An Operational Typology for Toll Financing of Highway Facilities

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ABSTRACT

There has been renewed interest among local and state agencies in tolling as a workable revenue-generating option for financing highway construction and maintenance activities. A multitude of complex decisions face the toll facility operators and researchers. An operational typology of tolling concepts for highway financing is presented and a framework for the analysis of such concepts and for the examination of related policy issues in a systematic manner is provided. Documentation is provided that characterizes existing toll operators in the United States. This is accomplished through a survey of operators, the results of which are analyzed according to the dimensions and levels of the foregoing typology. Finally, cell inconsistencies are examined, and cells that correspond to existing tolling concepts are highlighted. The typology also helps to identify tolling approaches that many not currently be in use but may nevertheless be worthy of further consideration.

Since the Federal-Aid Road Act of the 1920s, the federal government and most states have steered away from toll highway financing. Although a number of toll facilities have been constructed since World War II, that position is still quite prevalent. In fact, the Comptroller General of the United States in 1958 barred any state from using federal funds for toll facilities without congressional approval, and only about 20 toll roads have been built in the last 15 years or so. However, current funding considerations may bring about a change in this attitude.

Seven states are currently utilizing toll financing for a number of major roads, 9 states toll either one major highway or a few short segments, 4 use tolls to a very limited extent, and the remaining 30 operate no toll roads whatsoever. The scarcity of resources because of revenue shortfalls and the ensuing decline in road quality have prompted calls for more users to pay their share. This lack of revenue for highways will be the main thrust behind tolling because many states are experiencing dwindling shares of budgets for roads. For example, in 1965 Texas allocated one-third of its budget to highways; by 1982, that figure had been reduced to about 6 percent (1).

CURRENT ISSUES IN TOLL FINANCING

Conversion of Existing or Previously Planned Highways to Toll Facilities

With few exceptions, which can only be granted with congressional approval, roads financed (even partly) by federal funds are not eligible for toll operation. This also affects the feasibility of the advocated use of tolling as the principal (and according to some, the only practical) means of completing the remaining 4 percent of the Interstate system, which involves costly construction of urban links.

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Financial Objectives

The user-pay structure of tolling allows an increase in the user share of support for transportation because, as stated in 1977, "it is estimated that nonusers contributed 24 percent of the expenditures for highway purposes, yet were responsible for only 7 percent of the costs" (2, pp. 306-311).

Tolling is more equitable than general taxation; it is argued that although tolling is not as progressive as the income tax, it appears less regressive than a motor fuel tax (3).

Flexible toll pricing could allow a more equitable allocation of costs to various user groups; in this regard, pricing on the basis of cost appears to be easier to implement (technologically and politically) than some other schemes.

Public Acceptance

Travel for free is taken for granted in most states. The public is generally not well informed about toll financing for highways. Attitudes of a public accustomed to driving on exclusively tax-financed roads are therefore likely to present an obstacle, at least initially, to the expansion of road financing by tolls.

The potential impact on tourist trade and the accessibility to business may lead the affected business community to object to toll roads. This impact has to be compared with that of the potential low service levels offered by improperly maintained or severely congested roads.

On the subject of safety, the International Bridge, Tunnel, and Turnpike Association (IBTTA) and other organizations have compiled statistics that

appear to indicate that toll parkways are safer than other major freeways.

Other Objectives

Besides revenue generation, tolls might achieve other objectives such as congestion relief and efficient pricing, especially when coupled with operating concepts such as exclusive truck facilities or high-occupancy-vehicle lanes.

Recommendations have been made recently regarding a few of these issues. The following were recommended during the session on toll financing held at the 1983 Annual Meeting of TRB:

- New federally constructed roads should be allowed to be tolled,
- Revenues should be used on a facility-specific basis,
- Tolls should be removed after bond retirement, and
- No tolls should be allowed on existing federal projects.

In September 1985 the Institute of Transportation Engineers made the following recommendations (4):

> Transportation agencies should be permitted to develop toll highways in conjunction with use of federal funds on federally aided projects. Tolls should be allowed on federal aid highways and bridges where high maintenance, construction, or reconstruction costs exist. There should be no obligation to replay federal aid highway funds that have been expended on the facility.

And in 1982 FHWA recommended to the Subcommittee on Transportation of the Senate Committee on Environment and Public Works that tolls be used to fund federal construction; that the facility be made toll free after bond retirement; and that no funds for resurfacing, restoration, rehabilitation, and reconstruction (4R funds) be appropriated during the bond life. In 1983 FHWA supported Senate Bill 524, which made similar recommendations, but no such legislation has been enacted.

SCOPE AND OBJECTIVES

The preceding discussion reveals a multitude of complex considerations faced by agencies and researchers alike in assessing the desirability of tolling as a financing mechanism. This is further complicated by the existence of a confusing array of tolling concepts or approaches to implementing and operating a toll facility. The principal objective of this paper is to present an operational typology of tolling concepts for highway financing in order to provide a framework for the analysis of such concepts and examination of related policy issues in a systematic manner.

A second objective is to document and characterize existing toll operations in the United States. This is accomplished through a survey of operators, the results of which are analyzed according to the foregoing typology. Note that the scope of this work is limited to toll collection for the principal purpose of road financing. As such, tolls on urban bridges and tunnels, which serve an important congestion relief function, are not included.

The dimensions of the typology and their corresponding levels are presented next; the resulting cells of the typology are examined and inconsistencies are identified. The survey of operating agencies and its results are discussed in the following section, highlighting cells of the typology that correspond to existing and proposed tolling concepts. The typology also helps identify tolling approaches that may not currently be in use but may nevertheless be worthy of further consideration, as discussed in the concluding section.

THE TYPOLOGY

The typology consists of three dimensions of operating characteristics, each dimension made up of a number of mutually exclusive levels. Each combination of possible facility operating characteristics defines a cell, which represents a particular method of toll road operation. Of the total number of possibilities, many are found to be internally inconsistent, whereas others are not found in current practice. However, the typology allows the highlighting of some tolling concepts that, although not found in current practice, appear to exhibit good potential for applicability in a variety of contexts.

Those characteristics shared by all facilities have been omitted from the typology. For example, because all toll facilities, with the exception of those contributing all revenues to a state's general budget, fund administration and toll collection with gate receipts, this common attribute is not listed as a level within the third dimension of the typology.

The dimensions and levels of the typology have been identified as the following:

Dimension 1 is road status when tolls were introduced and contains three levels:

1.1 New facility,
1.2 Existing facility with payback of original financing, or
1.3 Existing facility with no payback of original financing.

Dimension 2 captures the administrative arrangement for the flow and use of toll revenues from a given facility, coupled with the contribution of these revenues to the facility's overall financing. This dimension also has three levels:

2.1 All revenues are contributed to a general budget,
2.2 The facility is completely self-supporting, or
2.3 The facility requires or is provided with some subsidy.

Dimension 3 describes the functional uses of revenues at the facility level:

3.0 No operations funded directly,
3.1 Right-of-way (ROW) and construction funded,
3.2 Maintenance only funded, or
3.3 ROW, construction, and maintenance funded.

A fourth dimension can be used in conjunction with the typology's feasible cells to examine the compatibility of these cells with tolling objectives under consideration. This dimension consists of five levels, which, however, are not mutually exclusive:

4.1 Road funding,
4.2 Revenue generation,
4.3 Perpetual funds,
4.4 Congestion relief, or

4.5 Truck-lane or authorized-vehicle-lane (AVL) tolling.

The foregoing characteristics are summarized in Figure 1 and are explained in the following paragraphs along with a brief discussion of related issues and trends.

Dimension 1: Type of Facility

Level 1.1 New Facility

Most toll roads in the United States were conceived, designed, and built as toll facilities. Federal law and many state regulations prohibit the implementation of tolls on any publicly constructed facility that was funded by taxes. Exceptions to these laws are occasionally granted, but by far the most common use of tolls for road financing has been on new facilities.

Level 1.2 Existing Facility with Payback

In 1954 Connecticut repaid to the federal government the funds provided for construction of some of the present Connecticut Turnpike. After repayment had been agreed on, Connecticut was allowed to charge a toll. Similar cases include federal repayment for Interstates by Maryland and Delaware in 1960, by Indiana and New Jersey in 1979, and by Maine in 1981 (3). At the present time, difficult-to-acquire congressional approval must be obtained before any repayment and conversion may be undertaken; however, trends show increasing acceptability of this procedure, and contemplated legislation could facilitate conversion in the future.

Level 1.3 Existing Facility with No Payback

Finally, and most controversially, tolls could be placed on an existing road. This might be perceived by the public as double taxation. This perception is reinforced by the knowledge that the road has already been paid for, even if tolls are charged only for maintenance and reconstruction.

Dimension 2: Financial Support Arrangement

Level 2.1 Revenues to General Budget

Revenues may be used on a general government (local, state, or federal) level either for specific projects or for the general budget. However, prevailing attitudes suggest a reluctance of the public to accept any cross-subsidy not closely related to transportation (3). Because revenues from the facility are channeled to a broader administrative level before eventually returning to support the facility, the typology will classify this type of operation as not directly funding any of its own financial requirements (see Dimension 3, Level 0).

Level 2.2 Self-Supporting Facility

In the next two levels, priority for use of toll revenues is given to support and finance the toll-

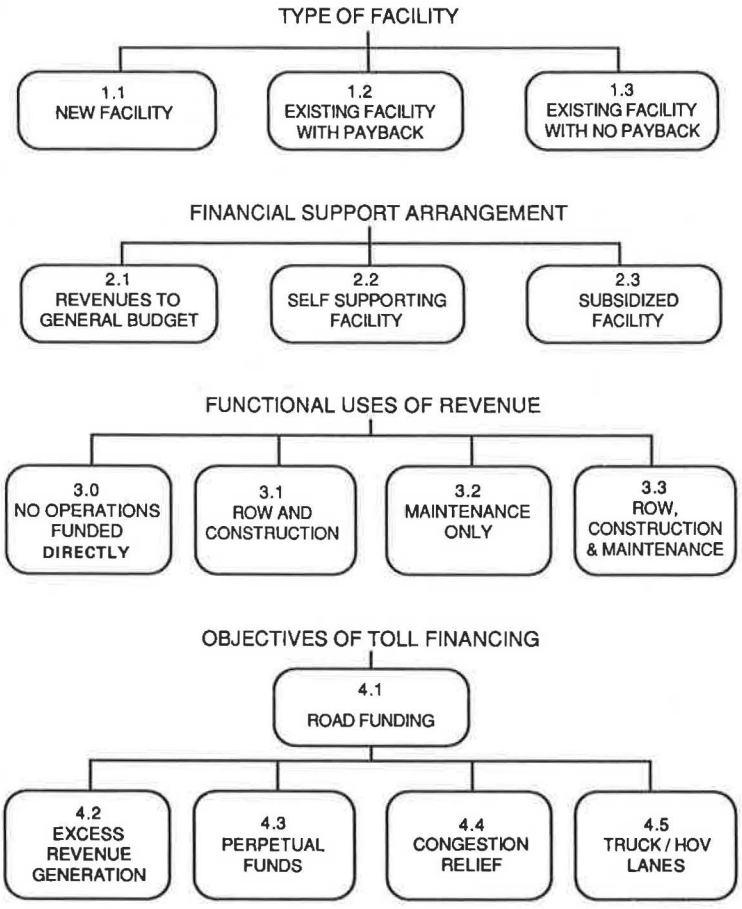

FIGURE 1 Dimensions and levels for toll road typology.

generating facility itself. Levels 2.2 and 2.3 differ in terms of the relative contribution of these revenues to the toll facility's overall financing. Under Level 2.2, the facility is self-supporting and excess revenues may even be generated. Further distinction can be made on the basis of the disposition of these excess funds. These might be limited to future spending on the generating facility only or be used to support the operating toll authority's other projects, thereby remaining within the bounds of that agency's budget. Other restrictions may stipulate that excess revenues be spent on roads in the immediate geographic or administrative area (e.g., Texas Turnpike Authority). Broader uses would allow the extra revenue to go into a general state or local road fund, or even into the highway trust fund.

Level 2.3 Subsidized Facility

When a toll facility cannot fully support itself, some toll authorities have the flexibility to allow alternative partial funding, such as support through tax subsidy, whereby a facility's deficit at the toll booth may be complemented by the use of tax dollars. On the positive side, the support of a toll facility by a tax base assures bond investors of a safe return, thereby enhancing bond rating and keeping interest payments lower. This funding would also allow for more income for maintenance and operations in the event of low gate receipts caused by unforeseen circumstances. However, this extra security may have a negative impact, particularly if the project's economic feasibility originally is dubious or if it is poorly planned.

Dimension 3: Function Uses of Revenue

Level 3.0 No Operations Funded Directly

Level 3.0 applies to those facilities that contribute all revenues to a general budget (Level 2.1). Although the facility is ultimately funded by this budget, the indirectness of this scheme loses the identity of the source of these funds, with no special restrictions applying to their use beyond those that affect funds from any source. This level is therefore denied in the typology to provide a level within Dimension 3 that is compatible with Level 2.1

Level 3.1 ROW and Construction Only

Expenses incurred in ROW acquisition and construction of a toll facility are usually funded by bonds, which in turn are repaid by toll revenue. The dedication of toll revenues to this purpose has been encountered in one situation where maintenance is provided by another agency (Richmond Metropolitan Authority).

Level 3.2 Maintenance Only

At some facilities, revenues are dedicated only to the maintenance and rehabilitation of the highway. In such a case authorities may implement tolls on existing facilities where ROW and construction has already been paid for, such as by the city of Colorado Springs.

Level 3.3 ROW, Construction, and Maintenance

Level 3.3 is provided to characterize the majority of facilities that toll for support of all operating expenses (ROW, construction, and maintenance). This level also represents those agencies operating on existing facilities where repayment of original funding classifies them as providing financing for ROW and construction as well as those operating new facilities that fund their own maintenance.

Dimension 4: Primary Objectives of Toll Financing

Tolling can contribute to multiple objectives, though the relative importance of each may vary from one case to another. The following levels are typical objectives that could be addressed by tolling. Unlike in the previous dimensions, these levels are not mutually exclusive because this dimension is not intended so much for classification as to provide a vehicle for examining the compatibility of these objectives with the various operating characteristics identified in this typology.

Level 4.1 Road Funding

Although various tolling objectives have promoted other types of facilities, such as bridges and tunnels, road funding is currently the primary objective exhibited by agencies collecting tolls for highway financing (see the section on the survey conducted for this study).

Level 4.2 Excess Revenue Generation

An objective of toll collection that has been considered for heavily used facilities is excess revenue production. High-growth corridors and congested areas are both candidates for such revenue tolling. A public-acceptance issue might arise, however, because this objective goes beyond the user-pay concept of tolling and the users are burdened with subsidizing other projects in addition to the cost of the tolled facility. However, in the absence of strong opposition, revenue tolling could provide a workable alternative to increasing taxes, particularly when the revenues are kept within jurisdictional areas.

Level 4.3 Perpetual Funds

Perpetual funds are savings accounts that are deposited from toll revenues during bond life. Once the bonds have been retired or the initial debt has been paid off, the interest from the perpetual funds is spent for maintenance or reconstruction. Although this procedure would increase tolls, the assurance of good maintenance after tolls have been lifted would be appealing to both the users and the highway departments that are finding it increasingly difficult to undertake care of these facilities.

Level 4.4 Congestion Relief

Pricing objectives may also include congestion relief in urban areas. Tolls could be adjusted during the day to reflect the "true" cost imposed by drivers on the system and provide incentives for drivers to change trip-making habits. A system like this has been tried in Singapore (5). There are other nontechnical issues associated with the implementation of congestion tolls, such as income redistribution, in which it is argued that individuals with high incomes receive a greater benefit from congestion pricing than do those with low incomes. The travel

choices available to the user when faced with congestion tolls include changing the time, destination route, or frequency of the trip as well as making the same trip and paying the toll (6). Any of these choices improves the situation of the facility, the last by increasing revenues and the others by increasing the level of service.

Level 4.5 Truck-Lane or AVL Tolling

In some states, trucks are already assigned to specific lanes or are prohibited from using certain facilities. Accommodating increasing traffic of larger and heavier trucks can be facilitated by constructing new turnpikes for truck use or by designating certain new or existing lanes as truck lanes and requiring only trucks to pay a substantial toll for the use of these facilities. Depending on the details of its implementation and perceived equity, this concept could receive opposition from the trucking industry or actually be welcomed by the many truckers who would prefer paying for premium, well-maintained, safe roads.

AVLs, including high-occupancy-vehicle (HOV) lanes, provide another example of restricted-lane use. It has been proposed that the excess capacity of some of these lanes could be utilized by toll-paying automobiles or trucks, thereby generating significant revenue and still allowing for a sufficiently high level of service. The basic concept consists of operating only the AVL as a toll facility on a "free" roadway or treating the AVL separately as another facility if the main lanes are tolled and then implementing a pricing scheme that would charge different rates to various user categories.

Formulation of Typology Cells

Dimension 4 will subsequently be used to examine the compatibility of the typology's feasible cells and various levels with the objectives defining Levels 4.2 through 4.5. The total number of cells that can be formed is equal to the product of the respective numbers of levels within each of the first three dimensions. Therefore, the total number of possible cells is 3 x 3 x 4 = 36 possible cells. This number is further reduced in the following discussion through the elimination of inconsistencies.

Elimination of Inconsistent Cells

Of the 36 cells, many can be shown to be internally inconsistent. The following cell inconsistencies have been identified. (See Figure 2 for identification of all 36 cells and for cells eliminated by inconsistency. Toll road operators are identified by letters that correspond to the list at the end of this paper.)

1. If all revenue is channelled into a general budget (2.1), no funds are directly used for support of facility ROW and construction (3.1), maintenance (3.2), or both (3.3).
2. The combination of self-supporting facility (2.2) and no operations directly supported by tolls (3.0) is inconsistent.
3. New (1.1) self-supporting (2.2) facilities must fund ROW, construction, and maintenance (3.3).
4. Existing repay facilities (1.3) do not provide funds for ROW and construction (3.1) or all operations (3.3).
5. Existing repay facilities (1.2) provide support for ROW and construction (3.1) or in the form of repayment (3.3).
6. New facilities (1.1) will always at least partly fund ROW and construction (3.1), maintenance (3.2), or all operations (3.3), unless all revenues go into the state's general budget.
7. Placing tolls on an existing facility with no payback (1.3) when no revenues go directly to road

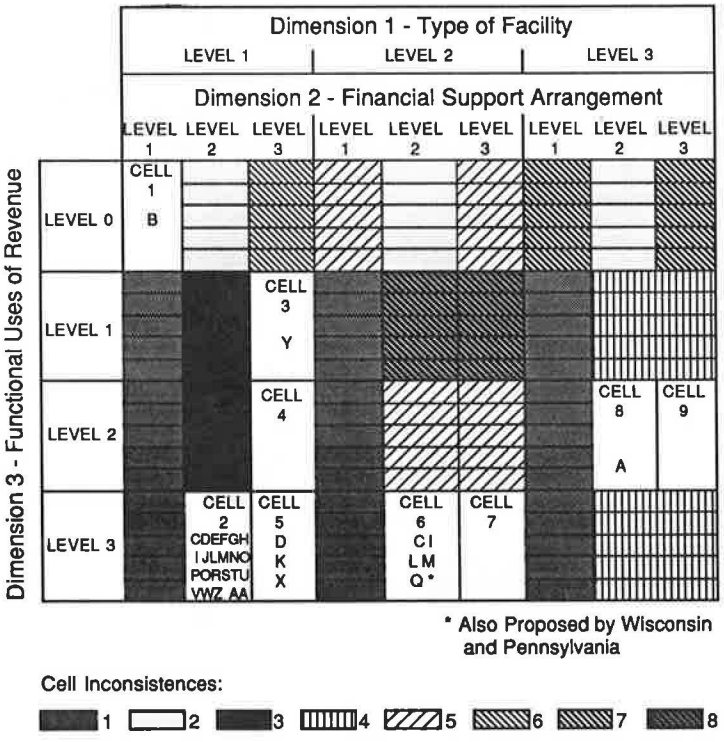

FIGURE 2 Typology for toll road financing: elimination of inconsistencies and identification of cells.

operations (3.0) is politically infeasible. This is just revenue generation.

8. Finally, placement of tolls on existing facilities with payback (1.2) is inconsistent with tolls being spent only to repay ROW and construction costs (3.1). (This would be useless.)

Elimination of inconsistent cells together with the omission of Dimension 4 (because road funding is the only current pricing objective) produces the final typology, which consists of nine cells (Figure 3).

SURVEY

To substantiate the typology's usefulness as a classification tool and document current toll operations, a survey of toll operators was conducted to obtain the data needed to identify (a) the relative prevalence of the various cells among current toll operations, (b) cells not currently represented, and (c) related issues and trends. The survey procedure is described next, followed by a discussion of the results.

Procedure

A questionnaire was sent to all toll road authorities in the United States that were members of the 1985 IBTTA. This survey was followed by phone calls to most operators, including all those not contacted by questionnaire. The data were collected on an agency basis and represented 27 major toll road operators. These authorities operate 62 toll roads, and 2 more are under construction. Although other toll agencies exist, either they operate only bridges, tunnels, short road segments connected to bridges or tunnels, or seasonal roads or they were not identified in the search. Because of the different operating characteristics of bridges and tunnels and the scope of the present study, they were not included in the data base, but future research could produce an effective typology for study of these facilities.

Discussion of Results

The survey results led to the grouping of the 27 agencies into six of the nine cells of the typology identified in the previous section. Cells are numbered in order of appearance in the dimensions and levels of the typology, and descriptions of their characteristics are as follows:

Cell 1 is represented by one agency and is characterized by collecting tolls on a new facility (Level 1.1) with all revenues going to the state's general budget (Level 2.1). The facility then in turn is wholly supported by an allotment from this budget (Level 3.0).

Cell 2 is by far the best-represented cell; 22 of the 27 agencies operate roads by this method. The cell's characteristics are appealing to user-pay advocates because operation is with new facilities (Level 1.1), is self-supporting (Level 2.2), and pays for ROW and construction as well as maintenance (Level 3.3).

Cell 3 is represented by one toll road operator. This method of operation on a new facility (Level 1.1) includes subsidy in two forms. First, maintenance is provided by another agency (Level 3.1), and second, support is available in the event of inadequate gate receipts (Level 2.3).

Cell 4 is currently unrepresented by toll road agencies. It characterizes new facilities (Level 1.1) operating with subsidies (Level 2.3) where only maintenance is funded by revenues (Level 3.2). This cell will probably never be represented because new

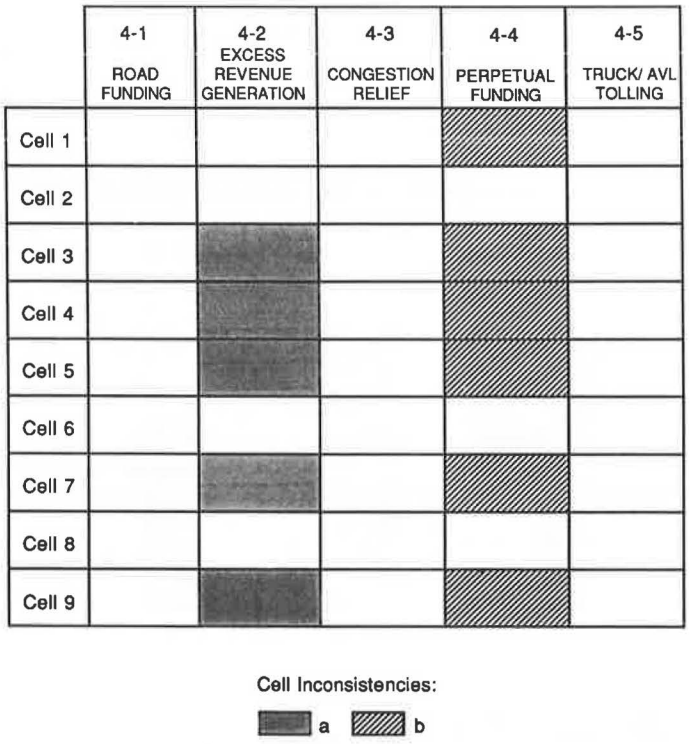

FIGURE 3 Typology for toll road financing: combinations of cells with tolling objectives.

facilities are expected to recover at least some of the ROW and construction costs.

Cell 5 is represented by three toll agencies and is similar to Cell 2 (Level 1.1) in that all operating expenses may receive funds from toll revenues (Level 3.3). However, tax or other subsidies exist to make up possible operating deficits (Level 2.3).

Cell 6 is represented by five agencies. Pennsylvania and Wisconsin are also proposing such facilities. This cell is characterized by facilities that are completely self-supporting (Levels 2.2 and 3.3) and that have been converted from free facilities by repayment of original financing (Level 1.2).

Cell 7 remains unrepresented at this date. It characterizes existing facilities tolled with payback of original funding (Level 1.2), subsidized for operations (Level 2.3), and using revenues to fund the repayment and maintenance (Level 3.3). This cell could become better represented if subsidy requirements for operation are not extensive.

Cell 8 is represented by one agency. This cell is characterized by the use of tolls only for maintenance (Level 3.2). The operation can be labeled self-sufficient (Level 2.2) because the road was constructed before tolls were introduced (Level 1.3). This cell could become better represented in the future as less tax revenues are being made available for road funding.

Cell 9 is not represented by any toll road authority. It characterizes tolls placed on existing facilities (Level 1.3) where subsidy is required (Level 2.3) and maintenance is at least partly funded by tolls (Level 3.2). This cell could become represented in the future by states that have problems with support of maintenance on heavily traveled roads.

CONCLUSION

The results of a survey of agencies operating toll roads in the United States indicated that methods used by the agencies could be grouped into six of the nine cells identified in the typology developed in this study. These methods differed by type of facility on which tolls were introduced, administrative level of financial support, and functional use of revenues. Cell 2 of the typology is represented by 22 of the nation's 27 toll road operators identified in this study. This cell characterizes facilities that were built specifically as toll-financed facilities, that are completely self-supporting, and that utilize gate revenues to support operations, ROW and construction obligations, and maintenance and rehabilitation.

Some of the typology's cells identify promising methods for toll financing of highways and will probably generate some interest in the future. If tolling is undertaken on a large scale, Cell 1 would present a method to consolidate funds (Level 2.1), thereby facilitating the administration of a number of operations. Cells 6 through 9 perhaps represent the methods for operations that exhibit the most promise. However, new legislation would be required, because all these cells represent conversion of existing facilities to tolling (Level 1.2 for Cells 6 and 7, Level 1.3 for Cells 8 and 9). Such legislative changes appear to be favored by current attitudes.

When the nine currently feasible cells are combined with the five primary objectives for tolling contained in Dimension 4, a number of new possibilities emerge. However, some inconsistencies reduce the number of possible schemes. The following inconsistencies involving the Dimension 4 combinations have been identified:

1. The objective of excess revenue generation (Level 4.2) is inconsistent with operating a subsidized facility (Cells 3, 4, 5, 7, and 9).
2. The objective of perpetual funding (Level 4.3) is inconsistent with all revenues going to a general fund (Cell 1), operation of a subsidized facility (Cells 3, 4, 5, 7, and 9), and exclusive use of funds for ROW and construction (Cell 3).

These inconsistencies are shown in Figure 3.

The typology provides an organizing framework for the discussion of legislative issues related to tolling. Subsidy, perpetual funding, truck tolling, revenue generation, congestion tolling, and especially repayment of original financing are some of the currently or potentially controversial issues that are of importance to transportation planners and decision makers.

The typology should be of particular interest to those agencies investigating the possibility of toll financing for their projects in that it serves as a mechanism for identifying the various toll road financing and operating schemes, thereby providing a starting point and an essential input to the evaluation and decision-making process.

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A--City of Colorado Springs, Colorado: Pikes Peak Auto Highway
B--Connecticut Department of Transportation
  Connecticut Turnpike
  Merritt Parkway
  Wilbur Cross Parkway
C--Delaware Turnpike Administration: John F. Kennedy Memorial Parkway
D--Florida Department of Transportation
  East-West (Miami) Tollway
  Alligator Alley (Everglades Parkway)
  36th Street (Miami) Expressway
  Airport Expressway (Miami)
  Buccaneer Trail (Ocean Highway)
  South Dade Expressway
  South Crosstown Expressway (Tampa)
E--Florida Department of Transportation and Florida Turnpike Authority: Florida's Turnpike
F--Florida Department of Transportation and Orlando-Orange County Expressway Authority
  Bee Line Expressway
  East-West Expressway
G--Jacksonville Transportation Authority, Florida: Jacksonville Toll Road
H--Illinois State Toll Highway Authority
  Northwest Tollway
  Tri-State Tollway
  East-West Tollway
I--Indiana Department of Highways: Indiana East-West Toll Road
J--Kansas Turnpike Authority
  Kansas Turnpike
  18th Street Expressway
K--Kentucky Turnpike Authority
  Western Kentucky Parkway
  Western Kentucky Parkway Extension

Mountain Parkway
Bluegrass Parkway
Jackson Purchase Parkway
Pennyrile Parkway
Audubon Parkway
Daniel Boone Parkway
Cumberland Parkway
Green River Parkway
L--Maine Turnpike Authority: Maine Turnpike
M--Maryland Transportation Authority: John F. Kennedy Memorial Highway
N--Massachusetts Turnpike Authority: Massachusetts Turnpike
O--New Hampshire Department of Public Works and Highways
New Hampshire Turnpike
F.E. Everett Turnpike
Spaulding Turnpike
P--New Jersey Expressway Authority: Atlantic City Expressway
Q--New Jersey Highway Authority: Garden State Parkway
R--New Jersey Turnpike Authority: New Jersey Turnpike
S--New York State Thruway Authority
Thomas E. Dewey Thruway (Main Line)
Berkshire Section
Niagara Section
New England Section
Garden State Parkway Connection
T--Ohio Turnpike Commission: Ohio Turnpike
U--Oklahoma Turnpike Authority
Turner Turnpike
Will Rogers Turnpike
H.E. Bailey Turnpike
Indian Nation Turnpike
Muskogee Turnpike
Cimarron Turnpike
V--Pennsylvania Turnpike Commission
Pennsylvania Turnpike
Northeastern Extension
W--Texas Turnpike Authority: Dallas North Tollway
X--Harris County Toll Road Authority, Texas
Hardy Toll Road
West Belt Toll Road
Y--Richmond Metropolitan Authority, Virginia
Powhite Parkway
Downtown Expressway
Z--Virginia Department of Highways and Transportation
Richmond-Petersburg Turnpike
Norfolk-Virginia Beach Toll Road
Dulles Toll Road
AA--West Virginia Turnpike/Toll Road Commission: West Virginia Turnpike/Toll Road

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