



Passenger Ferry Best Practice Case Studies for the Portland-Vancouver Market

How cities are taking advantage of underutilized waterways to reduce traffic congestion, improve air quality and strengthen community connections.

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Completed by the Friends of Frog Ferry



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Introduction

The transportation infrastructure of most metropolitan U.S. cities is being rapidly outgrown. “Greater Portland,” or as it is also known, the Portland metropolitan area (PMA), is the last major river city region in the country without water-based commuter transportation. This plan involves reviewing the best practices gleaned from a variety of case studies and then applying the lessons learned to a potential Portland, Oregon regional water ferry service. The selected markets were based on the findings of two years of meetings and interviews, after multiple conversations with passenger ferry experts who suggested similarities between the featured ferry markets in this report and the Portland market due to parallel operational or governance challenges.

Interviews were conducted with the leadership of most of the operators to help generate comparisons with the Portland regional service, in order to identify best practices that apply to our region from a political, cost or operational perspective. The six ferry transit operations analyzed were:

- I. KITSAP COUNTY TRANSIT - WASHINGTON STATE
- II. KING COUNTY WATER TAXI - WASHINGTON STATE
- III. SAN FRANCISCO BAY AREA FERRY - CALIFORNIA
- IV. POTOMAC RIVERBOAT COMPANY - WASHINGTON, DC
- V. CITYCAT - BRISBANE
- VI. THAMES CLIPPER - LONDON

The approaches used by these operations are helping to reduce greenhouse gas emissions, air pollution and road gridlock. Furthermore, they are strengthening communities through social interaction and connections to natural waterways and local history.

The following case studies provide a snapshot of passenger-only ferry services, also known as “foot ferries” or “water taxis”. Though the studies cover a wide variety of topics ranging from operational requirements to the governance of publicly-run versus privately-held organizations, they are not exhaustive; rather, the studies provide introductory insights into services, funding mechanisms, schedules, ticket costs and (skyrocketing) rider demand.

Like Portland, Oregon and Vancouver, Washington, the cities in which these services operate are experiencing unprecedented population and economic growth, worsening traffic congestion and air quality, and a potential stifling of continued economic vitality. A growing number of public and private operators have launched or expanded water transit services as an efficient and attractive method for improving commerce by giving workers another commuting option and by freeing up congested roadways for commercial vehicles.

The sectors of transportation and energy are shifting the community infrastructure landscape and rewriting how business is conducted. With the ever-changing demands of the traveling public and the general “greening” of the ferry industry, many new strategic alliances are being forged.

Obviously, foot, also known as passenger, ferries are not the sole solution to urban transit woes; however, as these water-based services clearly demonstrate, they can and do serve as integral players in a well-functioning and truly multimodal transportation ecosystem.

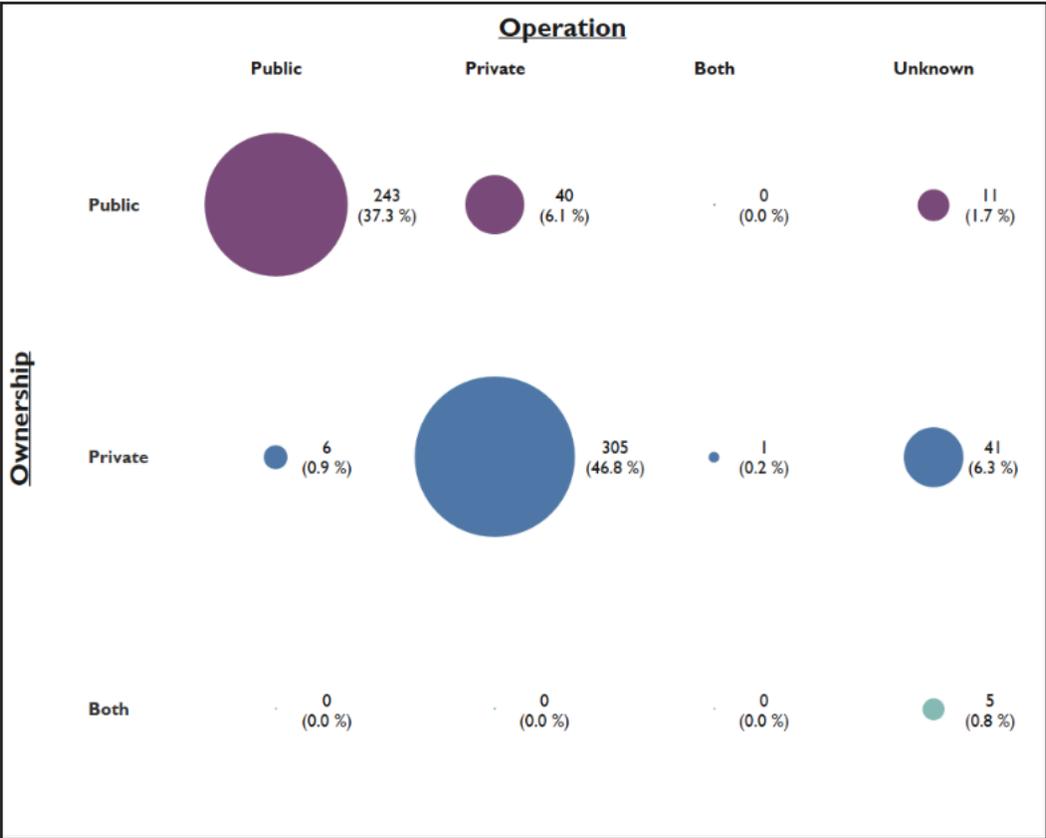


Situational Analysis: U.S. Ferry Service Overview

US Ferry Operation Highlights: Ferries are used to commute to work in river/coastal cities, to cross water in rural areas, to receive services in island regions and for recreation and tourism. There are approximately 220 ferry operators across 37 states, operating 652 vessels. In 2016, more than 119 million passengers were transported by ferry, with New York and Washington State accounting for the top passenger numbers. In New York City and San Francisco, there has been a recent resurgence in ferry use. New York City plans to add 10 new ferry terminals and 19 new vessels by 2020, to facilitate 4.6 million annual trips across six routes. From 2013-2015, San Francisco's ridership increased 25 percent, prompting the construction of new terminals, vessels and added route segments.

Of the 652 vessels, 313 are passenger-only vessels, with the average passenger capacity of 323 passengers, and a median passenger capacity of 149. The average operating speed reported 14 knots, with a maximum speed of 43 knots. 92% are fueled by diesel, 3.4% by gasoline engines, and 4 are powered by electricity (US Dept of Transportation, Bureau of Transportation Statistics, National Census of Ferry Operators 2017).

Figure 5: Number of Vessels by Ownership and Operation (2015) U.S. Bureau of Transportation Statistics. Source: U.S. Department of Transportation Bureau of Transportation Statistics, National Census of Ferry Operators 2016, Appendix A, Table 5, available at www.bts.gov as of October 2017.



History of Ferry Service on the Columbia & Willamette Rivers

Sources: Ruby, Brown. *Ferry Boats on the Columbia River*. Superior Publishing Company. 1974.
Charles F. Query. *A History of Oregon Ferries since 1826*. Maverick Publications. Revised 2008.

With special thanks to the Oregon Historical Society's research library.

Long before fur traders, miners, and early settlers arrived in the area, the Columbia and Willamette rivers were regulated, highly-utilized passageways that connected tribes throughout the region. These were the major arterials that made the shipment and trade of the region's bounty possible. Highly trafficked and well-worn paths led down to the river's edge, with many of these original Indian trails located where major thoroughfares exist today—most notably Sandy River Boulevard.

The influx of people descending on the region—early enterprisers such as the Hudson's Bay fur trading company, explorers like Lewis and Clark, miners and treasure seekers, and migrants such as Americans from other states looking to move out West—had a profound impact on river utilization. Tribal sovereignty was disrupted and regulation over the waterways and what traveled down them began to unravel. In 1848, the Oregon Territory boundary was established.

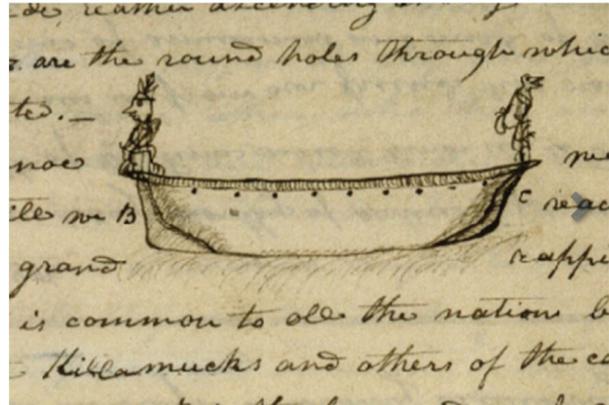


Photo: Confederated Tribes of Grand Ronde

Many people were interested in operating ferries along the river and for unique reasons: some wished to “cross” miners to the Indian trails to look for gold, some wished to shuttle livestock, some got in the business of transporting Oregon Trail settlers. All of this activity created economic opportunity (and opportunities to gouge ferry passengers with steep fares). In 1849, the newly formed Oregon Territory legislature passed “An Act Regulating Ferries” which granted licenses and set rates and taxes for would-be ferry operators. With this legislation came an untold number of applications for licenses. As the city of Portland was settled and growing into a bustling center for transport of freight along the Willamette valley, (with East Portland as its own city at the time), the need for ferry service crossing east and west along the river led to several ferry crossings whose notable names are recognizable to this day.

In addition to the smaller operators, Portland Railway Light & Power (PRL&P) played a heavy hand in large-scale ferry service between Portland and Vancouver. PRL&P was the local industrial monopoly that controlled all transportation facilities (and the still emerging electrical grid) in the Portland region. After 1853 when the Washington Territory made a break from the Oregon Territory, the Columbia River officially became the dividing boundary (and technically a federal highway) between the two territories, both of which would soon become states. Governance and regulation over the Columbia River fell under the control of the PRL&P. This included the major ferry crossing that connected Vancouver and Portland. With the advent of the automobile, and changing preferences by locals who wished for quicker ways of getting from ‘point A to point B,’ ferry service began to fall out of favor. PRL&P saw an opportunity to create an ‘interstate’ bridge that would allow rail freight to be moved at greater speed and efficiency. With strong public support, PRL&P underwrote the cost of the bridge. In 1917, the day that the new Interstate Bridge opened, Portland Railway Light & Power officially shut down ferry operations between Vancouver and Portland.

With public sentiment now wholly focused on automotive transportation, passenger ferry service effectively disappeared along the region's waterways. What were once bustling, activated routes of transportation, the Columbia and Willamette rivers went dormant for most uses, save for occasional barge freight such as gravel and wheat, and occasional sightseers and pleasure boaters.

Today's Transportation Challenge

The Portland Metro Area has experienced tremendous growth; it has become a regional daily topic of conversation. With inbound interstate migration increasing by 150 people per day, the enhanced density contained within the defined urban growth boundary has dramatically increased traffic congestion.

Portland has long been an innovator for multimodal transportation. In 1986, east-to-west and north-to-south running MAX Light Rail lines were installed; splinter systems including the Portland Streetcar, which operates as a central city circulator and the Willamette Shore Trolley, which runs summer weekends were later established. There are three ferry services that run in the Willamette Valley, that reflect passenger boarding counts (2015) of more than one million.

Costs of Congestion: Transportation infrastructure transforms communities and is a vital component of community development.

Traffic congestion is projected to increase by as much as thirty percent by the year 2040. Transportation comprises 37% of Oregon's greenhouse gas emissions. Investing in transit methods that employ green technologies will reduce net operating expenses while minimizing the impact on the environment.



Reduction of road congestion is the highest priority action item for the Oregon Business Plan Transportation Advisory Committee. Every day, more than 230,000 vehicles cross between Oregon and Washington using the Interstate (I-5) and Glenn L. Jackson Memorial (I-205) Bridges. Passage of the \$5.3B Oregon Transportation HB 2017 Funding Bill focused on infrastructure improvements over the next 10 years to stimulate the economy and improved the quality of life while reducing gridlock. The City of Portland approved \$36 million in transportation projects in November 2018. PMA traffic congestion impacted businesses and families with \$1.8 billion in lost time and increased fuel consumption costs.

Portland's distinctive personality shines through in nicknames and slogans like "River City", "Portlandia", "Stumptown", "Keep Portland Weird" and "City of Bridges." Locals take pride in being unique and creative, and they support using new and multiple modes of transportation to reduce PMA's carbon footprint. Bicycle lanes are a cultural norm, with 15,000 cyclists crossing five bicycle-friendly bridges each day. Portland is a walking friendly city with short blocks; the City of Portland, with support from Nike and other local business, has started BIKETOWN. This bike sharing program deploys 1,000 bikes to more than 100 stations across Portland. Recently, Portland approved the use of electric scooter sharing and in the 120-day trial period, people took 700,369 trips covering 801,887 miles. Of those with favorable opinions, 71% are using e-scooters as transportation to a destination. Portland was an early test market for Uber and Lyft, where usage has skyrocketed. These two companies gained 35% of the Portland International Airport market within the first two years of launch.

These diverse transportation choices are designed to give residents and visitors a fun, affordable and convenient alternative to autos, taxis and ride-sharing to help efficiently and effectively move people who are seeking to avoid congestion and high downtown parking fees.

Although there is a lot of proactive transportation planning in the PMA, the obvious passenger ferry option is currently not available. Naysayers may cite a lack of expertise or fear of unanticipated costs; however, Portland and Vancouver are iconic in that the communities sit at the confluence of two major rivers, there is ample expertise in the passenger ferry service in hundreds of markets around the world, where passenger ferries are considered a best practice and strategic use of public funding. This underutilized natural highway infrastructure must be seriously considered as another forward-looking solution to our traffic problems.

Mission Statement

Create a safe and sustainable river-friendly public passenger ferry service to better connect people to their river while alleviating traffic congestion in the Portland-Vancouver Metropolitan area.

Objectives

- New transit mode to connect people to workforce
- Emergency Response capacity builder
- People-driven, through a social equity lens
- Environmental Benefit, lower carbon emissions
- Cost effective: 30% farebox recovery, strategic public subsidy
- Efficient: Short 3-year time table to implementation. Low project management costs



Photo: Aerial view of Willamette Falls Locks



Photo: Seattle ferry

Case Studies

KITSAP COUNTY TRANSIT (WASHINGTON STATE)

Fun fact: Between 1850 and 1930, hundreds of small, steam-powered ferries called the Mosquito fleet carried travelers to and from islands and peninsulas in the Puget Sound.

BACKGROUND

Kitsap County voters approved a ballot measure in 2016 for a sales tax to support passenger-only “fast ferry” service to downtown Seattle from Bremerton, Kingston and Southworth. The Bremerton route launched in July 2017 and Kingston in November 2018. Southworth boats will hit the water in 2020.

FUNDING

Operations for the Kitsap County local and fast ferry service are funded primarily from fares and the dedicated sales tax. Capital projects are supported chiefly by federal and state grants. They have a 30% fare box recovery; the fare is \$12 per round trip while \$36 is the true cost. They move approximately 37,000 passengers a month.

KINGSTON FAST FERRY

The 40-minute commuter service features six round-trips (no Sunday service) — three in the morning and three in the afternoon — between the Kingston Ferry Terminal and Colman Dock in downtown Seattle. The cost is \$2 to Seattle and \$10 for the return trip. The ferry carries 350 passengers. All seats face forward for a clear line of sight and operate at 30+ knots. They run a hybrid model, which adds battery weight.

BREMERTON FAST FERRY

The 40-minute commuter service makes eight round trips - three in the morning, five in the afternoon. The cost is \$2 to Seattle and \$10 for the return trip. The ferry has a capacity of 118, including 12 spots for bicycles.

RIDERSHIP MILESTONE

The fast ferry service (across both routes) attracted a record 45,000 riders in May 2019. Ridership exceeded 334,912 passengers last year. Kitsap Transit forecasts a ridership of at least 500,000 passengers by 2023.



VESSELS

Kitsap County Transit runs two high-speed catamarans on each route, each with four engines and four jets. The area has wake restrictions, and these boats are designed to create a very low wake while operating at high speeds (roughly 40 miles per hour). The ferry carries 350 passengers. All seats face forward for a clear line of sight and operate at 30+ knots.

They run a hybrid model, which adds battery weight.

The transit agency has also ordered two new 250-passenger vessels with delivery expected around 2020 for service on both the Kingston and Southworth routes. The 140' by 37' by 12' aluminum, high-speed catamarans will have capacity for 26 bicycles.



(Image, King County)

INNOVATION

In addition to the fast ferries, Kitsap Transit operates two local ferry routes - between Bremerton and Port Orchard and Bremerton and Annapolis. A first-of-its-kind,

hybrid-electric vessel will soon service the Bremerton/Port Orchard route.¹ The 150-passenger boat uses a diesel engine to power a generator, which then charges a battery bank that propels the vessel. Once the batteries are charged, the engines shut off.

LESSONS LEARNED:

- Consider fuel burn, energy sources and vessel type.
- Impact of increased speed = increased fuel cost, vibration, maintenance cost.
- River debris can be an issue; Forward-Looking Infrared (FLIR) system is better in fog than in rain.
- Offer competitive compensation plan to retain great talent. Staffing Requirements: Eight employees (1 captain, 2 deckhands, 1 additional - AM and PM crews).
- Reliability is the primary determinant of success.
- Frequency is key factor.
- Dock facility specialized with proper ramping for the operation.

¹ Electric ferries are gaining steam. Taking a cue from industry pioneers in Norway, the Washington State Ferry system is converting (slowly) to hybrid and electric vessels. "But if you want an electric boat, you're not going to have a fast boat," says Sanjay Bhatt, a spokesperson for Kitsap County Transit. The charging infrastructure and battery size aren't sufficient to enable rapid marine transit, and for those reasons, the new hybrid vessel will not be put into service on the fast ferry route.

II. KING COUNTY WATER TAXI (WASHINGTON STATE)

Fun fact: Public ferry service between West Seattle and downtown Seattle ran from 1888 to 1913.

BACKGROUND: King County Department of Metro Transit Marine Division operates two passenger-only ferry services from Pier 52 in downtown Seattle to Vashon Island and West Seattle. The Washington State Ferry system operated the Vashon service from 1994 through mid-2008. Argosy Cruises, a private company, operated the West Seattle route from 1998 through 2009. This service was contracted by King County Metro and was a seasonal service. The Marine Division is responsible for the operations, moorage, and maintenance of the vessels that provide ferry services. Passenger-only ferry services are provided from Pier 50 in downtown Seattle, with service to Vashon Island and West Seattle.

FUNDING

Operation and capital funding come from fares, federal grants and a special property tax levied on all property in the county. Operating expenditures in 2018 were \$7.74 million. Fare revenues clocked in at around \$3.2 million. Fare box collection is 45% of revenue.



VASHON ISLAND FERRY²

The service features six round-trips daily, weekdays only and during the morning and evening commute. Tickets cost \$6.75 one way. In 2018, this route carried nearly 250,000 passengers, an 11% increase over 2017. The route has doubled annual ridership since taking over the operation in 2010.

WEST SEATTLE

The service features 12 round-trips during the morning and evening commute, with additional weekend and mid-day service April thru October. Tickets cost \$5.75 one way and the route carried nearly 415,000 passengers in 2018, which was a 10% increase over 2017.

RIDERSHIP MILESTONES

- 665,000 passengers were transported system-wide in 2018, bringing the total passenger count to more than 5.8 million since inception in 2009.
- The West Seattle route carried nearly 415,000 passengers in 2018, a 10.4% increase over 2017.
- Year-round commute ridership increased by 4.3% during this period.
- The Vashon Island route carried nearly 250,000 passengers in 2018. This is an 11.3% increase over the previous year, with the Vashon route doubling in annual ridership since King County took over service in 2010.
- Use of a 10% biodiesel blend fuel. High efficiency technology and design.

² The City of Tacoma is also pursuing fast ferry service to Seattle. A feasibility study completed last year estimated capital costs would be about \$40 million, with operating expenses running about \$2.83 million. The trip would take around 43 minutes, compared to 50 to 120 minutes by car.

VESSELS

The King County water taxi service operates two vessels, each with a capacity of 278 passengers. Federal funds covered 80% of the \$11.8 million cost.

SAFETY: To ensure safety, King County Water Taxi vessels are U.S. Coast Guard Certified under Subchapter K rules, crews are properly credentialed with merchant mariner documents and TWIC's, the division is in the process of implementing a safety management system, there is careful maintenance of a U.S. Coast Guard-approved vessel and carefully trained crews. The KCMD vessels are considered very stable due to the catamaran hull form. Crews are trained to navigate waterways shared with paddle boarders, kayakers, and recreational divers.

REDUCING GREENHOUSE GAS EMISSIONS: The King County Water Taxi has taken the following actions to reduce greenhouse gas emissions:

- Use of a 20% biodiesel blend fuel.
- High efficiency hull technology and design.
- Regional green mobility, including storage for 26 bike rack spaces on vessels.
- Facility energy audits.
- Strategies to reduce garbage and increase recycling from on-board operations.
- Green initiatives and Passenger Vessel Association memberships.

EMERGENCY PREPAREDNESS: Whether in response to an extreme weather event or seismic activity, a natural disaster or a threat to national security, ferries serve as an essential marine link for the transport of supplies or to serve as an evacuation platform as well as to transport first responders.

EDUCATION: Advancing the opportunities for career development and creating pathways to maritime jobs is supported through the Seattle Maritime Academy. Training opportunities exist through the King County Waste-water Division, internships, on-board response scenarios, and partnerships with other agencies.

PARTNERSHIPS: The King County Marine Division has formed many partnerships with agencies, businesses and communities throughout the Puget Sound region to develop solutions for providing efficient transportation solutions. Examples include partnerships with counties for transit, lease agreements with other agencies for use of docks and facilities, partnering on parking solutions at key stops, joint ownership of float/docks, partnering with transit agencies to align scheduled departures, presentations to community advisory groups, multi-jurisdictional maritime emergency response exercises, and local recreational group engagement.

LESSONS LEARNED:

- Operated by the mobility operating agency, Metro, and known for their bus services, they connect communities and are focusing their current strategic planning on underserved communities.
- The farebox recovery of 45% is considered best in class in the United States; however, the agency is also resisting increasing fares to remain cost effective and equitable for all riders.
- Their seven-month peak season begins in late March (coinciding with the Mariner's Season) and runs through the fourth week of October.
- Round-Trip Fares: Seattle to West Seattle – Cash: \$11.50 and ORCA \$10. Vashon to Seattle – Cash - \$13.50 and ORCA - \$11.50
- Waterways are less congested than roadways and experience far less variability in travel time; accordingly, on-time performance is 98% and the trip reliability rate is 99%.
- Integrated with the ORCA card for seamless transfers between other modes of transit; bus, light rail, street car.
- In order to encourage use, there is no additional cost for bike rack usage.
- 2018 ridership was up 11% over 2017 numbers to 660,000 passengers a year.
- Operations occur in a 14-foot tide variation.

III. SAN FRANCISCO BAY AREA FERRY (CALIFORNIA)

Fun fact: In the mid-1930s, boats ferried more than 150,600 passengers daily across San Francisco Bay.

BACKGROUND: The San Francisco Bay Area Water Emergency Transportation Authority (WETA)³ operates the San Francisco Bay passenger-only ferry system with service to the cities of Alameda, Oakland, Richmond, San Francisco, South San Francisco and Vallejo. An aggressive 20-year strategic plan calls for increasing the fleet from 17 to 44 vessels and growing ridership five-fold by 2035. Additional services to the Mission Bay neighborhood of San Francisco and Seaplane Lagoon in Alameda are expected to be up and running within a few years. For nearly 10 years, the agency was called “WTA,” but resilience planning was added to the mission in 2008 and “E” for “Emergency” was added. WETA was created in 1999 by the Bay Area Council, as a public-private taskforce, which was chartered to create and maintain the vision to start a service.

Ferry service is modular, and if a route changes, there is no need to remove rail lines or roadways. The modularity of the infrastructure means that special services for sporting events, can be added and dock sites are relatively easy to reconfigure depending on market demand. The San Francisco Bay has a fluctuating tide of approximately seven feet (the Willamette River is at 26 feet variance), and they have been challenged to create ADA-compliant gangways and docks that don't exceed a 12:1 slope with a flexible dock design that works with multiple vessel freeboards, that are flat and can interface with fixed points on land.

Key drivers of success include reliability, ride quality, and the ability for passengers to multitask and make good use of their time. Customer satisfaction ranks in the 90th percentile, and 92% of passengers have other transit options but choose the ferry: 40% BART/Rail, 12%Bus, 18% Drive Alone, 8% Carpool, 4% Casual Carpool, 7% TNC/Uber-Lyft. Passengers choose to ride the ferry: 65% to avoid traffic/parking; 50% ride quality; 50% relaxing experience; 30% ability to multi-task; 28% faster commute; 15% environmental benefit; 13% sightseeing; 5% no car; 5% less expensive; 5% other.

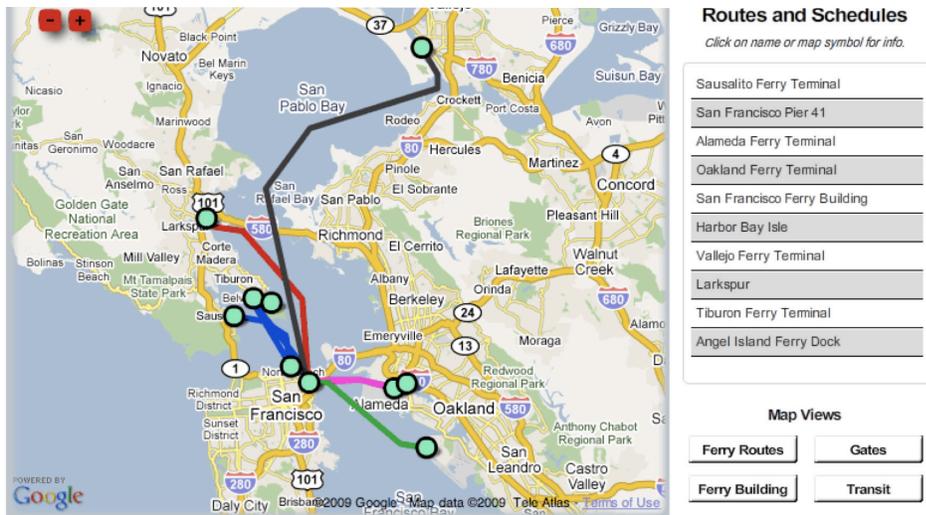
LESSONS LEARNED:

- WETA was created by a public-private partnership in 1999. These partnerships are considered a best practice for starting new organizations and modes.
- A ferry service is modular and provides more operational flexibility. When a route changes, rail lines or roadways needn't be removed.
- Ability to customize capacity for special events, ball games, emergency response.
- Flexible dock design accommodates a fluctuating tide while maintaining ADA compliance.
- Key success metric: On-time performance followed by highest use of personal time during transit. (i.e. Wi-fi for work, relaxing atmosphere.)
- Ferry commuters are willing to take multiple modes of transit when looking at first and last mile.
- Fluctuating tides can be challenging for ADA-compliant dock slopes.

FUNDING

Operating revenues are comprised chiefly of bridge toll revenues and fare revenues. Total operating expenses for 2017/2018 were \$38 million. Capital funding sources include California Proposition 1B transportation emergency bonds, federal transit dollars and regional levies. In January 2019, WETA launched service to Richmond, which was a project that included a \$20 million partnership between the Contra Costa Transportation Authority and the City of Richmond to build the Richmond Ferry Terminal.

³ WETA was created in the aftermath of the Loma Prieta earthquake in 1989, when damage to the Bay Bridge forced the return of ferry service. The system's popularity, along with renewed interest in water transit as a critical emergency response tool, led the state legislature to approve funding for the agency in 2007.



RIDERSHIP MILESTONES

The new Richmond line attracted more than 740 daily riders during April and May 2019 – up from the agency’s projected ridership of 480 daily rides. Ridership on the San Francisco-Alameda-Oakland run is up 115 percent over five years ago, while the San Francisco-Vallejo ferries are carrying 66 percent more passengers. The entire system carries around 2.7 million riders annually.

VESSELS

In the past two years, WETA has added four new 400-passenger ferries at a cost of \$15 million each. The 135’ aluminum catamarans are each equipped with a urea-based exhaust aftertreatment system from Hug Engineering, allowing them to meet new EPA standards for cleaner marine vessels. The engines burn biodiesel, further reducing emissions.⁴ Three additional high speed 445-passenger ferries will be delivered late in 2019, and a 300-passenger vessel is expected to be in service by 2020.



Passengers line up to catch the SF Bay ferry (Image: San Francisco Chronicle)

REFERENCE:

<https://sanfranciscobayferry.com/sites/sfbf/files/pr/MANewVessel181004.pdf>

San Francisco Examiner <https://www.sfexaminer.com/the-city/new-richmond-to-sf-ferry-service-nets-incredible-ridership-growth-years-early/>

San Francisco Chronicle <https://www.sfchronicle.com/bayarea/nativeson/article/Even-the-SF-Bay-ferries-are-crowded-these-days-12871007.php>

IV. POTOMAC RIVERBOAT COMPANY (WASHINGTON, DC)

Fun fact: White's Ferry is the last of 100 ferries that used to operate on the Potomac River. Elijah White, a former confederate officer, operated the ferry in the 1870s and named his boat after his former General, Jubal A. Early. The ferry connects Whites Ferry Road in Montgomery County, Maryland with a road by the same name in Loudoun County, Virginia.



BACKGROUND: The Potomac Riverboat Company, which launched its first water taxi in 2008, has operated dinner/tour boat cruises since 1974 and connects Alexandria to National Harbor and the Gaylord National Hotel and Convention Center in Oxon Hill, Maryland. In 2012 and 2018, respectively, Potomac added additional service from National Harbor and Alexandria to the National Mall and then to the Wharf. Round-trip tickets start at \$18.00 for adults and \$12.60 for children. (Potomac was acquired by Entertainment Cruises in 2016 and is pending another sale.)⁵

RIDERSHIP MILESTONES

In 2018, the company served about 250,000 riders. While most current passengers are tourists, the operator and public transit officials aim to attract more daily commuters. A test of commuter appetite is currently underway: As of Memorial Day, Potomac Riverboat had added extra service through September 8 to compensate for the Metro shutdown at the stops beyond the National Airport.

VESSELS

In June of 2018, the company invested \$10 million in the acquisition of four new boats and increased the water taxi fleet to seven ferries. Each of the 87-foot taxis carry 149 passengers and reach speeds of roughly 26 miles per hour. Unique open-air decks on the outside – a second level provides space during the pleasant summer months, with the rails and seats holding an additional 50 people. Mechanizing the folding rails in 6–8-foot sections has been recommended, as currently, they manually set 128 pin lanyards and bench seats. The seating on the lower deck accommodates 74, with standing room for 99. It is a T-boat classification of under 149 passengers (K-boat for more than 149 passengers). Bucket seats are installed on the lower deck and bench seating is found above. Additional room for six bikes exists on the back. As the longest route is only 45 minutes, the single restroom can support the ridership numbers.



Image, Potomac Riverboat

The bow slopes up near the forward gate for bow landing, however, consideration should be made to eliminate the slope. The engine rooms are tight, and there should be consideration of a wider and longer platform with more length and width at the hull. Consider narrowing and reinforcing the bow for potential impact with river debris. The Potomac operation uses propeller propulsion, which has experienced challenges with river debris and operates Sanya 500 HP twin engines. The ramps are built on the boat with a pulley-system ramp.

LESSONS LEARNED:

- Start with your culture: it's difficult to start if the public doesn't have a history or understand the value of water-based transit.
- From a policy perspective, boats are much easier than land-side planning and development.
- Remember that every plan starts with an idea. There is always room to grow and expand upon ideas. Don't try to accommodate everyone at the start.
- The BMT vessel meets most of our operational requirements. We must look at improvements for handling river debris and minimizing carbon output.
- Do your outreach early and get familiar with those who are most impacted by operations on the river. Citizens living near the river who are accustomed to no traffic will need considerable outreach.

REFERENCE:

Business Journals: <https://www.bizjournals.com/washington/news/2018/06/05/alexandria-company-adds-four-water-taxis-to-meet.html>

Washington Post: <https://www.washingtonpost.com/express/2019/05/14/during-metro-shutdown-riders-could-turn-water-taxis-transportation/>

Greater Greater Washington: <https://ggwash.org/view/71933/metro-bus-bike-maybe-ill-take-the-water-taxi-to-work-today>

4 Funded in part by California cap-and-trade appropriations, a private company, Clean Marine Energy, is building a proof of concept 70-foot, 84-passenger, hydrogen-powered catamaran to be piloted in San Francisco Bay. Clean Marine hopes eventually to sell its zero emissions fleet to transit agencies.

5 Although Potomac is the only private system featured in this roundup, it should be noted that many public transit ferry systems grew out of private companies that eventually merged under the auspices of a public authority.

V. CITYCAT, BRISBANE

Fun fact: The first ferry in Queensland started on January 1, 1843 with service crossing the Brisbane River.

HISTORY/BACKGROUND

Brisbane's CityCat passenger ferry service launched in November 1996. Today, the ferry transports approximately 5.4 million passengers during more than 219,000 annual trips. The fleet is managed by private operator TransDev on behalf of the Brisbane City Council. The network serves the University of Queensland, St Lucia Campus and Northshore Hamilton with daily services from 25 terminals along the Brisbane River.



Background - In June 2019, the city council approved a \$30 million budget for six high speed double-decker CityCats, which are scheduled to be completed by 2020. The first vessel to be delivered is the \$3.7M Supercat, featuring an upper-deck with 16 seats. The interior features table and lounge seating options, USB charging ports and larger windows.

CREW: All CityCats are operated by a crew of three - a master, a deck hand and a ticket seller.

SCHEDULE: The CityCat operates daily with the first route starting at 5:25 a.m. and the last ferry docking at 12:55 a.m. A \$5.60 ticket is good for two hours.

VESSELS: A fleet of 21 CityCats (catamarans) and nine monohulled ferries. A peak hour express service, SpeedyCats, launched in September 2018.



LESSONS LEARNED:

- Single-floor design for passengers (easy wheelchair and stroller/pram access)
- Faster loading/unloading when you don't need to allow for people changing floors
- Less liability by eliminating stairs
- Low staffing needs: captain + deckhand (plus optional barista)
- Low-wake
- Reliability and safety should be givens
- Plenty of inside room, but both front and rear outside decks are available for when the weather is good; available seating addresses the needs of the commuters and tourists
- Room for bicycles — a critical factor here in Portland
- Short stops of less than 2 minutes at each riverside ferry terminal help minimize commute times (see <https://www.brisbane.qld.gov.au/traffic-transport/public-transport/citycat-ferry-services/citycat-journeys>)

Amenities:

- Elevated bridge so that the captain can better see trees and other debris in the river; I don't know what can be done from a ship design/technology perspective to mitigate impacts to ferry schedules and avoid damage to vessels when conditions are sub-optimal.
- Espresso/snack counter.
- On-board Wi-Fi.

REFERENCE:

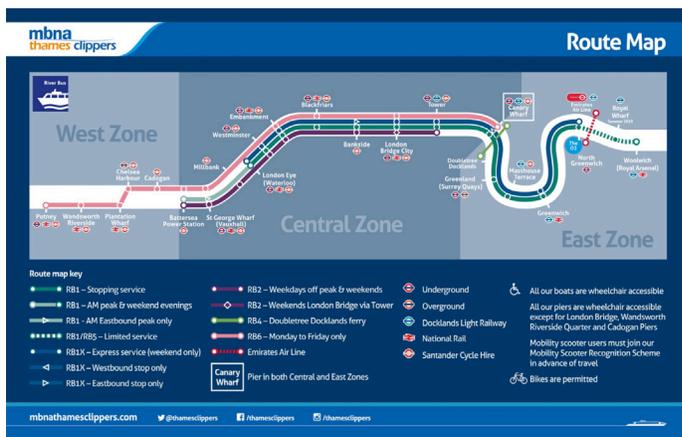
Brisbane Times <https://www.brisbanetimes.com.au/national/queensland/cat-s-out-of-the-bag-first-look-at-brisbane-s-double-decker-citycat-20190820-p52iuf.html>

Brisbane City Council: <https://www.brisbane.qld.gov.au/traffic-and-transport/public-transport/citycat-and-ferry-services>

VI. THAMES CLIPPER, LONDON

Fun fact: The first ferry on the Thames can be traced back to the 1300s, when it ran from a North Shore fishing village known today as Woolrich to Warren Lane on the South shore.

BACKGROUND: The company serves 8,500 commuters and tourists a day, running operations from eastern and central London. CEO Sean Collins founded MBNA Thames Clippers in 1999 with partner Alan Woods, recognizing the need for a reliable high-speed commuter and passenger river service. The service was acquired in September 2006 by U.S.-based Anschutz Entertainment Group. The network features six fast ferry routes (four commuter and two tourist) serving 22 piers between Woolwich, the O2, Greenwich, Rotherhithe and central London. A fleet of 19 vessels carries more than four million passengers a year, a number that continues to rise from the three million passengers who rode in 2013. Transport for London (TfL), a public agency, licenses the system and manages the piers. TfL and London councils subsidize a few of the routes.



Brisbane City Cat

PASSENGERS: Commuters during peak times and tourists during the day.

TICKETS: An adult single trip fare ranges from £4.40/\$5.30 to £9.90/\$11.90 (£3.90/\$4.70 to £7.50/\$9.00 if payment is made online, in an app or with an Oyster or Contactless Card) and is integrated into London's public transport payment system, Oyster and Contactless payments. Passengers save one-third off standard fares with a London Travelcard. A River Roamer ticket, valid for one day, is available for hop on/off service along the banks of the Thames.

SCHEDULE: Clippers depart every twenty minutes from the major piers of Westminster Millennium Pier, Woolwich Arsenal Pier, as well as 12 other stops. The Thames Clipper also operates a service at the Hilton Hotel Rotherhithe for guests of the hotel as well as the general public.



Thames Clipper

VESSELS: The Thames Clipper operates 19 vessels, 17 of which are high speed catamarans, at a maximum speed of 28 knots, with capacity for around 200 passengers. The newest vessel, the Venus Clipper, featuring twin symmetric hulls, has a capacity of 222 passengers and is the most energy efficient model to date.⁶ Collectively, the newer vessels are equipped to navigate the Thames shallow waters and pass under London's low-slung bridges.

⁶ A low sulfur-fuel cap that goes into effect in 2020 is expected to add extra costs for conventional car-based ferries but should boost prospects for passenger ferries, Peter Morton, CEO, Wight Shipyard, told Maritime Executive. "This is because it does not have to worry about finding the increased capex to fit scrubbers or face a huge surge in costs by changing to low sulfur fuel, as fast ferries already run on low sulfur fuel. When fuel costs go up for conventional ferries for low sulfur fuel post 2020, fast ferries will be in a much more competitive position."

MILESTONES: A joint venture finalized in 2018 handed the Clippers a five-year contract to manage the Central London Cruise Moorings, alongside the Port of Tilbury. The partnership will transport cruise passengers from their ships to the center of London. In October 2019, Clipper services began running to the new Royal Wharf, a new neighborhood on the north bank of the Thames.

INNOVATION: Thames Clippers is working in partnership with Beckett Rankine and Aus Yachts on a proposed electric, fully accessible ferry cross-river solution. The Clipper is also part of the Port of London Thames Vision that calls for doubling the number of trips using the Thames to 20 million a year by 2035. In addition, in September 2017, Thames Clippers ran a trial commuter service between Gravesend and Central London.

LESSONS LEARNED:

- Deckhand compiles passenger counts on and off and maintains the passenger log (for passenger counts in case of an emergency).
- There are eight CCTV camera locations that the captain can view, to help expedite boarding and de-boarding. Deckhand uses signals as well.
- Real-time data posted on the app as well as at the boarding location. They use paper and paperless tickets.
- They guarantee a seat. The vessel is popular for sightseeing as well as for commuters. (There are multiple water-based transit operators on the Thames River.)
- They have a low aircraft and low water draft requirement on the Thames River.

REFERENCE:

Port of London Authority

<https://www.pla.co.uk/Port-Of-London-Authority-awards-London-Cruise-Moorings-contract>

Maritime Executive: <https://www.maritime-executive.com/corporate/wight-delivers-first-in-class-to-mbna-thames-clippers>