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TOWN OF CALEDON
PLANNING
RECEIVED
September 23, 2025

TECHNICAL MEMORANDUM

April 9, 2025 Project# 30322

To: Louie Loberti – Costco Wholesale
From: Becca Hoffman; Chris Tiesler, P.Eng., PTOE
CC: Darryl Bird - WSP
RE: Caledon Costco - Gas Bar Operations & Queuing

Kittelson & Associates, Inc. (Kittelson) has prepared this gas bar operations and queuing memorandum for the proposed Costco Wholesale Gas Bar to be included in a larger development in the northwest quadrant of the Creditview Road / Mayfield Road intersection in the Town of Caledon, Ontario.

Project Background

Fieldgate is proposing a new commercial development located at 12100 Creditview Road, which is planned to include an approximately 158,000 square foot warehouse with a 24-position gas bar. Costco-specific gas bar queue data is being provided herein to accurately estimate gas bar operations and queueing.

Caledon Costco Gas Bar Operations

This section details the gas bar queue estimate for the proposed 24 fueling position Costco gas bar.

COSTCO TRIP GENERATION DATABASE

For over 25 years, Kittelson has maintained a database of traffic data and travel characteristics for Costco Wholesale. The database contains transportation information such as trip rates, trip type percentages, gas bar queue lengths, and parking demand for Costco locations in North America, including the United States and Canada. The database is updated and refined each time new Costco traffic counts or information become available to Kittelson. To best evaluate the anticipated characteristics of the Caledon Costco gas bar, the Costco database was used to inform the anticipated queues at the gas bar since it provides use-specific data that more accurately represents the anticipated traffic characteristics of the unique development type. Costco has invested significant effort into developing and maintaining this use-specific database for its warehouses, gas bars, and carwashes to enable it to better plan, design, and operate its facilities.

The Costco transportation database contains a large quantity of data specifically related to Costco gas bars. Trip generation, trip type, and queue length information for a total of 99 Costco gas bars of various sizes located throughout North America are included. The Costco-specific data presented herein follows nationally accepted practices for trip generation data collection as recommended by the Institute of Transportation Engineers (ITE) and presents a robust dataset upon which to confidently predict the gas bar queues of the Caledon Costco gas bar.

When comparing available Canadian site data to US data in the database, there is not a substantial difference. Canadian sites are found to generate similar levels of traffic and lie well within the overall distribution of trip rates. This comparison confirms the homogeneity of Costco trip generation characteristics regardless of geographic location.

CALEDON GAS BAR OPERATIONS

Due to the membership requirements and nature of Costco sales, Costco members have unique travel characteristics and patterns that are different from customers of other supermarkets or more traditional gas stations or convenience stores. These unique characteristics and patterns exist for Costco warehouses, Costco gas bars, and the interaction of trips between the two. Costco gas bars function as an ancillary use to the Costco warehouse, and members often combine their shopping trips at Costco warehouses with visits to the corresponding Costco gas bar.

As is the case for all Costco services, fuel can only be purchased by Costco members. Payment at the Costco gas bars can only be made with a credit or debit card at the pump, and unlike traditional gas or service stations, there are no other automotive services (such as repairs) or other types of sales (including food or sundries) associated with the Costco gas bars. The Costco gas bars have a minimum of one attendant working at all times who is responsible for safety, expediting members' use of the fuel positions, directing entering vehicles to available positions, and managing on-site queues.

The design of the Caledon gas bar provides a 3.65 metre aisle width between adjacent fueling positions, allowing vehicles enough space to enter and exit the facility without needing to wait for actively fueling members. Dispensers are also spaced to allow easy access to the middle dispenser without requiring additional vehicle maneuvers. These design features help optimize the efficiency and processing capacity of the gas bar.

Gas Bar Processing Capacity

From a review of historical transaction data at various Costco gas bar facilities across North America, the average amount of time members spend at the pump is between three (3) and four (4) minutes. The proposed Caledon Costco gas bar includes 24 fueling positions, resulting in a processing capacity of approximately 411 peak hour trips. Any vehicles not immediately serviced by the fuel facility accumulate behind the fuel dispensers in a queue as they arrive throughout the peak hour.

CALEDON GAS BAR QUEUING

To forecast the anticipated queues at the proposed Caledon Costco gas bar, queuing data recorded at twenty-four (24) Costco gas bars that have 24 fueling positions across North America were reviewed and averaged. **Table 1** presents the average, 95th percentile, and typical maximum queue estimates for the proposed Caledon 24 fueling position gas bar during the weekday AM, weekday PM, and Saturday midday peak hours. *Note the typical maximum queue reflects the maximum queue anticipated under typical conditions, the actual gas bar queue may be longer under atypical circumstances including but not limited to gas price fluctuations and holidays.*

Table 1. Forecasted Queues for Proposed Caledon Costco Gas Bar

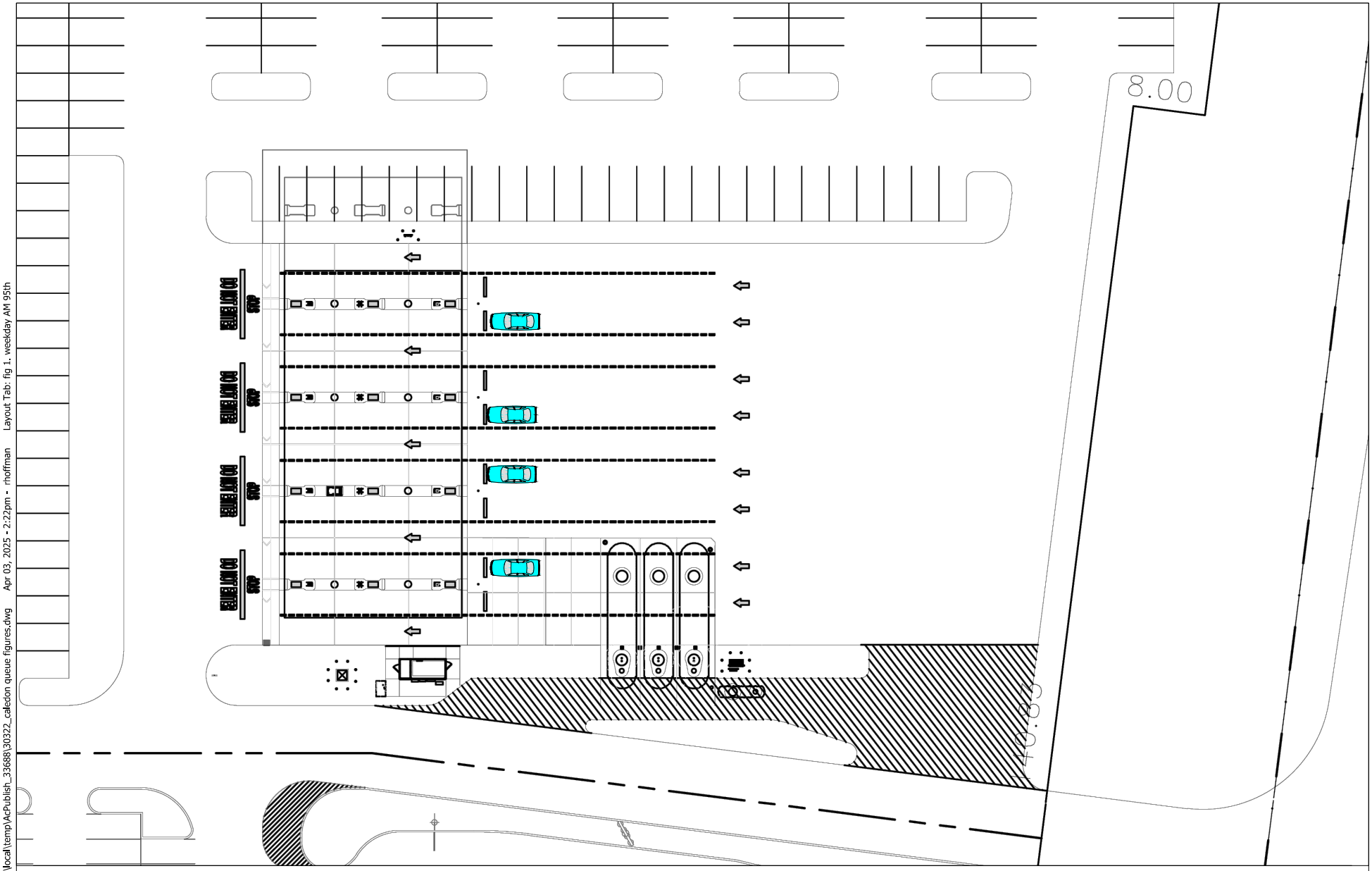
Site	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Midday Peak Hour		
	Average	95th Percentile	Typical Maximum	Average	95th Percentile	Typical Maximum	Average	95th Percentile	Typical Maximum
Proposed Caledon Gas Bar	1	4	5	7	13	16	13	21	24

Source: Kittelson & Associates, Inc. 2025

Figure 1, Figure 2, and **Figure 3** provide a visual representation of the anticipated 95th percentile queue lengths within the queue storage area, assuming 7.62 metres of headway per vehicle, available behind the first row of gas dispensers during the weekday AM, weekday PM, and Saturday midday peak hours, respectively.

As shown in the figures, the queue area has more than enough storage capacity to accommodate projected demand during peak periods. In fact, the available remaining area during the Saturday Midday peak hour could accommodate over 40 additional vehicles within the queuing area itself. This theoretical condition is depicted in **Figure 4**.

In rare occurrences/conditions where the projected peak period queues may be temporarily exceeded, the site is designed to accommodate that condition. In such instances, Costco will also typically add additional on-site attendants to help direct members to ensure efficient processing and balance across all eight lanes approaching the dispensers.



- Queued Vehicle

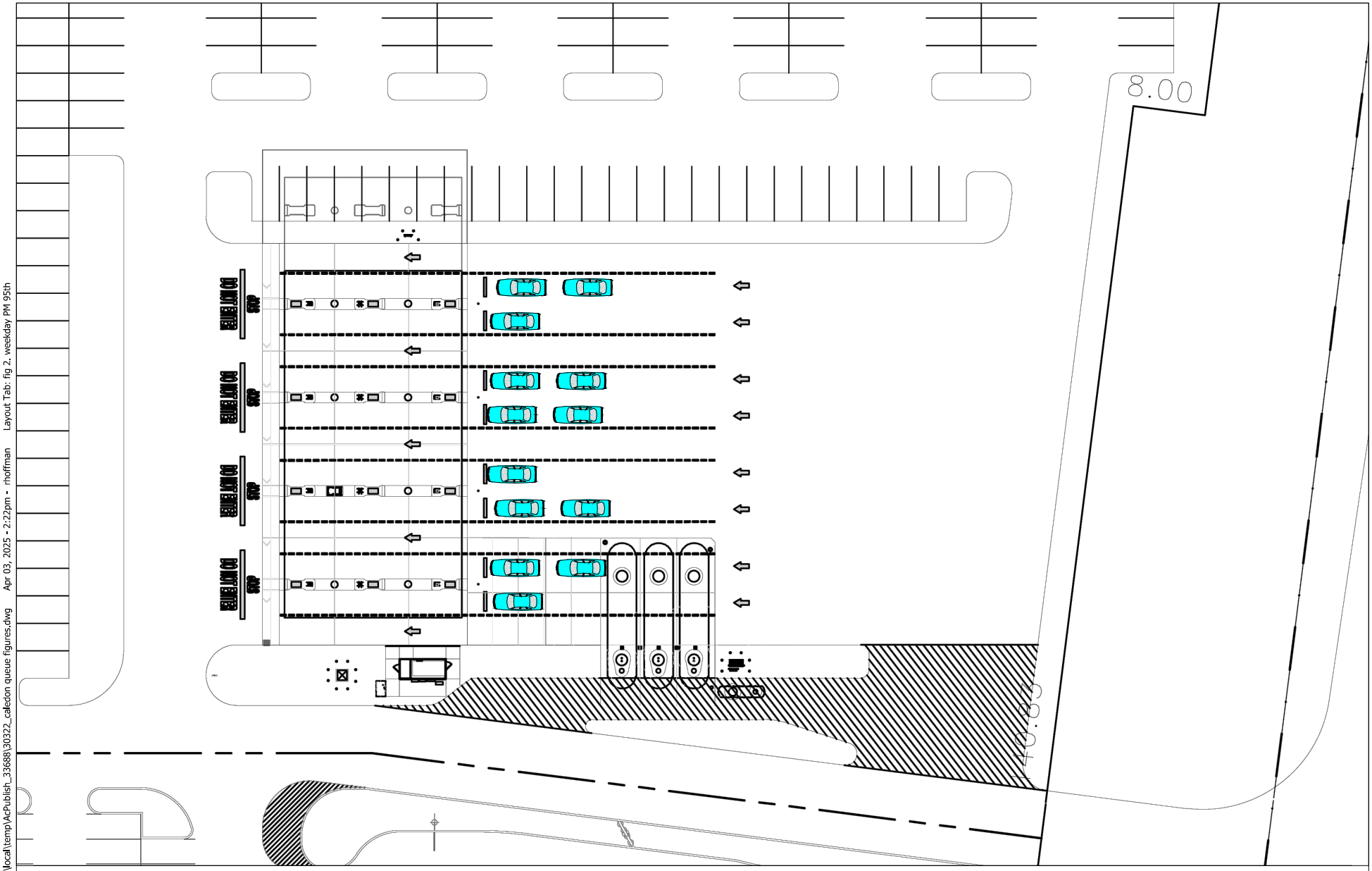
SITE PLAN RECEIVED ON 28 MARCH 2025

Anticipated 95th Percentile Queue
Weekday AM Peak Hour
Caledon, Ontario

Figure
1

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- Queued Vehicle

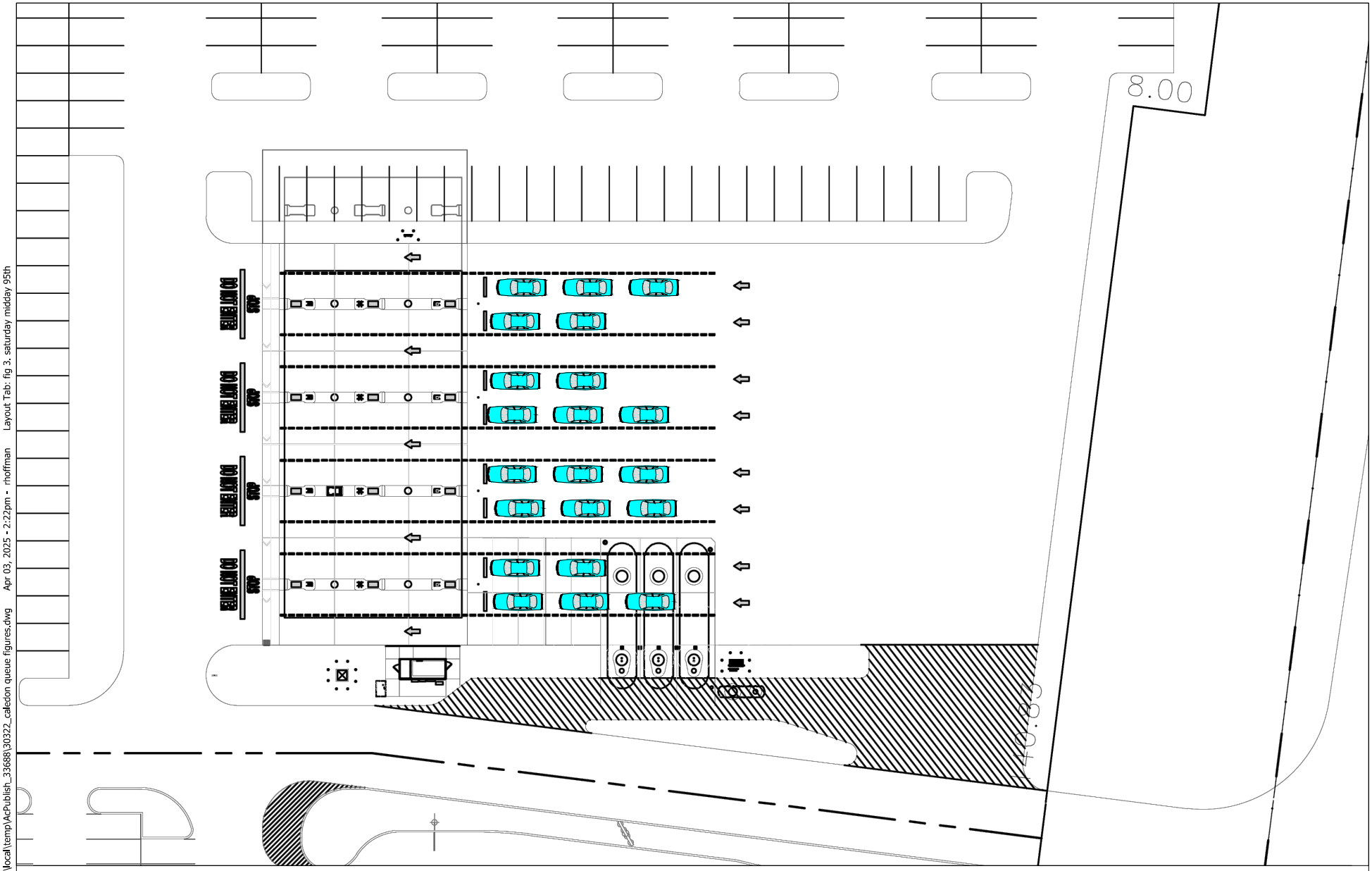
SITE PLAN RECEIVED ON 28 MARCH 2025

Anticipated 95th Percentile Queue
Weekday PM Peak Hour
Caledon, Ontario

Figure
2

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- Queued Vehicle

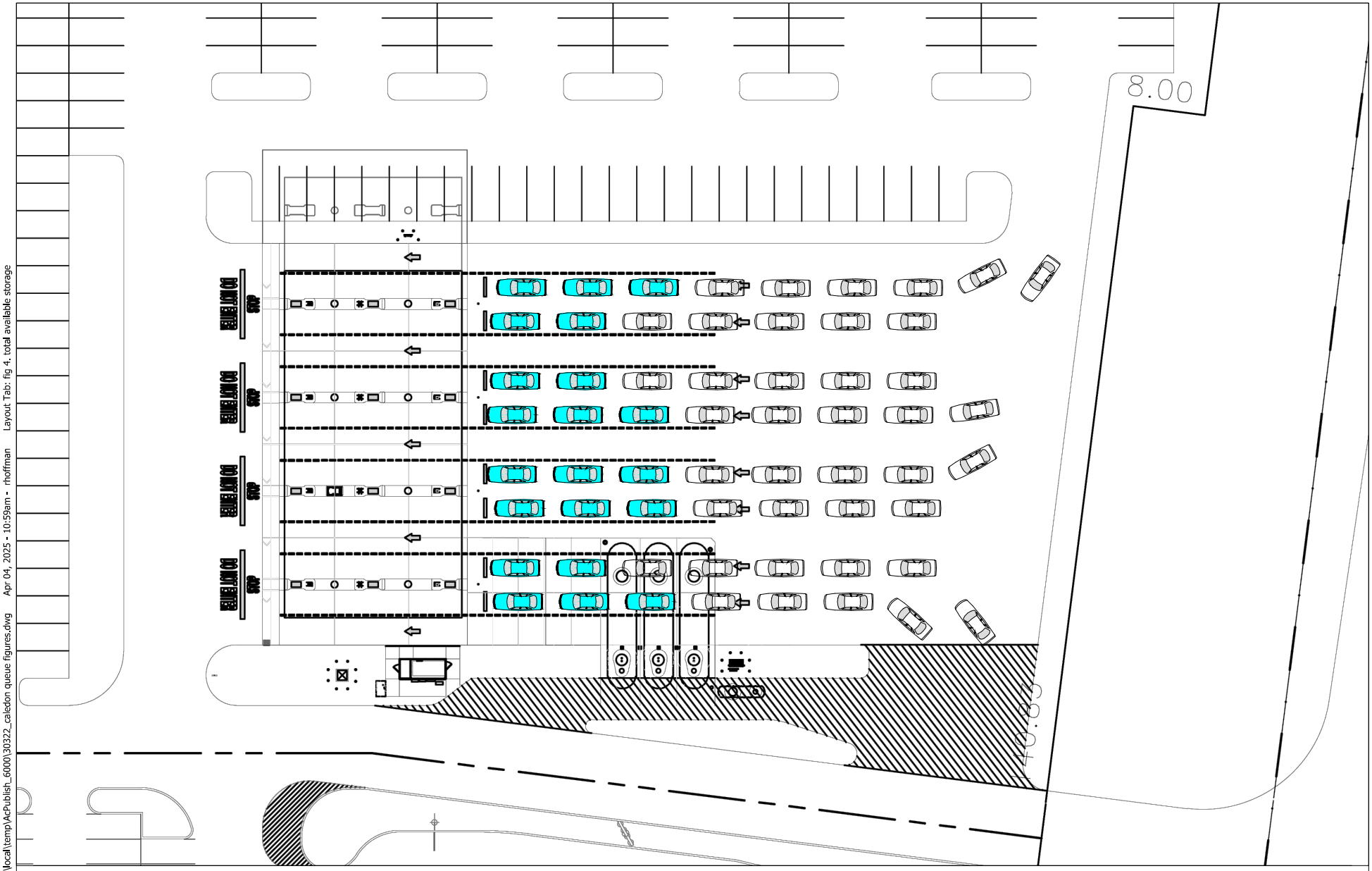
SITE PLAN RECEIVED ON 28 MARCH 2025

Anticipated 95th Percentile Queue
Saturday Midday Peak Hour
Caledon, Ontario

Figure
3

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- Anticipated Saturday Midday Queue (Figure 3)
- Theoretical Additional Vehicles Accommodated

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Theoretical Additional Vehicle Storage Capacity
Caledon, Ontario

Figure
4

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Conclusion

We trust this memorandum provides the required details regarding the anticipated performance and queuing of the Caledon Costco gas bar. If you have any questions, please contact Chris Tiesler at ctiesler@kittelson.com or 571.384.2943.