The Napa Statements on Motor Vehicle Policy:

Priority Findings of the International Council on Clean Transportation

INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

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Modern transportation systems provide mobility and freedom, enable commerce, and open the way for a greatly expanded human experience. But today's systems are altogether too damaging, and their impacts are projected to worsen. Cars and trucks are the principal source of urban air pollution, which, according to the World Health Organization, kills 800,000 people each year. They are a prime source of the greenhouse gas emissions that are changing our global climate. And urban neighborhoods worldwide are plagued with traffic noise and congestion.

Together, these problems are making the world's large cities increasingly unlivable. And without concerted, focused, visionary action, all these problems will become more severe.

Local control of vehicle pollution and energy use has been effective in many parts of the world, but as the number of cars and trucks rises, piecemeal control is proving increasingly insufficient. Some jurisdictions have done an outstanding job controlling pollution from new cars, but done little to clean up the existing fleet. Others are experiencing an auto boom with no comprehensive plan or capacity to control pollution. Few jurisdictions around the world have tackled the issues of congestion or greenhouse gases effectively.

Sponsored by the William and Flora Hewlett Foundation and the Energy Foundation, the objective of the International Council on Clean Transportation (ICCT) is to accelerate the process of building efficient, effective policies to clean up the world's vehicles and transportation systems. By discussing in detail which policies work, where, and why, and conversely, which ones have failed, policymakers and experts from across the world can build on successes and avoid repeating mistakes. The best policies, applied consistently and rationally, can make the world's cities cleaner and quieter, save billions of dollars, and provide outstanding mobility, without threatening the global environment.

The ICCT first met in 2001, and over a week developed an unprecedented consensus document on preferred government policies for shaping the future of motor vehicle technology worldwide. The Bellagio Memorandum on Motor Vehicle Policy—now available at www.cleantransportcouncil.org in English, Chinese, Japanese, Spanish, and Portuguese—details 43 principles for policymakers worldwide looking to speed the transition to clean vehicles. It can also serve as a guide for automakers and oil companies as they design their products for the next decade.

In May 2003, the ICCT convened to develop detailed consensus statements on several prominent transportation topics:

1. Sulfur in fuels.
2. Diesel vehicle emissions.
3. Urban heavy-duty vehicles.
4. Bus Rapid Transit systems.
5. Advanced vehicle technologies.

These statements are reproduced in full in this document, which serves as a companion piece to the 2001 Bellagio Memorandum. The experts that developed the Napa Statements[1] are listed on page 16.

The Bellagio Memorandum, the Napa Statements, and a number of special-purpose reports can be found online at www.cleantransportcouncil.org.

[1] The statements represent the collective expert opinion of the individuals participating in the May 4-5, 2003 meeting. They do not necessarily represent the views of any participant's organization or government.

I. SULFUR

A. Sulfur is the lead of the new century.

B. Reducing fuel sulfur content in gasoline and diesel is crucial to any serious effort to reduce air pollution from existing and new vehicles.

C. Reducing sulfur in all transportation fuels (including non-road machines) provides immediate air quality and public health benefits. Benefits include reduced particulate matter (PM) emissions from all vehicles as well as reduced acidification. For vehicles equipped with any type of catalyst technology, sulfur reductions also reduce emissions of carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x), and secondary PM.

D. Near-zero sulfur fuels[2] (10ppm or less) are required for advanced vehicle technologies, which are necessary for regions with severe air pollution problems, or countries that envision moving to world-class vehicle emissions standards.

E. It has been demonstrated that going directly from several thousand ppm to near-zero sulfur is cost effective and provides greater benefits than reducing sulfur in steps. Real-world costs have been consistently and significantly lower than projections.

F. Recent findings (US EPA non-road rule) have shown health benefits from near-zero sulfur fuel and associated–vehicle emissions control technologies exceeding costs by 50:1.

G. Some of the cost of sulfur reduction can be offset through reduced vehicle maintenance and increased reliability. In addition, in conjunction with aftertreatment technologies, near-zero sulfur can result in reduced fuel consumption by allowing greater use of advanced fuel efficient technologies.

H. The economic benefits of sulfur reduction have been demonstrated for a variety of conditions, but financing can be an obstacle.

1. Tax incentives can stimulate rapid and early introduction of these fuels.

2. Intelligent financing options used to reduce sulfur can also spur modernization of refineries.

[2] The ICCT participants agreed for this statement that fuels with a sulphur content of 10 ppm or less should be termed "near-zero sulfur."

I. In addition to sulfur, other fuel characteristics are important. Optimal benefits of sulfur reductions will be obtained by packaging them with a full set of improved fuel specifications.

J. Fuel standards without adequate enforcement are ineffective.

Considerations for Jurisdictions That Might Reduce Sulfur in Steps

K. It is most cost-effective to go directly to near-zero sulfur (10ppm) countrywide: allowing two different sulfur standards in one country will reduce overall effectiveness, complicate and raise the cost of fuel distribution systems, and can permanently damage advanced pollution control technologies.

L. For countries that need to move in steps, the following considerations should be taken:

1. Refinery technology paths should target an ultimate reduction to 10ppm without wasted funds along the way.

2. If different standards are necessary, countries should adopt safeguards to minimize cost inefficiencies, and to prevent mixing and misfueling.

3. To avoid institutional inertia, a stepped reduction strategy should have an enforceable long-term plan to get to near-zero levels.

II. DIESEL

A. Diesel vehicles and engines in use today are a principal source of urban air pollution and public health damage. Many studies show that diesel particulate is a cause of hundreds of thousands of premature deaths worldwide each year.

B. Over the past decade, diesel technology has advanced tremendously, and the higher efficiency of diesel engines compared to spark-ignited engines can be an important advantage in reducing worldwide global warming and oil consumption.

C. But even modern diesels produce significantly more NO_x and particulate pollution than their gasoline counterparts. This is a serious drawback to an otherwise promising technology.

D. It is not necessary or desirable to "trade" higher NO_x and particulate pollution for the efficiency advantages of diesels. Cost-effective technologies exist, and more are emerging, that can reduce NO_x and particulate from new diesels to modern gasoline vehicle levels or lower. New vehicle emissions standards and diesel fuel quality specifications should be sufficiently stringent to take advantage of these advanced technologies.

E. For passenger vehicles, future diesel standards should be equivalent to standards for comparable gasoline vehicles. Absent such equivalent standards, a shift to diesel should be discouraged by fiscal or regulatory measures to avoid worsening air quality problems.

F. Standards for non-road vehicles and fuels should closely track on-road vehicle standards.

G. Developing countries should move to world-class standards for all diesels as rapidly as possible.

H. Particulate emissions standards should also cover gasoline vehicles. This becomes especially important as direct injection gasoline engines become more prevalent.

I. Particle emission standards should be set such that PM filters are required because this technology has demonstrated very substantial reductions of the number of particles as well as the mass.

J. Existing diesel engines last for decades and these aging engines are a huge pollution problem. Aggressive control measures are necessary to clean up these vehicles.

K. Retrofit and rebuild programs to reduce particulate emissions from older diesel vehicles—including cars, but especially trucks and buses—are being implemented successfully in several regions and offer great public health benefits at reasonable cost. The menu of options available to clean the old fleet includes:

1. Retrofitting on an aggressive schedule.

2. Repowering (exchanging an older engine for a new cleaner engine).

3. Retiring old engines and vehicles, including an effective scrappage program to avoid simply exporting dirty engines and vehicles to another location.

4. Improving vehicle maintenance.

5. Eliminating clandestine and illegal trucks.

L. Effective inspection and maintenance programs are necessary for long-term performance and to accelerate fleet turnover.

1. Better inspection tests are required for existing and new diesels.

2. For new vehicles, on-board diagnostics (OBD) and on-board monitoring (OBM) with real-time data logging are necessary.

M. As new vehicle standards are introduced, special attention must be paid to ensure that these vehicles are not equipped with defeat devices that prevent attainment of the same emission levels in-use as in the laboratory. Similar attention must be paid to prevent an aftermarket in defeat devices.

N. The contribution of diesel particulate to global warming should be further explored, and current science should be taken into account by policymakers in evaluating the life-cycle global warming benefits of advanced diesel vehicles. This requires a careful assessment of the carbon dioxide benefits on the one hand and the black carbon penalty on the other.

III. URBAN HEAVY-DUTY VEHICLES

A. Because urban heavy-duty vehicles (buses, delivery trucks, garbage trucks, etc.) operate in densely populated regions, typically have highly emitting diesel engines, and run for many hours each day, pollution control efforts targeting these vehicles can be highly cost-effective. Clean fuels, strong tailpipe controls, and hybridization strategies can reduce pollutants by more than 90 percent, make vehicles much quieter, and reduce fuel consumption by half.

B. Cities and nations should work to transform the urban heavy-duty fleet by:

1. Cleaning up fuels (see sulfur section).

2. Moving quickly to world-class tailpipe standards.

3. Developing new vehicle technologies through research and development funding and tax credits.

4. Deploying super-efficient, clean, quiet commercially viable vehicles such as hybrids through fleet standards, concession requirements, and buy-downs of incremental costs.

5. Working with fleet operators to minimize unnecessary idling and inefficient operation.

C. Technology strategies for developing nations, where most urban growth is found, should be designed for unique developing nation conditions. For example, it may be especially important that clean and efficient urban heavy-duty vehicles are manufactured locally. However, it is critical under these conditions to quickly improve local capabilities to produce clean and efficient vehicles and engines.

D. Fuel choice for vehicles must take into account local capacities, including available fueling infrastructure and vehicle resale potential.

IV. BUS RAPID TRANSIT

A. The world's mega-cities have intolerable traffic problems—and the situation is only getting worse. Most also have unhealthy air and are noisy. Correcting this situation requires clean, efficient, fast, quiet, and safe transit systems.

B. Well-designed public transit systems can substantially reduce conventional pollutants, greenhouse gases, and congestion.

C. Bus Rapid Transit (BRT) systems, when intelligently designed, can achieve subway-like efficiencies at only a fraction of the cost (five to ten percent in recent experience). BRT has tremendous untapped potential in developing and developed countries alike.

D. Bus Rapid Transit is the only system that can substantially solve congestion, mobility, and air pollution problems in the world's megacities at a reasonable cost and in a short timeframe. The potential for BRT is very high, but not widely appreciated.

E. Cities should move quickly to develop comprehensive BRT systems, utilizing:

1. Segregated lanes.
2. Intelligent routing.
3. Electronic ticketing.
4. Bus stations, not stops.
5. Real-time schedule information.
6. Good social marketing.
7. Traffic light signaling priority.
8. Feeder systems.
9. Clean, fast, quiet buses.
10. Other features to make the system efficient and convenient.

Furthermore:

11. Pedestrian and bicycle transportation should be accommodated and encouraged in concert with BRT.
12. Commercial interests along the route must be protected.

V. ADVANCED VEHICLE TECHNOLOGIES

A. Advanced technologies are emerging that offer dramatic reductions in conventional and toxic pollution and greenhouse gas emissions in the near-term. The best versions of these emerging technologies must be encouraged with well-designed environmental performance standards and economic instruments.

B. Hybrid electric technologies now entering the market are particularly worthy of policy support: these vehicles offer large benefits in energy and environmental performance (with potential for further improvement), incorporate electric-drive systems and components that are also used in fuel cell vehicles, have market appeal due to their road performance and technology cachet, and are already available at relatively small incremental cost. For all of these reasons, efforts now to help automakers build sales of well-designed hybrids can pay big environmental dividends in the future. Advanced, high-efficiency diesels equipped with emissions controls equivalent to the best gasoline levels can offer similar potential. There are also advanced non-hybrid gasoline technologies, such as gasoline-direct-injection (GDI), that may offer excellent marketability and environmental performance, provided that they too have appropriate emissions controls.

C. Policies to encourage the best—most environmentally benign and forward-looking—emerging technologies must distinguish those vehicles that provide compelling social benefit and are therefore most deserving of public support. This discrimination is particularly important for hybrid-electric vehicles—the "hybrid" designation is used today to encompass a range of designs with varying levels of energy and environmental performance.

D. Environmental performance criteria to distinguish the best emerging technologies might stipulate that vehicles must:

1. Produce extremely low levels of conventional pollutants and toxics. For example (passenger cars), the Toyota Prius and Honda Civic Hybrid are certified to the California SULEV (U.S. EPA Bin 2) standards of 0.01 g/mile hydrocarbons, 0.02 g/mile NO_x, and 0.01g/mile diesel particulate (0.0063, 0.0125, and 0.0063 g/km, respectively).

2. Produce global warming emissions that are substantially lower than current new vehicle averages, for passenger cars perhaps 120 gm-CO_2/km or lower.

E. If technology standards are necessary, they should have high potential to move vehicles toward the environmental performance criteria. Such standards might require vehicles to:

1. Include two power sources to propel the vehicle, employ regenerative braking, and have idle-off capability.

2. Employ an electrical system operating at greater than 60 volts—the 60 volt minimum is a standard cut point for electric system design and separates hybrids from the more evolutionary 42-volt systems that simply use a small battery and motor to provide stop-start operation.

3. Provide 10 percent or more of the vehicle's peak power from the energy storage device (e.g., battery, ultra-capacitor, or flywheel). This ensures that hybrids encourage progress toward higher-power batteries, motors, and controllers.

4. These standards should be updated as technology evolves.

F. National efforts to develop other advanced technologies such as fuel cells should be coordinated across boundaries to accelerate learning and create a critical mass of research, infrastructure, and deployment.

G. Special attention should be paid to advanced technologies that can reduce the fuel consumption and pollution of 2- and 3-wheeled vehicles.

CONCLUSION

The statements above represent decades of experience in the world's largest auto markets. Because they are rooted in real-world experience, they can be applied with confidence. Indeed, a failure to follow these prescriptions, with suitable adaptations for local conditions, will condemn cities to increasing pollution, congestion and energy waste. Together with the Bellagio Memorandum (www.cleantransportcouncil.org), these statements offer a clear guide for policymakers, vehicle manufacturers, and energy suppliers across the world.

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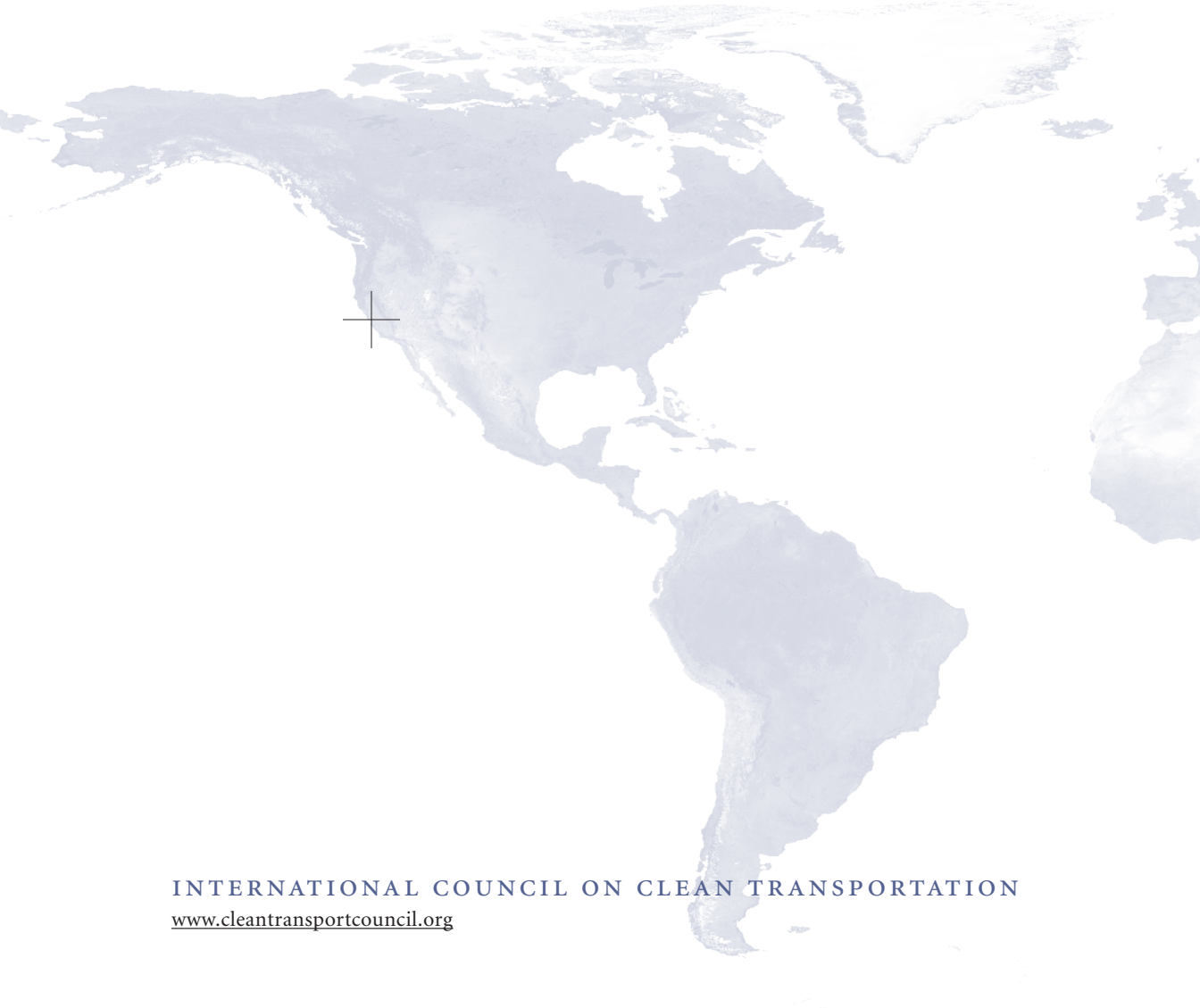

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