

EAN 2020 Network Summit Pitch

1. Pitch Submitted By [Name(s) and Organization(s)]: *

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4. Pitch Title: (one line) *

The Future of Rural Transit: Combining and Electrifying School and Public Transportation

5. Pitch Summary: (one paragraph) *

Let's prepare Vermont to have the most efficient, equitable, and cost-effective rural transportation system in the US for the post COVID-19 era. We propose addressing environmental, equity and economic challenges in transportation by combining public, medicaid, and school transportation into a single electrified public transportation system. The project will begin with outreach and education efforts to identify suitable partners (schools, transit agencies, and community action organizations) and routes for piloting this concept, as well as a detailed study looking at the opportunities and barriers of combining services, evaluating right-sizing vehicles and fleet sizes, and drawing from what Vermont and other states are learning about fleet electrification. Once suitable partners are designated, we will set up a demonstration pilot deploying small electric (cut-away) buses to serve 1-2 rural school systems and surrounding communities. This pilot will build on the Microtransit pilot currently underway in Montpelier, which has already proven the relative technical and financing barriers can be remedied with advanced software capabilities. This project will also incorporate managed charging to increase local resiliency, and may include testing a bi-directional charging system. This is the moment to build a successful rural transit system that provides efficient transportation options to the general public, students, seniors, and the disabled, that is heavily utilized, that is a means of accessing jobs, medical services, school, and other important destinations, and that provides zero tailpipe emissions.

6. How would you describe the status of this pitch? *

Level One: Initial idea that needs to be refined and developed with the expertise of relevant partners before work can move forward

Level Two: Project in the planning phase – ready to create an action plan, draft a grant proposal, complete necessary research, etc.

Level Three: Ready to begin implementing in collaboration with partners

7. What Energy Sector(s) Does this Pitch Apply to? (Check all that apply): *

Energy Efficiency

Electricity

Transportation

Thermal Heating and/or Cooling

None

Other:

8. Which Criteria Category(ies) Does It Address? (Check all that apply): *

Promote energy equity (that all people should have access to reliable, safe, and affordable sources of energy; protection from a disproportionate share of negative impacts or externalities associated with building and operating our energy supply and distribution systems; and equitable distribution of and access to benefits from these systems.

Significant reductions in fossil fuel use and GHG pollution from energy

A stronger and more just Vermont economy

Clean energy jobs

Energy security and resilience

Sustainable energy landscape

Other:

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9. Which Leverage Areas Would It Attempt to Shift? (Check all that apply): *

Policy & Regulatory Reform

Public Engagement

Workforce Development/Re-Training

Technology Innovation

Capital Mobilization

Other:

10. Scale of Impact on Vermont's Energy and Emissions Goals: If this proposal came to fruition, how would it help meet Vermont's energy and emissions goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations-- especially for emissions reduction estimates. *

According to the Vermont Department of Environmental Conservation (DEC), mobile source emissions from trucks, buses, passenger cars, and motorcycles are the largest source of air pollutants in Vermont. These and other toxic and carcinogenic air pollutants from diesel exhaust are of concern because they are known or suspected of causing cancer in humans, and pose a threat even at very low levels. Combining school, medicaid and public transit has the potential to reduce the number of vehicles on the road while increasing mobility options. This combining of trips would lead to reduced emissions even if these buses were to remain diesel

and gasoline, however the goal is to also work towards replacing diesel and gasoline buses with electric buses, which will make significant progress towards the Comprehensive Energy Plan goals. The precise expected scale of impacts from this project will be taken up in the study commissioned at the start of this project. However, preliminary research shows the following:

- One school bus can carry the equivalent of 36 cars - leading to annual savings in miles of driving, gallons of fuel, and pounds of CO₂. Combining school trips with public transit and transportation for elders and people with disabilities (E&D) will result in less trips overall for buses and cars, and the ability to take some older polluting vehicles off the road. This is likely to result in very significant GHG emission reductions, the scale of which will be projected in the study commissioned at the beginning of this project.
- Vermont has approximately 450 school buses and 420 transit buses. According to the Argonne National Laboratory one diesel transit bus emits nearly 119 short tons of annual greenhouse gas (GHG) emissions, uses 213 barrels of petroleum a year, and adds 37 lbs. of CO, almost 7 lbs. of volatile organic compounds (VOCs) and 91 lbs. of nitrogen oxides (NO_x) to the air annually. Replacing one diesel transit bus with an electric transit bus could reduce GHG emission by nearly 83 short tons annually while replacing a diesel school bus with an electric one reduces GHG emissions by 18 short tons annually. If we replaced 20 school buses and 14 transit buses each year with electric buses, Vermont could reduce GHG emissions by over 74,000 metric tons in the first five years through this clean vehicle conversion alone.
- Managed charging and bi-directional charging (if included in this project), will be used to reduce peak load, which has both carbon and cost benefits for the entire grid.

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11. Benefits and costs of this proposal for Vermont and Vermonters: Including, where possible, economic (local economic development and jobs), financial (consumer savings), social, public health, and environmental. Who will be better off? Who will not be able to benefit? *

Benefits:

- Energy Equity and Expanded Access: Help underserved and vulnerable Vermonters (e.g. the elderly, disabled, low-income, rural, and youth) to access affordable transportation to help them reach needed services, school activities, and jobs. Many of Vermont's most vulnerable populations do not have access to affordable transit to get to critical services. More rides will become available in harder to reach areas.

- Health: Provide healthier transportation specifically for our most vulnerable citizens - both the young and the old. Electric buses have much better air quality than diesel. The importance of air quality to health outcomes has only become more apparent during the COVID-19 crisis.
- Reduced Transportation GHG Emissions: In both school and the broader community there will be clear reductions in transportation GHG emissions.
- Clean Transportation Efficiency and Mobility: Through better integration of underutilized transportation resources (e.g., empty seats during non-school hours, part-time drivers, etc.) improved clean transportation efficiency and mobility can be effectively demonstrated. We will be able to utilize existing Go Vermont tools and the learning from the Montpelier Microtransit pilot to maximize public transit rides, including expanded routes to cover school transportation.
- Financial savings: this proposal has the potential to reduce budget pressures for both school districts and transit services as the schools are able to rely on the public transit system to provide more trips. If charging is managed properly, school districts and transit agencies should realize savings on fuel costs by converting to electric vehicles, with much more of the money spent on transportation fuel staying in state. With fewer moving parts on the vehicles, maintenance is also expected to cost less.
- Affordability: Transportation represents the largest share (over 50%) of dollars spent on energy for the majority of Vermont households, and the share is the highest for low-income and rural Vermonters.
- Efficiency: Vermont has over 450 school buses reaching every corner of the state, and 420 transit buses. By demonstrating that buses could be used for both school and transit, the pilot could help Vermont dramatically improve transportation efficiency.
- COVID 19: The impact of COVID 19 on Vermont's economy will be immense and the most vulnerable populations will be hit the hardest. Given the importance of transportation, the need for affordable alternatives will be critical. It will take time to expand services for the post-COVID era, and we need to be planning for those needs now.
- Assist in Grid Load Management/Cost-savings over Utility Service Area: By supporting managed charging, and possibly piloting bidirectional charging, Vermont can help build resilience for emergency response while reducing peak loads on the grid.

Costs

- Bus Costs: Capital costs are higher for electric buses (and batteries), though long term operations and

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maintenance costs are lower. There are current opportunities for subsidies that can be used for pilots, which may not be available for bringing this plan to scale. However, public transit has some stable, established funding sources and bigger opportunities for funding electrification (such as the FTA's Low or No Emissions Vehicle Program).

- New Technologies: Software and components of vehicle-to-grid are expensive new technologies. If this were to be part of the pilot, it would require significant investments of time and funds.
- Social Concerns: This vision represents a large societal change. Some families are likely to be uncomfortable

putting their children on a public bus. Processes must be put in place to make sure children are safe, and families are comfortable with this change. Some of these, such as a bus monitor system, might increase employment opportunities.

12. Collaboration and Commitment: What partners/organizations are already working together and/or committed to work together on this issue? *

Primary Partners:

- Vermont Energy Education Program
- VEIC
- Vermont Clean Cities Coalition
- Green Mountain Transit
- Linda McGinnis EAN Sr Fellow
- AARP
- Vermont Center for Independent Living
- Vital Communities

Additional Support from:

- Green Mountain Power
- Vermont Superintendents Association
- Transportation for Vermonters

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13. Key stakeholders and decision-makers: Who else needs to be involved to move this proposal forward? (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, people with lived experience, etc.) *

Stakeholders include those listed under number 12 above, plus:

- VTrans and Go Vermont
- VT ANR - who may be able to make funds available for electric bus deployment through VW settlement

funds.

- The VT Public Transit Association
- One or 2 communities and school districts willing to pilot the program (including municipal governments, school superintendents, principals, school board, parent teacher associations, energy committees, and parents)
- VECAN/ Climate Catalysts program
- Private School busing companies
- Public Service Department
- VT Department of Health
- At a later stage the legislature and governor will need to be involved to take this idea to scale.

14. If selected, EAN staff will support you in pulling together and facilitating a dedicated Action Team to work on this pitch over the next year, and possibly beyond. Describe what success would look like for this idea a year from now. *

A year from now research, outreach, and education will have identified barriers to the pilot as well as strategies to overcome them. The pilot plan will have been designed with suitable partner communities. Data will have been compiled from the selected bus routes for a comprehensive analysis of emissions, energy and cost savings, mobility changes for users and other benefits (health, environment) for Vermonters. Local, state and federal funding streams will be starting to come in to support the pilot. The Action Team will have begun to assess the potential for expansion in communities across the state, by convening a broad group of stakeholders to share the project and gather ideas. Team members will also have informed the legislature of the initiative and shared data on the pilot.

In order for this project to be successful, the team must engage with stakeholders and other partners to ensure there is community buy-in on the project. EAN Staff, a dedicated Action Team and community partners will be vital to ensure a robust outreach plan and feedback processes to help inform the project through each phase of implementation.

15. Is there anything else you would like us to know about this pitch? *

In most of the world, public transportation happens in one system that serves schools along with the rest of the community, saving money and adding functionality to the system. Even in Vermont, there are communities, like Burlington, where school children use the public bus system to get to school. The idea of combining school and public transportation on a larger scale is a very common suggestion in community forums, but there are

many barriers that have gotten in the way of making progress on the idea. We believe that this moment is the right time to make this shift for many reasons.

- COVID-19 has had a huge impact on finances for many families, making cost-effective transportation a higher priority than it was even a few months ago.
- Electrification of buses has the potential to remake the way we envision busing, and to vastly improve how healthy and pleasant taking the bus can be.
- Concerns about climate change are broadening and deepening in our state.

Getting rid of the yellow school buses in favor of a more comprehensive system would be an enormous culture shift, but if done carefully - taking account of community concerns about safety for youth and comfort for adults, it has the potential to increase mobility while decreasing cost and emissions. A project of this scale will necessitate a broad coalition of partners and stakeholders, but many relevant partners are already involved in the conversation, and this is the moment to make this idea a success. In this moment of climate instability and economic contraction, Vermont has the opportunity to lead the nation towards a radical change in the transportation system that addresses many problems at the same time. Let's do it.

References

- Air Pollution Information: <https://dec.vermont.gov/air-quality/mobile-sources/be-idle-free> - Vermont Energy Burden Report © 2019 - Justine Sears and Kelly Lucci, Efficiency Vermont. - "Conditions for Successful and Innovative Transportation in Rural Vermont" Final Report of the Innovative Transportation Working Group of the Middlebury College Senior Seminar in Environmental Studies, © Spring 2018
- "Windham Region Mobility Study: Coordination of Transportation Services to Improve Mobility for All of the Windham Region's Residents" by Steadman Hill Consulting, Inc for Windham Regional Commission © 2012 - Argonne National Laboratory emissions calculator: afleet-web.es.anl.gov/hdv-emissions-calculator

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