

Attachment 2

Financial Model

Basic Financial Model

Based on the landing site, route, vessel design, and ridership data generated above, a basic financial model for the initial start-up phase of Lake Union Ferry was performed. An initial fleet size of five is assumed along with landing sites limited to the three locations shown on the triangle and piston routes.

This financial analysis is simplistic nature in that it does not account for inflation, interest rates, or asset depreciation. Cost assumptions are discussed in the following sections.

Vessel

Capital Costs

This analysis assumes that each vessel costs \$350,000 to procure based on a rough cost quote obtained during a discussion with Bob Bekoff, a naval architect specializing in water taxis and ferries, indicating that vessels of the desired size range typically cost \$300,000 and a full electric package costs an additional \$50,000.

When purchasing vessels, it may be possible to reduce the per-unit cost of each vessel by ordering larger quantities. As an example, the San Antonio Water Taxi recently ordered a fleet of 43 all-electric vessels (42-passenger capacity and 27.5 ft length, aluminum construction) at a cost of 6.5 million dollars. This corresponds to a per-unit cost of \$151,162. However, these vessels do not include a hard side exterior or heating.

The vessel capital cost estimate may be refined through preliminary design phase that includes a preliminary cost estimate.

Operational Costs

Vessel operational costs can be broken down loosely in to four categories: vessel power (electricity), crew costs, insurance, and maintenance.

Vessel power cost is approximately 11 cents per kilowatt hour (a unit of electrical consumption per hour). The electrical capacities of the vessels are estimated from the San Antonio Water Taxi which is outfitted with a 6.5 kW motor and a 43.2 kWh battery bank with an endurance of 11 hours at a four-knot cruising speed. A general rule of thumb for vessel powering is that a 50% increase in speed requires double the power. Using this approximation, the Lake Union Ferry will require an 86.4 kWh battery bank.

Each vessel is assumed to use two full charges a day in the summer and one full charge per day during the winter, resulting in an electrical cost of \$19 and \$9.50 per day per vessel for each respective season. This is a simplistic approximation as the battery banks should not be drained to empty and the subject vessels will operate less than 22 hours a day. Additional requirements such as heating, and increased weight and resistance from a superstructure will also result in higher electrical usage.

Crew costs are assumed to be \$70,000 per year, which includes a \$50,000 annual wage and \$20,000 in benefits. Each vessel will require one crew member to operate, and each summer day is assumed to have two shifts. Each winter day is assumed to have one shift.

Vessel insurance was estimated at 2.5% of the capital cost per year.

Vessel maintenance costs are approximated at 5% of the capital cost per year. The vessel maintenance cost is heavily dependent on material and design and should be reevaluated after the preliminary design phase.

Terminals

Capital Costs

The capital cost of terminals can be broken down to the cost of a dock, and the waiting area.

The cost of erecting a floating dock was based on a bow loading arrangement as shown below. This arrangement minimizes the floating dock foot print. A smaller floating dock may also remove the need for additional struts and allow the ramp to act as a compression member.

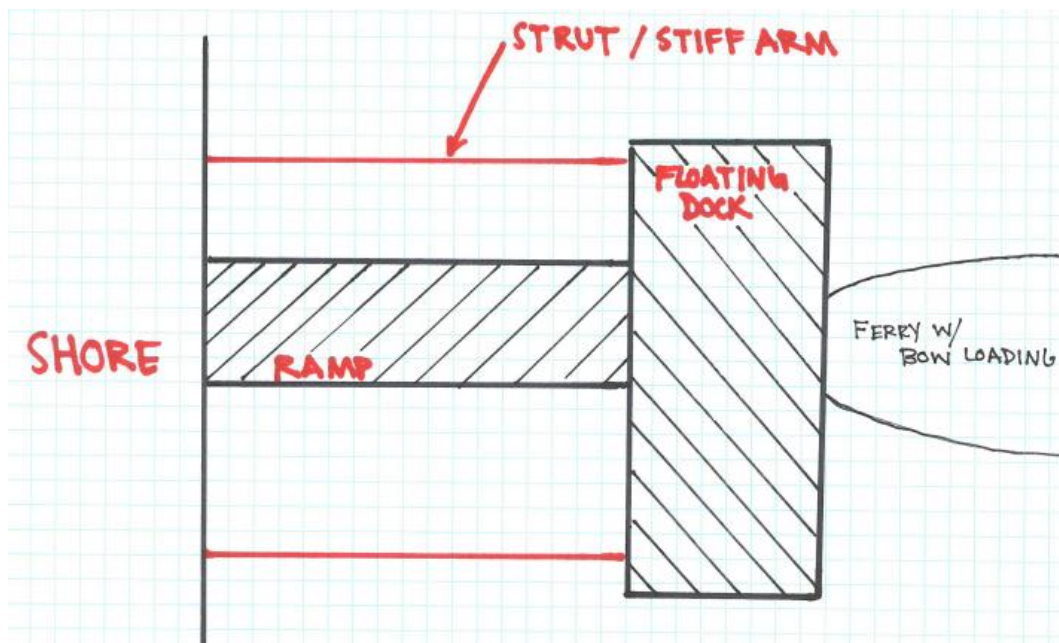


Figure 1: Bow Loading Ferry Landing

Capital cost guidelines for the floating dock was kindly provided by Andy Bennett at KPFF. The acquisition cost of the ramp and float can be estimated at \$200/square foot. However, the anchoring and abutment system costs may be higher, and is estimated at a conservative \$75,000. There will be an additional cost for the permitting process. Note that the Army Corps of Engineers has regulations against work in Lake Union during the summer months related to fish migration and in-water work with noise and bottom disturbance. The installation of a floating dock arrangement is possibly subject to this rule. All current codes must be followed, for example, at least 30% of the float must be grated with a 60% grating open area.

The permitting process on the Lake Union shoreline is regulated by the Seattle Shoreline Master Program (SMP). The permitting fee structure includes a base fee of \$210 and an hourly review fee of \$210. The number of review hours will vary by the complexity of the proposal. Because

the proposed dock arrangement is relatively simple, review hours were estimated at approximately 24 billable hours.

It is assumed that the waiting area will be minimalistic in nature; however, there will be a need for signage, perhaps a bench with shelter, and possibly a pay kiosk. The waiting area is assumed to cost approximately \$5,000.

Operational Costs

'Slip (dock) fees' or shoreline land usage rent will be a recurring charge, and is approximated at \$12 per foot per month. Based on the above approximation, and an assumption that the slip fee will apply to the width of the float (12 ft), the operational cost of each landing site is assumed to be approximately \$144 per month. In reality, the details of this fee will be negotiated separately for each landing site with the property owner.

* In the WUTC permit calculation the float was assumed to be 30 ft, to yield approximately \$4,500 annually per dock location.

Overhead Costs

In addition to the vessel and terminal costs there will be costs associated with running and promoting the business such as: insurance, taxes, accounting, website and mobile application creation, hosting and maintenance, marketing, and miscellaneous administration. As stated previously this model does not include interest, depreciation etc.

Rough order of magnitude costs were assigned for each of the above-mentioned overhead items as shown in Table 1 and Table 2 in the following section.

Vessel storage costs have been included as an overhead cost separately from terminal costs. The vessel storage facility is assumed to also be the electrical charging facility. Lease costs are estimated at \$10,000 per month.

Cost Summary

Based on the above stated assumptions, an initial three terminal locations, and an initial five vessels, the following capital and operational expenses were compiled as shown in Table 1 and Table 2. In rough order of magnitudes, the business capital expenses are expected to total 2.2 million dollars, and operational expenses are expected to reach 1.2 million dollars per year.

Table 1: Capital Expenses

VESSELS:		
Vessel	\$	300,000
Electric Propulsion	\$	50,000
Vessel Cost Per Unit	\$	350,000
TOTAL Fleet Cost	\$	1,750,000
TERMINALS:		
Ramp and Float Cost :	\$	200 per ft ²
Ramp:		
Length		36 ft
Width		3 ft
Area		108 ft ²
Float:		
Length		12 ft
Width		8 ft
Area		96 ft ²
Subtotal Ramp + Float:		
	Cost \$	40,800
Anchoring and Abutment System:		
	Cost \$	75,000
Seattle DIC Permitting:		
Base	\$	210
Review	\$	210 per hour
Review Hours		24
	Cost \$	5,250
ACE Permitting:		
	Cost \$	100
Waiting Area:		
	Cost \$	5,000
	Terminal Cost Per Unit \$	126,150
	TOTAL Terminal Cost \$	378,450
OVERHEAD:		
Website Design&Domain	\$	10,000
Mobile App	\$	10,000
Storage Facility Deposit	\$	10,000 assume one month rent
Business Licensing Fee	\$	19 for WA
WUTC Permit	\$	200
	TOTAL Overhead \$	30,219
TOTAL CAPEX:	\$	2,158,669

Table 2: Operational Expenses

VESSELS:		
Maintenance Cost		5% of CAPEX/year
Maintenance Cost Per Vessel	\$	17,500 per year
Insurance Cost		2.50% of CAPEX/year
Insurance Cost Per Vessel	\$	8,750
Cost of Power	\$	0.11 per kWh
Electrical Capacity of Vessel		86.4 kWh
SUMMER:		
Number of Charges Used		2 per day
Electrical Cost Per Vessel	\$	19 per day
Crew Cost	\$	70,000 per year
Crew Cost	\$	5,833 per month
Crew Number		1 per vessel
Crew Shifts		2 per day
Number of Crew		10
Total Crew Cost	\$	58,333 per month
WINTER:		
Number of Charges Used		1 per day
Electrical Cost Per Vessel	\$	9.50 per day
Crew Cost	\$	70,000 per year
Crew Cost	\$	5,833 per month
Crew Number		1 per vessel
Crew Shifts		1 per day
Number of Crew		5
Total Crew Cost	\$	29,167 per month
SIMPLIFYING ASSUMPTION:		
		31 days/month
Summer Months:		7 months
Summer Days:		217 days
Winter Months:		5 months
Winter Weekend Deduction:		5/7
Winter Days:		111 days
SUBTOTALS:		
TOTAL Summer Electrical Cost	\$	20,624
TOTAL Summer Crew Cost	\$	408,333
TOTAL Winter Electrical Cost	\$	5,261
TOTAL Winter Crew Cost	\$	145,833
TOTAL Insurance Cost	\$	43,750
TOTAL Maintenance Cost	\$	87,500
Total Vessel OPEX	\$	711,301 per year

Table 2 continued: Operational Expenses

TERMINALS:		
"Slip Fee" per Landing Site	\$ 144	per month
Lighting/Electricity	\$ 10	per month
Total Terminal OPEX	\$ 462	per year
OVERHEAD:		
Website Hosting	\$ 25	per month
Website and App Maintenance	\$ 2,500	per month
Storage Facility Rent	\$ 10,000	per month
Legal	\$ 10,000	per year
Insurance for Crew	\$ 60,000	per year
Marketing	\$ 5,000	per month
Accounting/Payroll	\$ 50,000	per year
Misc Administration	\$ 140,000	per year
Total Overhead OPEX	\$ 470,300	per year
TOTAL OPEX:	\$ 1,182,063	per year