

be employed to communicate toll information to motorists. Communication for toll transactions would go back to a remote office for processing via fiber connection.

3.8 Toll Operations Management

The operator of the toll system could be the NDOT, RTC or a third party contract or vendor. They would be serving the owner/client under prescribed policies regarding the minimum and maximum tolling thresholds, regulations regarding how the toll rate is changed, who is eligible for free or discounted use, and how the excess revenue is vested. They might also be charged with maintenance and operational reliability of the ETC infrastructure.

3.8.1 Preliminary ETC Cost Considerations

Operating costs likely to be incurred for a priced managed lane are divided into three categories: operations, maintenance and violation processing. Each category includes functional areas for the provision of services associated with the tolling operation. Operation costs involve administration, finance and accounting, customer service, and support staff at the tolling center. Operating expenses can include facility costs, office equipment costs, supplies and other direct costs associated with account management and revenue handling. In an established operation, the operating costs / expenses can be estimated to increase somewhere between \$200,000 and \$500,000 (2005 dollars) for every additional one million transactions processed. Maintenance costs involve preventative and corrective maintenance activities of the roadside tolling equipment and collection locations and central computer systems and application software. Maintenance expenses include facility and vehicle costs, technical support type contracts, and consumables. Depending on the scale of the deployment, maintenance service costs will vary widely depending on such factors as the number of tolling installations, access locations, operation and enforcement plan and length of the project.

Violation processing costs involve violation image review, finance and accounting, customer service, and appeals and hearing support. Additionally the cost of on-site enforcement activities and judicial or other adjudication proceedings must be included. Violation processing expenses include facility costs, office equipment, lookup fees, supplies and other direct costs associated with revenue handling. Excluding fixed costs for facilities and computer assets, the operating expenses in 2005 could be estimated to be between \$100,000 and \$500,000 annually per 100,000 violations processed, based on experiences from San Diego's I-15 HOT lanes.

Operating costs can be significantly reduced if the operations activities are supported by web-based applications. On-line account management and payment, including for violation fines and fees, on-line account statements and other e-services dramatically reduce the cost of service center operations.

Table 3-7 provides some preliminary cost estimates for tolling infrastructure deployment that may be anticipated for a prototypical 6 to 8-mile simple managed lane operation with up to five tolling stations.