

What Revenue Sources Are Available for Financing Surface Transportation Improvements?

Current Surface Transportation Revenue Sources

Surface transportation improvements are financed from a variety of user fees, general taxes, special purpose taxes, and private charges. Funds for highway and transit improvements come from all levels of government as well as the private sector. Freight rail improvements are financed almost entirely from charges to customers although some public-private partnerships (PPPs) recently have been established. Within each of the modes, there are differences in how individual projects are financed, depending on characteristics of the projects and the State or local area in which they

are being constructed. This section provides an overview of the current surface transportation finance system and options for the future.

Highways

The Federal, State, and local governments all play substantial roles in financing the Nation's highway system. The Federal government established the Highway Trust Fund (HTF) in 1956 to guarantee revenue for constructing the Interstate Highway System and other Federal-aid highways. In 2005, motor-fuel and vehicle taxes deposited in the HTF generated about \$31.2 billion. State and local governments raised \$78 billion and \$44 billion, respectively, for highway purposes in 2005. Exhibit 5-1 shows a breakdown of highway revenue by level of government.

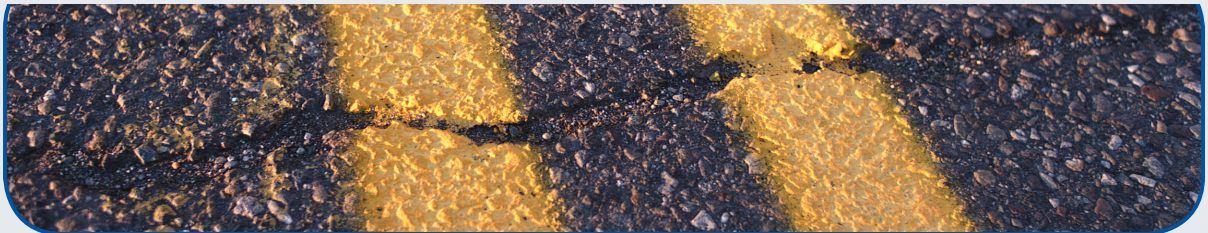
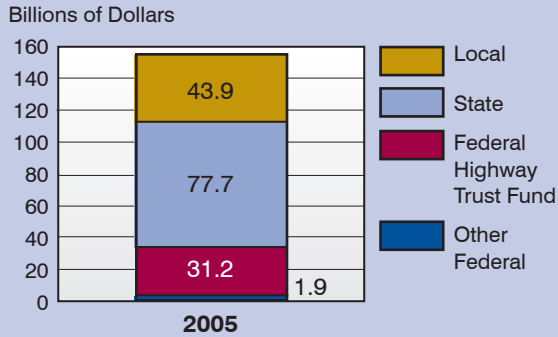




Exhibit 5-1. Highway revenue by level of government



This exhibit shows 2005 revenues for highway purposes by level of government.

Source: 2005 Highway Statistics, Table HF-10

Exhibit 5-2 shows highway revenues by source for each level of government. Fuel taxes represent about 90 percent of total revenues to the Federal HTE. Federal fuel tax rates have remained

unchanged since 1993. Since that time, however, the real Federal gasoline tax rate has decreased by 40 percent as measured by changes in the Producer Price Index for Highway and Street Construction. The other taxes supporting the Federal HTF are truck-related taxes. The largest of those taxes, the truck sales tax, increases with the sales price of trucks and truck trailers. The other Federal taxes—the tire tax and the Heavy Vehicle Use Tax—do not vary with either prices or costs. In 2005, about \$3 billion came from sales taxes on trucks and trailers, \$1 billion from the annual Federal Heavy Vehicle Use Tax, and about \$500 million from the Federal tax on tires rated for heavier loads. In total, Federal revenues accounted for 21 percent of the total of \$155 billion spent for highways by all levels of government in 2005.

At the State level, a broader variety of taxes supports highway construction, but fuel taxes are still the largest source of revenue. Other sources

Exhibit 5-2. 2005 revenues used for highways (by collecting agencies) in millions and percent

| Source | Federal | | State Agencies | | Local Governments | | Total | |
|--------------------------------------|-----------------|-----------|-----------------|-----------|-------------------|-----------|------------------|------------|
| | Amount | Percent | Amount | Percent | Amount | Percent | Amount | Percent |
| Motor-Fuel and Vehicle Taxes | \$31,179 | 20 | \$49,176 | 32 | \$2,234 | 1 | \$82,589 | 53 |
| Tolls | - | | \$6,356 | 4 | \$1,398 | 1 | \$7,754 | 5 |
| Property Taxes and Assessments | - | | - | | \$7,811 | 5 | \$7,811 | 5 |
| General Fund Appropriations | \$1,488 | 1 | \$3,384 | 2 | \$17,233 | 11 | \$22,105 | 14 |
| Other Taxes and Fees | \$388 | 0 | \$4,291 | 3 | \$4,620 | 3 | \$9,299 | 6 |
| Investment Income and Other Receipts | \$15 | 0 | \$2,897 | 2 | \$5,199 | 3 | \$8,111 | 5 |
| Bond Issue Proceeds | - | | \$11,622 | 8 | \$5,400 | 3 | \$17,022 | 11 |
| Grand Total Receipts | \$33,070 | 21 | \$77,725 | 51 | \$43,895 | 28 | \$154,690 | 100 |

This exhibit shows 2005 revenues for highway purpose by level of government and source of revenues.

Source: 2005 Highway Statistics, Table HF-10.



of revenue for highways at the State level include vehicle registration fees, motor carrier taxes, tolls, general fund appropriations, other taxes and fees, and the sale of bonds. There are significant differences in the extent to which individual States rely on these various revenue sources. State revenues accounted for just over 50 percent of total funds spent for highways in 2005.

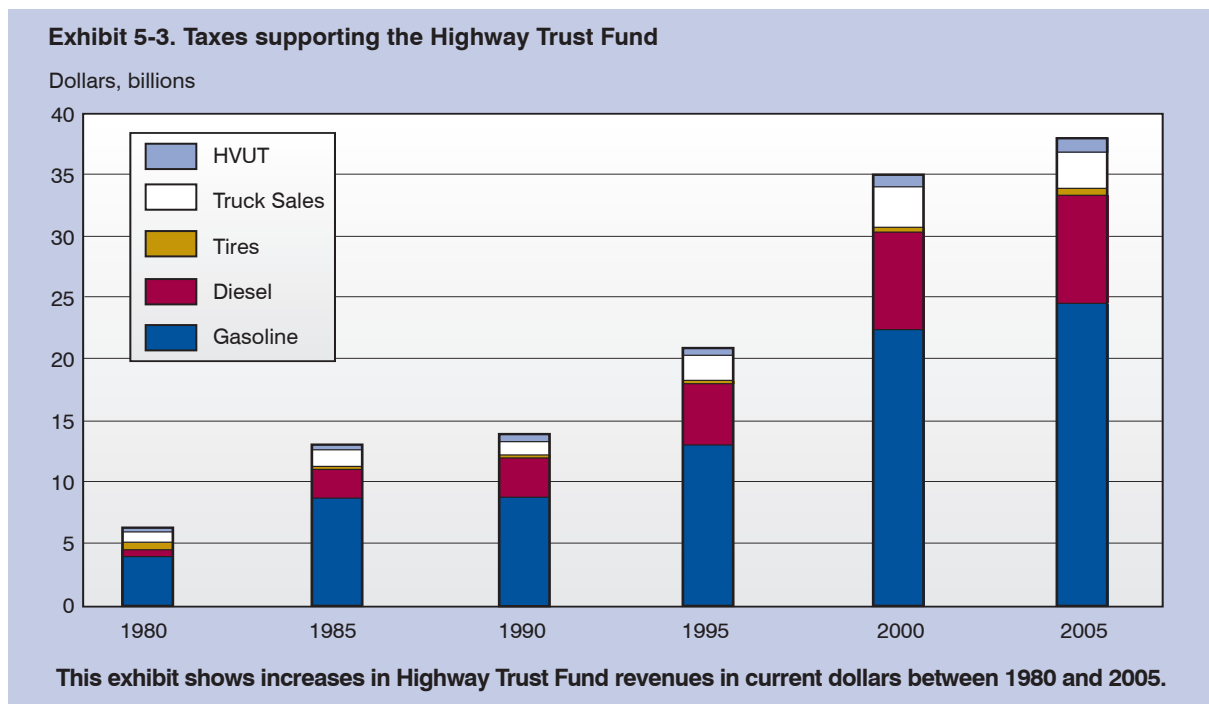
Local highway revenues come from a variety of sources including motor fuel and motor vehicle taxes, tolls, property taxes, other special taxes, bonds, and general fund appropriations which are the largest of the local revenue sources. In total, local revenues accounted for approximately 28 percent of total funds generated for highways in 2005.

Exhibit 5-3 shows trends in revenues from the various Federal highway user taxes since 1980. Receipts from the Federal gas tax (including gasohol) represent about two-thirds of total

HTF revenues, diesel taxes 23 percent, and the remaining truck taxes about 12 percent. Relative shares of revenue from each source have remained relatively stable over time. The fastest-growing tax in recent years has been the truck sales tax.

While HTF revenues have grown substantially since 1980 in current dollars, the growth in constant dollars has been much slower.

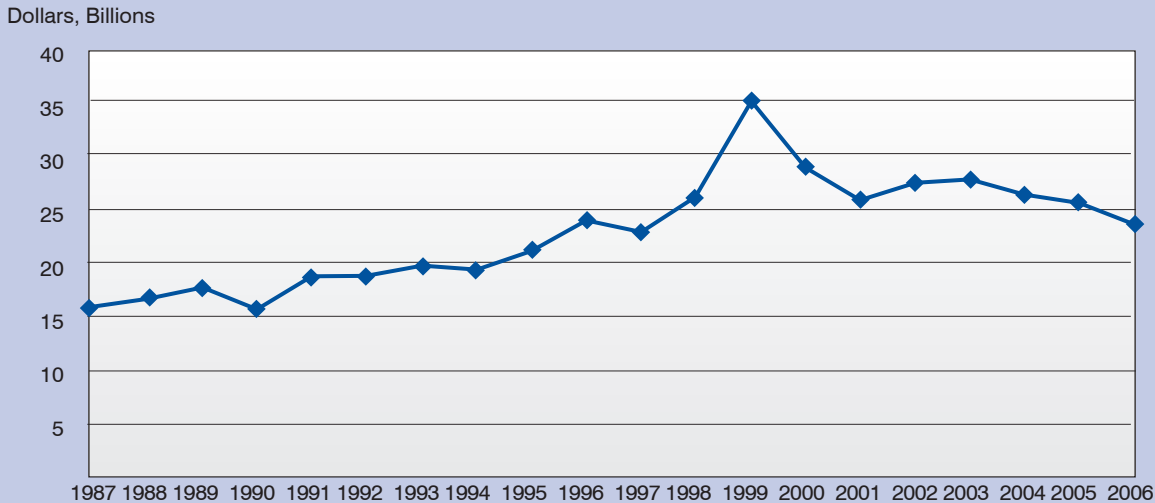
Exhibit 5-4 shows the growth in HTF revenues from 1987 to 2005 in 1993 dollars, deflated by the Bureau of Economic Analysis Producer Price Index for Highway and Street Construction. The average annual growth in real HTF revenues between 1987 and 2003 was 3.5 percent. The spike in 1999 was attributable to a provision in the Taxpayer Relief Act of 1997 that allowed taxpayers to delay the deposit of estimated fuel tax liabilities due in August and September of 1998 until October 5, 1998. Since 2003 HTF revenues have fallen by 4 percent a year in real terms.



Source: 2005 Highway Statistics, Table FE-210.



Exhibit 5-4. Change in Highway Trust Fund revenues in constant 1993 dollars



This exhibit shows the change in Highway Trust Fund revenues in constant 1993 dollars between 1987 and 2006.

Source: Commission Staff analysis.

Exhibit 5-5 shows how Federal fuel tax rates have changed since 1983, the first year that a portion of Federal gasoline taxes was dedicated for transit purposes. In 1990 the gas tax was raised from 9 to 14 cents per gallon, with half the increase going to the General Fund for deficit reduction. In 1993 the gasoline tax was raised another 4.3 cents per gallon, all of which went for deficit reduction. The amount for deficit reduction was reduced to 4.3 cents per gallon in 1995, and in 1997 the remaining 4.3 cents was returned to the HTF. Although the Federal gasoline tax rate has more than doubled since 1983, the real value in terms of purchasing power is at about the same level as in 1983 due to inflation. In 1957 the Federal gasoline tax rate was 3 cents per gallon; it would have to be raised to 22 cents per gallon to have the same buying power today that it had in that year.

Since 2000, balances in the Highway Account have been declining because expenditures from the Account have exceeded revenues. As will

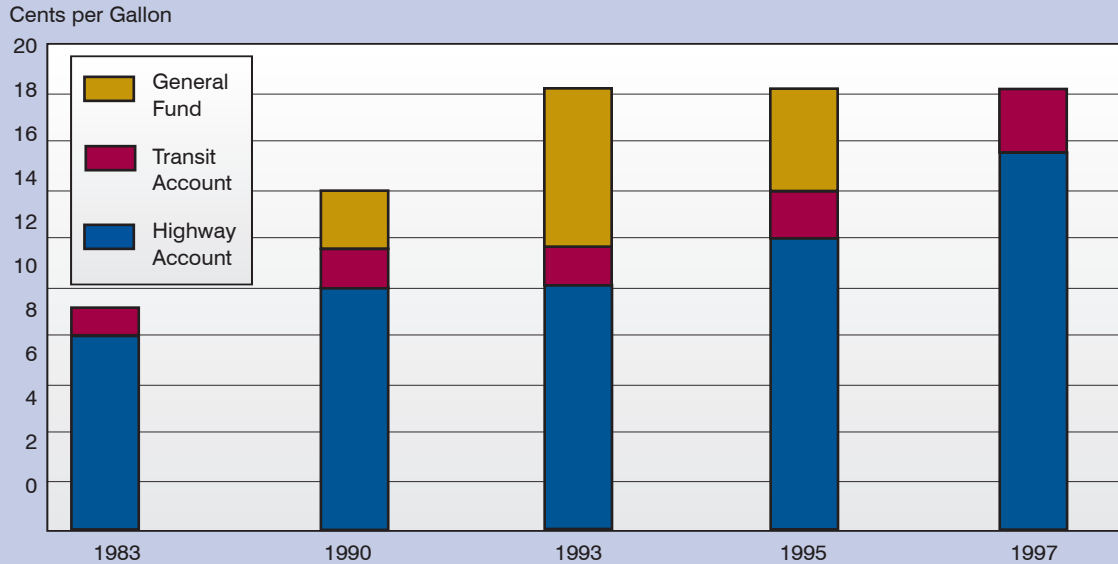
be discussed later in this chapter, the Highway Account is projected to have a negative balance of about \$4.3 billion at the end of FY 2009.

Exhibit 5-6 shows the growth in Federal, State, and local highway revenues from 1980 to 2005. The relative shares of total revenues have remained fairly constant over time. Federal revenues were between 21 and 27 percent of total revenues during this period, State revenues between 47 and 53 percent of the total, and local revenues between 24 and 29 percent of the total.

Fuel taxes, motor vehicle fees, and other traditional highway user taxes account for over 70 percent of total State highway revenues, while tolls, general funds, and other specialized taxes have accounted for the remainder. Shares of each of these revenue sources have remained fairly stable over the period, although other specialized taxes doubled from 3 to 6 percent of total revenues over the period. This reflects in part the difficulty



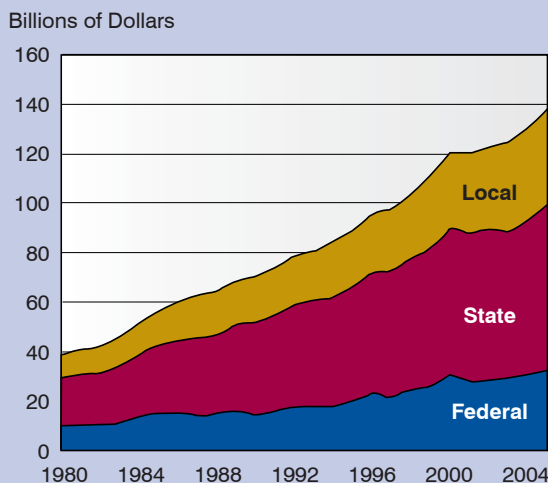
Exhibit 5-5. Federal gasoline tax rates



This exhibit shows the change in Federal gasoline tax rates since 1983 and the amounts going to the Highway and Transit Accounts of the Highway Trust Fund and to the Federal General Fund.

Source: 2005 Highway Statistics, Table HF-10.

Exhibit 5-6. Federal, State, local highway revenue, 1980-2005



This exhibit shows growth in the Federal, State, and local highway revenues between 1980 and 2005.

Source: Highway statistics (various years), Table HF-10.

some States have had in raising fuel taxes to fund new highway construction.

Exhibit 5-7 shows gasoline tax rates for each State. All States have a per-gallon excise tax, and many States impose additional taxes on gasoline and other motor fuels. Total excise taxes range from 8 cents per gallon in Alaska to 36 cents per gallon in Washington. Most fuel tax revenues are dedicated to highway and transit purposes, and in fact a number of States have Constitutional prohibitions against diversion of fuel tax revenues for non-highway purposes. Many States, however, also dedicate a portion of their fuel tax revenues for non-transportation purposes. Nationwide about 6 percent of total State motor fuel tax receipts went for purposes other than highway and transit in 2005. While there are large differences in State motor fuel tax rates, many States rely heavily on motor vehicle fees to finance



Exhibit 5-7. Motor fuel excise tax rates, January 1, 2007

| State | Excise Tax ¢/gallon | Additional Tax ¢/gallon | Total Tax ¢/gallon | Notes |
|-----------------------|------------------------|----------------------------|-----------------------|--|
| Federal | 18.3 | 0.1 | 18.4 | Leaking underground storage tank (LUST) tax |
| Alabama ¹ | 16.0 | 2.0 | 18.0 | Inspection fee |
| Alaska | 8.0 | | 8.0 | |
| Arizona | 18.0 | | 18.0 | ² |
| Arkansas | 21.5 | | 21.5 | |
| California | 18.0 | | 18.0 | Sales tax applicable |
| Colorado | 22.0 | | 22.0 | |
| Connecticut | 25.0 | | 25.0 | |
| Delaware | 23.0 | | 23.0 | Plus 0.5% Gross Receipts Tax ³ |
| Dist. of Columbia | 20.0 | | 20.0 | |
| Florida ⁴ | 4.0 | 11.3 | 15.3 | Sales tax added to excise ⁴ |
| Georgia | 7.5 | 7.7 | 15.2 | Sales tax added to excise |
| Hawaii ¹ | 16.0 | | 16.0 | Sales tax applicable |
| Idaho | 25.0 | | 25.0 | ⁵ |
| Illinois ¹ | 19.0 | 1.1 | 20.1 | Sales tax add., env. & LUST fee ² |
| Indiana | 18.0 | | 18.0 | Sales tax applicable ² |
| Iowa | 21.0 | | 21.0 | |
| Kansas | 24.0 | | 24.0 | |
| Kentucky | 18.3 | 1.4 | 19.7 | Environmental fee ^{6, 2} |
| Louisiana | 20.0 | | 20.0 | |
| Maine | 26.8 | | 26.8 | ³ |
| Maryland | 23.5 | | 23.5 | |
| Massachusetts | 21.0 | | 21.0 | |
| Michigan | 19.0 | | 19.0 | Sales tax applicable |
| Minnesota | 20.0 | | 20.0 | |
| Mississippi | 18.0 | 0.4 | 18.4 | Environmental fee |
| Missouri | 17.0 | 0.55 | 17.55 | Inspection fee |
| Montana | 27.0 | | 27.0 | |
| Nebraska | 27.1 | 0.9 | 28.0 | Petroleum fee ³ |
| Nevada ¹ | 24.0 | 0.805 | 24.805 | Inspection & cleanup fee |
| New Hampshire | 18.0 | 1.625 | 19.625 | Oil discharge cleanup fee |
| New Jersey | 10.5 | 4.0 | 14.50 | Petroleum fee |
| New Mexico | 17.0 | 1.875 | 18.875 | Petroleum loading fee |



Exhibit 5-7. Motor fuel excise tax rates, January 1, 2007, continued

| State | Excise Tax ¢/gallon | Additional Tax ¢/gallon | Total Tax ¢/gallon | Notes |
|---------------------------|------------------------|----------------------------|-----------------------|---------------------------------------|
| New York | 8.0 | 16.6 | 24.6 | Sales tax applicable, Petrol. Tax |
| North Carolina | 29.9 | 0.25 | 30.15 | ⁶ Inspection tax |
| North Dakota | 23.0 | | 23.0 | |
| Ohio | 28.0 | | 28.0 | Plus 3 cents commercial |
| Oklahoma | 16.0 | 1.0 | 17.0 | Environmental fee |
| Oregon ¹ | 24.0 | | 24.0 | |
| Pennsylvania | 12.0 | 19.2 | 31.2 | Oil franchise tax |
| Rhode Island | 30.0 | 1 | 31.0 | LUST tax |
| South Carolina | 16.0 | | 16.0 | |
| South Dakota ¹ | 22.0 | | 22.0 | |
| Tennessee ¹ | 20.0 | 1.4 | 21.4 | Petroleum Tax & Envir. Fee |
| Texas | 20.0 | | 20.0 | |
| Utah | 24.5 | | 24.5 | |
| Vermont | 19.0 | 1.0 | 20.0 | Petroleum cleanup fee |
| Virginia ¹ | 17.5 | | 17.5 | ⁷ |
| Washington ⁸ | 34.0 | | 34.0 | 0.5% privilege tax |
| West Virginia | 20.5 | 11.0 | 31.5 | Sales tax added to excise |
| Wisconsin | 29.9 | 3.0 | 32.9 | ³ Petroleum Inspection fee |
| Wyoming | 13.0 | 1 | 14.0 | License tax |

¹ Tax rates do not include local option taxes. In AL, 1 to 3 cents; HI, 8.8 to 18.0 cents; IL, 5 cents in Chicago and 6 cents in Cook county (gasoline only); NV, 4.0 to 9.0 cents; OR, 1 to 3 cents; SD and TN, one cent; and VA 2%.

² Carriers pay an additional surcharge equal to AZ-8 cents, IL-6.3 cents (g) 6.0 cents (d), IN-11 cents, KY-2% (g) 4.7% (d).

³ Portion of the rate is adjustable based on maintenance costs, sales volume, or inflation.

⁴ Local taxes for gasoline and gasohol vary from 10.2 cents to 18.2 cents. Plus a 2.07 cent per gallon pollution tax.

⁵ Tax rate is reduced by the percentage of ethanol used in blending (reported rate assumes the max. 10% ethanol).

⁶ Tax rate is based on the average wholesale price and is adjusted quarterly. The actual rates are: KY, 9%; and NC, 17.5¢ + 7%.

⁷ Large trucks pay an additional 3.5 cents.

⁸ Tax rate scheduled to increase to 36 cents on July 1, 2007.

Source: Compiled by Federation of Tax Administrators from various sources.



their highway systems. Nationwide fuel taxes accounted for about 56 percent of total State highway user revenues, excluding tolls, in 2005; but, for individual States, that percentage ranged from 28 percent in Vermont to 98 percent in South Dakota.

Transit

Unlike highways where the bulk of funding comes from Federal and State sources, most transit funding is local. Federal funds accounted for 17 percent of total transit funding in 2005. About 80 percent of the Federal revenues were from gasoline taxes deposited in the Transit Account of the Highway Trust Fund. Since 1997, 2.86 cents per gallon have been deposited to the Transit Account of the HTF; the remainder came from general funds. State funds represented 20 percent of total transit funding in 2005; but, unlike the Federal Government, only a small portion of State transit funding was from gasoline and other

highway user taxes. Almost all State funds for transit were from either special purpose taxes or State general funds. Local funds accounted for over 60 percent of total transit funding in 2005. Over 45 percent of those funds came from fares and other user fees, 25 percent from special purpose taxes, and the remainder from local general funds. Exhibit 5-8 shows the revenues and their sources.

Exhibit 5-9 shows the growth in transit revenues from Federal, State, and local governments, and fares and miscellaneous transit agency revenues from 1993 to 2005. As with highway revenues, the relative shares of transit revenues have not changed substantially over the 12-year period. Federal revenues have accounted for between 15 and 19 percent of total revenues over the period, State revenues between 18 and 21 percent, local revenues between 18 and 22 percent, and transit agency fares and miscellaneous revenues between 40 and 48 percent of the total.

Exhibit 5-8. 2005 revenues used for transit (by collecting agencies) in millions and percent

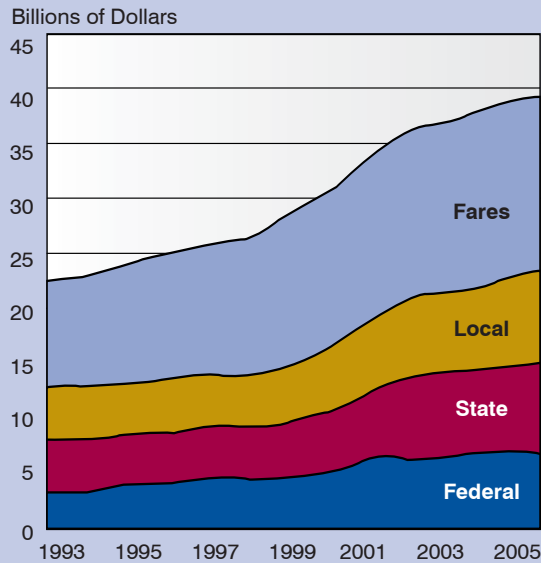
| Source | Federal | | State | | Local | | Total | |
|-------------------------|----------------|-------------|----------------|-------------|-----------------|-------------|-----------------|--------------|
| | Amount | Percent | Amount | Percent | Amount | Percent | Amount | Percent |
| Fuel Tax | \$5,484 | 13.5 | \$459 | 1.1 | \$183 | 0.5 | \$6,141 | 15.1 |
| Income Tax | | | \$292 | 0.7 | \$91 | 0.2 | \$383 | 0.9 |
| Sales Tax | | | \$2,401 | 5.9 | \$4,571 | 11.3 | \$6,979 | 17.2 |
| Property Tax | | | | | \$565 | 1.4 | \$565 | 1.4 |
| Other Specialized Taxes | | | \$994 | 2.4 | \$1,030 | 2.5 | \$2,027 | 5.0 |
| Other Public Funds | | | \$1,832 | 4.5 | \$4,889 | 12.0 | \$6,725 | 16.6 |
| General Fund | \$1,371 | 3.4 | \$2,219 | 5.5 | \$2,688 | 6.6 | \$6,278 | 15.5 |
| Fares | | | | | \$11,528 | 28.4 | \$11,528 | 28.4 |
| Total | \$6,855 | 16.9 | \$8,197 | 20.2 | \$25,544 | 62.9 | \$40,626 | 100.0 |

This exhibit shows 2005 transit revenues by level of government and source of funds.

Source: National Transit Database.



Exhibit 5-9. Federal, state, local agency transit revenue, 1993–2005



This exhibit shows the growth in transit revenues between 1993 and 2005.

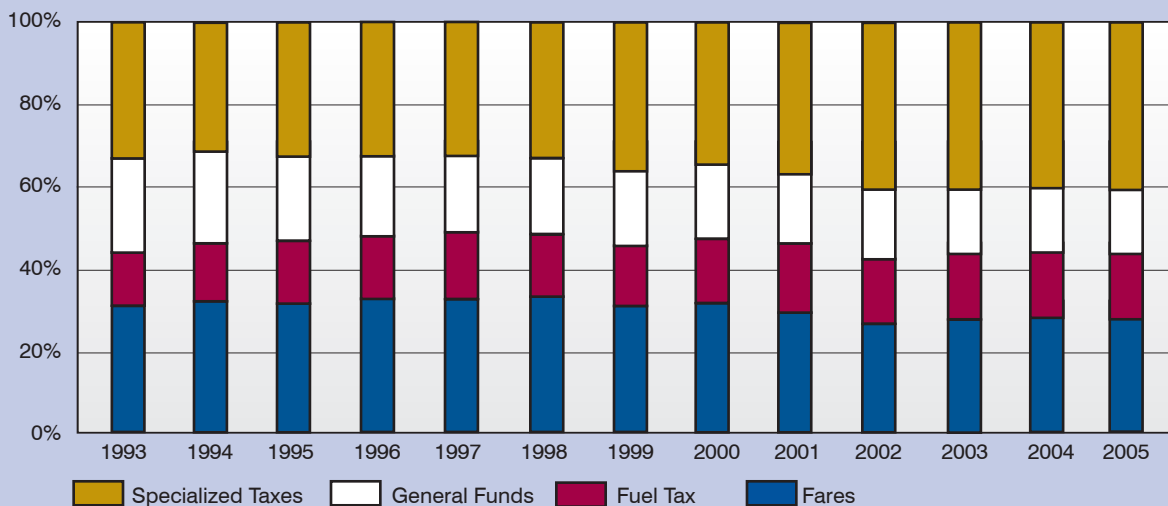
Source: National Transit Database.

Exhibit 5-10 shows the distribution of transit revenues by source since 1993. No one source predominates to the extent that user taxes dominate for highways. Perhaps the biggest change in transit funding has been the growth in property, sales, and other specialized taxes dedicated to transit and the decline in the amount of funding coming from general funds at all levels of government. Specialized taxes now represent the largest source of transit funding, accounting for 40 percent of the total.

Freight Rail

Freight rail infrastructure and operations are financed almost entirely by the private sector. This is especially true for the large Class I railroads, whose capital expenditures for infrastructure totaled \$8.5 billion in 2006. Of this total, about \$1.5 billion was spent on equipment, and \$7.0 billion on roadway and structures. Combining operating and capital spending

Exhibit 5-10. Distribution of transit revenues, 1993–2005



This exhibit shows changes in the sources of transit revenues between 1993 and 2005.

Source: National Transit Database.



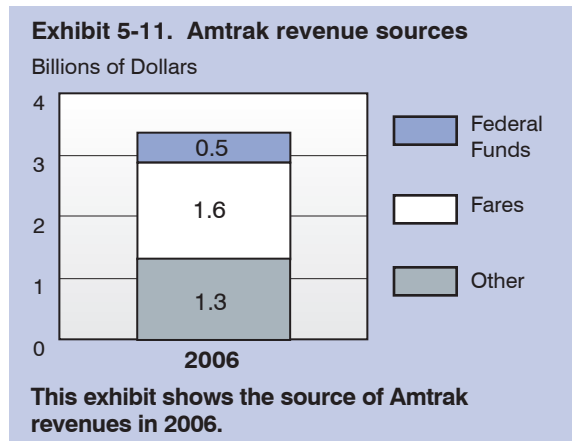
and adjusting for depreciation, 40 percent of the Class I railroads' revenue is spent on maintenance, replacement, or expansion of their track, structures, and equipment. In 2006, the Class I railroads spent \$10.6 billion maintaining and improving their infrastructure, and another \$8.7 billion on equipment.¹ Short line and regional railroads have received State and local funding in recent years to provide needed service to their jurisdictions that cannot be provided economically without public assistance. Short line railroads have also been the beneficiaries of a tax credit that is intended to assist them with upgrade and maintenance of their track to handle increasingly heavier rail traffic. State funding comes primarily from general funds and may be in the form of either loans or direct grants.

Currently, there are two Federal loan programs that may be used to provide both passenger and freight railroads with funding for rehabilitation or the development of significant transportation infrastructure. These include the FRA's Railroad Rehabilitation and Improvement Financing (RRIF) Program and the Transportation Infrastructure Finance and Innovation Act (TIFIA) loan program. The RRIF program was established by the Transportation Equity Act for the 21st Century (TEA-21) and amended by the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Under this program, the FRA Administrator is authorized to provide direct loans and loan guarantees up to \$35.0 billion. Up to \$7.0 billion is reserved for projects benefiting freight railroads other than Class I carriers. The TIFIA program provides Federal credit assistance to nationally or regionally significant surface transportation projects, including highway, transit, and rail. The program is designed to fill market gaps and leverage substantial private co-investment by providing projects with supplemental or subordinate debt.

Intermodal freight facilities are funded primarily through private operating revenue, although greater flexibility has been provided in SAFETEA-LU to finance public intermodal facilities from the HTF. These facilities are unique because they often link public and private infrastructure. This factor makes financing decisions difficult because of the intricate relationships among the public and private entities. There are no data that break out funding from all sources for intermodal facilities, but the public sector's role has been predominant in recent years.

Passenger Rail

Almost all intercity passenger rail services in the country are operated by Amtrak, known more formally as the National Railroad Passenger Corporation. Amtrak was established by Congress in 1971 to provide intercity passenger rail in the United States. In 2006, Amtrak's operating revenues were about \$2 billion and its operating expenses were about \$3 billion. Exhibit 5-11 highlights Amtrak's revenue sources. In order to maintain operations, Amtrak requires annual Federal grants for both operations and general capital funding. Amtrak operates most of its trains on tracks that are privately owned by the freight railroads, except for a portion of the Northeast Corridor.



Source: Amtrak Annual Report – 2006



Most Amtrak lines do not earn sufficient passenger revenues to cover operating expenses. The Northeast Corridor is the notable exception. In total, fares and other system revenues cover about 60 percent of operating expenses; Federal and State funds make up the difference. About 47 percent of total revenue comes from fares and other passenger revenues, almost 40 percent comes from Federal and State grants, 3 percent comes from contractual arrangements to operate commuter services, and 10 percent comes from other sources.

For a period Amtrak experimented with some limited freight transportation, but has largely given up that business except for hauling mail in some corridors. As congestion increases in competing highway and air corridors, Amtrak should be able to increase fares in those corridors. It may also be able to earn additional revenues by operating commuter services in certain corridors. Fourteen States currently provide operating support to Amtrak for intercity passenger service within their jurisdiction.

Ports and Waterways

Ports and inland waterways are critical components of the Nation's freight transportation

system. As highways and railroads become increasingly congested, ports and waterways can help relieve the pressure on the freight transportation system.

Exhibit 5-12 shows the sources of revenues used to finance port improvements between 2001 and 2005, based on surveys of members of the American Association of Port Authorities.² Different ports are represented in the data for individual years, so no trend analysis is possible and data cannot be directly compared from one year to another.

Over the 5-year period covered by the surveys, port revenues amounted to over half of all revenues supporting U.S. port improvements. Another third represented bond sales, some of which will be repaid from port revenues. The remainder came from loans, grants, and other sources.

The Federal Government participates in the cost of port feasibility studies, construction, and operating and maintenance (O&M) expenses. The maximum Federal share for harbor navigation projects varies depending on the size of the harbor, ranging from 80 percent for harbors less than 20 feet to 40 percent for harbors greater than

Exhibit 5-12. Revenues to finance U.S. port improvements, 2001–2005 (\$ thousands)

| Revenue Source | 2001 | 2002 | 2003 | 2004 | 2005 |
|--------------------------|------------------|------------------|------------------|----------------|------------------|
| Port Revenues | 802,331 | 547,040 | 751,044 | 299,667 | 1,422,016 |
| General Obligation Bonds | 96,478 | 334,372 | 206,051 | 345,837 | 348,696 |
| Revenue Bonds | 449,088 | 188,120 | 223,557 | 183,794 | 107,979 |
| Loans | 12,401 | 60,281 | 45,429 | 8,467 | 7,306 |
| Grants | 94,453 | 110,047 | 100,005 | 72,909 | 94,191 |
| Other | 119,005 | 187,076 | 191,299 | 56,304 | 69,874 |
| Total | 1,573,756 | 1,426,936 | 1,517,385 | 966,978 | 2,050,063 |

This exhibit shows the sources of port-related revenues between 2001 and 2005.

Source: U.S. DOT, Maritime Administration, *U.S. Public Port Development Expenditure Report (FYs 2005 and 2006 to 2010)*, July 2007.



45 feet. These funds come from general revenues. The Federal Government pays 100 percent of O&M costs for harbors less than or equal to 45 feet in depth and 50 percent of the cost for deeper harbors. The O&M costs come from the Harbor Maintenance Trust Fund, which receives proceeds from a 0.125 percent ad valorem tax on commercial port users collected by U.S. Customs. The Federal Government's participation generally is limited to the navigable channels. Individual berths and piers are generally dredged by the port or terminal operators.

Inland waterway navigation improvements are financed entirely by the Army Corps of Engineers. Feasibility studies, O&M costs, and 50 percent of construction costs are paid from general revenues, while the remaining 50 percent of construction costs are paid for through the Inland Waterways Trust Fund (IWTF). The IWTF receives proceeds of a 20-cents-per-gallon fuel tax on commercial vessels using inland waterways.

Future Surface Transportation System Financing Issues

This section discusses issues facing future financing of the surface transportation system. It presents forecasts of future revenues from existing sources and recommendations for meeting increased surface transportation investment requirements discussed in Chapter 4. Long-term alternatives to the fuel tax are also discussed.

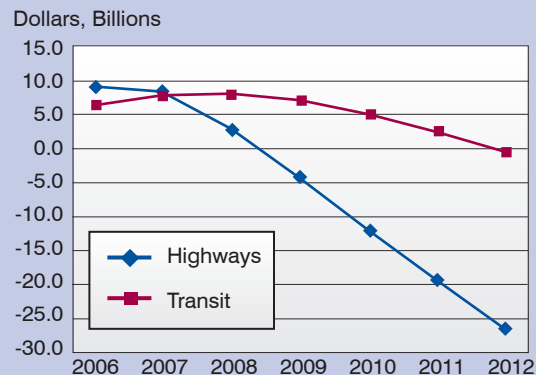
Keeping the Highway Trust Fund Solvent

It is widely known that balances in the HTF are falling, especially in the Highway Account.

Exhibit 5-13 shows projected cash balances in the Highway and Transit Accounts of the HTF from 2006 to 2012. The Highway Account balances are projected to decline from \$9.2 billion in 2006 to -\$4.3 billion in 2009 if corrective actions are not taken. Without action, Highway Account balances would become increasingly negative, reaching -\$26 billion by 2012; Transit Account balances are projected to increase slightly through 2008 but then decline to -\$0.7 billion in 2012.

The Commission recommends that legislation be passed in FY 2008 to keep the Highway Account of the HTF solvent and prevent highway investment from falling below levels guaranteed in SAFETEA-LU.

Exhibit 5-13. Projections of Highway and Transit Account Balances Through 2012



This exhibit shows projected balances in the Highway and Transit Accounts of the Highway Trust Fund through 2012 assuming no change in revenues or program levels.

Source: U.S. Department of the Treasury projections.

The following are several options that have been recognized as having the potential to address immediate shortfalls in the Highway Account of the HTF.

- Increasing one or more of the existing taxes that go into the HTF



- Ensuring that the HTF receives the full amount of the taxes levied on highway use by shifting the cost of exemptions from and refunds of taxes for certain highway users to the General Fund of the Treasury
- Retroactively reinstating the crediting of interest on the invested balances of the HTF. The crediting of interest ceased after FY 1998 pursuant to section 9004(A) of TEA-21, P.L.105-178)
- Crediting the proceeds of the gas guzzler tax under section 4064 of the Internal Revenue Code to the Highway Account
- Dedicating a portion of the revenue generated from transportation-related taxes, such as customs fees, to transportation purposes
- Taking measures to reduce evasion of fuel and other highway-user taxes
- Crediting the Highway Account of the HTF with funding that has been provided for emergency purposes from the HTF, and shifting that burden to the General Fund, which has been the source for appropriations for these purposes in recent years.

Federal Surface Transportation Trust Fund

In light of the recommendation to restructure future Federal surface transportation programs around functional lines rather than individual modes, the Commission recommends that the Federal HTF be restructured to be compatible with the new program structure recommended in Chapter 6. To emphasize the multimodal nature of future programs, **the Commission recommends that the name of the Highway Trust Fund be changed to the Surface Transportation Trust Fund.** With no separate highway or transit programs and no Federal funding dedicated specifically for transit as there is currently, separate highway and transit accounts would not be necessary under the Surface Transportation Trust Fund (STTF).

The STTF would continue the user fee principles of the HTF and extend those principles to other modes and other Federal revenue sources recommended below. Under the Commission's recommendation, the mix of highway and transit investments would be driven by the capital costs for the particular projects included in the plans developed under each program. Since no funding would be specifically dedicated for transit purposes, there would be no need to direct fuel tax revenues into specific subaccounts as is done today.

As outlined below, the Commission recommends extending the user fee principle to freight and passenger rail. Congress should consider whether it is necessary to establish new subaccounts into which these new revenue streams would be directed.

The Commission recommends that many of the features of the current HTF be retained. Funds deposited to the STTF should continue to be dedicated to surface transportation purposes, budgetary firewalls should continue to guarantee annual spending levels from the STTF, and a mechanism should be retained similar to Revenue Aligned Budget Authority (RABA) to adjust spending levels based on the latest estimates of available revenues.

Surface Transportation Finance Through 2025

Motor fuel taxes have been the principal source of highway funding at the State and Federal levels for 80 years, although other revenues are more prominent in the funding of local roads and transit. In the past, revenues were sufficient to construct the world's most extensive highway system; however, future costs to maintain the physical condition of this aging system and to improve its performance will exceed projected highway revenues.



There are several reasons why future revenues will fall short of meeting highway and transit investment requirements unless highway and transit revenues are increased. First, the fuel tax, which typically is levied on a per-gallon basis, fails to keep pace automatically with rising construction costs unless it is indexed to some measure of inflation as is done in several States. While highway construction costs are not expected to increase as quickly in the future as they did between 2004 and 2006, unless cost increases are taken into account when forecasting needed revenues, funding shortfalls will persist. Second, transportation funds are being used for a broader range of purposes than previously was the case. Some of these new expenditures have been required to mitigate adverse environmental impacts of transportation investments. Others are associated with the broad range of projects that can be funded as transportation enhancements that were not eligible for Federal aid in the past. Many of these new uses do not contribute directly to enhancing the condition and performance of the surface transportation system, although they may be justified for other purposes.

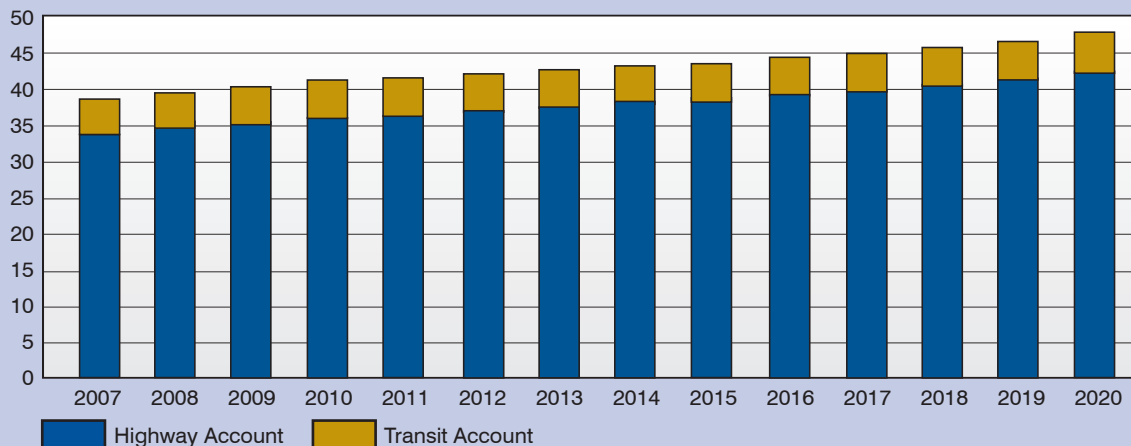
Perhaps the principal reason why revenues have fallen short of meeting investment requirements, however, has been the lack of a demonstrated will at all levels of government to raise taxes and fees to the levels required to maintain transportation condition and performance. As noted above, the Federal fuel tax rate has not been increased since 1993. About 20 States have increased their fuel tax rates since 2000, but legislative or voter approval for such rate increases is difficult to obtain. Motorist resistance to tolls is also high, but several polls have found that highway users may be more willing to pay for specific projects through tolls rather than fuel tax increases. A number of States have also turned to increases in sales and other specialized taxes rather than fuel tax increases to fund highway improvements.

Highway and Transit Revenue Projections

Exhibit 5-14 shows projections of HTF revenues from 2007 to 2020. During this period, total revenues are projected to grow from \$38.5 billion to \$47.0 billion, a 1.5 percent annual growth rate that is less than the expected increase in highway construction costs over this period. Growth in

Exhibit 5-14. Projections of Highway Trust Fund revenue, 2007–2020

Dollars, Billions



This exhibit shows projections of revenues to the Highway Account and Transit Account of the Highway Trust Fund from 2007 to 2020.

Source: U.S. Department of the Treasury projections and Commission Staff analysis.



revenues for the Highway Account will be slightly faster (1.6 percent a year) than overall HTF growth because truck taxes, which are growing faster than fuel taxes, go only to the Highway Account. Growth in revenues for the Transit Account, which receives only fuel tax receipts, is projected to be 0.9 percent a year. Growth in HTF revenues beyond 2020 is more conjectural because of the many uncertainties concerning vehicle fuel efficiency and potential new transportation fuels that may be in use after 2020.

Extrapolating Energy Information Agency projections of the fuel efficiency of the vehicle fleet out to 2035, assuming that alternative fuels would be taxed at an energy-equivalent rate to gasoline and diesel fuel, and assuming that current relationships between the truck taxes deposited in the HTF and the stock of trucks continue through 2035, it is estimated that 2035 HTF revenues will be approximately \$60 billion, 62 percent greater than 2005 HTF revenues.

A recent National Cooperative Highway Research Program (NCHRP) Report, *Future Financing Options to Meet Highway and Transit Needs*, has projections of highway and transit revenues through 2017. Exhibit 5-15 shows baseline forecasts for highway and transit revenues for four types of revenues—direct user fees, indirect user

fees, specialized taxes, and direct taxes. Direct user fees include highway tolls and transit fares. Indirect user fees include fuel, motor vehicle, and other fees imposed on users that are not tied directly to specific trips. Specialized taxes include property taxes, sales taxes, and other local option taxes that are dedicated for highway and transit purposes. General taxes are appropriations from the general fund and other miscellaneous taxes that are not dedicated to transportation purposes.

Projections in Exhibit 5-15 assume continuation of existing trends—motor fuel taxes are assumed to grow in proportion to growth in vehicle miles

“The federal motor fuels tax should be increased to restore lost purchasing power and generate revenues necessary to begin addressing the nation’s highway and transit infrastructure needs. We also believe that the federal motor fuels tax should be linked to a consumer price index to maintain future purchasing power.”

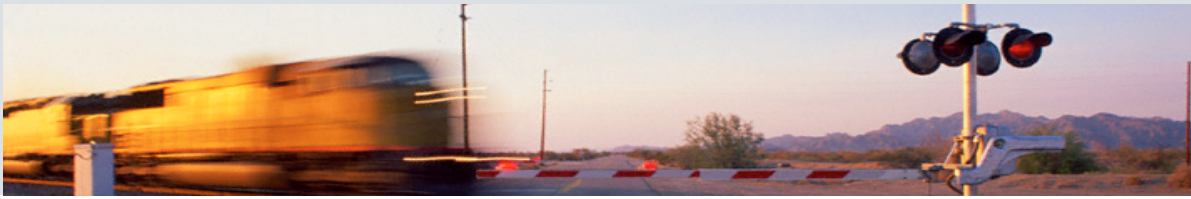
– Dr. Michael Walton, chairman of the American Road and Transportation Builders Association and a Professor at the University of Texas, at the New York field hearing.

Exhibit 5-15. Projections of highway and transit revenues, 2007–2017

| Year | User Fees | | Taxes | | Total |
|---------------------------------------|--------------|--------------|--------------|--------------|--------------|
| | Direct | Indirect | Specialized | General | |
| Highway Revenues (\$ billions) | | | | | |
| 2007 | 7.6 | 84.7 | 17.5 | 34.5 | 144.3 |
| 2017 | 12.4 | 104.2 | 26.7 | 48.7 | 192.0 |
| Annual Change 2007 – 2017 | 5.0 % | 2.1 % | 4.3 % | 3.5 % | 2.9 % |
| Transit Revenues (\$ billions) | | | | | |
| 2007 | 12.4 | 6.6 | 10.9 | 13.5 | 43.4 |
| 2017 | 17.8 | 7.8 | 16.7 | 18.9 | 61.2 |
| Annual Change 2007– 2017 | 3.7 % | 1.7 % | 4.4 % | 3.4 % | 3.5 % |

This exhibit shows projections of total highway and transit revenues through 2017.

Source: *Future Financing Options to Meet Highway and Transit Needs*, NCHRP 2006.



of travel (VMT) adjusted for projected changes in vehicle fuel efficiency, tolls are assumed to increase at their historical rate of 5 percent a year, specialized taxes are projected to grow at the same rate as long-term GDP, and general taxes are assumed to grow at their historical rates. In the aggregate, highway revenues during this period are projected to increase by 2.9 percent annually, and transit revenues by 3.5 percent annually. Using these growth rates to project revenues out to 2020, total highway and transit revenues are projected to be \$209 billion and \$68 billion, respectively, in 2020. When adjusted for inflation using the Consumer Price Index (CPI), real highway revenues are projected to increase by less than 0.5 percent annually and transit revenues by just 1 percent annually. If construction costs were to outpace the CPI over this period, as they have in recent years, the real purchasing power of highway and transit revenues could actually decline.

Transit generally has more balanced funding than highways, with fares, general funds, sales taxes, and other public funds all representing significant revenue sources. Impact fees currently are not as large a source of transit revenues, but they could become more important, especially where transit improvements are linked with broader land use development programs.

Projections of highway and transit revenues beyond 2017 are more conjectural. Factors that could affect surface transportation revenues beyond 2017 include more stringent fuel economy standards, potentially higher fuel prices, shifts to alternative energy sources for personal and commercial vehicles, and greater use of tolls and pricing.

As noted in Chapter 2, passenger travel is projected to increase at an annual rate of 1.8 percent through 2035 and 1.7 percent through 2055. Truck travel is projected to grow by 2.5 percent a year through 2035. If Federal fuel tax rates remain at their current levels and fuel efficiency continues to improve at the rates

projected by the Energy Information Agency, fuel tax revenues would increase by about 1.3 percent a year through 2035. If Federal truck taxes continue their historical growth rate, their growth from 2005 to 2035 would be about 5.6 percent a year. Overall growth in HTF revenues under these assumptions is estimated to be 2 percent a year between 2005 and 2035. This is slightly greater than the overall growth in VMT. The percentage of Federal HTF revenues from the fuel tax would decline from about 87 percent in 2007 to 67 percent in 2035. Taxes on trucks would make up an increasing share of total highway and transit revenues at the Federal level.

Many factors could affect the level of existing highway and transit revenues over the next 10 to 15 years; but, without changes in the current patterns of highway and transit finance, the capital investment required to meet performance goals recommended by the Commission cannot be met.

Freight Rail

The freight rail system is, for the most part, self-financing, with returns on investment improving from 4 percent in 1980 to 8 percent today. This level of return is not sufficient, however, to stimulate significant investment in new capacity, in part because rail is an extraordinarily capital-intensive industry. However, Class I railroads do invest in capital improvements when there is adequate return on investment. These types of projects enable the railroads to increase efficiency in the movement of their trains throughout their system as well as increase their bottom-line financial returns. Maintaining a balanced and stable system of economic regulation that allows railroads to realize adequate revenues is important to continued growth in railroad investment.

In general, Class I railroad capital expenditures have tracked income, as shown in Exhibit 5-16, increasing consistently in current dollars, since the economic deregulation of the railroads in 1980. One concern with this method of



financing is that it does not allow for long term planning since revenue cannot be predicted far in advance. Class I capital expenditures for infrastructure expansion totaled \$1.1 billion in 2005 and \$1.4 billion in 2006. The Association of American Railroads estimates that Class I capital expenditures for infrastructure expansion will total \$1.9 billion in 2007.

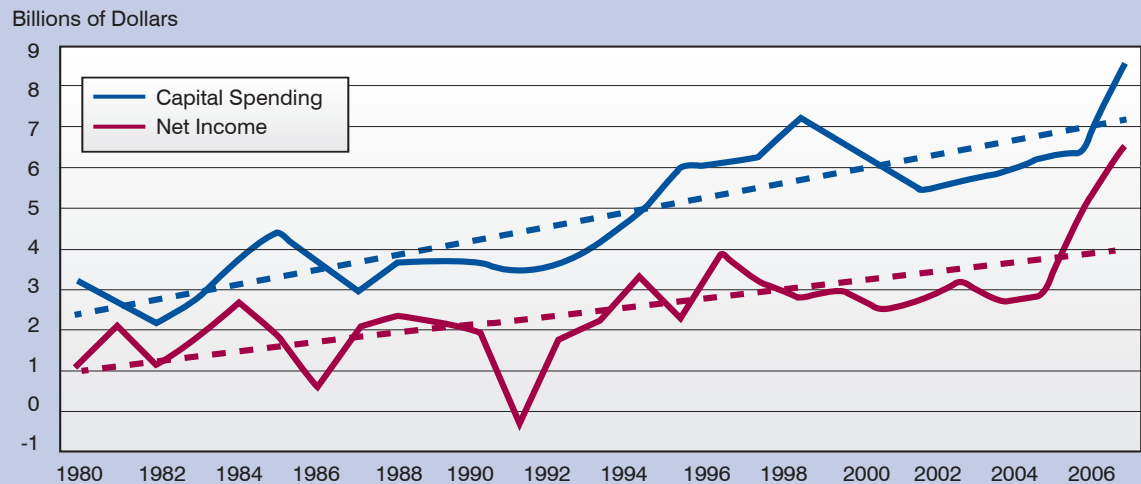
The Class I railroads anticipate that future revenues will grow proportionally to rail tonnage, currently forecast to increase by 88 percent by 2035. Assuming that revenues increase with tonnage and that railroads maintain their current level of effort for capital expansion, the Class I railroads will invest cumulatively about \$70 billion from 2007 to 2035. However, the AAR estimates that this level of capital investment will fall short of investment needed to accommodate growth in rail traffic by about \$1.4 billion per year through 2035. This could increase to \$1.8 billion per year for the period 2035 to 2055. Options for funding all or part of this shortfall include investment tax credits, PPPs, Customs duties, and container fees, depending on the specific characteristics of the project.

Alternative Federal Transportation Revenue Sources

As discussed in Chapter 4, revenues from existing sources clearly are insufficient to prevent the condition and performance of the Nation's highway and transit systems from deteriorating. Even with aggressive deployment of operational strategies, pricing, and advanced technologies, considerable new highway and transit capacity will have to be added to provide the transportation services required to sustain economic growth and meet the needs of a growing population. Additional revenues can come from a variety of sources.

Federal fuel and truck taxes currently support investment in the highway and public transit modes. Because the Commission believes there is a Federal interest in investing in other modes such as freight and passenger rail, it is appropriate to consider additional Federal financing mechanisms beyond traditional highway user fees. The 2006 NCHRP report, *Future Financing Options to Meet Highway and Transit*

Exhibit 5-16. Capital investment and income Class I Railroads, 1981 to 2006



This exhibit shows capital outlay and income for Class 1 railroads between 1981 and 2006. Dotted lines represent trend lines.

Source: American Association of Railroads data

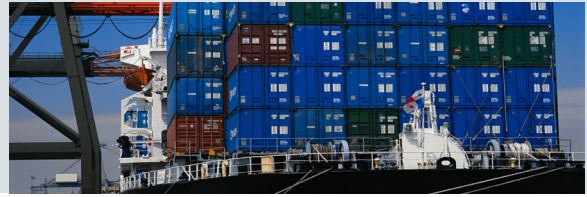


Needs, identified a broad range of options for increasing surface transportation revenues and estimated the additional funds that each option might provide through 2017. Those estimates are shown in Exhibit 5-17. Several of the most promising options for increasing Federal surface transportation revenues are discussed below.

- **Increase the fuel tax and existing truck taxes.** As noted above, user charges on fuel, motor vehicles, and other elements of the transportation system have been the backbone of highway finance for the past 80 years. The Commission strongly supports the principle of user financing. Personal and commercial travelers should pay for the transportation systems and services they use in proportion to the costs associated with that use. Historically the fuel tax has been a particularly important component of the highway user financing system. At the Federal level fuel taxes represent almost 90 percent of total HTF revenues. While there is a growing consensus that alternatives to the fuel tax may be necessary in about 20 years, the fuel tax should remain an essential component of surface transportation finance until viable alternatives are found. Among the attributes that make fuel taxes particularly attractive sources of surface transportation revenues are their (1) low administrative and compliance costs, (2) ability to generate substantial amounts of revenue (each penny of fuel tax raises almost \$2 billion), (3) relative stability and predictability, and (4) ease of implementation. While the direct relationship between the amount of travel and the amount of fuel taxes paid has diminished somewhat in recent years as disparities in vehicle fuel efficiencies have grown, the fuel tax still bears a reasonable relationship to the amount of travel.

One limitation of the fuel tax is that, when levied on a per-gallon basis, it is not responsive to increasing construction costs. That weakness can be remedied by indexing the tax to a measure of inflation such as the CPI or the Producer Price Index for Highway and Street Construction. The NCHRP report suggests several ways that the fuel tax could be indexed, the main difference being how much money would be generated. Indexing back to 1993 when the tax was last raised would produce considerably more money than beginning the indexing at a later year, but raising the fuel tax before starting to index would have the same effect. Converting all or part of the current per-gallon fuel tax to a fuel sales tax would allow receipts to vary with the price of fuel, but the price of fuel fluctuates widely and has little to do with factors affecting surface transportation investment requirements.

- **Levy a Federal ticket tax on all transit trips.** No direct user fee is levied on transit trips at the Federal level. The Commission believes that the user pay principle should be applied as widely as possible. One option for transit would be to levy a Federal ticket tax on all transit fares, similar to the tax imposed on airline fares.
- **Dedicate a portion of Customs duties for freight-related improvements.** Transportation requirements are among the major costs associated with imported commodities. One option for financing port-related improvements and other facilities used to transport imports would be to dedicate a portion of Customs duties for such improvements. Since imports ultimately are transported on virtually all major highways a case could be made for using the Customs



duties on all major highways; but a stronger case could be made for dedicating those revenues for transportation improvements that are uniquely necessitated by the imports. If 5 percent of Customs duties were dedicated to freight transportation improvements, revenues would be approximately \$1.8 billion per year, or the equivalent of about 1 cent per gallon of fuel tax. This dedication would result in an equivalent loss of Federal funds to the General Fund.

- **Levy new freight fees to finance freight-related improvements.** Another potential revenue source to fund freight transportation improvements would be fees levied on each container being transported through ports or other international gateways. Container fees currently are levied on containers flowing through the ports of Los Angeles/Long Beach to help finance freight rail improvements in the Alameda Corridor. A \$30 fee per container levied at each U.S. port could raise about \$2 billion a year.
- **Improve financial assistance to the railroads to support capacity enhancement.** The railroads have indicated that anticipated future revenues will be inadequate to allow them to privately finance all capacity improvements required to maintain their current market share of freight traffic. To help them make the capital investments that will be required to move the increasing volumes of goods, freight railroads have proposed a 25 percent Federal tax credit for expansion investments. They also have proposed that they be allowed to expense capital expenditures since other modes can expense their trust fund payments. Although such tax incentives for freight rail capacity expansion would be credited against the General Fund, they would help bridge the funding gap between demand and available

private funding in the coming years in a way that could offset the cost of the tax incentive. The railroads estimate that the expansion tax credit, together with immediate expensing of the remaining 75 percent of capital investment, would reduce expansion project costs by approximately 30 percent. The net effect is that project return would increase by 3 percent to 4 percent, making the expansion investment more likely.

Federal credit assistance programs are available to assist railroads in financing some needed improvements. These programs can be improved. For example, small changes in the Private Activity Bond (PAB) program, such as removing the requirement for other Federal funding and for the Federal Highway Administration (FHWA) to be the lead agency, would increase the utilization of PAB financing of railroad capacity projects. In addition, the RRIF program, which has not been widely utilized by Class I rail carriers, can be enhanced if it better mirrored private sector financing.

- **Potential sources of Federal funding for intercity passenger rail service.** Three potential sources of funding for intercity passenger rail service are worth particular mention: (1) a Federal ticket tax; (2) highway user revenues; and (3) Federal general fund revenues as are used for some transit programs. Federal investment in the aviation system is financed in part through taxes on airline tickets. Similar fees could be levied on tickets purchased by urban public transit users or intercity rail passengers. Based on total urban transit and Amtrak fare revenues of about \$13 billion in 2005, a 1 percent ticket tax could generate approximately \$130 million per year.

Exhibit 5-17. Revenue generating estimates for different funding mechanisms

| Short-Term Funding Mechanisms | Estimated Revenue Generation 2010 | Estimated Revenue Generation 2017 | |
|---|---|---|--|
| Federal Revenue Options to Increase Highway Trust Fund Revenues | | | |
| Index Federal fuel taxes retroactive to 1993 to capture full loss due to inflation | \$19.4 billion | \$31.7 billion | |
| Capture half of the loss due to inflation since 1993 | \$9.6 billion | \$19 billion | |
| Index Federal fuel taxes starting in 2010 | \$0.8 billion | \$7.6 billion | |
| Implement motor fuel sales taxes at the Federal level | \$10.8 billion | \$14.0 billion | |
| Reinstitute Federal light duty vehicle sales tax on new vehicles | \$15 billion | \$20.4 billion | |
| Index Heavy Vehicle Use Tax (HVUT) retroactive to 1997 | \$2.1 billion | \$3.7 billion | |
| Index HVUT starting in 2010 | \$30 million | \$374.3 million | |
| Eliminate exemptions to HTF starting in 2008 | \$1.2 billion | \$1.3 billion | |
| Recapture interest on HTF balances starting in 2008 | \$0.5 billion | \$0.5 billion | |
| Other Federal Revenue Options | | | |
| Authorize tax credit bonds (modeled after the Senate-proposed "Build America Bonds" - assumes \$5 billion in net proceeds per year) | \$5 billion, General Fund supported | \$5 billion | |
| Utilize 5 to 10 percent of current Customs duties for port and intermodal improvements | \$1.7 billion at 5 percent \$3.3 billion at 10 percent | \$2.2 billion at 5 percent \$4.5 billion at 10 percent | |
| Authorize freight/ intermodal investment tax credits (assumes \$500 million annual limit on monetization of 20-year tax credit streams) | \$1.2 billion | \$1.2 billion | |
| Container fees | \$1.7 billion | \$2.7 billion | |
| State Revenue Options | | | |
| Index state motor fuel taxes | \$1.4 billion | \$6.5 billion | |
| Increase state motor fuel taxes to catch up for inflation losses since 2000 | \$6.6 billion | \$8.6 billion | |
| Implement motor fuel sales taxes | \$8.9 billion | \$11.6 billion | |
| Raise motor vehicle registration fees to keep up with inflation | \$1.8 billion | \$6.4 billion | |
| Use vehicle sales tax for transportation | \$6.2 billion | \$8.4 billion | |
| Portion of state sales tax dedicated to transportation | \$9.0 billion | \$12.0 billion | |
| Increase tolling/pricing revenues (above current 5 percent per year increase) | \$0.2 billion | \$2.4 billion | |
| VM'I' fees (future); transition from short-term toll/pricing innovation | | | |
| Local Revenue Options | | | |
| Increase use of specialized dedicated local taxes, e.g., local option taxes, impact fees - Highway | \$3.5 billion | \$11.6 billion | |
| Increase use of specialized dedicated local taxes, e.g., local option taxes, impact fees, miscellaneous transit fees - Transit | \$1.8 billion | \$6.0 billion | |

This table identifies the additional revenues that could be generated from a set of alternative funding mechanisms.

Source: 2006 NCHRP Report, Future Financing Options to Meet Highway and Transit Needs.

| | Average Annual Revenue 2010 to 2017 | Revenue Generation Cumulative 2007 to 2017 | Comments |
|--|---|---|---|
| | \$25.3 billion | \$202.6 billion | Would result in 10 cent gas tax increase in 2010 with indexing to CPI thereafter. |
| | \$14.1 billion | \$113 billion | Would result in 5 cent gas tax increase in 2010 with indexing to CPI thereafter. |
| | \$4.0 billion | \$32.3 billion | Index fuel tax rates to CPI starting in 2010; first year of next reauthorization cycle. |
| | \$12.3 billion | \$98.4 billion | Assume 3 percent sales tax on motor fuels, starting in 2010. |
| | \$17.6 billion | \$140.8 billion | Seven percent rate phased out in 1971. Assume tax is reinstated in 2010 at 3 percent. |
| | \$2.9 billion | \$21.3 billion | Has been fixed at maximum of \$550 since 1984; assume indexing retroactive to 1997 to capture one-half loss due to inflation. |
| | \$200 million | \$1.5 billion | Assume indexing to CPI implemented in 2010. |
| | \$1.2 billion | \$12.3 billion | As proposed in President's 2006 budget, shift exemptions to general fund. |
| | \$0.5 billion | \$5.0 billion | Depends on HTF balances; estimates assume minimal balances through next reauthorization cycle. |
| | \$5 billion | \$55 billion | Debt-oriented financing technique that leverages a Federal tax subsidy to generate new transportation funding. |
| | \$1.9 billion at 5 percent \$3.9 billion at 10 percent | \$20.0 billion at 5 percent \$40.1 billion at 10 percent | These funds would be set aside for port and intermodal purposes; 30 percent assumed to offset highway needs, such as intermodal connectors. |
| | \$1.2 billion | \$13.2 billion | Modeled after the Graves proposal. Only 15 percent of ITCs are estimated to fund highway or transit needs such as highway-rail grade crossings. |
| | \$2.2 billion | \$17.5 billion | Start in 2010; applied on all import and export containers. |
| | \$3.8 billion | \$31.9 billion | If all states indexed fuel taxes by 2010. |
| | \$7.6 billion | \$70.0 billion | If all states were to catch up for inflation losses by 2010, results in average 5.2 cent increase. |
| | \$10.1 billion | \$94.3 billion | Three percent assumed dedicated to transportation. |
| | \$4.0 billion | \$33.4 billion | If all states were to raise in concert with inflation starting in 2007. |
| | \$7.2 billion | \$66.6 billion | If all states who have sales tax dedicate at least 3 percent of vehicle sales tax to transportation. |
| | \$10.5 billion | \$108.8 billion | Assume one-half percent dedication to highway and/or transit. |
| | \$1.1 billion | \$8.9 billion | Estimate based on aggressive use of tolling and pricing opportunities in SAFETEA-LU. |
| | | | High potential but widespread deployment assumed after 2015. |
| | \$7.2 billion | \$63.4 billion | Assume more aggressive growth rate of last 10 years continues. |
| | \$3.7 billion | \$32.8 billion | Assume more aggressive growth rate of last 10 years continues. |



Recommendations for Increasing Federal Revenues

At the Federal level, simply resolving the immediate HTF cash flow issue will not provide the funding required to meet vital long-term surface transportation needs. The gap between spending that can be supported from existing revenues and the investment required to improve the condition and performance of the surface transportation system shown in Exhibit 4-22 makes it clear that public and private investment must increase substantially. The annual Federal share of total transportation spending has varied over time, and tends to fluctuate from year to year. Over the last 10 years, the annual Federal share of total highway capital investment has ranged from 37 to 46 percent, while the annual Federal share of transit capital investment has ranged from 39 percent to 54 percent. The Commission believes the Federal Government must continue to play a strong role along with State and local agencies and the private sector in revitalizing the Nation's key surface transportation systems. While the level of Federal funding ultimately should be tied to what is necessary to achieve Federal goals, the Commission believes the Federal share of future capital investment should be approximately the same as it has been in recent years.

The 2035 investment gap range shown in Exhibit 4-22, expressed in terms of equivalent cents per gallon of fuel tax, is \$0.64 to \$1.01 per gallon of fuel. If it is assumed that the Federal share of this total should be approximately 40 percent, Federal funding would have to increase by the equivalent of approximately 25 to 40 cents per gallon of fuel. **The Commission recommends that the Federal fuel tax rate be increased by 5 to 8 cents per gallon per year over the next 5 years and indexed to inflation thereafter.** Once the National Surface

Transportation Commission recommended in Chapter 6 has been established, the exact amount of this rate increase and future adjustments to the fuel tax and other Federal tax rates would be based on recommendations by that Commission.

One tenet of highway taxation dating back to the creation of the HTF is that different vehicle classes should be charged in proportion to their contribution to highway investment requirements. The Federal Government and many State governments have conducted highway cost allocation studies to assess the cost responsibility of different vehicle classes. Increasing the fuel tax without commensurate changes in truck taxes could exacerbate the current situation where heavy trucks pay less than their share of highway costs. When adjusting Federal fuel tax rates, **the Commission recommends that tax rates on existing Federal truck taxes be adjusted proportionally to maintain the current allocation of highway cost responsibility.**

Federal Funding for Transit

Eighty percent of Federal funding for transit currently comes from the HTF, and the remaining 20 percent comes from the Federal General Fund. The portion from the General Fund reflects transit's role in providing basic mobility for those who do not have other travel options. The Commission believes this same split between Trust Fund and General Fund revenues should continue in the future. The maximum Federal share of transit project costs under any of the new programs also should be 80 percent. The Commission believes that the "user pays" philosophy should extend to the transit program. **Therefore, the Commission recommends that a Federal ticket tax be levied on all transit trips to supplement revenues from the Federal fuel tax and General Fund.**



Funding Dedicated for Freight-Related Transportation Improvements

Given the strong Federal interest in freight movement, Congress will need to make available a variety of funding sources to meet the needs of the Freight Transportation program. At the Federal level these include increased gas tax revenues, General Funds, and potentially a portion of Customs duties revenues and a Federal freight fee. It is also anticipated that tolling and PPPs would play an important role. A full range of financing options will be needed.

Freight fees have been used previously to fund key projects that benefit freight users. For example, fees on all containers passing through the ports of Los Angeles and Long Beach are levied to help finance Alameda Corridor improvements. Congress should consider whether to implement a freight fee (e.g., a container charge, freight waybill surcharge, or other equitable fee) to fund projects that remediate chokepoints and increase throughput. Such a fee should be designed to ensure that commerce is not burdened by local and state proliferation of such fees; no mode of transportation or port of entry is disadvantaged; and the ultimate consumer bears the cost.

Congress will need to create an accountable and transparent programmatic linkage between an assessed freight fee and the selection and funding of projects that facilitate increasing volumes of primarily trade-driven freight. The payers of such a fee must realize the benefit of improved freight flows resulting from projects funded by the freight program.

Another potential revenue source for funding freight-related improvements is a share of the Customs duties paid on all imports. Most Customs duties are deposited in the General Fund. If 5 percent of Customs duties were dedicated to freight transportation improvements,

revenues would be approximately \$1.8 billion per year, which is equivalent to a fuel tax increase of about 1 cent per gallon. Because of the large transportation requirements associated with imported commodities, **the Commission recommends that a portion of Customs duties be dedicated to help pay the costs of freight-related improvements.** As with the new freight fees, Customs fees dedicated for freight transportation improvements would be deposited in the STTF.

The railroads have indicated that anticipated future revenues will be inadequate to allow them to privately finance all capacity improvements required to maintain their current market share of freight traffic. Rail capacity expansion improvements may include intermodal facilities, terminals, ports, and freight gateways. To help them make the capital investments that will be required to move the increasing volumes of goods, freight railroads have proposed that a 25 percent Federal tax credit be granted for investments to expand capacity. They have also proposed that they be allowed to expense capital expenditures since other modes can expense their Trust Fund payments. Although such tax incentives for freight rail capacity expansion would be credited against the General Fund, they would help bridge the funding gap between demand and available private funding in the coming years in a way that could offset the cost of the tax incentive. **The Commission recommends that a Federal Investment Tax Credit be granted to transportation facility owners for capital improvements.**

Funding Dedicated to Passenger Rail

The Commission proposes three sources of Federal funding for intercity passenger rail service: (1) ticket surcharges, (2) highway user revenues, and (3) Federal general fund revenues as are used



for some transit programs. To implement the new Intercity Passenger Rail Program, the Commission recommends initial Federal funding of \$5 billion per year for grants to States, Amtrak, and/or other competitive service providers. **The Commission recommends that a new Federal ticket tax be levied on users of the system to supplement funding from fuel taxes and general funds.** This ticket tax should not be imposed until new service begins in a corridor. As previously noted, funding should be provided on a cost-to-complete basis for intercity rail corridors that are shown to be cost-beneficial. The Federal share of capital costs should be up to 80 percent of capital. As with transit funding, 80 percent of funding should come from the STTF and 20 percent from general funds.

Carbon Taxes or Trading. In the near term, Congress may enact a tax on carbon or a “cap and trade” system to reduce greenhouse gas emissions. To the extent that such a taxation or trading system encompasses transportation-related sources, Congress should ensure that transportation activities that reduce greenhouse gas emissions receive a proportionate share of any revenue generated by these new schemes.

Alternative State and Local Revenue Sources

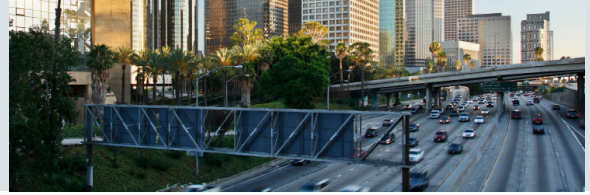
Based on the investment gap discussed in Chapter 4, the State and local share of additional investment requirements could range between the equivalent of 36 and 62 cents per gallon of fuel tax. This range could vary considerably among individual States depending on several factors, including their share of overall investment requirements and the extent to which they have the ability to use and choose to use other revenue sources. Overall, fuel taxes represent about 47 percent of total current highway revenues (excluding bond sales) for State transportation

agencies, so States already rely on funding from sources other than the fuel tax to finance their highway programs.

As mentioned previously, a significant increase in funding from all sources will be needed to upgrade our existing surface transportation system to a state of good repair and begin creating a more advanced system. This means that significantly more investment will be needed from State and local governments, as well as from the private sector.

Increase State fuel taxes and other highway user fees. As noted above, the gas tax has been a staple of highway finance at both the Federal and State levels for 80 years. Public acceptance of this mechanism, its ability to raise considerable revenues, and its low administrative cost have been significant positive attributes. Raising the fuel tax could generate about \$1.9 billion nationally for each 1-cent increase. Indexing the fuel tax or converting to a gasoline sales tax would allow revenues to increase with rising highway construction costs. The Commission expects that States and local governments will have to raise additional revenues as part of the effort to increase investment in our surface transportation system.

Provide new flexibility for tolling and pricing. The Commission recommends that **Congress remove certain barriers to tolling and pricing. States and local governments should be given the flexibility to toll and/or implement congestion pricing. This will give States and local governments that wish to make greater use of tolls and congestion pricing the flexibility to do so.** While the use of these tools is discretionary with State and local governments, the Commission believes that increased tolling and pricing must be part of the overall solution if we are to indeed create and sustain the pre-eminent surface transportation system in the world.



“Road user charging is one of the tools that will help solve our mobility challenges.

It’s not the only tool; but it’s a very important one. Tolling is important because it establishes a direct connection between the use of the road and the payment for that use.”

– Patrick D. Jones, Executive Director, the International Bridge, Tunnel, and Turnpike Association, at the Commission’s Washington, DC, field hearing.

Tolls currently account for about 5 percent of total highway-related revenues and 9 percent of current State highway revenues. These percentages have remained relatively stable for many years. They understate, however, the importance of tolls in funding highway capacity expansion. A recent FHWA study reports that “during the last 10 years, an average of 50 to 75 miles a year of new access-controlled expressways has been constructed as toll roads out of an overall average of 150 to 175 miles of urban expressways opened annually. Toll roads, therefore, have been responsible for 30 to 40 percent of new “high end” road mileage over the past decade.”³ With some exceptions toll revenues historically have been used almost exclusively on the tolled facilities themselves. The direct connection between use of the facility and the toll charge has been one reason that economists have tended to favor tolls over the gas tax. If toll rates produce more revenues than are needed for the facility itself and the excess revenues are used for other purposes, the connection between facility use and toll charges is weakened and the toll takes on some characteristics of a tax rather than a direct user charge. It should be noted that administrative costs of tolling are higher than the costs of administering the fuel tax, but the move toward

greater use of electronic toll collection should reduce those costs.

In the Commission’s analyses of gaps in future investment levels, the lower estimates of highway investment in 2035 and 2055 assume widespread implementation of congestion pricing. While widespread pricing reduced additional investment requirements by 30 percent, considerable investment in new capacity would still be required. In estimating the investment gap, no assumption was made that pricing revenues would be used to offset requirements for revenues from other sources. To the extent that pricing revenues were used for highway and transit purposes they would reduce requirements for revenues from other sources.

Most of the advantages and disadvantages of tolling in general also apply to congestion pricing. Pricing has been controversial, and there are many unanswered questions about how it might be implemented. The major additional advantages of congestion pricing compared with tolls are that pricing manages demand on congested facilities thereby reducing congestion, and it can generate additional revenues that could be used to expand highway and transit capacity in the corridor to reduce congestion. An additional advantage is that congestion pricing encourages the use of other routes and other modes of travel, such as public transportation. The major disadvantage of pricing is that during peak periods, tolls are higher for those who cannot change their destination or time of travel. For some travelers this could impose a hardship.

It should be recognized that commercial trucks usually do not have the discretion to change either their routes or the times when they must travel in response to tolls or congestion fees. Shippers determine pick-up and delivery times, and trucking operators have little or no influence over these decisions. Because tolls are not easily



passed directly by the carrier to the customer (e.g., how to allocate a toll payment among multiple customer shipments on one vehicle), there is little incentive for the shipper or receiver to adjust their schedules. Another concern for motor carriers dealing with a dynamically variable pricing scheme is determining the actual cost of a delivery and consequently the price quoted to the customer. Providing a direct incentive to shippers and receivers may be a more effective means of influencing trucking industry delivery schedules. Finally, the restrictions under driver Hours of Service rules maybe in conflict with congestion pricing designed for road use management. Truck drivers no longer have the option to “log-off” during rest breaks. Consequently, truck drivers who otherwise might want to alter their driving schedule through a peak period congestion

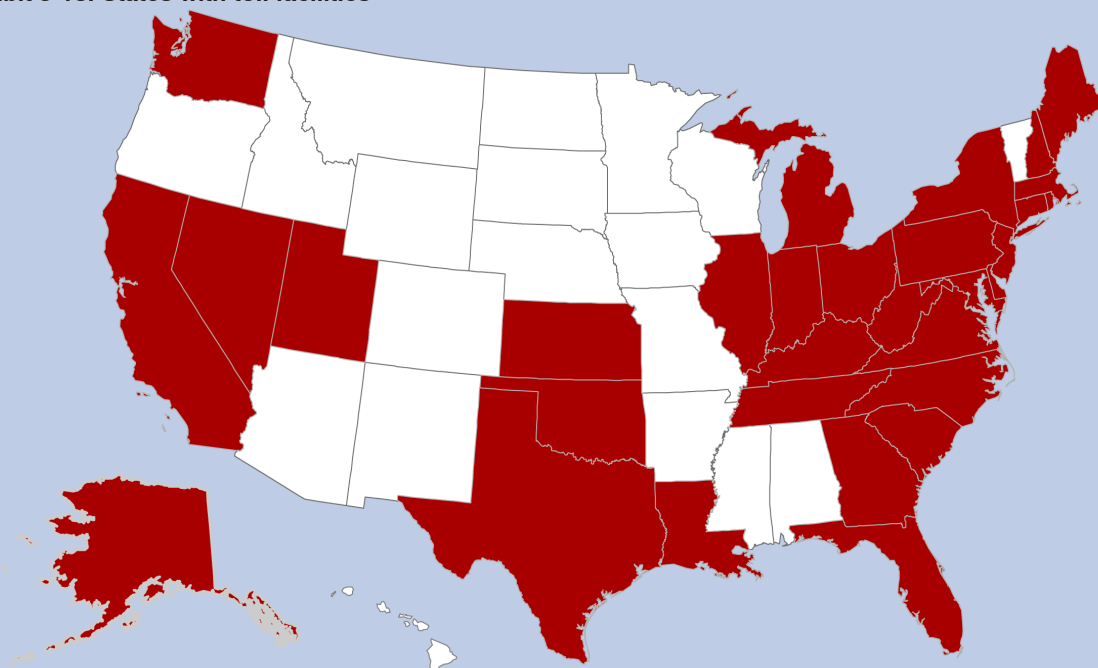
pricing scheme by taking a rest break cannot do so without violating the Hours of Service restrictions. Therefore, it is recommended that an adjustment be made to the Hours of Service regulations to take into consideration the need for rest breaks to accommodate congested metropolitan areas.

It should be noted that not all States have the authority to toll. Exhibit 5-18 shows the 31 States have one or more toll facilities. Since 1991, 27 States have initiated toll projects. Federal law currently prohibits tolling Interstate Highways except under several pilot programs.

The Commission recommends two basic changes to the Federal prohibition on tolling on the Interstate System.

First, the Commission recommends that flexibility be given to use tolls to fund new

Exhibit 5-18. States with toll facilities



This exhibit shows the 31 States that currently have toll facilities.

Source: *Highway Statistics 2005*, Tables SF-4B and LGF-4B.



capacity on the Interstate System, as well as the flexibility to price the new capacity to manage its performance.

And second, the Commission recommends that flexibility be given to implement congestion pricing on the Interstate System, on both new and existing capacity, in metropolitan areas with populations greater than 1 million. As noted above, congestion pricing likely will be used more widely in coming years as metropolitan areas explore strategies to manage their ever-increasing congestion problems. Congestion pricing could come in the form of high-occupancy toll (HOT) lanes, express toll lanes, full facility pricing, or area-wide pricing. The amount of revenues that can be generated by pricing will vary depending on how widely it is applied and the severity of the congestion. It is expected that this strategy will be limited to heavily congested corridors in the Nation's major metropolitan areas. The Commission believes that demand management in the form of pricing will be necessary as part of the solution to addressing congestion in major metropolitan areas.

■ **In implementing the tolling or congestion pricing recommendations, the Commission believes that Congress should put into place an approval process with strict criteria for tolling or pricing routes that are on the Interstate System:**

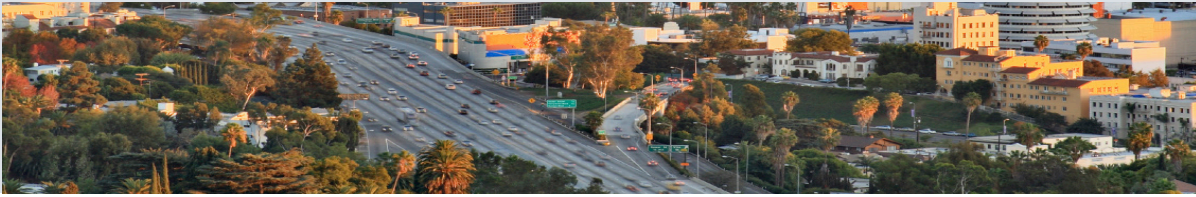
- Revenues should not be used for non-transportation purposes or to subsidize transportation improvements in other parts of a State or metropolitan area, but rather should be used to improve and expand the tolled facilities and to expand capacity on transportation alternatives within the same corridor.
- The use of tolls or pricing should be consistent with, and reflected in, freight,

metropolitan mobility, and other plans developed in connection with the new surface transportation programs. The use of toll or pricing revenues should be transparent so that all know where the funds will be expended.

- Adequate facilities for the trucking industry, including access to food, fuel, and safe parking accommodations for long-term rest, should be ensured.
- Rates should be set so as to avoid discrimination against Interstate travelers or any other group of users. Restrictions, conditions, or fees that discourage use of the facility by classes of vehicles (e.g., motor carriers) or commodities (e.g., hazardous materials) should be prohibited.
- Tolls should be collected with technologies that do not interfere with traffic flow, are compatible across regions, and are transparent to users so that they can make informed choices as they are choosing travel routes.
- Decisions on whether to toll particular facilities or to increase tolls on existing toll roads and bridges should explicitly consider the potential diversion of motor carriers onto adjacent routes that could lead to congestion, safety problems, and infrastructure damage.

The Commission also recommends that Congress promote the use of a nationwide, uniform system of electronic tolling so that toll collection does not become a burden on interstate travel and commerce.

Tolls already are being collected electronically on HOT lanes in California, Colorado, Minnesota, Texas, and Utah, as well as the recently completed Westpark toll road in Houston and the new



elevated express toll lanes on Tampa's cross-town expressway. Electronic toll collection is planned for several new toll roads in Texas; HOT lanes in northern Virginia, Miami, and Dallas; and existing toll roads operated by the North Texas Tollway Authority and the Miami-Dade Expressway Authority.

In the future, electronic toll collection is likely to replace tollbooths on most, if not all, toll roads. The advantages of electronic toll collection are the virtual elimination of delays, crashes, and pollution caused by long lines of vehicles waiting at tollbooths; reduced right-of-way requirements for tollbooths; lower administrative and operations costs; and increased convenience for the user. In addition to transponders, other technologies also are being used for electronic toll collection systems including automatic license plate recognition systems.

An alternative to tollbooths, during the transition to full deployment of electronic payment, could be redirection of cash-paying drivers to tollbooths off the main traveled lanes that would not impede the flow of traffic but provide a cash option. Early variations of this option are provided on many toll roads that have separate lanes for those with transponders who do not have to stop to pay a cash toll. The delays for drivers without transponders ultimately would be an incentive for

them to purchase single-use transponder devices if not multiple-use devices.

Encourage the use of PPPs, including concessions, for highways and other surface modes. A wide variety of PPP arrangements have been used in connection with surface transportation improvements. Private sector participation is not simply about supplying revenues. PPPs also can (1) prioritize projects that generate the highest returns, (2) improve life cycle investing, and (3) provide incentives for more efficient operations and maintenance. Private sector financing has been widely used in Europe, South America, and Australia.

As public sector revenue sources have been stretched in the United States, there has been increasing interest by some States in the private sector directly contributing to project financing. This has taken two general paths. One involves private sector participation in "greenfield" projects that involve the construction of new highways or the addition of new capacity to existing highways. The other major type of private sector financing involves the long-term leasing of existing toll facilities, so-called "brownfield" transactions. About 40 percent of the States have statutory authority to enter into PPPs. Several of those States have only recently passed enabling legislation, and several others have modified their





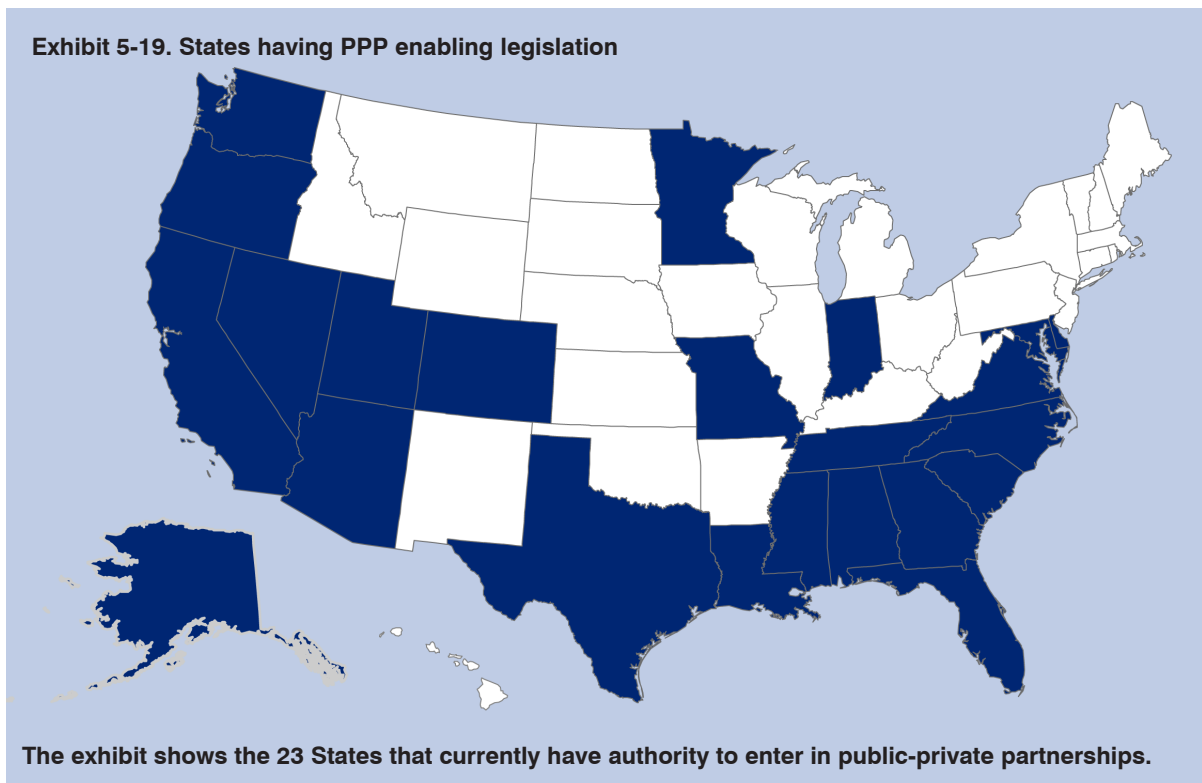
legislation to expand their ability to enter into partnership agreements. Exhibit 5-19 shows those States that have PPP enabling legislation.

The Commission believes that PPPs should play an important role in financing and managing our national surface transportation system. It can be another important financing tool for State and local governments. Therefore, the Commission recommends that Congress encourage the use of PPPs.

- **With respect to the Interstate System, PPP arrangements that involve tolling or congestion pricing should be subject to the same limitations and conditions discussed in the previous section. In addition, in order to ensure that the public interest is protected, the Commission recommends**

that the following conditions also be met when States use PPPs (including concession arrangements) on the Interstate System:

- Transparency should be a key element in all aspects of the process and the arrangement, including any tax incentives given to private sector partners. There should be adequate public participation, and all applicable planning and environmental requirements should be met. Confidentiality should be limited to only those instances where it is legally required.
- The terms of the agreement should include the following:
 - The condition and performance of the facility are adequately maintained over



Source: U.S. DOT Public Private Partnership Website: <http://www.fhwa.dot.gov/ppp/legislation.htm>.



the life of the concession agreement and, at the end of the agreement, the facility is returned to the State in good condition.

- There are no non-compete clauses that prohibit the construction or improvement of adjacent facilities; however, provisions that require the public entity to compensate private operators for lost revenues when improvements are made to adjacent facilities would be acceptable.
- Should the private partner enter into bankruptcy during the term of the agreement, the facility will revert to the State.
- Customers' interests are protected by capping the rate of increase in tolls at the level of the CPI minus an adjustment factor for productivity improvements.

Note: The Commission has explicitly rejected the use of rate-of-return regulation for PPPs. The learning in regulatory economics has proven that rate-of-return regulation blunts incentives for efficiency, and that a price cap approach is superior. This is also true in transportation. Private sector entities should be allowed to keep any added profits they obtain due to enhanced efficiencies, subject to the price cap.

- Revenue sharing provisions should be included in the lease agreement to ensure the public sector shares in the rewards if toll revenues are higher than projected during the valuation process. Alternatively, the lease agreement could include rebalancing provisions to bring the agreement terms back into

the financial balance achieved in the original negotiation.

- Concession agreements should not exceed a reasonable term. Following the termination of a concession agreement, public input and review must be undertaken before any renewal of the agreement.
- Concessions or other payments to public entities should not be used for non-transportation purposes or to subsidize transportation improvements in other parts of the State or metropolitan area, but rather should be used to improve and expand the tolled facilities and to expand capacity on transportation alternatives within the same corridor.
- No conflicts of interest exist involving any parties to the agreement.
- The private sector financing provides better value for money than if the concession were financed using public funds (similar to the public sector comparator used in several European countries). This assessment must take into account the loss of Federal tax revenue from tax-exempt municipal bonds, as well as the tax consequences of depreciation and other features of the private sector alternative.

Transit

As noted above, transit systems depend on local funding, including fare revenues, to a much greater degree than does highway construction and maintenance. In the future this trend is expected to continue, especially for rail transit systems, as local governments turn to more innovative finance techniques such as transit-oriented development and tax increment financing. Both of these strategies capture part of the increased real estate



values generated by the transit system. Transit joint development has been used successfully in New York City, San Francisco, and the Washington D.C. area to increase development adjacent to rail stations and capture some of the economic value of that development to help cover costs of the transit systems. Tax increment financing can be used to fund transit system improvements directly or to provide amenities that make areas adjacent to the transit system more attractive to development. In addition to raising revenues directly, development associated with these and related innovative finance techniques may also help to increase transit ridership and fare revenues.

In major metropolitan areas that implement pricing to relieve highway congestion, significant shares of the pricing revenues may go to transit systems to provide viable alternatives for those who choose not to pay the congestion toll. Both London and Stockholm use portions of the revenues from their areawide pricing systems for transit enhancement. In the United States there are no areawide pricing programs; but, about half of the total toll revenue from San Diego's I-15 HOT lanes funds transit service in the corridor. Also, 50 percent of any excess revenues from the I-394 HOT lanes in Minnesota are required by law to be spent on transit; but, there is little or no excess revenue at this early stage of the project.

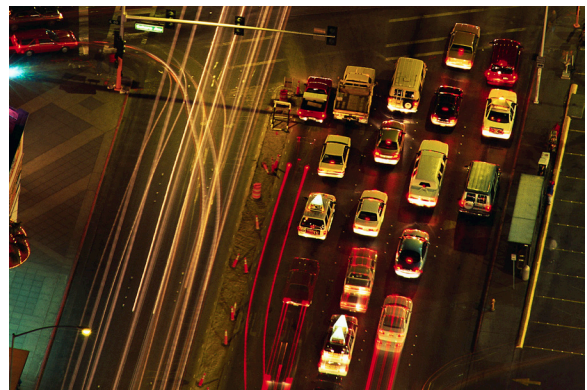
As noted above, improving transit service will be a critical component in efforts to reduce congestion and greenhouse gas emissions. All levels of government and the private sector will have to play a role in financing transit system improvements. Since 1982 Federal fuel taxes have been used to finance both highways and transit programs, and a number of States also use fuel tax revenues for transit system improvements. As alternatives to the fuel tax are identified, consideration should be

given to whether those options are also suitable for transit funding.

Evaluation of Alternative Transportation Revenue Sources

Advantages and disadvantages of alternative revenue sources can be evaluated against a number of criteria including yield, revenue stability, efficiency, equity, the applicability to different types of improvements, public acceptance, and other potential barriers to implementation.

Several studies recently have examined alternatives to the fuel tax, including studies sponsored by the National Chamber Foundation of the U.S. Chamber of Commerce, the Transportation Research Board (TRB), and the NCHRP. Exhibits 5-20 and 5-21 at the end of this chapter summarize advantages and disadvantages of alternative revenue sources in terms of six sets of criteria: (1) yield, adequacy, and stability; (2) cost efficiency and equity; (3) economic efficiency, (4) potential applicability at the program or project level and by level of government; (5) potential acceptability; and (6) implementation issues and potential strategies to overcome barriers. Exhibit 5-21 draws from the December 2006 NCHRP study, *Future Financing Options to Meet Highway and Transit Needs*.



Long-Term Revenue Sources

This section discusses long-term alternatives to current surface transportation revenue sources with a special focus on alternatives to the fuel tax that may be required in the next 20 years. Several studies are either completed or underway to examine potential alternatives to the fuel tax. These studies have been driven by a recognition that supplies of conventional petroleum-based fuels will get tighter in the future, leading to the possibility of higher fuel prices, greater disparities in vehicle fuel economy, increasing use of alternative fuels, and greater concern about energy security.

The TRB recently completed a study titled, *The Fuel Tax and Alternatives for Transportation Funding*, that examined these and other issues in detail. That report concluded:

“a reduction of 20 percent in average fuel consumption per vehicle mile is possible by 2025 if fuel economy improvement is driven by regulation or sustained fuel price increases . . . The willingness of legislatures to enact increases (in fuel tax rates to compensate for reductions in fuel consumption) may be in question, but the existing revenue sources will retain the capacity to fund transportation programs at historical levels . . . Although the present highway finance system can remain viable for some time, travelers and the public would benefit greatly from a transition to a fee structure that more directly charged vehicle operators for their actual use of roads . . . Ultimately, in the fee system that would provide the greatest public benefit, charges would depend on mileage, road and vehicle characteristics, and traffic conditions, and they would be set to reflect the cost of each trip to the highway agency and the public.”



THE OREGON MILEAGE FEE CONCEPT

Oregon recently completed a pilot project involving 260 volunteers to evaluate the technological and administrative feasibility of a mileage-based fee. A GPS-based receiver was used to estimate miles driven in different zones. Mileage data were transmitted wirelessly via short-range radio frequency to receivers at gasoline service stations. Participants stopped paying the fuel tax but were charged a fee of 1.2 ¢ per mile. In addition some participants were charged premiums for traveling in peak periods to determine whether such charges would change travel behavior. Key findings of the pilot are (1) the mileage fee system is viable and the pilot test proves the concept; (2) paying at the pump works; (3) the mileage fee can be phased in; (4) integration with current systems can be achieved; (5) congestion and other pricing options are viable; (6) privacy is protected; (7) there is a minimal burden on business; (8) there is minimal evasion potential; and (9) the administrative cost is low. Additional testing and development are needed to prepare for full implementation, including an operational test to simulate multi-state mileage fees and congestion pricing.

It is important to note that the TRB report reaffirmed the viability of the fuel tax to serve as the cornerstone of the Nation's transportation financing system through 2025, provided that political resistance to adjusting the rate can be overcome. With respect to the long-term transition to another revenue mechanism after 2025, the report recommended that governments adhere to the following principles that the Commission generally endorses:

- Maintain the practice of user fee finance, a system in which users of facilities are charged fees or special taxes, rates reflect the costs to serve each user, and the expenditures equal the fee revenue.



THE GERMAN TOLL COLLECT SYSTEM

The German Toll Collect system was instituted in 2005. The structure of the Toll Collect charge is subject to an EU directive that limits the toll on trucks to vehicles over 12 tons, limits the toll to motorways only (other roads are free), and limits the aggregate charge to direct capital and operating costs imposed by truck traffic on the motorway network. Within these constraints, the charge is allowed to vary by distance, by vehicle category (weight and environmental emissions) and by time of day (for congestion purposes). Of these, the Toll Collect charge factors in distance and vehicle category but does not include time of day. Accordingly, the main objectives of the system are to (1) Recover system costs associated with truck use of motorways in order to finance ongoing maintenance, repair, and improvements; (2) Promote environmental improvements by sending price signals that encourage a shift to lower emissions vehicles and a mode shift from road to rail; and (3) Reduce deadheading thereby encouraging more efficient use of vehicle stock.

The German system includes two distinct payment options. For infrequent users, there is a manual declaration and payment method that can be accessed via roadside toll stations or the Internet. For frequent users there is an automated electronic system based on the use of on-board equipment, which includes GPS and GSM. The GPS receiver is used to determine when a vehicle enters or exits the motorway as well as the route and distance traveled. The onboard unit then calculates the charges owed based on the kilometers driven and the vehicle type (which is pre-coded in the on-board unit) and transmits the information via GSM to the Toll Collect center, which sends out a corresponding invoice on a periodic basis.

- Seek opportunities where possible to apply pricing; that is, allow fees to ration access to facilities.
- Align responsibilities so that local governments provide facilities that serve mainly local travel, States serve regional traffic, and the Federal government retains only functions that it can perform more effectively than State and local governments. Governments must control the resources required to carry out these functions; therefore, a goal of reform should be to allow each jurisdiction to collect fees from all users of its facilities.
- Give full consideration to the environmental and equity consequences of reform. Fundamental finance reform that aligned fees more closely with costs would eventually have profound effects on the locations of households and industries. The overall economic and environmental impacts of reform would be positive, but some individuals and communities would suffer harm if no provisions were made for compensation.

The TRB Policy Committee that produced the report considered several potential alternatives to the fuel tax and concluded, “Road use metering and mileage charging appear to be the most promising approach to this reform within a comprehensive fee scheme that will generate revenues to cover the cost of an efficient highway program in a fair and practical manner.” Others who have looked at this issue have come to basically the same conclusion. A Road User Fee Task Force in Oregon examined 28 alternative highway financing mechanisms and concluded, “The only broad revenue source that the task force believes could ultimately replace the fuel tax is a mileage fee.”⁴ A pooled fund study involving 15 States and the FHWA examined potential



alternatives to the current system for financing highways. The study identified attributes of an ideal road user finance system and concluded “The best approach to assessing road user charges . . . is one that is based on the actual mileage traveled . . . With a vehicle-miles-traveled (VMT) user charge, an individual state can tailor the per-mile rates to pursue equity and efficiency objectives as well as to encourage environmentally friendly vehicles and travel on appropriate roads.”⁵

Mileage-Based User Fees

The fact that each of these three major studies identified forms of a VMT fee as the preferred alternative from among a number of other options suggests that such a mechanism should be strongly considered as a long-term replacement for the current fuel tax. Many technical and institutional questions remain to be answered concerning a mileage-based fee, but some of those questions are being addressed in pilot projects being conducted by Oregon, Washington State, and the University of Iowa. Those projects are described in more detail in Volume III.

One of the potential strengths of a mileage-based fee is that it could readily be converted to a congestion pricing charge or a weight-distance fee that would better reflect the impact of the



vehicle on road wear and tear. Pilot projects in Washington State and Oregon demonstrated the ability to apply mileage-based charges to congestion pricing, and factoring in a vehicle’s weight would also be possible. Thus, in addition to being a broad-based general fee that reflects overall highway use, it also can reflect the added costs associated with travel during congested conditions or the costs of travel at different weights in the case of trucks. Whether or not to enable these additional types of charges would be up to each jurisdiction.

A compelling advantage of a mileage-based fee compared to the fuel tax is that the revenues directly reflect the amount of travel, which is a key factor affecting the costs of supplying, operating, and maintaining highway services. While some argue that the fuel tax rewards those who choose to drive more fuel-efficient vehicles, there are other ways to offer such rewards without reducing the highway funds needed to accommodate travel by those fuel-efficient vehicles.

Another advantage of a mileage-based fee is that revenues can be collected from vehicles regardless of the type of fuel they use. While liquid fuels will likely be the main surface transportation fuel for many years, other technologies like plug-in electric vehicles and hydrogen fuel cell vehicles are being developed that could account for a growing segment of the vehicle fleet in the future. Taxing those fuels might be possible, but a concern would be whether that could be done in as equitable a manner as the fuel tax or a mileage-based fee.

Technological Challenges

There are a number of technological issues that must be resolved before a VMT fee could be implemented. Among those are the method for calculating the mileage traveled in each taxing jurisdiction, the way this mileage information would be transmitted to the tax collection agency,



and the way that the system would deal with equipment failures due either to malfunctions or tampering. Various approaches have been used to record miles traveled in pilot projects in this country and in actual mileage-based fee systems in use in other countries. The scope and purpose of the mileage-based fee strongly influences the type of equipment that can be used. Equipment used in some European countries to record mileage traveled on specific highways would not meet the needs of a system to record mileage traveled on all highways in many different jurisdictions.

Transmitting information from each vehicle on the mileage traveled in each taxing jurisdiction raises other technological issues. Options include dedicated short-range communications, cellular communications, and “chip cards,” but there are issues that must be addressed with each of these technologies. In the Oregon pilot project, information on mileage traveled was transmitted at fueling stations, making maximum use of existing tax collection mechanisms. More work remains to be done on this issue to ensure that communicating the data on mileage traveled is as seamless as possible and does not become a show-stopper for mileage-based fees.

Evasion of a VMT fee is another concern. Evasion problems for a VMT fee are different from those for the current fuel tax, and may be more serious. Whereas the fuel tax is paid by only about 1,400 taxpayers, every vehicle owner potentially becomes a taxpayer under a VMT fee. Furthermore, there are several ways a VMT fee potentially could be avoided unless contingency plans were in place. For instance, devices are available that can block global positioning system (GPS) signals, making that technology vulnerable to evasion unless alternative methods for calculating mileage are available when GPS signals are not being received.

Privacy is perhaps the biggest concern with a VMT fee. Many motorists fear that information

on when and where they drive would be transmitted to government authorities. Such detailed information is not needed to implement a VMT fee, however, and pilot projects in this country have been careful not to collect that type of information. Motorists will have to be convinced that detailed information on their travel patterns will not be accessible to others.

Institutional Challenges

Implementing a VMT fee has a number of institutional issues as well as technological challenges. Ideally, the fee should be paid frequently, both for cash flow purposes and to reinforce its user fee characteristics. Receiving frequent payments from operators of every registered vehicle would be a large increase in the tax burden for Federal and State tax collection agencies. In fact, many concepts for the operation of a VMT fee assume that a third-party collection agency would actually receive information on mileage traveled in each jurisdiction, bill the motorist, and then distribute funds among the jurisdictions based on miles traveled and the appropriate tax rate. Much more work remains to be done to develop mechanisms for administering a VMT fee, both in the short run when only a few States have such systems and in the long run when all States may be expected to have such systems.

Another institutional challenge relates to the question of system phase-in. The cost of the

“I would envision a shift away from the gas tax... to a per-mile basis of taxation...in which every vehicle is equipped for mileage-based road user charging in lieu of the gas tax, not in addition to it.”

– *Ed Regan, Senior Vice President of Wilbur Smith Associates, at the Commission's Dallas field hearing.*



in-vehicle technology required for a VMT fee—including an onboard computer, a GPS receiver, wireless communications, and the like—is non-trivial, and it is likely to be more expensive to retrofit existing vehicles than to install the equipment in new vehicles.⁶ For this reason, most VMT charging proposals envision that the charging system would be phased in over time. From the inception of the program, new cars would come equipped with the required onboard technology and begin paying road use charges on a per-mile basis. Older vehicles, in contrast, would continue to pay traditional fuel taxes until they were retired from the fleet. For this reason, it would be necessary to operate two revenue instruments in parallel for a period of perhaps 20 years before the entire fleet was equipped with the required onboard technology.^{5,6} Operating dual transportation revenue mechanisms is not necessarily problematic—for instance, some toll road users pay manually while others use transponders and are billed on a monthly basis—but it does increase administrative complexity.

The TRB study, *The Fuel Tax and Alternatives for Transportation Funding*, discussed issues involved in transitioning to a new user fee mechanism in some detail. One conclusion was that additional technical trials will be required to assess “the reliability, flexibility, cost, security, and enforceability of alternative designs and to gain



information about institutional requirements for administering such systems, user acceptance, and costs.” The ongoing pilot projects in this country and the mileage-based fees being implemented in Europe will provide valuable information on many of these technological and institutional issues.

The Commission agrees with others who have looked at long-term alternatives to the fuel tax that a VMT fee has many promising features; but, until more is known about collection and administrative costs, ways to minimize evasion, and the acceptability of such a mechanism to the taxpayers, it is premature to rule out other types of taxes and fees to supplement traditional fuel tax revenues.

As noted above, several demonstration projects are underway or have recently been completed that will help overcome some of these barriers. Pilot studies in both Oregon and Washington State were recently completed. Preliminary findings from both studies are encouraging in terms of the technology for mileage-based charging, but both concluded that more work is necessary before the fees could actually be implemented. A larger-scale demonstration called for in SAFETEA-LU is just getting underway through the University of Iowa. That study will assess technological, institutional, and public acceptance issues with VMT taxes in six locations across the country.

These several initiatives will provide valuable information on key issues that must be considered in developing a VMT fee to replace or supplement the fuel tax at both the Federal and State levels. They will not, however, resolve all of the issues that must be addressed before such a fee could actually be implemented.

Development of Transition Strategy

If the Nation is to transition to a VMT fee or some other alternative to the fuel tax by 2025,



it is crucial to go beyond the very limited pilot projects that have been undertaken to date. A broader consensus must be developed on the basic architecture of a VMT fee. To the maximum extent possible the technology should build upon technologies that will be implemented in connection with VII and other initiatives. Strategies must be explored to reduce risks of evasion, protect privacy, and keep administrative costs as low as possible. Potential ways must also be developed to garner public understanding and support for the new revenue mechanism and to make it clear that the new user fee is intended to replace current fees, not be a charge on top of existing fees. **The Commission recommends that the next surface transportation authorization act should fund a major national study to develop a strategy for transitioning to an alternative to the fuel tax to fund highway and transit programs:**

- A Phase I study should be conducted through the National Academy of Sciences in coordination with the FHWA, the Internal Revenue Service of the U.S. Department of the Treasury, State highway and revenue agencies, and affected stakeholder groups to address the technological and institutional barriers that would need to be overcome to implement a VMT fee. These would include evasion, privacy, the relationship to wear and tear of the highways, and administrative costs. The study should draw upon findings from VMT fee demonstration projects in this country and mileage-based user charge systems that are in place in other countries. The role of VII infrastructure and services in implementing a VMT fee should be assessed. An important goal of this study would be to confirm that a VMT fee is feasible and, if so, to agree upon a system architecture for implementing such a fee.
- While the issues related to implementing a VMT fee are being addressed, the Phase I study should also examine other potential long-term surface transportation revenue options. This analysis should build on the work that has already been done in this area and focus on alternatives to a VMT fee, including ways to equitably tax alternative fuels that cannot be taxed in the same way as current motor fuels, annual registration fees for motor vehicles, and other options that were judged to be promising. Results of the Phase I study should be provided within 2 years of project initiation and should include recommendations concerning which alternative(s) should be explored in greater detail in Phase II.
- If a VMT fee is judged to be feasible in Phase I, a Phase II study involving the same organizations should be conducted to develop a specific plan and timetable for implementing a Federal VMT fee and for coordinating that fee with VMT fees levied at the State and local levels. An important part of this Phase II study will be to conduct several large-scale pilot programs to test alternative mechanisms for levying a VMT fee. These pilot programs should include both passenger and freight vehicles and should evaluate the full range of potential issues that might arise in the implementation of a VMT fee. The study should also assess necessary standards that must be set, the roles of public and private sector organizations in implementing the tax, transitional techniques such as incentives for rental and leased fleets, and other key elements of a transition strategy. Results should be mandated within 3 years. If questions still remain about the feasibility of a VMT fee, the Phase II study should develop transition strategies for implementing other recommended alternatives.

Exhibit 5-20. Evaluation of potential transportation revenue sources against generally accepted evaluation criteria

| | Revenue Adequacy | Stability/Predictability | Responsiveness to Inflation | Flexibility | Appropriateness of Dedication | Compliance Costs | Administrative Costs | Equity by Vehicle Class | Equity by Income Group | Equity by Geography | Relationship to Economic Efficiency | Point of Taxation and Incidence | Evasion Potential | Ease of Implementation | Average |
|------------------------------|------------------|--------------------------|-----------------------------|-------------|-------------------------------|------------------|----------------------|-------------------------|------------------------|---------------------|-------------------------------------|---------------------------------|-------------------|------------------------|---------|
| Fuel Tax | | | | | | | | | | | | | | | |
| Indexed Fuel Tax | | | | | | | | | | | | | | | |
| Motor Fuel Sales Tax | | | | | | | | | | | | | | | |
| Value Added Tax | | | | | | | | | | | | | | | |
| Registration Fee | | | | | | | | | | | | | | | |
| Personal Property Tax | | | | | | | | | | | | | | | |
| Vehicle Sales Tax | | | | | | | | | | | | | | | |
| Traditional Tolls | | | | | | | | | | | | | | | |
| Tolling New Lanes | | | | | | | | | | | | | | | |
| Tolling Existing Lanes | | | | | | | | | | | | | | | |
| VMT Fees | | | | | | | | | | | | | | | |
| Indexed VMT Fees | | | | | | | | | | | | | | | |
| Congestion Pricing | | | | | | | | | | | | | | | |
| Local Option Sales Tax | | | | | | | | | | | | | | | |
| Impact Fees | | | | | | | | | | | | | | | |
| Innovative Finance* | | | | | | | | | | | | | | | |
| Public-Private Partnerships* | | | | | | | | | | | | | | | |
| Container Fees | | | | | | | | | | | | | | | |
| Customs Duties | | | | | | | | | | | | | | | |

* Assumes repayment from tolls

Legend: Excellent Very Good Good Not Good Poor Very Poor

This chart provides a subjective evaluation of a series of alternative revenue sources against a set of criteria.

Source: Commission Staff analysis.

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources

| Motor Fuel Taxes, Excise Tax (per Gallon) | |
|--|--|
| Source and History | <p>Motor fuel taxes have been the most important revenue mechanism for highway programs at the Federal and state levels.</p> <p>Most states have traditional “cents per gallon” excise taxes on the highway use of motor fuel. Some also have variable rates based on an inflation adjustment or a fuel price. Several alternative fuels currently are taxed on an energy equivalent basis to gasoline or diesel.</p> <p>Fuel taxes also support transit programs at the Federal level and in some states.</p> |
| Yield, Adequacy and Stability | <p>Historically motor fuel taxes have been attractive because of their high yield (currently about \$1.9 billion per penny of tax at the Federal level), their adequacy to support highway construction programs, and their stability. In recent years the adequacy of the fuel tax has come into question because it does not increase with inflation and because voters at all levels of government have been less willing to approve fuel tax increases</p> |
| Cost-Efficiency and Equity | <p>Motor fuel taxes are inexpensive to administer and have low compliance costs. Evasion has been a major issue, especially for diesel fuel, but states and the FHWA have reduced evasion levels.</p> <p>Motor fuel taxes at rates sufficient to fund all needs would not add enough to fuel prices to significantly impact travel volumes.</p> <p>Fuel taxes vary with highway use, but this relationship will become less direct as we move toward more fuel efficient vehicles and greater use of alternative fuels.</p> <p>Raising fuel taxes without at the same time raising truck taxes reduces the equity of the overall highway user fee structure because trucks would pay a lower share of their overall highway cost responsibility.</p> |
| Economic Efficiency | <p>Motor fuel taxes are not economically efficient because they do not vary as the cost of travel increases. They do vary with vehicle fuel efficiency, but the decline in fuel efficiency when vehicles operate in congested traffic does not reflect the full costs of travel in congested conditions.</p> |
| Potential Applicability at Program or Project Level and by Different Levels of Government | <p>Motor fuel taxes are applicable to financing programs of improvements, but not individual projects. All levels of government can and do impose motor fuel taxes.</p> <p>Recent studies suggest the fuel tax will be a viable revenue source for highway and transit programs for at least 15 to 20 years, but after that moves to alternative fuels and more fuel efficient vehicles will increasingly erode the ability of the fuel tax to serve its current role as the major revenue source for Federal and State highway programs.</p> |
| Potential Acceptability | <p>About 20 States have increased their fuel taxes since 2000, but the general aversion to tax increases has made it difficult to increase fuel taxes. The Federal tax has not been increased since 1993. High fuel prices make it even more difficult to raise fuel taxes, even though the tax represents a smaller share of the total price of fuel when prices are high.</p> |
| Implementation Issues and Potential Strategies to Overcome Barriers | <p>Based on history, adjustments through legislation to the motor fuel excise tax have been the method of choice in most states for major new funding resources to fill funding gaps for state highways.</p> <p>Flat rate fees per gallon have not been adjusted fast enough to keep pace with needs.</p> <p>Motor fuel taxes may be higher per gallon in some States than in neighboring states. Opponents of fuel taxes generally raise the issue of diversion of purchases to neighboring states with lower tax rates.</p> |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Motor Fuel Taxes - Indexing of Fuel Taxes | |
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| Source and History | About 5 States currently index their fuel tax to some measure of inflation. |
| Yield, Adequacy and Stability | The yield and adequacy of motor fuel taxes could be enhanced by indexing to inflation or, in some cases to fuel prices. They could also be indexed to needs estimates or to construction prices, making it responsive to anticipated program costs. |
| Cost-Efficiency and Equity | Motor fuel taxes by themselves are not equitable among vehicle classes, since the largest vehicles pay less in fuel taxes relative to the costs imposed on highways |
| Economic Efficiency | Indexing the fuel tax does not make the tax more economically efficient. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Indexing the fuel tax does not affect its applicability. |
| Potential Acceptability | Many argue that simply indexing the fuel tax to some measure of inflation does not constitute a tax increase and thus is more acceptable than a tax increase. Others disagree and say that changes due to indexing are tax increases. |
| Implementation Issues and Potential Strategies to Overcome Barriers | A ceiling and floor on the change in the indexed rate may be desirable to prevent large changes in tax rates. Many see indexing as just a backdoor way of increasing the fuel tax. |
| Motor Fuel Taxes - Sales Tax on Fuel | |
| Source and History | Several States impose a tax on the sales price of fuel. |
| Yield, Adequacy and Stability | A sales tax on fuel is likely to be more volatile, but could be subject to limits in terms of the maximum or minimum or the rate of change each year. |
| Cost-Efficiency and Equity | Motor fuel taxes are mildly regressive among income groups. Basing the rate on the sales price of fuel would make them more regressive. |
| Economic Efficiency | Basing the fuel tax on the price of fuel rather than on a gallonage basis would not improve the efficiency of the tax. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Basing the fuel tax on the price of fuel rather than on a gallonage basis would not affect its applicability. |
| Potential Acceptability | The volatility of fuel prices would adversely affect the public acceptability, especially when fuel prices are rising. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Sales taxes on fuel have recently been of greater interest due to the increase in fuel prices |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Other Types of Petroleum Taxes | |
|--|--|
| Source and History | |
| Yield, Adequacy and Stability | Other types of motor fuel taxes could be utilized. |
| Cost-Efficiency and Equity | |
| Economic Efficiency | Other types of petroleum taxes would be no more efficient than the current tax. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Fuel taxes by their nature are applicable only at the program level. |
| Potential Acceptability | Pennsylvania has an oil company franchise tax to collect fees on petroleum fuels. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Some believe that petroleum taxes have more voter appeal because of a perception that they are imposed on petroleum companies rather than on individual drivers; however, such taxes are normally passed through to drivers the same as other types of motor fuel taxes. |
| Value Added Tax | |
| Source and History | The U.S. is one of the few countries that does not have a value added tax. The tax is similar to a sales tax, but is levied at every stage in the production process, not just on final consumption as the traditional sales tax. |
| Yield, Adequacy and Stability | The yield could be high and would be fairly stable, fluctuating with changes in the national economy. |
| Cost-Efficiency and Equity | Administrative costs would be higher than for the fuel tax since there are many taxpayers and considerable documentation involved. This potentially could also make it subject to evasion. |
| Economic Efficiency | The economic efficiency would not be as great as the fuel tax since a VAT would not directly reflect transportation requirements or use. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | The VAT could be applicable to general transportation purposes. It would be applicable to financing programs of transportation improvements, but not individual projects. It almost certainly would be limited to the national level. |
| Potential Acceptability | Like any new tax it would face opposition from taxpayers and from businesses. |
| Implementation Issues and Potential Strategies to Overcome Barriers | A general VAT has been discussed for many years, but rejected. Estimating just the value added by transportation could be difficult. |
| Registration and Other Vehicle Fees | |
| Source and History | All states have traditional types of registration fees for light vehicles and somewhat higher and graduated fees for heavy vehicles. At the Federal level the Heavy Vehicle Use Tax is similar to a registration fee but it applies only to the heaviest trucks. |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

Registration and Other Vehicle Fees, continued

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| Yield, Adequacy and Stability | Registration fees provide major revenue sources for states and local governments (through state allocations) and must be adjusted through legislation. In addition to adjusting rates, other options include revising the type of registration fee. |
| Cost-Efficiency and Equity | Registration fees are relatively inexpensive to administer in relation to potential yield, but not as inexpensive as fuel taxes. The fact that registration fees do not vary by miles traveled is a major source of inequity and inefficiency. Registration fees allow for collections from vehicles using alternative fuels without establishing new mechanisms for collection. |
| Economic Efficiency | Registration fees can be varied by vehicle size and can be set in rough relation to highway cost responsibility, except for the impacts of different mileage by similar sized vehicles. Thus for trucks they may be somewhat more efficient than fuel taxes, but for passenger vehicles they likely are less efficient because they do not vary by mileage and they do not capture costs of congestion. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Like fuel taxes registration fees are applicable at the program level, but not the project level. The federal Heavy Vehicle Use Tax is similar to a registration fee and all States have registration fees. |
| Potential Acceptability | Registration fee adjustments are promising as both a short- and long-term option for funding highways. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Equity among vehicle classes would indicate that parallel adjustments in registration fees should be made applicable to all vehicles. |

Registration Fees Based on Value - Personal Property Taxes

| | |
|--|---|
| Source and History | A registration fee based on value can be structured as a personal property tax and be deductible from Federal income. |
| Yield, Adequacy and Stability | A fee on the value of a vehicle could raise substantial revenue, and could be structured to be deductible for Federal income tax purposes, thus increasing the state's revenue yield without an equal increase in net total tax payments. |
| Cost-Efficiency and Equity | Registration fees for light vehicles, if collected on a flat basis, are somewhat regressive by income class. Registration fees for light vehicles on the basis of value are progressive. |
| Economic Efficiency | Basing registration fees on value could improve their efficiency somewhat since newer vehicles tend to be driven more than older vehicles. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Levying fee on the basis of a vehicle's value would not change the overall applicability of registration fees. |
| Potential Acceptability | Registration fees (in actuality, personal property taxes on vehicles) based on value have the best revenue generating potential and are less costly to taxpayers in the state. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Some states have recently eliminated or reduced such fees despite their advantages in comparison to collecting other state taxes that are not deductible for federal income tax purposes. |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Sales Taxes on Vehicles | |
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| Source and History | The Federal Government and many States have sales taxes on vehicles. The Federal tax applies only to heavy trucks, but formerly had been applied to all vehicle sales. |
| Yield, Adequacy and Stability | Sales taxes on vehicles can be useful revenue sources. They can bring in relatively large amounts of money but their stability is threatened by trends toward the purchase of smaller, more fuel efficient vehicles that cost less than large cars and SUVs. |
| Cost-Efficiency and Equity | Sales taxes on vehicles will be fairly progressive. Administrative costs are relatively low, but especially with trucks there are issues concerning what specialized equipment should be exempt from taxation. |
| Economic Efficiency | Sales taxes do not vary with the amount of travel or other factors that affect the costs of travel and thus have poor efficiency. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Sales taxes are much more applicable to the program level than the project level. They are particularly applicable at the local level, but could be used at the State level as well. |
| Potential Acceptability | Sales taxes on vehicles have substantial revenue raising potential. |
| Implementation Issues and Potential Strategies to Overcome Barriers | All sales taxes already may be deposited into general revenue accounts. |
| Traditional Tolls | |
| Source and History | Selected highways and selected bridges have historically been toll facilities. |
| Yield, Adequacy and Stability | Existing toll facilities have been proven to be reliable and stable generators of revenue. The bonds of toll agencies are highly marketable. |
| Cost-Efficiency and Equity | Administration and compliance costs for tolling are greater than for motor fuel taxes, although these costs are reduced greatly through electronic toll collection. |
| Economic Efficiency | Traditional tolls vary by miles traveled and the size of trucks so are more efficient than fuel taxes, but traditional tolls do not vary with congestion levels. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Traditionally tolls have been used to finance individual projects. Several States allow tolls from one project to be used to provide front-end financing for other toll roads and thus tolls can be applicable to systems of toll roads or to transit facilities as well. Tolls are applicable at the State and local level, but have not been used at the Federal level. |
| Potential Acceptability | Tolls may be considered to be highly promising options for application to new highway capacity in the longer term with perhaps some limited short-term opportunities. |
| Implementation Issues and Potential Strategies to Overcome Barriers | A few existing toll facilities have been leased to international companies, substituting short-term revenue gains by public agencies for lesser longer-term revenues. |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Tolling New Lanes | |
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| Source and History | In the past 10 years, 30-40 percent of new limited access highway mileage has been financed at least in part through tolls. |
| Yield, Adequacy and Stability | Legislation may be necessary to enable new types of tolls or pricing initiatives. Electronic pricing could significantly expand future opportunities. Toll revenues have been relatively stable at from 5-7 percent of total revenues for highways. If tolls are indexed to inflation revenues could increase substantially. Variable pricing would also increase toll revenues. |
| Cost-Efficiency and Equity | Tolls collected at traditional toll booths are expensive to administer, but electronic tolling is much less costly. Tolls can be set to achieve equity among vehicle classes. Concerns about the impacts of tolling on equity among income groups continue, but HOT lanes have been supported by all income groups. |
| Economic Efficiency | Variable tolls are much more economically efficient than fuel taxes. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Tolls are predominantly facility-based revenue sources used to finance individual projects. Tolls are applicable at the State and local level, but have not been used at the Federal level. |
| Potential Acceptability | Major positive opportunities exist to toll new future capacity. Sometimes this could be accomplished with tolls covering only a portion of needed revenues, which provides more total revenue and capacity than no tolling new facilities. Special types of toll facilities such as for truck lanes or HOT lanes could be promising. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Acts allowing Regional Mobility Authorities (RMA) and a PPP act could expand future possibilities for tolling. Some states do not yet have a PPP act parallel to that of other states, which would enable private parties to initiate proposals to develop new facilities or to add toll lanes to existing facilities. |
| Tolling Existing Lanes | |
| Source and History | There currently are restrictions on tolling existing Interstate Highways but that can be done under several pilot programs for either pricing purposes or reconstruction of existing Interstate Highways. |
| Yield, Adequacy and Stability | Tolling existing lanes could provide very substantial additional revenues. |
| Cost-Efficiency and Equity | Tolling existing lanes could provide for greater equity than other sources of new revenues, but is widely perceived as inequitable (“paying twice”). This perception is false, however, since funds are needed for the continued maintenance and operation of the facilities. |
| Economic Efficiency | Variable tolls are much more economically efficient than fuel taxes. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Tolls are predominantly facility-based revenue sources used to finance individual projects. Tolls are applicable at the State and local level, but have not been used at the Federal level. |

| Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued | |
|--|--|
| Tolling Existing Lanes, continued | |
| Potential Acceptability | Opposition to tolling existing lanes is greater than to tolling new lanes. The greatest opportunity for tolling existing lanes may come with tolling Interstate facilities when they must be reconstructed. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Sentiment is against tolling any currently free highway lanes. Likewise, little opportunity exists for tolling existing free bridges. |
| VMT Fees | |
| Source and History | Fees on VMT could be longer-term options that could supply revenues without being directly tied to fuel consumption. VMT fees could be weighted by fuel economy, weight, emissions, or other factors to support other policy goals. |
| Yield, Adequacy and Stability | VMT fees could be set to yield any level of desired revenues, but unless indexed to inflation their purchasing power would erode over time as does the fuel tax currently. VMT fees do not conflict with the need to reduce energy costs, reduce the balance of payments, or reduce fossil fuel consumption. |
| Cost-Efficiency and Equity | VMT fees would be more costly to collect and administer than fuel taxes, but long term costs are uncertain. |
| Economic Efficiency | VMT fees are more directly related to vehicle use than fuel taxes or registration fees. VMT fees, especially if applied as congestion pricing fees or weight-distance taxes can send strong pricing signals to users. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | VMT fees are primarily for program financing rather than project financing – the counterpart at the project level is the toll. VMT fees could be used at the Federal, State, or local levels. |
| Potential Acceptability | A 2005 study of highway and transit revenue options for the U.S. Chamber of Commerce’s National Chamber Foundation identified VMT fees and congestion pricing fees as promising options in the long term (15 years or more). VMT fees do not reward use of fuel efficient vehicles as does the fuel tax, but incentives for fuel efficient vehicles could come through registration fees |
| Implementation Issues and Potential Strategies to Overcome Barriers | VMT fees or congestion pricing fees require the technology to collect those fees reliably and also the political will to implement a new approach. There are privacy concerns associated with VMT fees but concerns are not substantiated. Transitioning away from fuel tax and to a VMT tax will require substantial coordination and consensus building. |
| Congestion Pricing | |
| Source and History | Could be applied as a special kind of VMT fee, with fees varying based on the level of congestion on the road. Pricing can also be implemented on an area-wide basis or a cordon basis. While the primary goal of congestion pricing is demand management rather than revenue generation, pricing can generate substantial revenues as well. Pricing can be either facility-based or area-wide. Oregon is demonstrating the technologies for collecting VMT fees at the fuel pump. |
| Yield, Adequacy and Stability | To maintain purchasing power congestion-related fees would have to be indexed to respond to inflation, but such indexing might not result in the level of congestion tolls desirable to efficiently manage demand. The yield and adequacy of congestion pricing revenues depend on where and how they are implemented. In some cases facility-based charges may cover facility construction and operations costs, but in other cases they may not. |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Congestion Pricing, continued | |
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| Cost-Efficiency and Equity | Congestion pricing is more expensive to administer and enforce than motor fuel taxes. Concerns have been raised about the equity of congestion pricing. Equity is strongly influenced by the availability of good alternatives to driving on the priced highways. Rebate programs have been suggested as one way to reduce adverse impacts on lower income groups. |
| Economic Efficiency | Congestion pricing is more economically efficient than fuel taxes or most other revenue sources because users directly pay all or part of the costs their driving imposes on others. Congestion pricing could be combined with a weight-distance tax to capture the costs associated with operations of heavy trucks. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | In the long run, VMT fees and congestion pricing could replace all or a portion of current user fees. Congestion pricing is applicable at either the project level or an area-wide level, but it generally would not be applicable to financing entire statewide transportation improvement programs. |
| Potential Acceptability | In the U.S. pricing generally has been limited to individual bridges and to HOT lanes and express lanes. The HOT lane and express lane applications have generally been well accepted since they provide drivers the choice of whether to pay to avoid congestion or not. Acceptance of pricing entire facilities or entire areas of a city is more controversial. |
| Implementation Issues and Potential Strategies to Overcome Barriers | The ability to apply pricing on the Interstate System is limited by federal law. Good transit alternatives also must be available for those who cannot afford the congestion toll and cannot change their trip destination or time of day. |
| Local Option Taxes | |
| Source and History | Have been widely used in many states to support highway and transit investments. Local governments in most states have implemented some type of local option tax, which must be specifically allowed by state enabling legislation. Local option taxes for transportation investments include motor fuel, vehicle, property, sales, and income taxes. |
| Yield, Adequacy and Stability | Sales taxes tend to have the highest yield compared to other local option taxes. Motor fuel and vehicle taxes tend to generate less revenue compared to other local option taxes. Except for motor fuel and vehicle taxes, other local option taxes tend to be indexed with inflation. Sales taxes respond to economic growth. Fluctuations in economic conditions tend to affect sales tax yield. Gasoline taxes and income taxes also could be impacted to some level by fluctuations in the economy. |
| Cost-Efficiency and Equity | Collection mechanisms already are in place to levy these taxes at the state or local level. Most local option taxes are regressive (except for income taxes). However, sales taxes tend to receive stronger support than other local option taxes. People consider that sales taxes are more "fair," since everyone pays, whether they are vehicle or transit users. |
| Economic Efficiency | Most local option taxes do not reflect the costs associated with highway use and thus are not economically efficient. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Local option taxes may be applicable to a major project, but are more applicable to a program of transportation improvements. By definition these fees are applicable only at the local level. |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Local Option Taxes, continued | |
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| Potential Acceptability | <p>State legislation must be in place that allows local option taxes.</p> <p>Sales taxes have been widely used by transit agencies to support operations and capital investments.</p> <p>Rates of success with ballot measures to fund transportation have been increasing, as documented by the Center for Transportation Excellence.</p> |
| Implementation Issues and Potential Strategies to Overcome Barriers | <p>Commonly, local option taxes require voters' approval. While an expenditure plan that specifies projects and/or programs to be funded with the new local option tax levies is not always required, local option taxes have better chances of success for implementation where expenditures and uses are clearly defined.</p> <p>Implementation plans that are well designed have resulted in very high success rates for ballot measures to enhance transportation revenues.</p> |
| Beneficiary Charges: Impact Fees | |
| Source and History | <p>Impact fee legislation exists in 26 states (excluding Florida). Impact fees for transportation improvements are widely used in California and Florida.</p> |
| Yield, Adequacy and Stability | <p>Revenues from impact fees are typically dedicated for certain road and transit improvements that would serve the new development. In addition, revenues from impact fees will be highly dependent on development opportunities in the area where implemented.</p> <p>Value capture tools are subject to increases in property value realized by infrastructure improvements.</p> |
| Cost-Efficiency and Equity | <p>These charges can be relatively equitable if properly structured. Benefit districts can target the specific beneficiaries.</p> <p>While impact fees are directly charged to developers, they pass those charges to buyers, increasing the cost of real estate.</p> <p>TIF allocates a portion of the additional property taxes resulting from the increase in property values.</p> <p>Communities and local agencies could argue that implementation of TIF would take away revenues that otherwise would be used to meet other public needs.</p> |
| Economic Efficiency | <p>Beneficiary charges send modest pricing signals to encourage better transportation and land use integration.</p> |
| Potential Applicability at Program or Project Level and by Different Levels of Government | <p>Beneficiary charges may be applicable to a major project, or to a program of transportation improvements in a local area. These fees are applicable only at the local level.</p> |
| Potential Acceptability | <p>Implementation is subject to enabling legislation that allows the collection of impact fees and the formation of assessment districts.</p> <p>These tools tend to be most applicable in higher growth state or localities.</p> |
| Implementation Issues and Potential Strategies to Overcome Barriers | <p>Impact fees are only applicable to new development. TIF and other property assessments may require the formation of districts, where property tax levies are dedicated for transportation improvement. This may require voters' approval from district residents and business owners.</p> <p>Beneficiary charges have been the subject of numerous lawsuits in many areas.</p> |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Innovative Finance | |
|--|--|
| Source and History | Most states have used one or more forms of the IF financing tools. Innovative finance is not a source of new revenues, but rather a method of financing projects or programs of projects. It usually involves borrowing that must be repaid from other sources of funds such as fuel taxes, tolls, or other revenue sources. |
| Yield, Adequacy and Stability | IF financing tools are used to leverage capital in the form of debt or equity. They rely on existing or new revenue sources to pay the indebtedness. |
| Cost-Efficiency and Equity | Incurring longer-term debt helps advance programs and projects that would otherwise take years to develop if at all. Innovative finance may be more equitable than financing high-cost projects out of current revenues because it spreads the cost to future users who will also benefit from the investment. |
| Economic Efficiency | The economic efficiency will depend on the source of revenues from which indebtedness is repaid. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Innovative finance is more often used at the project level, but it also is applicable to the program level as well. It is most applicable to the State and local levels of government. |
| Potential Acceptability | Innovative finance is usually well accepted since it spreads the cost of projects over time. |
| Implementation Issues and Potential Strategies to Overcome Barriers | States may require enabling legislation to issue GARVEE bonds. Most innovative finance grant management tools are codified under Title 23 U.S.C. and require no special action from states to be used. To test new grant management tools, states may apply to U.S. DOT under the SEP-15 or TE-045 programs. Debt mechanisms must be balanced against long-term revenue sources. Many states cap the amount of debt that can be issued. |
| Public-Private Partnerships | |
| Source and History | PPPs are commonly used in Europe to reduce public-sector costs to construct, operate, and maintain highway facilities but are not yet widely used to support similar projects in the United States. PPPs are primarily financing and project delivery mechanisms, but like innovative finance they may help accelerate project delivery. Highway improvements are now eligible for financing with private activity bonds. |
| Yield, Adequacy and Stability | States and other public sponsors increasingly consider private-sector involvement as a way to spur implementation of large projects. Since these projects typically are supported by tolls, the yield, adequacy, and stability will depend on characteristics of the specific project. |
| Cost-Efficiency and Equity | PPPs can facilitate access to private capital and bring innovative cost-saving projects delivery methods. Cost-efficiency and equity will be similar to other types of tolls. Since the private sector often handles toll collection and must deal with enforcement, public agency costs for those items are low. |
| Economic Efficiency | The economic efficiency of PPPs as a financing mechanism is similar to other toll facilities, although PPPs are more likely to use electronic toll collection and other methods for improving operational efficiency. Other efficiencies unrelated to financing may also be realized through the use of PPPs. |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Public-Private Partnerships, continued | |
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| Potential Applicability at Program or Project Level and by Different Levels of Government | PPPs that involve private sector capital generally are implemented at the project level. Several states are using PPPs to operate and maintain portions of their highway systems, but those do not all involve tolling. PPPs are applicable at either the State or local level. |
| Potential Acceptability | PPPs have become quite controversial. Several States routinely consider PPPs for certain types of projects while uncertain public acceptance has prevented other States from doing so. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Specific project proposals need to be evaluated to determine if it will be cost-effective. May require enabling legislation. More than 20 states have explicit PPP acts that provide means to bring the private sector into funding and management of highways. Virginia's act has fostered a wide range of proposals. |
| Container Fees | |
| Source and History | A number of current and emerging trends are driving the exploration of container charges and other direct user fees as a transportation revenue source. These include the rapid growth in international and domestic freight volumes and recognition that new revenue sources will be needed to fund freight-specific transportation improvements. |
| Yield, Adequacy and Stability | Container fees represent a potentially large source of revenue. A recent NCHRP report estimated that a \$30/TEU fee applied at all U.S. ports, would generate average annual revenues of \$2.2 billion through 2017. A study performed in 2005 for the Southern California Association of Governments (SCAG) found that a container fee of \$192 per TEU assessed on every inbound loaded container at the San Pedro Bay ports could fund about \$20 billion in access infrastructure improvements. |
| Cost-Efficiency and Equity | Container fees offer a way to tie freight system users more directly to the resources and infrastructure they use. These fees are seen by many as a more equitable method to raise revenue that can be dedicated specifically to freight system improvements. |
| Economic Efficiency | Economic efficiency will depend on the extent to which the container fees reflect the costs associated with the freight facility. If congestion costs are not significant and container traffic represents the preponderance of traffic on the facility, container fees may be relatively efficient, although they would not capture differences in the container weights. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | There are limited options to fund or finance non-highway freight improvement projects. Current federal programs may be applicable to small, localized freight system improvements, but are not well suited to larger regional intermodal freight improvements. Container fees could provide substantial revenues for such large-scale projects and would be appropriate for both rail and highway components of intermodal projects. Container fees could be applicable to either State or local projects. |
| Potential Acceptability | It will be challenging to develop consensus among competing jurisdictions and other stakeholders on the types and locations of projects to be developed. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Implementing a container fee that equitably links costs and potential benefits for the mix of freight traffic using any given gateway may be difficult. |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Customs Duties | |
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| Source and History | The majority of customs duties currently are deposited into the U.S. General Fund, although a portion is used to support costs of Customs and Border Patrol operations. |
| Yield, Adequacy and Stability | In FY 2002 customs duties amounted to \$23.8 billion in gross revenue, three quarters of which was collected from marine sources. This would be a very stable source of revenues. |
| Cost-Efficiency and Equity | Fees based on the value of cargo are not as equitable as those on the volume because they do not reflect the transportation requirements as well. |
| Economic Efficiency | The economic efficiency of customs duties is poor since the value of cargo has little bearing on costs associated with moving the cargo. The efficiency of customs duties would also depend on the type of facilities financed from those fees. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | Customs duties would be most appropriately used for improvements to waterside or landside port or airport facilities, to improve the connections between these facilities and the highway and freight rail systems, or to improve freight facilities serving large volumes of international shipments. They would be applicable to the Federal level only. |
| Potential Acceptability | One key disadvantage is the likely resistance by the Congress and federal agencies to the diversion of Customs duties to offset freight transportation investments. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Some will argue that gateway improvement programs already exist and point to SAFETEA-LU's Coordinated Border Infrastructure Program (Section 1303), but finding from that program currently is inadequate. |
| Tax Credit Bonds | |
| Source and History | Like innovative finance, tax credit bonds are a financing mechanism and not a new source of revenue. Tax credits would represent reductions of income taxes owed by bond holders. |
| Yield, Adequacy and Stability | Tax credit bonds could provide a large and stable source of funds to finance transportation improvements for a fixed period of time. |
| Cost-Efficiency and Equity | Tax credit bonds would have low administrative and enforcement costs since those costs would be small increments of costs associated with processing Federal income tax returns. Bonds would be relatively progressive with income since bond interest would be paid from general tax revenues. |
| Economic Efficiency | Income tax from which bond interest would be "paid" has no relationship to costs of transportation system use. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | This financing mechanism would be applicable at the program level and would apply to the Federal Government. |
| Potential Acceptability | Implementing such a financing mechanism would be difficult since it could represent a loss of General Fund revenues. |
| Implementation Issues and Potential Strategies to Overcome Barriers | Several tax credit bond proposals for surface transportation have been introduced in recent years (e.g., Build America Bonds, Amtrak, other rail infrastructure), but none has yet been enacted. |

Exhibit 5-21. Advantages and disadvantages of alternative revenue sources, continued

| Infrastructure Bank | |
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| Source and History | Over the years various forms of infrastructure bank have been proposed as mechanisms to provide funds for infrastructure investment. These banks are not necessarily limited to transportation investment. Like other financing mechanisms, funds borrowed from the infrastructure bank would have to be repaid from some other general or project-related revenue source. |
| Yield, Adequacy and Stability | Infrastructure banks can provide large and stable sources of funds for a limited period of time. |
| Cost-Efficiency and Equity | Administrative costs generally would depend on the revenue source from which borrowed funds were repaid. |
| Economic Efficiency | The relative economic efficiency would depend on the source of revenues from which borrowed funds were repaid. Tolls would tend to be more efficient than fuel taxes or other general revenues. |
| Potential Applicability at Program or Project Level and by Different Levels of Government | This financing mechanism would be applicable to either the program or project level. Revenues to repay loans would come from the State or local level of government. |
| Potential Acceptability | Borrowed funds would likely come from the Federal General Fund. Getting agreement to allocate General Funds for this purpose could be difficult. |
| Implementation Issues and Potential Strategies to Overcome Barriers | As noted, there have been several proposals for infrastructure banks over the years, but it is not believed any have been enacted. |

This table provides details supporting the summary evaluation of alternative revenue sources presented in Exhibit 5-20.

Source: December 2006 NCHRP study, *Future Financing Options to Meet Highway and Transit Needs* and Commission Staff analysis.

Endnotes

- ¹ Association of American Railroads (AAR)/ Cambridge Systematics, *National Rail Freight Infrastructure Capacity and Investment Study*, 2007.
- ² U.S. Department of Transportation, Maritime Administration, *U.S. Public Port Development Expenditure Report (FYs 2005 & 2006-2010)*, July 2007.
- ³ *Current Toll Road Activity in the U.S. A Survey and Analysis*, http://www.fhwa.dot.gov/ppp/toll_survey0906.pdf.
- ⁴ Road User Fee Task Force, *Report to the 72nd Oregon Legislative Assembly on the Possible Alternatives to the Current System of Taxing Highway Use through Motor Vehicle Fuel Taxes*, March 2003, p. 2.
- ⁵ Forkenbrock, David J., and Kuhl, Jon G., *A New Approach to Assessing Road User Charges*, Public Policy Center, University of Iowa, 2002.
- ⁶ Whitty, James, *Oregon's Mileage Fee Concept and Road User Fee Pilot Program*, Final Report, November 2007, (http://www.oregon.gov/ODOT/HWY/RUFPP/docs/RUFPP_finalreport.pdf).



