

## Memorandum

TO: CTIO BOARD OF DIRECTORS  
FROM: KELLY BROWN, CHIEF TOLL OPERATIONS OFFICER  
SUBJECT: CENTRAL 70 DYNAMIC PRICING ALGORITHM CRITERION RECOMMENDATIONS  
DATE: JANUARY 17, 2024

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### Purpose

Present to the CTIO Board of Directors (CTIO Board), for their consideration, the recommended dynamic pricing algorithm criterion for the Central 70 Express Lanes.

### Action

Informational only, the CTIO Board is not being asked to vote on the recommended dynamic pricing criterion for the Central 70 Express Lanes at this month's meeting. The Board will vote on it at the February meeting.

### Recommended Dynamic Pricing Algorithm Criterion for Central 70 Express Lanes

Pursuant to the CTIO amended toll rate setting and adjustment policy (November 2023), three primary criteria of the dynamic pricing algorithm were evaluated for the Central 70 Express Lanes (refer to Attachment A: The Central 70 Express Lanes Dynamic Pricing Parameters Setting - Central 70 Technical Memo and include:

1. Minimum and maximum toll rates
2. Rate change interval (5 minutes to 15 minutes)
3. Maximum increment and decrement (5 cents to 50 cents)

These three dynamic pricing algorithm criteria function as a framework so that the goals of the CTIO Tolling Policy listed in *Section 4 Express Lanes toll rates setting objectives (revenue versus throughput maximization)* continue to be met for the Central 70 Express Lane. The CTIO Tolling Policy is Attachment B for the Board's reference.

### Minimum and Maximum Toll Rates

**Minimum Toll Rate:** The minimum AVI toll rate of \$1.50 is set to cover the AVI toll systems and operation costs (the same minimum AVI rate applies to the current TOD pricing).

**Maximum Toll Rate:** The maximum toll rate is set to manage demand during peak hours to maintain the desired traffic level of service in the Central 70 Express Lanes. Based on current traffic conditions (Refer to Attachment 1) with maximum toll rates set at \$4.50, speeds in the Central 70 Express Lanes are nearing the 45mph threshold required by FHWA. Based on modelling the highest peaks and given that Central 70 Express Lanes are still in the ramp-up stage (25 % historical ramp up on Colorado Express Lanes between first and second year of operation), it is recommended to set the maximum allowable toll rate at \$5.50.

### Rate Change Interval

The rate change interval is set to allow the algorithm to respond to rapid demand fluctuations. A range of 5 to 15 minutes is recommended based on Central 70 traffic patterns and speed of traffic volume ramp-ups.

### Maximum Increment and Decrement

**Maximum Increment:** The maximum increment is set to manage abrupt increase in Central 70 traffic demand. Based on Staff analysis, a maximum increment of 50 cents is recommended.

**Maximum Decrement:** The maximum decrement is set to attract vehicles to the Central 70 Express Lanes

once the desired level of service is reached. A maximum decrement rate of 20 cents is recommended.

If the algorithm determines that the current toll rate is sufficient and no toll rate change is necessary at the next Rate Change Interval, the Maximum Detriment of \$0.00 is acceptable in order to keep the toll rate unchanged.

### License Plate Tolling (LPT) Surcharge

License plate tolling (LPT) costs more than AVI tolling due to additional back-office costs and LPT leakage. Therefore, LPT rates are developed by imposing a surcharge on the AVI toll rates. Additionally, the eastbound direction of the Central 70 Express Lanes has 3 toll points while the westbound direction only has 2 toll points. Hence, the LPT rates for the eastbound direction will be higher than those for the westbound direction.

- LPT surcharge covers back-office additional cost and LPT leakage
- LPT leakage is assumed at 40 percent based on historical data
- LPT leakage includes uncollectable and unbillable LPT transactions
- Cost related to image review and other systems
- The LPT surcharge is recommended at 150% of the Central 70 Express Lanes AVI toll rates.

### Summary of Central 70 Express Lanes Recommended Dynamic Pricing Algorithm Criterion

Criterion	Value
Minimum toll rate:	\$1.50
Maximum toll rate:	\$5.50
Rate change interval range:	5-15 minutes
Maximum Increment:	50 cents
Maximum decrement:	20 cents

### Central 70 Express Lane Operational Policies

The following operations policies still apply the Central 70 Express Lanes:

- Hours of operation: 24 hours a day, 7 days a week, 365 days a year
- High occupancy vehicles with three or more passengers (HOV3+) use the Express Lanes for free
- Motorcycles use the Express Lanes for free
- Vehicles with four or more axles pay a surcharge of \$25 in addition to the AVI or LPT toll rate

The Central 70 Express Lane dynamic pricing algorithm criteria presented above will be analyzed on an annual basis and any proposed adjustments to the current Central 70 Express Lane dynamic pricing algorithm criteria will be brought to the board as is the current process for time of day pricing. In the case(s) where one or more of the approved dynamic pricing algorithm criterion are not functioning as expected, Staff will return to the CTIO Board to update the criterion prior to the yearly toll rate adjustment analysis period. This will ensure that Central 70 Express Lane corridor will continue to meet the overall tolling policy objectives and cover its Express Lane obligations.

### Next Steps

- The CTIO Board is encouraged to provide feedback on the recommended dynamic pricing algorithm criterion for the Central 70 Express Lanes.
- CTIO staff will integrate any requested changes and will return at the February 14, 2024 board meeting with a resolution for CTIO Board approval of the Central 70 dynamic pricing algorithm criterion.

### Attachments

Attachment A: The Central 70 Express Lanes Dynamic Pricing Parameters Setting - Central 70 Technical Memo

Attachment B: [CTIO Tolling Policy Link](#)