WHAT THERIDE HEARD ABOUT ZERO EMISSION BUSES FROM THE COMMUNITY

I am surprised that you did not include any consideration of the safety of the two options. Hydrogen gas is highly flammable, which makes the safety of these vehicles a major concern. And Lithium-ion batteries are also risky because, once there is a fire, it is unputdownable because of the extreme heat they generate. Also, it is not entirely true that either is "Zero Emission" because the manufacturing of the buses and the batteries do emit CO2. Kitty 10/26/2022
Hi, You can convert a nat gas or diesel bus to electric for about 1/3 to 1/4 the cost of a new one. https://elexicongroup.com/our-services/bus-conversions-to-ev/ Tim 10/25/2022
The presentation notes "These transition costs and their funding needs must be balanced with other capital projects stemming from the long-range transit plan" - I agree entirely, and The Ride should prefer *improving service* to electric buses. From a carbon perspective, it's preferable to reduce private car driving and have more people ride a diesel bus, rather than a less-full electric bus. Given capital constraints, The Ride should invest more in the rider experience (better bus stops, shelters, dedicated bus lanes and infrastructure, etc) and in providing more service (shorter headways, late night service, etc) so that riding the bus is a more compelling proposition for folks getting around Ann Arbor and Ypsi. Furthermore, the technology for electric vehicles is improving each year, and waiting to acquire electric buses will save money and perhaps lead to better performing (range, temperature, etc) electric buses in a couple years. The report notes "A full transition to ZEBs will impact GHGs in the Ann Arbor area by less than 1%" - in order to reduce GHGs more, it's better to reduce total VMT by offering more convenient, faster bus service to drivers to get folks to stop using their cars. The electrification can come later. Kheterpal 10/22/2022
It is critical to begin this transition as soon as possible. My view is that a procurement based approach to BEB-only replacement is optimal. Hydrogen fuel supply chain immaturity, emissions intensity of the same, lack of standards, and the very high capital costs make BEB the way to go. Remaining diesel fleet can be tasked to the long range routes until technology improves. Additionally, electric buses can be used for grid stability when not on routes.

continued …

One thing the study appeared not to address was predicted improvement in BEB cost and capacity over time - which adds to the wisdom of using a procurement based approach.

John 11/1/2022

Many of us are delaying buying a new car in anticipation of advances in technology , hopefully in the near future. I would suggest the same with replacing the buses, not to rush just to get all electric or hydrogen fuel cell.
I don't currently use the AATA services, but I know people who do and, as I get older, anticipate needing public transit in the future. Service still looks sketchy with places one can't get to, and, especially, limited service in the evenings, weekends, and holidays.
With the recent passage of a significant mileage increase, I would like to see more creativity, less reliance on big buses, more flexible ways to help us get around. Perhaps a system that looks more like Uber?
Thank you for asking for input from those of us who supported and will pay for the mileage. We look to you to spend our money wisely.

Lucy 11/2/2022

I urge the ride to consider not just the economics and CO2 reductions, but also the ability for the program to influence development and adoption of zero-emission vehicles and trucks.

It is clear that the transition to battery electric cars and light trucks is well underway. Unfortunately, there are transportation sectors for which battery electric vehicles are likely to be unsuitable due to the heavy weight of batteries and their low energy density and long recharge times. These sectors include towing, long-haul trucking, interstate bus service, and especially airplanes. For example, the Consultant's report says that an electric bus with 675 kWh battery would successfully deliver 97% of TheRide's service on mild-weather days, but only 62% on cold days.

Purchasing battery electric buses will help the environment but do little or nothing to further development of battery electric vehicles, as similar electric battery bus purchases are already common and widespread. On the other hand, purchasing hydrogen fuel cell buses could significantly accelerate the development and acceptance of fuel cells and fuel cell vehicles. For example, it would create a large-scale hydrogen refueling station in Ann Arbor (which hopefully could be open to the public); help advance the production, storage, and delivery of hydrogen; and, perhaps most importantly, provide long-term data on the cost, durability, fuel savings, and CO2 emissions of fuel cell buses.

Ann Arbor is famous for supporting technology and innovation. This is a prime area where The Ride can choose to either help accelerate development of fuel cells that are required for some transportation sectors, or simply go along with the crowd and purchase battery electric buses.

continued …

Background: I worked in vehicle technology and regulatory areas for 46 years, with about one decade each at Chrysler, EPA, Honda, and ICCT (an NGO), plus 4 years as an independent consultant. As just one example of my expertise, I was Honda's Manager for Environmental and Energy Analysis when Honda introduced the first EPA certified fuel cell vehicle in 2003, the Honda FCX.

I would be happy to answer any questions you might have or provide additional information.

John 11/7/2022

Very thoughtful presentation today Matt. I think it is very wise to do what you are doing regarding this topic.

I would like to point out a simple fact that I believe was misstated by your consultant. BEBs do not deliver a "smoother" ride. The composite frame is very stiff and provides a rougher ride than a traditional steel chassis. The two main complaints we receive about the new BEBs from riders is (1) rough ride (2) high step - even when the low floor BEB is kneeled. I know that the point about ride quality is very minor, but it is one that the public will remember forever if it is not true.

David 11/15/2022

I am extremely disappointed to see that the report dismisses trolley buses out of hand, while focusing on utterly fanciful unproven "solutions" like hydrogen powered buses, and doubly so that streetcars and light rail are not even examined in a cursory fashion.

Despite what the report claims, trolley buses are used in many cities in the US (I rode them every day in Seattle). They are about 5x more efficient than hydrogen powered buses (which are only slightly better than fossil fuel powered buses), and they do not have the high environmental and maintenance costs of battery powered buses.

Yes, some trees will have to be trimmed, but a system of overhead powered trolley buses would set Ann Arbor up well for a future transition to light rail with a dedicated right of way. If we truly want to reduce our carbon footprint, we should start building out systems like trolley buses or light rail that are directly powered by overhead or underground power lines. These are proven technologies, not inefficient pipe dreams like hydrogen powered buses are.

Brian 11/15/2022

Thank you for your study into this. I'm a big fan especially of the battery electric buses option, especially if you work with the cities of Ann Arbor and Ypsilanti to build appropriate pantograph lines. Appropriate overhead lines, even fairly short ones, could greatly increase the range available to the buses, especially when we consider that these buses typically have moderate-length stops at one of the transit centers every hour or two. Even short/partial charges during this break time can extend the range of the buses quite significantly.

While it makes sense from the perspective of Diesel buses to ensure that they can run for a full day without refueling, this isn't the case for battery-electric buses. Just like the owners of many electric cars seldom charge their cars to 100%, the buses need not charge to 100% on each charge. While buses are parked at either of the transit centres they can charge.

If we presume a 5h 0-100% charging time for a stopped bus attached to a pantograph, a 15 minute midday stop at a transit center can add 5% to the battery with the same equipment used for overnight charging. Presuming a stop like this every 2 hours, over a 16h day this can add a full 80% to the bus's battery capacity. Using pantographs that are capable of faster power distribution (e.g. a 300 kW one rather than a 150 kW one), this can be extended further. While this might not work for every route in Ann Arbor currently, this can be used alongside other mechanisms (such as LNG or diesel heating) and re-deployment of existing diesel and hybrid buses to extend the time needed to solve these issues.

Another way to assist with this is a more dispersed charging infrastructure, such as overhead lines running along convenient (low-tree) streets that have many bus routes. This includes the areas of 4th, 5th, and William around the Blake, but also significant chunks of Huron St. and Plymouth Rd. Further away from the transit centers, the section of Washtenaw between Platt Rd and Carpenter runs 3 different bus lines and has comparatively little foliage. Overhead lines on this segment with high power capacity could provide significant range boosts for buses on those lines.

Between this and the enormous energy overhead of hydrogen fuel cell based transportation, it's clear to me that if we're going to switch to zero-emissions buses, battery-electric buses or, better yet, dual-mode battery trolleybuses are the way to go.

Alex 11/16/2022

I greatly appreciate the thoroughness of this assessment and The Ride's commitment to zero emissions propulsion. Based on market trends, national investments, incentives, and local commitments, I strongly encourage The Ride to move forward with investing, immediately, in electric buses. And the new SEMCOG approved bus between downtown Ypsilanti and Ann ARbor should be the first pilot electric bus. Moving forward with these investments as soon as possible is a true imperative. It's important financially to ensure funding support from the federal administration, it's important pragmatically because of the long lead times to getting the buses and the need to locally apply the technology as soon as possible before scaling, and it's a social and moral imperative given the immediate realities of climate change. I realize this may feel like a risky situation but the public made its self clear when it commented on The Ride's long-term plan that they expect The Ride to be a world class organization that is deeply devoted to sustainability and equity. It's time The Ride stepped up to make that reality a vision.

Missy 11/28/2022

Please proceed with this - on the accelerated timeline. This is desperately needed to help Ann Arbor achieve our carbon neutrality goals, and will make our community healthier, more livable, and more equitable. Either type of ZE buses would be a huge step forward! Thanks for considering this step, and I truly do hope it moves forward.

Sean 11/25/2022

I agree there are certainly benefits and tradeoffs for battery electric and hydrogen buses. I am not an expert in the field, but worry about the ability of hydrogen infrastructure to develop at the rate of decarbonization advocated for by the public, and a potentially higher risk of relying on local green hydrogen production and transportation. I was not able to read the full 221 page report cover-to-cover, but searched and did not see a clear statement of how renewable energy procurement decisions would be prioritized (such as prioritizing additionality, local production, and/or local investments).

The Ride completed extensive community engagement to develop the 2045 long range plan. I would strongly encourage leveraging that information to consider what the public stated as priorities when considering technologies. The public said they would like to see increased transit efficiency and higher frequency routes. What does that mean for how many buses are needed in the fleet, and how they will be used? The public also stated that they would like to see a more sustainable transportation system. I believe that any bus decarbonization plans should reflect the accelerated rate of decarbonization Ann Arborites and other users of TheRide have asked for.

In addition, I believe that the impact of local air quality should be taken into account when planning for bus decarbonization and prioritizing highest impacts. While decarbonization is a priority, a very important co-benefit of removing fossil fuel burning buses from the fleet is a reduction in hyper-local air pollution that disproportionately impacts bus drivers, riders, and those using active transit (walking, biking, and recreating) along bus corridors, especially where buses stop and start, like at bus stops. I was discouraged to hear that The Ride considered the GHG contribution of the bus fleet to be insignificant, while the diminished air quality from diesel buses can be quite significant, and directly impacts the health of individuals.

Thea 11/25/2022

My first note is on the point of the “small” emissions from the AAATA fleet referenced in the executive summary. While it can be viewed as 0.5% of the emissions in the region, resulting in a small amount of emissions with a high cost, this argument is disingenuous. A large amount of the emissions in referenced in the A2ZERO plan come from the electric and fuel usage, which results in a smaller percentage for the AAATA fleet; however, the emissions from the AAATA fleet are felt in a much greater capacity on our local air quality. While much of the emissions in Ann Arbor from the electric and gas usage in buildings, the emissions are not always directly in the region, the emissions from the AAATA fleet are. Everyday, people are walking and riding their bikes past busses or sitting next to idling buses at lights or at stops, dealing with the poor air quality from the tailpipe emissions. This is not healthy or pleasant, while directly contributing to the climate crisis. Any argument downplaying the effect is disingenuous and should not be used in this discussion.

Continued …

Secondly, there needs to be a greater consideration for the system as a whole. In the report, it is looking just at busses, and to a very small extent, bus facilities. One benefit of electric busses is they have great potential to be fully emission free, depending on their source. They can harness their energy from solar, which can be placed at AAATA sites where feasible, or purchased elsewhere. Potentially, solar ports in the parking structures and other locations could be utilized to great effect. There is no consideration in this report to on-site solar or geothermal, which could have great impacts. Outside of AAATA specific locations, the grid is getting cleaner every day, with DTE committing to more renewable and the City of Ann Arbor and others looking at options outside of DTE. So, while true it is not yet clean energy, it has the potential to be, unlike diesel which will always have emissions. Additionally, what of the various buildings owned and planned by AAATA? Those also need to be zero carbon. The more parts of the system that are included could also lead to further savings when considering renewable energy, such as geothermal. Overall, there needs to be a greater consideration of the entire system, including renewable energy options owned by AAATA, the grid as a whole, and the other assets owned by AAATA.
Third, this transition needs to happen as soon as possible, and any discussion on "clean" diesel in the interim should be a non-starter. Regardless of an increase in efficiency or lower impact the exhaust will still be laden with PM 2.5, NOx, and other pollutants that will be spewed into our air. As the report mentions, the average life expectancy for a bus is around 12 years. For every diesel bus that is purchased today, we are locking ourselves into a decade plus of emissions, with no possibility of reducing the emissions from those busses. These emissions are deadly, and no matter how much we want to say they are clean they just aren't. The climate crisis is happening now. We don't have the carbon budget to lock ourselves in to another decade plus of diesel fuel – the transition needs to happen now.
Fourth, the data is clear, residents in Ann Arbor and the region support tackling the climate crisis, and it is time for our systems to follow suit. Looking at past votes, citizens have routinely come out in support of efforts focused on decarbonization. Just this month, on the Climate Action Millage, citizens voted to put their money where their mouth is to combat the climate crisis with a 70% vote of support. Washtenaw County has a goal of carbon neutrality by 2035. This has been shown time and time again through votes, petitions, and citizen feedback. This is what people want, and all our systems – government, businesses, and citizens – need to work together to make meaningful results in every area, even if it is only 10,700 tons of CO2e annually.

Joe 11/2/2022

A week ago this evening we discussed the future of the AAATA. I certainly enjoyed meeting you, and other board members, and being able to give my insights on the system, gained since the beginning in 1969.
As promised, I've given the question of reducing carbon emissions a lot of thought, studied the Stantec report, and put together the attached proposal for your consideration. I believe residents would like the door-to-door feature of Dial-A-Ride service; its convenience would probably expand ridership!
I think you would agree that this small-bus approach poses far fewer 'headaches' for you than electrifying, and recharging, about 100 large buses.
Taxpayers would like it too!

Continued …

I didn't address the A-Ride service, nor the service to outlying towns, etc., but they could surely consider the smaller bus approach, if not already using it.
The Dial-A-Ride service would benefit from brighter computer/Internet guys than me, but I have some thoughts about the communications with drivers that the experts could consider.
Just email or call me if you have any questions or comments.

PS. For his Eagle Service Project in ~1973, our eldest son, Paul, distributed fliers promoting use of the fledgling bus system to residents in the Miller Ave. area. If their ridership is higher than normal, you can probably thank him!

Dave 11/22/22

Proposal for Reduction of Carbon Emissions from AAATA Bus Fleet

Dave 11/22/22

Purpose

The following is a plan for significantly reducing carbon emissions from the AAATA fleet, while improving service and reducing cost.

Background

In 1969 I urged Ann Arbor City Council to take over operation of bus service from a private Flint, Michigan firm that had provided spotty service, and to provide reliable service to its citizens. The hope and expectation was that residents would respond enthusiastically to a convenient and well-managed system by frequently riding the buses. However, my close observation of the city's bus system over the ensuing 53 years is that good ridership simply has not materialized; never has it risen above five percent of all the trips made by residents, in my estimation. This is because of people's strong 'love affair' with their car, which affords them comfort, convenience, flexibility, and time-savings. Despite the fact that the city provides magnificent service with low fares, it has not been able to woo many residents away from their car. And now, as drivers transition to electric, autonomous, cars that are inexpensive to operate and very reliable, the ridership of buses is more likely to fall, than to rise.

It is imperative to tailor the size of buses to the low demand. Surely, a few large (14-ton) buses are needed on some routes, especially the Ypsilanti to U. of M. campus (and the two hospitals) routes during rush hour, as well as for the three public high schools at the start and end of classes, and to U. of M. stadium football games in the fall. But small buses/vans would be fully adequate for most of the vast, remaining area. These small vehicles would provide the following benefits:

A very large reduction in carbon emissions (lowering the 'carbon footprint'):

- 50-70% reduction, using fossil fuel vehicles
- 80-90% reduction, using electric vehicles

Improvement in service

Door-to-door service: Dial-A-Ride ("Text-A-Ride/Trip"?) [Preferable service]

OR

Improved line service

More frequent service
More closely spaced routes

` Avoiding immense cost of electrifying fleet of large buses

Avoiding cost of expanding current bus garage

Ability to refund part of large bus millage to homeowners

Transition Plan

Sell off 5-10 large buses (Newer, to obtain good price).
Buy small buses with proceeds.
Use small buses on lighter line routes.
Continue the selling/buying process until 30-40 small buses obtained.
Enough for Dial-A-Ride
Enough for non-rush-hour line service on heavy routes
Sell those unneeded large buses to provide operating expenses.

Service

Line service on high-density routes
Large buses during rush hour
Small buses at other times

Dial-A-Ride service in remaining areas of Ann Arbor and Ypsilanti
Suggest 1-3 buses in each quadrant of Ann Arbor (fewer, evenings/weekends)
Suggest 1-3 CW and 1-3 CCW buses on AA belt or circular routes.
Suggest 1-3 buses in Ypsilanti

Type of Small Buses

All small buses will reduce carbon footprint significantly.
Electric buses reduce footprint more, but cost more and require recharging during the day, especially in cold weather.
Suggest buying 5-6 electrics to gain experience, but using mainly fossil fuel buses until electric bus industry is more mature.
An example of a fossil fuel bus (VA Hospital) is shown here. But smaller buses or vans should also be considered.

Personnel

Fewer drivers would be needed.
Extra staff needed to coordinate Dial-A-Ride.
Transition some unneeded drivers to U. of M. bus service.
Provide early retirement for senior drivers.
Give generous severance pay to remaining unneeded drivers.

(End)

Facebook:

- "Diesel is the only way to go." – Samuel
- "2 or 3 people on a bus running all day from Ypsilanti to Ann Arbor 3 time day is not green on tax payers money always want a new millage every 3 years." – Lloyd
- "You are still burning coal to get electricity this is a flat out lie. Solar and wind is unreliable and the only way to an electric future is via nuclear power." – Ray
- "Yes, and I fart fairy dust and ride a unicorn to work. F***ing morons. You have zero logic. You can't run an industrialized global economy of wind and solar power. Oh, well, maybe if you get an electric generating bicycle and peddle your dumb a**es off. Green globalists are a threat to all of us. Bugger off." – Scott
- "You want the ride to be zero emissions then walk." – Scott
- "Great photos Ally!" – Anne
- "Why are half your electric buses out of service. No parts to fix them for about 2 years." – Jan
- "Jan what electric buses? DDOT & SMART have them AAATA doesn't that was a demo years ago" – John
- "John what kind of buses are we using with zero emissions?" – Jan
- "You can't fix stupid" – Scott
- "Ray Coal? About 22%" – Jeff

Instagram:

- "One way is to tell the city of Ann Arbor, Washtenaw County and mdot to time the traffic lights better especially on Washtenaw ave." – Instagram User
- "LaGrin Houston Tuesday Middle Community" – Instagram User