

Current Toll Road Activity in the U.S.

A Survey and Analysis



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"Tolling is shaping up as one of the biggest philosophical changes in transportation policy since the toll-free Interstate highway system was created under President Dwight D. Eisenhower in 1956."

New York Times 4/28/2005

1.0 Introduction

The expanded use of tolling was promoted in the last two rounds of federal highway program reauthorization and today tolling is the subject of increasing interest as a potentially important funding source for transportation improvements and as a mechanism for managing congestion in metropolitan areas. Both the National Surface Transportation and Revenue Study Commission and the National Surface Transportation Infrastructure Financing Commission recognized the importance of toll revenues and related institutional arrangements.

At a time when the motor fuel tax—the primary Federal resource dedicated to the nation's transportation needs—is becoming increasingly constrained, it is essential to understand more fully the roll played by alternative funding sources at the state and local level. Since ISTEA of 1991, there has been considerable learning regarding toll project development—including new tolling and pricing technology, new types of projects (such as HOT lanes), new forms of public-private partnership and new state and local processes to better organize toll project development.

The potential role of toll roads is of special importance as the future of the federal aid program is under consideration – including the systems, the program structure and the funding. In addition, the current economic and financial climate introduces a new set of considerations in both conventional and toll investment. While many of the toll-related projects in this survey will be impacted by the current credit crisis, the timeline involved in highway project development suggests that financing solutions will be reached in the decadal time frame of consideration in this analysis.

Given the importance of—and interest in—the potential of toll finance within the entire federal aid program, it is essential to maintain a reliable database regarding toll projects, their development processes and sponsors, the stages of development and their contribution to overall highway finance. In 2006, a survey conducted by PB Consult for the FHWA Office of Transportation Policy Studies established a new toll project database and related analyses covering:

- The net contribution of toll projects to the highway network and to highway finance
- The trends in terms of project type, location, and characteristics, such as HOT and priced facilities
- The evolving roles of innovative finance, project sponsors, and development processes

There has been an increase in toll-related activity since that time, due in part to strong federal support and state and local leadership. This research updates that inventory and provides related analyses.

The survey indicates that 32 U.S. states and one U.S. territory have advanced toll projects since the passage of ISTEA (1992). A total of 235 new toll-based improvement projects have moved into various stages of development since ISTEA, including 70 opened for operations and others in various stages of planning, design, finance and construction. Together these projects represent over 4,511 centerline miles of highway and would provide over 15,690 lane miles of capacity if fully realized. While cost information is incomplete, particularly for projects in the earlier stages of development, an estimate of



the total investment involved is approximately \$160 billion. Of the 235 improvement projects, 79 involve “greenfield” (new road) facilities providing 1,942 centerline miles and 8,136 lane miles of new highways, representing a net investment of over \$66 billion. Detailed toll activity tables are presented in subsequent sections and are also available on-line at http://www.fhwa.dot.gov/PPP/toll_survey.htm.

The data compiled in the survey indicate that the rate of toll road development (measured in centerline miles) has increased significantly from about 50 to 75 miles per year in the decade after ISTEA (1992) to over 180 miles per year expected in the next decade (based on all current projects in the construction, design/finance and a portion of those in NEPA and planning phases).

The rate of development, the type of projects being implemented and the development processes being used suggest some important changes from past trends that merit closer consideration. Recent development towards “institutionalizing” toll finance within state DOTs suggests that the rate of toll-based project development may be expected to increase in those states that develop the capacity to process multiple projects. In addition, the entry of international capital and toll facility development and operations expertise into the U.S. toll arena is introducing a set of financial and management innovations that may substantially increase the potential role of toll-related finance as well as the use of public-private partnerships to develop new toll projects. With 10 new HOT lane facilities in operation and an additional 60 under study, there is also a marked increase in the use of variably priced tolls as a tool to manage congestion. This trend has been complemented by the availability of new electronic toll collection technologies and open road tolling applications that enable the use of a wide variety of pricing options.

2.0 Point of Departure

The most recent FHWA statistics indicate that tolls are currently collected on bridges, roads and tunnels in 35 states and one U.S. territory on 5,356 centerline miles of the 162,000-mile National Highway System. Overall there are approximately 34 discrete Interstate toll facilities and 83 significant non-Interstate toll facilities currently in operation—out of which non-Interstate (and zero Interstate) facilities have been developed since ISTEA. Most of the older toll facilities predating ISTEA were built during the pre-Interstate highway era when the need for controlled access, high-capacity, high-speed facilities was clear in heavily traveled corridors, and toll roads represented the only practical way to finance them. In addition, since ISTEA 10 HOT lane facilities, 21 toll bridges, and three toll tunnels have been completed.

Today, state or metropolitan road networks with one or two toll roads are a well-known phenomenon. Several states have multiple toll road facilities and 12 states are advancing HOT lane concepts, of which four involve HOT or ETL lane networks (California, Texas, Virginia, and Maryland). Five states (Florida, New Jersey, New York, Pennsylvania and Illinois) receive over 10 percent of their total highway revenue from toll roads. The latest available data (2006) indicate combined revenues from all toll facilities – state and local—included in the federal statistics amount to about \$8 billion, constituting about five percent of the \$161 billion 2006 national highway-related expenditures of all levels of government.

New toll project revenues are used primarily to develop the project. 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 national average of the 150 to 175 miles of urban expressways opened annually. Toll roads, therefore, have been responsible for over 30 percent of new “high end” road mileage over the past decade. This percentage should increase with the near doubling of annual toll road mileage that is anticipated to be built in the coming decade, but due to the uncertainties of future funding and authorization cycles, it is not possible to predict what the precise level of that increase will be in terms of centerline miles.



Since ISTEA, new projects have been located in the larger and faster-growing metropolitan areas of the Sunbelt states where state and local governments' conventional funds are already stretched to meet the demands of systems preservation. In these states toll revenues represent a significant component of new capacity investment resources – estimated to be 50 percent or more of total investment in upper level highway facility new capacity. The current financial environment may, however, impact this situation for a period of time, although it will also likely impact conventional transportation financing as well.

At the state level, most toll projects have been developed and managed as “one off” facilities in settings of clear demand, reinforced by public support and provided via special-purpose state authorities or regional entities authorized by the state. Over the last three to four years—with the acceleration of multiple toll road development, especially in Texas, California and Florida, and with considerable federal and industry support—toll road development processes have become increasingly standardized in some states and municipal regions.

While the past role of toll roads in most states has been modest and functionally specialized, the analysis of the survey results—as discussed below—suggests some of these trends may be accelerating, and toll roads appear to be playing a larger and more varied role in highway systems development.

3.0 Methodology

The survey was based on a compilation and analysis of publicly available materials combined with interviews of key participants. The principal sources included:

- FHWA Office of Highway Policy Information December 2007 survey of Toll Facilities in the United States: Bridges-Roads-Tunnels-Ferries (<http://www.fhwa.dot.gov/ohim/tollpage.htm>) based on information provided to FHWA by State Departments of Transportation (DOTs), providing listings of existing and “planned” tolled highways, bridges and tunnels under their jurisdiction
- A search of websites, including those of all State DOTs, state and local turnpikes, toll and transit authorities, private developers and individual projects
- The InnovativeFinance.org and FHWA Public-Private Partnership (PPP) Websites
- A review of information from industry journals, including:
 - Public Works Financing
 - TOLLROADS news
 - Tollways – Journal of the International Bridge, Tunnel and Turnpike Association
 - Reason Foundation Annual Privatization Reports
 - Project Finance (Euromoney)
 - Innovation Briefs
- Review and interchange with industry experts

In some cases, follow up communications were held with local officials and transportation professionals to obtain further clarifications on specific projects or groups of projects.

4.0 The Database

The research effort identified a total of 235 toll highway improvement projects and 45 toll bridge or tunnel improvement projects that have been moved forward into the planning, NEPA review, design/finance, construction, or operation phase since 1992.

The information obtained on the toll improvements was imported into a spreadsheet database environment and organized geographically, first by state and then by city or region. The database



contains the fields listed below. Additional information on the definitions of Improvement Type is provided in Section 6.0 Results of this white paper.

**Table 1
Database Fields**

<p><u>Improvement characteristics</u></p> <ol style="list-style-type: none"> 1. Name of Toll Facility 2. State 3. Location 4. Length (<i>centerline miles</i>) 5. Number of Lanes 6. Lane Miles 7. Implementation Status 8. Key Dates 9. Facility Type 10. Type of Pricing 11. Interstate Status 12. Improvement Type 	<p><u>Sponsorship</u></p> <ol style="list-style-type: none"> 1. Project Sponsor 2. Private Development and Financing Information
<p><u>Project Finance</u></p> <ol style="list-style-type: none"> 1. Capital Cost 2. Facility Characteristics 3. Type of Financing 4. Innovative Finance Tools 5. Toll Policy 	<p><u>Information Sources</u></p> <ol style="list-style-type: none"> 1. Information Source 2. Comments 3. Website Links

The survey results have been compiled into a set of worksheets. These worksheets include a comprehensive list containing all the information that was obtained for the 235 highway improvement projects and a set of data sorts that summarize the base data information.¹ The 2008 survey updates an earlier survey effort completed in August 2006. The 2006 survey contained a total of 168 toll-backed highway improvements. The 2008 update has identified a total of 235 toll-backed highway improvements, together with 45 toll bridge and tunnel projects. The bulk of the increase between the improvements captured in the two surveys is due to increased toll activity. However, a portion is the result of evolving project definitions. The comprehensive list and each of the sorts indicate the survey year in which each highway improvement was first identified. In addition, the comprehensive list displays in blue font any information for the 2006 survey projects that has been updated in 2008. This distinction is not made in the sorts.

It is important to note that the database provides cost information only for those projects for which such estimates were available. This information has been used to identify average per-lane-mile implementation costs for highway improvements of different types. These unit cost estimates have been used to scale up costs for the total cost summaries in this report.

¹ The worksheets are available on the FHWA PPP webpage at http://www.fhwa.dot.gov/ppp/toll_survey.htm.



The database sorts have also been used to identify key trends in project location and sponsorship, velocity, status and scale, function, cost and financing. The bridge and tunnel data is provided in a separate worksheet, together with a smaller number of sorts. The database also includes a worksheet containing toll projects that are on hold or have been cancelled. A final worksheet contains a listing of “preliminary” toll facilities that have been mentioned in the press but which are not noted on the sponsoring agencies websites.

5.0 Caveats

The limitations of these sources and methods and the uneven level of information readily available suggest that errors and omissions are possible at the individual project level. While more systematic analysis may be available in the future, this survey represents the most comprehensive data currently available. The data has also been reviewed and vetted with independent industry experts associated with the publications cited above.

Caution must be exercised regarding interpretation of the results. Many toll projects in early stages of development (planning and environmental review) may not prove to be financially feasible or attractive as toll projects and ultimately may not be implemented.

6.0 Definitions

The toll-related improvements covered in the survey encompass a range of project types. For maximum clarity, the projects have been sorted into 14 categories defined as follows:

- **New Greenfield Centerline Mile Toll Toads** – New toll highway facilities in previously undeveloped corridors
- **New Greenfield Centerline Mile Extensions** – The lengthening of existing toll highways
- **New Greenfield Centerline Mile Express Toll Lane (ETL) Projects** – The provision of new greenfield highway facilities operated as ETLs in previously undeveloped corridors
- **Replacement Centerline Mile Improvements** – The replacement of existing highway capacity with newly constructed toll facilities
- **Toll Road Widening to Accommodate Rail** – The provision of a new rail transit line within a toll highway right-of-way financed all or in part by toll proceeds generated in the corridor
- **Toll Conversions** – The conversion of existing general purpose highway lanes to tolled use
- **Tunnels** – The provision of a new tolled roadway tunnel
- **Widenings** – The addition of new tolled travel lanes to existing toll road facilities
- **Bridges** – New tolled bridge crossings
- **ETL Widenings** – Existing general purpose highway corridors widened to provided ETLs where all motorists using the lanes are charged a variably priced toll to ensure faster and more reliable trip conditions at all times, including peak travel periods
- **High Occupancy Toll (HOT) Lane Conversions** – The conversion of existing high occupancy vehicle (HOV) lanes to HOT operation that provide free or reduced cost access to qualifying HOVs, and also provide access to other paying vehicles not meeting passenger occupancy requirements in exchange for a variably priced toll related to peak conditions
- **HOT Conversion and Widenings** – The implementation of HOT lanes on an existing highway corridor by converting existing HOV lanes and the construction of new travel lanes



- **HOT Widening, Conversion and New Centerline Mile Improvements** – The implementation of HOT lanes on an existing highway corridor by converting existing HOV lanes and by both widening and extending the highway corridor
- **HOT Widenings** – The provision of new HOT lanes on an existing highway corridor

7.0 Findings

The survey found that 32 U.S. states and one U.S. territory have advanced a total of 280 toll improvements since the passage of ISTEA. Of these, 235 involve toll highway improvements of different types, 38 involve toll bridges, and seven involve toll tunnels. Table 2 provides a further breakdown of the projects included in the survey by major improvement type.

**Table 2
All Toll Improvements by Type**

Number	Improvement Type	Percent
80	New Highway Facility	28.6%
38	New Bridges	13.6%
7	New Tunnels	2.5%
70	HOT/ETL Expansion	25.0%
46	Highway Lengthening	16.4%
33	Highway Widening	11.7%
6	Toll Conversion	2.1%
Totals		
280		100.0%

One-hundred-twenty-five of the 280 toll improvements captured in the survey can be considered stand-alone, greenfield facilities. These projects are organized by both project type and status in Table 3, and include 80 toll highways, 38 toll bridges, and 7 toll tunnels. A total of 60 new toll facilities were opened to service in the 1992-2008 period. These projects include 36 new toll highways, 21 new toll bridges and three new toll tunnels, each of which is identified in Table 4.

**Table 3
Stand-alone Toll Facilities by Type and Status (December 2008)**

Toll Facility Type	Open 1992-2008	In Construction	In Design/ Finance	In NEPA	In Planning	Totals
Toll Roads	36	5		9	24	80
Toll Bridges	21	3	1	6	7	38
Toll Tunnel	3			1	3	7
Totals	60	8	1	16	34	125



Table 4
Greenfield Stand-alone Toll Facilities Opened 1992-2008

Name	State	Location
Toll Highways Open 1992-2008		
1 Foley Beach Express	AL	Foley
2 Alabama River Parkway	AL	Montgomery County
3 Emerald Parkway	AL	Montgomery County
4 Black Warrior Parkway Bridge	AL	Tuscaloosa County
5 Eastern Transportation Corridor	CA	Orange County
6 Foothill Transportation Corridor	CA	Orange County
7 San Joaquin Hills Transportation Corridor	CA	Orange County
8 SR 125 South / South Bay Expressway	CA	San Diego
9 Northwest Parkway	CO	Denver
10 E-470 (4 segments)	CO	Denver
11 Delaware SR1	DL	Dover Airforce Base to Churchman's Crossing
12 Polk Parkway SH 570	FL	Lakeland (<i>east of Tampa</i>)
13 Osceola Parkway	FL	Orlando
14 Seminole Expressway SH 417 Project 1	FL	Orlando (<i>northeast</i>)
15 Daniel Webster Western Beltway Part A SH 429	FL	Orlando (<i>northwest</i>)
16 Suncoast Parkway	FL	Tampa
17 Veterans Expressway SH 589	FL	Tampa (<i>northwest</i>)
18 Beaver Valley Expressway (James E. Ross Highway)	PA	Beaver County
19 Mon/Fayette Expressway	PA	Pittsburgh
20 Southern Beltway (Findlay Connector)	PA	Pittsburgh
21 Greensburg Bypass (Amos K. Hutchison Bypass)	PA	Westmorland
22 Southern Connector	SC	Greenville
23 Cross Island Parkway (US 278)	SC	Hilton Head
24 CR 183-A Turnpike	TX	Austin
25 President George Bush Turnpike	TX	Dallas North
26 121 Tollway (Segment 1)- Denton Tap Rd to Old Denton Rd	TX	Dallas, Collin, Denton counties
27 Fort Bend Parkway Tollroad	TX	Houston
28 Grand Parkway, segment I-2	TX	Houston
29 Sam Houston Tollway	TX	Houston
30 Westpark Tollway	TX	Houston
31 Camino Columbia	TX	Laredo
32 Loop 49 (Segments 1 and 2)	TX	Tyler
33 Adams Avenue Parkway	UT	Ogden
34 Chesapeake Expressway	VA	Chesapeake VA
35 Dulles Greenway	VA	Loudoun County
36 Pocahontas Parkway VA 895	VA	Richmond



Table 4 (continued)
Greenfield Stand-alone Toll Facilities Opened 1992-2008

Name	State	Location
Toll Bridges Open 1992-2008		
1 Benicia-Martinez Bridge (Northbound Span)	CA	Bay Area
2 Midpoint Memorial Bridge	FL	Cape Coral / Fort Myers
3 Sanibel Causeway	FL	Cape Coral / Fort Myers
4 Garcon Point Bridge (SR 281)	FL	Pensacola
5 Mid-Bay Bridge	FL	Pensacola
6 Frank E. Bauer Bridge	IL-IA	Rockford
7 Blue Water Bridge	MI	Port Huron
8 Lake of the Ozarks Community Bridge	MO	Ozarks
9 Ocean City Longport Bridge	NJ	Cape May County
10 Teodoro Moscoso Bridge	PR	San Juan
11 Camino Real International Bridge	TX	TX-MX border
12 Bridge of the Americas	TX	TX-MX border
13 Brownsville & Matamoros Bridge	TX	TX-MX border
14 Los Indios-Lucio Blanco Bridge	TX	TX-MX border
15 Pharr-Reynosa International Bridge	TX	TX-MX border
16 Veterans International Bridge at Los Tomates	TX	TX-MX border
17 World Trade / Laredo North Bridge	TX	TX-MX border
18 Weslaco-Progreso International Bridge	TX	TX-MX border
19 Chesapeake Bay Bridge-Tunnel (Parallel Crossing)	VA	Chesapeake
20 George P. Coleman Bridge	VA	Hampton
21 New Tacoma Narrows Bridge	WA	Tacoma
Toll Tunnels Open 1992-2008		
1 Anton Anderson Memorial Tunnel	AK	Whittier, AK
2 Ted Williams Tunnel	MA	Boston
3 Addison Airport Toll Tunnel	TX	Dallas

In addition to these stand-alone facilities, the survey also documented an additional 155 toll-backed highway improvements involving the widening or lengthening of existing highway corridors, the conversion of existing free highways to toll operation, and/or the addition of HOT or ETL lanes to existing highway corridors. Among the improvements to existing highways, 70—nearly half—involve the addition of various types of HOT or ETL lanes, reflecting the growing interest in the use of pricing to manage congestion.

Together, all the improvements captured in the survey—if fully realized—would provide over 4,500 centerline miles of tolled highway with nearly 15,700 lane miles of capacity and a total of 38 new bridges and 7 new toll tunnels.

Table 5, Summary of Interstate and Non-Interstate Toll Road Activity by Type Since 1992, organizes the 235 highway improvements captured in the survey by project type and Interstate status. It shows that



71 of the highway improvements involve Interstate highway facilities, while 164 are proposed on non-Interstate roads. The preponderance of toll improvements on non-Interstate roads reflects the fact that until the passage of ISTEA, tolling was not allowed on the Interstate system. The SAFETEA-LU Authorization Act of 2005 created pilot programs to allow for the expanded use of managed lanes on certain Interstate facilities, as well as the limited use of tolling as a means to finance certain improvements on Interstate highways that would not otherwise be able to be built due to cost constraints.

As shown in Table 5, three of the 71 toll-based improvements proposed for the Interstate System involve the construction of new greenfield centerline facilities. The remaining 68 include the introduction of tolling on five Interstate highways, 43 Interstate HOT and ETL lane enhancements of various types, and the widening of 12 legacy toll facilities that were re-designated as part of the Interstate Highway System.

Among the 164 non-Interstate enhancements identified in the survey, 77 involve the construction of new greenfield, stand-alone, toll facilities—including one all-ETL facility, and one replacement facility that would be tolled. An additional 43 improvements involve the construction of extensions to existing non-Interstate toll facilities. The survey also identified 27 HOT or ETL improvements proposed for non-Interstate roads, as well as 20 widenings, one rail widening, and one toll conversion improvement.

Given that cost information is incomplete or preliminary for several projects, an average per-lane-mile construction cost of \$10.26 million was calculated and then used to generate the cost data provided in Tables 5 through 9 in this white paper. When this figure is applied to all toll improvements captured in the survey, the 235 projects have a collective construction value in excess of \$160 billion. It should be noted that the database itself only includes cost figures for improvements for which they were available. When totaled, the total construction costs captured in the survey amount to \$136 billion.



Table 5
Summary of Interstate and Non-Interstate Toll Road Activity by Type Since 1992

IMPROVEMENT TYPE	No.	States	Centerline Miles	Percentage	Lane Miles	Capital Cost (millions)
Interstate Toll Facilities						
ETL Widening Improvements	3	1	75	4.6%	193	\$4,031
HOT Conversion Improvements	8	5	133	8.1%	296	\$237
HOT Conversion and Widening Improvements	4	1	156	9.5%	371	\$420
HOT Widening Improvements	33	9	628	38.5%	1,723	\$33,388
HOT Widening, Conversion, and New CLM Improvements	1	1	19	1.2%	38	\$1,400
New Greenfield Centerline Mile Facilities	3	2	210	12.9%	840	\$6,666
New Greenfield Centerline Mile Extension Improvements	1	1	13	0.8%	75	\$795
Toll Conversion Improvements	5	1	69	4.2%	138	NA
Widening Improvements	13	8	332	20.3%	858	\$7,035
Subtotals	71		1,634	100.0	4,532	\$53,972
Non-Interstate Toll Facilities						
ETL Widening Improvements	1	1	16	0.6%	65	\$1,354
HOT Conversion Improvements	6	3	61	2.1%	103	\$83
HOT Conversion and Widening Improvements	4	1	145	5.0%	290	\$328
HOT Widening Improvements	10	4	101	3.5%	365	\$7,066
New Greenfield Centerline Mile Facilities	75	16	1,714	59.6%	7,188	\$57,043
New Greenfield Centerline Mile ETL Facilities	1	1	18	0.6%	108	\$2,570
New Greenfield Centerline Mile Extension Improvements	45	9	540	19.1%	2,325	\$24,643
Replacement Centerline Mile Facilities	1	1	2	0.1%	13	\$2,800
Rail Widening	1	1	14	0.5%	NA	\$5,200
Toll Conversion Improvements	1	1	3	0.1%	11	NA
Widening Improvements	19	5	254	8.8%	690	\$5,655
Subtotals	164		2,877	100.0%	11,158	\$106,741



Table 5 (continued)
Summary of Interstate and Non-Interstate Toll Road Activity by Type Since 1992

IMPROVEMENT TYPE	No.	States	Centerline Miles	Percentage	Lane Miles	Capital Cost (millions)
Total for All Toll Facilities						
ETL Widening Improvements	4	2	91	2.0%	258	\$5,385
HOT Conversion Improvements	14	6	193	4.3%	399	\$320
HOT Widening and Conversion Improvements	8	1	301	6.7%	661	\$748
HOT Widening Improvements	43	10	730	16.2%	2,087	\$40,454
HOT Widening, Conversion, and New CLM Improvements	1	1	19	0.4%	38	\$1,400
New Greenfield Centerline Mile Facilities	78	17	1,924	42.7%	8,028	\$63,709
New Greenfield Centerline Mile ETL Facilities	1	1	18	0.4%	108	\$2,570
Replacement Centerline Mile Facilities	1	1	2	0.0%	13	2,800
New Greenfield Centerline Mile Extension Improvements	46	9	561	12.4%	2,400	\$25,438
Rail Widening	1	1	14	0.3%	NA	\$5,200
Toll Conversion Improvements	6	2	72	1.6%	149	NA
Widening Improvements	32	11	586	13.0%	1,548	\$12,690
TOTALS	235	-	4,511	100.0%	15,690	\$160,713

7.1 Tolling Activity Since 1992 by State

The distribution of toll roads is very uneven and concentrated in a dozen states, as indicated in Table 6 on the subsequent pages. While these states are typically those undergoing significant metropolitan expansion or those with a long-standing toll tradition, tolls are also being used in several other states simply to respond to funding challenges. Table 6 shows tolling activity by state.



Table 6
Summary of Toll Highway, Bridge and Tunnel Activity by State Since 1992

State	Total Toll Improvements	All Toll Improvements in Planning	All Toll Improvements in NEPA Review	All Toll Improvements in Design / Finance	All Toll Improvements in Construction	All Toll Improvements in Operation
Texas	78	19	7	13	11	28
California	45	25	8	1	4	7
Florida	37	5	2	5	7	18
Virginia	14	2	4		2	6
Colorado	11	3	4			4
North Carolina	9	3	3	1	1	1
South Carolina	9	6		2		1
Illinois ¹	7				5	2
Pennsylvania	7		2		1	4
Alabama	5	1				4
Arizona	5	5				
Tennessee ²	5	5				
Washington ³	5	1	2			2
Louisiana	4	1	1	1	1	
Maryland	4		2		2	
Puerto Rico	4			2	1	1
Utah	4				1	3
New Jersey	3			2		1
Oklahoma	3					3
Alaska	2		1			1
Delaware	2				1	1
Maine	2	1				1
Michigan	2		1			1
Minnesota	2				1	1
Missouri ⁴	2			1		1
Arkansas	1	1				
Georgia	1	1				
Indiana ⁵	1	1				
Kansas	1					1
Massachusetts	1					1
Mississippi	1	1				
Nevada	1	1				
Ohio	1				1	
West Virginia	1		1			
Totals	280	82	38	28	39	93

¹ Washington-Oregon bridge in NEPA

² Missouri-Illinois bridge in NEPA

³ Tennessee-Arkansas bridge in planning

⁴ Illinois-Iowa bridge open

⁵ Indiana-Kentucky bridge in planning



Activities of the most aggressive states are characterized below:

- Texas – With a total of 78 toll roads, bridges and tunnels undertaken since ISTEA, Texas has the most toll activity of any state. This is not surprising in light of the Texas DOT policy of giving priority consideration to tolls for new capacity—and its aggressive pursuit of public-private partnerships in the concession model. The innovative toll arena in Texas has included aggressive promotion of tolling and the development and standardization of procurement and contracting procedures and documents. In addition, several new regional and metropolitan toll authorities have been authorized, in addition to the state authority. Twenty-eight of these projects were completed in the 1992 to 2008 period, and the remaining 50 are in other stages of development. These projects have been sponsored by the Texas Turnpike Authority, as well as local agencies including transit agencies, regional toll road authorities, and regional mobility authorities. Texas has also negotiated private concessions on a large-scale corridor basis including up-front payments used to fund a wide range of regional mobility improvements. In December 2008, the Texas Legislative Study Committee on Private Participation in Toll Projects recommended that the State Legislature end its 18-month moratorium on new PPP toll road projects, noting that none of the conventional alternatives for closing the state's transportation funding gap were sufficient. The committee also recommended that the state use a public sector comparator approach to compare the cost of delivering toll projects as public procurements or public-private collaborations, and then use that analysis to identify the approach that delivers taxpayers the better value for money. It should be noted that the I-35 and I-69 multimodal Trans-Texas Corridor projects are not included in the database given that many of their component improvements have yet to be finalized.
- California – California ranks second in tolling activity since the enactment of ISTEA, with a total of 45 improvements. These include seven operating projects, among which are some of the earliest and most successful HOT lane facilities in the United States. Of the 38 toll improvements currently under study or development in California, 34 involve HOT lane applications of various types. These projects include major expansions programmed in San Diego, two HOT conversion projects in Los Angeles under implementation as part of the City's Congestion Reduction Demonstration agreement with U.S. DOT, HOT feasibility studies in Orange, San Bernardino and Riverside Counties, and an aggressive initiative to develop a 600-mile HOT lane network extending across six counties in the Bay Area.
- Florida – Florida ranks third in tolling activity since the enactment of ISTEA, with 37 projects undertaken—including 18 that became operational in the 1992 to 2008 period. Florida toll roads are being developed by the Florida Turnpike Enterprise, a part of Florida DOT, as well as local expressway authorities in Miami, Tampa, and Orange County, among others. The state's most recently opened toll facility is the I-95 Express—a new HOT conversion project implemented through Miami's Urban Partnership Agreement with U.S. DOT.
- Virginia – Virginia has undertaken 14 toll projects since the passage of ISTEA, including 6 facilities which are now operational. Virginia's toll projects are being delivered through the states Public-Private Transportation Act (PPTA) of 1995 that allows private entities to enter into agreements to finance, construct, improve, maintain and operate transportation facilities. A number of Virginia's toll projects, including the I-495 and the I-95/395 HOT lanes, were first introduced in the form of unsolicited PPTA offers submitted to Virginia DOT by private sector toll road developers.
- Colorado – Colorado follows Virginia with a total of 11 toll projects in different stages of development. These include four operational facilities developed by public highway authorities established as political subdivisions of the state, one of which, the Northwest Parkway, was recently transferred to the private sector for long-term operations and maintenance through an innovative PPP. One of these facilities is currently being expanded. Five of the remaining nine projects in



Colorado are sponsored by the Colorado Tolling Enterprise (a division of the Colorado DOT) that is currently carrying out systematic feasibility studies.

Other states with active tolling projects include both North and South Carolina (each with one operating facility and eight toll improvements under development); Pennsylvania (four projects completed and three in development); Illinois (two operating facilities and five improvements in implementation); and Alabama, Arizona, Tennessee and Washington State, each of which have five toll improvements under study or already implemented. An additional 20 states and one U.S. territory have undertaken one to four toll initiatives since 1992.

7.2 Development Status of Toll Projects Initiated Since 1992

Table 7 shows the development status of the 235 toll improvement projects studied and/or implemented since the passage of ISTEA. Of the total 4,511 centerline miles of new capacity that these facilities would provide, approximately 22 percent are open, 13 percent are under construction, 11 percent are in design/finance (defined as post-Record of Decision [ROD]), 15 percent are in NEPA review (pre-ROD), and 39 percent are in planning. As noted in Section 5.0 of this report, many of the projects in planning and NEPA review may not move to construction as toll roads. Therefore the tables may overstate the total number of projects likely to emerge in the next decade (although these same projects may be developed with conventional funding and additional projects may be advanced as toll projects). Nevertheless, with this many projects in the early stages of development, it is certain that the rate of new toll road development in the next ten years will increase significantly.

Table 7
Status of All Toll-Based Highway Improvements Initiated Since 1992

STATUS	No.	States	Centerline Miles	Percentage	Lane Miles	Capital Cost (millions)
Toll Projects Open	70	17	1,008	22.4%	3,903	\$40,040
Toll Projects Under Construction	36	13	571	12.7%	1,734	\$17,793
Toll Projects in Design/Finance	26	9	483	10.7%	1,887	\$19,363
Toll Projects Undergoing NEPA Review	31	10	676	15.0%	2,266	\$23,253
Toll Projects in Planning	72	17	1,772	39.3%	5,900	\$60,535
TOTAL	235	-	4,511	100.0%	15,690	\$160,984

7.3 Toll Projects Initiated Since 1992 by Type of Tolling

Tolls are now being applied in a range of contexts related to demand management as well as road finance. As shown in Table 8, most of the 235 toll improvement projects are general purpose toll projects on their own right-of-way—either new projects where all lanes are tolled, or the widening of existing toll facilities.



However, tolls are now being utilized as part of a “managed lane” strategy in the form of priced lane additions to existing free roads. Nearly 30 percent of the projects in process have special management functions. Of the 4,503 centerline miles of toll road projects proposed since 1992, five percent are express toll lanes, 21 percent are HOT lanes; and three percent are dynamically priced HOT lanes. These include:

- Express Toll Lanes (ETL) variably priced to provide premium service despite congestion in adjacent free lanes
- High Occupancy Toll lanes (HOT) priced for single occupant vehicles and allowing preferential use by qualified HOV and transit vehicles, with several different variants
 - Conversion of HOV lanes to HOT operation (HOT conversion)
 - Highway widenings providing new tolled HOT lanes (HOT widenings)
 - Fixed, variably priced HOT lanes for which toll levels are adjusted throughout the day pursuant to published schedules
 - Dynamically priced HOT lanes for which toll levels change in real time based on demand and traffic conditions

In these pricing contexts, the application of tolls may or may not be directly related to project revenue financing.

Table 8
All Toll-Based Highway Improvements Initiated Since 1992 by Type of Tolling

TOLL TYPE	No.	States	Centerline Miles	Percentage	Lane Miles	Capital Cost (millions)
Express Toll Lane Projects	11	3	243	5.4%	705	\$7,233
HOT Lane Projects	47	8	939	20.8%	2,297	\$23,565
Dynamically Priced HOT Lane Projects	8	2	116	2.6%	333	\$3,417
HOV or HOT Lane Projects	6	1	75	1.7%	151	\$1,547
Toll Road Projects	163	26	3,138	69.6	12,205	\$125,221
TOTAL	235	-	4,511	100.0%	15,690	\$160,984

7.4 Toll Improvements Initiated Since 1992 by Facility Type

Of the 235 toll projects proposed since 1992, 41 have been intercity facilities. While the distinctions are often difficult to make, 102 appear to be urban circumferential or “by-pass” routes (noted as “non-radial” in the survey), and 92 are urban radial routes. In terms of centerline miles, 27 percent of the toll-backed improvements proposed since 1992 involve intercity toll facilities, 45 percent are non-radial facilities, and 28 percent are radial toll roads. This information is shown in Table 9.



Table 9
All Toll-Based Highway Improvements Initiated Since 1992 by Type of Facility

FACILITY TYPE	No.	States	Centerline Miles	Percentage	Lane Miles
Intercity Toll Roads	41	15	1,212	26.9%	4,023
Non-Radial Toll Road Projects	102	18	2,033	45.1%	7,654
Radial Toll Road Projects	92	17	1,266	28.1%	3,014
TOTAL	235	-	4,511	100.0%	15,690

7.5 Toll Projects Initiated Since 1992 Using Public-Private Partnerships

While the vast majority of existing toll facilities in the United States have been developed by public toll operators, over 20 percent of the toll-backed highway improvements advanced since ISTEA have involved PPPs where a private entity has been responsible for toll road development, construction, and in some cases, finance and operations. Twenty-four of the toll improvements captured in the survey will be implemented using PPP models, and the PPP approach is being considered for another 24 improvements. The number and type of the 48 improvements likely to involve partnerships is shown in Table 10. It should be noted that given the focus of the current survey on identifying new tolling activity initiated during the 1992 to 2008 period, the survey does not include long-term concessions of public toll road facilities, such as the Chicago Skyway or the Indiana Tollroad. The Pocahontas Parkway is included in the survey given that this facility was built during the survey period. The extension of this roadway to Richmond International Airport is also included in the survey. However, the long-term lease of the existing roadway is not.

Table 10
Public-Private Partnership Improvements by Type

PPP Improvement Types	
4	ETL Widening
1	HOT Conversions
1	HOV Conversion, Widening, and new CLM Improvement
8	HOT Widening
25	New Greenfield Centerline Mile Facilities
6	New Greenfield Centerline Mile Extensions
1	Rail Widening Project
2	Widening Projects

Of the remaining toll-based improvements documented in the survey, 57 completed toll improvements have been built without private involvement, and an additional 74 currently in development have no plans for private involvement. Sponsorship is yet undetermined for an additional 55 improvements. In



addition, the concession for one HOT lane project that was implemented initially on a PPP basis was later purchased by the public sector. This information is outlined in Table 11 below.

While with this survey it has not been possible to ascertain the project-specific financing mix and structure for each of the planned projects, it is apparent that the role of the private sector in toll road development and finance is growing for the following reasons:

- Increased flexibility in recent legislation regarding the tax treatment of private finance for toll roads using private activity bonds (PABs), new forms of credit support to accommodate the challenges of the current credit crises through the Transportation Infrastructure Finance and Innovation Act (TIFIA) Credit Program, and experimental flexibility in the accommodation of procurements involving public-private partnerships through the SEP-15 Program.
- “Institutionalizing” of public-private partnerships toll project development procedures at the state and local level, so that these projects do not pose unique management challenges. This is accomplished by standardized procurement procedures, performance criteria, term sheet formats, and contract provisions in order to minimize staff burdens by establishing an easily replicated project development process.
- Introduction of international practices into U.S. toll project finance (financial structure, concession periods, equity interests, use of comparator) and toll road operations to expand the envelope of financial viability as traditionally considered under the U.S. municipal finance model.
- The benefits of PPPs including: providing access to new sources of financing not otherwise available for transportation uses; capturing the dynamic, efficiency-seeking motivations of the private sector, maximizing the benefits of life-cycle costing, accelerating project implementation, and providing the ability to use limited public funds on other improvements.

8.0 Implications of Current Trends

The survey provides a benchmark in support of gauging the current level of activity in toll road development. Some of these changes can be put in context for their future implications.

8.1 Changes in the Rate of Toll Road Development

Tolls currently play a specialized role in the nation’s highway program, heavily focused on the creation of new roads and the management of congestion on existing capacity. Over the last decade, 50 to 75 out of an average nationwide total of approximately 150 miles-per-year of new access-controlled expressways (Interstate, other freeways and expressways) have resulted from new toll road development. Toll roads, therefore, are already responsible for approximately one-third to one-half of new upper level road system mileage. Going forward, it appears the rate of conventional new upper level highway capacity may increase slightly, but the rate of toll road development is expected to increase significantly from about 50 to 75 ceterline miles per year in the last decade to about 180 per year expected in the next decade (based on current projects in construction or design/finance, and a portion of those in the NEPA and planning stages of development).



Table 11
All Toll-Based Highway Improvements Initiated Since 1992 Using Public-Private Partnerships

PRIVATE DEVELOPMENT	No.	States	Centerline Miles	Percentage	Lane Miles	Capital Cost (millions)
Tollroads with Private Involvement	24	9	635	14.1%	2,165	\$22,210
Toll Projects with Possible Private Involvement	24	12	921	20.4%	3,247	\$33,318
De-Privatized Toll Road	1	1	10.0	0.2%	40.0	\$410
Toll Improvements with Private Involvement yet to be Determined	55	9	1,128	25.0%	3,184	\$32,673
Completed Toll Improvements with No Private Involvement	57	15	862	19.1%	3,411	\$34,996
Ongoing Toll Improvements for which Private Involvement Is Not Currently Contemplated	74	16	955	21.2%	3,643	\$37,376
TOTAL	235	-	4,511	100.0%	15,690	\$160,984

8.2 The Financial Potential of Toll Revenues

Despite the more than 50 percent increase in total (nominal) highway funds since ISTEA, the proportion of total transportation funding represented by user fees (fuel taxes, tolls and fares) has remained about constant. Table 12 illustrates the general breakdown of revenues used for highways in 2006.

Tolls continue to contribute about five percent of total highway revenues. The dollar increase (all levels of government) has been from \$3 billion in 1993 to \$8 billion in 2006 (the latest date for which data is available).

While toll revenues are currently a relatively small part of overall highway-related revenues (\$8 billion out of \$165 billion), tolls are already an important source of income for some state DOTs. Revenues from state and local toll roads in six large states are over \$500 million (Florida, Illinois, New Jersey, New York, Pennsylvania and Texas). These receipts are often used as the basis of bond issues and therefore are translated into significantly higher toll-derived revenues used for highways in any given year. Private concessions of toll roads (Illinois, Indiana, and Texas) are also being used to fund other transportation improvements.

The level of current toll road development in many of the most rapidly growing states with some of the greatest capacity needs (Texas, California, Florida, Virginia, Colorado, etc.) reflects a policy to develop most new upper level roadway capacity via tolls—including HOT lane development. In addition, in a few cases, toll revenues are mixed with other state and local revenue sources.



Table 12
Revenues (\$Billion) Used for Highways 2006 (by Collecting Agencies)
(Rounded to nearest \$Billion)

Revenue Source	Total Federal	State Agencies	Local Governments	Total
Motor-Fuel and Vehicle Taxes	\$32	\$51	\$2*	\$85/52%
Tolls	-	\$7	\$1	\$8/5%
Property Taxes and Assessments	-	-	\$9	\$9/5%
General Fund Appropriations	\$2	\$5	\$20	\$26/16%
Other Taxes and Fees		\$6	\$5	\$10/6%
Investment Income and Other Receipts		\$4	\$5	\$9/5%
Bond Issue Proceeds	-	\$12	\$6	\$18/11%
Grand Total Receipts	\$34	\$84	\$48	\$165/100%

Source: 2006 Highway Statistics Table HF-1

In many states with multiple toll projects, the processes associated with toll project development have moved beyond the traditional ad hoc approach and become more standardized, thereby reducing soft costs and streamlining development schedules.

9.0 What the Future May Hold

Toll revenues are a modest but growing component of the U.S. highway program. The survey indicates some important trends that may indicate a significantly greater role for toll roads in the future:

- The current financial climate has slowed deal flow and raised uncertainty in highway finance – In the short run a combination of the recession and the turmoil in the capital markets introduces significant uncertainties into toll finance, impacting both toll-backed and traditional sources of transportation revenue and financing. As the credit markets resume functioning, credit structures for toll roads are likely to reappear given the relative appeal of toll revenues to both long-term debt and equity.
- The reauthorization of the Federal Aid program may support a context for tolling – The Secretary of Transportation's July 2008 proposal to reform U.S. surface transportation programs (*Refocus. Reform. Renew. A New Transportation Approach in America*) called for greater state and local flexibility to use tolling and pricing. In addition, both the National Surface Transportation Policy and Revenue Study Commission and the National Surface Transportation Infrastructure Financing Commission have recognized the overall funding challenge and have suggested that tolls and pricing play a major roll in highway finance.
- The growing financial, management and technological sophistication in the toll arena – States with multiple toll projects are gaining experience with project finance and with the procurement and



management of privately-outsourced finance and development, including institutionalizing the procurement and contracting procedures to reduce project development costs which may otherwise be significant. Global capital (equity as well as debt) and international finance structures and practices have had a significant impact by demonstrating significant advantages over the U.S. tradition of tax-exempt municipal finance approaches, and international investors remain interested in the US market. Furthermore, advances in tolling technology have made toll projects more attractive.

- Federal and state support for innovative financing capacity enhancement – U.S. DOT and FHWA continue to support technical capacity building for innovative finance and program delivery, of which toll-related projects are a major component. FHWA's newly established Office of Innovative Program Delivery expects to provide states with stronger and more effective federal support to deliver transportation projects using innovative project development, financing and congestion pricing. In addition, U.S. DOT, with AASHTO support, has established a Center for Excellence in Project Finance which provides educational resources to State transportation departments in the development of finance plans and project oversight tools. Certain state and local leaders are also providing support for innovative financing, tolling and pricing programs.
- Continuation of federal credit support – SAFETEA-LU promoted federal loans, guarantees and credits to large-scale revenue-based projects via the TIFIA credit program, and by allowing state and local governments to use up to an aggregate total of \$15 billion in tax-exempt PABs to help pay for, among other major projects, innovative tolling and pricing projects. In addition, there has been some success in streamlining the environmental process for toll projects planning and permitting, including the expanded use of "experimental programs" to allow states to develop new approaches to financing, project development and permitting. There are currently a range of proposals to enhance these facilities in the next reauthorization act.
- Tolling the Interstates – The Interstate system continues to carry significantly higher traffic volumes relative to other roadways, particularly in congested metropolitan areas. At the same time, the aging Interstate System is facing severe rehabilitation and maintenance needs. Tolling provides a dual opportunity to use innovative pricing policies as a means to combat congestion and at the same time generate new sources of income to meet the nation's growing investment needs. At present, while about 8.5 percent of the urban NHS is tolled, only seven percent of urban Interstates are tolled, due principally to projects grandfathered into the Interstate system 50 years ago. The constraints on conversion of Interstate highway facilities to tolled operation were breached slightly in recent surface transportation authorization bills via the Interstate System Reconstruction and Rehabilitation and Interstate System Construction Programs, among other pilot tolling programs. The recommendations of the two national commissions appear to trend towards reducing the current restrictions in the context of capacity additions, as there is recognition that tolls may be necessary to improve performance and fund the reconstruction of existing Interstate highways.
- Expanded use of public-private partnerships – Recent experience is leading to both federal and state consideration of the most effective ways to encourage the use of PPPs in the development of new toll facilities. The current credit crisis notwithstanding, the potential of private sector investment portfolios and the attraction of global equity into road development could radically alter the highway finance landscape in the future. State and local transportation authorities across the country are currently considering the use of PPP structures in the development of more greenfield toll projects than at any comparable time in U.S. history.
- The use of pricing and new technology and systems for congestion management – Recent highway policy discussions on congestion and system performance have increasingly focused on congestion pricing, HOT lanes and ETL networks, including pilot FHWA programs involving variable pricing.



Several metropolitan areas are in the process of developing HOT lane *networks* as a means of providing choices for travel markets. As pricing moves beyond the current few pilot projects—stimulated both by experience and technology—it is changing the conversation about tolling. At the same time this momentum may be enhanced by a growing interest in introducing a vehicle-miles-of-travel (VMT) charge over the long-term. The convergence of tolling (in terms of policy, technology and institutions), congestion pricing and VMT regimes may presage new ways of managing and financing metropolitan highway networks.

- Tolls are assuming a key role in highway finance and development – While only a small proportion (20 percent) of total highway revenues is used to develop new highway capacity, a much higher proportion (60 to 70 percent) of new toll project revenues is used to pay for new highway, bridge and tunnel capacity. Although toll revenues are currently a relatively small part of overall highway-related revenues—\$8 billion out of \$165 billion nationally—tolls are an essential source of income for some state DOTs. Annual revenues from state and local toll roads in six large states (Florida, Illinois, New Jersey, New York Pennsylvania and Texas) exceed \$500 million, and these receipts are often used as the basis of bond issues leveraged into significantly higher amounts. In some cases, toll revenues are also mixed with other state and local revenue sources. The level of toll road development is expanding in many of the most rapidly growing states and metropolitan areas where capacity needs are greatest, such as Texas, California, Florida, Virginia, and Colorado. The use of tolling to develop most new upper level roadway capacity can be expected to expand in these areas in the coming decade.