Measuring the Cost of Toll Operations

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To	Mandy Putney, Strategic Initiatives Director
From	WSP
Subject	Cost of Operations in Relation to Available Toll Revenue

1 Toll Operation Concepts

When planning and implementing a toll collection system there is often an expectation that revenue generated through toll collections, as well as any associated fees, will be sufficient to cover some level of operations and maintenance costs, and at minimum, the cost of processing toll trips (comprising one or more toll transactions) and collecting toll revenue. In most cases toll collection costs include three general categories of costs as outlined in Table 1: roadside equipment, back-office processing costs, and agency administrative costs. Other costs covered by toll revenue may include maintenance costs of the facility (roadway surface, guardrails and maintenance of easements), allocations to partner agencies including state police, financial services, traffic management and signals, and insurance premiums. The latter is intended to cover losses to revenue generating bridges and structures and their potential revenue loss to protect bondholders and the state, noting that ODOT may opt to self-insure the I-205 structures. Direct expenditures or deposits to a reserve account may be established to cover periodic repair and replacement of toll equipment and facility assets, periodic procurement of toll vendors and consultant support, and debt service if tolls contribute to financing. The following documentation focuses on benchmarking anticipated toll collection costs for I-205 in comparison to existing operational facilities and systems.

Table 1: Typical Components of Toll Collection Costs

ROADSIDE
- Roadside toll zone and gantry maintenance and utility costs - Roadside toll system maintenance and operating costs, including the depot, spares, maintenance vehicles, and may include cloud computing costs - Roadside toll system transaction processing (mostly image review) operating costs
BACK-OFFICE
- Commercial back office system maintenance and operating costs, including software, web presence (which may include cloud computing costs), credit card costs, other processing costs - Customer service center operations costs to include in-person contact center operations, buildings and services, internet and utility services, mail house, lookup services, transponder inventory management and distribution, and costs for third-party retail distribution
ADMINISTRATIVE
- Ongoing marketing and public relations, advertising, etc. - Violation hearings and support staff and activities - ODOT operations: labor, consultant and staff-augmentation costs, audit, professional audits, compliance monitoring, ongoing testing, and other services

In deploying a toll system, there are many factors as well as unanticipated challenges in determining toll collection costs per toll trip as well as opportunities to reduce transactional costs.

- Promotional and ongoing discounts, and credits or exemptions offered to certain groups of customers could add to the complexity and the cost of collection
- Implementation of a low-income toll program may be a cost driver. Developing a low-income toll program (LITP) that aligns with existing programs may help to reduce incremental toll collection costs
- Aligning toll and vehicle classification schedules reduces complexity for users and transaction processing for the back office, specifically during interactions with customers, lowering the cost of collection
- Adopting time-of-day variable tolling on a set schedule rather than more complex dynamic pricing operations will simplify operational requirements and lower the cost of collection
- Automatic Vehicle Identification (AVI) refers to the collection of tolls based on the automatic identification and classification of vehicles using electronic systems which will lower the cost of collection
- Offering user-friendly digital solutions such as phone payments can help to enhance customer service while reducing staffing costs
- Encouraging customers to purchase transponders, to reduce the number of higher cost video transactions, will typically help to reduce overall toll collection costs. In the future, accounts for embedded telematics in the vehicles will likely offer a further option with a lower collection cost than video tolls invoiced by mail
- Auditing and overseeing the toll collection vendors to ensure the effective delivery of operations services within the budget, will help reduce the contractual costs

The following points warrant careful consideration when evaluating or comparing toll collection costs, average toll collection costs per trip, and toll collection costs as a percentage share of revenue across facilities and agencies:

- **Toll User Identification:** Electronic Toll Collection (ETC) helps to simplify the toll collection process and reduce collection costs compared to manual collection, especially in a distance-based arrangement. ETC systems typically deduct tolls from a customer's registered account, at the lowest cost. License plate-based identification is typically offered with ETC systems to enable toll payment from customers without a registered ETC account or a valid transponder in their vehicle. License plate transactions with unregistered customers often require license plate lookups, and most often require invoicing and in many cases multiple mailings. These actions have much higher costs than collection of tolls by ETC. Toll operators typically pass on these higher costs in the form of higher toll rates and/or additional fees.

- **Type of System:** ETC can be deployed on multiple types of toll facilities or programs often referred to as open and closed toll systems. *Open toll systems* typically charge customers at mainline barrier plazas or gantries. *Closed toll systems* collect tolls from all users / for all trips, typically based on

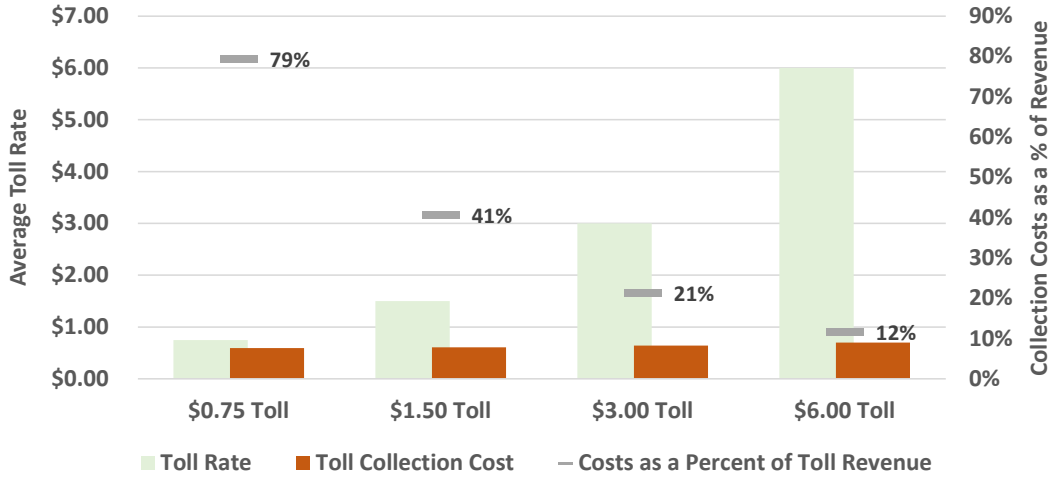
entry and exit locations. Because a closed toll system is normally distance-based, a more complex collections process is used to calculate the toll amounts to be charged, which may also include more gantries and hardware, increasing the cost of collection compared to a simple fixed-point toll.

- **Vehicle Classifications, Exemptions, Discounts:** Tolls are often specific to vehicle classification, specifically vehicles (e.g., trucks) with three or more axles or of a specific size or weight. For I-205 volumetric shape-based classifications are anticipated to be used. Exemptions and discounts might be considered for emergency vehicles, repair vehicles, and transit operators. Additional categorization of vehicles for different toll rates or exemptions and discounts often incurs additional costs for vehicle identification, typically included in toll collection costs.

- **Single Facility vs. Network:** Toll systems with multiple toll facilities often benefit from reduced costs per toll trip as centralized back-office and administrative fixed expenses are shared and allocated across a greater number of transactions.

Many factors, including traffic demand, scale of operations, toll rates, and collection methods impact toll collection costs *as a percentage share of revenue collected*, making comparisons difficult if not irrelevant, The toll rate (or the average revenue per trip with time-of-day variable tolls) — rather than the cost structure — generally has the largest influence in determining the toll collection costs *as* a percentage share of revenue. As shown in Figure 1, a constant toll collection cost of $0.58 per trip combined with a 2% credit card fee yields a total cost of $0.60, resulting in a 49% cost share of revenue for a $0.75 toll. At higher toll rates of $1.50, $3.00 or $6.00, the cost of $0.58 per trip remains constant with slight increases in credit card fees of $0.03, $0.06 and $0.12 per trip, respectively, and results in 41%, 21% and 12% cost shares of revenue, respectively.

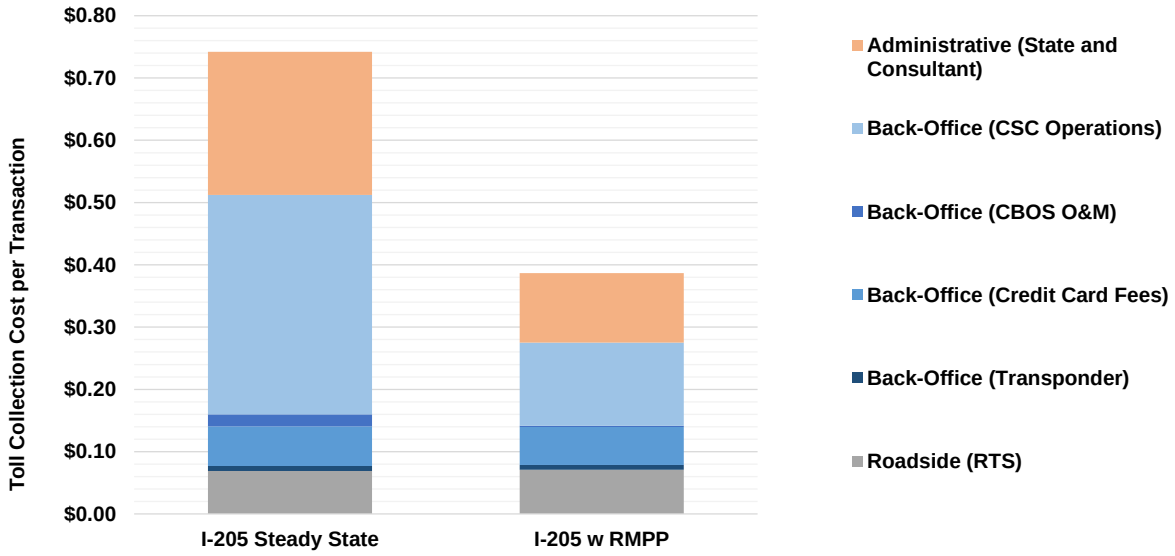
Figure 1: Measuring Toll Costs as a Percent of Toll Revenue



The ODOT toll system supporting I-205 will serve as the back office for future toll facilities in the region including the ODOT Regional Mobility Pricing Project (RMPP) and the Interstate Bridge Replacement (IBR). The toll facilities will be ETC systems with no cash collection or barriers. An initial evaluation of costs as part of the Level 2 T&R analysis completed in October 2022 estimated the cost of collection per toll trip at just over $0.70 during initial ramp-up of the facility through steady state operations. As categories of toll

collection costs are not specific to a single facility, and can be applied to a system of facilities, systemwide fixed costs may decrease as more facilities are added. When including the tolling on I-5 and I-205 as part of the ODOT RMPP, costs decrease to an average of $0.40 per toll trip. Figure 2 provides a breakdown of costs by category aligned with the anticipated facilities in operation.

Figure 2: ODOT I-205 Projected Collection Costs Per Toll Trip in Year of Expenditure Dollars



2 Industry Benchmarking

In evaluating the projected toll collection costs for I-205, other active toll facilities across the country were reviewed to benchmark costs and verify the reasonableness of the cost forecast.

When developing benchmark metrics for toll collection costs, there are many challenges as there is no consistent set of cost components used by toll operators to calculate their cost of collection as well as varying methods of toll collection. At a high level, variations such as size and scope of toll facilities, traffic levels, average tolls, and operating policies can have a significant influence on how the cost of collection is calculated and what costs are included. The cost-allocation exercise can be influenced by the toll agency's organizational structure, business rules, and toll collection methods.

A desktop review of publicly available data on toll collection for other ETC-equipped toll facilities comparable to the I-205 Project was conducted. Cost details are reviewed and extracted from the latest annual report or financial report for each toll operator to provide a more relatively accurate representation of current conditions. To protect the identity of the toll operators, they have been anonymized in the chart below.

Once trips and costs have been identified for each facility or toll system, the cost per transaction is calculated by dividing the annual cost of toll operations by the total annual number of toll transactions. Note that the data provided below often includes all operations costs, and not just the incremental costs of toll

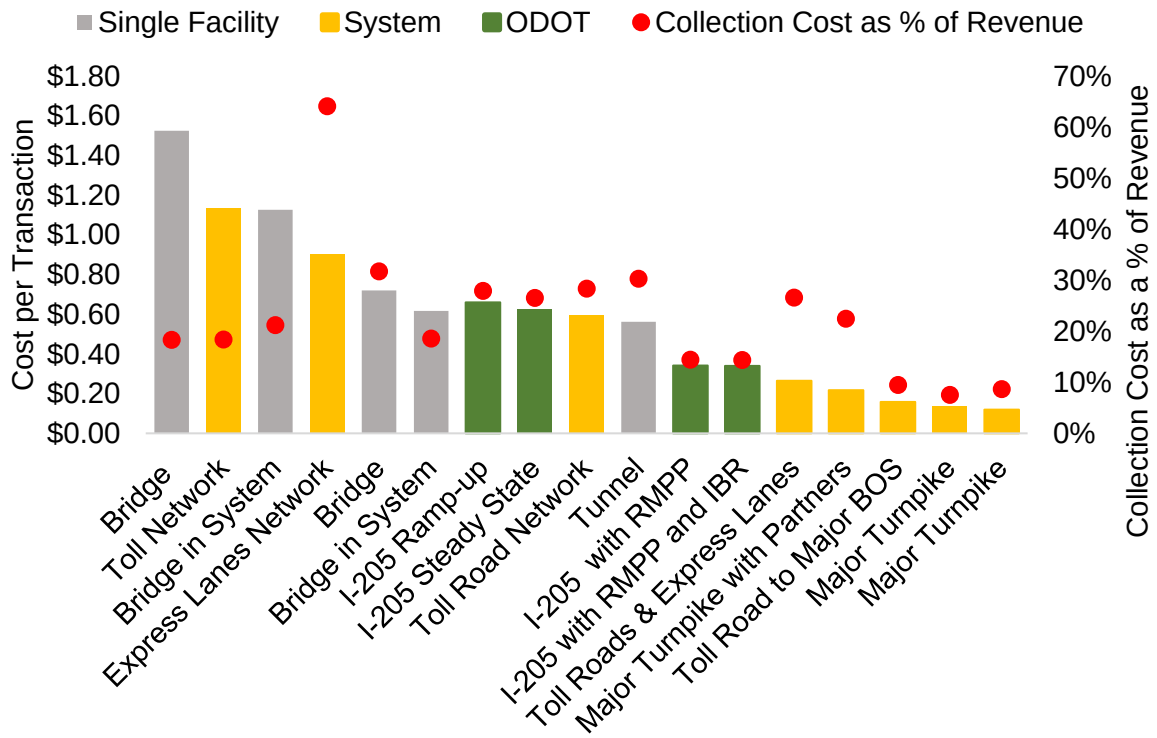
collection. Where costs do not align with the standardized toll collection costs as identified they are excluded from consideration.

Figure 3Figure 3 provides a summary of the analysis findings with a range of toll collection costs for the various facilities and systems in comparison with projected costs for I-205 as a standalone facility, and as part of a system when including RMPP and when including RMPP and IBR.

There is no standard for toll collection costs due to numerous factors. For the I-205 Toll Project, where we have done the most work, we have calculated total toll collection costs of $0.70 - $0.80 per trip, which equates to about 25-30% of revenue collected. These percentages would decline as RMPP or IBR join the system of active toll facilities. These rates are within the range of similar facilities studied for this exercise.

For some of the major multi-facility toll agencies, toll collection costs as a percentage share of revenue can be as low as 7.5 percent in systems that process around one billion transactions per year. With advancements in vehicle identification technology and communications there will be opportunities to further reduce toll collection costs.

Figure 3. Toll Collection Cost per Transaction by Facility in Current Dollars[1]



[1] Sources: Interpretations of publicly available annual financial reports from Toll Operators and ODOT Toll Cost Forecasts