



**AT/Comm ETTM System
Toll Pricing & Payment Options**

Payment options for Standard, Fixed Price, Closed Tolling include:

- cash
- credit card
- bank transfer
- post-pay
- clearinghouse

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Mixed, Fixed Price, Open/Closed Tolling

This pricing method is unusual, but not unheard of in conventional toll pricing. This is used on roadways that base toll prices on entry and exit points, but also charge a fixed toll for an intervening bridge or across-the-road barrier. With the AT/Comm ETC system, the toll schedule for all classes and entry and exit combinations is broadcast to all transponders from the broadcast radio beacon just prior to the exit payment plaza/ramp/lane on the closed portion of a facility. If an intervening fixed price open toll exists between the entry and exit point on the closed portion of the facility, the transponder will pay that toll for its class (tolls conveyed by a broadcast beacon) but retain the entry data in memory for use in calculating the toll upon exit from the closed portion of the facility. In both cases, the transponder calculates the toll, based on its class, and pays its respective toll as the vehicle passes through the lane. At a minimum, the I.D. of the transponder and the toll paid is conveyed to the in-lane system for audit.

Payment options for Mixed, Fixed Price, Open/Closed Tolling method include:

- cash
- credit card
- bank transfer
- post-pay
- clearinghouse

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Commuter Pass Pricing, Open/Closed Tolling

This pricing method is used in some conventional facilities for a special class of customers, in most cases for private vehicles with facility usage greater than five times per week. Commuter pass-eligible vehicles typically receive unlimited passage through a designated facility(s) for a fixed price and fixed period of time. For instance, a patron could pay a flat monthly fee of say, \$10, and be allowed unlimited passage over a bridge for that respective month. A more complex version of this pricing method is applied to a closed tollway, where unlimited passage applies to only a specific portion of the roadway, say between interchange 4 and interchange 8.

With the AT/Comm ETC system, the transponder is programmed for commuter pricing at any time via radio, in the lane or at a business center. The patron simply pays the flat rate and the transponder is programmed for unlimited passage - no toll lane debiting - for a specific time period (from/to) and for a specific facility(s), including interchange-range if applicable. Each time the transponder passes through an authorized payment lane during the valid period, the transponder simply conveys its I.D. for audit, as it passes through the lane. The transponder is programmed to automatically reset for valid passage under the commuter pricing plan for the subsequent month. If the patron has not prepaid for that month by some agency-set date after expiration of the previous month's period, the transponder invalidates its commuter pass or is disabled via radio. The only way for that transponder to be re-validated as a commuter, is for the patron to pay the month's fare in a designated toll lane or at a business center. However, between the end-date of a valid month and the subsequent date when the subsequent month's payment is due, the

transponder beeps and displays a warning, indicating that the patron must prepay the respective fare due or be invalidated.

Payment options for Commuter Pass Pricing, Open/Closed Tolling include:

- cash
- credit card
- bank transfer

Obviously, for this pricing method, cash by mail, credit card, or bank transfer are most convenient for the patron.

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Commuter/Fixed Pricing Hybrid

This pricing method combines the attributes of a standard pricing plan (flat rate per class, for closed tolling) with a commuter pricing plan. This applies to a toll road where the commuter plan is valid for only a designated distance on the tollway, say between interchange 4 and 8. In this case, the transponder has a separate account in its memory for prepaid fund debiting outside the commuter zone, but is also programmed for unlimited passage between designated interchanges for the valid period. If a commuter/hybrid patron travels within the designated zone/period, no toll is debited from the prepaid account. However, if the travel is outside the valid zone/period, the prepaid account is debited as the vehicle passes through a payment lane. Appropriate information is conveyed to the ETC lane equipment for audit.

Payment options for Commuter/Fixed Pricing Hybrid include:

- cash
- credit card
- bank transfer
- post-pay
- clearinghouse

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Congestion Pricing

This pricing method is considered by many to be that which will become prominent in the future. Toll prices will be based flexibly on time of day and traffic conditions, and periodically adjust accordingly. For instance, in this model, a base-toll may exist and be augmented with surcharges based on the time of day (peak/off peak) and/or current traffic conditions. In most cases, congestion pricing will be done on an open-highway basis (no toll booths) at highway speeds and be accompanied by certain advance traffic management techniques such as in-vehicle signing and incident detection/warning.

The AT/Comm system is uniquely capable of meeting the broad demands of congestion pricing. The availability of a microprocessor and large memory for flexible pricing, combined with sophisticated, long-range vehicle-to-roadside communications for real-time traffic management, along with a visual display and audio for in-vehicle signing, make the AT/Comm system a turnkey congestion pricing system.

Radio beacons can be set up throughout a road network in an urban area. These simple broadcast beacons would convey their location and time-of-day to passing vehicles. At a subsequent data-gathering point, vehicles could be queried (read-write communications) as to the drive-times between various points in the network. This real-time data can be used in a neural context to determine current and upcoming traffic conditions. Vehicles/drivers could then be directed to alternate routes via audio/visual information on the transponder. And, toll congestion pricing could be varied, based on this traffic data.