

Abstract

Intercity Transit offers one of the best transit services in Washington State. The institution is known for its quality of service and environmental sustainability efforts in the northwest, largely as a result of their responsiveness to ridership surveys. As a municipal corporation, the organization has in recent years faced many of the challenges other public entities are seeing nationwide. The biggest challenge intercity faces in the short-term is finding funding to maintain current service levels. State tax cuts have hit the organization's primary source of revenue, sales tax receipts. Although service cuts have been avoided through a series of increases in local tax revenue; collecting taxpayer dollars will continue to be a problem for the foreseeable future. Long-term financial problems include the cost of diesel, which will inevitably continue to go up as supply worldwide diminishes and increased demand for a new fleet within the decade.

Background

- Established in 1981
- Management: Municipal Corporation with Board of Directors
- Services: Olympia, Tumwater, Lacey and Yelm
- Awarded: America's Best Public Transit System by the American Public Transportation Association (APTA)
- Fleet: 101 Busses, 68 Coaches, 33 Dial-a-Lift Vans and 221 vanpool vans

Sustainability Initiatives:

1. Replace Incandescent lights with LED's
2. Increase use of biodiesel in coaches
3. Train drivers to drive in a way that is conducive to emitting fewer emissions
4. Carbon based route planning (location of stops, avoid left turns)
5. Switch to natural gas for heating of facilities

Fuel Mix

Intercity Transit's fleet of coach busses runs off of B20, a mix of 20% biodiesel and 80% conventional diesel. This mix allows the diesel engine to run off of the maximum amount of biodiesel with no modifications. Biodiesel can extend the use of our energy. For every unit of energy invested in the production of biodiesel, 2.5 to 3.5 units of energy are produced. This includes farm equipment used to grow crops. Therefore, using our conventional diesel to

produce biodiesel yields more fuel than not investing energy in biodiesel ("Biodiesel handling and," 2009).

Biodiesel also reduces emissions. Biodiesel contains 11% oxygen by weight, which allows the fuel to burn more completely. With a more complete burning, there is less waste and a higher density of energy ("Biodiesel handling and," 2009). An increased amount of oxygen in the fuel is like premium gasoline, it increases performance by being more flammable.

Problems

Some of the biggest problems Intercity Transit has faced in the past is finding funding to support green initiatives. Intercity Transit receives most of its funds from sales tax. In fact, just 10.5% of all of Intercity Transit's revenue comes from fares ("2013 budget summary,"). This causes a dilemma. If the operation costs go up, taxes are the first to be used to increase funding. Raising taxes is always a difficult task for an organization. Intercity Transit tries to keep their budget low to prevent tax hikes. As a result, some green energy initiatives to be cut. Intercity Transit would like to do everything in their power to cut carbon emissions. For example, an ideal system would be 100% electric busses with electricity produced on site using renewable sources. But with limited resources and technology that hasn't caught up yet makes this dream just a dream.

The Present

Intercity Transit has acquired enough funding to lead the pack in green initiatives. In the past few years, Intercity Transit has worked to replace aging engines in old busses with more fuel efficient counterparts. Some engines have also been retrofitted with carbon reduction equipment ("Intercity transit strategic," 2012). This new equipment can capture and store harmful emissions before entering the atmosphere.

Future Prospects

The future of reduced emissions at Intercity Transit looks bright. There is a push to run a B40 diesel mix on busses. A 6 month test was run in 2007 with no detrimental effects on the engine. A switch to B40 for the entire fleet would greatly reduce emissions, however increase the fuel cost ("Intercity transit strategic," 2012). Another initiative is the addition of fourteen hybrid busses. These busses reduce fuel consumption by a third compared to conventional busses and will replace aging inefficient busses ("Hybrid bus fact,"). Drivers are also taught to drive in a way that is more fuel efficient. Studies show that being a more efficient driver can reduce fuel consumption by up to 33% ("Owner related fuel," 2001). Intercity Transit also is coach busses more accessible to disabled persons would reduce costs and emissions by taking the Dial-a-Lift vehicles off the road.

Intercity Transit also has plans to reduce energy use in their buildings. There is a plan to replace all of their light fixtures by the end of 2013 to a more efficient alternative. The new lights are estimated to reduce cost by 50%. Intercity Transit also aims to be LEED Gold Certified by 2018 in new facilities.

Conclusion: Adaptation vs. Mitigation

The future of intercity transit is hanging in the balance. Their initiatives to create a more sustainable planet are often at odds with their need for a more sustainable business model. The raised foundations in the agency's proposed 3.4 million dollar expansion to the Olympia Transit Center are not the only way in which this organization is adapting to a changing climate. Reliance on taxpayer support in the form of sales tax receipts has proven shaky as the public becomes less willing to maintain service levels with hard economic times. Over the long term, the solvency of intercity transit is fixed to fuel prices which will inevitably go up over the next few decades. Without community support, the organization will have to consider new ways of doing business including a partial or complete privatization. Environmentally, Intercity Transit is focused more on adapting to climate change than mitigating it, because they hope to maintain the size and range of services they currently provide. Hydroelectric and Cogeneration are examples of mitigation, though the agency must utilize renewable resources in place of coal, which accounts for 36% of their electricity consumption, if it is to remain at the forefront of cutting carbon emissions.

Works Cited

- Intercity transit strategic plan 2013-2018*. (2012, October 31). Retrieved from <http://www.intercitytransit.com/SiteCollectionDocuments/strateticplan2013-201820121112.pdf>
- Owner related fuel economy improvements*. (2001, December). Retrieved from <http://www.fueleconomy.gov/feg/pdfs/OwnerRelatedFuelEconomyImprovements.pdf>
- Hybrid bus fact sheet*. (n.d.). Retrieved from <http://www.intercitytransit.com/SiteCollectionDocuments/HybridFactSheet20120802.pdf>
- 2013 budget summary*. (n.d.). Retrieved from <http://www.intercitytransit.com/SiteCollectionDocuments/BudgetSummary2013.pdf>
- U.S. Department of Energy, (2009). *Biodiesel handling and use guide*. Retrieved from website: <http://www.nrel.gov/vehiclesandfuels/pdfs/43672.pdf>

Intercity Transit and Sustainability

Alex Yeager and Donald Gribbons

Abstract

Intercity transit has done a tremendous job at lowering the Thurston county areas total greenhouse gas emissions. Their fleet is entirely biodiesel with one quarter of their large buses using hybrid electric engines. Intercity Transit also has long distance van pool options for commuters, as well as carpool options. All of these options he'll reduce congestion allowing for a better flow of traffic. Intercity Transit has goals set in place to increase sustainability and eventually become emissions free.

Intercity Transit has worked very hard to do their part and more to help reduce emissions from transportation drastically. With over 15000 riders per day the transit system plays a crucial part in keeping cars off the road. Currently, one quarter of the buses are hybrid electric and the rest run off biodiesel. Intercity Transit has also tried to make options available for commuters who travel long distances and usually use their own cars. So they offer vanpools called ride share, which travel long distances from Olympia for workers to commute, as well as other car pool options. These reasons combined with others is why Intercity Transit was one of the four members of the American Public Transportation Association to receive a gold status level for their commitment to sustainability. This commitment begins with the Intercity Transit Authority.

The Intercity Transit Authority is a committee consisting of five elected officials who represent the Thurston County Board of Commissioners and the Cities of Lacey, Tumwater, Olympia, and Yelm. Three of these members are Citizen Representatives appointed by the Board, and one member is a labor representative. Except for the labor representative, board members represent, and must live in, the public transportation benefit area. Citizen Representative's terms our three years, and the elected officials serve at the pleasure of their respective Mayors and Commissioners. A few years ago, The Authority adopted the 2010 – 2015 Strategic Plan, which includes policies to reduce energy use and greenhouse gas emissions. The Authority formally adopted an Environmental and Sustainability policy in 2011.

The fleet of transportation vehicles is one of the most fuel-efficient in the country. Of the 68 coaches, 13 are hybrid electric buses that average six miles per gallon. The remaining 55 average 4.85 miles per gallon. The 221-vanpool vans, which have had a 78%, increase in ridership, averaging 15.35 miles per gallon. Vanpools are important for reducing emissions by increasing the average miles per gallon per passenger and removing congestion from highways. This allows for better flow and therefore better gas mileage. Dial a Lift, which has seen a 22% increase to 118,000 rides in 2011, averages 8.83 miles per gallon for their 33-van fleet.

This fleet is not fueled by gasoline, however. The entire bus fleet is B20 biodiesel, meaning the fuel is a mixture of 20% biodiesel and 80% ultra-low sulfur diesel. The fuel blend reduces carbon monoxide emissions by 13%, and hydrocarbon emissions by about 10%. This fuel is also renewable as it is made from vegetables and is biodegradable. Ridership is also growing making the city of Olympia and the surrounding areas more efficient in terms of transportation.

In 2011, Intercity Transit facilitated a record 5,338,850 passenger trips on its fixed-route, Dial-A-Lift, and vanpool services. A new all-time record ridership level jumped again in 2012 with 5.4 million total trips. A fixed-route service average 15,000 rides each weekday. The agency operates 20 regular and three express routes, as well as other transportation services. Annual fixed-route ridership has grown more than 57 percent between 2005 and 2011 when Intercity Transit began increasing service frequency and implementing transit facility enhancements as gas prices jumped. Community support has also been strong for Intercity Transit, in helping promoted further ridership.

Over the past decade, the community voted twice to increase the local sales tax to support Intercity Transit services (2002 and 2010). This support, along with fare increases, federal/state funding awards, and a conservative budget approach, enabled Intercity Transit to continue its high quality and diverse transportation services despite the economic downturn. In mid-2012, sales tax receipts remained 8 percent below their 2008 levels.

Evergreen's need for transit for getting students to and from school, while also balancing institutional values match well with Intercity Transit. Routes 41, 48, and the nightline are the largest routes averaging up to 43.4 passengers per service an hour and up to 1600 passengers each day. This helps Evergreen to meet its zero emission goal by providing low emission transportation to and from school. If each student that took public transit to and from school were to stop riding public transit and take a car averaging 2 people per car, there would be over a million more pounds of CO2 in the air.

Intercity Transit would like to do more to battle climate change, but due to funding issue since the economic crisis there been delays. Intercity Transit's 2012 operating budget is \$33.3 million, with a capital budget of \$25.4 million and sales tax revenue – the primary portion of funds for transit systems operating here in Washington State – have been woefully down and have had dramatic impact on the agency's near and longer term operating stability. On the state level, only 2% of the total share of transit operating and capital funds comes from state funds. The national average is 22%. Some of the changes that Intercity Transit would be able to make if funding were higher include: all electric buses, on site energy production, installing rain gardens, and a closed loop water system. Even with the budget problems priority #1 for Intercity Transit is improving the emissions for their fleet.

So how is Intercity Transit doing at meeting its goals? Many would say yes. Intercity Transit has received various awards for their excellence in sustainability including the following:

- 2012 American Public Transportation Association "Gold" signatory status level for agency commitment to sustainability
- 2012 Olympia Thurston County Chamber of Commerce Green Business of the Year Award
- 2009 American Public Transportation Association Outstanding Public Transportation System Achievement Award
- 2009 Federal Transit Administration Enhancing Ridership Award
- 2008 & 2007 American Public Transportation Association Ad Wheel Grand Prize Awards
- 2008-2011 Thurston County Green Business Award
- 2003 Washington State Department of Ecology Environmental Excellence Award
- 2002 Governor's Commute Smart Award
- 2001 Clean Cities Award

In-between 2006 and 2010 Intercity Transit made several steps in lowering the Thurston county area emissions, while still increasing ridership. During this time Intercity Transit was able to accomplish many objectives:

- Reduce total agency output waste by 4.8 percent.
- Reduce total agency water use by 5.5 percent.
- Reduce energy use per transit trip by 8 percent.
- Increased transit ridership by an astounding 31.9 percent.
- Increased displaced emissions by 35 percent by replacing older emissions technology with new cleaner technology.
- Increased greenhouse gas savings 23.6 percent.
-

This combination of ridership increase while maintaining low emission transportation shows how effective Intercity Transit can be.

The Intercity Transit has consistently showed the nation that they want to lead the nation in creating an environmentally sustainable public transit system. As the nation debates the national debt, green infrastructure investment projects are delayed even though they would create growth in the United States. The problem of funding has affected small communities throughout the country, but Intercity Transit has worked with in their budget to continue becoming more sustainable. They have worked with in their means to do what is right for their customers in keeping fees affordable, while polluting as little as possible. This balance is one of constant trade offs between raising cost and protecting the environment. What is clear from the information above is they are succeeding in providing services customers demand; they have been able to cut down on overall emissions by attracting consumers away from using their own cars for transportation. On top of that with Intercity Transit's commitment to more efficient buses or a different energy source that burns cleaner it puts them in position to be a national leader for public transportation. There is clearly room for improvement with the current energy source they use in B20, but with the limited funding their future electrical bus fleet plan is on hold. But overall the Intercity Transit system is cutting down on emissions by concentrating passengers and allowing them to not use their cars because of their vast efficient bus network. Overall, we don't see many public bus networks reducing carbon emissions so dramatically like the Intercity transit system.