Good To Go! and Wave2Go Advance Ticketing Payment Options Study for Washington State Ferries' Fauntleroy Ferry Terminal

WSDOT

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1. Executive summary

Background

Washington State Ferries (WSF) is conducting a Planning and Environmental Linkages (PEL) Study to replace the aging Fauntleroy ferry terminal in West Seattle. The terminal serves more than three million riders per year on the "Triangle" route between Southworth/South Kitsap County, Vashon Island, and Fauntleroy.

The "Triangle" route is part of State Route 160, and the Fauntleroy ferry terminal is accessed by Fauntleroy Way SW, a minor arterial owned by the City of Seattle. It is the only WSF terminal not served by a state route or major arterial. The terminal faces many challenges, including vehicles backing up along Fauntleroy Way SW, with only one lane to serve two destinations. The dock is limited with capacity of 84 cars on average serving three Issaquah Class ferries that hold 124 cars each.

As part of the PEL study, WSF is considering strategies to improve terminal operations, including *Good To Go! (GTG!)* and Wave2Go (W2G) advance ticketing, and other operational changes to make it easier to walk, bicycle, roll and drive onto the ferry.

WSF's goals for studying *GTG!* and W2G advance ticketing at the Fauntleroy ferry terminal include:

- Improve operational efficiency, including processing vehicles more efficiently and supporting on-time performance.
- Determine feasible solution(s) for implementing *GTG!* at Fauntleroy that WSF could replicate at other terminals for consistent operations.
- Identify policy changes and weigh economic justice priorities necessary to support *GTG!* implementation.
- Evaluate the viability of maintaining the current dock size at the terminal.

In WSF's Summary of Planning and Environmental Linkages (PEL) Level 3 alternatives, which built upon the Level 1 and 2 screening process, two Level 3 alternatives are outlined that consider *GTG!* (Alternative A-2) or strategies to enhance and increase use of WSF's W2G advance ticketing (Alternative A-3). WSF identified four Level 3 screening criteria to help evaluate *GTG!* and W2G advance ticketing, including:

- Ability to improve operational efficiency (minimize dwell time, process vehicles more efficiently, maintain on-time performance).
- Project cost (design, planning, right of way, risk, construction) alignment with funding.
- Alignment with current project schedule.
- Policy risk.

This study evaluates all Level 3 alternatives.

- **Alternative A** – Similar dock size that maintains existing terminal berthing structures.
- **No Build and Alternatives A-1, A-2, A-3:**

  - No Build – Requires preservation and maintenance to keep the terminal functional and does not meet the purpose and need. WSF considers this option as a baseline for comparison as required by the National and State Environmental Policy Act.
  - Alternative A-1 – Similar dock size and new terminal berthing structures.
  - Alternative A-2 – Similar dock size as A-1 with the addition of *GTG!*
  - Alternative A-3 – Similar dock size as A-1 with an enhanced W2G advance ticketing as the only payment method.

- **Alternative B and B-1**
  - Alternative B – Longer, larger dock.
  - Alternative B-1 – Longer, larger dock with extra holding lane.

- **Alternatives B-2 and B-3**
  - Alternative B-2 – Longer, larger dock with the addition of two shorter holding lanes.
  - Alternative B-3 – Longer, larger dock with two shorter holding lanes.

- **Alternative C** – Longer, larger dock with extra-full-length holding lane and two shorter holding lanes.

WSF applied the following four *GTG!* options and one W2G-only advance ticketing option to the alternatives:

- Option 1 – *GTG!* as a payment option.
- Option 2 – *GTG!* semi-automated with toll booth ticket seller.
- Option 3 – *GTG!* dedicated, single-lane barrier concept.
- Option 4 – *GTG!* all-electronic tolling (no cash, credit or W2G payment option).
- W2G advance ticketing – enhanced W2G advance ticketing only (W2G).

GTG! is an account-based payment system. Instead of paying at the toll booth, charges are billed directly to a *GTG!* customer account. *GTG!* options 1, 2 and 3 maintain W2G advance ticketing to expand customer choice and provide consistency on the Triangle Route.

Between 50 and 60 percent of Triangle route customers purchase W2G tickets in advance, however many customers reload their ePurse or Multi-Ride tickets at the booth, which slows processing. Cash payments have the slowest toll booth processing times, which can slow ferry loading, especially during peak sailings. Increasing the use of W2G advance ticketing in any form saves time loading ferries.

Analysis

This study builds upon WSF's traffic analysis to help evaluate operational efficiency for all Level 3 alternatives. The analysis includes a traffic simulation model to determine total ferry unload and load times for all alternatives. This model also provides insight into how *GTG!* and W2G advance ticketing options perform for all alternatives based on the following metrics. The traffic analysis uses ridership projections from WSF's 2040 Long Range Plan with a three-boat schedule.

Processing time. WSF defines processing time as the time it takes to unload and load all passengers to and from the ferry. WSF modeled peak weekday load and unload times for

people walking, bicycling, rolling and driving for each *GTG!* and W2G advance ticketing option and each alternative. WSF analyzed two evening sailings and results show average time savings compared to the baseline "no build."

Schedule sailing dwell time versus model dwell time. WSF compared and analyzed the three-boat scheduled sailing dwell times (the time spent unloading and loading the ferry) with the model unload and load time results to identify potential time savings and its effect on on-time performance for each *GTG!* and W2G advance ticketing option. WSF measures on-time performance as the percentage of ferry trips that depart within 10 minutes of their scheduled departure time within a defined time frame.

Queueing

- Vehicle queue lengths: Measured in feet along Fauntleroy Way SW to the toll booth entrance.
- Vehicle queue length over time: WSF measured how fast the vehicle queue decreases over time.

Implementation costs and schedule. WSF calculated the cost and time to plan and implement *GTG!* based on a similar system. WSF considered project planning, contracting, community engagement, policy and fare change processes, operations and maintenance and customer service center support.

Customer experience. WSF considered features and benefits that affect customer experience, including fares, on time departures, less time unloading and loading, lower toll booth payment wait times and less backup along Fauntleroy Way SW.

WSF studied potential impacts of implementing all-electronic options on customers, including ferry dependent Vashon Island riders. The study considered the potential disproportionate impacts of increasing fares and changing fare payment methods on people who are ferry-dependent or marginalized communities.

Policy and fares. Based on available technology within the project timeline, WSF developed sample fare tables that progressively balance technology and maintain revenue neutrality with the following policies.

- WSDOT/WSF adheres to principles of Washington state's HEAL **(**Healthy Environment for All) Act, enacted in 2021.
- WSDOT's Title VI Plan outlines the steps to meet the requirements for programs or agencies receiving federal financial assistance and requires affirmative steps to ensure that prohibited discrimination does not occur in any of the recipient's programs or activities, regardless of funding source.
- The Federal Transit Act requires discounts due to age and disability, tribal agreements and state laws regarding discounted fares.

Conclusions

The results of this study show that *GTG!* and W2G offer minimal benefits to operational

efficiency for the Level 3 alternatives. The following outlines key concerns about *GTG! O*ptions 3 and 4.

- **Minimal time savings**. Based on the traffic analysis results, *GTG!* and W2G could save up to three minutes in unloading and loading ferries and reduce vehicle queues along Fauntleroy Way SW slightly over time. The time savings progressively increase to three minutes until the dock size and ferry capacity match (Alternative B), with no overall additional time savings for the largest dock options (B-1, B-2, B-3 and C). These time savings do not significantly help meet WSF's on-time performance metric of departing within 10 minutes of scheduled departure time, however, *GTG!* does better protect against large volumes of vehicles arriving at the same time.

- **Fare increases.** *GTG!* Options 3 and 4 could require an increase in fares by about 30 percent to align with available technology. Fare increases of this magnitude are unprecedented for WSF and would significantly burden people who are entirely dependent on ferries, living and working on Vashon Island.

- **Policy risk.** The fare increases associated with *GTG!* Options 3 and 4 do not align with the policies outlined above (Washington state's HEAL Act**,** WSDOT's Title VI Plan, and the Federal Transit Act).

- **Cost and schedule.** *GTG!* Options 3 and 4 are costly and would delay WSF's work to replace the aging Fauntleroy ferry terminal on time and within budget.

Based on the results of this study, WSF recommends pairing *GTG!* Option 2 with Alternative A-2 and advancing A-3 (W2G advance ticketing only) to Level 3 screening. WSF may consider fully automated tolling systems in the future that support the current fare structure.

- **Alternative A-2** with *GTG!* Option 2 best balances operational efficiency time savings up to 1.5 minutes or 10 percent, retains the current fare structure, costs less ($9M) and aligns with the project schedule (32 months). WSF may consider fully automated tolling options in the future once technologies that support the current fare structure are available.
- **Alternative A-3** W2G advance ticketing provides a shorter, lower-cost option saving up to 1.5 minutes. Future funding is planned to improve the W2G system with a new webstore and W2G app for more efficient processing and better customer experience. These upgrades allow WSF to fully integrate W2G with *GTG!* in future.

GTG! improves overall processing times at the toll booths on larger PEL alternative dock size. However, the time savings are minimal when the dock size meets or exceeds the size of the dock.

If WSF implements *GTG!* and W2G at Fauntleroy, the program will be evaluated as part of the *Good To Go* pilot program (WAC 468-300-040*)* to validate operations and evaluate customer behavior.

Table ES-1 summarizes the results of this study.

Table ES-1. Chart of Level 3 alternatives evaluation

PEL ALTERNATIVE	*GTG!* / WTG OPTION	TIME SAVINGS	COST (MILLIONS)	TIMELINE (MONTHS)	VEHICLE QUEUE LENGTH REDUCTION OVER TIME	POLICY CONSIDER-ATIONS
Alternative A	Option 1	(0.7) min.	$ 7.02	26	4 veh./min.	No
	Option 2	(0.5) min.	$ 9.13	32	5 veh./min.	No
	Option 3	0.4 min.	$13.92	56	5 veh./min.	Yes
	Option 4[a]	2.5 min.	$16.75	64	8 veh./min.	Yes
	W2G Adv. Ticketing	0 min.	$8.9	30	4 veh./min.	No
Alternatives A-1 A-2 A-3 No Build	Option 1	1 min.	$ 7.02	26	4 veh./min.	No
	Option 2	1.5 min.	$ 9.13	32	5 veh./min.	No
	Option 3	2 min.	$13.92	56	5 veh./min.	Yes
	Option 4[a]	3 min.	$16.75	64	8 veh./min.	Yes
	W2G Adv. Ticketing	1.5 min.	$8.9	30	4 veh./min.	No
Alternatives B B-3	Option 1	4.5 min.	$ 7.02	26	4 veh./min.	No
	Option 2	4.5 min.	$ 9.13	32	5 veh./min.	No
	Option 3	4.5 min.	$13.92	56	5 veh./min.	Yes
	Option 4[a]	4.5 min.	$16.75	64	8 veh./min.	Yes
	W2G Adv. Ticketing	4.5 min.	$8.9	30	4 veh./min.	No
Alternatives B-1 B-2	Option 1	4.5 min.	$ 7.02	26	4 veh./min.	No
	Option 2	4.5 min.	$ 9.13	32	5 veh./min.	No
	Option 3	4.5 min.	$13.92	56	5 veh./min.	Yes
	Option 4[a]	4.5 min.	$16.75	64	8 veh./min.	Yes
	W2G Adv. Ticketing	4.5 min.	$8.9	30	4 veh./min.	No
Alternative C	Option 1	4.5 min.	$ 7.02	26	4 veh./min.	No
	Option 2	4.5 min.	$ 9.13	32	5 veh./min.	No
	Option 3	4.5 min.	$13.92	56	5 veh./min.	Yes
	Option 4[a]	4.5 min.	$16.75	64	8 veh./min.	Yes
	W2G Adv. Ticketing	4.5 min.	$8.9	30	4 veh./min.	No

[a] No cash or credit option at terminal; all other *GTG!* options have a ticket seller at one or both toll booths.
veh./min. = vehicles per min.

2. Introduction

Washington State Ferries (WSF) evaluated the feasibility of implementing *Good To Go! (GTG!)* and Wave2Go (W2G) advance ticketing programs at the Fauntleroy Ferry Terminal to improve operational efficiency as part of the Fauntleroy Ferry Terminal Replacement Project. WSF considered ways to apply these technologies to reduce queue length and processing time to support on-time departures. WSF's analysis also identifies policy changes and economic justice priorities needed to support *GTG!* implementation.

This study helps WSF determine the feasibility of maintaining a similar dock size at the terminal. WSF used the following objectives to evaluate *GTG!* and W2G options that support operational efficiency, a key component of the project's purpose and need:

- Provide efficient and safe loading and fare processing for people walking, bicycling, rolling and driving.
- Invest in technology that enhances the customer experience and accommodates ridership growth, consistent with WSF's 2040 Long Range Plan (WSDOT 2019).

GTG! is a single price, account-based payment system used on current and future toll roads in the state of Washington. Its purpose is to assess and price a customer's trip quickly and efficiently and post the trip fee to a customer account for payment. The system was upgraded in 2021 and continues to meet the needs of millions of customers in the Puget Sound region.

This study builds upon WSF's Traffic Analysis that evaluates *GTG!* and advance ticketing options for the Level 3 alternatives.

WSF's Triangle route serves the communities of Vashon Island and Southworth/South Kitsap County communities from the terminal in West Seattle. The route serves more than 3 million passengers annually and is expected to grow, as discussed in WSF's 2040 Long Range Plan (WSDOT 2019).

Reducing the processing time at the toll booths is a component of the overall time to unload and load the ferry. Load time is one component WSF evaluated as part of studying payment prior to reaching the toll booth (advance ticketing) with W2G or *GTG!* payment.

Other components include:

- Analyzing the traffic microsimulations with VISSIM to inform *GTG!* viability and performance for Level 3 alternatives.
- Identifying policy changes and considerations needed to support *GTG!* or modernizing W2G advance ticketing.

In 2007, WSF launched the W2G electronic fare collection system to reduce wait times at ferry toll booths. This study analyzes the continued use and enhancement of W2G, adding *GTG!* technology to increase customer use with faster advance payment options.

Advance ticketing is defined as tickets purchased before the customer arrives at the ferry toll booth, including payments online, via mobile app or at a kiosk. Customers who bought a ticket in advance via the online webstore arrive at the terminal as a "pre-ticketed customer." Customers can also buy a Multi-Ride card online at the WSF customer store and use it for trips.

This study also considered W2G advance ticketing as the only form of payment as a separate option.

With an overall increase in W2G or *GTG!* advance ticketing, WSF aims to decrease processing times and optimize load times for each Level 3 alternative. The results of this study may also help WSF assess performance and viability of implementing *GTG!* or W2G advance ticketing systemwide.

WSF's prior evaluations of *GTG!* focused on fully integrating two different systems, which proved too difficult to achieve at the time. This study focuses on integrating *GTG!* at the terminal to maximize the following benefits:

- Enhance the customer experience by providing multiple options for payment to increase advance ticketing use.
- Evaluate operating W2G and *GTG!* systems in parallel.
- Minimize the complexity of aligning W2G and *GTG!* payment systems, which differ in age, purpose and function.
- W2G and *GTG!* each requires new functionality, updated business workflows and pricing to align with operational needs and customer use. By remaining separate, the systems provide redundancy while upgrading independently throughout their life and funding cycles. This approach considers a variety of payment options designed for faster throughput while leveraging all available technology to improve payment processing.

Charged with increasing overall loading efficiency, WSF developed four *GTG!* options based on complexity, scalability, potential for deployment at other WSF terminals, project implementation timeline and overall customer experience.

To achieve these measures, the following four *GTG!* options progressing in complexity were analyzed and measured against Level 3 alternatives:

- Option 1 – *GTG!* as a payment option
- Option 2 – *GTG!* as a semiautomated option with toll booth ticket seller
- Option 3 – *GTG!* as a dedicated, single-lane barrier concept
- Option 4 – *GTG!* as all-electronic tolling
- One hundred percent enhanced W2G advance ticketing

The performance of each option is measured and compared with a No Build base condition. This includes four *GTG!* and one stand-alone W2G option. The stand-alone W2G option is measured to understand the performance of using W2G only (all other payment options removed). This allows for a side-by-side performance comparison with *GTG!* Option 4 (-all electronic tolling).

By leveraging a comparable *GTG!* toll facility (Tacoma Narrows Bridge) dataset, the analysis of each *GTG!* option yielded a potential single-vehicle processing time. The processing times and estimated use percentages were used as inputs into the VISSIM microsimulation analysis. The model replicated the existing ferry operations at the terminal to determine new operational outcomes based on the new *GTG!* processing times combined with those of the Level 3 alternatives.

The operational options yielded potential time savings in modeled peak period pedestrian, bicycle, vehicle unload and load times relative to No Build (unload and load times) simulations and queue length changes on Fauntleroy Way SW.

3. *GTG!* and W2G Level 3 alternatives and screening criteria

Beyond operational efficiency, WSF assessed:

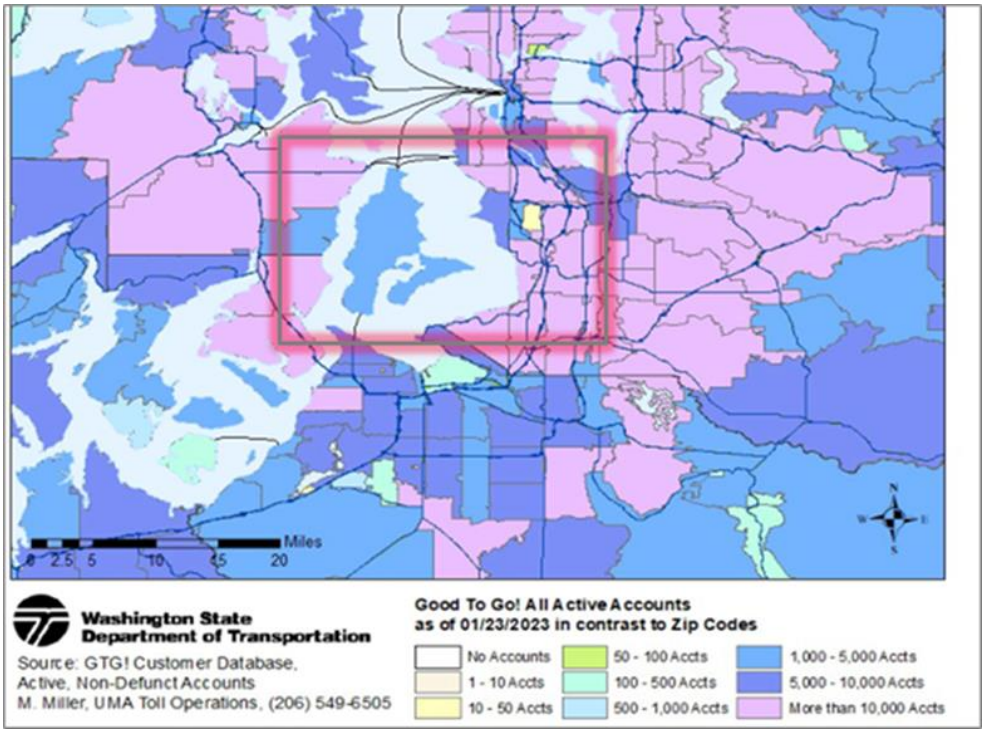
- Complexities and limitations
- Costs and timelines
- WSF business rules and technology changes
- Customer experience
- Equity, fare and policy considerations

As technology evolves, there will be more ways to connect to *GTG!* and W2G to increase pricing and discount flexibility and encourage customers to purchase tickets ahead of time.

This study centers on applying *GTG!* and W2G technology enhancements to achieve or enhance advance payment at the terminal. Overall, WSF's analysis outlines potential solutions and information based on additional advance ticketing choices and modeled peak period unload and load times for people walking, driving, bicycling, rolling and driving. Additional observations are presented, such as time savings, cost, flexibility, customer satisfaction, equity and policy for the Level 3 alternatives. The solutions can potentially be extended to other WSF terminals as a pilot or permanent application.

GTG! is an existing transportation payment system specializing in high-volume, fast-transaction processing used on select corridors in the highway system. It has a large and established customer base across the region. As shown on Exhibit 1, the Triangle route travel shed has many existing *GTG!* customers.

Exhibit 1. *GTG!* Customer map for Triangle route



The *GTG!* system enhancements allow for customization, flexibility and scalability, as demonstrated by the growth of toll facilities across the region.

Level 3 screening criteria

The Level 3 alternatives evaluation builds upon WSF's Level 1 and Level 2 screenings to determine how well alternatives or possible solutions to improve operations and preserve and upgrade facilities compare with the current conditions. WSF refined the alternatives and screening process with the goal of identifying an alternative through the Level 3 screening, including:

- Implementing *GTG!* and/or requirements for increased use of WSF's W2G advance ticketing to reduce vehicle processing time, improve customer experience and ensure equity for socioeconomic groups and ferry dependent communities. This includes identifying potential policy changes or impacts.

The Level 3 alternatives consider *GTG!* advance ticketing or requirements for increased use of W2G advance ticketing options to reduce vehicle processing time and improve customer experience. The two options build upon Alternatives A-2 and A-3 and consider advance ticketing options against all Level 3 alternatives. Alternatives A-2 and A-3 are as follows:

- Alternative A-2 – Replace dock at same size and location and add *GTG!*.
- Alternative A-3 – Replace dock at same size and location and add W2G advance ticketing.

WSF identified the following four applicable Level 3 screening criteria to evaluate and determine an overall *GTG!* and W2G advance ticketing recommendation in the PEL *Summary of Level 3 Alternatives 2024*:

- **Ability to improve operational efficiency (minimize dwell time, process vehicles more efficiently, maintain on-time performance).** The VISSIM microsimulation analysis uses *GTG!* inputs to measure vehicle processing times and provide the resulting modeled peak period pedestrian, bicycle and vehicle unload and load times and time savings models relative to the No Build option for each Level 3 alternative and *GTG!*--W2G combination. In addition, the model provides corresponding queue length variances over the modeled sailings for each option against each Level 3 alternative.
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- **Project cost (design, planning, right of way, risk, construction) alignment with funding.** Costs associated with hardware and software changes for the *GTG!* Back Office System (BOS) and Roadway Toll System (RTS) will be calculated. The cost is based on a similar single toll facility with toll booths (Tacoma Narrows Bridge) to determine implementation costs. The estimated pricing of each of the four *GTG!* options accounts for vendors, consultants and infrastructure costs.
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- **Alignment with current project schedule.** The timeline to construct the alternative includes time for policy review and changes, customer outreach, hardware and software changes for each ticketing option that will be used to determine a project schedule.
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- **Policy risk.** Applicable policies are considered and measured against related fares and WSF operational impacts. Based on existing policies, does the alternative present risk for substantial project delay?

Guiding principles and assumptions

The guiding principles and assumptions for considering *GTG!* and W2G for each Level 3 alternative are discussed in the following paragraphs.

Customer payment behavior. Increase customer payment preferences for the advance ticketing options of either *GTG!* or W2G. The greatest way to improve vehicle processing time is to convert more toll booth ticket purchases to an advance ticketing payment method.

Option independence. The options do not have to be used in sequence or start with Option 1. This allows ferries to consider the option that best balances operational needs with other WSF considerations,

Integration simplification. To reduce the complexity of integration and maximize customer options, the systems will remain independent.

Fare equity. Functionality enhancements for fares must adhere to all federal and state requirements, laws and agreements. Examples include discounts for senior and disabled customers, volume discount programs, tribal agreements, equity considerations, promotions and possible demand management programs (programs designed to encourage carpooling or off-peak travel).

The Washington State Transportation Commission sets fares based on recommendations from WSF and the public to meet budget requirements and state and federal laws and guidelines.

Current programs include the following:

- Free passage for youth under 18 years of age and younger. (WA ESSB 5973)
- Subsidized/discount travel of seniors and individuals with disabilities. (*49 U.S.C.* [United States Code] *Section 5307(c)(1)(D) of the Federal Transit Act)*
- Free passage for the Yakama and Nez Perce Sovereign Nations. (*Yakama /* Nez Perce *Nations Fare waiver policies)*
- Compliance with WSDOT's Title VI plan. (WSDOT, 2024)

Fare alignment. *GTG!* and W2G propose to function independently, without integration of the systems. It is necessary for the fare structures of both systems to have fare alignment to ensure consistency for the customer. The goal is to maintain the existing fare structure to the greatest extent possible. Products like Multi-Ride tickets and discounts will be maintained, but each system will capture them differently.

Fare evaluation. While balancing vehicle processing times**,** policy requirements and minimal impact to the current fare structure, WSF evaluated how fares might change with *GTG!*. Some level of fare restructuring may be necessary. WSF acknowledges fare restructuring must be considered with the overall customer benefit.

Advance ticketing improvements decrease loading times. The single biggest driver of vehicle processing is the time it takes to pay at the toll booth. Traditional payments such as cash and credit purchases for tickets at the toll booth are the slowest methods, averaging 30 seconds. The two advance ticketing systems, *GTG!* and W2G, have the fastest processing times.

Customer service. Dispute inquiries and communications standards are necessary to provide an optimal customer experience. The fare structures will be identical. However, Customer Service Center (CSC) support will follow the type of transaction (W2G or *GTG!*) used for payment by the customer. The goal is a seamless customer experience regardless of the transaction type at the CSC.

Considerations

Revenue impact of proposed fares. A fare review analysis will be conducted to show the potential fare structure for each *GTG! o*ption with the goal of creating equitable distribution of environmental benefits, revenue neutrality to meet revenue targets set by the Legislature.

Scalability potential. Based on the evaluation of *GTG!* and W2G advance ticketing, *GTG!* may be scalable on other WSF routes. There is a potential systemwide benefit of an additional *GTG!* payment option for the overall WSF customer base contributing to an enhanced customer experience and more consistent service. This could be a customer benefit at the terminal and throughout the WSF system where *GTG!* benefits can be tailored to specific routes.

Diversity, Equity and Inclusion considerations. WSF follows policies guided by the principles of Washington State's **Healthy Environment for All** (**HEAL) Act,** enacted in 2021. The HEAL Act sets standards for environmental justice, the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, rules, projects, and policies.

Environmental justice includes addressing disproportionate environmental health impacts in all laws, rules, projects, and policies with environmental impacts by prioritizing vulnerable populations and overburdened communities, the equitable distribution of resources and benefits, and eliminating harm.

Title VI of the Civil Rights Act "*prohibits discrimination based on race, color, and national origin in programs and activities. No person in the United States, on the ground of race, color, or national origin, shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.* WSF receives federal funds and must adhere to the federal guidelines in Title VI. This includes adverse effects that WSDOT must consider "…*significant individual or cumulative human, health or environmental effects, including interrelated social and economic*

WSDOT's Title VI Policy also includes language on whether a program is federally funded as follows "*…be denied the benefits of or be otherwise subjected to discrimination under any WSDOT program or activity, whether federally funded or not. WSDOT further assures compliance with related nondiscrimination statutes that prohibit discrimination based on sex, age, and disability in all its programs and activities, whether federally funded or not.*

EJ and Title VI of the Civil Rights Act address the distribution of the physical, social, and economic impacts of a proposed project and its potential alternatives. Protection of the community's civil rights and the fair distribution of a project's burdens and benefits lie at the heart of the issue, and WSDOT is required by state and federal law (see Section 458.

There a many federal and state requirements and directives that guide the Washington State Transportation Commission in establishing fares to meet federal and state standards and ensure economic justice (EJ) and the "fair treatment and meaningful involvement of all people…" and prioritizes *"equitable distribution of resources, benefits and burdens."* (HEAL Act, 2021)

Economic Justice is defined by the state as *involving collaboration among various stakeholders...and leverage and create an inclusive economy that benefits everyone in the long term.* (HEAL Act, 2021)

Fare policies. Below are the primary policies around WSF fares for the terminal project and others.

49 U.S.C. Section 5307(c)(1)(D) of the Federal Transit Act. Federally subsidized transit providers may not charge more than half of the peak fare for fixed route transit during off-peak hours for seniors, people with disabilities, and Medicare cardholders. This is not an Americans with Disabilities Act (ADA) requirement. Rather, this is a general condition placed upon those receiving federal funding for transit from the Federal Transit Administration (FTA). The discount does not apply for purposes of determining the fare for ADA complementary paratransit, which, under 49 C.F.R. [Code of Federal Regulations] Section 37.131(c), would be calculated without regard to discounts such as this.

ESSB 5973, or the 2022 **Move Ahead Washington** transportation legislation authorizing free passage for those 18 years and younger on all system routes, including youths riding as passengers in vehicles and those walking, bicycling, or rolling onto state ferries.

Tribal Fare Waiver Policy. All Yakama / Nez Perce Nation enrolled members and Yakama / Nez Perce Nations' government employees shall be allowed to travel for free when their enrollment card or employee identification card is presented to the ticket seller. The waiver shall also apply to the enrolled member or employee's vehicle without a Yakama / Nez Perce Nations license plate, regardless of fare type and length. Yakama / Nez Perce Nations government employees are only eligible when traveling on official business.

WSF shall allow free passage for all vehicles, regardless of fare type and length, traveling on WSF vessels with a Yakama / Nez Perce Nations license plate. The fare waiver will apply to the vehicle, driver and all passengers regardless of whether the driver or passengers qualify for the fare.

RCW 47.60.290 Fare Guidance. Though not specific to *GTG!*, this policy would apply to proposed fare changes with the addition of *GTG!* as a payment option.

The following is the Washington Legislature's guidance on fare setting:

- Recognize each travel shed is unique and might not have the same farebox recovery rate and the same pricing policies.
- Use data from the current survey conducted under RCW 47.60.286.
- Be developed with input from affected ferry users through public hearing and by review with the affected ferry advisory committees, in addition to the data gathered from the survey.
- Generate the amount of revenue required by the biennial transportation budget.
- Consider the impacts on users, capacity, and local communities.
- Keep fare schedules as simple as possible.
- While developing fare and pricing policy proposals, WSF must consider the following:
  - Options for using pricing to level vehicle peak demand.
  - Options for using pricing to increase off-peak ridership.

WAC 468.300.040. *GTG!* Pilot Program (Washington State Legislature)

The *GTG!* Pilot Program already establishes the following framework for special ferry toll rates:

- WSF Assistant Secretary will design the program, submit a proposed program, and fare schedule and fare policies.
- The Washington State Transportation Commission will review, modify and approve the fare schedule and fare policies before implementation.
- WSF will provide, at a minimum, updates to the Commission every 6 months of the pilot.
- The pilot will conclude no longer than 3 years from its implementation.

4. Fauntleroy ferry terminal overview

The terminal in West Seattle serves more than 3 million riders per year, supporting WSF's Triangle" route between Fauntleroy, Southworth/South Kitsap County and Vashon Island. The Triangle route communities have unique geographic and transportation needs, outlined below.

Southworth/South Kitsap County

Southworth/South Kitsap county is attracting more residents with the lure of affordable homes and remote work opportunities. The ferry is cited as a connection to more job opportunities and urban amenities in the Seattle/Tacoma metro areas, including the Seattle-Tacoma International Airport.

Southworth/South Kitsap County is a younger community with 43 percent of the population 15 to 47 years of age. According to Data USA , the average commute time is 30 minutes (Deloitte, 2023).

Before the pandemic, South Kitsap County had one of the highest rates of growth in the WSF system. This area expects continued growth as cited in WSF's 2040 Long Range Plan (WSDOT 2019). In addition, Southworth/South Kitsap County serves as a gateway to the Olympic National Park. Traffic increases during the peak summer season with visitors from around the country and Canada.

Residents of this community have other transportation options to reach Seattle, Tacoma and SeaTac, including the Tacoma Narrows Bridge and WSF's Bremerton Ferry, which transfers vehicles and passengers directly to downtown Seattle. Additionally, for passengers and bicycles, the Kitsap Fast Ferry runs eight round-trip sailings per weekday to and from Southworth to Pier 50 in downtown Seattle

About one-third of Triangle route customers travel to and from Southworth/South Kitsap.

Vashon Island

Vashon Island has been served by a WSF ferry from Fauntleroy since the 1950s, and the island's population is dependent on the ferries to connect them to work, goods and services (such as fuel, building supplies, food and health services to fill their most basic needs).

WSF ferries are the only way on and off the island for vehicles and passengers. On the north end of the island, the Vashon Island Ferry Terminal connects passengers to Seattle, and on the south end, the Tahlequah Ferry Terminal provides access to Tacoma. Access to medical and emergency care is vital to islanders because of the limited medical facilities on Vashon.

Vashon Island's population is older, with a median age of 52.1, ten years higher than the Washington state average (U.S. Census Bureau data). Its population experiencing poverty is0.3 percent (± 4.2 percent) higher than the state's average. As a ferry dependent community, low-income Vashon riders are particularly sensitive to price increases.

A King County Water Taxi operates on weekdays between Vashon Island and Pier 50 in downtown Seattle. There are 10 round-trip sailings per day from Vashon.

Comments received by WSF from Vashon residents emphasize frequent and reliable service as their primary concern. Vashon also attracts seasonal visitors during the spring and summer months to bicycle, hike and participate in island activities. Starting July 1, 2024, King County Water Taxi service will be expanded to nine weekday sailings per day with the addition of midday travel.

About two-thirds of Triangle route customers travel to and from Vashon Island.

Fauntleroy and surrounding communities

Fauntleroy is a group of residential communities in West Seattle. The ferry is a central feature of life dating back to the 1950s. During peak travel times and summer months, vehicles queue for the terminal in the shoulder holding lane on southbound Fauntleroy Way SW, a street serving the terminal, residences, businesses and local parks. In surveys, Fauntleroy customers value safety and security as it relates to the ferry and those entering and exiting the ferry. They have concerns about increased traffic, Lincoln Park/Cove Park access and environmental impacts to the surrounding areas. Additionally, an estimated 150 students from West Seattle and surrounding communities travel on the ferries during the school year to attend Vashon Island schools.

WSF recognizes the complexities of finding solutions that meet all the needs of the three Triangle route communities of Southworth, Vashon and Fauntleroy.

WSF has a strong commitment to working with advisory groups and engaging the public to find solutions that address the specific needs of each community.

Triangle route ridership

In 2019, the Triangle route had 1,335,490 annual vehicle trips (WSF 2019). Table 1 lists the monthly ridership (vehicle drivers, vehicle passengers and foot passengers) for each segment of the route. The ridership varies on the route throughout the year, with the highest ridership during July and August and the lowest ridership in November, January and February.

Table 1. Monthly Triangle route ridership

2019 WSF TRAFFIC STATISTICS RIDER SEGMENT REPORT			
Triangle Route	**Vehicle Drivers**	**Vehicle Passengers**	**Foot Passengers**
FA–SW	387,300	244,473	142,827
FA–VA	847,678	549,468	298,210
SW–VA	100,512	5,762	94,750
Totals	1,335,490	799,703	535,787

Source: WSF 2021
FA = Fauntleroy
SW = Southworth
VA = Vashon

Triangle route ridership attributes

- Ridership varies slightly throughout the week, increasing for all types of vehicles and passengers primarily from Monday to Friday.
- Vashon has one of the highest levels of single-occupancy vehicles (SOVs) in the WSF system. The number of passengers in vehicles increases on weekends, despite the reduction in the number of vehicles. This translates to a large drop SOV use and an increase in vehicles with passengers. This may be attributed to more social travel on weekends. (Cullen et al. 2018).
- Walk-on passenger travel decreases on weekends.
- Current methods of payment for travel at the terminal are online (Wave2Go.wsdot.com/Webstore) and at the two toll booths at the head of the terminal. All ticket types are offered at the toll booth. WSF ticket sellers accept prepaid passes, including One Regional Card for All (ORCA), credit cards and cash payments for vehicles (vehicles, trucks and motorcycles), drivers and any additional vehicle passengers. Ticket sellers are responsible for verifying the length of vehicles, so the proper fare is assessed and the appropriate special discounts for seniors, people with disabilities and youths are applied. Passengers walking, bicycling, or rolling onto the Triangle route ferries can pay at Wave2Go.wsdot.com/Webstore or in the passenger building at the kiosk(s).
- The existing dock has a smaller vehicle holding capacity than the ferries it serves. The shoulder holding lane traffic rules change throughout the day, with parking permitted during non-peak times.
- Triangle route ferries are delayed for Vashon Island ambulances and medical emergencies because ferries are the only way island residents receive emergency care.
- An estimated 150 school children travel from West Seattle to Vashon Island schools as walk-on passengers.

Unique Fauntleroy ferry terminal features

The terminal operations are complex in comparison to those of other WSF terminals. Among its constraints, the current dock cannot hold enough vehicles to fill an Issaquah Class ferry assigned to the Triangle route (124-vehicle capacity). Other observed constraints are described in the following paragraphs.

Sorting. As one of two multi-destination routes in the WSF system, terminal traffic attendants must “sort” vehicles by destination once they pass through the toll booth from Fauntleroy Way SW. Customers are traditionally sorted by a visual placard on the windshield (purple for Vashon and green for Southworth). When a vehicle passes through the toll booth, the staff direct the vehicle to the lane assigned to its destination for proper loading. Staff must make quick calculations about loads by destination in a small amount of space and time to load boats correctly and to full capacity for single- and dual-destination sailings.

Queueing along Fauntleroy Way SW. Vehicles approaching the terminal queue along the shoulder lane on Fauntleroy Way SW, north of the dock. Vehicles queueing in line must navigate

park entrances, bus stops and driveways (no stopping zones) to load onto the ferry. Residents and community members must cope with the queued traffic for access to driveways and Lincoln Park.

Chasing. The current dock holds about 84 vehicles, leaving the remaining 40 vehicles to queue in the shoulder lane on Fauntleroy Way SW. As the first 84 vehicles begin loading and space becomes available, the remaining vehicles must be processed at the toll booth, sorted on the dock by destination and loaded onto the ferry. This is referred to as “chasing.” While sorting, staff must determine the destination of the “chasing vehicles” to load the boat correctly for off-loading while trying to load the ferry to capacity in the scheduled time to maintain on-time departures.

Triangle route fare complexity. Because of the multi-destination legs, Triangle route fares differ by destination from the terminal including round-trip and one-way fares. Fares are based on distance traveled on the ferry. The longer route, Fauntleroy to Southworth, has a higher fare due to the longer distance traveled.

Most vehicle/driver tickets in the WSF system are one-way except for Fauntleroy/Vashon, Southworth/Vashon, Point Defiance/Tahlequah and Anacortes/San Juan Islands.

Table 2 lists the terminal fares. Most tickets and passes are available online and at the toll booth, with exceptions noted in Table 2.

Table 2. Fauntleroy terminal fares

FAUNTLEROY TERMINAL FARES	
Fauntleroy Fare Collection	**TO VASHON** • Round-trip travel (all fares). **TO SOUTHWORTH** • One-way travel from Fauntleroy to Southworth (Vehicles, motorcycle and drivers). • Round-trip travel adult passenger, bicycle and adult rider.
Southworth/Vashon Fare Collection	• One-way travel Southworth to Fauntleroy (vehicles, motorcycles and drivers). • Round-trip travel Southworth to Vashon (vehicles and drivers).[a]
Vashon Fare Collection	• Passenger fares from Southworth to Vashon are scanned on Vashon.
Youth	• All passengers under 18 years of age travel free regardless of mode of travel unless driving a vehicle (age 15-18 years).
Multi-Ride Passes. *expires 90 days from date of purchase	• Passes are available for the vehicle and driver and motorcycle and driver, and walk-on and vehicle passengers. • Multi-Ride passes for vehicle and driver and motorcycles and drivers are available (10 rides FA–VA and VA–SW) and 20 rides (SW–VA and SW–FA). • Multi-ride passes for walk-on and vehicle passengers. • FA – VA – 10 rides (round trip). • FA – SW – 10 rides (round trip). • SW – VA – 10 rides (round trip) NOTE: Collected on Vashon.
Revalue Multi-Ride Passes *expires 90 days from date of purchase	• Available for purchase only at Wave2Go.wsdot.com/Webstore. • Re-Value card mailed to the customer. • Replenishment with a credit card on file when tickets are used or expire.
Monthly Passenger Pass	• Vehicle passengers and walk-on passengers. • Re-value monthly passenger pass
Vehicle size	• Fares vary by size (car, buses, trucks). • Truck fares may include vehicle length. • Additional costs for trucks over 80 feet in length
Onsite Purchase Only	• Commercial and oversized vehicles can only be purchased at the toll booth for non-business accounts and vehicles over 40’ length. Commercial vehicle length-based tickets can be purchased in advance through Business Wave2Go account (up to 40').
Peak Season Fares	• In effect May to September. • Peak Season fares do not apply to Multi-Ride passes or passenger fares
Fare Verification	• Verification required for senior and disability fares at toll booth.
ORCA Pass	• Load card with a cash value. • Available for walk-on or vehicle passengers and to purchase vehicle fares • WSF passenger monthly or Multi-Ride passes can be loaded onto an ORCA card[b] • ePurse can be used to pay for any passenger or vehicle fare at the toll booth.

[a] Vehicle and passenger ticket are only required when departing Southworth.
[b] ORCA card is a transit payment card for Puget Sound.
[c] ePurse is a method for adding funds to your ORCA card.

5. WSDOT fare payment programs

GTG! tolling system

For more than a decade, Washington state has used tolling as a tool to manage congestion, enhance mobility and fund public improvement projects.

Exhibit 2 on the next page shows the three key components of the *GTG!* tolling system.

Roadway Toll System (RTS). The RTS is the equipment installed on toll roads and bridges that captures a vehicle's details when passing through a tolling point. The RTS generates a toll transaction and associates a cost. Based on how the details are captured (license plate or *GTG!* pass), the cost of the toll is determined and reported to the Back Office system (BOS). Drivers using toll roads have the following options to pay for tolls:

- Cash/credit card at a toll booth if one is available (only on the Tacoma Narrows Bridge).
- Electronically by opening an account with a payment method and purchasing a *GTG!* pass. Drivers with an account pay the lower *GTG!* rate.
- Pay By Mail, where the license plate photo is used for identification, and a bill is sent to the registered owner of the vehicle at a higher Pay By Mail toll rate.

GTG! toll systems are currently installed at the following locations:

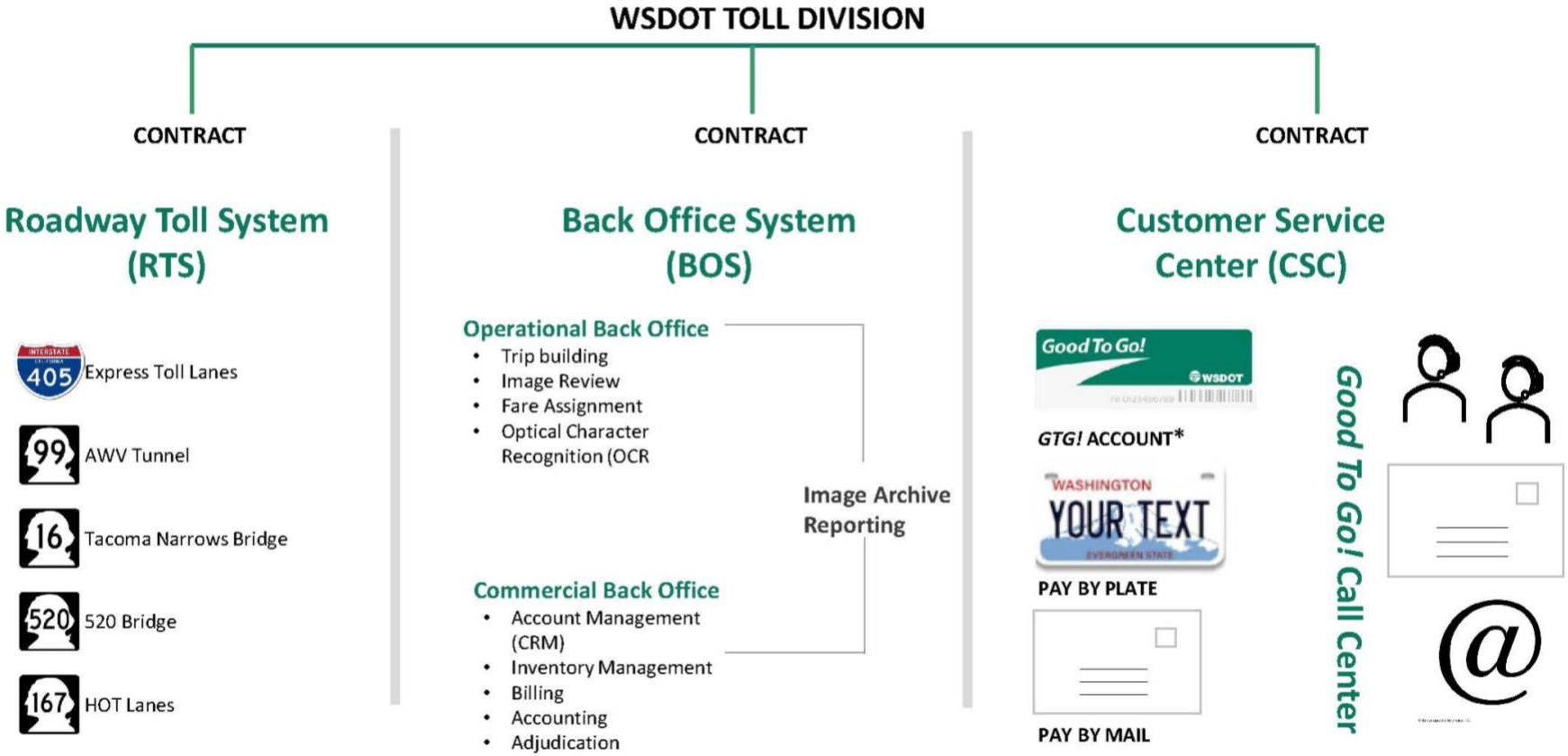
- Interstate 405 express toll lanes
- State Route (SR) 16 Tacoma Narrows Bridge
- SR 167 high occupancy toll lanes
- SR 99 Alaskan Way Viaduct replacement tunnel
- SR 520 Bridge

Back Office System. The BOS is a centralized hub that connects the RTS and Customer Service Center (CSC) and supports the customer-facing website for self-service and account management.

A toll road driver (vehicle owner) may open a personal or business account, fund the account by selecting a payment option and buy an electronic pass to install in the vehicle. Every time a vehicle with a *GTG!* pass goes through a tolling point, bridge or tunnel, the RTS reads the pass details and generates a toll transaction. The toll transaction is sent from the RTS to the BOS, where the pass associated with that account is identified, and the transaction is posted to the driver's account.

The toll amount for the transaction is then deducted from the driver's account balance. When the account balance falls below a minimum threshold, the customer can add funds (automatically or manually) by attaching a credit card or other approved payment method to the account. The BOS maintains an inventory of passes, which are sold to customers who open a new account or require additional passes for an existing account.

Exhibit 2. Key Components of the *GTG!* tolling system



A new *GTG!* BOS system was launched in 2021 with a suite of new features based on customer feedback.

- Toll bill payment and account management features.
- New “Pay As You Go” account that does not require prepayment. Tolls are accrued on an account, and the credit card on file (required) is debited twice a month for prior toll use. Tolls are billed at the lowest toll rate.
- Full accounting and transparency on monthly bills with all trips, charges and credits in one location.
- Customer online history records for all transactions.
- Large, existing customer base that is expanding with 2 million active *GTG!* passes. It is anticipated the customer base will grow with the addition of new toll facilities in western Washington over the next 5 years.
- Planned process to add other (interoperable) passes to the *GTG!* System (Oregon, California, Best Pass, Audi, etc.).
- Local rental agency and renter accounts with online self-service.
- National fleet account management.
- Business account management (Amazon, UPS, FedEx, etc.).
- mygoodtogo.com self-help improvements, such as add, remove, and borrow (loaner) and removal of vehicles, online payment for toll bills and management of disputes.
- Ability to provide custom discount plans, multiple fare structures (Tribal, time-of-day, carpool, etc.).
- Tiered pricing plans for vehicles with a pass and vehicles without a pass.
- Customized pricing by facility and time of day.

Customer service center (CSC). The CSC is the customer-facing function of tolling, providing services from customer inquiries, disputes, account setup, bill payment and pass management. The CSC operations staff uses the *GTG!* BOS application to provide customer service to *GTG!* customers.

Table 3 provides information about the *GTG!* account types.

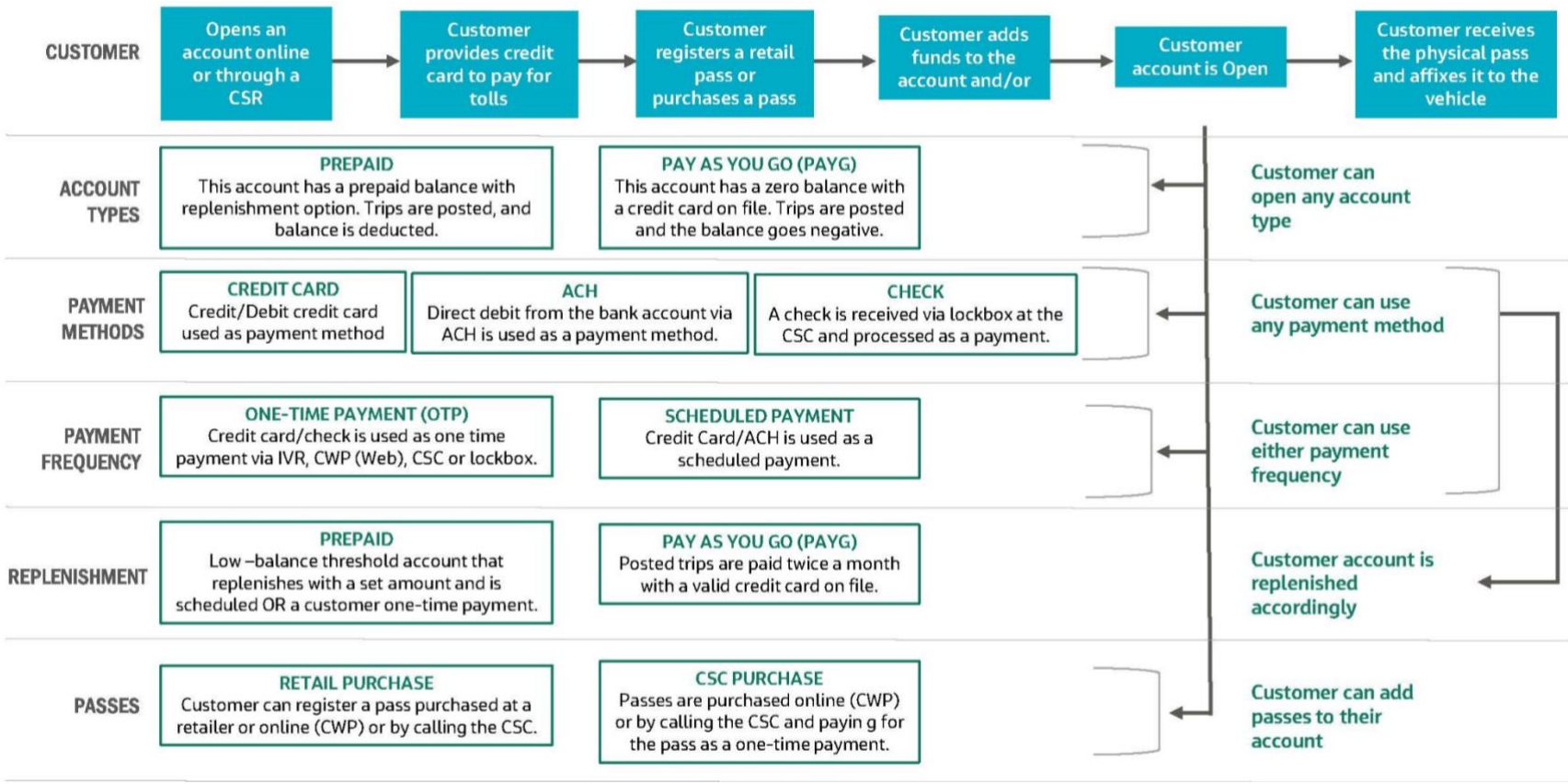
Table 3. *GTG!* account type descriptions

ACCOUNT TYPES	DESCRIPTION
Prepaid Individual	Set up by an individual customer with a positive balance of $30. Tolls are deducted from the balance. Customers can pay with a credit card or electronic check. The account is replenished when it meets an $8 minimum balance or higher balance, as specified by the account holder.
Prepaid Business Fleet	Set up by a business with a positive balance of $30. Tolls are deducted from the balance.
Pay As You Go Individual and Commercial customers	Set up by an individual customer with a valid credit card, which is charged twice a month to pay for any tolls posted to the account.
Pay By Mail Regular Individual and Commercial customers	Set up by an individual customer or business with zero balance on the account. A toll bill is mailed on a monthly billing cycle.
Pay By Mail Rental Agency	Set up by a rental agency with zero balance on the account. A toll bill is mailed on a monthly billing cycle.
Pay By Mail System Individual and Commercial customers	Set up by the system for an individual or commercial customers without a *GTG!* account who uses a toll road. The vehicle license plate details are used to identify the registered owner with details from the Washington Department of Licensing (DOL) and to establish a pay-by-mail account for billing. A toll bill is mailed on a monthly billing cycle.
Pay By Mail Rental Individual	Set up by a customer service representative for an individual rental customer. A rental agency identifies the renter and provides the renter's details for billing, including dates and times of use. A toll bill is mailed on a monthly billing cycle.
Pay By Mail Rental Commercial customers	Set up by a customer service representative for a rental agency customer. A rental agency identifies the renter and provides the commercial renter's details, including dates and times of use. A toll bill is mailed on a monthly billing cycle.
Short Term Individual and Commercial customers	Set up by an individual or business with a valid credit card for short-term- use with a start date and end date set for the account to close. All tolls posted during the account's open period are paid, and the account is closed by the system on a set date.

Account establishment. Customers can open an account and order passes online or through the CSC. Passes can also be purchased at select Fred Meyer and QFC stores. CSC staff can also set up a *GTG!* account for customers. Once an account is established and the pass is installed on the vehicle, the customer pays for tolls using their *GTG!* account. Account holders' customers without a *GTG!* pass pay an additional 25 cents per toll.

The workflow for customers to establish an account is shown on Exhibit 3. After establishing an account and installing the pass on their vehicle, the customer can pay for tolls using their *GTG!* account.

Exhibit 3. Establishing a *GTG!* Account



ACH = Automated Clearing House (electronic check payment)
CSR = Customer Service Representative
CWP = Customer Web Portal

Toll account management. The *GTG!* BOS application allows CSC staff to perform various toll customer services. Any updates or changes are tracked in the *GTG!* BOS application, creating a complete audit trail of updates.

Toll account replenishment. The *GTG!* BOS application allows the customer to automatically replenish their account when their balance falls below a specific threshold by setting up a payment method (credit card or electronic check). For example, a *GTG!* prepaid account starts with a balance of $30 and has a replenishment threshold of $8. As transactions are posted to an account and the balance falls below $8, the BOS application will use the payment method on the account to replenish funds based on the set replenishment amount set (typically $30).

The *GTG!* BOS application self-service channels (for example, www.mygoodtogo.com, interactive voice response and mobile applications [iPhone and Android mobile phones]) allow customers to set up, view and update replenishment thresholds and payment methods on their account at any time.

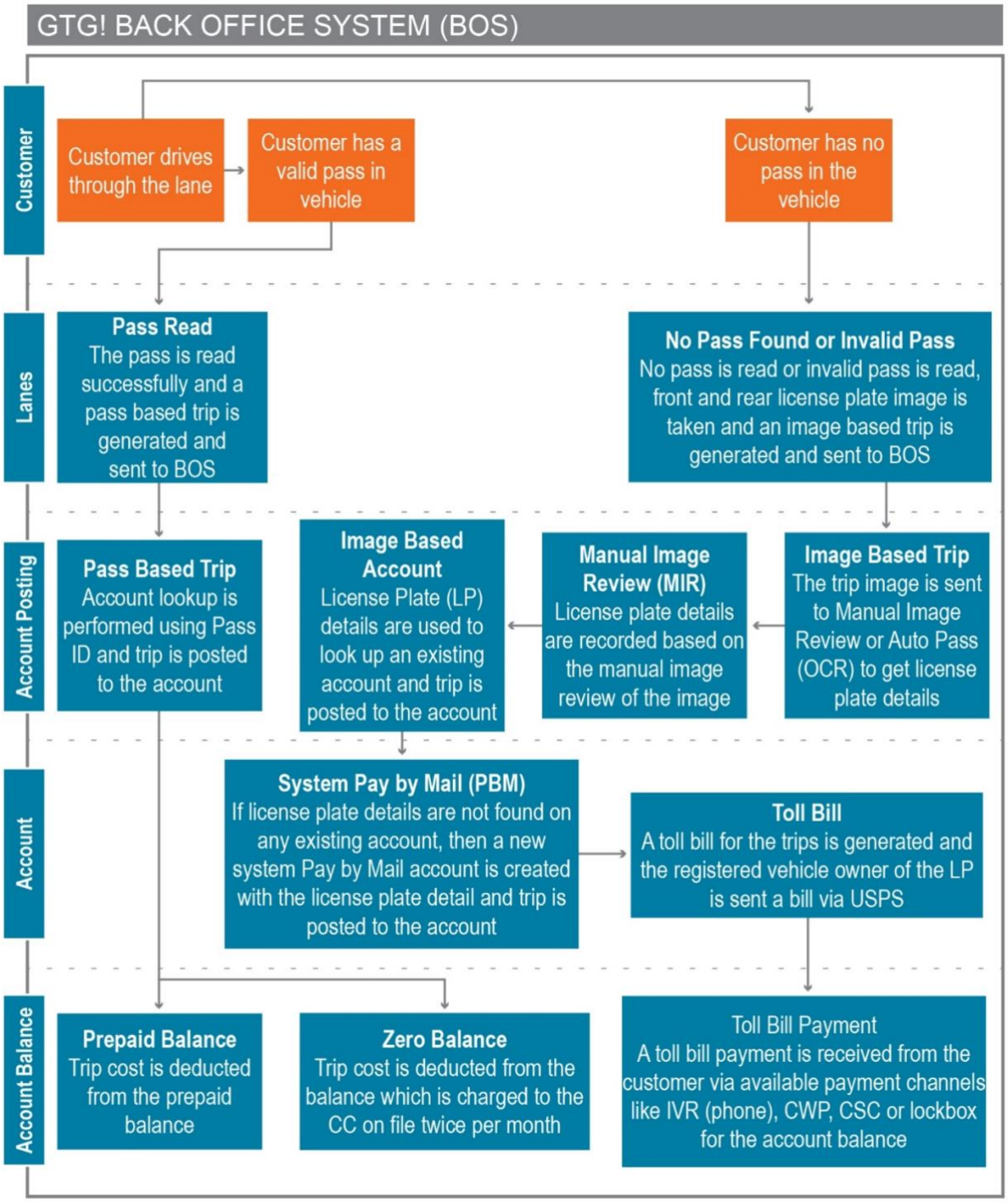
Toll posting. The *GTG!* BOS application interfaces with the RTS to receive toll transactions from each toll facility and post them to a customer account. The RTS either generates a pass-based- toll transaction, or if a vehicle pass is not read, it takes photographs of the license plate. The image-based transaction is sent to the BOS. The *GTG!* BOS application uses the pass details to look up the customer account and correctly post the toll to the account.

For image-based toll transactions, the BOS application uses a manual image review process where the license plate details are recorded based on a manual review of the image. Once the license plate details are recorded, an initial lookup is performed to determine whether there is a license plate match for a valid *GTG!* account.

If there is a match, the toll transaction is posted to the account. If details are not found, then a DOL lookup is performed, and the DOL's registered owner details are used to create a system Pay By Mail account. A toll bill is mailed to the registered owner of the vehicle at the higher Pay By Mail -I toll rate.

Exhibit 4 (*GTG!* BOS flowchart) shows how a customer payment is processed through the BOS.

Exhibit 4. *GTG!* Back Office System flowchart



W2G system

W2G is the electronic fare payment system for WSF, which moves people and goods throughout the Puget Sound. Established in 2007, the W2G fare payment system was designed to modernize the ticketing and payment process for ferry customers and expedite operations on WSF's 14 ferry routes. The W2G system's strengths include convenience, passenger familiarity with the system, and ability to use multiple fare types. Reservations on specific routes are managed by a separate system (SaveASpot) that allows the customer to reserve place on the ferry.

W2G supports two types of transportation services: toll marine highway and transit service. It allows passengers to purchase tickets online, download them to an ePurse or mobile application, print them at home or buy them at a kiosk or at a toll booth at the terminal. WSF accepts major credit cards and cash payments.

W2G also offers discounts on tickets for Multi-Ride purchases and specialty customers such as seniors, youth and disabled persons. There are products for frequent users, occasional users and visitors. W2G also manages a reservation system for some routes, providing assurance to customers that they have a place on a specific sailing.

WSF/W2G ticketing

The following are ways to purchase W2G tickets:

- The W2G website (Wave2Go.wsdot.com/webstore) offers direct purchase of most fare passes (credit card only). Tickets can be mailed, emailed and/or added to an e-wallet for redemption and are then presented at the toll booth. Credit cards and cash are the accepted forms of payment at the toll booth.

- With an ORCA Transit Card, which can be loaded with a pass (monthly passenger, or passenger Multi-Ride) or stored value on an ePurse. Customers present the card at a toll booth for vehicles and passengers or walk-on passengers scan the card at the passenger kiosk.
- At a WSF ticket kiosk in the terminal building.

Ticket purchase details

- Ticket prices are locked in when sold and are valid through their expiration date even if prices change. Prices are the same for online and toll booth purchases.
- Most tickets expire 90-days from the date of purchase. Unused tickets are not refunded. The monthly passenger pass for frequent travelers (good for up to 31 roundtrips) is valid for a calendar month.
- Physical tickets and ticket images (Photo, ePurse or third-party app) are scanned at the toll booth or kiosks.
- Tickets can be scanned into a third-party application such as Ferry Friends. The app is not supported by WSF. The app is shown at the toll booth for payment and tracks remaining rides in the app (Multi-Ride passes).

- Customers get a receipt for ticket purchase from the ticket seller. Multi-Ride customers are responsible for tracking their remaining rides.
- Tickets are not specific to an individual and can be shared. Ticket sharing is limited; tickets cannot be used at multiple terminals at the same time. ORCA cards and monthly passes cannot be shared.
- Separate tickets must be purchased for the vehicle/driver and for vehicle passenger(s).

  Corporate accounts (that is, trucking fleets or business vehicles) are set up online only.
- Regardless of ticket type, all customers must stop at the toll booth /kiosk where tickets are redeemed. A ticket seller verifies the type and length of a vehicle and the number of passengers and determines the fare(s) for payment.

The key components of the W2G system and specific elements applicable at the terminal are described in the following subsections.

Fare policy and funding

Like *GTG!*, the Washington State Transportation Commission is charged with balancing policy objectives, legislative budget targets, state, federal and tribal laws and agreements, operational constraints and customer concerns. Fares are determined by the Commission using a method that includes the following:

- Demand management policies designed to influence customer behavior to use infrastructure in more efficient ways. An example of this would be reducing SOVs or spreading demand across more sailings.
- Discounts to account for impacts on overall customer costs (frequent use, youth free travel, commercial fleets use or similar) and other policies such as discounts for seniors and disabled persons, free passage and Yakama / Nez Perce tribal members.

As part of WSDOT, WSF relies on legislative budgets and limited transportation resources to provide funding to upgrade and maintain W2G. In some cases, the Washington State Legislature sets fares (for example, free fares for passengers under 19 years old) and other rules, including the current authorization of a *GTG!* pilot.

W2G usage

An estimated 50 to 60 percent of 2019 Triangle route tickets were purchased through W2G in advance (e.g., Multi-Ride tickets).

W2G ridership

As with all transportation networks, ferry ridership declined during the pandemic. Starting in 2022, ferry ridership rebounded from pandemic lows with more than 1.3 million additional riders boarding ferries in 2023 and reaching annual ridership of 18.7 million.

The rise in annual ridership was fueled by a large jump in walk-on passengers, a 14.2 percent increase “as tourism and in-person work continued to rebound from the COVID pandemic.” (WSF 2024).

Vehicle traffic on ferries rose by 372,000 in 2023, or 4.3 percent, continuing a two-year growth trend.

Ridership in 2023 was at 78 percent of pre-COVID-19 levels, with vehicles at 86 percent and walk-on customers at 56 percent of 2019 numbers. Ridership is expected to increase. Demand is projected to grow 21 percent by 2040 (WSF Long Range Plan 2019).

Specifically, at the Fauntleroy terminal over the last two years, ridership has mirrored the overall trend and continues to climb from pandemic lows. According to the 2023 Traffic Statistics Rider Segment Report, travel patterns have changed as have the types of trips (WSF 2023). This information is displayed in Table 4.

Table 4. Post-pandemic traffic statistics for the Triangle route

TRIANGLE ROUTE	2023 TRAFFIC INCREASES*			
	Total Riders	Vehicle/Driver	Vehicle Passengers	Foot Passengers
Fauntleroy to Vashon	5.7%	9.3%	7.6%	13.2%
Fauntleroy to Southworth	7.5%	8.4%	2.9%	26.7%
Southworth to Vashon	1.7%	1.1%	1.1%	1.6%

Source: WSF 2023 *Compared to 2022 traffic

In January 2024, WSF published a contingency plan to address challenges with staffing, an aging fleet, and service levels because of these and other constraints. As it applies to the Triangle route, there is currently a two-boat service with a plan to return to three-boat service to accommodate current and WSF projected increases in ridership (WSF Long Range Plan 2019). Until then, these challenges may affect service on the route, especially during peak travel times and seasons.

W2G fares and fare payment

There are two main types of fares for passengers on the Triangle route: single ride and Multi-Ride. Multi-Ride ride tickets (10 rides) on this route can be a one-time purchase or an automatic replenishment (ReValue). Table 5 displays W2G ticket details.

Table 5. W2G Triangle route Multi-Ride tickets

MULTI-RIDE TICKETS[a] • Valid up to 90 days from purchase • 10 one-way rides per purchase for SW-FA 10 round trip rides per purchase for FA-VA or SW-VA vehicles/motorcycles (10 roundtrips) • Discounted from single fares. • Cash or credit card **REVALUE TICKETS**[a] • Charges automatically • Replenished when all rides are used, or ticket expires (90 days from date of purchase) • Credit card payment only • Initial order shipped by mail only		**FA–SW or SW–FA**	**FA–VA or SW-VA Round-trip**
	Vehicle and Driver 14 to 22 feet	$221.70	$180.80
	Vehicle and Driver Under 14 feet	$175.10	$142.45
	Adult Passenger (Ages 19 to 64)	$ 61.90	$ 52.40
	Motorcycle/Driver	$ 97.70	$ 78.10
[a] Tickets for more expensive routes can be used on less expensive routes.			
Senior passenger Revalue Tickets – 5 rides (Card) **Disability passenger** Revalue Tickets – 5 rides (Card) **Monthly pass ReValue** – 30 days for the month – (maximum of 31 trips per month)			
- Requires proof of eligibility for senior or disability fares - Automatically recharges credit card (five rides when all rides are used or upon expiration)			
Youth fares (18 years old and under)		Free	

WSF fares are based on the route's geographical location; the length of the vehicle; and the length of time (distance) of the ferry route. As demonstrated in the ticket price, the Triangle route distance is shorter to Vashon and farther to Southworth. There are two discount fares for customers based on age or disability; these types of tickets require eligibility verification and are half the regular passenger fare.

Peak Season fares. Starting in May and through the end of September, ferries charge a peak season surcharge for single-vehicle fares. Passenger and Multi-Ride tickets are not included in the seasonal price change.

Business account. Business accounts assist WSF's commercial customers who have multiple vehicles using the ferries. WSF allows commercial customers to open business accounts and provide their drivers or passengers with a way to pay a fare. Once the account is open, it allows an authorized account manager to order multiple charge cards for their use.

Charge cards are mailed to the registered business address and can be used by the business user to pay for any fare product for the vehicle and passenger. Charge card use is tracked by

the W2G payment system. At the end of the month, an invoice is sent to the business for payment. Invoices for these accounts are payable by check only.

ORCA cards. ORCA is the regional smart-card product used by seven Puget Sound regional transit agencies, including WSF. WSF accepts ORCA for passenger full fares, monthly and Multi-Ride fares, and for employer purchases of passes. This primarily includes passenger fares.

Wide, tall or heavy trucks. Special arrangement or preapproval may be required before travel for these types of vehicles (for example, a large moving truck). A request form must be submitted and approved before travel.

6. Architectural analysis

This section explores the required adjustments that must be made to the *GTG!* BOS to incorporate the terminal. This includes changes to the existing *GTG!* workflows to allow WSF customers to pay with *GTG!*.

All proposed architectural system changes to *GTG!* relate to the following:

- A customer opt-in design requirement for WSF transactions is necessary due to the significantly larger dollar value per ferry trip as compared to tolling.
- Prepaid and postpaid transaction business rules as decided by *GTG!* and WSF.

Base architecture changes

WSF currently uses the W2G online webstore, kiosks, and toll booths to sell tickets. All W2G ferry tickets are purchased and paid for in advance or at the toll booth before travel. Advance purchasing and payment are a fundamental difference between W2G and *GTG!*. *GTG!* receives most payments after trips are completed. This is a foundational reason for two independent systems.

Because of the differences in architecture between W2G and *GTG!,* the best way to enable *GTG!* to accept and route WSF transactions is by adding a "WSF" workflow to the *GTG!* architecture. In the following discussion, each *GTG!* option is analyzed for integration and includes sample workflows for how the system would accommodate WSF transactions on both the account level and at the terminal.

Payment collection changes

The W2G and *GTG!* systems allow prepayment (prepay) for travel. W2G customers primarily prepay but allow for payments after a trip is taken (post-pay) for approved business accounts.

Vehicles and vehicle passengers must prepay for tickets ahead of travel (at the toll booth, on the W2G website, or at a kiosk) with credit cards or cash.

W2G payment. The W2G system allows post-pay for business accounts that register with W2G and use a W2G-issued charge card associated with the account to track the trip and send the invoice at the end of the month. The business must pay with a check upon receipt of an invoice. In general, this type of account is used by businesses and fleets. Business accounts receive a built-in discount if their usage hits a threshold per WAC 468-300-040. The discount is applied on the monthly invoice.

***GTG!* payment**. Alternatively, *GTG!* allows individual customers and businesses to either set up payment methods as prepay, which requires an account with a valid form of payment, (credit card or electronic check) or post-pay. Post-pay account examples include accounts without a payment method on file. Post-pay for ferry use triggers the system to send a bill. The bill is mailed to the registered owner of the vehicle. *GTG!* customers without an account are billed in a similar method where a license plate is used to track and mail the bill to the registered owner of the vehicle. *GTG!* also offers business and fleet accounts to help customers manage large numbers of vehicles. Business and fleet customers are sent a consolidated bill each month.

Fundamentally, WSF receives payment before travel (prepay), whereas *GTG!* collects payment after the trip is taken (post-pay). There are pros and cons for each method of payment. The potential for leakage in revenue reconciliation is greater with post-pay. Leakage can occur for assorted reasons, such as system issues, incorrect addresses, license plate photo quality and more. While not a significant occurrence, leakage is a fundamental difference of *GTG!* technology and would need to be accepted in some form by WSF. Each *GTG!* option is described in the following discussion and sample WSF BOS workflows are included that would need to be developed for each *GTG!* option.

Infrastructure and equipment changes

The following eight types of equipment of systems are needed for implementing *GTG!* at the terminal and are accounted for in the cost estimates:

RFID pass reader – An RFID reader is a radio frequency device that emits a signal through an antenna. This signal is received by the RFID pass that responds to the signal from the reader by providing its key identification information.

The pass response is read by the reader, and using different protocols, the RFID reader and the RIFD pass communicate with each other. RFID readers read the pass ID when the pass is in the RFID reader read zone (20 to 30 feet around the antenna) and send the information to the lane controller system.

Lane controller system – The lane controller system is a customized computer system that communicates with all the devices and sensors in the lane. The devices include the RFID readers, vehicle classification system, POS touch terminal, light signals and any other devices for a specific lane setup. When a vehicle with a pass goes through the lane, all the devices record their input and send it to the lane controller system. The lane controller system then uses the input details and frames a lane trip recording the vehicle details, pass details and other relevant information needed to identify the traveler account and post the trip to the account.

Automatic Vehicle Classification (AVC) system – The AVC system includes an overhead light-based- profiler device that identifies a vehicle by profiling the shape, size, length and axles to a classification provided as an input to the lane controller system. The lane controller system uses the AVC system to apply the correct fare to the trip for posting.

Point of Sale (POS) touch screen terminal – This is inside the toll booth that the ticket seller uses to collect the passenger fares. The touch screen terminal is connected to the lane controller system that displays the fare to be collected based on the input received from other devices in the lane. The POS also allows the ticket seller to enter the fare manually and collect the fare for the vehicle in the lane.

Network connectivity – Network connectivity lets the lane controller system connect to the BOS server where customer accounts are maintained. Via a secure network connection, the lane trip details are sent to the BOS to be posted to the appropriate account.

Roadside toll host system – This is a centralized computer server system that communicates with all the lane controller systems at each lane. The roadside toll host receives trips from every configured lane, batches them together and sends it to the *GTG!* BOS for posting to the

account. Based on the system architecture design, a centralized toll host can be configured at every terminal to receive data from lanes/toll booth at that terminal, or it can be configured at the WSF agency level, which receives data from all terminals lane/toll booth.

Image capture system – This system includes the cameras installed at the booth to capture the front and back license plate images and send it to the lane controller system to store the image captured for later review.

Image Review System – This includes the optical character recognition (OCR) system that reviews front and back license plate images and coverts it into the actual license plate number that can be used for getting name and address detail from DOL for the register owner of the vehicle and send the invoice for payment.

GTG! and W2G financial reconciliation and operational costs

The revenue generated each month must be accounted for and exchanged between *GTG!* and WSF. Revenue and financial reconciliation requirements and supporting business rules must be developed during the first phase of implementation. Ferry transactions will be posted to the *GTG!* account as prepaid or postpaid transactions and tracked through the accounting and recognition stages. Each month, transaction and revenue reconciliations will be performed, and reports will be generated. The reconciliation details will be exchanged with WSF system either via an interface or reporting for their overall financial reconciliation due each month (or a frequency mutually agreed upon).

It is acknowledged that *GTG!* costs would be coordinated between WSF and Toll Division to account for *GTG!* costs to collect on a transaction level and that *GTG!* operations staff would support new functionality specific to WSF needs. Certifications for age, disability and tribal discounts would require staff to review, customer follow-up and approvals will require staff and additional cost to maintain support. These costs will need to be determined on an ongoing basis once in operation.

GTG! and W2G options

The following *GTG!* options were reviewed as proposed solutions for the Triangle route and for possible use on additional WSF routes:

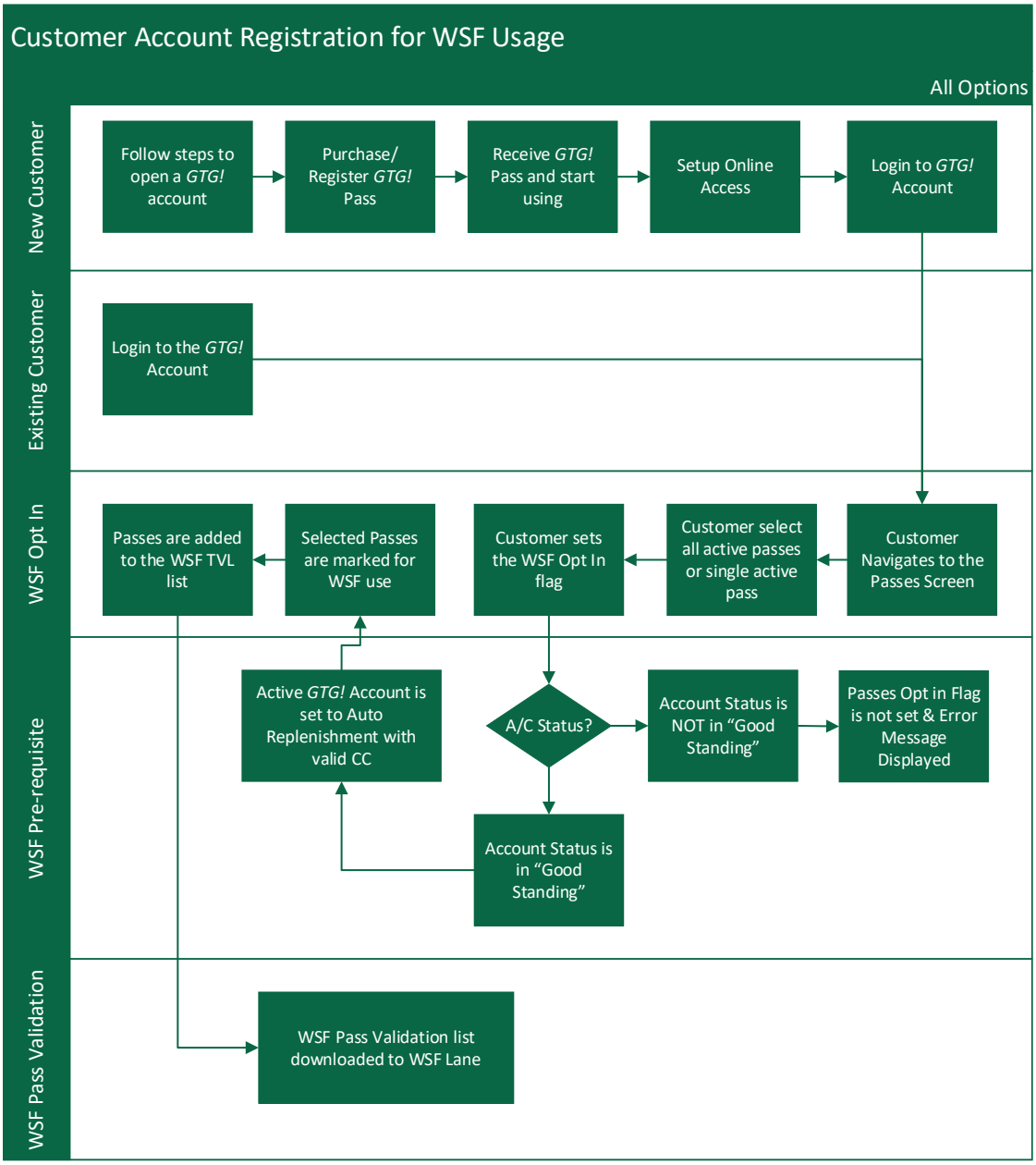
- Option 1 – *GTG!* as a payment
  - A reader identifies an eligible *GTG!* pass on a vehicle. The ticket seller assesses the size of the vehicle and the number of vehicle passengers to determine a price. The ticket seller offers the customer the option to pay with *GTG!* The customer pays with *GTG!* or at the toll booth with cash and credit.
- Option 2 – *GTG!* semiautomated with ticket seller
  - *GTG!* camera/reader technology automatically reads the eligible *GTG!* pass and packages price based on length of vehicle. The ticket seller determines the number of passengers in the vehicle and offers customers with a *GTG!* pass the choice to pay through their *GTG!* account method and charges the account.

- Option 3 – *GTG!* dedicated single lane barrier
  - *GTG!* camera/reader technology reads the eligible *GTG!* pass and calculates and processes the fare, and the parking arm raises to allow vehicles to enter a holding area for sorting. The camera/reader captures a photo of the license or *GTG!* pass to charge or send a bill to the customer. This system would be enacted on both toll booths to allow redundancy and accepting other forms of payment for the non-dedicated lane.
- Option 4 – *GTG!* All-electronic tolling technology
  - Customer drives in designated lanes under gantry with *GTG!* camera/reader technology and enters the holding area for sorting without stopping to pay. The technology captures a photo of the license or *GTG!* pass to charge or sends a bill to the customer. This system eliminates toll booths, and staff can be reassigned to support operations.
- W2G advance ticketing
  - W2G with planned modernization mirrors *GTG!* Options 1 to 3. W2G currently has funding for modernization of the ticketing and reservation system. The main objective is to improve W2G operational efficiency and speed up processing time. The purpose of the upgrades is to drive up the use of pre-ticketing which a more modern ticketing system with a better app/mobile webstore.
  - In its optimal configuration with enhancements, all customers could use W2G (100 percent). This could meet *GTG!* Options 2 and 3 for average processing time of 18 seconds per transaction.
  - There is currently no funding authorized to determine vehicle length or passenger detection.

GTG! registration requirement (all options)

Exhibit 5 is an example of a WSF registration workflow for all customers to open a *GTG!* account and allow their *GTG!* account to be used at the terminal. Because of the overall transaction price on average being so much greater than a typical roadway toll charge, the customer would need to opt in to have their account usable for WSF transactions. The new workflow for *GTG!* registration would prompt existing and new users to opt in and establish specific preferences to apply to WSF transactions.

Exhibit 5. *GTG!* registration process flow for WSF usage



Following a customer's selection of a WSF workflow, the *GTG!* system can be configured to accept WSF trip transactions. Based on the selection, a vehicle pass validation file is used to determine pass status at the terminal of either yes or no. This status then determines the customer's ability to use their *GTG!* account in the preferred mode for a specific *GTG!* option deployed at the terminal. Otherwise, depending on the *GTG!* option, an alternative payment would need to be provided at the toll booth, or the system would default to a license plate read transaction, and a customer bill would be sent in the mail.

Option 1 – *GTG!* as a payment option

This option is a basic building block with minimal changes to fare structure at the terminal, simply offering customers an additional payment method with a *GTG!* account. It will require a

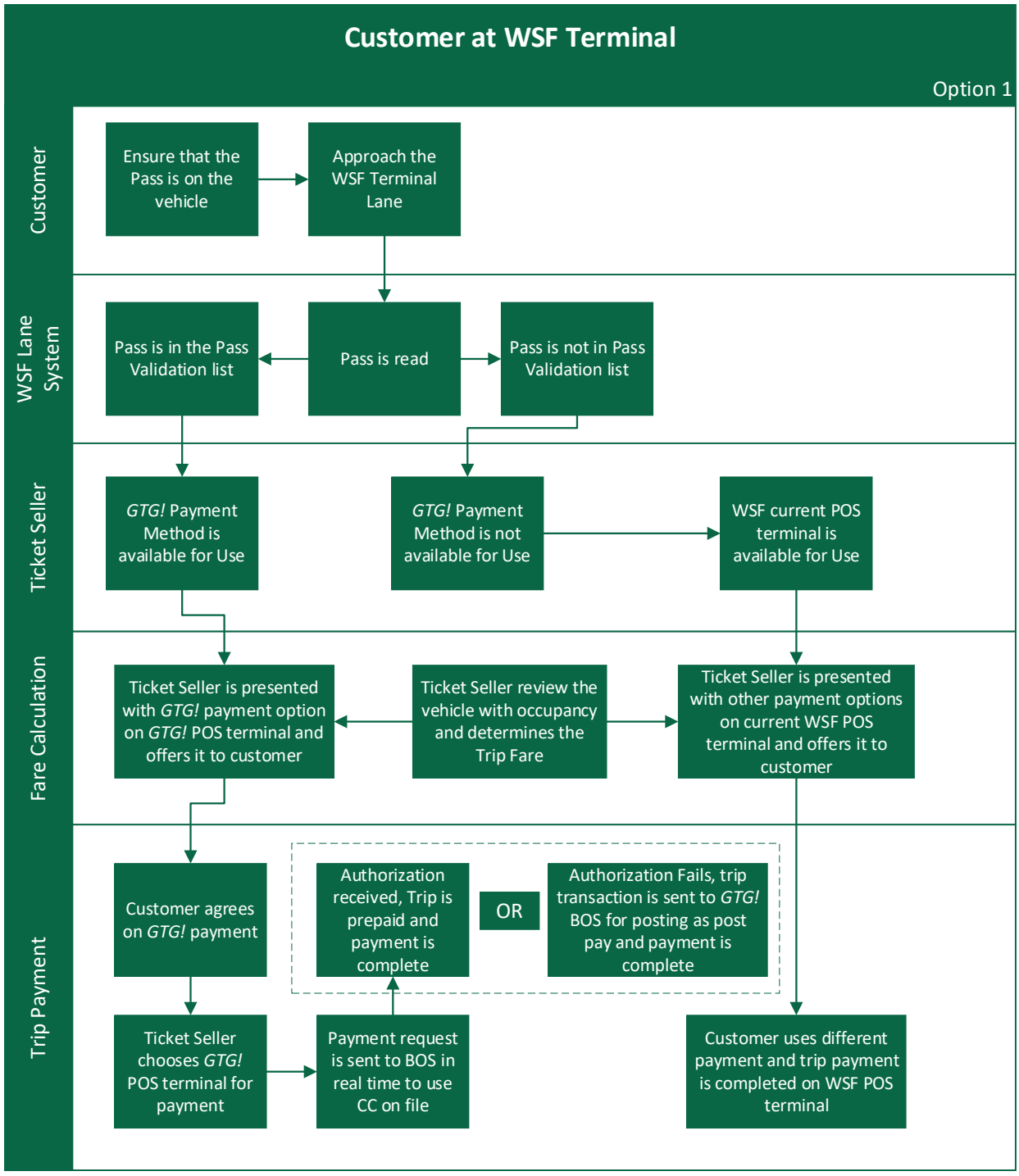
GTG! Point of Sale (POS) terminal in addition to the current WSF POS terminal in each tollbooth.

The only change from current operations is that of *GTG!* is a payment option at the toll booth that is processed through a separate *GTG!* POS terminal. All functionality and ticket seller responsibilities remain the same for calculating the trip price at the toll booth.

Customer experience. The vehicle and driver stop at the toll booth to pay for a trip, and the *GTG!* pass is read and validated. The ticket seller determines the fare and asks the driver how they would like to pay, offering the customer payment options that include W2G advance ticketing, cash, credit card or *GTG!*. If the passenger chooses to pay with their *GTG!* account, the ticket seller enters the payment details in the *GTG!* POS terminal and completes the sale for the passenger, and the trip details are sent to *GTG!* BOS for posting to a customer's account.

Exhibit 6 illustrates shows the Option 1 process workflow for the WSF customer at the ferry terminal.

Exhibit 6. *GTG!* Option 1 process workflow



The toll equipment required for implementation for *GTG!* Option 1 is listed as follows:

- RFID pass readers (2)
- Lane controller system (1)
- POS terminal with touch screen (2)
- Roadside Toll Host (1)
- Network connectivity to Roadside Toll Host and *GTG!* BOS

The pass readers on each toll booth will be connected to the lane controller system and a POS device with a *GTG!* application to record the payment. The trip transaction recorded via the terminal will be sent to the *GTG!* BOS for posting to a customer account.

Option 2 – *GTG!* semiautomated

Option 2 builds upon Option 1. Where Option 1 requires the ticket seller to assemble the vehicle price and determine vehicle length, Option 2 automatically calculates the vehicle price by using the AVC package and the readers to verify an eligible *GTG!* pass to calculate the base fare for the ticket seller.

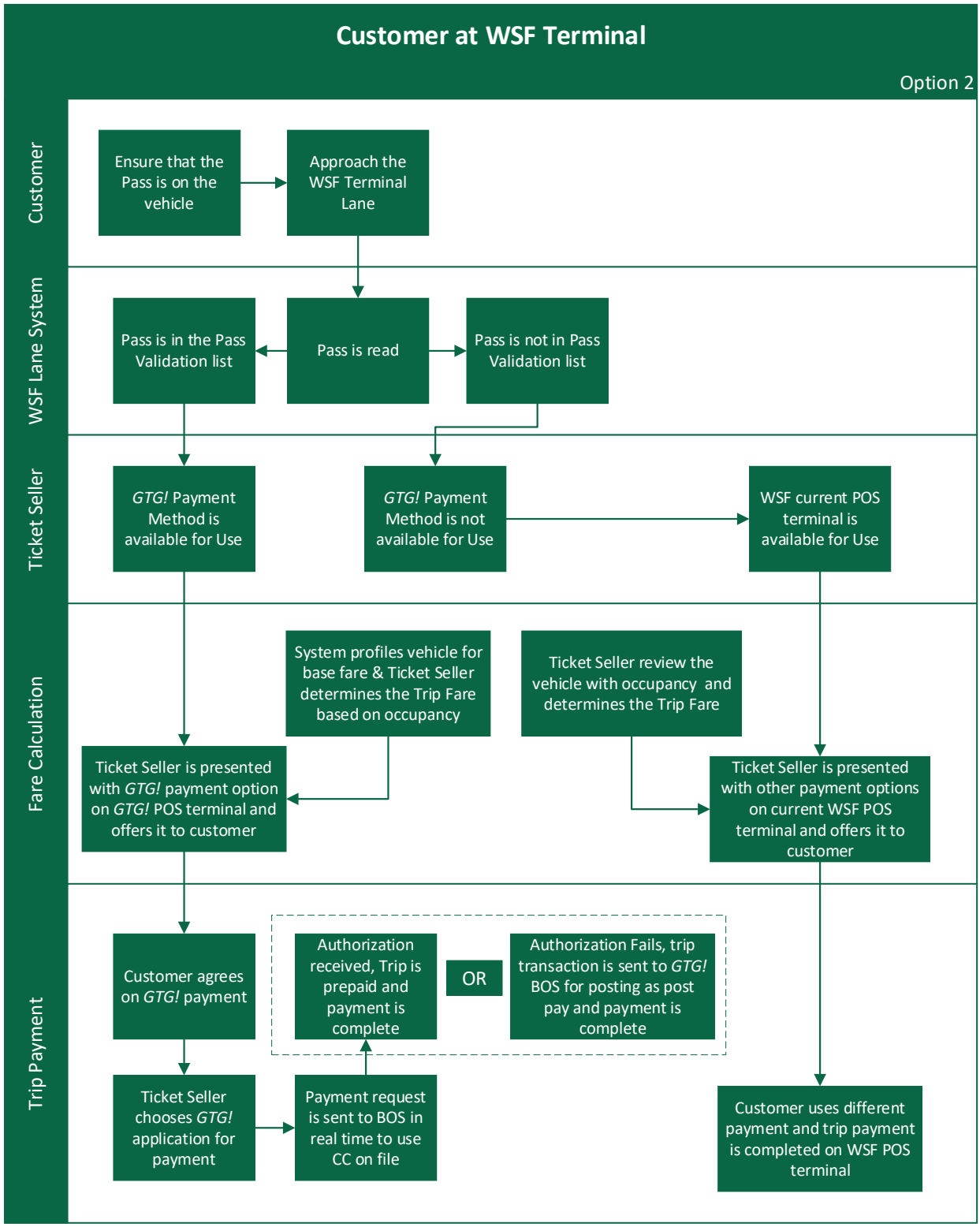
This technology is used for all *GTG!* customers if they have a *GTG!* pass and decreases the average time at the toll booth compared to *GTG!* Option 1. The ticket seller calculates any additional vehicle passenger fares to determine the final trip price.

If eligible, the customer can choose to use *GTG!* for payment. The final trip pricing at the toll booth is the same for *GTG!* and W2G.

Customer experience. Like Option 1, the customer stops at the toll booth, and the *GTG!* system automatically calculates the base vehicle/driver fare for the ticket seller based on length. The ticket seller assesses any additional passenger fares and verifies the payment method with the customer using *GTG!*, and the trip details are sent to the *GTG!* BOS for posting to a customer's account.

Exhibit 7 illustrates the process workflow for the WSF customer at the ferry terminal.

Exhibit 7. *GTG!* Option 2 process workflow



The toll equipment required for implementation of Option 2 is as follows:

- RIFD pass readers (2)
- Lane controller system (1)
- AVC system (2)
- POS terminal with touch screen (2)
- Roadside Toll Host (1)
- Network connectivity to Roadside Toll Host and *GTG!* BOS

Pass readers and the AVC system cameras are installed on each toll booth. The readers and AVCs are connected to the lane controller system and terminal POS. The *GTG!* toll application, running in the background, displays the base fare and records a *GTG!* payment. The trip transaction is recorded via the terminal and is sent to *GTG!* BOS for posting to the customer account.

Option 3 - Dedicated single lane with barrier

Option 3 is built upon Options 1 and 2 capabilities and has some flexibility in how it is configured and designed. It can be used to incorporate additional technologies and integration of an enhanced W2G.

This option leverages in-lane equipment to identify the vehicle length to calculate the fare without a ticket seller and to allow the customer to pay with a *GTG!* account. Because a ticket seller is not required at the dedicated lane, vehicle occupancy detection is necessary to determine the number of passengers in a vehicle and support fare determination. Occupancy detection has limitations that may not fully align with WSF current fare structure and may require policy and fare adjustments.

The alternative would be to remove fares for vehicle passengers. This would require all other fares increase to make up the difference without funding provided by the Legislature. Payment with cash, credit or W2G advance ticketing would be at the other toll booth. As designed in future configurations, the dedicated lane could also include an enhanced W2G payment processing. Operations would be able to use either toll booth as the dedicated *GTG!* lane but not at the same time to allow existing payment methods. While a ticket seller is not required in the dedicated lane, during the introduction period, a ticket seller is recommended to assist the customers that incorrectly selected the lane.

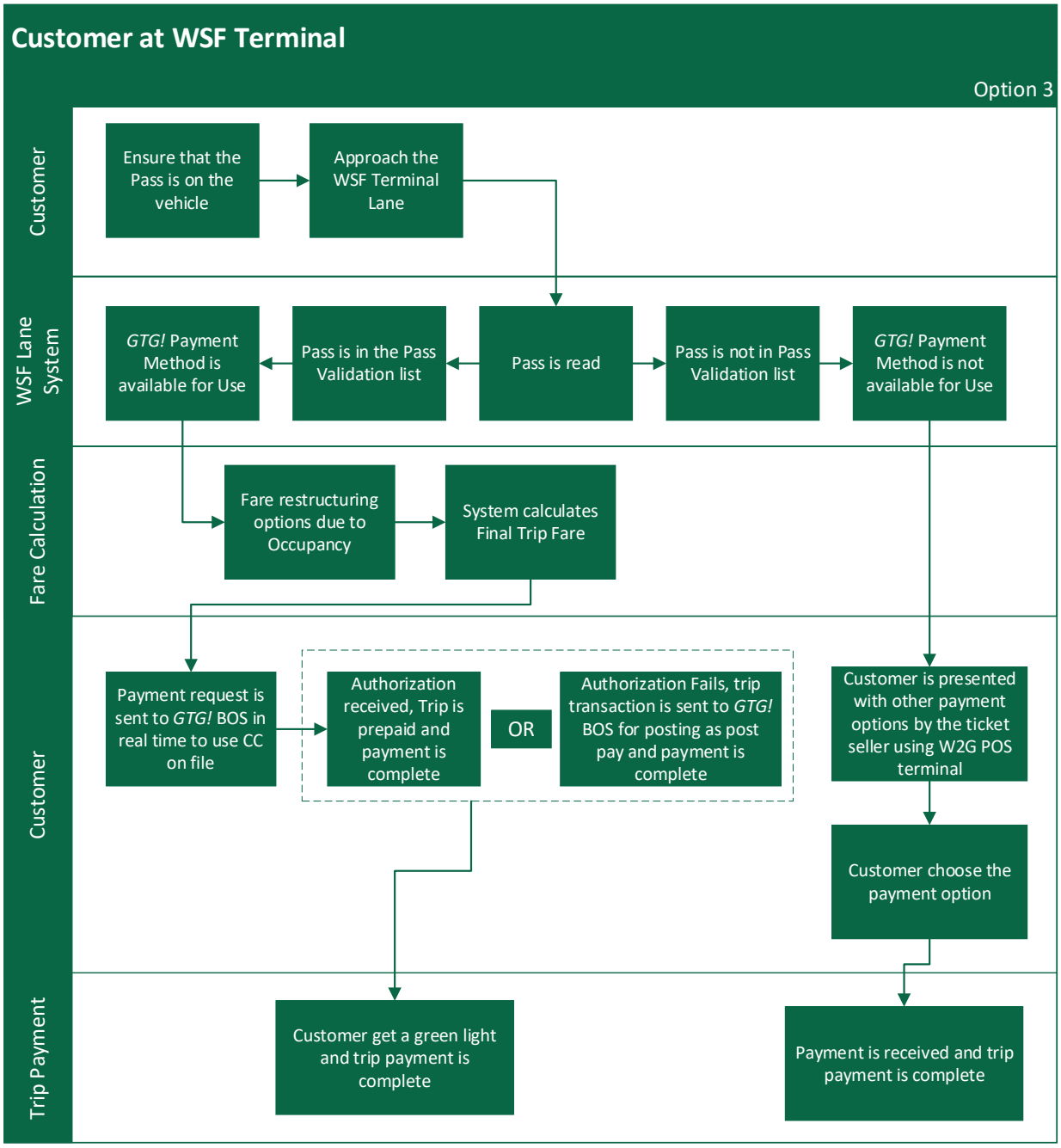
Without occupancy detection integration, fare simplification will be necessary to streamline fare types in the *GTG!* system. The fare will be calculated and posted based on the options configured in a *GTG!* account, including whether the customer will use a prepay or post-pay account method.

Customer experience. The driver selects the *GTG!* lane or W2G advance ticketing/cash/credit lane. The *GTG!* customer stops at the red light at the unmanned toll booth. The reader profiles the vehicle (length), validates the *GTG!* pass in the vehicle and charge the customer's *GTG!* account. The light turns green, and the driver enters the dock.

Customers in the W2G advance ticketing and credit/cash lane stop at the toll booth for these payments, the ticket seller assesses and collects the fare using W2G POS and allows the vehicle to go the dock.

Exhibit 8 shows the post-pay workflow for the WSF customer at the ferry terminal.

Exhibit 8. *GTG!* Option 3 process workflow



The toll equipment required for implementation of Option 3 is as follows:

- RFID pass readers (2)
- Lane controller system (1)
- Automatic vehicle detection and classification system (2)
- POS devices with touch screens (2)
- Fare displays (2)
- Roadside Toll Host (1)

- Network connectivity to Roadside Toll Host and *GTG!* BOS

The pass readers, fare display and AVC system on each toll booth will be connected to the lane controller system. A computer terminal with a *GTG!* toll collection application running records the payment for the customer using their *GTG!* account and displays the fare to the customer via the fare display. The trip transaction recorded via the terminal will be sent to the *GTG!* BOS for posting to the customer's account.

Option 4 - *GTG!* all-electronic tolling

Option 4 uses all-electronic tolling as the only method of payment. All-electronic tolling requires additional equipment mounted on a gantry to identify the vehicle type, classification, license plate and passenger occupancy to calculate the fare without stopping at a toll booth.

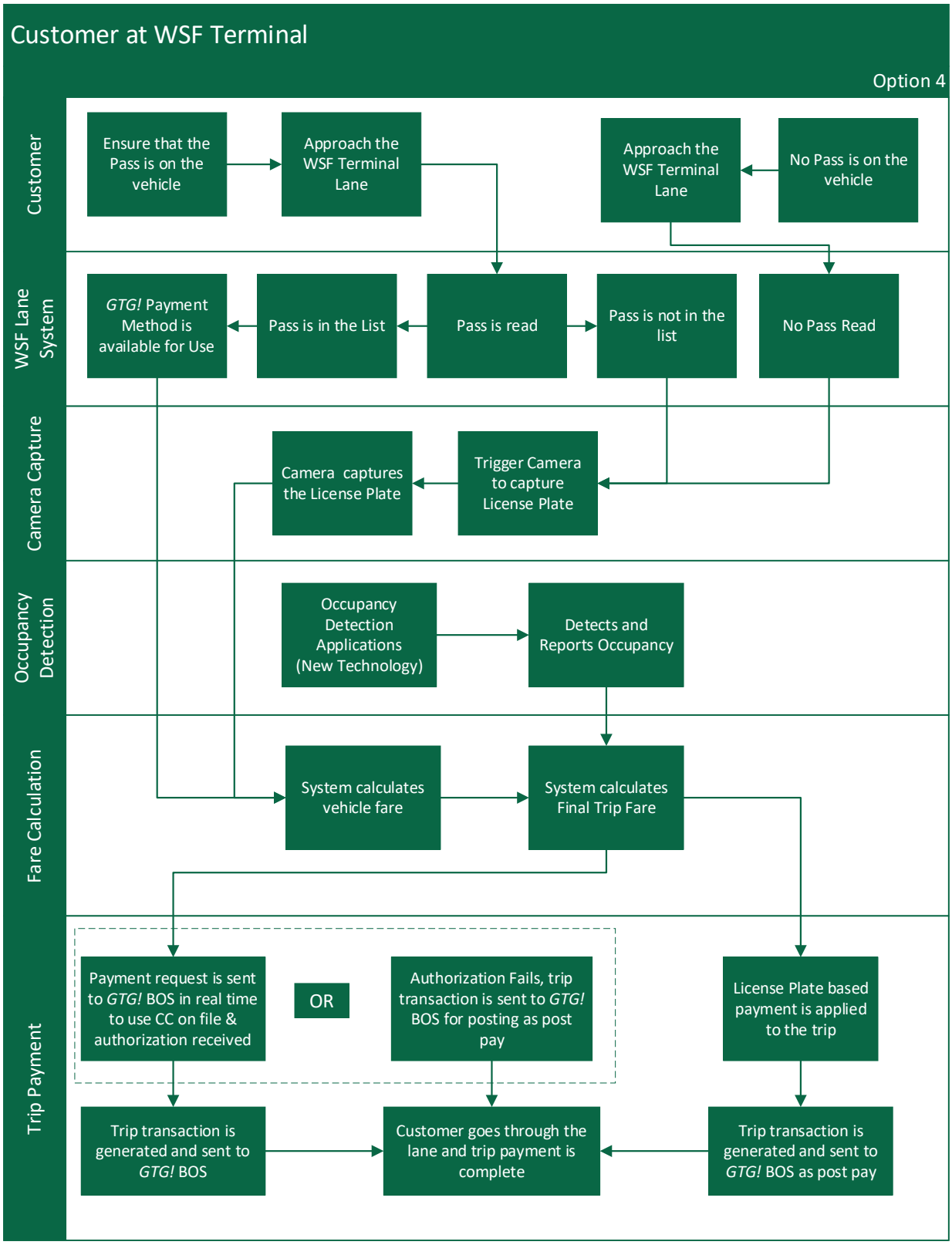
This option uses license plate image capture to allow WSF to bill those customers without a valid *GTG!* pass.

With no additional development of the *GTG!*, this will require the simplification of fares based on no occupancy detection or discounts.

Customer experience. Drivers use a dedicated lane and travel under a *GTG!* toll gantry directly onto the dock for sorting. Customer accounts are automatically read, and a payment is made. If a *GTG!* pass is not read, the registered owner of the vehicle is sent a bill in the mail at a higher pay-by-mail rate.

Exhibit 9 illustrates the process workflow for the WSF customer at the terminal.

Exhibit 9. *GTG!* Option 4 process workflow



If a pass is not read, then a license plate image is captured by the camera, and the license plate image details are sent with the trip details to the *GTG!* BOS for posting to a license plate based *GTG!* account and billed to the customer. The customer is billed based on the vehicle's registered owner (as per the DOL). There is also a system in place to bill out-of-state or non-U.S. drivers.

The toll equipment required for implementation of Option 4 is as follows**:**

- RFID pass readers (2)
- Lane controller system (1)
- Automatic vehicle detection and classification system (2)
- Image capture system (2)
- Image review system (1)
- Computer terminal with touch screen (2)
- Roadside Toll Host (1)
- Network connectivity to Roadside Toll Host and *GTG!* BOS

The pass readers, fare display and AVC system will be connected to the lane controller system and a computer terminal, which will have the *GTG!* Toll Collection application running to record the payment and show the fare to the customer via the fare display. The trip transaction recorded via the terminal will be sent to the *GTG!* BOS for posting to the customer account.

W2G advance ticketing option

The W2G advance ticketing option could achieve process efficiency and faster processing time with better customer experience to all ferry riders. Enhanced technologies like occupancy detection and automated vehicle classification tools can be leveraged to improve the processing time. A new improved web store can support increase in the pre-ticketing sales for the ferry riders.

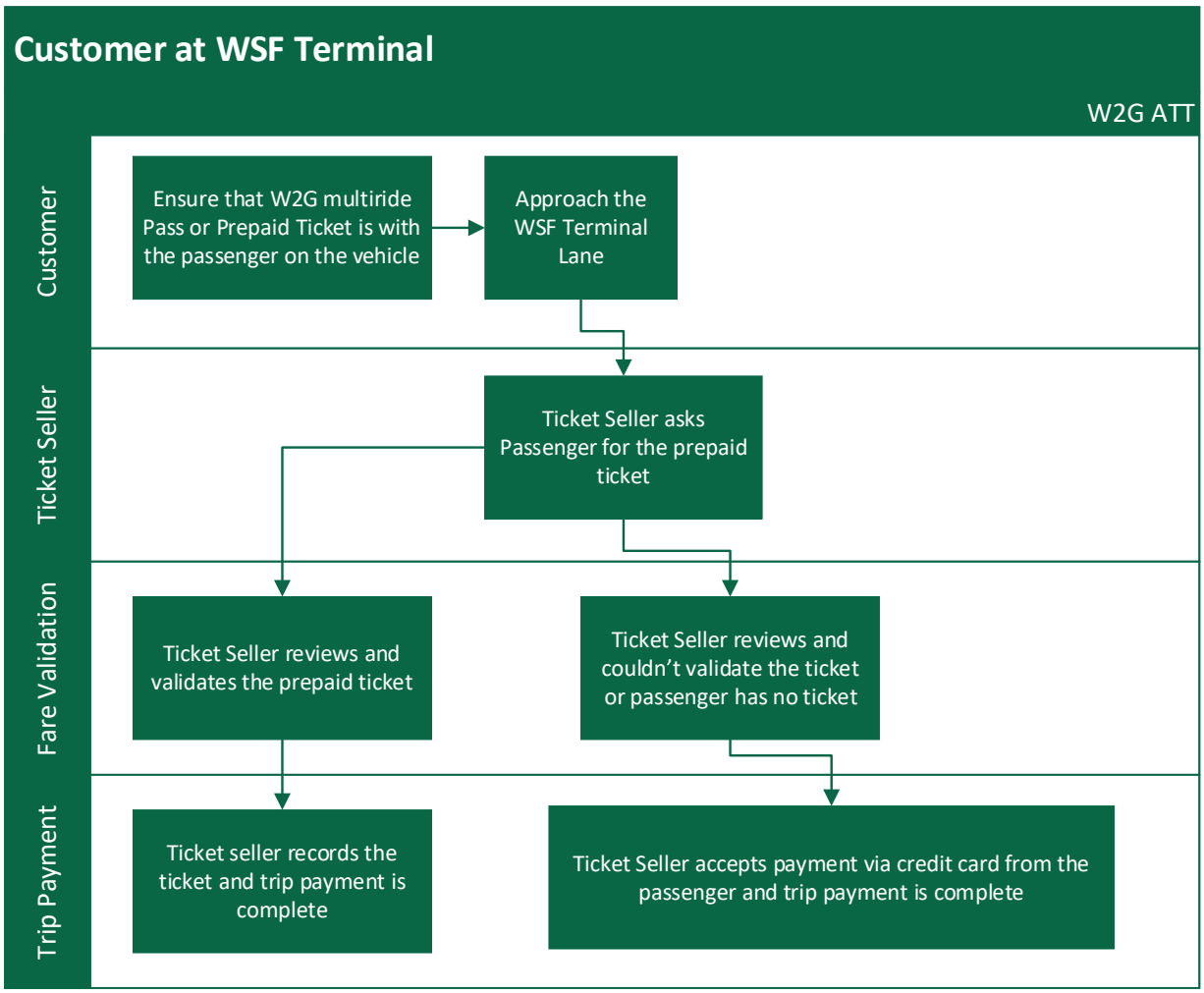
The W2G advance ticketing option is similar in set up to *GTG!* Option 1 but it is built upon the W2G technology, which currently allows prepurchase before arriving at the terminal. Enhancements to W2G could include standalone classification cameras like *GTG!* Option 2 to aid in the assessment of price and improve vehicle processing even further. Overall, without pass and license plate capture technology W2G would be limited in moving to an all-electronic option.

Customer experience: The customer approaches either toll booth with a prepaid ticket that is scanned by the ticket seller, and the driver proceeds onto the dock for sorting. For customers without a ticket, the customer can pay traditionally with cash or credit card. Enhancements to W2G will make prepurchase and processing through the toll booth more efficient like *GTG!* by increasing the number of customers who use advance ticketing and optimizing unload and load speeds for on-time sailings. Exhibit 10 shows the W2G advance payment workflow.

Enhancements to W2G will make prepurchase and processing through the toll booth more efficient by increasing the number of customers who use advance ticketing and optimizing unload and load times for on-time sailings.

Exhibit 10 shows the W2G advance payment workflow.

Exhibit 10. W2G advanced payment process



7. Traffic analysis results

WSF used the traffic analysis results to evaluate each *GTG!* option and one stand-alone W2G option for all alternatives. The *GTG!* options leverage tolling technology to explore improving toll booth processing and operational efficiency at the terminal. This section:

- Determines feasible *GTG!* options for implementation at the terminal that can be replicated at other WSF terminals if needed.
- Determines feasible inputs to represent the four *GTG!* options for application at the terminal to help meet on-time performance goals.
- Uses the traffic model to help evaluate loading and operational efficiency for each Level 3 alternative.
- Models all Level 3 alternatives for operational efficiency at the terminal.

Level 3 alternatives – on-dock holding capacity

Consistent with the alternatives, *GTG!* options were evaluated in VISSIM based on traffic model microsimulation assumptions. Table 6 shows the on-dock holding capacity for each alternative.

Table 6. On-dock holding capacity by alternative

ALTERNATIVE A	NO BUILD AND ALTERNATIVES A-1 (A-2, A-3)	ALTERNATIVES B AND B-3	ALTERNATIVES B-1 AND B-2	ALTERNATIVE C-1
76 vehicles	84 vehicles	124 vehicles	155 vehicles	186 vehicles

Methodology

To assess *GTG!* and W2G vehicle loading time for each of the Level 3 alternatives, WSF used the same VISSIM analysis conducted for the baseline condition during the 2040 weekday evening peak period (SR 160 – Fauntleroy Ferry Terminal – Trestle and Transfer Span Replacement Project Traffic Analysis). Other than toll booth processing times, *GTG!* and W2G used the same modeling assumptions as the baseline condition for the VISSIM analysis.

Because of ridership variability during the COVID-19 pandemic, the baseline model used data from before the pandemic: May, August 2019, and January 2020. The analysis applies the same terminal base conditions to the model, which allows for two additional inputs to account for and measure *GTG!* and W2G impact:

The first input is to provide key *GTG!* transaction processing times derived from tolling datasets at the Tacoma Narrows Bridge. This study uses the Tacoma Narrows Bridge as a comparable toll facility with manual toll booths that best mirrors payment processing at the terminal. In line with the same period of May, August 2019, and January 2020, the Tacoma Narrows Bridge traffic dataset was used, and an average time per vehicle was calculated for various lane configurations, including cash lanes, mixed-use (cash and *GTG!*), toll collector lanes and *GTG!*-only lanes.

The second input is the projected customer use percentages or the percentage of people expected to use *GTG!* and W2G at the terminal.

Tacoma Narrows Bridge dataset

Tacoma Narrows Bridge is the toll facility with toll booths that best mirror Fauntleroy ferry terminal operations with *GTG!* and is used here for comparison. Using the peak traffic processing times from 2019 at the Tacoma Narrows Bridge, processing times and estimated usage for the various *GTG!* lane-type configurations were provided as inputs to the VISSIM model for analysis. Table 7 summarizes the dataset input provided to the VISSIM model. All other model inputs and assumptions can be found in the WSDOT *SR 160 - Fauntleroy Ferry Terminal - Trestle and Transfer Span Replacement Project, Traffic Analysis Methods and Assumptions* (2024b).

Table 7. Options summary times input into VISSIM

TICKETING AND TOLL BOOTH[A]		
Options	**Per Vehicle in Seconds**	**Estimated Usage (% of vehicles)**
Current	18 seconds W2G	55%
Option 1	16.72 seconds	67%
Option 2	11.58 seconds	77%
Option 3	7.47 seconds	77%
Option 4	5.12 seconds	100%
W2G advance ticketing	18 seconds	100%

[a] 30 seconds was the average baseline time per vehicle for remaining cash/credit customers in usage percentage.

Option 1 – *GTG!* as a payment option.
Option 2 – *GTG!* semi-automated with toll booth ticket seller.
Option 3 – *GTG!* dedicated, single-lane barrier concept.
Option 4 – *GTG!* all-electronic tolling (no cash, credit or W2G payment option).
W2G advance ticketing – enhanced W2G advance ticketing only (W2G).

W2G advance ticketing

WSF's W2G option allows customers to buy tickets in advance online, at the toll booth and at WSF kiosks or with an ORCA card. In 2019, W2G advance ticketing usage ranged between 50 to 60 percent of daily customer ticket payments. For the microsimulation analysis, the W2G advance ticketing option is modeled at 100 percent usage in its current state to understand its maximum potential. While still allowing other forms of payment at the toll booth to adhere to required policies, 100 percent usage is not achievable. However, with the planned enhancements for W2G advance ticketing, it is possible for W2G to reduce its current 18-second average time. Therefore, it is assumed the output will be an accurate representation of W2G's best case.

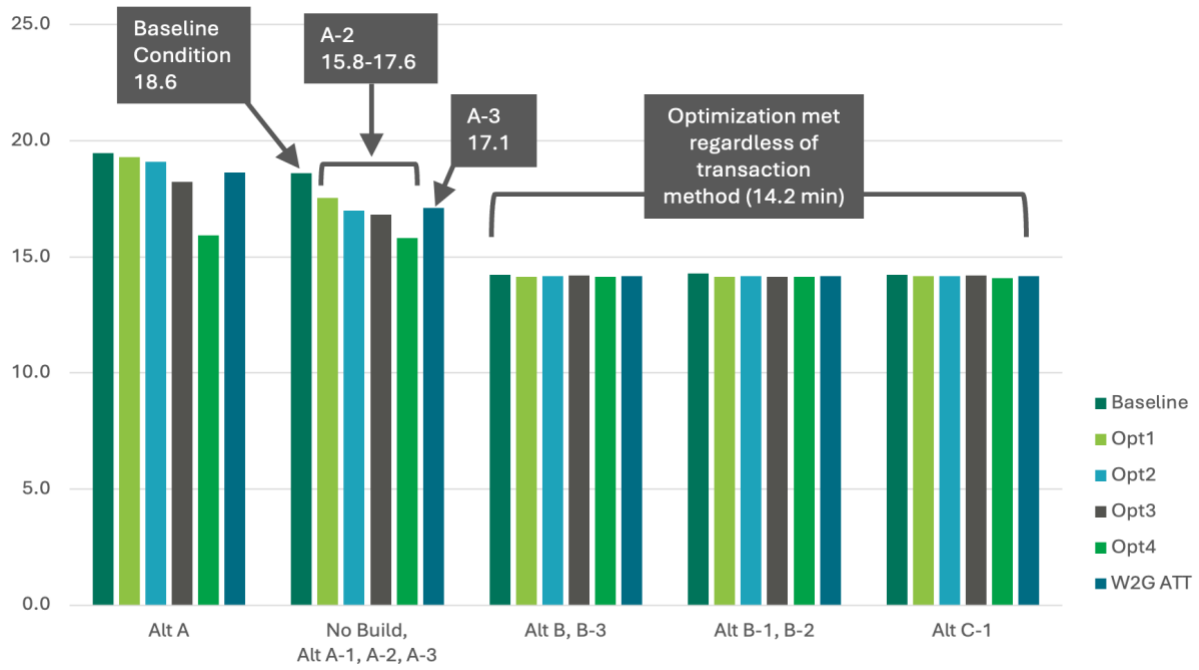
Performance measures

The same performance measures used in the traffic analysis were applied to the *GTG!* and W2G advance ticketing options to evaluate the Level 3 alternatives for operational efficiency.

Unloading and loading times by option

The pedestrian and bicycle unload and load times are the same across all the alternatives. The vehicle unload times were also essentially the same across all alternatives, leaving the vehicle loading as the only component to show any significant variation by alternative. The No Build and Alternative A-1 unload, and load times were 18.6 minutes under the baseline condition. Alternative A-2 (same size as A-1) considers each *GTG!* option and shows a gradual improvement in overall time savings, *GTG!* Option 4 has the shortest unload and load times of 15.8 minutes and W2G advance ticketing (Alternative A-3) has unload and load times of 17.1 minutes. The analysis shows that *GTG!* Option 4 (within Alternative A-2) provides the maximum overall time savings of 2.8 minutes. The W2G advance ticketing option (Alternative A-3) time savings was 1.5 minutes, in line with *GTG!* Option 2 (1.5 minutes).

Exhibit 11. Unloading and loading times by option in minutes



- Option 1 – *GTG!* as a payment option.
- Option 2 – *GTG!* semi-automated with toll booth ticket seller.
- Option 3 – *GTG!* dedicated, single-lane barrier concept.
- Option 4 – *GTG!* all-electronic tolling (no cash, credit or W2G payment option).
- W2G advance ticketing – enhanced W2G advance ticketing only (W2G).

The analysis shows that Alternative A has the longest unload and load times, followed by the No Build and Alternatives A-1, A-2 and A-3. The No Build and Alternatives A-1, A-2 and A-3 also require a chasing scenario where a portion of the loading vehicles need to wait in the queue upstream of the toll booths. After the loading process begins, vehicles on the dock begin to load, allowing for vehicles queued outside of the toll booths to proceed through the toll booths and onto the dock for sorting and staging as capacity allows.

For alternatives with an on-dock holding capacity of at least 124 vehicles, equal to the Issaquah Class vessel capacity, the overall pedestrian, bicycle and vehicle unload and load time optimization was achieved, and there is minimal improvement in time savings with the *GTG!* options and W2G compared to the baseline and the No Build. All alternatives, including Alternatives B, B-1, B-2, B-3 and C, had an average unload and load time of 14.2 minutes, which is approximately 4.4 minutes of time savings as compared to the No Build baseline. Across the alternatives, all *GTG!* options provide the benefit of faster processing of vehicles through the toll booths, which is reflected in the reduced unload and load times, improving operational efficiency and the chance of achieving on-time performance.

Table 8 shows the overall unload and load time savings compared to the baseline condition. Alternative A-1 includes A-2 and A-3 as they are the same size.

Table 8. Unload and load time savings relative to the baseline condition (minutes)

OPTION	ALTERNATIVE A	ALTERNATIVES A-1 and NO BUILD	ALTERNATIVES B and B-3	ALTERNATIVES B-1 and B-2	ALTERNATIVE C
Baseline	-1	0.0	4.5	4.5	4.5
GTG! Option 1	-1	1.0	4.5	4.5	4.5
GTG! Option 2	-0.5	1.5	4.5	4.5	4.5
GTG! Option 3	0.5	2	4.5	4.5	4.5
GTG! Option 4	2.5	3	4.5	4.5	4.5
W2G advance ticketing	0.0	1-1.5	4.5	4.5	4.5

Performance on three-boat schedule dwell time by Level 3 alternative

The unload and load times for each *GTG!* and W2G option were compared against the scheduled dwell times for the Triangle route's three-boat schedule as provided in Table 9. The microsimulation analyzed specific p.m. peak weekday sailings for a time agnostic representation of the sailings. This comparison is an estimate to show the potential for *GTG!* and W2G to influence on-time performance.

All alternatives achieve some benefit when compared to the No Build baseline depending on the fare option. For the smaller Alternative A in Table 9, *GTG!* Option 4 is the only option to help one

additional sailing currently not achieved by the No Build baseline condition. Alternative A-2 *GTG!* Options 2, 3 and 4 help with on-time departures for the sailing times as presented in Table 9. Alternative A-3 with W2G advance ticketing also shows the ability to achieve the same additional sailing. All remaining Level 3 alternatives (B, B-1, B-2, B-3 and C) indicate meeting all scheduled three-boat departures without *GTG!* or W2G enhancements.

Table 9. Estimated *GTG!* and W2G performance on three-boat schedule dwell time by Level 3 Alternative

ESTIMATED *GTG!* and W2G PERFORMANCE on THREE BOAT SCHEDULE DWELL TIME by LEVEL 3 ALTERNATIVES																
Sailing Time	Schedule Dwell (min)	No Build	Alternative A [min]					Alt. A-1, A-2, A-3 [min]					Alt. B, B-1, B-2, B-3, C [min]				
		B	1 [19]	2 [19]	3 [18]	4 [16]	5 [19]	1 [18]	2 [17]	3 [17]	4 [16]	5 [17]	1 [14]	2 [14]	3 [14]	4 [14]	5 [14]
1610	30	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1635	17	N	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1710	15	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y
1740	20	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1815*	15	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y
1835*	17	N	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1915*	15	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y

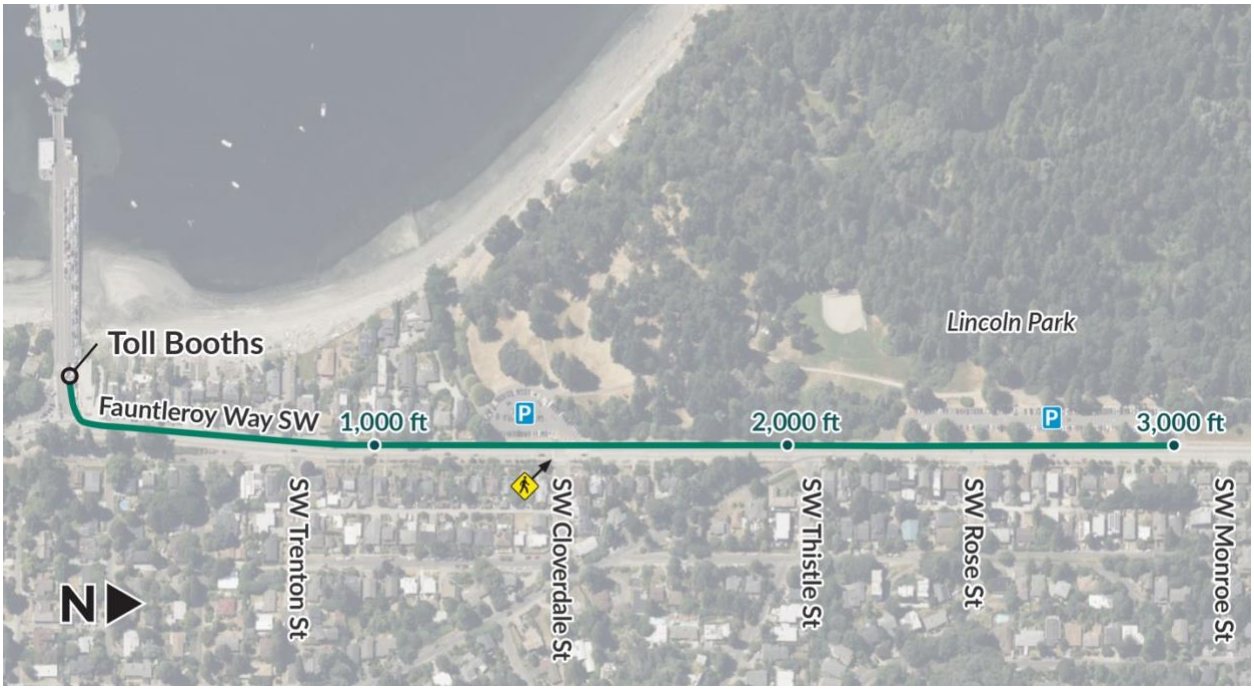
*Not Modeled. Only Peak PM period was modeled. Additional sailings are shown for illustration.

LEGEND:
B= No Build [Baseline] | 1= *GTG!* Option 1 | 2 = *GTG!* Option 2 | 3=*GTG!* Option 3 | 4=*GTG!* Option 4 | 5 = W2G AT
Y= Load and unload time will meet sailing
N = load and unload time will not meet sailing

Fauntleroy Way SW queue length analysis

Exhibit 12 shows an aerial view of the Southbound Fauntleroy Way SW queue length. The queue length and its dissipation rate (that is, the rate the queue dissipates) on Fauntleroy Way SW holding lane was analyzed for each Level 3 alternative with each *GTG!* option and W2G advance ticketing. Queue lengths were measured in linear feet in the southbound direction of Fauntleroy Way SW, beginning at the terminal's toll booths.

Exhibit 12. Southbound Fauntleroy Way SW queue length (feet) by Level 3 alternative



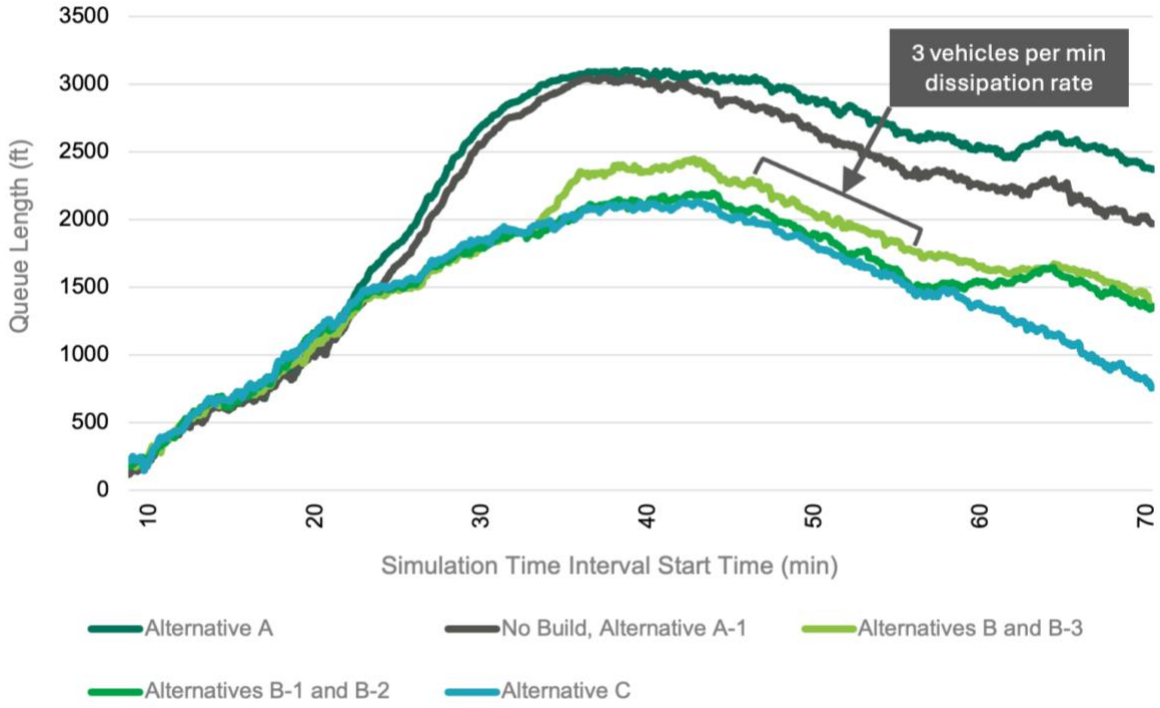
The modeling prohibits vehicles from queueing in clear zones for driveways along the southbound Fauntleroy Way SW shoulder. Queue lengths were collected every 5 seconds during the simulation to show how queues vary during the weekday p.m. peak period. Vehicle queue lengths on southbound Fauntleroy Way SW were analyzed for the weekday p.m. peak period for each *GTG!* option with W2G advance ticketing by the Level 3 alternative using VISSIM analysis.

Exhibits 13 through 19 show the queue lengths versus time for the various options by Level 3 alternative. Alternative A-1 includes A-2 and A-3 as they are the same size. Summary of the level 3 alternatives are provided below along with the GTG! options. Detailed descriptions for each GTG!/W2G Option are on page 29:

ALTERNATIVE A	NO BUILD AND ALTERNATIVES A-1 (A-2, A-3)	ALTERNATIVES B AND B-3	ALTERNATIVES B-1 AND B-2	ALTERNATIVE C-1
76 vehicles	**84 vehicles**	**124 vehicles**	**155 vehicles**	**186 vehicles**

Exhibit 13 shows the baseline queue observation by Level 3 alternative.

Exhibit 13. Baseline queue observation by Level 3 alternative



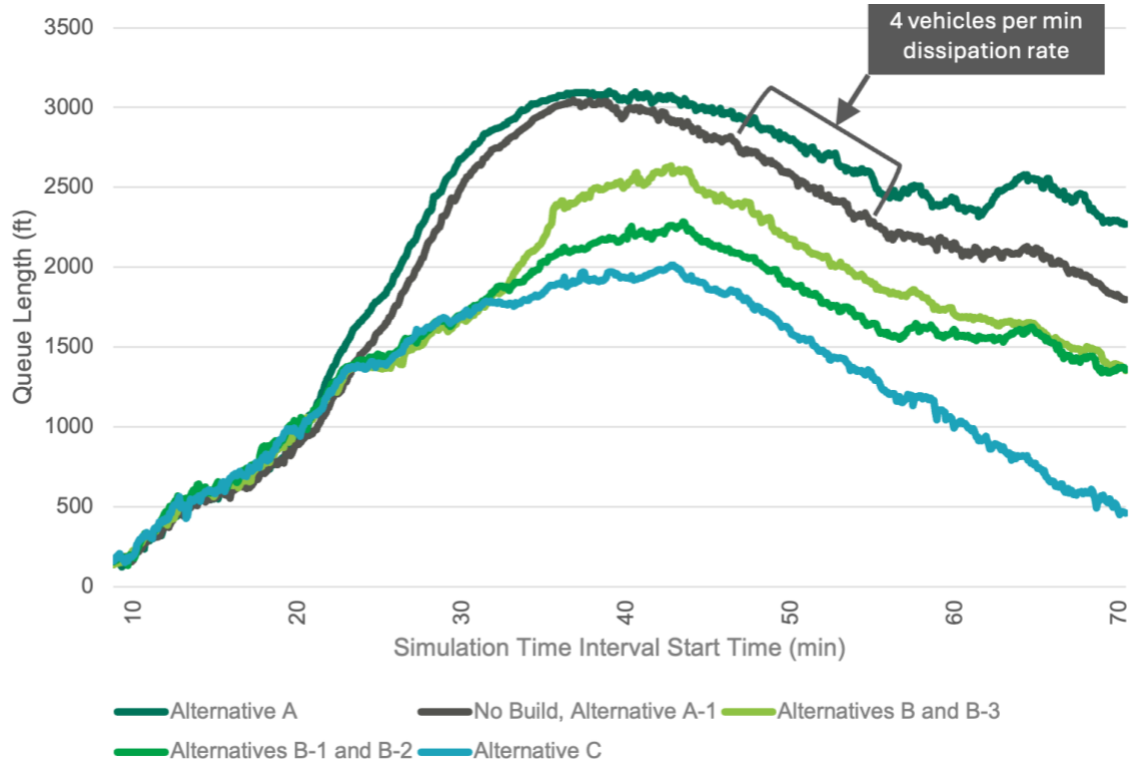
The baseline queue observations include the following:

- Alternatives A, A-1 and No Build peak at a 3,000-foot queue length.
- Alternatives B and B-3 peak at a 2,500-foot queue length.
- Alternatives B-1, B-2, and C-1 peak around a 2,000-foot queue length.
- The overall dissipation rate of baseline is three vehicles per minute.
- Baseline buildup duration is around 35 to 45 minutes to reach peak.

Under the baseline condition, Alternatives A, A-1 and No Build have the highest queue length and shortest peak time when compared with other alternatives. Alternatives B-1, B-2 and C-1 provided the lowest queue lengths and longest peak time. The dissipation rate of three vehicles per minute helps reduce the queue length faster for alternatives B (B-1, B-2 and B-3) and C-1 than Alternatives A, A-1 and No Build.

Exhibit 14 shows the queue length for the *GTG!* Option 1 with the Level 3 alternatives.

Exhibit 14. Option 1 queue observations



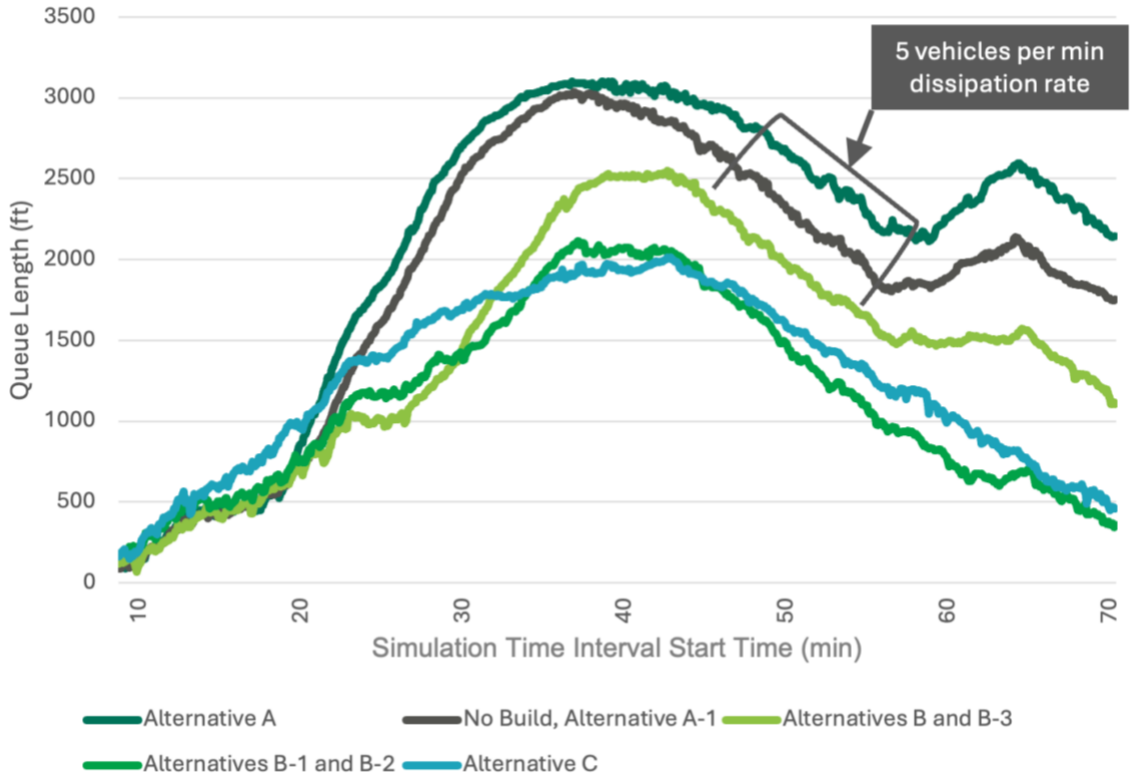
The *GTG!* Option 1 queue observations include the following:

- Option 1 – *GTG!* as a payment option with W2G
  - Alternatives A, A-1 and No Build peak at a 3,000-foot queue length.
  - Alternatives B and B-3 peak at a 2,500-foot queue length.
  - Alternatives B-1, and B-2 peak around a 2,200-foot queue length.
  - Alternative C-1 peaks around 2,000-foot queue length.
  - Overall dissipation rate of Option 1 is four vehicles per minute.
  - Buildup duration ranges from 36 to 43 minutes to reach peak.

Under the *GTG!* Option 1 loading, Alternatives A, A-1 and No Build have the highest queue lengths and shortest peak times when compared with other alternatives. Alternative C-1 provided the lowest queue length and longest peak time. The dissipation rate of four vehicles per minute helps to reduce the queue length faster for Alternatives B (B, B-1, B-2 and B-3) and C-1 than for Alternatives A, A-1 and No Build. A summary of level three alternatives is provided below along with the *GTG!* options. Detailed options for each *GTG!* option are on page 29.

Exhibit 15 shows the queue length for the *GTG!* Option 2 with the Level 3 alternatives.

Exhibit 15. Option 2 queue observations



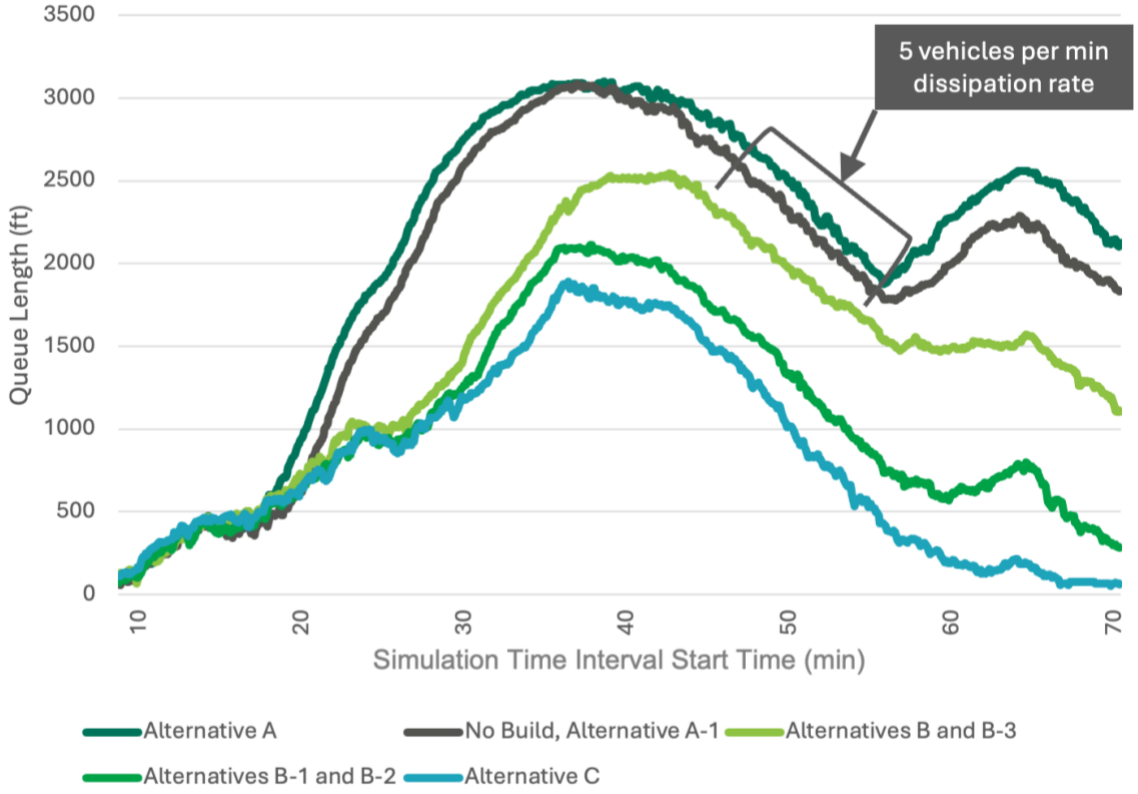
GTG! Option 2 queue observations include the following:

- Alternatives A, A-1 and No Build peak at a 3,000-foot queue length.
- Alternatives B and B-3 peak at a 2,500-foot queue length.
- Alternatives B-1, B-2, and C-1 peak around a 2,000-foot queue length.
- The overall dissipation rate of Option 2 is five vehicles per minute.
- Buildup duration ranges from 38 to 44 minutes to reach peak.

Under the *GTG!* Option 2 loading, Alternative A, A-1 and No Build have the highest queue lengths and shortest peak times when compared with other alternatives. Alternatives A, A-1, and No Build also start building up the queue again once they reach approximately 58 minutes duration and peak at approximately 65 minutes. Alternatives B-1, B-2 and C-1 provided the lowest queue lengths and longest peak times. The dissipation rate of five vehicles per minute helps to reduce the queue length faster for Alternatives B-1, B-2 and C-1 than for Alternatives A, A-1 and No Build.

Exhibit 16 shows the queue length for the *GTG!* Option 3 with the Level 3 alternatives.

Exhibit 16. Option 3 queue observations



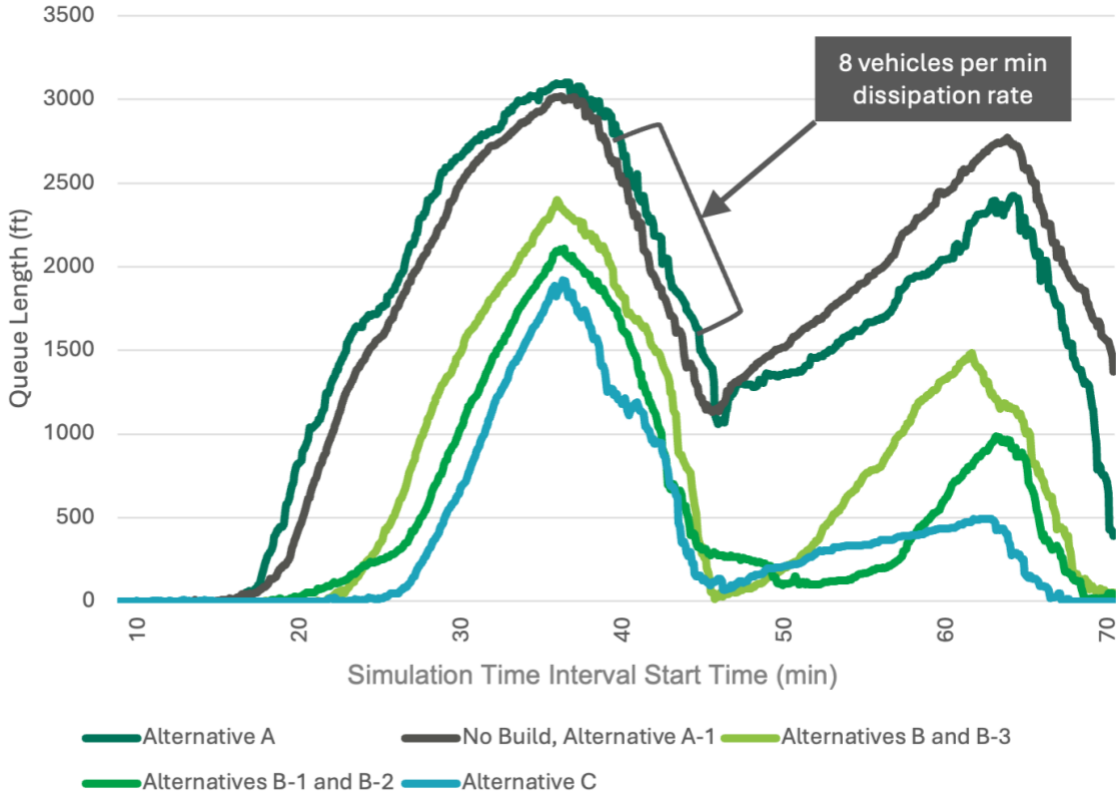
GTG! Option 3 queue observations include the following:

- Alternatives A, A-1 and No Build at a 3,000-foot queue length.
- Alternatives B and B-3 peak at a 2,500-foot queue length.
- Alternatives B-1 and B-2 peak around a 2,000-foot queue length.
- Alternative C-1 peaks around 1,800-foot queue length.
- The overall dissipation rate of Option 3 is five vehicles per minute.
- Buildup ranges to 36 minutes to reach the peak for all alternatives.

Under the *GTG!* Option 3 loading, Alternatives A, A-1and No Build have the highest queue lengths when compared with other alternatives. Alternatives A, A-1, A-2, A-3 and No Build also start building up the queue again once they reach approximately 56 minutes in duration and peak at approximately 63 minutes. Alternatives B-1, B-2 and C-1 provide the lowest queue lengths. The peak time to reach the maximum queue length was 36 minutes for all the alternatives. The dissipation rate of five vehicles per minute helps to reduce the queue length faster for Alternatives B-1, B-2 and C-1 than for Alternatives A, A-1and No Build.

Exhibit 17 shows the queue length for the *GTG!* Option 4 with the Level 3 alternatives.

Exhibit 17. Option 4 queue observations

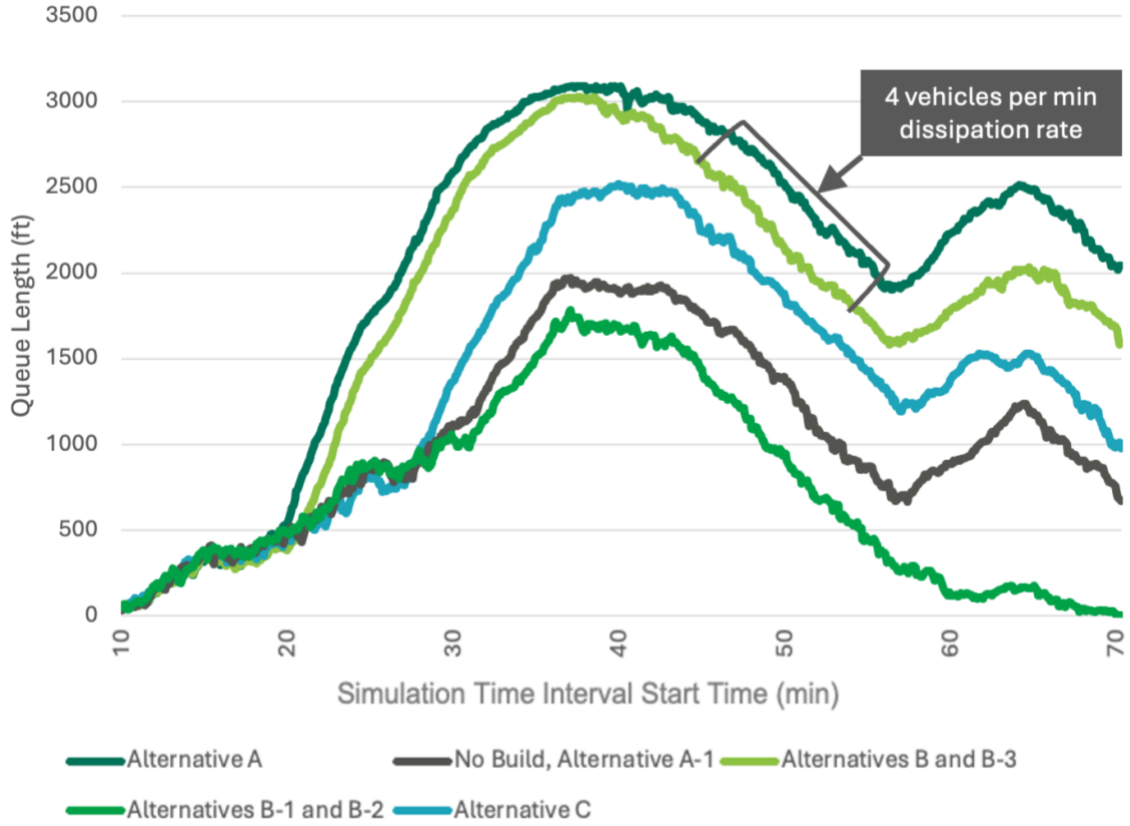


GTG! Option 4 queue observations include the following:

- Alternatives A, A-1 and No Build peak at a 3,000-foot queue length.
- Alternatives B and B-3 peak at a 2,400-foot queue length.
- Alternatives B-1 and B-2 peak at around a 2,100-foot queue length.
- Alternative C-1 peaks at around a 1,900-foot queue length.
- Overall dissipation rate of Option 4 is eight vehicles per minute.
- There is a 16- to 20-minute resistance before building up, reducing the duration to approximately 16 to 20 minutes to reach the peak.
- Completes two cycles of buildup and clearing the queue for Alternatives B (B, B-1, B-2 and B-3) and C-1.

Under the *GTG!* Option 4 loading, Alternatives A, A-1 and No Build have the highest queue lengths when compared with other alternatives. Alternatives A, A-1 and No Build reduce the queue within eight minutes and start building up the queue again once it reaches approximately 46 minutes in duration and peaks at approximately 63 minutes. Alternative C-1 provides the lowest queue length. The peak time to reach maximum queue length was 36 minutes for all the alternatives. The dissipation rate of eight vehicles per minute helped to reduce the queue length to almost zero for Alternatives B (B, B-1, B-2 and B-3) and C-1 in comparison with Alternatives A, A-1 and No Build. The 16-minute delay begins to build the queues for Alternatives A (A, A-1and No Build), and the 20-minute delay for Alternatives B (B, B-1, B-2 and B-3) and C-1 reduces the duration of peak buildup to 16 to 20 minutes before the queue reduces and starts to build up again. Exhibit 18 shows the queue length for the W2G advance ticketing option.

Exhibit 18. W2G advance ticketing queue observations



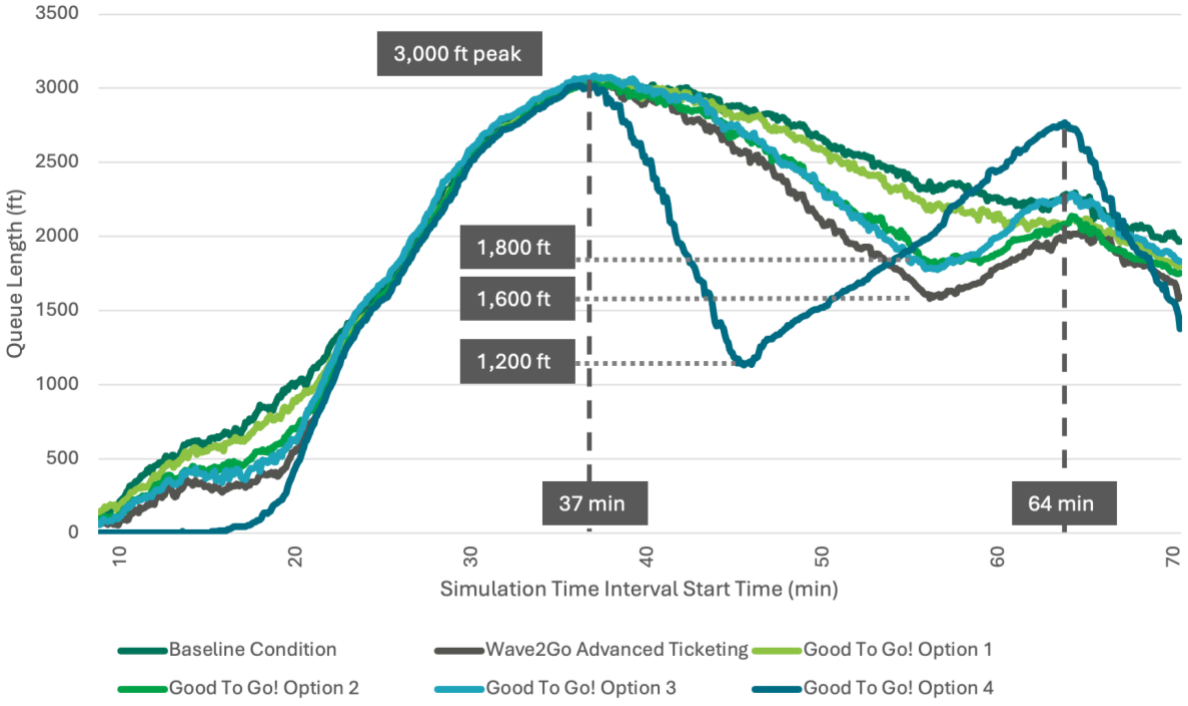
W2G advance ticketing queue observations include the following:

- Alternatives A, A-1 and No Build peak at a 3,000-foot queue length.
- Alternatives B and B-3 peak at a 2,500-foot queue length.
- Alternatives B-1 and B-2 peak at around a 2,000-foot queue length.
- Alternative C-1 peaks at around a 1,700-foot queue length.
- The overall dissipation rate of (100 percent usage or enhanced) of W2G is four vehicles per minute.
- Buildup duration takes around 37 minutes to reach the peak.

Under the W2G advance ticketing loading, Alternatives A, A-1 and No Build have the highest queue lengths when compared with other alternatives. Alternatives A, A-1 and No Build also start building up the queue again once they reach approximately 58 minutes in duration and peak at approximately 64 minutes. Alternatives B-1, B-2 and C-1 provide the lowest queue lengths. The peak time to reach was 37 minutes for all the alternatives. The dissipation rate of four vehicles per minute helps to reduce the queue length faster for Alternatives B-1, B-2 and C-1 than for Alternatives A, A-1 and No Build.

Exhibit 19 shows the baseline Southbound SW Way queue length by various *GTG!* options (Alternative A-2) and W2G advance ticketing (Alternative A-3).

Exhibit 19. Alternatives A-1, and no build queue lengths for each *GTG!* option



Alternatives summary

The microsimulation output addresses one applicable Level 3 screening criteria: operational efficiency. As defined by the *Summary of Level 3 Alternatives (WSF 2023)*, Alternatives A-2 and A-3 are variations of Alternative A-1 that have the same layout as A-1 and include *GTG!* (A-2) or only W2G advance ticketing technology (A-3). For the purposes of the microsimulation and addressing operational efficiency for the analysis, the derived inputs for Alternatives A-2 and A-3 were applied to produce estimated overall time savings in loading and assess queue performance when compared to the baseline "No Build" condition.

Alternative A – time savings and queue summary

For Alternative A, the analysis shows the true sensitivity of microsimulation and when the on-dock storage is reduced below the current No Build baseline. Alternative A shows benefit in only *GTG!* Option 4 and otherwise performs worse in time savings compared to baseline. The peak queue length rises slightly above 3000 feet baseline; however, dissipation rates mirror the other options.

Alternative A-2 (*GTG!*) – time savings and queue summary

For A-2 , the time savings improved for each option however peak queue length of 3000 feet did not change from baseline. What did change was how the queue itself performed over the microsimulation duration. Some options showed resiliency to buildup while most options showed progressive improvement reducing the queue length faster than baseline due to increased dissipation rate.

GTG! Option 1 shows the smallest 1-minute time savings and no queue improvement to baseline. After reaching a peak of 3,000 feet the queue length gradually reduces over 30 minutes reaching the minimum queue length of approximately 1,800 feet before eventually building up for the next sailing.

GTG! Options 2 and 3, have similar performance to each other with 1.5 to 2 minutes of time savings and the queue length decreases 9 minutes faster than baseline reaching the minimum 1,800 feet before building up again for the next sailing. Options 2 and 3 also demonstrate resiliency to initial queue buildup with about half the queue length accumulated versus baseline over the same amount of time.

GTG! Option 4 provides the fastest dissipation rate of eight vehicles per minute when compared with the other *GTG!* options and baseline conditions for Alternative A-2. After reaching the peak, the queue length minimizes at 1,200 feet (lowest among all options) a full 20 minutes faster than baseline before building up again in the next 23 minutes while waiting for the next sailing. On the front end, Option 4 also delays the start of any queue buildup by 15 minutes, thus reducing the overall cycle time to reach the peak and return to a minimum. Overall, Option 4 provides the best overall dissipation time and lowest queue length when compared to other options for the No Build and Alternative A-1 dock sizes.

Alternative A-3 (W2G advance ticketing) – time savings and queue summary

The Alternative A-3 W2G advance ticketing option shows similar queue performance to *GTG!* Options 2 and 3, with a time savings range of 1 to 1.5 minutes. The queue length peaks at approximately 3,000 feet at the same interval as *GTG!,* reduces nine minutes faster than the baseline and potentially outperforms the *GTG!* Option 2 minimum queue length by 200 feet at 1,600 feet.

Alternative B, B-1, B-2, B-3 and C – time savings and queue summary

Based on the model results, Alternatives B, B-1, B-2, B-3 and C are indifferent to vehicle processing speed once the on-dock storage matches the vessel capacity. However, even though the operational optimization has been achieved, *GTG!* and W2G advance ticketing offer some insight into vehicle processing and queue length performance even if no additional time savings are available. In general, the max peak queue length shortens proportionally for each alternative as the on-dock storage increases. Vehicles that would typically be queuing up Fauntleroy Way SW are now processed and waiting on the dock for loading. While the need for faster vehicle processing is diminished, *GTG!* and W2G microsimulation results provide benefit to the larger alternatives by minimizing queuing along Fauntleroy Way SW and when waves of arriving vehicles occur closer to the next sailing, *GTG!* and W2G can manage that demand improving the likelihood of making the boat without negatively influencing time performance.

8. Key considerations

WSF considered additional factors for using *GTG!* with the W2G payment system, including implementation costs, overall schedule, policy and fare evaluation.

Cost considerations

WSF identified *GTG!* costs more than the project budget are necessary to incorporate any new payment option at the terminal. These costs account for community engagement and customer outreach; consultant oversight; hardware and software changes; operations and maintenance; and customer service center support by *GTG!* vendors.

Adding WSF to the *GTG!* system is treated as a new roadside toll facility with each terminal as a small manual toll booth like SR 16 Tacoma Narrows Bridge. The estimated costs are based on existing *GTG!* single toll point implementation with similar equipment scaled to WSF. With improved network connectivity, toll booths (like tolling lanes) are connected to a centralized toll host system. This centralized application at the toll booths and other ferry terminal toll booths reduces upfront costs. The cost for expansion would be less per additional location. Table 10 shows the sample projected cost summary for implementation.

Table 10 Estimated implementation cost by *GTG!* option

ESTIMATED IMPLEMENTATION COST BY *GTG!* OPTION					
System	Function	OPTION 1 ($M)	OPTION 2 ($M)	OPTION 3 ($M)	OPTION 4 ($M)
***GTG!* BOS**	Oversight	$ 1.01	$ 1.40	$ 1.51	$ 1.60
	Implementation	$ 0.63	$ 0.90	$ 1.26	$ 1.70
	O&M	$ 0.66	$0.79	$ 1.32	$ 1.59
	C&O	$ 0.25	$ 0.25	$ 0.35	$ 0.35
	CSC Operations	$ 0.64	$ 0.84	$ 1.11	$ 1.31
	Subtotal	$ 3.19	$ 4.18	$ 5.55	$ 6.55
Roadside Toll Host	Oversight	$ 0.81	$ 1.22	$ 1.56	$ 1.60
	Implementation	$ 1.29	$ 1.50	$ 1.86	$ 2.68
	O&M	$ 0.53	$ 0.79	$ 1.27	$ 1.90
	C&O	$ 0.10	$ 0.10	$ 0.10	$ 0.10
	Subtotal	$ 2.73	$ 3.61	$ 4.79	$ 6.28
RTS Equipment (For One Lane/Toll Booth)	Oversight	$ 0.10	$ 0.15	$ 0.20	$ 0.20
	Implementation	$ 0.39	$ 0.42	$ 0.535	$ 0.54
	O&M	$ 0.06	$ 0.10	$ 0.16	$ 0.24
	C&O	$ 0.00	$ 0.00	$ 0.00	$ 0.00
	Subtotal	$ 0.55	$ 0.67	$ 0.895	$ 0.98
No of Lanes/Toll Booth		2	2	4	4
Total RTS Equipment		$ 1.10	$ 1.34	$ 3.58	$ 3.92
Total Cost		$ 7.02	$ 9.13	$ 13.92	$ 16.75

O&M = operation and maintenance C&O = communication and outreach

The overall cost estimate is divided into three *GTG!* systems: BOS, Roadside Toll Host and RTS equipment (for one lane/toll booth).

The *GTG!* BOS is the customer relationship application that manages all *GTG!* customer accounts. The roadside toll host is a centralized server application that communicates and receives the transactions from all the connected lanes, packages all the transactions and sends it to *GTG!* BOS for posting the transactions to the customer account.

The RTS toll host and RTS equipment consist of all the equipment required at each toll booth like readers, POS terminals, an AVC system, a lane controller system etc. Each lane of RTS

equipment is estimated individually based on options that can be used for the implementation budget planning.

For the purposes of this study, WSF assumes the most efficient centralized configuration for *GTG!* BOS and RTS Toll Host that would allow for expansion across the WSF terminal network (systemwide), providing system scalability without having to incur additional costs for *GTG!* BOS and RTS Toll Host. There may be incremental costs for *GTG!* BOS and RTS Toll Host in allowing to integrate with the new WSF terminal facilities.

Initial costs are higher to set up the WSF terminal as a toll facility, any subsequent additional terminals would be 30 percent to 50 percent of the above *GTG!* BOS initial implementation cost.

This bodes well for future scalability across WSF routes. The CSC operational cost to handle WSF customers is estimated at 25 percent of the total implementation cost for budgeting purposes. For the automated *GTG!* Options 3 and 4, additional toll booth equipment is budgeted and planned at each destination (Vashon and Southworth) to identify where the vehicle has traveled and apply the correct round trip or one-way fare. This brings the total count to four lanes of RTS equipment. The cost for implementation progressively increases, with Option 1 being the lowest cost and Option 4 being the highest. Further cost budgeting and estimation will be needed for the actual implementation planning based on the technical solutions of each option.

The Fauntleroy specific *GTG!* costs above do not include any enhancements of the W2G system. Any costs required by the current WSF operations to support the implementation, maintenance and operations of the selected *GTG!* option would need to be determined. However, WSF has already estimated the budget in preparation for modernization of W2G and integration with *GTG!*. While this study assumes no official integration and the continued separation of systems, the budget allocated by WSF for the integration with *GTG!* was planned as phase 3 activity with a simplistic approach to reading the GTG passes without any automated vehicle classification or passenger occupancy detection technology. Based on the current reviewed options, the proposed phase 3 funding will be insufficient to implement *GTG!* options and would require additional funding with operational changes. Table 11 presents the details of W2G advance ticketing phase 3 funding for *GTG!* integration.

There are currently funds allocated in Phases 1 and 2 for W2G enhancements. Phase 3 below is for costs specific to *GTG!* integration.

Table 11. W2G advance ticketing implementation planned costs

PHASE	ACTIVITIES	ALLOCATED BUDGET ($M)	PLANNED BIENNIUM
Phase 3	*GTG!* implementation including hardware upgrades	4.112	Future

Schedule considerations

Before implementing *GTG!* WSF must first consider how *GTG!* affects our customers and the communities they serve. Any changes to current fares structure require policy change and time for meaningful community engagement. Second, *GTG!* implementation cannot begin until WSDOT renews the *GTG!* RTS contract. The RTS contract has reached its limit, and the current schedule estimates award of a new contract in early to mid-2026. WSF also needs to request additional funding from the Legislature to implement any *GTG!* option. The project assumes WSF requests funding in the 2025 or 2027 Biennium. Any delays in funding or policy approvals would have a direct impact on the schedule estimates below.

Implementation. Implementing a typical *GTG!* single point tolling facility can take 14 to 36 months, including contracting, completing the software development life cycle and coordinating the BOS, RTS tolling vendors and the roadside contractor. Typically, contracting will take 3 to 6 months to establish the necessary amendments to activate and negotiate the new facility scope of work. This study assumes any necessary policy and fare restructuring would happen before BOS or RTS contracting. *GTG!* Options 1 and 2 retain current fares and do not require policy changes. The more complex all electronic Options 3 and 4 would require extensive policy changes to increase fares which would require coordination with and approval from the Washington State Transportation Commission (WSTC). Table 12 shows the sample schedule for each *GTG!* option.

Table 12. Estimated overall schedule duration by option

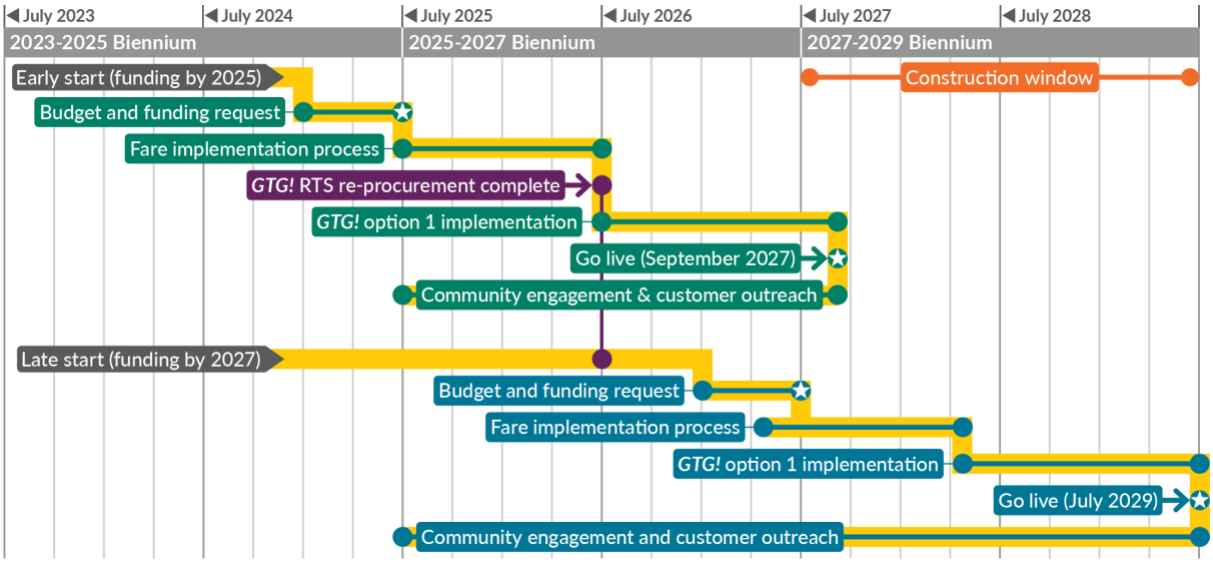
OPTIONS	FUNDING, POLICY & FARE (mos.)	IMPLEMENTATION					TOTAL (mos.)
		Contracting (mos.)	Design (mos.)	Develop (mos.)	Deploy (mos.)	Test (mos.)	
Option 1	12	4	2	3	2	3	**26**
Option 2	12	4	3	5	4	4	**32**
Option 3	24-36	4	5	6	5	6	**56**
Option 4	24-36	4	6	10	7	7	**64**
W2G ATT	12	4	6	4	2	2	**30**

The biennium budgeting process and timeline to implement a *GTG!* option for the terminal is based on WSF requesting the budget and completing either as soon as possible or by the completion of the planned construction cycle in 2029 for each *GTG!* option, given the starting timeline assumption of January 2025.

The timeline provides an overview of how some activities can run in parallel. It also shows the activities that are sequential, and when overlaid with the biennium budget cycle, it allows planning for budget requests based on the timeline of WSF implementing a *GTG!* Option. All timelines below are represented in Month and Years.

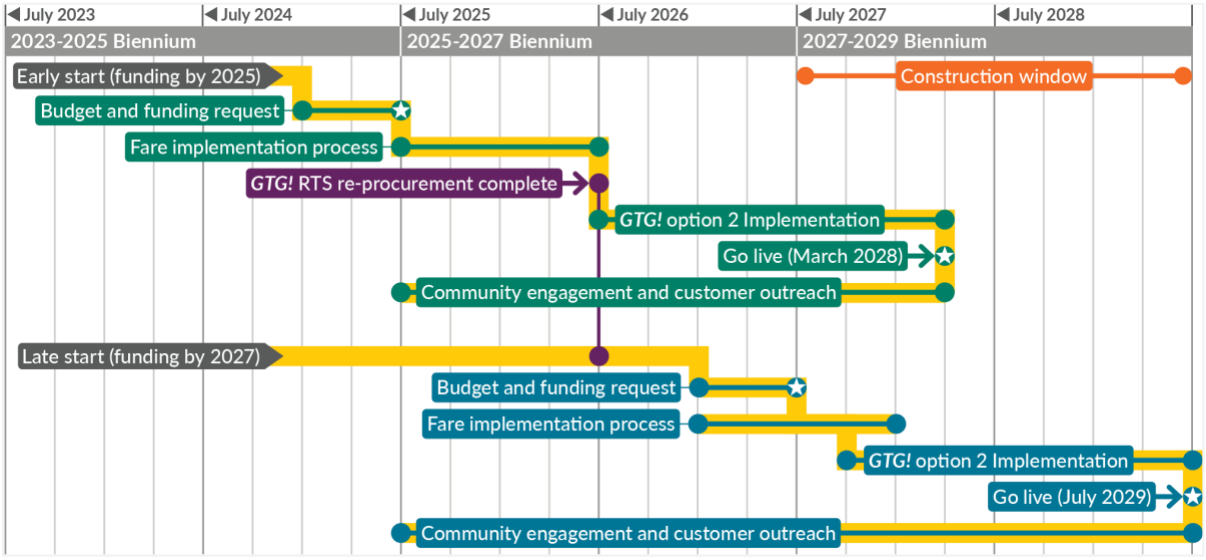
***GTG!* option 1.** The *GTG!* Option 1 implementation timeline is shown on Exhibit 20. Based on the timeline and RTS contract renewal, WSF can start implementing *GTG!* Option 1 by July 2026 and complete the implementation by August 2027. Option 1 does not require policy changes, but WSF would follow the typical fare process. WSF will engage communities and customers early and often throughout this process. In this scenario, WSF would need to request additional funding in the 2025 or 2027 Biennium to meet this schedule. WSF could also choose to pursue funding in the 2027-2029 biennium.

Exhibit 20: *GTG!* Option 1 implementation timeline and budget planning.



***GTG!* Option 2.** *GTG!* Option 2 implementation timeline is shown on Exhibit 21. Based on the timeline and RTS contract renewal, WSF can start implementing *GTG!* Option 2 by July 2026 and complete the implementation by February 2028. Option 2 does not require policy changes, but WSF would follow typical fare process. WSF will engage communities and customers early and often throughout this process. In this scenario, WSF would need to request additional funding in the 2025-2027 biennium to meet this schedule. WSF could also choose to pursue funding in the 2027-2029 biennium.

Exhibit 21: *GTG!* Option 2 implementation timeline and budget planning.

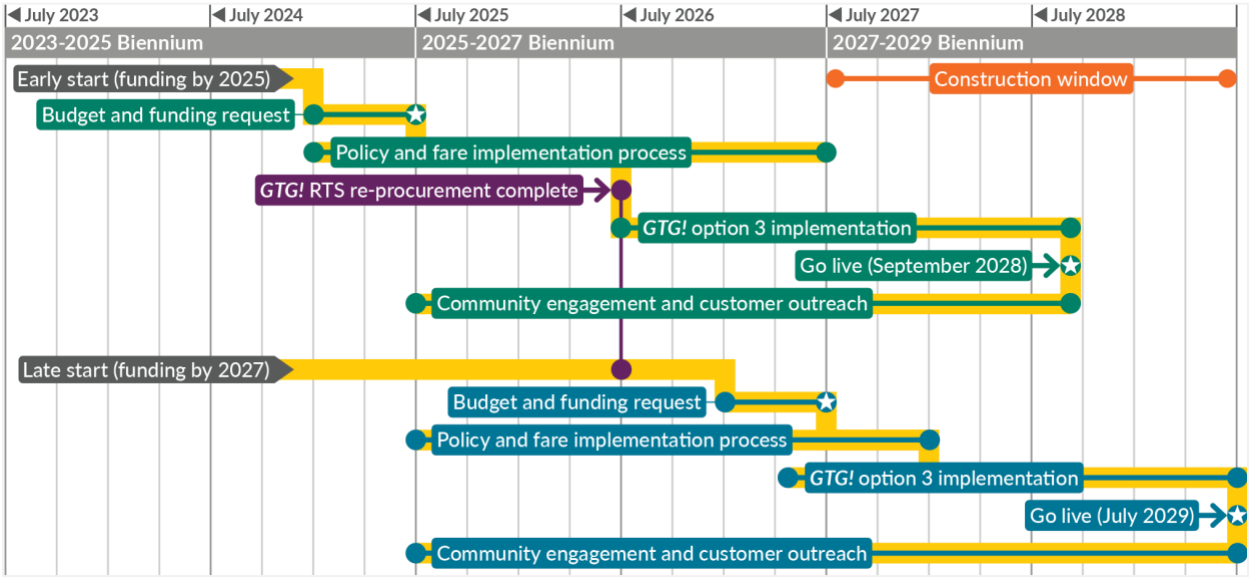


***GTG!* Option 3.** The potential timeline for implementing *GTG!* Option 3 is shown in Exhibit 22. In addition to renewing the RTS contract, Option 3 requires significant policy and fare changes and more funding. WSF anticipates significant community concern about fare increases. Option 3 requires fare restructuring due to occupancy detection and discount challenges for vehicle passengers and does not align with policies under FTA, HEAL Act and Title VI. This process could take at least three years to complete, and likely much longer. In addition, since the WSTC officially reviews, proposes, and approves WSF fares, a more involved fare policy process is expected.

The earliest WSF could begin implementing *GTG!* Option 3 is July 2026. WSF estimates policy conversations would take at least two to three years and any delays in this process would impact the overall schedule. Option 3 brings significant risk to the schedule since this option does not align with WSF policies and guiding principles to provide equitable fares to ferry-dependent customers.

Under all options, WSF would conduct extensive communications and engagement. Option 3 would require requesting more funding by the 2027 Biennium. WSF could also choose to pursue funding in the 2027-2029 Biennium which will allow WSF to start implementing the project in May 2027.

Exhibit 22: *GTG!* Option 3 implementation timeline and budget planning.



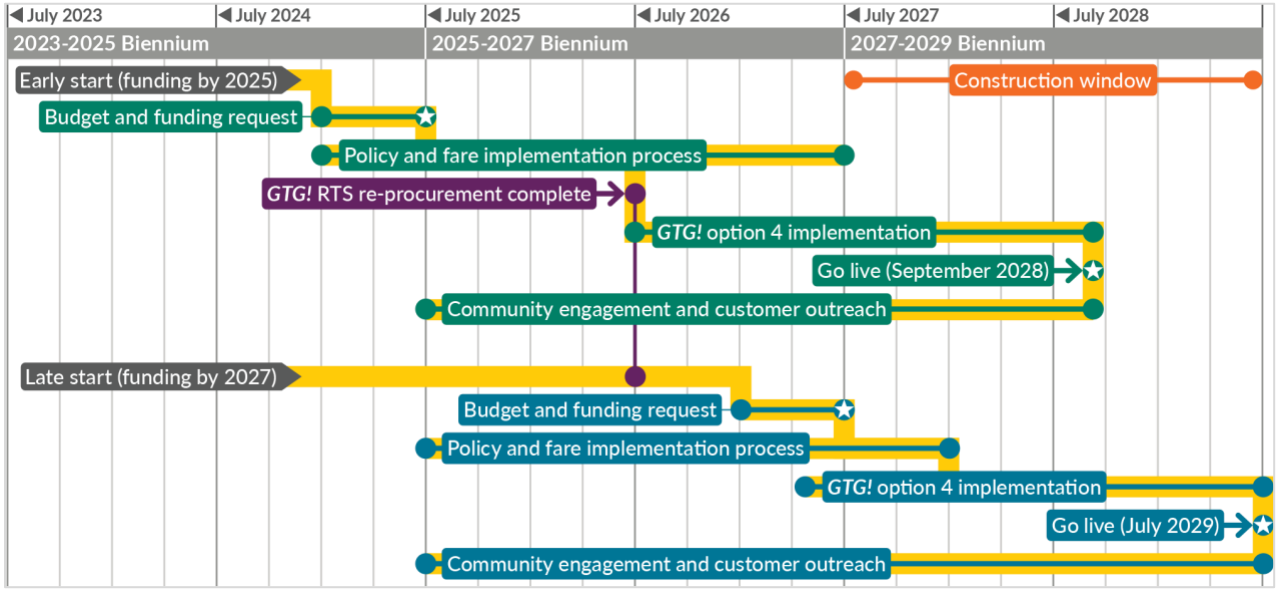
***GTG!* Option 4.** The *GTG!* Option 4 implementation timeline is shown in Exhibit 23. As discussed, one of the key items to start *GTG!* implementation is the contract re-procurement for RTS by WSDOT tolling, policy and fare decision completion and budget request and allocation. The policy timeline is estimated to take up to 36 months to navigate and weigh potential changes. Option 4 requires fare restructuring due to occupancy detection and discount challenges for vehicle passengers, potentially compromising policies like FTA, HEAL Act and Title VI.

Based on the suggested timeline and prerequisites, WSF could start *GTG!* Option 4 implementation by July 2026 and complete the implementation in April 2029. Assuming longer policy discussions with the WSTC and other stakeholders, the policy decision timeframe for this option is planned for up to 36 months with it starting as soon as this year. If policy decision takes longer the schedule will slip accordingly. This represents the highest risk to the schedule since the potential policy compromises from fare restructuring may not be approved based on the inability of WSF to adhere to its guiding principles of providing fare equity and environmental justice to all ferry riders.

Communication outreach and engagement is planned the same as Options 1 and 2 as a 48-month continuous process, which has a July 2025 start date for this timeline. If WSF plans to implement *GTG!* option 4 with this timeline, then the required budget must be requested in the 2025 - 2027Biennium budget cycle. WSF could choose to pursue funding in the 2027-2029 Biennium and still meet the construction schedule. However, to meet the construction deadline activities such as implementation would need to start no later than September 2026.

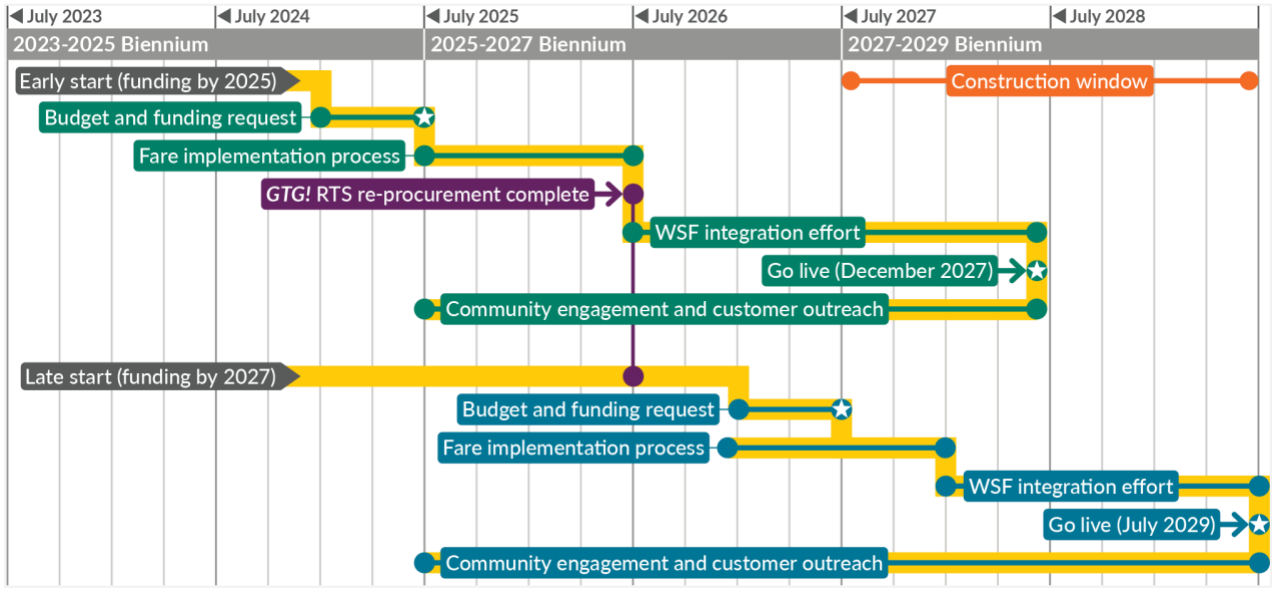
Any delays in funding or policy approvals past 2027 would have direct impact on the schedule and would delay past the construction window.

Exhibit 23: *GTG!* Option 4 implementation timeline and budget planning.



W2G advance ticketing. The following W2G advance ticketing schedule considers two timelines with an early start and late start based on the timing of funding authorization for *GTG!*. If additional budget is needed, then funding can be requested in 2027-2029 Biennium.

Exhibit 24: *W2G* implementation timeline and budget planning.



Operational considerations

The operational consideration relates to the overall operational logistics that involve guiding the vehicles through the complete loading process from queueing before the toll booth on the

shoulder lane of Fauntleroy Way SW, guiding traffic onto the lanes, sorting the vehicles based on the destination and ultimately loading the vehicles onto the ferry. *GTG!* and W2G offers nominal benefit to these operational activities at the terminal.

GTG! Options 1 and 2 require no change to current procedures. *GTG!* Options 3 and 4 operational considerations will also follow the current procedures and process but will have to adjust to account for the increased vehicle processing rate. WSF reviewed how the current operational considerations could be handled with the automated *GTG!* Options 3 and 4 solutions and acknowledges further review and analysis of the current procedures would be needed during the design phase. The severity of operational conditions created by an increased vehicle processing is also tied to the Level 3 alternatives. Increased space available may allow for increased flexibility by operations to address some of the following considerations.

On-dock vehicle sorting

Once a vehicle clears the toll booth, it still requires direction by operational staff to the correct lane for a specific destination, which changes based on the sailing and the number of vehicles for each destination. Currently, ferry customers receive a colored placard to identify a destination. Future technology could be available to assist with sorting, but current *GTG!* technology does not support dock sorting. Because of increased vehicle processing at the toll booth, the on-dock vehicle sorting will require additional manual intervention where an attendant will direct vehicles to go to the correct laned based on the destination.

Hazardous materials control

Hazardous materials, gas or propane control procedures will be followed as the same process with manual intervention after the vehicle has passed the toll booth. The procedure will be reviewed during the design phase and updated as required.

Low tide restriction

If a low tide restriction is in place, the existing process will be followed. If the vehicle must turn back, the system will confirm the trip did not take place and will not apply payment. The procedure will be reviewed during the design phase for the automated *GTG!* options and updated accordingly if required.

Oversize vehicles

Oversize vehicles will be managed with the existing procedure. The new toll booth placement will be designed to maximize turning radius. The procedure will be reviewed during the design phase and updated accordingly if required.

Lane cutting

GTG! does not encourage but will not solve lane cutting. Lane cutting is customer behavior and is assumed for this study to handled operationally and through enforcement as done currently. The procedure will be reviewed for the automated *GTG!* options and updated accordingly if required.

Customer considerations

WSF centers the needs of our customers and communities they serve in decision-making. The more complex *GTG!* Options 3 and 4 require changing fare structure.

Customer experience. WSF considered features and benefits that affect customer experience, including fares, on time departures, less time unloading and loading, waiting to pay at the toll booth and less backup along Fauntleroy Way SW. Overall, *GTG!* offers minimal time savings and slightly shorter queues along Fauntleroy Way.

- The tradeoff for these minimal operational benefits is increased fares by 30 percent, significantly impacting customers. Fare increases of this magnitude are unprecedented for WSF, especially for people living on ferry-dependent Vashon Island.
-
- Implementing *GTG!* only at the Fauntleroy ferry terminal could also confuse customers due to inconsistent payment method and fare structure across the system.

Communications and engagement

WSF is committed to meaningfully engaging customers and communities who rely on the Fauntleroy ferry terminal in considering any tolling or changes to W2G technology.

WSF prioritizes the needs of all customers, including those who rely on WSF's discount programs, such as seniors, people with low incomes and people with disabilities, to ensure they receive equitable access to ferry service.

For people who live on ferry-dependent Vashon Island, these considerations are essential to connecting people with critical medical appointments, work, food, and other services. WSF will engage all customers ahead of making any decisions about implementing tolling or changes to advanced payment technologies.

If WSF implements *GTG!* or enhances Wave 2 Go, WSF would develop a multi-phase communications and engagement approach to share information with customers and carefully consider community input.

WSF and *GTG!* Toll Division collaboration

WSF and *GTG!* Toll Division would need to develop joint business rules, standard operating procedures, customer service protocols, detailed cost estimates, workflows and communications guidelines for review at all levels, including the Legislature, Commission, ferry customer groups and customers, surrounding communities and operations staff, among others.

WSF and *GTG!* would need to coordinate the development, integration and communication of new payment options to the public as early as possible.

Technical implementation considerations

WSF reviewed various technical implementation considerations that may be required in the *GTG!* BOS for automated *GTG!* Option 3 and 4. In the following subsections, a few considerations are reviewed for their possible technical implementation:

Discount validation

The proposed validation necessary to provide discounts for age, disability and Multi-Ride for *GTG!* would be implemented as follows:

- Senior Discount – Available to customers 65 and over. Requires a valid DOL certification to register age on *GTG!* account. BOS then automatically applies a discount on the account level after the transaction posts.
- Disability – Requires appropriate documentation to be verified and applied to *GTG!* account. Certification would be either through the CSC (potentially in person) or by submitting through the case functionality used for contesting tolls. The documentation could be reviewed, and the status could be applied to make the customer eligible for discount when traveling.
- Multi-ride – Commuter/frequent rider discount. The BOS stores all transactions on the account level. Once the commuter/frequent rider reaches the desired trips within the desired duration, a discount is applied in the form of a credit against the current or future balance.
- Tribal-based Discounts – Requires appropriate documentation to be verified and applied to *GTG!* account. BOS then automatically applies a discount on the account level after transaction posts. *GTG!* is currently working on several solutions to adhere to this policy.
- Other discounts could expand the discount suite to other groups such as low-income riders.

Occupancy detection

Occupancy detection technology and solutions are being explored by tolling agencies for handling HOV lanes declaration validations. Currently *GTG!* does not use occupancy detection in any form but is exploring smartphone-based applications. Due to the high rate of speed on the freeways alternative camera-based occupancy detection has limitations. Since WSF would be capturing passengers at a slower speed both versions are applicable.

Occupancy detection technology currently identifies the number of passengers in the vehicle but cannot make any further deduction on additional parameters such as age or disability as required by WSF. Therefore, the technology has a limitation for WSF purposes, and a fare structure decision will be needed to account for capturing vehicle passengers using this technology without identifying potential discount eligibility.

WSF explored possible solutions that can be used for counting the number of passengers in the vehicle.

Good To Go! has a Flex Pass, which is currently used for carpools on I-405 express toll lanes and SR 167 HOT lanes. When a customer(s) qualifies as a carpool, they self-declare carpool status by switching the Flex Pass to HOV mode. This declaration does not indicate the exact number of occupants and relies on enforcement to discourage a false declaration. This declaration does not indicate the exact number of occupants and relies on enforcement to discourage a false declaration.

Camera-based occupancy detection. The camera-based occupancy detection solutions are used nationally for HOV enforcement and are typically more effective at slower speeds like at

the terminal. Installing a set of side- or top-mounted cameras in the lane that can capture the occupant image details and count how many passengers are in the vehicle. However, because of Washington legislation and privacy concerns, camera images cannot store personal information that could be used to identify and profile people. Some pilot programs are being implemented that can identify occupants without collecting personal identity (using Artificial Intelligence [AI] blurring or thermal imaging) by few tolling agencies, but more research and analysis is needed before implementing.

Smartphone application-based occupancy detection. A primary emerging technology researched for this study to address the need for occupancy detection is RideFlag. RideFlag's vehicle occupancy detection (VOD) camera technology accurately counts and verifies vehicle occupants. Using only one smartphone and proprietary AI, carpoolers can declare and verify their occupancy in approximately 5 seconds or less. Verification can be completed with a face mask, sunglasses, in all lighting conditions and with children. RideFlag's VOD smartphone app is being tested on multiple express lane facilities to help improve the technology and optimize its impact on creating new and sustained carpools.

The RideFlag application originally envisioned for HOV declaration could then be reconfigured with *GTG!* to assess the number of people in the car and use that identification to package the appropriate fare at the ferry terminal, inclusive of all passengers. However, since the occupancy detection count is self-certification by the passenger via the app, it can lead to fare evasion and difficulty in enforcing the current occupancy fare revenue collection for WSF.

For either occupancy detection method, further research into how it can be successfully applied to WSF is needed. WSF will need to map the specific workflow, define enforcement to ensure the intended customer behavior and achieve a solution that allows the appropriate fare when vehicle passengers will not be able to declare eligibility for age, disability, or tribal discounts.

Unbanked or underbanked customers

Unbanked or underbanked customers are those customers who do not have a checking or savings account or a debit card with a bank or credit union and those who have a bank account but also use alternative financial services such as check cashing, prepaid debit cards etc.

Currently, the *GTG!* BOS receives payments from unbanked or underbanked customers in the form of money orders via lockbox with a payment coupon to tie the payment to their trips. *GTG!* BOS is also looking into QR code technology integrated with third party payment applications that can receive cash payment at convenience stores by scanning the quick response (QR) code and accepting payment for it.

GTG! Options 1 and 2 already accept cash payments and will handle unbanked or underbanked customers as managed currently by WSF. WSF reviewed how the unbanked customers will be handled with the automated *GTG!* Options 3 and 4. W2G advance ticketing already accepts ORCA card ePurse payments for the ferries, and the same interface can be built with *GTG!* BOS to accept ORCA card payments from the unbanked customers. ORCA cards allow customers to reload their cards via cash, credit or debit cards. Another option could be digital wallets like Apple Pay, Google Pay or Venmo using QR codes that can be implemented as

payment method at *GTG!* BOS to accept payments from unbanked customers. These payment interfaces would be established during the design and development phase.

Fare implementation by destination and trip confirmation (one-way versus round trip)

The terminal is unique because of its Triangle route with multiple destinations and different fares by destination. In general, the system will not apply a payment unless the trip is confirmed. To confirm the appropriate fare is applied, either a one-way or round trip, an origin and destination solution is required. The pass or plate is read at the terminal, and then the exit lane at the Vashon and Southworth terminals will be equipped with the RFID pass reader technology to read the pass at the destination and confirm the customer took the trip.

The *GTG!* BOS will receive the complete trip information and apply the fare based on the origin and destination combination. The correct fare is applied and posted to the customer's account. If one of the transactions is missed, then historical dataset can be used to apply fare to the customer trip, or a round trip will be applied, and customer could call in the CSC for the adjustment if they took a one-way trip.

Some other options like specific passes based on the destination or specific pass mode to use for specific destination can also be explored to handle the fare implementation by the route destination.

9. Policy considerations

Fare analysis and impacts

WSF reviewed current fares with the identified technical solution for *GTG!* Options 3 and 4 and for potential impacts to the current fare structure. Currently, the fares for a passenger in a vehicle require occupancy detection and validation by a ticket seller at the toll booth. A ticket seller to verify vehicle occupancy would be retained for *GTG!* Options 1 and 2 and W2G. However, to achieve vehicle passenger verification through automation, as required in *GTG!* Options 3 and 4, additional technology integration would be necessary.

The current technological occupancy detection and validation solutions available for *GTG!* are primarily dependent on two possibilities, a customer's self-declaration through an app or validation by a camera. Currently *GTG!* does not use occupancy detection in any form but is exploring smartphone-based applications for occupancy detection. Due to the high rate of speed on toll roads, camera-based occupancy detection has limitations on toll facilities, however it would be appropriate for a WSF application.

To assess fare impacts with occupancy detection limitations for Options 3 and 4, WSF and WSTC would need to follow the established fare setting process to maintain revenue neutrality. In the 2023-2025 WSF Biennial budget, WSF's operations budget was $770.4 million. Ferry fares are expected to fund 48 percent of the overall budget. WSF recovery rates may differ by route. Currently, the Triangle route generates 36.4 percent of revenue from fares. This study used this revenue target to evaluate fares.

To determine fare impacts, the following assumptions were used.

- 2019 Ridership data for the Triangle route was applied to establish demand for each fare type for each Triangle route destination.
- Vehicle passenger counts were determined for each fare type and the resulting revenue generated in 2019.
- Revenue associated with vehicle passengers was redistributed to the appropriate vehicle and driver fares weighted by ridership.
- Fares were then adjusted to 2024 rates.
- Adherence to Title VI and the Federal Transit Act discount requirements based on federal funding will continue to support ferries.
- This fare analysis is specific to the Triangle route and aligned with revenue targets. While the calculation for determining fares is the same from a system-wide perspective, each terminal would align with its revenue targets.

This analysis measures the impacts of any fare change proposals and will be evaluated by the WSTC for review and approval. WSF reviewed how the fares might look for *GTG!* options 3 and 4 under the following three scenarios:

1. No occupancy detection and validation.

2. No occupancy detection and validation solutions are used for vehicle passenger fares, resulting in free fares for vehicle passengers only
3. Redistribution of the fare structure to meet revenue goals.

NOTE: Passenger walk-on pricing would remain.

WSF reviewed the possibility of removing the passenger vehicle fares to speed up processing. Keeping in line with required policies and the fare revenue targets, the vehicle fares suggested increase would be in the range of 24 to 34 percent for a round trip to meet the current revenue target (thus, if revenue targets increase, fares would be expected to increase accordingly).

An additional potential benefit of having a single vehicle-based fare is that it will encourage High Occupancy Vehicle (HOV) travel and reduce Single Occupancy Vehicles (SOV) travel, potentially creating some reduction in vehicle queueing. A complete sample fare table that accounts for this scenario is available in Appendix A.

Occupancy detection only. Occupancy detection is used to verify the number of passengers in the vehicle only. Technology cannot validate other discount attributes such as age and disability currently offered by WSF. This results in a single flat fare approach for all vehicle passengers that is half the fare of the regular adult walk-on fare to adhere to the Federal Transit Act. This allows a senior and disabled person to always be charged the discounted half fare of the regular passenger fare but also allows all vehicle passengers to pay the half fare. Waivers for Yakama & Nez Perce tribal members and persons aged 18 years and younger can be addressed only as the driver with a *GTG!* account or walk-on passenger but not as a vehicle passenger. This assumption would go through the appropriate approval and review process by the fare business development, legal and policy groups.

With the possibility of occupancy detection, this would help mitigate fare increases to meet revenue targets. The suggested increase for vehicles would be in the range of 13 to 25 percent for a round trip to generate the current revenue target. It is unknown if this would influence HOV/SOV distribution since some would be encouraged to be a vehicle passenger and some would be encouraged to drive or walk on to ensure a discount/waiver. A sample fare table that accounts for this scenario is available in Appendix A.

Time-of-day pricing. WSF also reviewed *GTG!*'s current use of time-of-day pricing and its influence on fare structure and customer behavior.

This strategy requires no technology and uses the change in fares to influence customer behavior during peak demand. To meet required age and disability policies and the fare revenue targets, the fare increase would be in the range of 26 to 28 percent for the round trip during peak times. Conversely, the fares would decrease during off-peak times to encourage more use. The off-peak fares would be in the range of 36 to 50 percent less than peak. A sample fare table that accounts for this scenario is available in Appendix A.

Currently revenue neutrality for the Triangle route focuses on redistributing the vehicle passenger fare among the vehicle fare categories only. Alternatively, the revenue deficit due to removing vehicle passenger fares can be distributed evenly among other fare categories to reduce the percentage increase in the vehicle fare category only.

Further fare strategies for Fauntleroy could be analyzed and any fare changes would go through the WSF fare setting process to determine the approach and any associated impacts. The Triangle route is the focus of *GTG!* application in this study, any systemwide fare considerations of *GTG!* would still need to be analyzed for each route's revenue targets. Below is the snapshot of the Triangle route fare analysis of various scenarios evaluated to meet revenue neutrality for *GTG!* options 3 and 4.

Table 13. Fare analysis snapshot to meet revenue neutrality for options 3 and 4

***GTG!* OPTION 3 and OPTION 4 FARE IMPACT BY SCENARIO TO MAINTAIN REVENUE NEUTRALITY**			
Scenarios	**Average Vashon Vehicle and Driver Fare Impact**	**Average Southworth Vehicle and Driver Fare Impact**	**Notes**
No occupancy detection and validation	24 - 34% ($4-7) increase for the roundtrip fare	Approx 10% ($1.50) increase for the one-way trip	All vehicle passengers are free
Occupancy detection	13 - 25% ($2-5) increase for the round-trip fare	Approx 5% ($0.75) increase for the one-way trip.	Flat fee for all vehicle passengers at a minimum of 50% of the adult passenger fare to meet FTA requirements

Table 14. Fare time of day impact for options 3 and 4

FARE IMPACT BY TIME OF DAY TO MAINTAIN REVENUE NEUTRALITY			
Scenarios	**Fare Impact (Peak)**	**Fare Impact (Off-peak)**	**Notes**
Time-of-day pricing	26 - 28% increase for round-trip fare	36 - 50% decrease for round-trip fare	Off-peak must be half of peak rate

Fares for *GTG!* options 1, 2 and W2G Advance Ticketing, no fare changes were considered because the ticket seller at the toll booth must validate the customer ticket and required credentials. Through the modernization of W2G, WSF will explore emerging technologies and further enhancements of W2G advance ticketing. Further incorporation or changes of existing products like Multi-Ride can be developed to capture this pricing strategy.

This fare impact assumes adjusting Multi-Ride fares based on time of day. From a *GTG!* perspective the discount products would be built on the account level and can be configured in any way to match the preferred business requirement(s) for frequent users. The time of day is captured with each transaction and therefore tracked by the account to apply the appropriate discount. For W2G to adjust to this approach it would require further investigation of the enhancements planned and how to implement a digital solution for the Multi-Ride.

Fare setting process

The following describes the process and entities that oversee reviewing and implementing fare setting policies.

WSF conducts fare reviews as per Legislative budget targets for the biennial transportation budget. As part of this process, WSF develops a fare proposal for submittal to the Commission.

Ferry Advisory Committee on Tariff (FAC-T) provides input for fare development.

Washington State Transportation Commission (WSTC) sets ferry fares and policies in consultation with WSF to meet budget requirements and all state, federal and tribal agreements. WSTC may adopt fares that are effective for multiple years and may exceed the fiscal growth factor. Fares are based on the route's geographical location, length of a vehicle as well as the sailing distance.

Unique to WSF, WAC 468-300-040 authorizes special toll rate(s) for a *GTG!* pilot program on any ferry route. The fares would be submitted by WSF's Assistant Secretary to the WSTC with regular reporting requirements. "The pilot will conclude in no longer than three years"

Washington State Treasurer oversees the financial operations of WSDOT including the Toll Division and WSF.

Diversity, equity and inclusion policies

WSF has defined itself by committing to guidance and policies to maintain and balance diversity, equity, and inclusion with operational performance. WSF is committed to effectively meeting the needs of all people, to ensure equitable distribution of transportation benefits and to avoid, minimize or mitigate disproportionate effects associated with transportation decision making.

Exhibit 25 shows the key federal and state laws guiding WSF fares.

Exhibit 25: Federal and state laws guiding WSF fares

EO 12898 (2023) ENVIRONMENTAL JUSTICE TITLE VI OF THE CIVIL RIGHTS ACT	WASHINGTON STATE HEAL ACT	FEDERAL TRANSIT ACT	ESSB 5974
Communities with EJ concerns may include: • Urban/rural areas • Tribal Nations and their lands / Tribal Agreements • Low income, persistent poverty / inequality • People of color • Geographically dispersed and mobile populations, such as migrant farmworkers.	Reduce disparities among overburdened communities and vulnerable populations, which could include: • Racial or ethnic minority. • Low-income populations • Populations disproportionately impacted by environmental harms • Populations of workers experiencing environmental harms • Tribal consultation and coordination.	Specific discounts for: • Age • Disability • Medicare cardholders • Federally subsidized transit providers may not charge more than half of the peak fare for fixed fare transit during off-peak hours for seniors, people with disabilities and Medicare cardholders.	All riders 18 years of age and younger ride free of charge on all (WSF) system routes. WAC 468-300-010

As outlined in WSDOT's Title VI Plan there are the following key components for ensuring environmental justice (EJ) and adherence to all applicable state and federal acts related to equity around access and fares. The key elements of the plan are as follows:

- Defining the project and conducting demographic analysis.
- Developing a communications plan including specific EJ communication strategies for continuous and meaningful involvement early in the process.
- Community engagement consulting with all potentially affected community members, including those who are historically underserved.
- Alignment with interagency HEAL Act working groups.
- Determining the potential impacts, mitigation and benefits on overburdened communities and vulnerable populations.
- Documenting methodology/findings to ultimately help WSDOT make an informed decision(s).

Following current vehicle/passenger discounts would not be available in *GTG!* Options 3 and 4.

- Free vehicle passage for youth 0-18 years of age (Washington State Law ESSB 5973).
- Senior vehicle passenger discount fares required under the Federal Transit Act.
- Disabled vehicle passenger discount fares required under the Federal Transit Act.
- Yakama/Nez Perce Nation Fare Waiver for vehicle passengers.

Policy implications

WSF considered policies that protect our customers (Washington State's HEAL Act**,** WSDOT's Title VI Plan, and the Federal Transit Act.) in analyzing *Good To Go! and* recommending a balanced, thoughtful and inclusive solution.

GTG! Options 1 and 2 and enhanced W2G advance ticketing options align with current policies. *GTG!* Options 3 and 4 identify more complex tolling technology to maximize operational efficiency, at a higher cost. Options 3 and 4 require occupancy detection technology to validate the number of vehicle passengers. This technology does not account for legally required discounts for age, disability or tribal affiliation. The fare increases associated with *GTG!* options 3 and 4 do not align with the policies outlined above. These fare changes do not meet the revenue neutral target for the Triangle Route. Below are the policy implications for *GTG!* options for DEI policy and fare considerations:

Table 15. DEI fare considerations by option.

	FARE CONSIDERATIONS					DEI POLICY IMPACT		
	Free Travel Yakama / Nez Perce Nations Agree-ments	Disability Senior Medicare Discount	Youth (Free) 0-18 years of age	Cash payment/ unbanked customer	Vehicle passenger fares	Washington State Heal Act	Title VI	Federal Transit Act
***GTG!* OPTION 1**	No change from current	No change from current	No change from current	No change from current	No change from current	None	None	None
***GTG!* OPTION 2**	No change from current	No change from current	No change from current	No change from current	No change from current	None	None	None
***GTG!* OPTION 3**	Available at the *GTG!* account level after trip/post processing	Available at the *GTG!* account level after trip/post processing	Available at the account level after trip/post processing	No cash accepted but ePurse like ORCA can be used to pay for or prepaid card then applied to *GTG!*	Occupancy detection is available, no discounts can be applied	Populations disproportionately impacted by environmental harms	Yes, due to dedicated lane, no vehicle passenger discounts for *GTG!*	Yes, no discounts available for vehicle passengers
***GTG!* OPTION 4**	Available at the account as after trip/post processing	Available at the account as after trip/post processing	Available at the account as after trip/post processing	No cash accepted but ePurse like ORCA can be used to pay for or prepaid card then applied to *GTG!*	Occupancy detection is available, no discounts can be applied	Populations disproportionately impacted by environmental impacts	Yes, due to all electronic tolling. No managed toll booth.	Yes, for cash paying customers and for automated payments for *GTG!*
W2G	No change from current	No change from current	No change from current	No change from current	No change from current	None	None	None

10. Conclusions

GTG! Options 1 through 4 and W2G advance ticketing were analyzed against all Level 3 alternatives. The analysis focused on loading ferries to support on-time sailings by measuring the time it takes to load a 124-vehicle Issaquah Class ferry.

There are eight key factors—operational efficiency, queue length, queue length dissipation rate, implementation cost, implementation schedule and timeline, policy, and customer experience, fare considerations—that contribute to the viability of the Level 3 Alternatives A-2 and A-3.

Operational efficiency: Total loading time saved ranged from 0 minutes to 3 minutes.

Queue length: Dock capacity directly influences overall peak queue length, ranging from 3,000 feet (smallest dock alternative) to 2,000 feet (largest dock alternative).

Queue length dissipation rate: The speed at which the queue length dissipates is a function of the payment processing effectiveness. Rates were improved from baseline and ranged from three cars per minute to eight cars per minute through the toll booth.

Implementation cost: The approximate costs range from $7 to $17 million.

Implementation schedule and timeline: Schedules range from approximately 26 months to 64 months. Note that while certain elements can begin earlier, design and installation of the *GTG!* roadside elements could not begin before the current RTS contract is reprocured, which is anticipated to be in 2026. *GTG!* options 1 and 2 can be completed during the 2027-2029 construction window. *GTG!* options 3 and 4 bring significant risk and add time to the project schedule.

Policy and fare considerations: W2G advance ticketing and *GTG!* Options 1 and 2 have no fare structure or policy changes. *GTG!* Options 3 and 4 require higher fares for vehicle and driver fare category due to inability to apply discounts for vehicle passengers to maintain revenue neutrality and meet budget targets set by the legislature.

Options 3 and 4 do not align with Washington state's HEAL Act and Title VI of the Civil Rights Act. Adherence to these policies to allow for new technology may disproportionately affect historically marginalized communities/groups.

Customer experience. Overall, *GTG!* and W2G advance ticketing bring minimal time savings for ferry customers. Options 3 and 4 costs taxpayers more, delays WSF's work to replace the aging terminal and substantially increase fares.

11. Recommendation

- The results of this study show *GTG!* and W2G advance ticketing offer minimal benefits to operational efficiency for the Level 3 alternatives. The following outlines key concerns about *GTG! O*ptions 3 and 4.

- **Minimal time savings**. Based on the traffic analysis results*, GTG!* and W2G could save up to three minutes in unloading and loading ferries and reduce vehicle queues along Fauntleroy Way SW slightly over time. The time savings progressively increase to three minutes until the dock size and ferry capacity match (Alternative B and B-3), with no additional time savings for the largest dock options (B-1, B-2 and C). These time savings do not significantly help meet WSF's on-time performance metric of departing within 10 minutes of scheduled departure time.
- **Fare increases.** *GTG!* Options 3 and 4 could increase fares by about 30% to align with available technology. Fare increases of this magnitude are unprecedented for WSF and would significantly burden people who are entirely dependent on ferries, living and working on Vashon Island.
- **Policy risk.** The fare increases associated with *GTG!* Options 3 and 4 do not align with the policies outlined above (Washington State's HEAL Act**,** WSDOT's Title VI Plan, and the Federal Transit Act).
- **Cost and schedule.** *GTG!* options 3 and 4 are costly and would delay WSF's work to replace the aging Fauntleroy ferry terminal on time and within budget.
- Based on these results of this study, WSF recommends pairing *GTG!* Option 2 with Alternative A-2 and advancing A-3 (W2G only) to Level 3 screening. WSF may consider more automated tolling systems in the future if the system evolves to avoid or manage these issues.
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- **Alternative A-2** This analysis shows some benefits for using *GTG!* with all Level 3 alternatives. *GTG!* helps WSF process transactions faster while offering a customer -friendly, account-based system. *GTG!* is flexible and can meet WSF's needs today and in the future. For the traditional WSF customer, *GTG!* provides flexibility to meet WSF needs by providing more ways for customers to pay in advance.
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  GTG! Option 2 best balances operational efficiency saving up to 1.5 minutes or 10 percent, retains the current fare structure, costs less ($9M) and aligns with the project schedule (32 months). WSF may consider fully automated tolling options in the future once technologies that support the current fare structure are available.
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- **Alternative A-3** W2G advance ticketing provides a shorter, lower-cost option saving up to 1.5 minutes. Future funding is planned to improve the W2G system with a new webstore and W2G app for more efficient processing and better customer experience. These upgrades allow WSF to fully integrate W2G with *GTG!* in future.
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- If WSF implements *GTG!* and W2G at Fauntleroy, they will evaluate the program as part of the *Good To Go* pilot program (WAC 469-300-040*)* to validate operations and evaluate customer behavior.

Additional general observations

- Alternatives B and B-3 show the best balance of improving operational efficiency, relieving strain on the neighborhood, customers and WSF service with the smallest increase in dock size. *GTG!* Options 2, or enhancing W2G, allow for faster processing and reduce vehicle queues.
- *GTG!* provides no additional benefit to alternatives B-2, B-3, and C because the larger dock alternatives provide enough space to sort vehicles and manage operations effectively.
- The Legislature's pre-authorized *GTG!* pilot does not allocate funding to implement the project. WSF does have about $4 million to help upgrade the W2G system. Initial cost estimates to implement *GTG!* (not including preplanning or policy effort) range from $7 to $16 million. WSF would need to seek additional funding from the Legislature to implement these changes.
- WSF could explore a range of strategies to improve vehicle processing times. WSF would need to analyze potential disproportionate impacts and equity considerations for all customers.
- The potential to speak to Multi-Ride Ticket functionality during peak during non-peak times.
- Overhead loading combined with any Level 3 alternative and *GTG!* or W2G could also improve operational efficiency by unloading and loading people walking, bicycling and rolling at the same time as vehicles. WSF will continue evaluating overhead passenger loading to provide future flexibility to accommodate demand.
- WSF reviews fares and its discount products annually as part of a normal fare pricing process and considers all applicable policy considerations. This paper focuses on the addition and evaluation of the benefits and limitations *of GTG!.*

12. Next steps

The following are the key next steps for implementing *GTG!* Option 2 or W2G advance ticketing:

- Apply Level 3 screening criteria to evaluate and compare project alternatives with *GTG!* and W2G advance ticketing.
- Share study results with community for input.
- WSF and Toll Division to determine *GTG!* or increased W2G advance ticketing inclusion at the terminal.
- Request funding for the 2025- to 2027 biennium to implement *GTG!* at the terminal.
- Review pilot authorization to possibly accelerate *GTG!* Implementation.
- Plan for implementation between WSF and Toll Division.
- Begin implementation.

13. Appendix

Fare table examples

Example 1 – Fare table with vehicle passengers fare included in vehicle fare

	VASHON (ROUND-TRIP)		SOUTHWORTH (ONE-WAY)	
Passenger Fares	**Current**	**Suggested**	**Current**	**Suggested**
Adult (ages 19–64)	$ 6.50	NC	$ 7.70	NC
Senior (age 65 and over)/Disability	$ 3.25	NC	$ 3.85	NC
Youth (age 18 and under)	Free	NC	Free	NC
Multi-Ride Commuter Card 10 Ride	$52.40	NC	$ 61.90	NC
WSF Monthly Pass 31 Ride	$83.85	NC	$ 99.05	NC
Vehicle, Motorcycle Fares	**Current**	**Suggested**	**Current**	**Suggested**
Bicycle Surcharge Only (19 and over)	$ 1.00	NC	$ 1.00	NC
Vehicle Under 14' (less than 168”) & Driver	$ 17.90	$ 20.35	$ 13.55	$ 14.78
Vehicle Under 22' (standard veh.) & Driver	$ 22.75	$ 25.11	$ 17.25	$ 17.52
Vehicle U14' (less than 168") & Sr/Disability Driver	$ 14.65	$ 18.07	$ 11.60	$ 14.28
Vehicle U22' (standard veh.) & Sr/Disability Driver	$ 19.50	$ 23.09	$ 5.30	$ 17.99
Multi-Ride Commuter Card - Vehicle U14' & Driver 10 Ride	$ 42.45	$147.09	$ 75.10	$179.10
Multi-Ride Commuter Card - Vehicle U22' & Driver 10 Ride	$180.80	$185.84	$221.70	$231.65
Motorcycle & Driver/Stowage Fare	$ 9.75	$ 14.64	$ 7.45	$ 9.92
Motorcycle & Senior/Disability Driver/Stowage Fare	$ 6.50	$ 13.74	$ 5.50	$ 6.20
Multi-Ride Commuter Card - Motorcycle & Driver 10 Ride	$ 78.10	$ 82.77	$ 97.70	$1 01.76
Vehicle Length Based				
Vehicle Under 30' Under 7', 2″	$ 33.90	NC	$ 25.65	NC
Vehicle Under 30' Over 7', 2″	$ 67.30	NC	$ 50.75	NC
Vehicle Under 40'	$ 89.60	NC	$ 67.50	NC
Vehicle Under 50'	$ 111.85	NC	$ 84.25	NC
Vehicle Under 60'	$ 134.15	NC	$101.00	NC
Vehicle Under 70'	$ 156.40	NC	$117.75	NC
Vehicle Under 80'	$ 178.70	NC	$134.50	NC
Cost per foot over 80'	$ 2.25	NC	$ 1.70	NC

NC = no charge

Example 2 – Fare table with peak/off-peak travel for demand management

Fare Description	Current	ILLUSTRATIVE EXAMPLE			
		Peak (6:00 a.m.–11:29 a.m.)	Off-Peak (11:30 a.m. 3:59 p.m.)	Peak (4:00 p.m.–8:59 p.m.)	Off-Peak (9:00 p.m.–5:59 a.m.)
Passenger					
Adult (ages 19–64)	$ 6.50	$ 8.25	$ 4.13	$ 8.25	$ 4.13
Senior (age 65 & over)/Disability	$ 3.25	$ 4.13	$ 2.06	$ 4.13	$ 2.06
Youth (ages 18 and under)	NC	NC	NC	NC	NC
Multi-Ride Card 10 Ride	$ 52.40	$ 66.51	$ 33.25	$ 66.51	$ 33.25
WSF Monthly Pass 31 Ride	$ 83.85	$106.42	$ 53.21	$106.42	$ 53.21
Bicycle Surcharge Only (ages 19 and older)	$ 1.00	N/A	N/A	N/A	N/A
Vehicle, Motorcycle, and Stowage Fares					
Vehicle Under 14' (less than 168") & Driver	$ 7.90	$ 22.72	$ 11.36	$ 22.72	$ 11.36
Vehicle Under 22' (standard veh.) & Driver	$ 2.75	$ 28.88	$ 14.44	$ 28.88	$ 14.44
Vehicle U14' (less than 168") & Sr./Disability Driver	$ 4.65	$ 18.59	$ 9.30	$ 18.59	$ 9.30
Vehicle U22' (standard veh.) & Sr./Disability Driver	$ 19.50	$ 24.75	$ 12.37	$ 24.75	$ 12.37
Multi-Ride Commuter Card – Vehicle U14' & Driver 10 Ride	$ 42.45	$180.80	$ 90.40	$180.80	$ 90.40
Multi-Ride Commuter Card – Vehicle U22' & Driver 10 Ride	$180.80	$229.48	$114.74	$229.48	$114.74
Motorcycle & Driver/Stowage Fare	$ 9.75	$ 12.37	$ 6.19	$ 12.37	$ 6.19
Motorcycle & Senior/Disability Driver/Stowage Fare	$ 6.50	$ 8.25	$ 4.13	$ 8.25	$ 4.13
Multi-Ride Commuter Card – Motorcycle & Driver 10 Ride	$ 78.10	$ 99.14	$ 49.57	$ 99.14	$ 49.57
Vehicle Length Based					
Vehicle under 30' under 7', 2"	$ 33.90	$ 43.03	$ 21.51	$ 43.03	$ 21.51
Vehicle under 30' over 7', 2"	$ 67.30	$ 85.42	$ 42.71	$ 85.42	$ 42.71
Vehicle under 40'	$ 89.60	$113.72	$ 56.86	$113.72	$ 56.86
Vehicle under 50'	$111.85	$141.96	$ 70.98	$141.96	$ 70.98
Vehicle under 60'	$134.15	$170.16	$ 85.08	$170.16	$ 85.08
Vehicle under 70'	$156.40	$198.38	$ 99.19	$198.38	$ 99.19
Vehicle under 80'	$178.70	$226.67	$113.33	$226.67	$113.33
Cost per foot over 80'	$ 2.25	$ 2.25	$ 1.13	$ 2.25	$ 1.13

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14. References

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Exhibits

Tables

Examples