayer support for the technology, e.g., a quid-pro-quo commensurate with the economic benefit that would be domestically derived by the U.S. taxpayer from U.S.-based manufacture must be demonstrated.

Such benefits may include one or more of the following:

- Direct or indirect investment in U.S.-based plant and equipment.
- Creation of new and/or higher quality U.S.-based jobs.
- Enhancement of the domestic skills base.
- Further domestic development of the technology.
- Positive impact on the U.S. balance of payments in terms of product and service

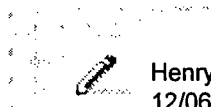
exports as well as foreign licensing royalties and receipts.

- Cross-licensing, sublicensing, and reassignment provisions in licenses which seek to maximize the benefits to the U.S. taxpayer.

Leveraging of government resources in furtherance of DOE program goals.

II. Department of Defense: U.S. Army Tank-Automotive and Armaments Command: National Automotive Center

- There is no specific prohibition of foreign entities being recipients of Other Transactions (OTs) and Cooperative Agreements (Cas). However, the Supplement (March, 1998) to the 1994 Interim Guidance Department of Defense Research & Engineering (DDR&E) Guidance for Cooperative Agreements and Other Transactions requires the inclusion of a Foreign Access to Technology clause that as a minimum, provides that the recipient may not exclusively license subject inventions to foreign firms that would allow the manufacture in foreign countries of products that result from the research under the agreement without first obtaining Government approval. This guidance would apply to any recipient, but presumably could have a greater effect on foreign firms.
- The Defense Advanced Research Projects Agency (DARPA) has interpreted this guidance to require controls on foreign access to important technology developments and their Foreign Access to Technology clause contained in their model OT reflects these controls. However, the Army is not bound by DARPA's interpretation of the guidance.
- Concerning Cooperative Research & Development Agreements (CRADAs), 15 USC 3710a(c)(4) says that preference for the award of CRADAs shall be given to business units located in the United States which agree that products embodying inventions made under the CRADA or produced through use of such inventions will be manufactured substantially in the United States. Also, in the case of an industrial organization subject to the control of a foreign company or government, consideration should be given to whether or not the foreign government permits United States entities to enter into cooperative research and development and licensing agreements.
- Any agreement with a foreign entity is subject to all the laws and regulations, such as the ITAR, governing dealings with foreign entities, or any treaties or MOUs we may have with with particular countries.



Henry C. Kelly
12/06/99 09:56:09 AM

Record Type: Record

To: Angela C. Mizeur/WHO/EOP@EOP, Roger S. Ballentine/WHO/EOP@EOP, Morley A. Winograd/OVP@OVP

cc:

Subject: truck meeting 

In today's 21st century truck meeting we will learn about the industry reaction to our proposed initiative as presented by the interagency team. We will also make decisions about next steps.

Agenda:

Ballentine Introduction and establishment of goals for the meeting (see below)

Haper (DoD) makes a few remarks and turns the briefing over to Paul Skelney (sp?)

Briefing (attached below) takes about 10 minutes

Next steps:

- complete briefings and consultations by Jan 15
- prepare statement of intent (following PNGV approach) which could be the basis for an announcement.

Decisions:

- FY2001 Budget requests for key agencies DoE, DoD, EPA. Do we have enough to make this a budget initiative. What is the above guidance request for each agency?
- Should we include Class 2b trucks (and bring in Ford, GM, Chrysler)
- How to draft and review the statement of intent

o hscs 7?

=====

Roger's talking points:

- State mission of the meeting (learn about industry reaction and focus on budget and drafting statement of intent)
- Thank the interagency team for their work with particular praise for the Army's work
- Highlight the near term need to make budget decisions: do we have an initiative, what above guidance amounts are needed to make it work. [hk note. I believe that we should encourage the Army to ask for \$50 above current levels and EPA to ask for \$10 more to cover some really innovative projects they have. DoE will speak for itself here.]



- D991203 OSTP Briefing.ppt

ATTENDEES FOR 21ST CENTURY TRUCK INITIATIVE

Confirmed to Attend:

~~Gardner~~
~~Seabright~~
~~Henry Kelly~~
~~Kelly Kirkpatrick~~
Neal Lane
Morley Winograd

~~Kevin Doxey (DoD)~~
~~Paige Hooper (Army)~~
~~Paul Skalny (Army)~~
~~Thomas Gross (Energy)~~
Gupreet Singh (Energy).
~~Don Zinger (EPA)~~
Fenton Carey (DoT)

Pending:

Linda Lance
Randy Steer

~~Elgie~~
Minsk

Confirmed NO:

George
Perciasepe
Reicher
Mort Downey (DoT)
Margo Oge (EPA)

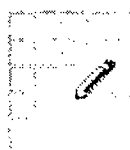
Secretary of Energy Bill Richardson Invites You to Attend the Announcement of a Bold New Truck Initiative

What: A new Research and Development Partnership between Industry and Government to promote the development of cleaner more fuel efficient and safer trucks and buses.

When: Friday, April 21, 2000, 9:30-11:45 am

Where: Alvan Motor Freight, 9911 Harrison Road, Romulus, Michigan

Who: Vice President Al Gore, Secretary of Energy Bill Richardson, Secretary of Transportation Rodney Slater, Environmental Protection Agency Administrator Carol Browner and General John G. Coburn, Commanding General, United States Army Materiel Command will attend. The House and Senate delegation as well as other state and local dignitaries are invited. Private sector invitees include representatives from medium and heavy-duty truck manufacturers, engine manufacturers, and major heavy vehicle component and systems suppliers.



Henry C. Kelly
04/18/2000 12:04:30 PM

"Line Haul,
not "Long-Haul"

Record Type: Record

To: Roger S. Ballentine/WHO/EOP@EOP

cc: skalnyp@cc.tacom.army.mil , Morley A. Winograd/OVP@OVP, skalnyp@cc.tacom.army.mil

Subject: industry contacts

Called Hakim of Detroit Diesel. He said that the Chairman of the Board who got our letter is not well versed in technology and as a result may be somewhat confused about what is happening. This is partly our fault since we sent the letter to the Chairman instead of the CEO due to a miscommunication with Detroit Diesel last month. The CEO would have been a better choice. The bottom line is that Hakim sees no reason why Detroit Diesel would want to change its position. This week is very bad for them to attend anything since they have their annual Board meeting wednesday with events that spill over to the weekend

Morley asked that I not call anyone at Ford. You should talk with him.

Skalnyp is trying again to reach Freightliner but hasn't heard back from them. Paul, what's happening with navistar?

11 A.M.
11-12 P.M.



A DaimlerChrysler Company

703-739-4266

Michael von Mayenburg
Senior Vice President
Engineering & Technology

April 12, 2000

Mr. George Frampton Jr.
Acting Chair, Council on
Environmental Quality
The White House
Washington, DC 20500

Freightliner Corporation
4747 N Channel Ave.
Portland, OR 97217
503.735.8030 Phone
503.735.8192 Fax
MichaelvonMayenburg@Freightliner.com

Mr. Roger S. Ballentine
Deputy Assistant to the President
For Environmental Affairs
The White House
Washington, DC 20500

Dear Messrs. Frampton and Ballentine:

This responds to your letter of March 24th, regarding the 21st Century Truck Initiative. National Automotive Center personnel visited Freightliner on two occasions during the initial planning stages of the program and our staff provided comments on the "declaration of intent."

Freightliner Corporation has undertaken numerous efforts to develop technological solutions to solve truckers (our customer's) problems as well as address society's concerns. Thus, we agree with the program's goals for a coordinated effort by Government, Industry and Academia to improve fuel efficiency, reduce emissions, enhance safety, and reduce total ownership and operating costs while maintaining or enhancing performance. Coordination of government sponsored R & D, across agency boundaries, where goals often conflict and coordination is lacking, offers great promise. Also, we appreciate the opportunity to participate at the planning level through the proposed "Partnership Coordinating Committee."

But, on the other hand, Freightliner also has some concerns about the initiative. For example, we are concerned that the specific research objectives, e.g. doubling and tripling fuel efficiency, are arbitrary, perhaps unreachable, or at least unrealistic under real world conditions. We also question the commitment of individual agencies to coordinate their actions without a legislative mandate. All too often, program managers use their individual missions as an excuse to disregard the important side effects their regulatory actions may have. An example of this is EPA's current effort to impose "voluntary" restraints on truck engines for 2004 without regard to the effects on truck design and fuel consumption.

The funding mechanism for the planned 21st Century research is also of concern. "Sharing" of costs cannot result in a diversion of limited resources from our near-term / mid-term strategic development projects where changing economic conditions always limit available funds and manpower.

Our commercial interests also dictate that certain developments not be shared with our competitors and remain our intellectual property. This is especially true on research that leads to near term product opportunities. Therefore, there must be a mechanism that can provide such assurances.

From an overall policy perspective, we are also concerned that Government and Industry are spending hundreds of millions of dollars each year on R & D, yet much of the technology is not finding its way in large numbers into the commercial, and government fleets, including military vehicles. Here we see a need to remove disincentives such as outdated excise taxes and instead provide incentives for wide spread adoption of proven technology.

In closing, Freightliner will participate in your planned meeting to discuss taking the next steps toward realizing a mutually acceptable and beneficial Initiative. But, we cannot make any commitment at this time for considerably more R & D effort than is already underway in the context of the 21st Century Truck Initiative.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael von Mayenburg". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael von Mayenburg

 Henry C. Kelly
04/13/2000 05:07:32 PM

Record Type: Record

To: Roger S. Ballentine/WHO/EOP@EOP, skalnyp@cc.tacom.army.mil

cc:

Subject: Communications with Fazio(ford) and patten (cummins)

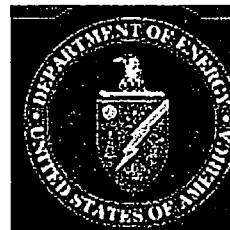
Fazio got my email and asked whether I'd gotten his email saying no. I said that we had indeed gotten the email but my understanding based on second hand reports of conversations with Janet and others that Ford didn't want to absolutely close the door. He said that this was absolutely correct and seemed happy that I had copied him on the note. He began asking about ton-miles per gallon and seemed to recognize for the first time that there really was a difference between the driving cycle of delivery trucks and SUVs (making higher fuel economy gains easier) and that credit could be given for lowering the weight of the vehicle and adding more freight (keeps total truck weight the same but delivers more pounds of freight per gallon of fuel). This seemed to give him room to get more daylight between SUVs and real trucks.. He said that Ford would just have to make a cedisio

Patten sent an email asking why we were going ahead when some "auto companies" were still worried. I said that we felt a sense of urgency to get moving and since there were a lot of companies involved we just needed to put down some kind of deadline to get started. I also noted that we had a terrific core set of companies and the founding partners could always agree to add more. He was in complete agreement, understood the need to "just do it" and agreed that we needed to start -- particularly to get ahead of the Congressional appropriation cycle.

21ST Century Truck Initiative



**Department of
Defense**



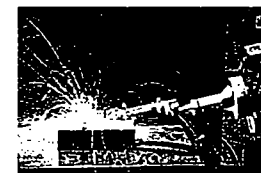
**Department of
Energy**



**Department of
Transportation**

21st Century Truck Initiative

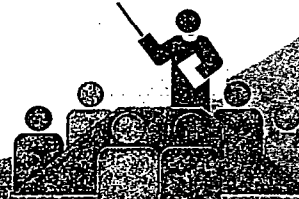
**Government Agencies and Industry collaborating
to improve fuel efficiency, reduce emissions,
increase safety, and reduce the cost of ownership
for the nation's commercial and military trucks.**



Industry



**Environmental Protection
Agency**



Academia

21ST Century Truck Initiative

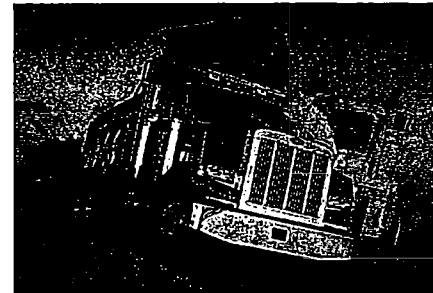
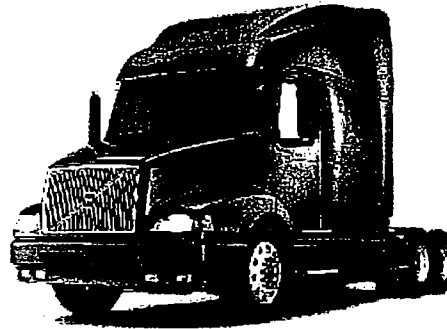
Goals for This Meeting

- **Agree on Program Goals**
- **Design Management Team**
- **Launch Industry Coordination**
- **Establish Timetable for Next Steps**

21ST Century Truck Initiative

Trucks are Vital to the Nation

Trucks Account for Over 81% of the Nation's Freight Business



There are over 458,000 motor carriers in the United States, of which 70% are fleets of 6 trucks or less.

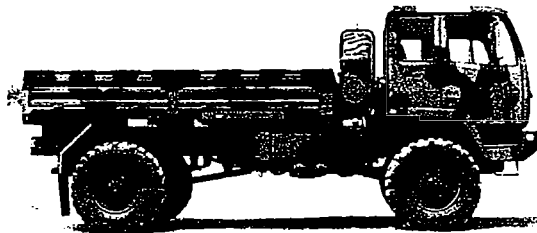
There were over 19.8 million commercial trucks registered in 1997.

In 1997, the nation's trucks drove over 428 billion miles for commercial business and consumed over 42.5 billion gallons of fuel.

21ST Century Truck Initiative

Trucks are Vital to the Army

Trucks Provide the Logistical Backbone to the Army



Fuel constitutes 70% of bulk tonnage needed to sustain a military force on the battlefield. This equates to about 600,000 gallons per day.

- Fuel Efficient AAN Task Force

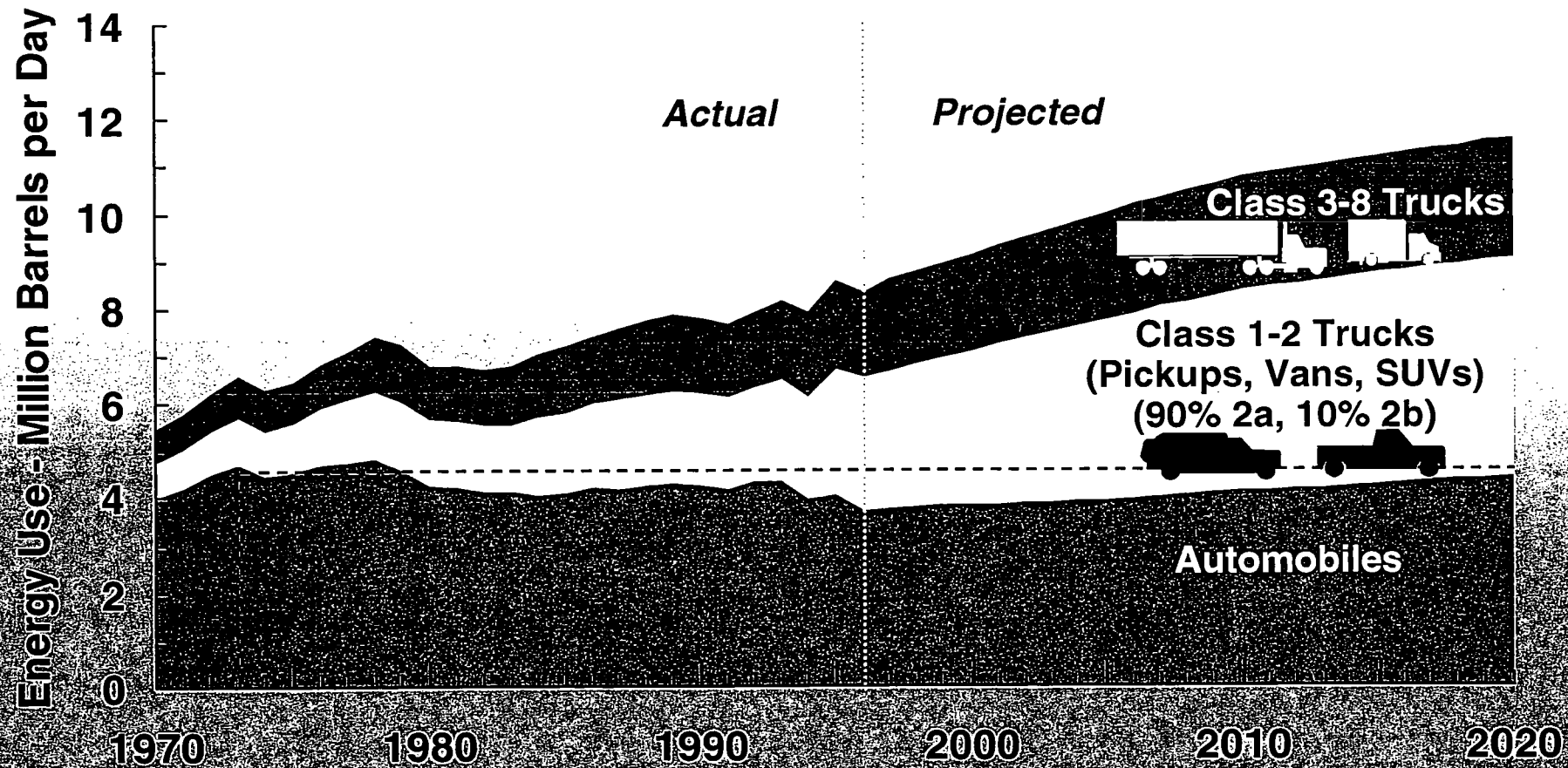
The US Army has a fleet of over 246,000 tactical wheeled vehicles and drives 823 million miles annually.

Army After Next Goal:

“...75% Reduction in Fuel Requirements for a Deployed Force...”

21ST Century Truck Initiative

Since the 1973 Oil Embargo Essentially All of the Increase in U.S. Highway Fuel Consumption has been due to Trucks

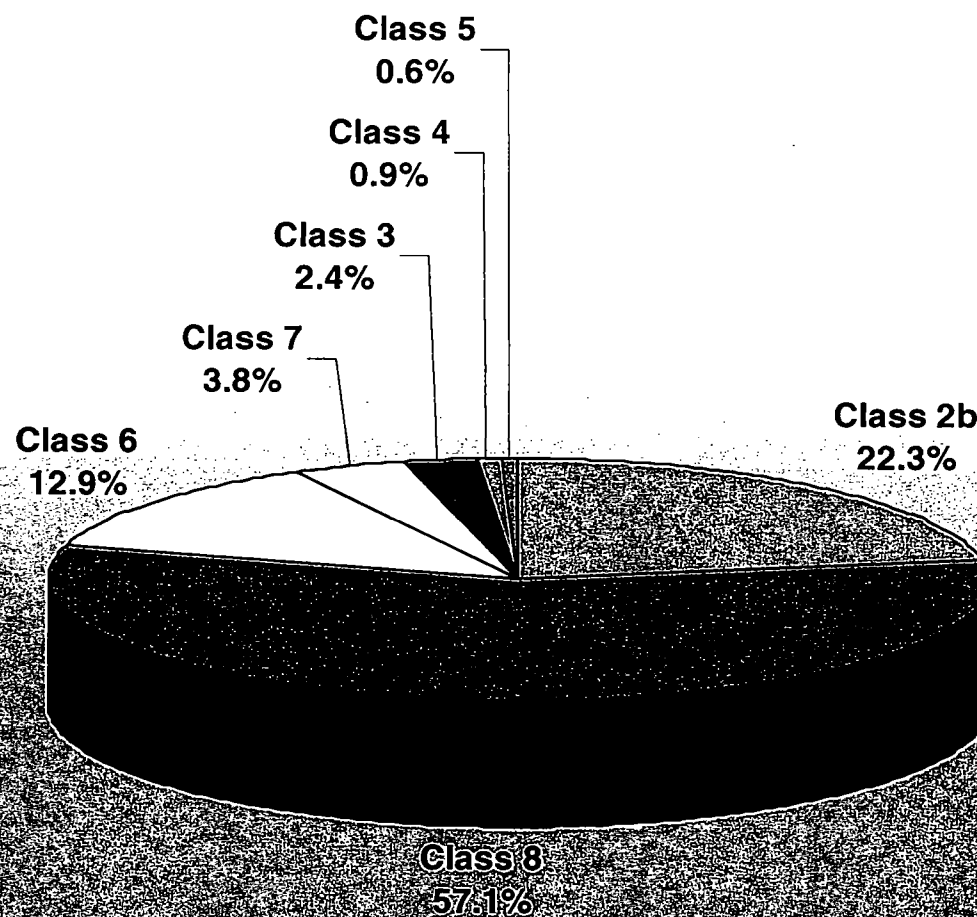


source: EIA Annual Energy Outlook 1998
Federal Highway Administration, Highway Statistics

As of: 28 Oct 99

21ST Century Truck Initiative

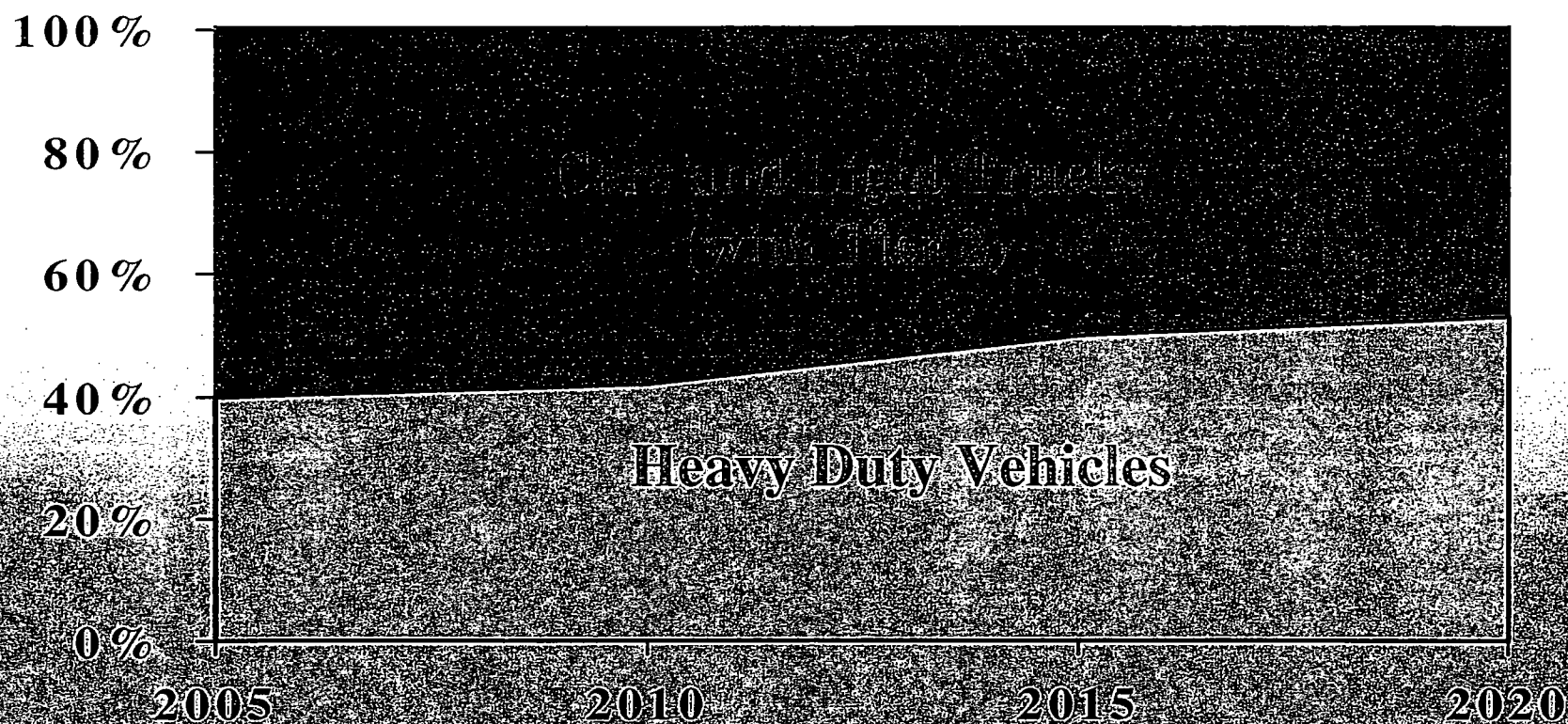
Class 2b - 8 Truck Fuel Use



Source: ORNL Transportation Energy Data Book, Edition 18 Data from 1992

21ST Century Truck Initiative

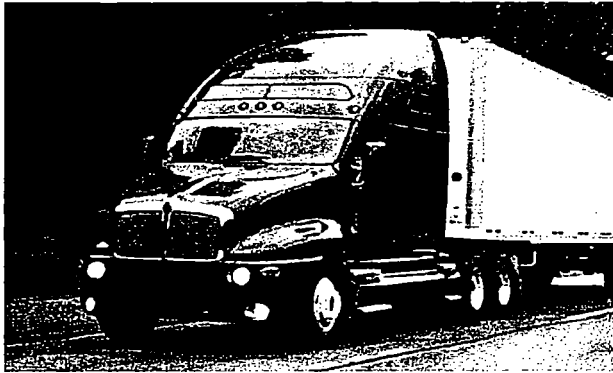
Highway Vehicle NO_x Emissions



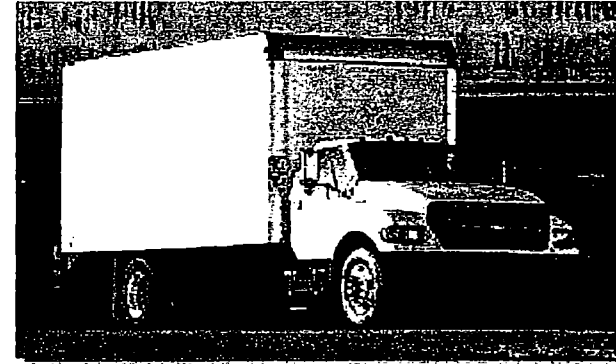
Source: EPA Tier 2 Regulatory Impact Analysis, March 1999

21ST Century Truck Initiative

Representative Commercial Trucks



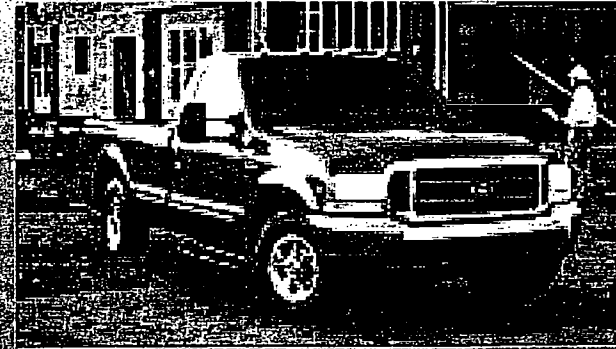
**Class VIII Line Haul Rig
(Kenworth T-2000)
430hp Diesel, 80,000 lbs GVW
67,500 lbs simulated**



**Class VI Enclosed Delivery Truck
(Ford F-650)
190hp Diesel, 26,000 lbs GVW
22,000 lbs simulated**



**Class VIII Transit Bus
(Nova RTS)
275hp Diesel, 40,000 lbs GVW
36,500 lbs simulated**



**Class IIB Utility Truck
(Ford F-350)
235hp Diesel, 10,000 lbs GVW
8,500 lbs simulated**

21ST Century Truck Initiative

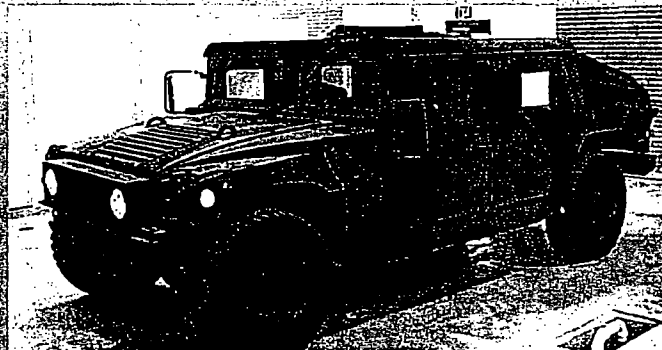
Representative Military Trucks



Class VIII - M915 Line Haul Rig
430hp Diesel, 105,000 lbs GVW
67,500 lbs simulated



Class VI - FMTV Tactical Truck
225hp Diesel, 26,000 lbs GVW
21,100 lbs simulated



Class IIB - HMMWV M998 Utility Vehicle
190hp Diesel, 10,000 lbs GVW
8,500 lbs simulated

21ST Century Truck Initiative

Fuel Efficiency Goals (mpg)

- **3X - Class IIB & VI**
- **3X - Class VIII Bus**
- **2X - Class VIII Line Haul**

21ST Century Truck Initiative

Technology Improvements to Achieve Fuel Efficiency Goals

- **50 - 55 % Maximum Engine Efficiency**
(current maximum engine efficiency is 44-46%)
- **60 - 65 % Maximum Engine Efficiency with Bottoming Cycle**
- **86 - 90 % Overall Drivetrain Efficiency (e.g. Continuously Variable Transmissions)**
(current overall drivetrain efficiency is 77-82% automatic for Class II, VI, and VIII Bus and 84-87% manual for class VIII Line-haul)

21ST Century Truck Initiative

Technology Improvements to Achieve Fuel Efficiency Goals

- **55 % Recovery of Vehicle Energy Normally Lost to Braking**
(Current Recovery of Vehicle Kinetic Energy is 30 % for Recovered and Re-applied)
- **21 - 35 % Reduction in Aerodynamic Drag and Rolling Resistance (e.g. Streamlining Vehicles and Reducing Wheel Bearing Friction)**
- **21 - 45+ % Reduction in Empty Vehicle Weight (e.g. Composite Materials)** *Note: These savings would translate into increased payload per truck. A transit bus could yield up to 60% reduction in weight.*

21ST Century Truck Initiative

*Emissions Goals (g/hp*hr)*

	2010 Goal	2002/2004 Decree/Reg	Current Regulation
NO_x	0.10	2.0 (1)	4.0
Particulate Matter	0.01	0.1	0.1
Carbon Monoxide	2.00	15.5	15.5
Hydrocarbons	0.05	0.5 (1)	1.3

Carbon Dioxide

- 67% Reduction for Class 2b, Class 6, and Class 8 Bus**
- 50% Reduction for Class 8 Trucks**

Note 1: These emissions regulations are additive requirements for non-methane hydrocarbons plus NO_x

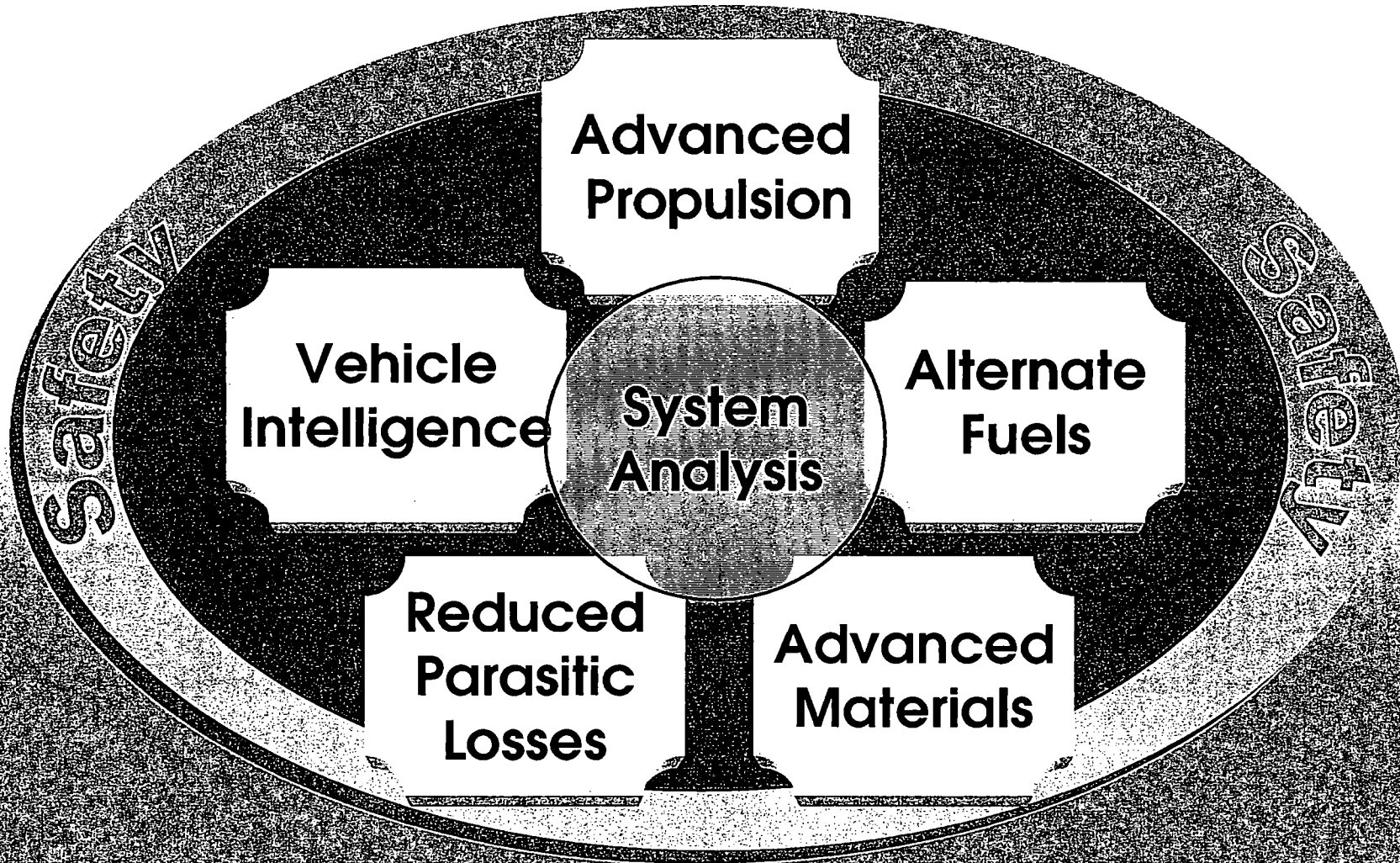
21ST Century Truck Initiative

Technology Improvements to Achieve Emissions Goals

- **Use of EGR for Near-term NOx Reduction**
- **Selective Catalytic Reduction (SCR) for Mid-term NOx Reduction**
- **Particulate Matter Trap Required**
- **Oxidation Catalyst Required for Class IIB Vehicles**
- **NOx Adsorber for Far-term NOx Reduction**
 - **requires ultra-low sulfur fuel**

21ST Century Truck Initiative

Research Focus



21ST Century Truck Initiative

Related R&D Efforts (\$ Millions)

	FY99				FY00			
	DoE	DoT	EPA	DoD (NAC)	DoE	DoT	EPA	DoD
Engines	18.2	0	0	1.6	27.5	0	4	8.3
Fuel Cell R&D	0	5.7	0	1.2	0	5.4	0	1.6
Materials	9.5	0.3	0	1.3	9	0.3	0	0.9
Fuels	10.7	0	0	0	14	0	2	3
Drivetrain & Systems	1.5	1.4	0	0.6	12	1.5	1	1.8
TOTAL	39.9	7.4	0	4.7	62.5	7.2	7	15.6

21ST Century Truck Initiative

Related R&D Efforts (\$ Millions)

	FY01 Proposed			
	DoE	DoT	EPA	DoD (NAC)
Engines	31	0	3.5	5.8
Fuel Cell R&D	0	5.8	0	0.8
Materials	10	0.5	0	1.7
Fuels	14.15	0	2	0.15
Drivetrain & Systems	5	4.5	1.5	2.7
TOTAL	60.15	10.8	7	11.15

21ST Century Truck Initiative

Issue 1: Platforms Covered

Class 8 and Class 6 plus:

A. Class 2b ✓

Pro: Significant fuel use and major Army vehicle.

Con: Class 2b, made primarily by GM, Ford and D-C, would mean more complex management.

B. Transit Bus ✓

Pro: Highly visible urban vehicle.

Con: Comparatively small fuel use,
more manufacturers in team.

21ST Century Truck Initiative

Issue 2: Goals

A. How Ambitious?

- ✓ Aggressive goals (2x for Class 8 Trucks and 3x for all other classes, stretch environmental goals).
- Moderate goals (justifiable without bottoming cycle engines, advanced energy storage).

B. How Measured?

- Increase in Miles Per Gallon
Pro: Easy to explain

- ✓ Increases in Ton-Miles per gallon.
Pro: Greatest interest to industry, gives incentive for weight reduction technology.

21ST Century Truck Initiative

Issue 3: Management

Federal Agencies Plus:

A. 4 Major Diesel Engine Manufacturers

Pro: Simpler management group and easy to justify the selection. Other participants would serve on technical teams.

B. ✓ 15-20 Companies (4 engine, 4 truck, transmission, trailer, autos, others)

Pro: Greater coverage of the industry.

21ST Century Truck Initiative

Next Steps

- **Agreement on Goals & Management (today)**
- **Contact industry to confirm partnerships (begin immediately, complete by mid-December)**
- **Public Announcement of Program (early Spring)**



The Secretary of Energy
Washington, DC 20585
April 20, 2000

Dear Friend:

I am very pleased to invite you to help us celebrate a bold new initiative to promote the development of cleaner, more fuel efficient, and safer trucks and buses. This event will be held on Friday, April 21, 2000, at Alvan Motor Freight from 9:30 am to 11:45 am. Alvan Motor Freight is located at 9911 Harrison Street, Romulus, Michigan. Vice President Gore will be on hand to lend his support to our efforts.

This initiative is a research and development partnership between private industry and the Federal Government. The industrial partners include representatives from the heavy-duty truck manufacturers, engine manufacturers, and major heavy vehicle component and systems suppliers. The Federal Government is represented in this program by the Departments of Energy, Defense, and Transportation, as well as the Environmental Protection Agency, the Office of Science and Technology Policy, the Council on Environmental Quality, the National Partnership for Reinventing Government, and the Office of Management and Budget. Together, we will work to: 1) reduce our dependence on foreign oil, 2) improve our Nation's air quality, 3) enhance the competitiveness of the U.S. truck and bus industry, and 4) ensure safe and affordable freight and bus transportation.

Please accept my invitation to participate in the announcement of this exciting initiative. In addition, please consider including any interested members of your management team. I look forward to seeing you there. Since security requirements will be necessary, I suggest you arrive as early as possible.

Yours sincerely,

A handwritten signature in black ink, reading "Bill Richardson", is positioned below the "Yours sincerely," text.

Bill Richardson



**Allison**
Transmission

David M. Piper
Director of
Engineering

TELEPHONE (317) 242-3843
FACSIMILE (317) 242-3011

April 20, 2000

Mr. Paul Skalny
Assistant Director
National Automotive Center

Dear Paul:

Consortia that help to advance technology are important. We appreciate that the government recognizes its role in that process. If we are to address the challenges of mobility in the future, advanced propulsion technologies will have to be part of the solution. Allison Transmission Division has been a leader in that area.

While Allison is unable to attend the event in Michigan tomorrow, April 21, we would be pleased to participate in the 21st Century Future Truck program. As has been identified, Allison's expertise is well recognized by the government in the areas involving series and parallel hybrid systems for heavy-duty trucks and buses. We think Allison's participation could help inform the technical analysis and program that the government wishes to undertake with those vehicles.

Because Allison does not manufacture vehicles, certain parts of the 21st Century Future Truck program, as outlined in the Declaration of Intent, are not applicable to us. Accordingly, we would not proceed to be a signatory of that document as currently configured. We appreciate that you recognize it would be important and constructive for us to be part of the governance group. Allison would accept the roles and responsibilities attendant to that position, consistent with our stated concerns.

Please let us know if Allison's participation, in the form we have described, is agreeable to you.

Respectfully,

cc: Fred Cartwright

**Allison Transmission Division****P. O. Box 894****Indianapolis, Indiana 46206****Speed Code: K05****F A X****Date:**

Number of pages including cover sheet:

TO: Angie Mizeur**FROM:** Fred Cartwright**PHONE:****FAX:** (202) 456-1736**PHONE:**

317/242-3844

FAX:

317/242-4046

REMARKS:

Angie,
Per conversation with Paul Skalny.

03:17

121APRDTWDC A11A/D«

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2NW      86 F8 J2 C2 Y9 B9 DTWDCA 8 1155A 117P 320 S/ 0 XJ DCA
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6NW  268 F5 Y9 B9 M9 H9 DTWDCA 7  655A  829A 320 S/ 0 DCA
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THE WHITE HOUSE

Office of the Vice President

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VICE PRESIDENT GORE ANNOUNCES AGREEMENT WITH MAJOR TRUCK MANUFACTURERS TO DEVELOP SUPER FUEL-EFFICIENT TRUCKS AND BUSES

Detroit, MI -- Vice President Gore announced today a new research partnership with many of the nation's largest heavy-duty engine and truck companies to develop super fuel-efficient vehicles that will dramatically improve America's fuel economy while cutting greenhouse gases and other air pollution.

"This new technology will reduce our consumption of foreign oil, clean our air and ultimately make our roads safer," Vice President Gore said. "The heavy truck manufacturing industry deserves great credit for pledging to work with this Administration to create trucks and buses that are cleaner, safer and more economical. We have learned that a strong economy and a safe environment go hand in hand."

The goal of the 21st Century Truck Initiative is to develop revolutionary technologies for increasing the fuel economy and safety of four specific classes of commercial trucks and buses, which account for more than 90% of all fuel used by all such vehicles in the U.S. This partnership to develop advanced technologies is designed to lead, within 10 years, to "production prototypes" that:

- Triple the fuel economy of heavy pickups, large delivery vans, and full-sized passenger buses;
- Double fuel economy for 18-wheeler long-haul trucks;
- Improve safety ;
- Achieve superior operational performance and lower costs for truckers;
- Exceed expected emission requirements for 2010 by making major reductions in NOx, particulates, and other local air pollutants.

The initiative will also strengthen our national security by dramatically cutting operational support costs and increasing combat effectiveness. As the U.S. Army transforms itself to be a lighter, more mobile force (70% of the bulk tonnage needed to sustain the Army during a conflict is fuel), the rapid integration of advanced commercially viable technologies into trucks is vital.

The Administration's FY2001 budget proposes to increase spending in areas supporting 21st Century truck research by \$47 Million to a total of \$142 Million--a 48% increase. Research priorities, which will be developed in cooperation with industry partners, will include

advanced engines, fuel cells, lightweight materials, advanced propulsion technologies, vehicle design, and advanced emission control and vehicle safety systems.

" Now is the time to lead the world in the emerging market for more fuel-efficient vehicles of all kinds, " the Vice President said.

The new partnership links many of the nation's largest manufacturers of heavy trucks and truck components with research teams in four federal agencies: the Departments of Defense (represented by the U.S. Army), Energy, Transportation, and the Environmental Protection Agency. Industry participants are: Mack Trucks, Oshkosh Trucks, Paccar, Volvo Trucks North America, Cummins Engine Company, Caterpillar, Detroit Diesel Corporation, Eaton Corporation, and Lockheed Martin Control Systems.

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Key Questions/Answers on the 21st Century Truck Initiative

Q: Your materials point out that the Administration is already spending upwards of \$100M on this type of research, so what's new here?

A: We are announcing a new research partnership between government (the Departments of Army, Defense, Energy, Transportation and the Environmental Protection Agency) and the trucking industry (and its associated tier suppliers) committed to achieving ambitious new goals to double or triple fuel economy, while enhancing safety and environmental performance of commercial trucks and buses. The partnership will cost-share investments to more rapidly integrate advanced technologies into commercial trucks and transit buses. This effort will bring together the best minds in industry and government to protect our environment and enhance our energy security in ways neither could do as well alone.

Q: What exactly are these companies committing to?

A: This Partnership is a statement of mutual intent, among the government and the companies to work together, to share resources and expertise, so that we can achieve ambitious goals for these important technologies. We set out ambitious goals and declare our joint intent to meet them, but there is no legal agreement or contractual commitment made by either side. We are confident that the importance of the goals, and the economic and environmental benefits that meeting them would produce, is sufficient to keep the parties focused and on a path to success.

Q: What percentage of the cost share is industry expected to provide?

A: Over the life of the Initiative, industry and government are expected to cost share 50% each. We expect that the Federal agencies will cover a larger percentage of the research costs for high-risk, long-term research, while industry will appropriately bear the larger percentage of lower risk, short-term applied research that most likely will be converted to commercial products.

Q: Is this all the Vice President has to say about Earth Day?

A: Not at all. While this is an extremely important announcement, the Vice President has been involved in a number of recent announcements that demonstrate the well-proven commitment that this Administration has made to both protecting our environment and growing our economy. For example, [OVP supply list of recent announcements].

Q: Isn't this just another fig leaf like PNGV to save the Administration from having to do something on CAFE?

A: None of the vehicles covered by this agreement are covered by fuel economy standards, so that the Administration has no authority to regulate the fuel efficiency of these vehicles. We believe an aggressive research effort will help to deploy new fuel efficiency technologies rapidly. The trucking industry is very interested in reducing fuel costs and there should be a strong market for the kinds of technical improvements that can be achieved through this agreement.

Q: Does this initiative cover SUVs?

A: The 21st Century Truck partnership is aimed at improving the fuel economy of trucks that move freight and other heavy loads, specifically trucks that exceed 8500 pounds. These are almost entirely commercial vehicles and are not covered by the CAFÉ fuel economy standards. While a small number of the very largest SUVs now being produced exceed 8500 pounds, they currently represent only a small fraction of the class 2b trucks covered by the new agreement. The partnership will concentrate on heavy commercial pickup trucks, HMVS or similar vehicles because they consume 90% of the fuel used in the heavy truck category. The initiative covers only vehicles not covered by the PNGV agreement.

Q: If this Initiative will be good for the trucking industry why are market forces not enough to accomplish the Initiative's goals?

A: The Initiative's research objectives are more ambitious than the industry would likely undertake with corporate funds because the technical risks are high and because the discoveries are likely to benefit competitors. Research benefits such as reduced production of greenhouse gases, improved driver safety, and emission reduction below current regulatory requirements, have clear public benefits but no clear benefits to investors. Public contributions to research are needed in such cases.

The partnership will also help the federal agencies with goals in safety, fuel economy, emissions and other areas coordinate their research priorities in partnership with businesses, which bring a focus on affordability and cost reduction. This has been invaluable in PNGV helping identify the most important areas of research and eliminating duplication.

Q: It is interesting that the Departments of Defense and Army are key players in this Initiative. Why so much interest?

A: As the Army transforms itself to be a lighter, more mobile force (70% of the bulk tonnage needed to sustain the Army during a conflict is fuel), the rapid integration of advanced commercially viable technologies into trucks is vital. Technologies like hybrid electric propulsion systems are eagerly awaited to improve combat effectiveness through improvements in acceleration, reductions in fuel required, enhancements in stealth capability and reductions in stand-alone power generation equipment.

The Army is the largest medium & heavy truck fleet owner in the Government, and one of the largest in the United States, with nearly 250,000 trucks. The Army spends approximately \$2B per year (fuel accounts for over 20% of the dollars spent) operating and maintaining its truck fleet. Early on, the Departments of Defense and the Army realized that a national initiative for trucks, with a focus on partnering with industry and other government agencies to significantly increase fuel efficiency and enhance the safety and affordability of medium and heavy trucks, would benefit the military greatly. This is the reason why the Department of Defense asked the Army to initially develop a “21st Century Truck Initiative Plan” signed off in September 1998, and why the Army has taken a pro-active role in the Initiative.

Q: Why is funding proposed for this program lower than PNGV funding levels?

A: Many PNGV technologies can be applied to heavy trucks. We will ensure close coordination between the two programs.

Q: Is this going to increase the cost of trucking?

A: On the contrary, the goal is to reduce the cost of delivering freight by using advanced technologies to improve overall productivity of the vehicle and the manufacturing process.

Q: Why isn't Ford or GM a member of the partnership?

A: The founding partners of the agreement represent the major producers of heavy truck and truck component manufacturers in the U.S. Ford and GM have expressed a desire to be a participant in individual research projects conducted under this initiative when this is appropriate, but neither is a major manufacturer of these types of vehicles (same with Daimler).

Q: What are the potential environmental benefits of this initiative?

A: The potential benefits are large. Heavy trucks use about a quarter of all highway fuels and produce about a quarter of the greenhouse gases associated with driving. Over the long term, this initiative could cut these emissions at least in half. Improving fuel economy will also reduce fuel costs for truck owners, and better insulate them from the volatility of energy prices. In addition, commercial trucks produce one third of regulated air pollutants. These air pollutants contribute to serious respiratory and circulatory health problems.

Q: The fuel efficiency increases of two and three times current vehicles appear extremely aggressive. What approaches does the Initiative tend to employ to meet these research objectives?

A: To meet the aggressive fuel efficiency goals, three approaches will be taken. First, energy needs to be converted more efficiently (early target is 50% - 55% maximum engine efficiency). Second, the vehicles' kinetic energy must be recaptured through regenerative braking (early target is a 55% recovery). Third, energy demand for the vehicles must be reduced (early targets are a 21% - 35% reduction in aerodynamic drag and rolling resistance, a 21% - 45% reduction in empty vehicle weight, and a 86% - 90% overall drivetrain efficiency)

Q: In what research areas will we see cost-shared investment by both Government and Industry? How does the Initiative plan to prioritize these cost-shared investments?

A: Cost-shared investments from industry and government will cover the full range of research areas supporting the goals of the Initiative. These areas include:

- advanced propulsion technology, with a focus on advanced diesel engine, hybrid electric, fuel cell, and advanced drivetrain technologies;
- fuels, with a focus on clean burning fuels that are adaptable to the full range of propulsion sources;
- advanced materials, with a focus on the optimized use of materials like high strength steels, aluminum, magnesium, and composites;
- vehicle intelligence for safety, efficiency, and emission control, with a focus on advanced communication and early warning technologies, vehicle diagnostics and prognostics;
- advancements in vehicle designs to reduce aerodynamic drag, with a focus also on reducing other forms of parasitic losses like rolling resistance; and,
- safety, with a focus on the driver-environment, driver-hardware and hardware-environment areas.

To help prioritize investment opportunities, over the next 150 days, government and industry, with the assistance of the academic community, will develop a Research Plan or Technology Roadmap geared towards meeting the Initiative's research objectives. A successful Research Plan/Technology Roadmap is keenly dependent on an awareness and inventory of current research and technology programs, an understanding of the limitations of current research and technology, the technical barriers that need to be overcome, and on an vision of potential future technologies. The Research Plan/Technology Roadmap will be continuously refined throughout the program.

Q: You say the initiative will make highways safer -- for whom? How will this happen?

A: Trucks will be safer for truck drivers, for other vehicles on the road and for pedestrians. New technologies such as video displays in the truck cabs will eliminate blind spots and let drivers see more clearly even in poor weather conditions. Advanced warning systems will alert drivers and maintenance crews immediately to problems with brakes or any other system that could compromise safety. Detection devices will warn drivers when they are approaching other vehicles or obstacles too

rapidly or when other vehicles are approaching them from the rear. This partnership will help accelerate the research in this area.

Q: Why are you subsidizing companies that EPA recently sued for illegally violating current Clean Air Act emission requirements (and recovered large fines as a result)?

A: The government's research funds are best deployed where they can achieve the greatest benefit. The enormous public benefits to our environment, economy, and national security of more efficient trucks argue for making that investment here. The regulatory responsibilities of the various agencies with respect to this industry are unaffected by this new partnership, but remain separate from it. The agencies will continue to enforce the rules as they see fit, and it will not preclude our working on other issues of national interest with this industry.