

Lummi Island Ferry Advisory Committee (LIFAC)

August 2021 Meeting: 6pm, August 11 on Zoom platform

CALL TO ORDER

Rhayma Blake, Chair, called the meeting to order at 6:01pm

ROLL CALL

(Quorum) **Rhayma Blake; Charles Bailey, Jim Dickinson, Judy Olsen**. (Late Arrival: **Mike McKenzie** at 6:30. Absent: **Gregory Rice**.)

Whatcom County Public Works: Ferry Senior Captain Rich Hudson.

Others Attending:

Gallery—**Tom Philpot, Mary Ross (Zoom host), Mike Skehan, Mary Jane Van Hoesen, David Kershner**.

MOMENT OF SILENCE

OPEN SESSION

Mary Ross: “During a recent unscheduled ferry outage on Saturday, July 31 July, my husband Jim experienced an urgent need to get to the hospital emergency room. It was not enough to call the (airlift) helicopter but if it had lasted much longer, it would have. We called the EMS services, they responded, and we decided to try to go on the ferry. That couldn’t happen.

“Fortunately, (Island Chapel pastor) Chris Immer was providing rides and we were able to get down the riprap and onto Chris’s boat. (Note: Mary was referring to the shoreline where Chris docked.) We were met by an aide car, got Jim to the hospital, the problem was resolved, and he’s OK.

“That became a really strong, powerful moment for me, and I realized how much the Island needs a community dock where a regular, private boat can get people off the island at times of an emergency [ferry] outage. Also, we had 24 guests here for dinner that night, and some needed to get off the island. One woman wasn’t able to get down the riprap, and a friend got her to the other side.

“I spoke to County Executive (Satpal) Sidhu, to Councilman Todd Donovan, with Roland Middleton (Public Works project manager), to Jon Hutchings (Director of Public Works), and to LICA members. I want to state clearly on the record, Lummi Island needs a community dock for emergencies...a way to evacuate in non-life-threatening situations. Walking down the riprap is not acceptable or safe.

“(I propose) taking the issue to Bellingham and Whatcom County to advocate for a public dock that a recreational boat can tie up to. I’d love to see LIFAC support this community effort. We can’t wait five years for new docks to be designed and in place.”

RESPONSES:

Judy asked if Mary & Jim tripped the EMS system with a 911 call. Mary said they did. But airlift is not an option unless the situation is life-threatening. She said: I could have easily driven Jim to the ER because EMS would have put me in front of line. But we saw that the ferry was coming in sideways.”

Rich Hudson noted that Island EMS sometimes uses the Bellingham Fire Department fire boat and it picks up at the Scenic Estates dock. Mary said that option was not offered, or they would have taken that. (In relation to that, Jim stated that “EMS services can commandeer private dock facilities in an emergency...just like a Safe Harbor in a big storm when somebody has to land.”]

Charles asked what the County Executive said about it. Mary said he said “he was sorry and thought it was important.” She informed him that she’s an active community member who will organize presenting the issue to County Council and whoever else could get something moving.

Rhayma inquired about rules for using the Scenic Estates private dock. It is for residents and renters only, but Mary Jane said they are “flexible.”

Charles presented two ideas: One, in the short term put a floating dock at the county-owned beach park across the street from Beach Store Cafe where the ferry dock was located decades ago. That, he said, would avoid acquiring an expensive shoreline property and could be installed more quickly than the proposed new terminal (5 years out). In the longer term, when the new ferry is under construction, the new terminal could be constructed to include an access point to deal with the emergency situation.

Jim said the Island needs an emergency airfield. He detailed how groups associated with the American Pilots Association and the Experimental Aircraft Association do airlifts “absolutely free of charge...they could fly in a Cessna 182 or larger plane and take you to town. Not (an airstrip) for a Gulf Stream jet for people going to the Willows Inn...a purely local operation.”

Jim added, “The County has “quite a bit of stash of Public parks money and could make a field for walking dogs and other activities, but also have a runway of 2,000 feet. It would require a lot of tree removal and many neighbors don’t want to do that.”

He further pointed out, “We’re the only island in the San Juans group that doesn’t have an operating airfield.” (Mary Ross said that she learned from long-time LICA treasurer/archivist Paul Davis that we’re also “the only island in the San Juans with major population that doesn’t have a public dock.”)

Charles inquired about possible use of the private dock of the Village Point Marina. Jim said it requires having a float in place and that it’s not been in use the last five years or so.

Rhayma concluded the discussion by asking Mary Ross to let LIFAC know specifically ways it can help. “Parks and Recreation seems like a good place to start.” (Mary Jane said that Terry Terry is the island representative for Parks & Rec.)

APPROVAL OF MINUTES

Charles moved for acceptance of the minutes of July 14, submitted by Judy Olson— thanks, Judy!— in Mike’s excused absence; Judy seconded. Approved unanimously, 4-0.

LIFAC INTERNAL BUSINESS

Rhayma revisited the matter of staging monthly meetings only by Zoom or with a hybrid in-person option. She recommended tabling that until next month...”until we see what happens with Delta variant of Covid-19. Charles and Judy agreed. Jim and Mike are on record preferring an in-person option. The September meeting will be on Zoom only and the issue will be addressed once again.

OLD BUSINESS:

Rich Hudson reported on numerous items:

- Re: the portable toilet at Gooseberry Point: It appears not terribly abused and it’s going well. Judy said, having used it a couple of times, it’s in fine shape.
- Weather station: Mike McKenzie and Ferry Captain John Mulhern are pursuing funds. The project is ongoing.
- Re: a request for identification and schedule of Ferry employees: “I broached this with (Public Works Assistant Director) Liz Kosa and her response was a hard no. It’s a matter of privacy and safety that we don’t share information about the

comings and goings of our crew members.”

Rich addressed past suggestions of having name tags and publicly listing names of ferry workers (similar to the Fire/EMS Department). “Crew members are just not into it. I get it, it would feel really nice to have a roster, but they collectively don’t want to and we can’t make them. It’s OK to just introduce yourself. And, if you have a bad experience, phone and let me know when and I can determine who was working at that time and address it.”

Dry dock planning:

- Everything is on schedule. All details will be published in the next week—passenger boat schedule, parking maps, coming-in and out-of-service times, shuttle van schedules and maps (service starts Sept. 10, the day before dry dock).

“One thing noteworthy,” Rich said. “On Saturday, September 11 when you wake up there’ll be no ferry of any kind until the passenger vessel gets up and running in the afternoon. We’ll be sure to highlight that publicly.”

When the *Whatcom Chief* returns from Seattle, there will be a passenger boat here providing service throughout the morning hours. Change-over to regular vehicle service is scheduled to occur about 8pm on Oct. 2.

Mary Ross asked about status of the sink hole on West Shore Drive. Rich said he’s attending a preconstruction meeting next week and consensus going in is that County would like to have it repaired to prevent disruption of the van shuttle service routes. (NOTE: The repairs took place in August.)

- Capital work: Gooseberry Point dock sandblasting and painting are all on schedule. County doesn’t anticipate any disruption. “Just noisy and nasty and not pleasant like last year,” Rich said.
- Gary Poole assumes the position of on-site representative for the County at the shipyard during Dry Dock. “Having had back surgery recently prevents me from conducting my duties as required,” Rich said, “including lot of crawling around with the Coast Guard close behind me. Gary will be our eyes and ears on-site and I will provide support from the island...and I’m still responsible for signing off on paperwork and business transactions.

- Emergency Outage Planning on the Agenda: Rich presented a detailed account of events that occurred the day of the emergency suspension of ferry service for about 9 hours on Saturday, July 31. His account is **Attachment 1** to these minutes. “We had follow-up meetings about ways to assure that nothing like that happens again.”

On the topic of installation of floats at the ferry terminals, Rich said that conversation has gone on for quite a while about that, especially stepped-up by internal planning on the replacement vessel and terminals. “There’s a lot to be gained from it.”

However, he said, even if that were possible now, the float would not be available to personal vessels unless (a.) they were under contract with Public Works and (b.) they had a 100-ton or six-pack license and were fully insured to carry passengers. Liability is a major issue.

If floats were available, the County’s contracted passenger vessel could operate on emergency standby and rush to the island “really quick.”

Rich said that emergency outage situations get complicated if the *Whatcom Chief* is not able to move. “How would that look—OK, if the ferry is broken four hours, do we get a tugboat and pull it to Bellingham? Do we get the passenger vessel up here and start taking people back and forth? Perhaps. That all comes at a great cost. And if an unplanned outage takes longer than anticipated, when do we launch floats and call it quits? All that takes about 12 hours to get up and running and depends on tides.

- Rich estimated that around 90 percent of unplanned emergency outages has to do with “super pesky rudder feedback units.” (**See below.**)

“When we upgraded from an analog system to a digital system, those units were supposed to be of a more robust quality. But they were installed hastily; they look fine from outside, but when taken apart it became obvious a lot of things didn’t go well.”

- The goal, of course, is to prevent recurrences, and when unplanned outages occur to insure it doesn’t take as long to get back into service.

- a. To that end, Public Works created an emergency marine contract with an individual Rich described as “super-talented, who has a business in Bellingham and lives on the island...(he’s) retained as a consultant if we need him, or an emergency if need him. He’s also providing us a whole list of recommendations we can implement during dry dock.”

Public Works also bought two more rudder feedback units so they would always have those critical spare parts on hand, on the boat.

- b. Further, some more items have been added to the inspection sheet for Senior Engineer Gary Poole, who inspects the ferry every three weeks, changes oil and filters, etc.

Replacement Ferry Status:

On behalf of Roland Middleton, the project manager who is on vacation, Rich reported that the only thing he was instructed to report is that everything is on schedule for grant applications being submitted in September.

Mike McKenzie is working on a letter-writing campaign consisting of:

- One to U.S. Secretary of Transportation Pete Buttigieg specifically inviting him to visit Lummi Island and see our ferry needs and plans first-hand and what the requested \$20 million federal grant would provide.**[Attachment 2]**
- Template letters to all of our government representatives requesting support of the County’s grant requests. The letter templates would become available to the public in as many ways as possible (websites, emails, in-person, etc.) and constituents can personalize them, then print and mail or email them

Roland, when told of the intent to invite Sec. Buttigieg here, responded, “That’s great, you never know.” And he told of a time when Public Works invited the governor of the state to come visit. One day he dropped in out of the blue while on a business trip to Vancouver, B.C.

The letters will be presented to LIFAC at the September meeting. Roland told Mike it’s not urgent right this minute, but time is ripe to get the mail campaign rolling. Rep. Larson is on the Transportation Committee in Congress, and Roland said all of our reps are aware of the need for grants, so “keep nudging them—the more letters they receive, the better.” The other representatives to contact are Del Bene, Murray, and Cantwell.

NEW BUSINESS:

Replacement ferry fuel consumption report:

Charles asked for the report from Elliott Bay consultants and the back-and-forth emails exchange he had with Roland Middleton to be attached to the minutes.

The documentation of both comprise **Attachments 3-5**.

Charles summarized the highlights of the report:

1. The Whatcom Chief consumes 180 gallons of fuel a day during summer, less during winter
2. The new diesel/battery hybrid ferry consumers 186 gallons a day even though it is more than twice size of Chief. "That's welcome news," Charles said. "Progress toward our goal of carbon neutrality."

When LIFAC takes up issue of ferry scheduling, as requested by Public Works, this report has graphs and tables that compare consumption patterns with frequency of traffic. "The good news is that consumption is less than we thought," Charles said.

Rhayma wondered why there's a sense of urgency about LIFAC working on the new ferry schedule of runs. Charles said that Roland is "a go-ahead guy" and just wants us to starting thinking about it.

Rich take on scheduling runs: "I'm thrilled to see the new fuel consumption numbers—great news across the board, awesome. Regarding fuel vs. ridership, I hammered out a schedule I thought was pretty decent...conscientious about fuel but also the level of service we intend to provide. When the time comes we can craft an interim schedule, then when the boat shows up we'll have a good idea of what we want it to do.

"Once we get in service, we'll see what information it provides. When we do that over time, we'll have hard, conclusive fuel consumption data. We can start drilling down after maybe a year, on seasonal schedules, check ridership, all that. But this is really good news compared to what's going on right now."

Rhayma: "Scheduling shouldn't be on our agenda any time soon."

Charles: "I made a note to put on the agenda in 2026." ☒

Jim, when asked by Rhayma what he thought about the report, replied:

"I'm not comfortable with the numbers on fuel consumption. Numbers that I worked out, not with the hybrid but with a straight one with that particular hull, based upon our

horsepower requirements, would burn a minimum of 210 gallons a day. The daily average of the Chief, year-long, is about 145 a day. The new boat (as designed) would be about 186.

He stated that a summer schedule wouldn't make much difference and he devised a schedule of 27 runs a day instead of 39 because the boat is bigger, which "tries to keep frequency where it is now, which is what people seem to want."

Jim said he, Bill Fox, and several others have jointly reached out to port engineers in Texas to obtain numbers and received numbers "higher than we thought on the amount of fuel...on a 28-car ferry not a 34. Jury's out on this."

Jim opined, "This hull is dragging and it's the reason I don't like it. With a proper hull, fuel would run about 140 gallons a day average on 27 trips. Reason I don't like it." He cited statistics of the new ferry requiring 750 horsepower to get to 10 knots compared with 210 HP on the Whatcom Chief. "Also, they're making a shallow boat, which we don't need...that's where we come a cropper.

On-shore power assessment

Charles presented a draft LIFAC recommendation for a County Council resolution that would keep the county moving forward on its carbon neutral goal stated several years ago. LIFAC recommends that County Council pass this resolution to ask the County Executive to ask Public Works to commission a detailed technical and cost assessment of options to increase the supply of electric power at both terminals sufficient for future full-time operations of the new ferry.

Charles reported that we learned from Elliott Bay consultants that the new boat consumes about 1 megawatt of power per day. There is currently not enough power available at either terminal to meet this need and fully charge the boat's batteries. "We want to consider options of a micro-grid and battery storage, etc., and for the County to start thinking about this necessary next step. We recommend that the report of this assessment be completed by 1 Dec 2023, giving them over 2 years to complete it. That's so we don't press now while they're going full-bore toward getting the ferry funded. This would be the next order of business once the boat is funded and under construction, and we want to keep this suggestion from slipping off the radar. Roland Middleton and Todd Donovan are supportive."

Rich Hudson raised the question of funding this study, concerned how County Council would allocate the costs? "Every nickel and dime we spend out of the ferry fund," he

said, "I gain more anxiety about them asking us to revisit fares. I'm all for this proposal, but if viewed as coming out of the ferry budget, it's poor timing."

Charles responded that he learned that County Council allocates budgets and money all the time, as a part of their routine operations. They would put out proposals for bids, as they do all contracts.

Rhayma concluded that the issue isn't pressing today, yet it's good to get experts to chime in sooner than later.

Judy raised a question about including both terminals in the assessment, recalling that we concluded previously that charging the vessel on Gooseberry was not in the best interest of the Island EMS system. "Is it worth spending money to evaluate Gooseberry Point?" she asked.

Charles: "Right. Given all the complexities and that the vessel spends the night here, it's best to charge on this side. Not to pre-judge, but Public Works might decide to divide the work into two parts, comparing each side, and drill down on that."

Discussion led to concentrate the resolution on beefing up shore power on Lummi Island. Factors: Diesel capability as backup, it must be on the island side, and it must be able to leave quickly. At Gooseberry, it's getting too complex.

Jim raised a concern of having to keep crew on board, which would get more expensive. Also, he's of the belief we won't get the electrical supply, citing national moves toward shutdowns. "Current (U.S.) administration doesn't want gas plants." Jim characterized the resolution request as "a dead duck." And said he wouldn't vote for it unless the report is free because "we don't need more out of ferry budget."

Charles moved to change the wording to reflect that the resolution would cover increasing the Lummi Island electrical supply to a level sufficient to support the carbon neutral resolution in 2017 by County Council to become carbon neutral.

From the gallery, Mike Skehan, who has spearheaded efforts to create a micro-grid on the island, said he thought the idea of researching it on the island (instead of both terminals) was appropriate, and Mike McKenzie said, "It's all consciousness-raising, so let's go with it."

Rhayma moved to adopt the resolution with the two minor changes. Charles seconded. Motion passed 4-1 (Blake, Bailey, Olsen, McKenzie for; Dickinson against.)

PUBLIC AWARENESS

Mike McKenzie will prepare a draft of an article for Sept. 10 Tome deadline with details of the letter-writing campaign to government representatives seeking support of the County grant applications for ferry funding.

Charles requested that the article include how to sign up for LIFAC between-meetings announcements by getting on our email list.

ADJOURNMENT

Moved and passed 6-0.

Meeting adjourned 7:26pm

ATTACHMENTS

Rich Hudson Outage Narrative:

"I got phone call (not exactly time) 2-2:10pm) from Capt. Kent Dixon that upon approach he'd lost (No. 1 end) rudder. Chose No. 1 and No. 2 end to refer. End that faces LI. Non-responsive, goes hard over and can't move it. Sails usually to the starboard.

Called engineer, Gary Poole came down. Looked at everything, ran diagnostics, started working. Loaded started to transport to GP side. At which time, No. 1 end rudder again, no steerage, makes it tricky to handle. Capt. Kent made safe landing. Unloaded traffic. Called me. Hoping for best. That's when went out of service first time.

We called regular channels—Marie, info officer get messaging out...mechanics to get help on the way (PW), also Poole and ass't engineer Dixon contacted our Hamilton Jet rep, our technician who handles our steering system—actually on a camping trip with his family. Gave Kent and Gary exactly step by step what to do to diagnose.

When PW mechanic showed up, ran diagnostics. Steering started working again. We're good to go (thumb up). Then, on approach to LI side thinking fixed, loaded, left for LI, both rudders failed over hard. Got into dock. Dixon going into engine room and manually forcing the hydraulics to handle way we needed to to get in. Game over.

Called Marie again. Word out. Got a hold of HJ sales person on vacation in Hawaii. Sounded alarm, get HJ tech on site with spare parts and his gear. Marine mechanical

technician and electrical tech resident on island and has own business (in Bellingham) on emergency contract, he agreed, went down to ferry.

GP assisted him in changing a rudder feedback unit (on No. 1 end), elec device that commands and relays info from steering wheel. Got back to GP to meet HJ tech.

Changed out other rudder feedback unit (had gone bad). Back up and running about 11:15pm

Typically, always carry one rudder feedback unit in reserve. With old system, those two ends don't talk to each other. In new digital system, the rudders do talk to each other. No. 1 installed not well, had failed, polluted the other one on No. 2.

In response, added gentleman—who wishes to remain anonymous for now, own biz, lives on island—agreed to work for us under contract whenever needed, primarily emergencies. Purchased two rudder feedback units, so have two on hand.

When tech local provides us invoice for work that night, also provide list of recommendations that we can implement in dry dock to insure doesn't happen again.

INSTALLING FLOATS AT TERMINALS—A conversation been going on for a while. Lot to be gained from it. Planning all internal conversations last few months in prep for bringing on new vessel and terminals. Even if had way to launch and put floats in water would not be available to personal vessels, unless under contract with PW. Unless 100-ton or six-pack license, insured, to carry passengers.

What would be handy, if had floats and find way to make it work, our passenger vessel that we contract, we have him on an emergency standby. Could simply rush to island. Whatcom Chief sitting? And how that would look—ok, ferry broken 4 hours, get tugboat to b'ham, get passenger vessel up here and start taking people back and forth. Perhaps. All comes at a great cost. Get here really quick and provide service. Unplanned outage, longer than anticipated, when do we launch floats, call it quits, all takes about 12 hours to get up and running and depending on tides.

Liability in question.

MJ: Coordination w/ PW? Parts? Whole thing I see it too. 90 percent has unplanned emergency outage has to do with super pesky rudder feedback units. When upgraded from analog system to digital system, those units supposed to be more robust quality. Installed hastily, look fine from outside, when take apart lot of things didn't go well.

MJ: Assembly. But also? Rich: Insure, if recurs, goal never, doesn't take as long: added emergency marine contract, super-talented, lives on island. Retained as consultant if we need him, emergency if need him. Also bought two more rudder feedback units, always have those critical spare parts on hand on the boat.

Incorporated into Gary's every three weeks inspects everything, changes oil, filters, added a few things to his inspection sheets. Also, tech we hired from island provide whole list of recommendations we can implement during dry dock.

MJ: (old maintenance person) Preventive maintenance? Mary Jane Van Hoesen.

Attachment 2:

Hon. Pete Buttigieg, Secretary of Transportation
1200 New Jersey Ave SE
Washington, DC 20590

Date

Dear Secretary Buttigieg,

Please visit us on Lummi Island, Washington. We'd love to show you our paradisiacal corner of the U.S. and why it's essential that we obtain a RAISE grant to build a new ferry. Ours is almost 60 years old and really outdated!

Whatcom County needs funding for the only available means of public transportation to and from mainland.

The new ferry Whatcom County would build with a RAISE grant will have diesel battery hybrid propulsion explicitly designed to convert to a fully carbon-neutral vessel.

The ferry—an equivalent to a road or bridge—has functioned over 100 years as a crucial lifeline for emergency services. The *Whatcom Chief*, our current ferry, has exceeded its useful life.

It delivers passengers, vehicles, and goods and services for nearly 1,000 full-time residents, including several multi-generational family households.

The populace comprises a daily commuting workforce that has broad impact on the regional economy. Many others have retired here, many have a second home here, and thousands of visitors journey to Lummi Island every year.

You'll love this community that bustles with several small, enterprising businesses (eateries, farms, construction, furniture-makers, artists, a grocery, online entrepreneurs, *et al*), nature walks and hiking & biking appeal. And Lummi Island boasts uniqueness:

- Reef-net salmon fishing, a centuries-old practice;
- A 100-year-old elementary school which follows the International Baccalaureate (IB) curriculum;
- A world-class destination restaurant—The Willows Inn on Lummi Island.

Please join us, Secretary Buttigieg, and experience the essence of life on Lummi Island. You will readily see the urgency of updating the ferry system that begs your signature, providing reliable, affordable transportation that's been required by ordinance since 1924.

We're excited about your consideration of a visit to us.

Gratefully,
Whatcom County-appointed Lummi Island Ferry Advisory Committee (LIFAC)
[signatures]

Attachment 3:

>> -----Original Message----- (Roland's replies are **in red**.)
>> From: Charles <baileychasr@gmail.com>
>> Sent: Friday, July 23, 2021 7:03 AM
>> To: Roland Middleton <RMiddlet@co.whatcom.wa.us>
>> Cc: Rich Hudson <RHudson@co.whatcom.wa.us>; Elizabeth Kosa <EKosa@co.whatcom.wa.us>; Rhayma Blake <rhayma@me.com>; Mike McKenzie <mcwriterm@gmail.com>
>> Subject: Re: Comparative fuel consumption-Chief v. new ferry
>>
>> Dear Roland,
>>
>> Thank you for your swift reply with your analysis and the EBDG report. I have several clarifying questions:

>>

>> 1. In last week's LIFAC meeting and in your note you indicate that the fuel comparison is between the Whatcom Chief and the new diesel battery hybrid (DBH) boat. However the EBDG report doesn't explicitly say this; its comparison is between the DBH boat and "a conventional diesel propulsion system" (paragraph 2, etc.). The report cites the earlier EBDG analyses—"Propulsion Selection Study" and "Speed and Powering Analysis"—as its sources. However I searched both of these documents and could find no fuel consumption data for the Chief. So is EBDG's comparison really between a new boat with DBH propulsion and a new boat with conventional diesel?

The tables in the memorandum are the 34 car hybrid vessel and a conventional diesel of the exact same size and hull configuration as the 34 car hybrid vessel. The Whatcom chief burns an average of 180 gal/day in the peak summer and 160 gal/day in the slow season winter. The average fuel consumption numbers for the Chief are not found in any EBDG study, these are the actual amounts that we purchase. This is solid data from our fuel supplier invoices.

>> 2. If the the comparison is to a new boat powered solely by a diesel engine, Figure 3 and Figure 4 challenge the conventional wisdom that a DBH vessel will burn more fuel than a diesel vessel owing to the energy supposedly lost in generating the electricity on board with the diesel engine. Can you just confirm that the DBH vessel outperforms the conventional diesel on fuel consumption please?

Yes, the hybrid outperforms a conventional diesel of the same size and hull configuration

>> 3. Your note also says "Comparing the new boat to the current number of vehicles moved by the Chief..." but the report doesn't contain any data on numbers of vehicles moved. One can perhaps infer vehicle numbers from the data. For example in the two graphs the point of optimum fuel consumption is the intersection point of the two curves at about 42 minutes per round trip. The tables make this 40 minutes per round trip. At this level the boat would do 24 round trips per 16 hour day. With the deck filled each trip, the new ferry would make 48 single trips x 34 vehicles /trip = 1,632 vehicles moved both ways over the 16 hour day. This number is the same for both boats analyzed in the EBDG report, which also suggests it is not the Chief that is being compared.

Not quite understating your question. However, if you are looking at fig. 1 and fig. 2 the intersection of the lines are not indicating the optimal fuel consumption they are merely 2 different graphs overlaid onto each other as indicated by the 2 different y-axis values.

>> 4. You were right to advise LIFAC we need to start thinking about a schedule for the new DBH ferry and the EBDG report alludes to this. In doing so it would be helpful to have an additional column in these tables that shows number of trips per hour for each option. For example, at the 40 minutes per round trip level, optimal for fuel consumption, translates into $24/16 = 1.5$ round trips per hour. Of course we need whole numbers here but adding this column to the table would make the trade off between scheduled trips and optimal fuel use much clearer. Put another way, at 40 minutes per round trip and 8 knots (average?) speed, the new boat would

take 6 minutes 45 seconds to cross one way or $2 \times 6 \text{ mins } 45 \text{ secs} = 13 \text{ minutes } 30 \text{ seconds}$ for one round trip, leaving the balance of time for loading/ unloading and idling in the dock at 26 mins. 30 sec. This is the scenario for optimal fuel consumption level of 40 minutes round trip time, ie one round trip per hour. The boat is capable of up to two round trips per hour so adding this arithmetic to the table would be both straightforward and helpful.

This example is the perfect starting point in discussing the schedule. In the coming months Whatcom County Public Works is asking LIFAC to provide input into the trip schedule for the new vessel. An open and thoughtful discussion is necessary to balance the needs of abundant crossings and the critical nature of reduced carbon emissions.

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Attachment 4:

MEMORANDUM

From: Kurt Jankowski, PE
Reference: 17098.01-04M Rev -
Date: 6/23/2021
Subject: New Lummi Island Ferry Fuel Consumption Estimates



PURPOSE

This memorandum summarizes fuel consumption estimates for the New Lummi Island Ferry, a 184 ft x 54 ft x 13.25 ft, 34 car, 150 passenger, double-ended ferry with a maximum loaded draft of 7.5 ft. The new ferry is intended to replace Whatcom County's current ferry (M/V WHATCOM CHIEF) on the same route between the ferry terminals on Lummi Island and the mainland at Gooseberry Point. The vessel will be owned and operated by Whatcom County Public Works (WCPW).

The estimates in this memorandum compare the fuel consumption of the diesel battery hybrid and a conventional diesel propulsion system across a range of round-trip durations to help inform schedule development.

WORK PERFORMED

The consumption estimates were developed in Microsoft Excel using the same underlying route characteristics as those in Reference [1]. The propulsion power was estimated from Reference [2]. The calculations were completed for a range of round-trip times from 26 to 120 minutes. A minimum vessel speed of 8 knots was assumed when calculating the transit time. The total round trips per day assumed a continuous 16-hour operating day.

During slack time at the dock (when not loading or unloading), the energy for pushing against the terminal facilities was drawn from the batteries until their maximum discharge was reached. Any additional slack time assumed the aft engine was operating at 5% load.

RESULTS

Table 1 shows the consumption estimates for the diesel battery hybrid propulsion system. The most efficient single-trip fuel consumption occurs at a round-trip time of 28 minutes. However, the lowest overall daily fuel consumption occurs at a round-trip time of 110 minutes. Figure 1 shows a plot of the consumption data.

Table 1: Fuel consumption estimates for the diesel battery hybrid propulsion system

ROUND TRIP TIME [MIN]	FUEL CONSUMPTION PER ROUND TRIP [GAL]	SPEED [KTS]	TOTAL ROUND TRIPS PER 16HR DAY	TOTAL FUEL PER DAY [GAL]
120	13.40	8.0	8	107
110	12.50	8.0	8	100
100	11.62	8.0	9	105
90	10.72	8.0	10	107
80	9.84	8.0	12	118
70	8.94	8.0	13	116
60	8.32	8.0	16	133
50	8.02	8.0	19	152
40	7.76	8.0	24	186
30	7.48	8.0	32	239
28	7.44	8.5	34	253
26	8.74	11.8	37	323

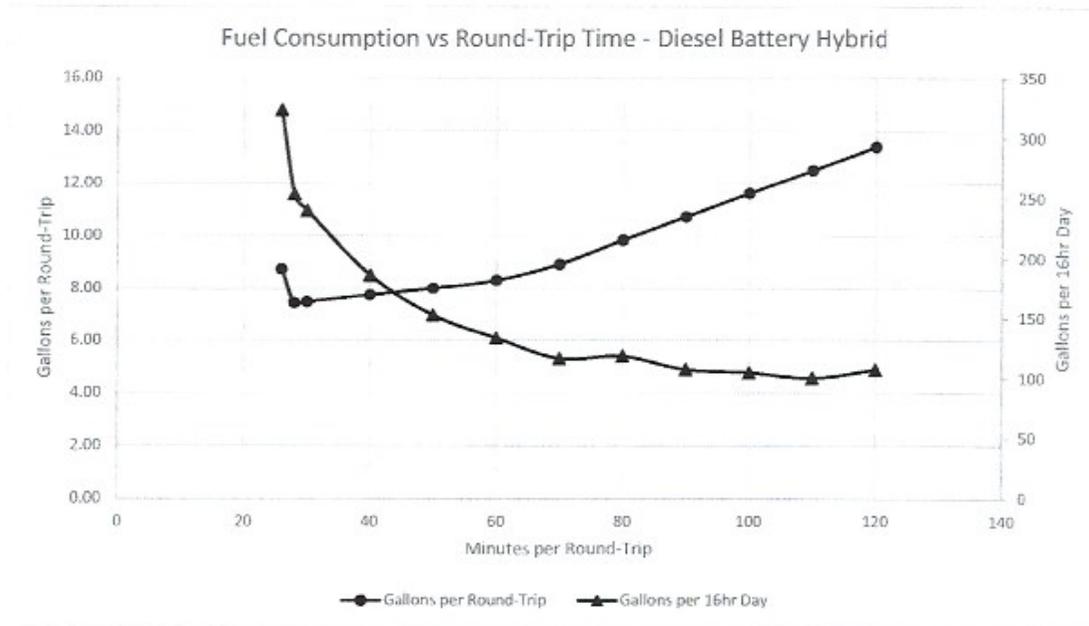


Figure 1: Fuel consumption estimates for the diesel battery hybrid propulsion system

Table 2 shows the consumption estimates for the conventional diesel propulsion system. While the conventional diesel system's lowest single-trip and daily fuel consumption occur at the same round-trip times as the diesel battery hybrid system, the conventional system consumes an average of 25% more fuel than the hybrid system.

Table 2: Fuel consumption estimates for the conventional diesel propulsion system

ROUND TRIP TIME [MIN]	FUEL CONSUMPTION PER ROUND TRIP [GAL]	SPEED [KTS]	TOTAL ROUND TRIPS PER 16HR DAY	TOTAL FUEL PER DAY [GAL]
120	16.56	8.0	8	132
110	15.68	8.0	8	125
100	14.78	8.0	9	133
90	13.90	8.0	10	139
80	13.00	8.0	12	156
70	12.12	8.0	13	158
60	11.22	8.0	16	180
50	10.34	8.0	19	196
40	9.44	8.0	24	227
30	8.56	8.0	32	274
28	8.46	8.5	34	288
26	9.88	11.8	37	366

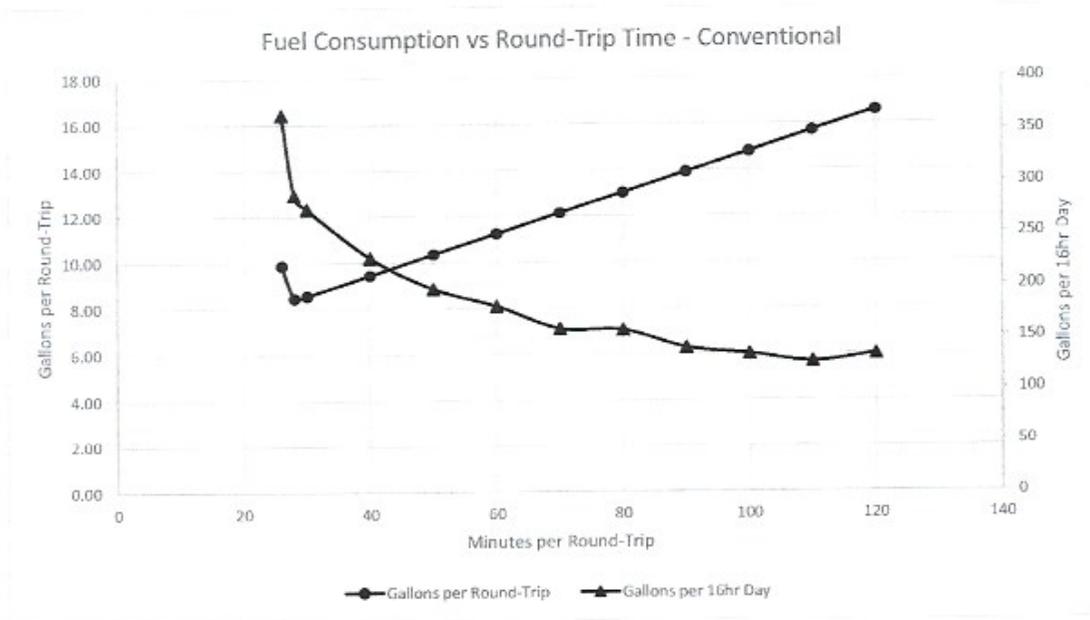


Figure 2: Fuel consumption estimates for the conventional diesel propulsion system

Figure 3 and Figure 4 compare the fuel consumption of the diesel battery hybrid to the conventional diesel propulsion system.

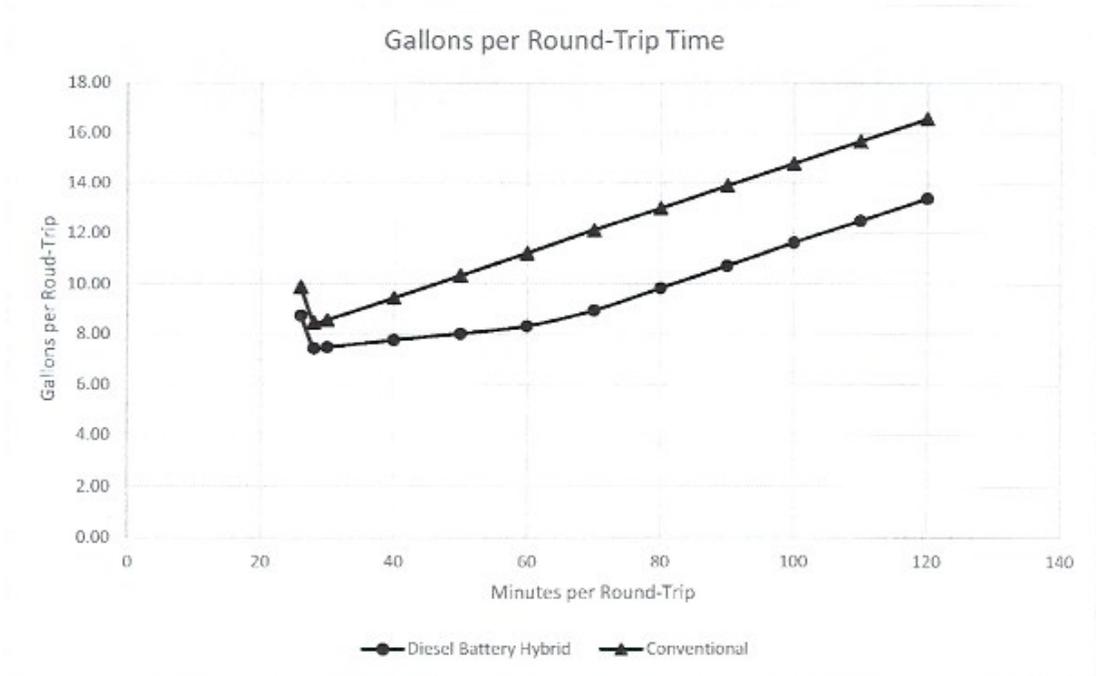


Figure 3: Comparison of gallons per round-trip for each propulsion system

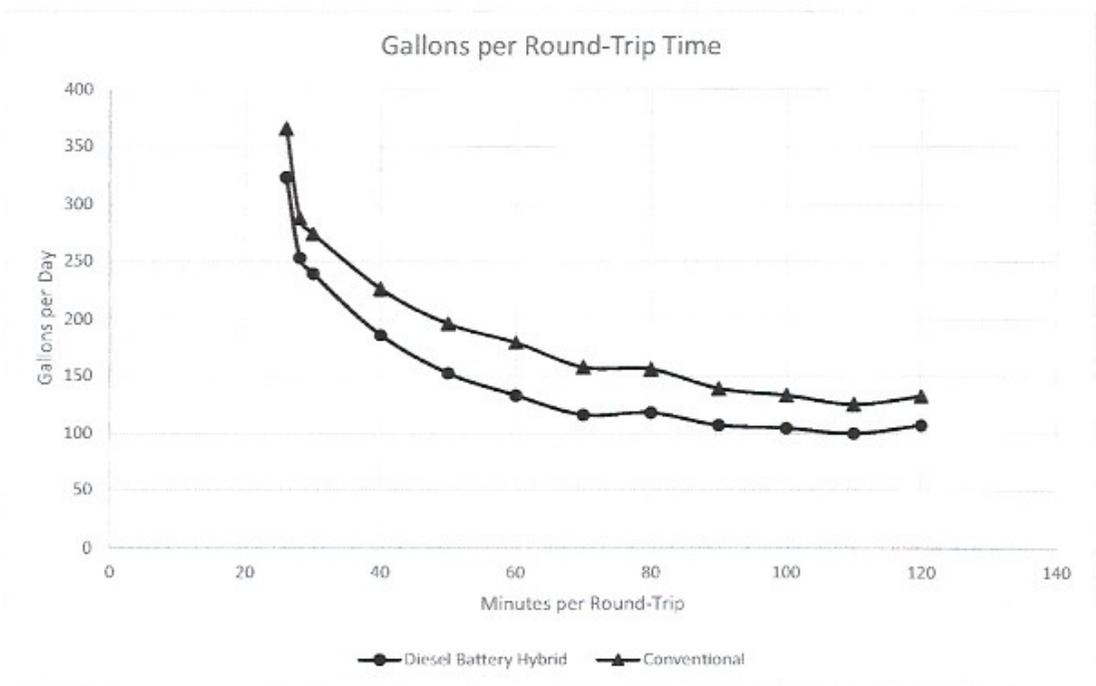


Figure 4: Comparison of total gallons per day for each propulsion system

REFERENCES

- [1] Elliott Bay Design Group, "Propulsion Selection Study," 17098-01-001-062-1 Rev -, Seattle, WA, April 2, 2020.
- [2] Elliott Bay Design Group, "Speed and Powering Analysis," 17098.01-002-050-1 Rev A, Seattle, WA, December 11, 2020.

PROPOSED BY:
INTRODUCED:
RESOLUTION NO.

**ASSESSING SUFFICIENT ON-SHORE ELECTRIC POWER
FOR THE LUMMI ISLAND FERRY SYSTEM**

WHEREAS, the Lummi Island Ferry Advisory Committee was established to review and provide recommendations on proposed changes to ferry operations and fares; and,

WHEREAS, the Lummi Island Ferry Advisory Committee was established to assist the county in collecting information from ferry riders on actual and desired ferry services, concerns, and ideas for improved service; and,

WHEREAS, the Lummi Island Ferry Advisory Committee was established to analyze and develop recommendations to continue and improve the cost-effective operation of ferry service to Lummi Island; and,

WHEREAS, the Lummi Island Ferry Advisory Committee was established to research, review, and make recommendations regarding ferry replacement, long-term planning, parking, transportation to and from ferry docks, alternative docking locations, alternative funding sources, and other major capital and operational issues regarding ferry service to Lummi Island; and,

WHEREAS, the alternatives analysis identified in Policy 6C-9 of the Whatcom County Comprehensive Plan is complete; and,

WHEREAS, the Whatcom County Council approved the Level of Service Action Plan for the Lummi Island Ferry Service proposed by the Lummi Island Ferry Advisory Committee as Exhibit A in Council Resolution 2018-026; and,

Whereas the Level of Service Action Plan sets the goal of a carbon neutral vessel to be approached through a hybrid diesel-electric propulsion system designed flexibly for future full-electric conversion; and,

Whereas the capacity to charge the ferry vessel at either or both terminals will be required to achieve the goal of a carbon neutral ferry; and,

Whereas currently available electric power at the two terminals is not sufficient to allow future all-electric conversion; and,

Whereas the Lummi Island Ferry Committee recommends that the Whatcom County Council pass a resolution asking the County Executive to direct the Department of Public Works to commission a detailed technical and cost assessment of options to increase the supply of electric power at the Lummi Island ferry terminal to a level sufficient for future full-electric operations of the new ferry. The study should include, but not be limited to, increasing the voltage on the

Approved by the Lummi Island Ferry Advisory Committee- August 11, 2021

existing undersea cable and a Microgrid on Lummi Island. The study should be completed on or before December 31, 2023.

NOW, THEREFORE, BE IT RESOLVED that the Whatcom County Council asks the County Executive to direct the Department of Public Works to commission a detailed technical and cost assessment of options to increase the supply of electric power at the Lummi Island ferry terminal to a level sufficient for future full-electric operations of the new ferry. The study should include, but not be limited to, increasing the voltage on the existing undersea cable and a Microgrid on Lummi Island. The study should be completed on or before December 31, 2023.

APPROVED this day of , 20__.

WHATCOM COUNTY COUNCIL