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Highway and Transit Program Reauthorization: An Analysis of Environmental Protection Issues

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Summary

Balancing public needs for surface transportation infrastructure with protecting the environment has been a long-standing issue among states and local communities. These two objectives can often conflict due to the rise in pollution that typically results when new highways or roadways are constructed, or a highway is expanded, to provide greater traffic capacity. Expanding highway capacity can be especially challenging for states, if the resulting rise in pollution would be great enough to make compliance with federal air quality standards more difficult. In order to receive federal highway funds, the Clean Air Act requires states with air quality problems to demonstrate that their transportation plans conform to their plans to control emissions, referred to as “transportation conformity.”

To help reduce potential conflicts between highway capacity needs and environmental requirements, Congress has authorized the use of federal highway funds to alleviate some of the pollution resulting from highway construction and travel. The most recent multi-year funding authorization for these activities was provided in the Transportation Equity Act for the 21st Century (TEA-21, P.L. 105-178), which expired at the end of FY2003. How to meet state needs for highway infrastructure, while ensuring compliance with environmental requirements, is among the key issues for reauthorization.

TEA-21 authorized a total of \$218 billion for federal highway and transit programs from FY1998 to FY2003. It set aside \$9 billion for air quality projects, including \$8 billion for the Congestion Mitigation and Air Quality Improvement Program (CMAQ) to offset some of the emissions from highway travel, as a means to assist states in complying with federal air quality standards. The other \$1 billion was authorized for the purchase of clean fuel transit buses. TEA-21 also expanded funding eligibility to allow states to use federal highway funds for mitigating water pollution from highway runoff. The law also authorized funding for environmental research and the development of advanced vehicle technologies, and it included several other provisions related to environmental protection.

The use of federal highway funds to address environmental needs has focused mostly on air quality projects, due primarily to requirements for states to demonstrate conformity as a condition for receiving federal highway funds. Most of this funding has been provided under the CMAQ program. While the program’s effectiveness has been questioned, there is broad support for increasing its funding in response to an upcoming rise in air quality needs among the states. Other air quality issues involve the use of transit funding for the purchase of clean fuel buses, offering tax benefits for cleaner-burning alcohol-based fuels, and exempting certain low-emission vehicles from High Occupancy Vehicle (HOV) lane requirements. The extent to which water pollution mitigation projects and environmental research and development activities should be eligible for federal highway funds are issues as well.

This report provides background information and analysis of key issues to serve as a resource document for the reauthorization debate. It will not be updated.

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Highway and Transit Program Reauthorization: An Analysis of Environmental Protection Issues

Introduction

Meeting highway capacity needs while protecting the environment is a challenging task for many states. In order to receive federal highway funding, several environmental requirements must be met. The Clean Air Act requires states with poor air quality to demonstrate that plans to expand highway capacity would conform with their plans to control emissions, referred to as “transportation conformity.” A state may be denied access to federal highway funds if conformity is not demonstrated, or if air quality plans are determined to be inadequate. As required by the National Environmental Policy Act of 1969 (NEPA), the potential environmental impacts of all highway and transit projects are also subject to review prior to the approval of federal highway funds for final project design, property acquisition, or construction. While air quality impacts are a prominent consideration in the approval of many projects, other common environmental impacts include water pollution from contaminated runoff and the loss of wetlands or other natural habitat that may occur from clearing the land for construction. Such impacts would need to be mitigated as a condition of approval for federal highway funds. Environmental permits or other documentation may also be required before certain aspects of a project may proceed.

To address potential conflicts between surface transportation needs and environmental quality, Congress has established numerous programs and authorities intended to help mitigate pollution resulting from highway construction and travel. The most recent multi-year funding authorization for these activities was provided in the Transportation Equity Act for the 21st Century (TEA-21, P.L. 105-178), which expired on September 30, 2003. This law authorized a total of \$218 billion for federal highway and transit programs from FY1998 through FY2003. It set aside approximately \$9 billion of this amount for air quality projects, authorized tax benefits for cleaner-burning alcohol-based fuels, and permitted states to exempt certain low-emission vehicles from High Occupancy Vehicle (HOV) lane requirements. TEA-21 also made funding available for mitigating water pollution from highway runoff, and authorized funding for environmental research and the development of advanced vehicle technologies.

The most controversial issues for the reauthorization of federal highway and transit programs have been the amount of funding to provide for surface transportation infrastructure needs and how to allocate this funding among the states. Demonstration of conformity with air quality requirements and the performance of environmental reviews are pertinent to these overall funding issues, as they play a major role in the approval of federal highway funds for individual projects.

Transportation stakeholders, including numerous state departments of transportation and transportation advocacy organizations, argue that extending the time frame for conformity would provide more time to control emissions and that streamlining the environmental review process would be more efficient, thereby speeding project delivery. On the other hand, some environmental organizations have expressed concern that such changes may compromise environmental protection.

There also has been significant interest in the adequacy of funding for air quality projects under the Congestion Mitigation and Air Quality Improvement Program (CMAQ). States and environmental organizations advocate significantly increasing the funding for this program, in light of emissions reductions that states may soon need to make in order to attain stricter federal air quality standards for ozone and fine particulates. Stakeholders have expressed differing levels of interest in other environmental issues regarding the adequacy of funding for the mitigation of water pollution from highway runoff, research on how surface transportation impacts the environment, and the development of advanced-vehicle technologies. Whether to extend tax benefits for renewable alcohol-based fuels, and whether to expand the exemption for low-emission vehicles from HOV lane requirements, are also issues.

This report provides background information on activities intended to help mitigate pollution resulting from highway construction and travel, and analyzes key issues for Congress. This report is a resource document for the reauthorization debate and will not be updated. (For a discussion of reauthorization legislation, see CRS Report RL32454, *Environmental Provisions in Surface Transportation Reauthorization Legislation: SAFETEA (S. 1072) and TEA-LU (H.R. 3550)*; CRS Report RL32226, *Highway and Transit Program Reauthorization Legislation in the 2nd Session, 108th Congress*; CRS Report RL32032, *Streamlining Environmental Reviews of Highway and Transit Projects: Analysis of SAFETEA and Recent Legislative Activities*; CRS Report RL32106, *Transportation Conformity Under the Clean Air Act: In Need of Reform?*; and CRS Issue Brief IB10128, *Alternative Fuels and Advanced Technology Vehicles: Issues in Congress*.)

Revenue and Financing Issues

Slower growth in motor fuels excise tax revenues that support the Federal Highway Trust Fund is a significant consideration in determining how much funding is available for surface transportation infrastructure and related environmental needs. During the previous authorization cycle, robust gasoline sales led to a substantial increase in trust fund revenues. Congress used the greater availability of funds to significantly expand most highway and transit programs, including numerous environmental activities. However, the fiscal climate of the current authorization cycle is more restrictive, due to a smaller balance in the trust fund as a result of slower growth in motor fuels excise tax revenues. The limitation on available funding has made it more challenging to balance highway capacity needs with protecting the environment and other competing priorities.

In addition to deciding how much funding is made available for environmental activities, the category of funding under which these activities would be authorized

will be a critical factor in determining whether their support is insured. TEA-21 established a new budget category of discretionary spending guarantees that function as a “firewall” to ensure a minimum level of funding for the majority of highway and transit programs, including most environmental activities. Guaranteed funding is separated from the rest of the discretionary budget in a way that prevents the use of Federal Highway Trust Fund revenues for any other purpose, and as such, is not subject to reduction in the annual appropriations process.¹

In addition to guaranteed funding, TEA-21 authorized traditional discretionary funding for certain programs, which is entirely subject to the annual appropriations process. In appropriations subsequent to TEA-21, Congress did not fully support the authorized levels for some of the traditional discretionary funding for environmental programs, such as those for clean fuel buses, environmental research, and advanced vehicle technologies. Consequently, an issue for the reauthorization of environmental programs is the extent to which funding for them should be firewalled to guarantee support for their implementation.

Air Quality Issues

Motor vehicles have become cleaner in operation with the gradual tightening of federal emission standards since 1965.² However, the rise in the number of vehicle miles traveled has offset some of the reductions in air pollution achieved by more advanced emission controls.³ As a result, motor vehicles continue to be major sources of air pollution, including ground-level ozone, commonly referred to as smog.⁴ Emissions from motor vehicles continue to contribute significantly to poor

¹ However, surplus revenues in the highway account of the trust fund that would exceed the guaranteed funding levels are subject to the annual appropriations process as Revenue Aligned Budget Authority (RABA). For further discussion, refer to CRS Report RS21164, *Highway Finance: RABA's Double-Edged Sword*.

² Congress first required vehicle emissions to be regulated in amendments to the Clean Air Act under the Motor Vehicle Air Pollution Control Act of 1965 (P.L. 89-272). Congress subsequently amended the Clean Air Act in 1967, 1970, 1977, and 1990 to tighten controls on vehicle emissions and establish other requirements. EPA promulgated the most recent vehicle emission standards in February 2000 (65 FR 6698), which will be phased in between model years 2004 and 2009. (For a history of the Clean Air Act, refer to CRS Report RL30853, *Clean Air Act: A Summary of the Act and Its Major Requirements*.)

³ During the same period that vehicle emission standards have become more stringent, the Department of Transportation reports that the number of highway miles traveled has tripled from nearly 890 billion in 1965 to nearly 2.8 trillion in 2001, as indicated in *National Transportation Statistics*, Table 1-32, available online at [http://www.bts.gov/publications/national_transportation_statistics/2002/].

⁴ According to emissions data compiled by EPA, on-road vehicles account for 62% of carbon monoxide (CO) emissions in the United States, 37% of nitrogen oxides (NO_x), and 27% of volatile organic compound (VOCs). NO_x and VOCs contribute to ground-level ozone pollution, commonly referred to as smog. These percentages are based on emissions data released in February 2003 in *Average Annual Emissions, All Criteria Pollutants, Years* (continued...)

air quality in numerous metropolitan areas, making it difficult for some states to comply with emissions limits in their State Implementation Plans (SIPs) to attain and maintain the National Ambient Air Quality Standards (NAAQS).⁵ How to meet public needs for greater highway capacity while controlling emissions is a major issue for states with areas that are in nonattainment with the NAAQS and areas that must maintain them, as the availability of federal highway funding in these areas is dependent on the state demonstrating that its transportation plan conforms to the emissions budget for motor vehicles in its air quality plan.

In order to reduce conflicts between highway capacity needs and air quality requirements, Congress has authorized the use of federal highway funds for various projects that would reduce vehicular emissions. The majority of the air quality funding authorized in TEA-21 was allocated to the CMAQ program. Federal transit funding has also been made available to local transit agencies for the purchase of clean fuel buses. Congress has also authorized tax benefits to encourage the production and sale of renewable alcohol-based fuels that reduce vehicular emissions and petroleum consumption. In addition, states have had the flexibility to allow the single-occupant use of certain low-emission vehicles in High Occupancy Vehicle (HOV) lanes, in order to encourage the purchase of cleaner vehicles. Further background information on transportation conformity and specific air quality programs and authorities, and key issues for Congress, are discussed below.

Transportation Conformity

The Clean Air Act requires states and metropolitan planning organizations to demonstrate that their transportation plans conform to their air quality plans. The purpose of this requirement is to ensure that the change in emission levels resulting from new transportation projects would not interfere with the state's efforts to attain or maintain federal air quality standards. Many states have experienced greater challenges in demonstrating conformity as air quality requirements have become more stringent.

Background. Section 176 of the Clean Air Act prohibits federal agencies from funding projects in nonattainment or maintenance areas, unless those projects conform to a state's SIP.⁶ Because new highways generally lead to an increase in emissions, both the statute and regulations currently require that a metropolitan planning organization's Transportation Improvement Program (TIP) demonstrate

⁴ (...continued)

Including 1980, 1985, 1989-2001, [<http://www.epa.gov/airtrends>].

⁵ The NAAQS set safe ambient levels for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. Localities that have exceeded the NAAQS for one or more pollutants are classified as "nonattainment areas." Once attainment is achieved, a locality is reclassified as a "maintenance area." States must develop plans to reduce emissions and comply with the standards in nonattainment areas and to control emissions and sustain air quality in maintenance areas. EPA reports that 107 areas with a combined population of nearly 98 million are in violation of the NAAQS for one or more pollutants, of which 85 million people reside in ozone nonattainment areas.

⁶ 42 U.S.C. 7506.

conformity no less frequently than every two years. Highway and transit projects cannot receive federal funds unless they are part of a conforming TIP. States also must demonstrate that their long-term transportation plans conform to their air quality plans over a 20-year time frame. In addition to conformity requirements, Section 179 of the Clean Air Act authorizes federal highway funds to be withheld from a state if an adequate SIP is not prepared or implemented properly.⁷ (For additional discussion of conformity requirements, refer to CRS Report RL32106, *Transportation Conformity Under the Clean Air Act: In Need of Reform?*)

Key Policy Issues. There has been increasing support for allowing states more time to demonstrate conformity, due to the likelihood that the impact of conformity requirements on states will grow in the next several years. Numerous factors have made it more challenging for states to control emissions and demonstrate conformity, such as (1) the growth of emissions from sport utility vehicles (SUVs) and other light trucks whose emissions are not regulated as strictly as passenger vehicles, (2) greater than expected increases in vehicle miles traveled, (3) recent court decisions that tightened conformity rules, and (4) the implementation of more stringent federal air quality standards for ozone and fine particulates, scheduled for 2004, which will result in more areas being subject to conformity demonstrations.

Numerous metropolitan areas may face a cutoff of highway and transit funds in the future, unless they impose sharp reductions in emissions to demonstrate conformity. During a lapse in conformity, a state may receive federal highway funds only for a limited set of exempted projects (mostly safety-related or replacement and repair of existing transit facilities). The rules do not even allow funding of new projects that might reduce emissions, such as new transit lines. How conformity requirements may affect a state's access to federal highway funds has raised significant concerns for the reauthorization of federal surface transportation programs. While conformity requirements could be modified to provide greater compliance flexibility for states, proposals to do so have been controversial because conformity is the only current mechanism to ensure that states consider how their transportation planning decisions might affect air quality.

Congestion Mitigation and Air Quality Improvement Program

Congress established the CMAQ program under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA, P.L. 102-240). This program is based on the fundamental concept that lowering the number of miles traveled by motor vehicles, and reducing congestion to make vehicles operate more efficiently, can reduce emissions and improve overall air quality. The program has been widely popular among local areas struggling to reduce air pollution, as it is the largest single source of federal funding for air quality projects. While questions have been raised about the program's effectiveness, there appears to be broad support for increasing its funding levels in response to concern that greater emission reductions will be needed in many states when new nonattainment areas are designated.

⁷ 42 U.S.C. 7509.

Background. Congress originally authorized \$6 billion for the CMAQ program from FY1992 through FY1997. In enacting TEA-21, Congress authorized another \$8.1 billion for continuing it from FY1998 through FY2003. CMAQ funding is available only for projects that would reduce traffic congestion and assist states in complying with the NAAQS for carbon monoxide, ozone, and particulate matter. States with areas that are in nonattainment with the NAAQS for these pollutants, and those that must maintain them, receive CMAQ funds according to a formula based on the severity of air pollution in those areas and the population residing in them. States that do not have any nonattainment or maintenance areas receive 0.5% of the total annual CMAQ apportionment, and have the flexibility to use this amount for transportation projects that are eligible under CMAQ or the Surface Transportation Program. TEA-21 also allowed each state to transfer a portion of its CMAQ funds to other highway programs that the state determines to have a higher priority, if certain conditions are met.

Most transportation control measures identified in Section 108 of the Clean Air Act are eligible for funding.⁸ CMAQ projects generally fall into one of the following eight categories: (1) mass transit; (2) traffic flow improvements; (3) rideshare programs; (4) traffic demand management programs; (5) bicycle and pedestrian projects; (6) public education; (7) vehicle inspection and maintenance programs; or (8) alternative fuel conversions. According to the Federal Highway Administration, more funding has been obligated for conventional mass transit projects than for any other activity, approximately 44% of total CMAQ funds since FY1992.

Key Policy Issues. After more than a decade of implementation, questions have been raised as to whether the CMAQ program has reduced emissions significantly enough to help states comply with the NAAQS. Whether to modify various elements of the program to improve its effectiveness, or possibly to shift its focus, is an issue for reauthorization. Congress included a provision in TEA-21 that required the National Academy of Sciences (NAS) to study whether the emission reductions from CMAQ projects have been large enough to help states comply with the NAAQS. The NAS released its report in the spring of 2002.⁹ The study indicated that the air quality benefits of CMAQ projects were difficult to assess because of the lack of quantitative data for all projects. For those with quantitative data, the NAS concluded that the emission reductions were relatively small and that these projects were less cost-effective than other pollution control measures. However, the NAS also concluded that when these emission reductions are assessed collectively the overall air quality benefits that they provide may be great enough to help states attain and maintain the NAAQS in areas that are on the margin of compliance. Consequently, the NAS recommended that the program be continued and suggested various modifications to improve its effectiveness.

The findings of the NAS have raised numerous issues for reauthorization. Since the impact of the program on air quality was difficult to quantify, some argue that the

⁸ 42 U.S.C. 7408(f).

⁹ The National Academy Of Sciences. Transportation Research Board. *The Congestion Mitigation and Air Quality Improvement Program: Assessing 10 Years of Experience*. 2002. 508 p. Refer to [<http://gulliver.trb.org/publications/sr/sr264.pdf>] for the full text.

focus should be shifted to reducing traffic congestion in general, rather than linking eligibility to air quality benefits that are questionable. There also are arguments that the statutory formula should at least be amended to provide a higher amount of minimum funding to states that do not have any air quality problems, but that would still benefit from a reduction in traffic congestion. Rising traffic congestion and progressively lengthier commuting times in some metropolitan areas have motivated support for such options among some transportation stakeholders.

On the other hand, proponents of the program argue that areas on the verge of attainment may benefit from the continued use of CMAQ funds for air quality projects, even if the emission reductions are relatively small. They also argue that more areas will be in need of emission reductions in order to comply with stricter federal standards for ozone and fine particulates, scheduled to become effective in 2004, and that air quality benefits from CMAQ projects, no matter how small, would be helpful. However, the current funding formula does not include a factor to account for new areas that will be in nonattainment with these stricter standards. Consequently, the formula would need to be changed during reauthorization, in order to allow affected states to receive greater funding.

Clean Fuel Buses

In general, transit projects provide air quality benefits by reducing the number of motor vehicles on the road and the emissions that are generated from their operation. However, transit vehicles (mainly buses) produce emissions themselves. In many local areas with air quality problems, transit agencies have purchased buses that operate on cleaner-burning fuels as a means to control emissions. In enacting TEA-21, Congress set aside funding for a program to assist transit agencies in purchasing clean fuel buses, but subsequently redirected this funding to a more general fund for bus purchases not restricted to fuel type.

While this program has not been implemented, many transit agencies have still chosen to purchase clean fuel buses with federal funds at their discretion. The upcoming designation of new nonattainment areas has sparked further interest in the use of clean fuel buses, and some have advocated that a dedicated source of funding should be established for acquiring them. This proposal has been controversial to those who argue that local transit agencies should be allowed to decide what kinds of buses best meet their capacity needs, rather than having a portion of federal transit funds restricted to certain types of buses based on fuel type.

Background. TEA-21 authorized the Secretary of Transportation to establish a Clean Fuels Formula Grant Program to assist transit agencies in acquiring low-emission alternative-fueled buses, improving facilities to accommodate them, and rebuilding pre-1993 engines with clean fuel technology. Under this authority, the Secretary of Transportation may award competitive grants to transit agencies based on a formula that factors in the number of vehicles in a transit system's fleet, the number of passenger miles traveled, and the severity of air pollution in a recipient's area. Eligible technologies include compressed natural gas (CNG), liquified natural gas (LNG), biodiesel fuel, battery power, alcohol-based fuel, hybrid electric power, fuel cells, clean diesel fuel, or similar technologies.

To support the program, TEA-21 authorized \$200 million annually from FY1999 through FY2003, for a total authorization of \$1 billion over five years. Of the \$200 million annual authorization, \$100 million was authorized as guaranteed “firewalled” funds, and the remaining \$100 million was authorized as traditional discretionary funds subject to the annual appropriations process. In appropriations bills subsequent to TEA-21, Congress has not appropriated any of the \$100 million in traditional discretionary funds that were annually authorized for the program, and has redirected the \$100 million in guaranteed annual funding to traditional capital bus improvement projects. The Federal Transit Administration reports that data are not available to determine the extent to which transit agencies have purchased alternative-fueled buses with the redirected funding.

Even though there is no dedicated source of funding for the purchase of clean fuel buses, they do receive preferential treatment under federal matching funds requirements to help local areas attain or maintain federal air quality standards. Generally, federal transit programs provide up to 80% of the cost of new bus purchases, and local transit agencies are responsible for securing funding from state or local sources to pay the remaining 20%. However, the federal contribution can be increased to 90% to purchase buses that use “clean” or “alternative” fuels for the purpose of complying with Clean Air Act requirements.¹⁰

The major capital assistance programs administered by the Federal Transit Administration that have funded the purchase of alternative-fueled buses include the Capital Investment Grants and Loans Program, Urbanized Area Formula Program, Non-Urbanized Area Formula Program, Elderly Persons and Persons with Disabilities Program, and the Job Access/Reverse Commute Program. Some funding is also available under the “New Starts” Program. Of these programs, the Urbanized Area Formula Program has been the largest source of funding for buses that operate on alternative fuels.

Alternative-fueled buses have accounted for a significant share of Federal Transit Administration funding obligations in recent years. The agency began compiling data on new bus purchases by fuel type in FY2000. As indicated by the data in the table below, an average of 34% of the federal funding obligated for the purchase of new transit buses from FY2000 to FY2002 has been devoted to those that operate on alternative fuels.

Air quality concerns are frequently among the most prominent factors in a transit agency’s decision to purchase clean fuel buses, despite their typically higher costs. For example, transit agencies located in metropolitan areas that need emissions reductions to comply with federal air quality standards under the Clean Air Act are more likely to choose cleaner buses that operate on alternative fuels. Other factors may include the extent to which the purchase of cleaner buses would improve the public’s perception of transit and increase ridership, and whether there are any state or local mandates or incentives for the use of alternative fuels.

¹⁰ 49 U.S.C. 5323(i).

Apart from air quality concerns, an economic factor that transit agencies typically consider in their planning process is the extent to which the purchase of alternative-fueled buses would help to maximize the benefits of past investments in the refueling infrastructure necessary for such vehicles. Consequently, transit agencies that have invested in alternative-fueled buses in the past are more likely to purchase additional ones in the future. Conversely, transit agencies that have not yet invested in them are less likely to do so, as they would need to invest additional resources in new refueling infrastructure.

Federal Funding Obligated by the Federal Transit Administration for the Purchase of Buses by Type of Fuel from FY2000 to FY2002^a

Fiscal Year	Diesel or Gasoline		Alternative Fuels ^b		Total	
	Buses	Dollars	Buses	Dollars	Buses	Dollars
2000	9,568	\$999,819,016	2,295	\$669,627,704	11,863	\$1,669,446,720
2001	8,192	\$795,561,837	1,373	\$272,687,218	9,565	\$1,068,249,055
2002	8,465	\$790,677,654	1,900	\$450,271,569	10,365	\$1,240,949,223

Source: Prepared by the Congressional Research Service using data from the Federal Transit Administration, *Statistical Summaries* for FY2000, FY2001, and FY2002.

^a Dollar amounts in the table reflect the amount of federal funding obligated to assist transit agencies in purchasing buses. Dollar amounts do not include funds provided by transit agencies to meet matching funds requirements, and therefore do not reflect the total cost of bus purchases.

^b Alternative fuels include compressed natural gas, liquified natural gas, liquified petroleum gas, methanol, ethanol, electric, biodiesel, dual fuel operation, fuel cell, and hybrid electric.

Key Policy Issues. As indicated by the above data, funding obligations for alternative-fueled buses have significantly exceeded the original \$200 million annual authorization for the Clean Fuels Formula Grant Program. This trend has caused some to argue that setting aside funding exclusively for the purchase of alternative-fueled buses is not necessary to encourage their use, and that the favorable 10% matching funds requirement is sufficient encouragement. Some also point out that stricter standards for heavy-duty diesel engines and fuels, which are scheduled to be phased in beginning in 2007 and 2006 respectively, will allow diesel buses to achieve a level of emissions performance that is equivalent to alternative fuels such as CNG. Such critics say that the cleaner performance of new diesel buses that are on the way will negate the need for reserving a portion of transit funds for alternative-fueled buses in order to reduce emissions. On the other hand, some environmental organizations have expressed skepticism that diesel buses equipped with cleaner engines will generate as few emissions in actual operation as those that operate on alternative fuels. They argue that dedicated funding should be set aside in reauthorization for alternative-fueled buses to ensure that transit agencies continue to purchase them, as a means to improve air quality.

Federal Tax Benefits and Revenues for Renewable Alcohol-Based Fuels

The federal government currently provides an excise tax reduction and an income tax credit to promote the production, sale, and use of renewable alcohol-

based fuels, including ethanol and methanol.¹¹ Vehicles operated on these fuels typically produce fewer *tailpipe* emissions (particularly carbon monoxide) than those operated on conventional gasoline or diesel. A reduction in tailpipe emissions can help to reduce the impact of highway travel on air quality. However, alcohol-based fuels can be more “volatile” than conventional gasoline or diesel, and the use of these alternative fuels can result in higher *evaporative* emissions during refueling, which could offset tailpipe emission reductions in some cases. While alcohol-based fuels have the potential to improve air quality, the preferential treatment of these fuels in the U.S. tax code has been controversial.

Background. The current authority for the tax benefits that apply to alcohol-based fuels expires at the end of 2007. These benefits are available for alcohol-based fuels if they are derived from renewable sources. Those produced from petroleum, natural gas, or coal are specifically excluded from eligibility under the U.S. tax code.¹² Ethanol is produced primarily from the distillation of corn and is therefore renewable. While methanol can also be derived from renewable biomass or municipal waste, it usually is produced from natural gas, which is not renewable. Consequently, the tax benefits for alcohol-based fuels apply mostly to the sale of ethanol.

Among alternative fuels, ethanol is the most commonly used. The majority of the ethanol sold is not used in its pure form. Rather, it is blended with gasoline to produce “gasohol,” which can be used in any conventional vehicle as a substitute for ordinary gasoline. Ethanol is also used as an additive for various purposes. It is commonly added to “reformulated” gasoline (RFG) to increase the oxygen content of the fuel. RFG must be made available in certain areas to meet Clean Air Act requirements to reduce vehicular emissions of precursors to ground-level ozone, commonly referred to as smog. During the winter months, RFG also must be used in certain areas to reduce emissions of carbon monoxide. In addition to meeting oxygenate requirements for RFG, ethanol is added to gasoline in some areas to increase octane levels. (For additional information on ethanol, refer to CRS Report RL30369, *Fuel Ethanol: Background and Public Policy Issues*.)

The excise tax reduction for ethanol is most commonly taken at the blended state by either fuel producers or distributors. The amount of the tax reduction depends on the percentage of the blend that is composed of ethanol. The current tax reduction is 5.2 cents per gallon for gasohol consisting of at least 10% ethanol, 4.0 cents per gallon for blends of at least 7.7% ethanol, and 3.0 cents per gallon for blends of at least 5.7% ethanol. These amounts reduce the excise tax levied on the sale of gasohol below the current tax rate of 18.4 cents per gallon for ordinary gasoline. While nearly all of the excise taxes on gasoline are deposited into the Federal Highway Trust Fund, 2.5 cents of the per gallon tax for gasohol are deposited into general Treasury funds, and are therefore not dedicated to the support of federal surface transportation programs.

¹¹ The statutory authority for the income tax credit is codified at 26 U.S.C. 40, and the statutory authority for the excise tax reduction is codified at 26 U.S.C. 4081.

¹² 26 U.S.C. 40(d)(1) for the income tax credit, and 26 U.S.C. 4081(b)(3) for the excise tax reduction.

Key Policy Issues. Since the wholesale cost of ethanol is relatively high, tax benefits for the sale of ethanol are needed to make it competitive with other fuel additives and with conventional fuels. However, there has been disagreement as to whether these benefits are appropriate. Proponents argue that ensuring the commercial viability, and resulting availability, of ethanol improves air quality due to reduced vehicle emissions, lowers U.S. dependence on foreign oil, and provides an additional market for corn farmers who grow the biomass needed to produce ethanol. On the other hand, opponents argue that gasohol tax benefits are essentially a subsidy for the ethanol industry, which reduces overall revenues for the Federal Highway Trust Fund. Some also argue that the emissions and energy benefits of ethanol can be offset by the energy needed to produce the fuel and the resulting emissions from generating that energy. Key issues for reauthorization include (1) whether to extend the tax benefits beyond this time frame, (2) whether to increase or decrease the amount of the excise tax reduction and the income tax credit, and (3) whether to continue the current policy of devoting a portion of alcohol fuel tax revenues to general Treasury funds.

Use of High Occupancy Vehicle (HOV) Lanes

Many states have constructed HOV lanes as a means to reduce traffic congestion. Through reducing congestion, these types of lanes also can provide air quality benefits because vehicles typically generate fewer emissions when operating more efficiently at steady speeds. In TEA-21, Congress approved a novel approach to using HOV lanes for air quality purposes by allowing states to permit vehicles with extremely low emissions to operate in an HOV lane with only one occupant. The premise was to offer a benefit that would possibly encourage the purchase of cleaner vehicles, thereby helping to improve air quality. This authority expired on October 1, 2003. Some have advocated that it should be renewed and expanded to include other low-emission vehicles that were not clean enough to qualify under the previous authority. However, others have expressed concern that expanding this benefit to include a greater number of vehicles could cause traffic congestion to rise, impairing the primary function of HOV lanes.

Background. TEA-21 provided the authority for states to permit a vehicle with only one occupant to operate in an HOV lane, if the vehicle is certified under federal regulations as an “inherently low-emission vehicle” (ILEV). The law authorized states to implement this policy through September 30, 2003, and granted each state the right to revoke this policy within its borders if HOV lane congestion were to increase as a result of this practice. EPA established the ILEV category to recognize the inherently low emissions of certain types of fuel and vehicle technologies and to encourage their use. The ILEV standards are so strict that only those vehicles without evaporative fuel emissions are able to meet them. Consequently, a vehicle that burns any quantity of gasoline or diesel cannot meet the standards, including hybrid vehicles that operate on a combination of gasoline or diesel and electric batteries. Vehicles that operate entirely on alternative fuels with no evaporative emissions, such as compressed natural gas (CNG), liquified natural gas (LNG), or purely electric vehicles, are the only ones that are able to meet the standards. Such vehicles account for a very small percentage of the on-road fleet. Due to the limited availability of ILEVs, few motorists have been able to take advantage of the HOV lane benefit provided in TEA-21.

Key Policy Issues. There has been growing interest among motorists, the vehicle industry, and some states in renewing the HOV lane benefit and expanding it to hybrid vehicles, which are more widely available. Proponents argue that hybrid vehicles are almost as clean as ILEVs, and that expanding this benefit to include them would encourage additional sales of “cleaner” vehicles that would help to improve overall air quality. Over the short-term, allowing hybrid vehicles to use HOV lanes with only one occupant may not cause HOV lanes to become noticeably more congested in areas where there is excess HOV lane capacity to accommodate them, because they currently represent a fairly small percentage of the vehicle fleet. However, HOV lanes could become more congested in some areas over the long-term, if the popularity and corresponding sales of these vehicles were to rise, making them a larger share of the on-road fleet.

Water Quality Issues

In addition to contributing to air pollution, highway travel and construction activities can impair water quality. Runoff from highways can deposit a variety of petrochemicals and other potentially hazardous substances into adjacent waterways and wetlands, which can migrate over time throughout a watershed and result in violations of water quality standards. Highway runoff is basically a “nonpoint” source that is more difficult to quantify and control than a conventional “point” source, such as a water discharge pipe from a stationary facility.

In seeking federal funds for new highway construction, states must consider the potential impacts of highway runoff on water quality and wetlands during the environmental review process, required by NEPA. Depending on the extent of these impacts, mitigation, such as storm water management systems, may be required to prevent or minimize the potential for pollution. If wetlands would be lost as a result of new highway construction, other measures, such as mitigation “banks” may be required in order to make up for these losses. TEA-21 established a preference for the use of these banks to address the impact of new highway construction on wetlands.¹³ The costs of water pollution mitigation and the replacement of wetlands is typically absorbed as part of the total costs for a new highway construction project.

However, many highways were constructed prior to more recent requirements for the installation of storm water management systems, or other water pollution mitigation measures. Consequently, many waterways adjacent to highways have been contaminated from years of runoff and are in need of environmental restoration. In response to these needs, Congress has provided authority for states to use federal highway funds for environmental restoration or mitigation projects to address water pollution from existing highways. Eligibility for these projects is provided under the Surface Transportation Program in general, and under the Transportation Enhancements set-aside within this program. The conditions of eligibility under each authority and key issues for Congress are discussed below.

¹³ In July 2003, the Environmental Protection Agency, Federal Highway Administration, and Army Corps of Engineers issued new guidance on the preference for the use of wetlands mitigation banks, see [<http://www.fhwa.dot.gov/environment/wetland/tea21bnk.htm>].

Surface Transportation Program

Most federal highway programs are devoted to meeting specific needs, such as interstate maintenance, bridge repair, or highway safety, and states are generally not permitted to use funds allocated to these programs for other purposes. The Surface Transportation program is different in that it gives states broad flexibility to use federal highway funds to meet multiple surface transportation needs. In enacting TEA-21, Congress amended the eligibility requirements of the Surface Transportation Program to include projects that would address the impacts of highway travel on water quality.

Background. Under the Surface Transportation Program, the Federal Highway Administration is authorized to make funds available to the states for environmental restoration and pollution abatement projects that address water contamination or environmental degradation attributed to runoff from an existing highway.¹⁴ For clarification purposes, the construction or retrofit of storm water treatment systems is highlighted as an eligible activity. Surface Transportation Program funds may be spent on environmental restoration and pollution abatement activities only when an existing highway is undergoing “reconstruction, rehabilitation, resurfacing, or restoration.” The portion of program funds that can be spent on environmental restoration and pollution abatement activities for these types of highway projects is limited to 20% of the total project cost. The law does not provide the authority for states to expend program funds to mitigate water pollution from past runoff, if improvements are not being made to the highway at the time.

While environmental restoration and pollution abatement activities are eligible for funding, the law does not require states to expend their Surface Transportation Program funds on these activities. Rather, a state may use program funds for these activities at its discretion. Determining how many states have done so, and in what amount, is not possible because states are not required to comprehensively track this information. However, states may voluntarily supply this information to the Federal Highway Administration. Based on the data that have been provided, the states report that they have spent a total of \$19 million in Surface Transportation Program funds on environmental restoration and pollution abatement projects from FY1998 through mid-FY2003. However, the actual expenditure may be significantly greater than this amount, due to the absence of complete data from all states. States also must spend a portion of their federal funds for new highway construction to satisfy water pollution mitigation requirements. Due to the scope of most new construction and the extent of its impacts, these amounts mostly likely have exceeded the funding that has been spent to mitigate pollution from older highways. However, data on the specific amount of funding are not available because states do not typically separate mitigation costs out from the total costs of new highway construction.

Key Policy Issues. Some of the relevant issues for the reauthorization of the Surface Transportation Program are (1) whether to increase the limitation on the portion of the total project cost that can be spent on environmental restoration and pollution abatement activities, in order to accommodate cases in which mitigation

¹⁴ 23 U.S.C. 133(b)(14).

costs may exceed the current 20% cap; (2) whether to establish a comprehensive reporting mechanism for tracking the amount of STP funds expended by states on these activities, so as to gain a better understanding of the extent to which transportation facilities have impacted water quality and necessitated mitigation; and (3) whether to permit STP funds to be used to address water pollution from highway runoff, even if no highway improvements are underway at the time.

Transportation Enhancement Set-Aside

Although states have the flexibility to fund a wide variety of projects under the Surface Transportation Program, they must set aside 10% of their annual apportionment of funds under this program for “transportation enhancements” that would improve the multimodal, environmental, cultural, or aesthetic aspects of the nation’s surface transportation system. In enacting TEA-21, Congress modified the definition of enhancements to include the mitigation of water pollution from highway runoff as an eligible activity. While the use of enhancements funding to address water quality needs has not been controversial, some criticisms have been raised about the use of federal highway funds for some enhancements that are not directly related to surface transportation infrastructure needs.

Background. States may choose to spend their enhancements funds on numerous categories of eligible activities. The categories that have received the most funding include bicycle paths and pedestrian walkways, preservation of historic transportation facilities, and landscaping and scenic beautification.¹⁵ Of the eligible categories, mitigation of water pollution from highway runoff has received a relatively small percentage of overall enhancements funding. TEA-21 authorized a total of \$3.3 billion for transportation enhancements from FY1998 through FY2003. Of this amount, the National Transportation Enhancements Clearinghouse reports that states had expended \$66 million (or nearly 2%) on water pollution mitigation projects through mid-FY2003.¹⁶ While this amount represents a small fraction of enhancements funding, it is more than three times the amount that states had reportedly spent on these types of projects with general Surface Transportation Program funds.

The federal contribution to the cost of projects funded under the Surface Transportation Program, including pollution mitigation, is generally limited to 80%,

¹⁵ The categories of eligible transportation enhancements include (1) facilities for bicycles and pedestrians; (2) acquisition of scenic easements and scenic or historic sites; (3) scenic or historic highway programs; (4) landscaping and scenic beautification; (5) historic preservation; (6) rehabilitation and operation of historic transportation structures or facilities; (7) preservation of abandoned railway corridors; (8) control and removal of outdoor advertising; (9) archaeological planning and research; (10) mitigation of water pollution due to highway runoff; (11) transportation museums; and (12) measures to reduce vehicle-caused wildlife mortality.

¹⁶ The National Transportation Enhancements Clearinghouse is sponsored jointly by the Federal Highway Administration and the Rails-to-Trails Conservancy. The clearinghouse compiles data from the states on the categories of transportation enhancements for which federal funding is obligated.

as is the case with most other federal highway programs. However, states have the flexibility to calculate the nonfederal share of the total cost of Transportation Enhancements based on individual projects, multiple projects, or on a programmatic level. States also can use funds from federal agencies other than the Department of Transportation to count toward the nonfederal share of the cost of enhancements.¹⁷ Consequently, the federal share of the cost of an individual project can be as high as 100%, if the federal share for others is low enough to offset that amount and yield a federal share of no more than 80% for an entire group of projects.

Key Policy Issues. While numerous states, local communities, historic preservation interests, and environmental organizations have expressed support for the diversity of activities that are supported with enhancements funding, some argue that certain enhancements are an ineffective use of federal highway funds. Opponents believe that federal highway funds should only be spent on improvements to surface transportation infrastructure, rather than on projects that may provide some related benefit, but that do not meet highway capacity needs, help to relieve traffic congestion, or meet an environmental requirement necessary for project approval. Limitations on federal highway funds as a result of a recent decline in trust fund revenues have sparked some support for such arguments. If the funding for transportation enhancements were reduced or eliminated, states would still be able to use general Surface Transportation Program funds at their discretion for pollution mitigation projects, assuming that current authority were not repealed.

Environmental Research and Development Issues

The majority of research and development activities that are supported with federal highway funds focus on how to improve the overall function and safety of the nation's surface transportation system, in order to meet travel needs. A relatively small fraction of federal highway funds has been devoted to researching the environmental impacts of highway travel or developing environmentally beneficial technologies. Some argue that more highway resources should be devoted to environmental research and development in light of the impacts of vehicular travel on air and water quality. Others counter that highway capacity and safety needs should remain the focus of research funded with motor fuels tax revenues, and that other federal agencies, such as EPA or the Department of Energy, already conduct a variety of activities to research pollution from motor vehicles and develop advanced vehicle technologies. While TEA-21 authorized the Secretary of Transportation to establish an environmental research program, it was never implemented due to lack of funding. TEA-21 also authorized a program to develop advanced vehicle technologies, but its implementation has been limited due to insufficient funding.

¹⁷ 23 U.S.C. 133(e)(5)(C).

Surface Transportation-Environment Cooperative Research Program

TEA-21 authorized the Secretary of Transportation to establish a Surface Transportation-Environment Cooperative Research Program to be carried out with other federal agencies, state and local officials, scientists and engineers, and environmental organizations. It was designed to examine the complex relationships between surface transportation systems and the environment, and to improve methods for assessing transportation needs and determining the environmental impacts of transportation. The law authorized \$592 million in guaranteed funds for surface transportation research from FY1998 to FY2003, but a specific amount was not allocated for the environmental research program. In subsequent appropriations, Congress has not designated funding to implement the program, nor has the Administration allocated funding for it within its discretion.

Advanced Vehicle Technologies Program

TEA-21 authorized the Secretary of Transportation to establish an Advanced Vehicle Technologies Program to encourage the development of multimodal and environmental technologies to improve the efficiency, safety, and cost-effectiveness of the national transportation system. The law directed the Secretary of Transportation to promote technological advances through contracts, cooperative agreements, grants, and other transactions with other federal agencies, state and local governments, businesses, and research or educational organizations. TEA-21 authorized a total of \$250 million in general Treasury revenues to support the program from FY1999 to FY2003, which was subject to the annual appropriations process. Of the \$250 million authorization, Congress has appropriated \$10 million to date. Consequently, the implementation of the program has been limited. The projects that have been funded have focused on the development of low and zero emission technologies, such as hybrid, all- electric, and fuel cell power trains.¹⁸

Streamlining the Environmental Review Process

Many stakeholders at the state and local level have expressed long-standing concerns that the environmental review process for highway construction projects can be overly time-consuming and can impose additional costs. Some state transportation departments and transportation advocacy organizations support revisions to certain elements of the process that could speed project delivery. However, environmental organizations have expressed concern that changes to the process might weaken environmental protections. They also argue that lengthy environmental reviews are sometimes warranted due to the scope of proposed alterations to the natural landscape and the potential effects of increased traffic capacity on air and water quality.

¹⁸ For further information, refer to [<http://scitech.dot.gov/partners/nextsur/avp/>].

Background

The National Environmental Policy Act of 1969 (NEPA, P.L. 91-190) requires all federal agencies to consider the environmental impacts of their proposed actions. To ensure that these impacts are considered before final decisions are made, NEPA requires federal agencies to provide a detailed statement of environmental impacts for every proposed federal action *significantly* affecting the quality of the environment. The “detailed statement” has been subsequently referred to as an Environmental Impact Statement (EIS). The EIS must include a description of the project’s purpose and need, an analysis of all reasonable project alternatives, a description of the affected environment, and the environmental consequences of impacts to the affected environment of each alternative.¹⁹ The EIS must also demonstrate that appropriate comments were solicited from relevant federal, state and local agencies and from the public. Relevant agencies obligated to provide comments are those with jurisdiction by law or special expertise with regard to the environmental impacts of the project.

If it is not clear whether a project would have significant impacts, an Environmental Assessment (EA) must be prepared. An EIS is required if significant impacts are identified at any time during preparation of the EA. Otherwise, a Finding of No Significant Impact (FONSI) will be issued. Projects that do not individually or cumulatively have a significant social, economic, or environmental impact are excluded from the requirement to prepare an EA or EIS. Such projects are processed as a Categorical Exclusion (CE), which according to the Federal Highway Administration, account for about 91% of all highway projects. State agencies are required to provide FHWA with documentation to prove the action qualifies as a CE. The type of documentation required will depend upon the project. Final design activities, property acquisition, or project construction cannot proceed until one of the following occurs: an action is classified as a CE, a FONSI is approved for an EA, or an EIS is approved. (For further discussion, refer to CRS Report RL32024, *Background on NEPA Implementation for Highway Projects: Streamlining the Process.*)

The Federal Highway Administration reports that approximately 3% of all federally funded highway projects have a significant enough impact on the environment to require the preparation of an EIS. These projects have received about 9% of all federal highway funds. While these amounts represent a relatively small portion of projects and overall funding, projects requiring an EIS are usually large and costly and affect sizeable populations. Consequently, construction delays can be controversial. The Federal Highway Administration has indicated that the planning and construction of a major highway project typically takes between 9 and 19 years, depending on size and complexity. Of these projects, the preliminary design and environmental review process accounts for one to five years of this time.

¹⁹ Federal Highway Administration regulations implementing the NEPA process are specified at 23 CFR 771; further guidance is available on the “NEPA: Project Development Process” web page at [<http://environment.fhwa.dot.gov/projdev/index.htm>].

Key Policy Issues

To reduce the approval time for highway projects and speed the delivery of federal highway funds to states and local areas, Congress included provisions in Section 1309 of TEA-21 which require the Secretary of Transportation to streamline the environmental review process. Environmental streamlining can generally be described as cooperatively establishing realistic project development time frames among transportation and environmental agencies, and then working together to adhere to those time frames. The Department of Transportation has taken numerous administrative actions in response to this requirement, but has not issued final regulations to put streamlining into practice on a national scale.

While the Clinton Administration did submit a streamlining regulatory proposal in May 2000, it was widely criticized on numerous grounds by Congress, the states, highway interest groups, and environmental organizations. The principal criticisms were that it did not fully address the requirements of TEA21, and that it would have added new elements to the planning and development process that may have resulted in further project delays.

Due to these concerns, the Bush Administration withdrew the proposal in September 2002, and indicated that a new proposal would not be forthcoming until it is clear how Congress may address the issue during surface transportation reauthorization. In the interim, President Bush has issued an executive order which directs federal agencies to expedite environmental reviews for high-priority transportation projects, and has established specific goals to reduce the time frames for review.²⁰

Hearings were held during the 107th Congress to examine the streamlining issue, and streamlining has been discussed in hearings on surface transportation reauthorization during the 108th Congress. In the conference report on TEA-21 (H.Rept. 105-550), Congress stated its expectation that the Secretary of Transportation would implement the streamlining requirements through the regulatory process. Some Members have expressed their disappointment that five years after the enactment of the law, streamlining regulations have yet to be finalized. The lack of final regulations has increased interest in further legislative action to speed project delivery and meet public demands for transportation infrastructure.

²⁰ For more information, refer to [<http://www.fhwa.dot.gov/stewardshipeo/index.htm>].

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