

Modes of public transportation in San Francisco came to a screeching halt in 2020 as ridership plummeted due to the COVID-19 Pandemic. The invaluable ferries of San Francisco were stuck in idle as the commuting workforce the vessels depended on moved online.

The San Francisco Bay Ferries were the Bay's fastest growing mode of transportation, but the cornerstone of the Bay area nearly capsized without ride fare to keep it afloat. Now, however, the city of San Francisco and its ferries are proving to be as resilient as the gold miners who laid the groundwork for it over a century ago, building back stronger and *cleaner*.

Seamus Murphy, the Executive Director of the Water Emergency Transportation Agency (WETA) says the ferries are not only back to near 100 percent capacity prior to the pandemic, but they are expanding with alternative options of power.

Following the wake of electric cars, Bay area ferries are next in line to move to net-zero emissions.

Funding for the overhaul is received through grants from both the state and federal government, Murphy said. The funding stems from a \$250 million grant program in the infrastructure bill, which rewards programs with grant money for low or zero emission projects.

Combined between the state and federal level, WETA has received around \$100 million for five vessels.

Redwood City and Vallejo services are projected to launch new terminals in the next five years, and the most effective way is to move toward a more rewarding future.

WETA operates the cleanest ferry fleet in the nation and has recently completed its four-vessel Gemini Class Clean Air Conversion Project, which significantly decreases pollution emissions.

While the public agency is exploring all viable solutions for zero emissions, Murphy said electric is most feasible, adding that a pair of fully electric vessels are in the works for the next two years as part of the zero-emission plan within the next decade.

“We need enough of the project completed to power the first two boats when they arrive in two years,” he said. “My biggest fear is that we're going to get electric boats delivered and not have enough power to operate in the way that we want to. So, we're making sure that that we have the infrastructure in place to operate so that we can show that this is a successful way to go.”

The biggest obstacle WETA faces, though, is the infrastructure to be able to accommodate the electric output and accessibility needed. A cumulative 50 megawatts are expected to be required to operate the vessels across the fleet's seven terminal locations. For reference, one megawatt can power 750 homes simultaneously.

San Francisco fleets have seven terminal locations across the bay, with each one needing an overhaul to be able to operate vessels.

“We have to work with the utilities because every location is different,” Murphy said.

“Some of them have more access to the grid than others. Some of them don't have any.

And so, we're connecting our terminals to the same grid that powers this office. And

adding a strong enough connection so that we can get enough power to that location. And that is complicated because then you're dealing with underground utilities in an area that's pretty old and you don't know what you're going to find.”

Once completed, the vessels would plug in and charge just as an electric car would. The infrastructure isn't the only dilemma WETA is facing, however. The immense size of the batteries needed to charge the ships would drastically decrease its speed. To combat this, smaller, lighter batteries would be built into the vessels that would have enough charge for them to complete their route before rapid charging at each terminal.

Outside of electricity, WETA is examining one other possible source of energy.

“I took a class at California Maritime Academy called marine engineering, and we had to write a paper — this was almost 25 years ago almost – but the topic I chose was the future of hydrogen powered ferry boats on the San Francisco Bay,” Ryan Boatright recalled. “From my marine engineering class, I learned it was possible, it could be done. The only byproduct is water.”

Boatright, who graduated from California Maritime Academy and has worked for the Blue and Gold fleet since 2003, said he is involved in the testing Sea Change, the world's first hydrogen fuel-cell powered commercial vessel.

“It's kind of a big experiment,” Boatright said. “I think that's a big part of why WETA took it on to see how it goes and study the feasibility of this. Whether it's something they wish to pursue in the long run or if it's just going to be a giant headache.”

Sea Change has proven to be a giant headache as WETA is still awaiting approval from the US Coast Guard before any test runs with passengers get underway. The 70-foot, 75-passenger ferry was funded through private capital SWITCH and developed through funding by the California Air Resources Board as a pathway for fuel cell marine technologies.

The other downside with the still new hydrogen powered fuel cell is its low power output, as it only travels up to 15 knots, not ideal for commuting. The Gemini Class have capabilities of traveling up to an efficient 35 knots.

The pandemic played a role in not only delaying research and testing of the new power sources, but how Murphy and WETA sat in the market. WETA created a new market for their consumers by significantly reducing fares to set an equal market between the bus, BART and Muni.

Blue and Gold Captain Dushan Crawford said he sees growth despite the hiccup of the pandemic and its lingering effects of hybrid work schedules.

“I definitely still see growth,” he said. “There are cities that are further away that are just itching and chomping at the bit to get, you know, a ferry service.”

In order for San Francisco to continue to grow and fuel the regional economy, ferries are going to be a critical part of that equation.

