

# Slowing Down the Washington State Ferries

## Save Fuel Dollars and the Environment

Slowing down the Mark IIs from 18.5 knots to 16 knots would save 6 million + dollars per year.  
(originally written and submitted to WSF in 2008...)

Using available data, I originally wrote this rough fuel analysis last September, 2008 to illustrate the possibilities that are out there to amend WSF schedules to address the USCG mandate for "Crew Endurance Management" which is the current catch phrase for the crew fatigue standards instituted after the Exxon Valdez incident. What I found was that by slowing the ships down a little, we could save millions of fuel dollars per ship per year and reduce the Greenhouse Emissions by thousands of Metric Tons per ship per year. Here are the numbers to back up this assertion.

The following estimates are derived from the "Jumbo Mark II Underway Basic Fuel and Emission Information" report that was put together to support running the ships on two engines vs. three. The raw data for this analysis is included below. This data is available in great detail from the WSF Port Engineer's office. WSF has saved considerable fuel dollars by shutting down one engine while running across the sound but this original study seems to be focused on maintaining our 18.5 knot cruising speed. We can do much better...

If you slow a Jumbo Mark II class ferry down from 18.5kts to 16kts while running on two engines, the fuel savings can be in excess of two million dollars per year (per ship...). Slowing the boats down to 16kts adds about 3-4 minutes to a 30 minute crossing.

**The bottom line is that those last two "top-end" knots of speed are very expensive. They also pump considerable pollution into our atmosphere.**

As state employees we are all stewards of the taxpayer's dollars. I am a taxpayer too. We may be able to do a better job serving the public interest by slowing the ships down a little thus saving a substantial amount of money and pumping considerably less pollution into the atmosphere. Scheduling the Seattle/Bainbridge boats to leave the dock on the hour (during non-peak times would be less confusing for our customers, make better use of the available vehicle capacity and the additional few minutes in port would not only allow us to conduct more meaningful crew training, but also allow the cabin crews to keep the boats a little cleaner which is the ferry system's biggest source of complaints... a win/win for everybody. Changing the schedules for the Bainbridge Island run is just one example of how this slow down concept would work. It is possible that a modified version of this concept can be used on other runs too.

Our job at WSF is to move people and commerce across the sound in a safe, efficient and reliable manner. I have worked in the maritime industry my entire adult life. In my maritime career I have sailed all over the world and been part of many complicated marine operations. Washington State Ferries is without a doubt the most complex (non-military) operation I have ever had the honor to be associated with. WSF does a great job. However, we can do better. Dan Twohig

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Jumbo Mk II burns 389 gallons/hour at 18.5kts on two engines (165 shaft RPM).  
This same ship burns 266 gallons/hour at 16kts on two engines (140 shaft RPM).  
This is a fuel savings of 123 gallons per hour.

Ships on the Bainbridge run operate an average of 19 hours per day, about 340 days per year. In order to be conservative with these estimated numbers, I used 16 hours per day running time to compensate for in-port time "pushing the dock" for loading, speeding up and slowing down. I realize that the data is available to be more accurate but I am using these estimates for demonstration purposes only. This is a rough analysis. A more comprehensive report can be requested from the WSF Port Engineer's Office.

123 gallons saved per hour X 16 hours/day X 340 days/year = 669,120 gallons/year.

At \$3.00 per gallon, fuel savings = \$2,007,360 per ship, per year.

At \$3.25 per gallon, fuel savings = \$2,174,640 per ship, per year.

At \$3.50 per gallon, fuel savings = \$2,341,920 per ship, per year.

Although we have no way to predict exactly where fuel prices will go this formula demonstrates that for every \$0.25 bump in price, slowing these vessels down to 16kts creates an additional \$167, 280 in fuel savings.

A Jumbo Mk II produces 8,786lbs of greenhouse gasses and particulates per hour at 18.5kts. The same ship produces only 6000lbs at 16kts. Using the same formula and assumptions as above, this is a reduction of 2,786 lbs. of greenhouse pollutants per hour or 17,997,560 lbs. per ship, per year.

To make this number easier to understand, 17,997,560 lbs./2000 lbs. = 8999 MT (Metric Tons) of greenhouse gasses and airborne particulate pollutants not released into the atmosphere of Puget Sound.

If we were to slow the ships down to 16kts, have departures from Bainbridge and Seattle every hour on the hour, during non-peak times we would continue to provide the needed commuter service, make better use of the capacity that we have, save the state millions of dollars per ship per year and reduce the level of pollutants pumped into the atmosphere of Puget Sound by tens of thousands of Metric Tons per year.

This savings estimate is just for the Jumbo Mk II class ships. There are three of them (Wenatchee, Tacoma, and Puyallup). Multiply the above savings by three: \$6,000,000 plus dollars and approximately 27,000 Metric Tons of airborne pollutants then ask, "What data is readily available for the other classes of ferries?"