DRAFT

Portland – Peaks Island Ferry Landside Operations Study

Task 2 – Projected Future Conditions and Impacts of Increased Demand

Introduction

Based upon the existing operations and ridership patterns of the Peaks Island Ferry, presented in Task 1, Task 2 will explore the projected future conditions and the potential impacts associated with increased demand on landside operations on Peaks Island. Generally, projected future demand is expected to continue to grow, particularly passenger trips during the peak season, and vehicle trips during the off-peak season. The subsequent sections will explore detailed projections for passenger and vehicular growth on the Peaks Island Ferry as the basis for expected future baseline demand. With high ridership already exhibited under existing conditions and often constrained by vessel capacity, and as ridership continues to grow, several operational changes have been proposed to address projected future baseline conditions. These efforts, in combination with the future baseline projections, will form the basis of an assessment of potential future impacts of increased ridership demand.

Future Operations

Casco Bay Island Transit District (CBITD) has identified several proposals for future operations to manage the expected increase in passenger and vehicular demand. The most significant proposal to address the expected future demand is the planned construction of a new vessel to replace the aging Machigonne II, the vessel that currently provides the majority of trips operating between Peaks Island and mainland Portland, Maine. CBITD has also identified several potential schedule modifications that could more effectively allocate resources for efficient passenger movement.

New Vessel Characteristics

In March 2019, the CBITD Board of Directors voted to approve further investigation of a new passenger/vehicle transport vessel to replace the Machigonne II, which has been in service since 1987. The CBITD Board approved a new vessel capacity of 599 passengers, which is about a 50 percent increase in passenger capacity relative to the Machigonne II capacity of 399 passengers. The Board also approved a cap on the vessel loading at 499 passengers for trips travelling from mainland Portland to Peaks Island as a demand management measure. The majority of fully-loaded, “capacity” trips (i.e. sailings on which all passenger capacity is taken up, and there may be excess passengers who need to wait for the next trip) occur on trips returning to the mainland from Peaks Island during the summer, so the added capacity is expected to relieve crowding, queuing, and extended waits (due to lack of vessel space) for passengers making this return leg of the trip.

Based on this decision, a proposal has been developed for a new, double-ended vessel with a maximum capacity of 599 passengers and 15 vehicles. The proposed vessel would be powered by a diesel-electric hybrid propulsion system with on-board energy storage, to be charged by an automated quick-charger to

be installed at the mainland pier. The Board of Directors approved the vessel design recommended in the Preliminary Design Report at its June 25, 2020 Board meeting.

The new vessel's 15-vehicle capacity would be a 25 percent increase from the capacity of 12 vehicles on the Machigonne II. This expanded capacity is intended to alleviate crowding on the vessel as well as queuing on both the mainland and Peaks Island, mitigating potential traffic impacts. It is anticipated that the new vessel will be approximately 40 feet longer and 2 feet wider than the Machigonne II. The design is also planned to include new areas for freight cargo and bicycles, which are expected to help expedite boarding and alighting of the craft.

Additionally, the new vessel is planned to accommodate improved passenger and vehicle loading operations. The new vessel is proposed to have side-loading capabilities, which will enable better organization of passenger, vehicle, and freight loading, with improved speed and safety of loading. The new vessel is also proposed to have double-ended loading, which means that the vessel will not need to rotate when docking, which will reduce travel time and provide greater operational flexibility.

Major Service Changes

At the time of writing, the CBITD Board of Directors has not yet adopted any schedule modifications for the Peaks Island Ferry; however, CBITD continues to explore options for schedule modifications. Currently, the Peaks Island Ferry schedule is split into three seasonal schedules: Winter, Shoulder, and Summer. To accommodate expected increased ridership and create consistency among trips, reduce confusion for passengers and staff, and to simplify scheduling, it has been proposed that the existing three-season schedule be reduced to two schedules: Summer and Non-Summer. To create additional uniformity among schedules, the modified schedule would have standardized departure times year-round, with all departures from Portland to Peaks Island scheduled for 45-minutes past the hour, and all departures from Peaks Island scheduled for 15-minutes past the hour.

Additionally, to accommodate the expected increase in ridership, the new schedule would add an additional round trip to each season, resulting in a total of 17 daily roundtrips in the summer, and 15 daily roundtrips in the non-summer season. This proposed schedule would also modify the weekday schedule to include a trip in the 6:00 hour, to accommodate commuters from the island, where one does not currently exist. This trip would accommodate cars, allowing for easier commutes for island residents working on the mainland. While there is no new direction from the Board to consider any schedule modifications at this time, expected increases in ridership, as discussed in subsequent sections, may necessitate modifications of this kind to the existing schedule.

Future Baseline Conditions

The following is a summary of the projected future baseline conditions.

Future Passenger Demand and Travel Patterns

In early 2019, CBITD conducted a thorough analysis of its schedule and fleet that included ridership and demand projections for the future through the *Casco Bay Lines Schedule and Fleet Analysis*. Additionally, when undertaking preliminary design for the proposed new vessel, CBITD also conducted an analysis of historical data to develop future projections for demand as part of its *New Peaks Island Vessel 30 Year*

Financial Pro Forma. Much of this data has been sourced within this section to identify the future expected baseline conditions of the Peaks Island Ferry.

The *Schedule and Fleet Analysis* identified that CBITD ridership trends differ greatly between peak and off-peak seasons. During the peak summer season, existing service often experiences passenger constraints due to high utilization, especially during weekends and special events. As shown in Figure 1, passenger demand has grown at a significant rate during the summer months between 2004 and 2018. Summer demand, which encompasses June through September, is expected to continue to grow at a comparable rate, forecasted to be an average of around two to three percent annually (Figure 2).

In contrast with the peak summer season, passenger capacity of the Machigonne II is rarely reached during the off-season, and year-over-year growth has been much lower than during the summer season. Figure 1 shows that between 2004 and 2018, strong growth continued through the autumn months of October and November, but passenger demand actually declined during the months of December through March.

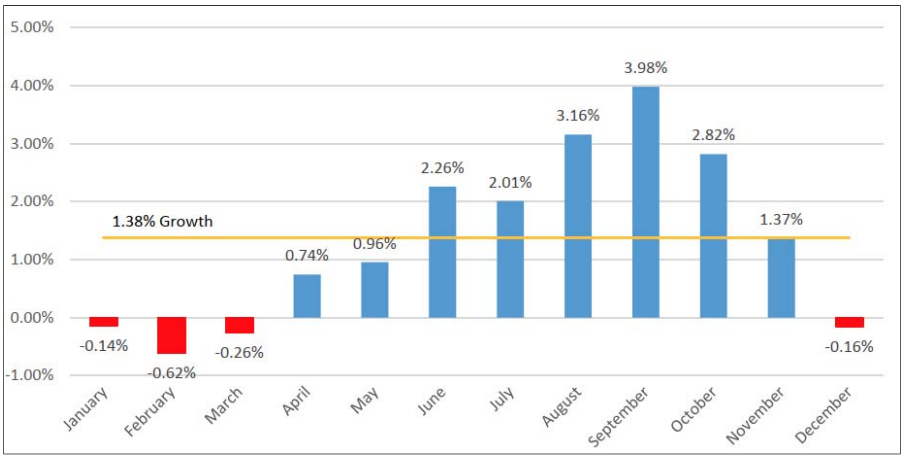


Figure 1: Peaks Island Passenger Growth Rate by Month (2004 – 2018) (Source: CBITD New Peaks Island Vessel 30 Year Financial Pro Forma)

Nevertheless, future forecasts still account for modest growth of just under one percent during the off-season period (Figure 2). With an expected growth of approximately 1.4 percent annually (Figure 3), yearly trips (assuming unconstrained ridership demand) are expected to exceed one million by roughly 2028, putting strain on a ferry service already approaching capacity during critical peak periods.

	Unconstrained Ridership			Growth Rates (CAGR)		Constrained Ridership			Growth Rates (CAGR)	
Schedule	2018	2023	2028	2018 - 2023	2018 - 2028	2018	2023	2028	2018 - 2023	2018 - 2028
Summer	416,871	476,685	532,049	2.72%	2.47%	414,980	471,759	523,300	2.60%	2.35%
Off-Season	431,281	451,552	469,734	0.92%	0.86%	431,281	451,552	469,734	0.92%	0.86%
Total	848,152	928,236	1,001,783	1.82%	1.68%	846,261	923,311	993,034	1.76%	1.61%

Figure 2: Peaks Island Baseline Ridership Estimates (Source: Casco Bay Lines Schedule and Fleet Analysis)

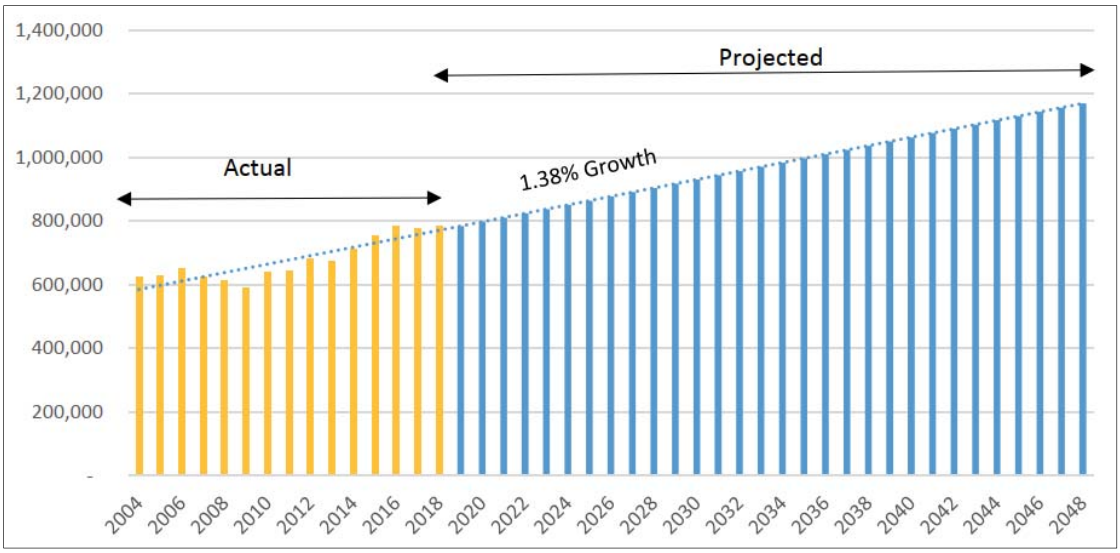


Figure 3: Peaks Island Passengers – Actual and Projected (2004 – 2048) (Source: CBITD New Peaks Island Vessel 30 Year Financial Pro Forma)

Peak Summer Season Changes

Demand during peak summer months is driven primarily by recreational, tourism, and event-related travel to and from Peaks Island; this demand is in addition to the base level of travel by year-round residents. These summer season travelers include: summer-time residents; visitors who are renting property on Peaks Island, both short-term and longer-term rentals or at staying at lodging businesses; and "day-trippers" who travel to Peaks Island for a visit and return to the mainland on the same day.

All of this travel, whether overnight or same day, is generated by attractions on Peak Island that include vacationing on the island; special events such as weddings and parties; and regular events such as "Reggae Sunday" at Jones Landing adjacent to the ferry landing, which finishes in the late afternoon on Sundays, exacerbating an already peak demand time for ferry travel. The short travel time and relatively low fares for travel between the mainland and Peaks Island makes even short duration trips attractive, and contributes to growing demand for ferry service.

The significant growth in summer ferry demand, both in the recent past and projected for the future, reflect the popularity of the events and attractions on Peaks Island and enhanced ability of the island to accommodate visitors through web-based property rentals. Anecdotal reports suggest that important factors in the peak summer ridership growth (both past and anticipated in the future) are also the recent tourism promotion by the City of Portland and the growth in web-based vacation rentals through such services as Airbnb, Vrbo, and HomeAway.

All of these factors have increased the demand for ferry travel, which has contributed to crowding and capacity voyages throughout the summer. In 2018, over 70 sailings reached capacity in July and August alone. According to CBITD figures, between 2004 and 2018 the number of capacity trips experienced an annual growth rate of 8.5 percent. Under baseline conditions, this trend is likely to continue, leading to more capacity trips in the future during peak season, creating additional instances of capacity trips and associated queueing and crowding when waiting to board the vessel.

The capacity of the existing vessel (399 passengers) does not always meet existing demand. With ridership expected to rise, capacity constraints would not only continue, but would be expected to get worse as more trips approach capacity limits. At the current highest ridership peaks, nearly 100 passengers would need to wait an hour for the next trip to occur, exacerbating queue times and traffic buildups. According to CBITD projections in its *Casco Bay Lines Schedule and Fleet Analysis*, it is expected that in 30 years, the total number of passengers would increase by about 50 percent. Given the higher growth rate in peak season, the total number of passengers in July and August would increase by proximately 81 percent to 143 percent. Assuming current vessel capacity constraints, half of all the trips would be over capacity during peak season.

The CBITD *Casco Bay Lines Schedule and Fleet Analysis* demonstrates that most capacity trips between 2014 and 2018 were those originating on Peaks Island, traveling to the mainland (Figure 4). During this period, a total of 272 trips reached capacity, with 162 (60 percent) originating at Peaks Island. With recreational visitors and tourism expected to rise, and continuing trip demand for Peaks Island residents, this trend can be expected to continue. In the absence of additional vessel capacity, this will result in unmet passenger demand, especially for trips originating at Peaks Island.

Summer ridership trends for high ridership days, as shown in Figure 5, demonstrate the growth of tourism-based travel, with high ridership from the mainland in the morning and high ridership from Peak Island back to the mainland in the evening. While tourist travel demand is expected to continue following these trends, exact peak periods are difficult to predict and analyze given the weather-dependent nature of Peaks Island tourism. Nevertheless, the CBITD *Casco Bay Lines Schedule and Fleet Analysis* indicates that between 2004 and 2018, passenger trips at capacity increased at a rate of 8.54 percent annually, with 84 percent of these trips occurring in the months of July and August.

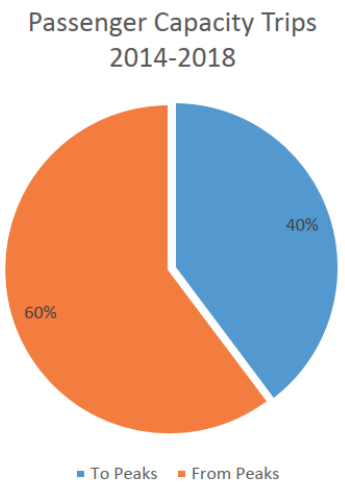
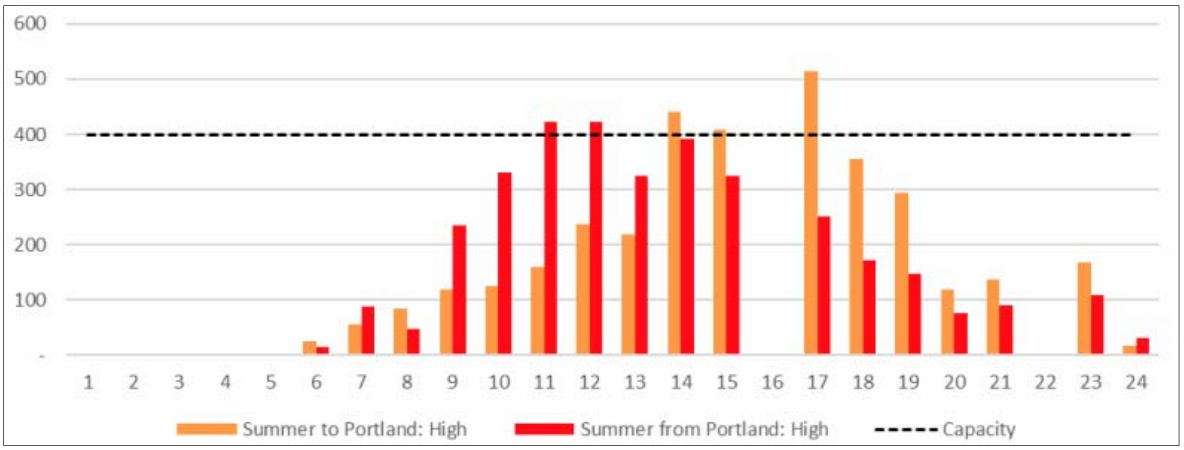


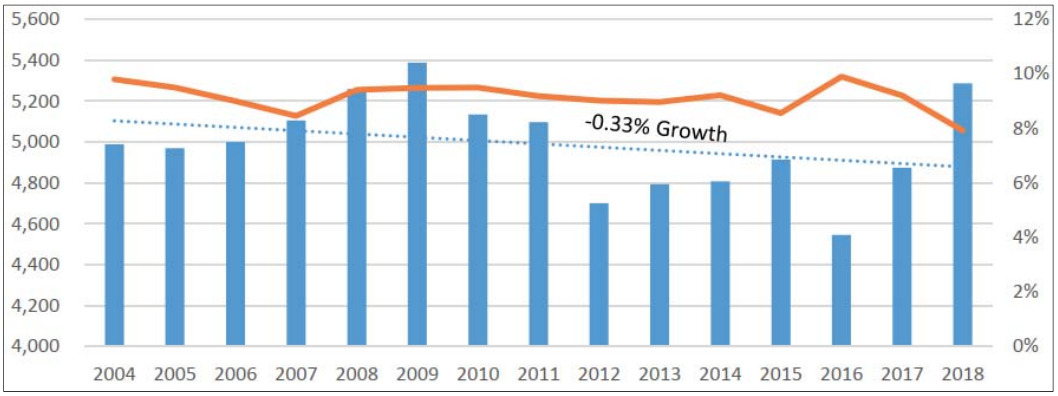
Figure 4: Passenger Capacity Trips (2014 – 2018) (Source: CBITD New Peaks Island Vessel 30 Year Financial Pro Forma)



Note: X-Axis is time of day in 24-H time.

Figure 5: Peaks Island Hourly Ridership – High Ridership Days (Source: Casco Bay Lines Schedule and Fleet Analysis)

As the number of capacity trips in the summer is expected to rise, the inverse is expected for "low ridership" trips (e.g. trips with fewer than 45 passengers) in the peak season, with such low ridership progressively decreasing as a proportion of total sailings. Figure 6 shows historic counts of low ridership trips and the percentage of these trips that occur in the peak months of July and August. The figure shows that the number of trips with low ridership been trending downward at an annual rate of -0.33 percent, and this trend is expected to continue. Additionally, the busiest months of July and August are expected to account for fewer than 8 percent of these low-ridership trips in the near future, indicating an increase in summer ridership. As the average number of summer-season passengers continues to grow, CBITD is expected to operate more capacity trips and fewer low-ridership trips during the summer season.



Note: Left-hand Y-Axis corresponds with blue bars – number of yearly trips with 45 or less passengers. Right-hand Y-Axis corresponds to orange line – percentage of those trips occurring in July and August.

Figure 6: Peaks Island Trips with 45 or Fewer Passengers with Percentage Occuring in July, August (Source: CBITD New Peaks Island Vessel 30 Year Financial Pro Forma)

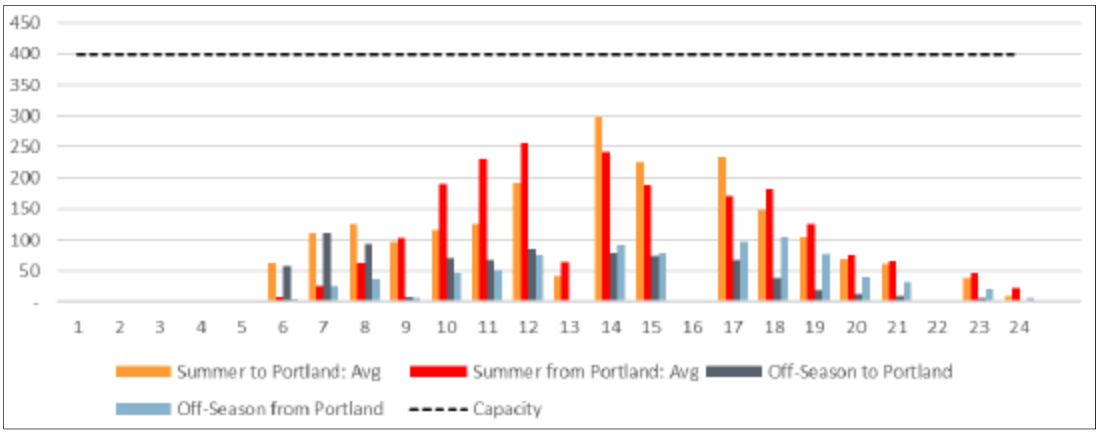
It is also worth noting the potential impact of the Coronavirus/COVID-19 crisis on ferry demand projections. This impact is likely to manifest itself in several ways. The most immediate effect from Coronavirus/COVID-19 is the continuing social distancing and isolation practices, which have greatly reduced all travel, even regular travel associated with commuting and personal business. The secondary

effects of Coronavirus/COVID-19 on travel behavior are likely to be felt for years. First, social distancing and isolation has had tremendous negative impacts on economic activity and employment; this may extend the reduction in everyday travel, and is also likely to diminish people's disposable income and financial capability for leisure travel. In addition, continuing caution related to infection may change travel behavior due to increased work from home practices and reluctance of travelers to expose themselves to infection in transit and at their destinations.

There is a very high level of uncertainty related to these effects. Figure 3 shows the annual travel demand for ferry ridership from 2004 through 2018. The effects of the Great Recession on travel demand can be seen clearly, with marked reductions in demand during the 2007 – 2009 period; these reductions may include both reductions in everyday travel by Peaks Island year-round residents as well as decreased leisure travel. After 2009, steady growth in demand resumed at a similar rate to pre-Recession trends. It is uncertain whether Coronavirus/COVID-19 will affect travel demand in a similar manner, with a similar overall pattern but more severe effect on total ridership, or with very different pattern and future trajectory.

Off-Season Changes

While current non-summer demand does not approach vessel capacity (Figure 7), projected increases in non-summer ridership are expected to approach existing summer ridership totals in the future (Figure 2). Off-season ridership trends are nearly inverse of summer trends, with heavier passenger demand on trips from Peaks Island to the mainland occurring during the morning commute hours, and heavier passenger demand from the mainland to Peaks Island occurring during the evening commute hours. This ridership can be linked to island resident population, as the majority of these trips encompass island commuters accessing the mainland for work.



Note: X-Axis is time of day in 24-H time.

Figure 7: Peaks Island Hourly Ridership – Average Ridership Days (Source: Casco Bay Lines Schedule and Fleet Analysis)

Vehicle and Freight Demand

In addition to a projected rise in passenger demand into the future, it is expected that vehicular demand will also continue to grow. As shown in Figure 8, between 2004 and 2018 the annual demand for vehicle travel on the ferry grew steadily; demand projections indicate a continued annual increase of just over 2 percent. As a result, vessel trips at vehicular capacity rose dramatically between 2004 and 2018. However,

in contrast to passenger growth and projections, the primary impacts on vehicular demand have been in off-peak months.

This increase in vehicular demand during the non-summer season indicates increasing levels of commuter demand, rather than use by visitors and tourists (Figure 9). In fact, in the *New Peaks Island Vessel 30 Year Financial Pro Forma*, CBITD estimates that approximately "60% of vehicle capacity trips are occurring during the non-peak season."

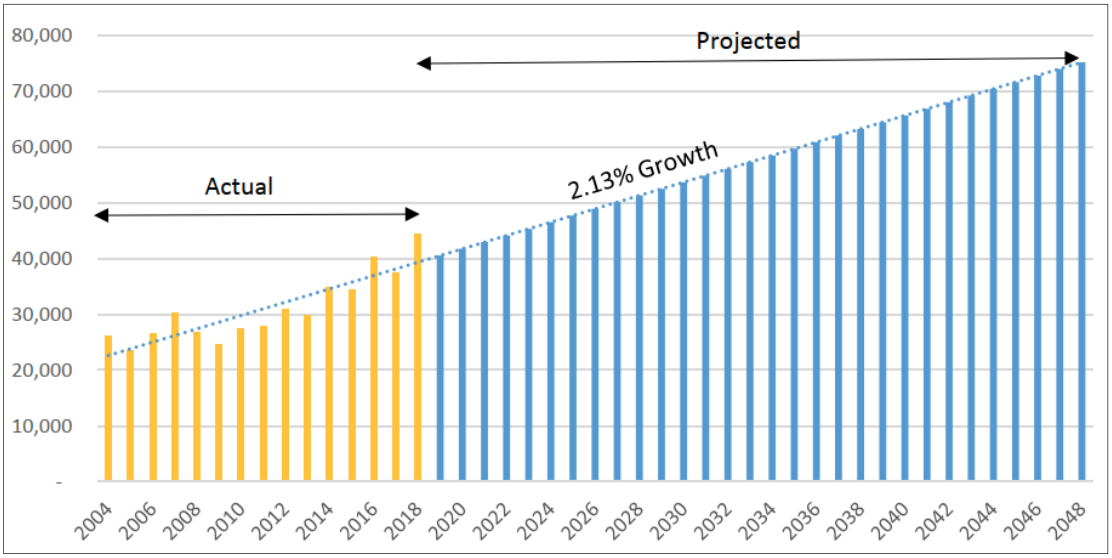


Figure 8: Peaks Island Vehicles – Actual and Projected (2004 – 2048) (Source: CBITD New Peaks Island Vessel 30 Year Financial Pro Forma)

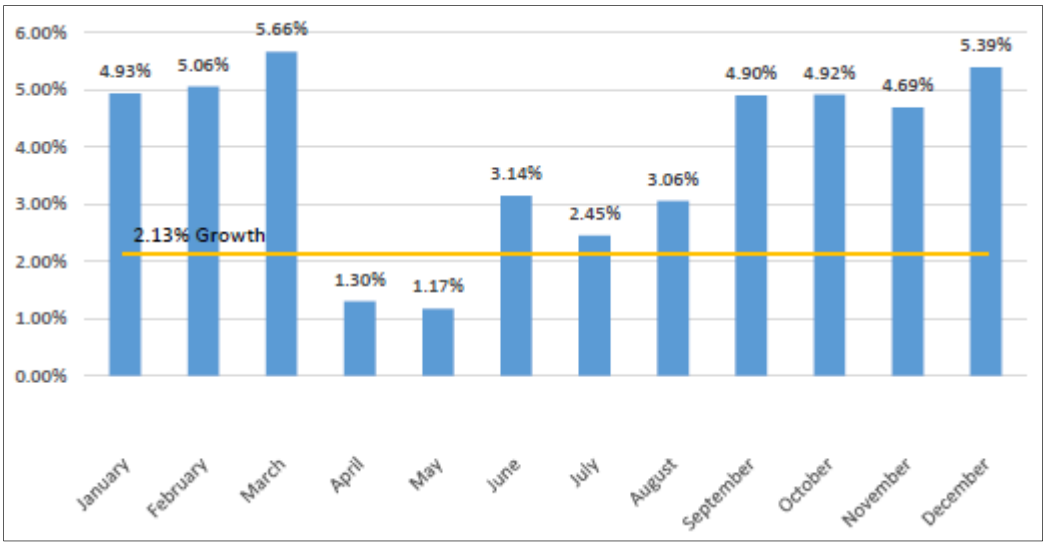


Figure 9: Peaks Island Vehicle Growth Rate by Month (2004 – 2018) (Source: CBITD New Peaks Island Vessel 30 Year Financial Pro Forma)

In addition to personal vehicular travel, freight demand has historically grown rapidly and is expected to continue to do so. According to the CBITD *New Peaks Island Vessel 30 Year Financial Pro Forma,* freight tonnage on the Peaks Island Ferry grew by approximately 9 percent annually between 2012 and 2016, and by some estimates is expected to reach double digit annual growth percentages into the future. As noted in the *30 Year Pro Forma*, CBITD indicates that this increased rate of growth can be attributed to

"increasing resident island populations and the ease and convenience of shopping for goods delivered through the mail," that is, internet-based e-commerce and delivery. With a shared space for freight, bicycles, and often vehicles, continue growth in freight demand may limit capacity for these other non-passenger travel modes, i.e. automobiles and bicycles.

Future Conditions Under Proposed Changes

Future Passenger Demand and Travel Patterns

As part of the *Casco Bay Lines Schedule and Fleet Analysis*, CBITD assessed the impact of three different scenarios on future ridership that build upon the baseline projections discussed previously. Given CBITD's recent approval for the construction of a new vessel, this study's analysis assumes that Casco Bay Lines implements Scenario B. This scenario entails the previously-discussed future modifications to the existing schedule, and is consistent with the current proposal for a new vessel with a 599-passenger capacity and space for 15 vehicles.

Under Scenario B, the *Schedule and Fleet Analysis* projects that even on high ridership days, ridership would be more fully accommodated than under baseline conditions, reducing unmet demand by approximately 20 percent. If service and schedule changes were not implemented, vessel loading and capacity trips may surpass those presented below, with fewer (baseline) trips scheduled to serve the increased number of passengers forecasted for the future. While a larger vessel would accommodate more passengers, more frequent, predictable service would further accommodate anticipated ridership growth.

Projections indicate that with additional capacity, annual ridership will surpass one million within the next decade, with most increases during the summer peak period. As shown in Figure 10, Scenario B forecasts that the increased capacity of the new vessel and additional service would enable summer ridership growth to outpace projected baseline growth, nearing three percent annual growth for unconstrained trips. While more modest increases are expected for off-season ridership, growth rates of nearly 1 percent annually are expected to strain the system over the longer term.

	Unconstrained Ridership			Growth Rates (CAGR)		Constrained Ridership			Growth Rates (CAGR)	
Schedule	2018	2023	2028	2018 - 2023	2018 - 2028	2018	2023	2028	2018 - 2023	2018 - 2028
Summer	444,052	507,929	566,922	2.72%	2.47%	441,915	502,090	556,480	2.59%	2.33%
Off-Season	433,903	454,438	472,952	0.93%	0.87%	433,903	454,438	472,952	0.93%	0.87%
Total	877,956	962,367	1,039,874	1.85%	1.71%	875,818	956,528	1,029,432	1.78%	1.63%

Figure 10: Peaks Island Scenario B Ridership Estimates (Source: Casco Bay Lines Schedule and Fleet Analysis)

Similarly, it is expected that under the assumptions of Scenario B, the number of vehicle trips will also grow significantly (Figure 11), surpassing 50,000 annual trips by the end of the decade, with the majority of trips occurring during the off-peak season. While the increased vehicular capacity would alleviate of some of this growth, the expected increase in freight traffic and bulk goods may still impose limits on the vessel's ability to accommodate the projected growth in vehicle trips.

The patterns exhibited by vehicular travel differ greatly by season, with summer vehicular travel attributed principally to tourists looking for increased mobility on the island, and off-season vehicular travel attributed principally to island residents using personal vehicles to access the mainland and return home, particularly during the winter months.

These two populations and their vehicle demand have different impacts. While vehicular travel is lower during the summer, these non-resident vehicles represent "new" vehicles on Peaks Island, which create more demand for public parking for visitors to the island. While the proposed increase in vehicular capacity will help accommodate crowding on the vessel itself, it is expected that more vehicles on the island will create impacts to the local communities and ferry operations.

Peaks Vehicles				Growth Rates	
Schedule	2018	2023	2028	2018 - 2023	2018 - 2028
Summer	18,350	20,792	22,973	2.53%	2.27%
Off-Season	26,602	27,676	28,657	0.79%	0.75%
Total	44,951	48,468	51,630	1.52%	1.39%

Figure 11: Peaks Island Scenario B Vehicle Estimates (Source: Casco Bay Lines Schedule and Fleet Analysis)

Transportation Demand and Impacts

Vehicle Queuing

As discussed in the previous section, the *Casco Bay Lines Schedule and Fleet Analysis* projects that vehicle demand will continue to grow in the future, particularly during the off-season. Even with a modest increase in capacity for vehicles on the new vessel, this increased demand is expected to create longer vehicular queues on primary Peaks Island roadways, including Welch Street and Island Avenue. Given the fact that queues already impact local businesses and residents under existing conditions, an increase in the number of queued vehicles would be expected to have negative effects on pedestrian access and perceptions of safety, as well as on quality of life for residents.

Managing demand for vehicle trips is paramount because it is estimated that by 2048, the number of cars queued on Peaks Island, seeking to return to the mainland, could effectively double during peak ridership events. In short, this means that even loading a vessel to the expected capacity of the new vessel (15 cars), there may still be cars left in line, resulting in wait times of nearly two hours for those near the end of the queue. With cars idling for that amount of time, impacts on the local community can be expected to grow.

Pedestrian and Bicycle Impacts

With projected increases in both passenger demand, it is expected that the ferry docks and surrounding areas on both the mainland and Peaks Island will experience increased pedestrian and bicycle activity. Increased tourism activities, and planned improvements and development at the Eastern Waterfront on the mainland, are also expected to contribute to increased pedestrian activity. Pedestrian safety is a vital component of landside operations, so managing pedestrian flows in the docking areas are a paramount consideration in addressing the challenges of increased ferry demand, particularly as waterfront build-out increases and pedestrian traffic increases.

As discussed in the Task 1 memorandum, high levels of pedestrian activity, constrained physical space, and insufficient pedestrian infrastructure could pose safety concerns at the Peaks Island dock loading area, particularly at peak times. During recent public meetings, ferry passengers and island residents have underscored the limitations of the physical space to handle the growing number of passengers, as well as the perception it creates around lack of safety with growing crowds. Heavy pedestrian and vehicle queuing on Peaks Island can result in de facto shared pedestrian and vehicular spaces; this has raised concerns about further increases in pedestrian volume and queuing, particularly regarding the limited amount of physical space to accommodate this expected increase.

During peak loading and unloading times, passengers traveling from Peaks Island back to the mainland are often faced with long lines and uncertainty regarding the boarding and unloading process. With pedestrian queues typically forming prior to arrival of the ferry, several potential conflict points can be identified. Given the limited footprint of the Peaks Island docking area, there are conflict points between the passenger queues, the vehicle queues, and vehicle operations at the surface parking access points, the vehicle turn-around loop, and private driveways.

Existing pedestrian queues often extend a significant length along Welch Street. Given projected ridership demand increases, particularly in the summer peak, these queues can be expected to increase as more passengers queue to board. With already constrained space and amenities, increased demand and pedestrian queuing could strain the capacity of the existing Peaks Island infrastructure, as queues could potentially extend all the way to Island Avenue.

For example, as discussed in Task 1, observations for a peak Sunday trip from Peaks Island to the mainland consisted of 365 passengers and the queue extended 180 feet. If we assume, based on ridership projections, an annual increase of 2.7 percent, a given peak trip could surpass 400 passengers in the near future. Assuming, based on the observed queueing, that similar spacing is maintained, queues on Welch Street for a 400-passenger wait could surpass easily surpass 200 feet or more in the near future, further constraining space and amenities and impacting businesses and vehicles at conflict points. If passenger demand were to generate a queue reaching the full capacity of the proposed new vessel (599 passengers), the queue would nearly double and reach approximately 300 feet. Figure 12 shows potential conflict points and projected future queue lengths.

Figure 12: Potential Terminal Area Conflict Points

As shown in Image 1 and Image 2, passengers unloading from the ferry on Peaks Island must utilize limited sidewalk infrastructure on Welch Street. These pedestrians must travel alongside substantial vehicle queues waiting to board, which creates pedestrian safety and comfort issues. In addition, there are reported concerns over emergency vehicles access during peak queue times, creating concern over public safety during an emergency or medical event.

Space constraints along Welch Street often result in only a single side of the roadway being available for passengers to unload from the ferry, with boarding queues extending east along Welch Street on the north side of the roadway. This limits those deboarding to the southern side of the roadway, where they must share the space with vehicles unloading and those accessing the surface parking lot. Although demand patterns make it unlikely that Peaks Island will experience simultaneous peak unloading and queuing unlikely, potential for significant increased demand in both flows requires consideration of new operating procedures for passenger queuing, boarding, and alighting, as well as a potential expansion of queuing space should be a priority for proposed improvements to ferry landside operations. These physical and procedural management strategies will be the primary focus of Task 3.

Image 1: Peaks Island Ferry Landing Area

Image 2: Peaks Island Ferry Landing Area

Beyond safety, it has been noted that the lack of amenities could contribute to an uncomfortable experience for passengers waiting for the ferry, especially during peak periods with long lines, rainy weather, and hot and sunny conditions. As passenger growth continues to rise, considerations for additional restroom facilities, shade structures, and other amenities would improve conditions for the growing passenger queues. Management of existing space and identifying opportunities for reuse of underutilized space in the terminal area are priority items for consideration to expand both the physical space available to handle projected increases as well as public amenities to support them.

Parking Operations

With increasing passenger and vehicular travel, additional parking impacts can be expected. These impacts will be felt both on the mainland, with passengers parking their vehicles at various public parking options in the terminal area and boarding the ferry on foot or on bicycles, as well as on the island, with residents returning from trips to the mainland with personal vehicles, or visitors traveling to Peaks Island with vehicles and parking on the island.

On Peaks Island, parking constraints already exist, with the existing parking lot frequently reaching capacity during the peak season under existing conditions. This often results in parking overflow on residential streets near the docking area, as well as increased congestion resulting from drop-offs and pick-ups. This added congestion could contribute to conflicts with pedestrians and passenger queues.

Parking on the mainland is also already constrained; increasing vehicle demand will require long term solutions for increased tourism and visitors during both the peak and off-peak seasons. Parking at the existing mainland ferry terminal parking structure is reserved by permit only. As such, visitors traveling to Peaks Island without their vehicle must utilize alternative parking options on the mainland, some of which are not in immediate proximity to the terminal. To address some of the existing and future parking constraints on the mainland, the City of Portland recently converted a vacant ferry terminal parking and queueing area to temporarily provide approximately 150 parking spaces for daily parking on the eastern waterfront. It is unclear to what extent these spaces can be relied upon in the future, so consideration for future parking needs will need to be considered.

Proposed development plans for the eastern waterfront often include considerations for the consolidation of public parking into parking structures, to improve functionality and availability of parking in the waterfront area. Additionally, the City of Portland has initiated a pilot program designating 42 on-

street parking spaces on Marginal Way as 2-hour parking for visitors, and non-time restrictive parking for residents of any of the Casco Bay islands; the City also provides a shuttle from this parking area to the ferry terminal. This program operated between June and September 2019 as a pilot for potential future improvements. It is expected that this program would primarily be utilized during the summer months, when parking demand is at its peak.

While this parking and shuttle program offers benefits for island residents, much of the expected increase in travel demand is expected to be tourists and visitors. The lack of parking on the mainland for island residents and visitors may result in an increase in vehicle demand for Peaks Island ferry among travelers who may otherwise have not brought their car to the islands. Recommendations for managing these constraints are provided in the following section.

Even without additional future demand, the existing parking lot on Peaks Island often reaches capacity and may not be able to accommodate additional vehicular activity. This could lead to parking overflow on local, often residential, roadways for on-street parking. With an expected increase in demand, parking capacity will be reached even more quickly, and perhaps extend into non-peak season as well. In addition to traditional motor vehicles, golf carts are frequently utilized on the island both by residents and visitors, contributing to the type and quantity of needed parking facilities.

In early 2020, updated conceptual plans were made for modifications to the existing public parking at the Peaks Island terminal (Figure 15). The realigned parking would create an additional 6 spaces for personal vehicles (for a total of 61), as well as 11 additional spaces for golf carts (for a total of 16), and racks for an additional 7 bicycles (for a total rack capacity of 56 bicycles). Beyond this increase, the plan also proposes to modify the direction of travel within the parking lot entrance, improving flow and allowing for vehicles to access and leave the lot more efficiently and safely.

The proposed parking plan seeks to balance the increasing demand for multimodal options on Peaks Island by modestly increasing capacity for all supported means of personal transportation on the island, for use by tourists and residents alike. While this proposed plan will not satisfy the needs of the projected increase in vehicular traffic on the island, these improvements could alleviate parking conditions in the short term and support future parking operation modifications. Task 3 will identify other potential solutions to mitigating the increased demand for parking on Peaks Island.

Figure 13: Proposed Modifications to Peaks Island Public Parking Lot (2/14/2020) (Source: City of Portland Department of Public Works)

Conclusion

Task 2 of the Peaks Island Ferry Demand and Operational Analysis focused on future demand projections for passengers and vehicles traveling to and from Peaks Island. This included review of a proposed new ferry vessel, future passenger demand and travel patterns during both the peak summer season and off-season periods, and expected growth in vehicle and freight demand. Further, the chapter identified potential and expected impacts on vehicle queueing, pedestrian queuing, safety, and flow, and parking operations. Critical impacts that will need to be addressed through mitigation, demand management, and infrastructure strategies include:

- Managing expected increases in summer peak passenger ridership and growing vehicular usage in off-peak season.
- Managing passenger queuing lines, particularly at the Peaks Island terminal where existing queues, particularly during peak periods, are often long and existing capacity and amenities are not sufficient to handle large queueing events.
- Optimizing queuing and circulation for all travel modes to ensure safe and efficient access.
- Managing increased vehicular traffic and parking demand on Peaks Island.
- Managing vehicular queues on Peaks Island and the mainland as vehicle trips are projected to grow.
- Improving safety, comfortability, and overall experience of pedestrian queuing by providing sufficient capacity and amenities, particularly for vulnerable travelers.

Developing strategies for managing these challenges will be critical for providing safe, efficient, and, comfortable queuing and access on Peaks Island. Task 3 will evaluate ongoing efforts, as well as present potential options for improvements to operational efficiencies through creation, improvement, and expansion of passenger amenities and spaces; improved parking operations; vehicular traffic management; and facilities and procedures to alleviate constraints on passenger and vehicle queuing and conflicts. These strategies for addressing the impacts of increased passenger and vehicle demand will aid the City of Portland and CBITD in supporting passenger safety and comfort for all users, regardless of traveler type or mode of travel.