

Marcela Moreno:

Thanks again for listening to Next Stop: Transit Tech. We're very excited to bring you another episode on the ins and outs of transit technology deployments. Today, we're talking to Carrie Butler, the executive director of TARC and Geoffrey Hobin, director of grants and capital programs also of the transit authority of river city in Louisville, Kentucky, for a look into their acquisition and deployment of electric vehicles just in time for Low-No season coming up and the recent federal investment into public transportation. Shout out to FTA and the administration for the Infrastructure Investment and Jobs act. We hope that you can take away some inspiration and lessons learned for your own agency. So, thank you for joining us today. If you guys can please introduce yourselves and while you're giving that introduction, share a little bit about your journey into the transportation industry.

Carrie Butler:

I am Carrie Butler, the executive director of TARC, as was mentioned, and just thanks for having us. We bot... Geoffrey, who you'll hear from next, we love to talk about transit and we really love to talk about electrification and EVs and all the good work there. So really excited about today. I got my start in transit almost by default. I had applied to graduate school for urban and regional planning and wrote my essay to get into school on public transit, just a suggestion of a colleague of mine at the time. Someone before me was awarded a transit fellowship. But they didn't want it. They were already working professionally, and so the fellowship wasn't a good option. But, for me it was great. It was an opportunity to work during the school year for Tallahassee's transit agency. It's now StarMetro.

Carrie Butler:

And then in the summer I worked for Miami-Dade Transit Agency, MDTA at the time and as an intern. So, it was those experiences, especially going to Miami-Dade who has busway, commuter rail, heavy rail, people mover, a very broad, expansive bus system, really kind of inspired me to stay in this industry for as long as I have. So that was kind of my first foray into public transit.

Marcela Moreno:

Very cool.

Geoffrey Hobin:

And I'm Geoff Hobin. Like many people, I came to public service and transit specifically after going to school at a music conservatory and then spending 15 years working in the theater. You're the exception, Carrie. I honestly...

Andrew Carpenter:

I know like four people who have gone to transit from the start.

Geoffrey Hobin:

But actually, when I was leaving the theater, I spent some time teaching and working in a long-term transitional care program while I was pursuing my master's degree, where I met Barry Barker, who was then the executive director of TARC. I was studying TARC's budget and he came to the class that I was involved in, on finance and budget and public entities, and we started a relationship that has lasted, oh, what is it, about 26, 27 years? No, something like that.

Marcela Moreno:

That's great. Wow. I like the dichotomy of the two stories. Like Andrew was saying, I feel like most people we ask that question to are like, "I ended up here eventually, and I like it. So I stayed forever." The common thread is everyone loves it and stays forever.

Carrie Butler:

Yes. Yep.

Andrew Carpenter:

You find your way in by mistake.

Marcela Moreno:

Yes.

Andrew Carpenter:

But you never leave.

Andrew Carpenter:

TARC first introduced electric vehicles into their fleet in 2015. So, you're one of the original electrificators. So TARC introduced their... I'm going to try this again.

Andrew Carpenter:

So, TARC first introduced electric vehicles to your fleet in 2015. So you're one of the original systems to begin electrification. Can you tell us how TARC decided that electrification was the right decision for your fleet?

Geoffrey Hobin:

Sure. The credit really goes to Barry. In 2013, we had 19 diesel-powered, historic replica trolleys that provided service on downtown circulators in Louisville. 10 of them were 27 years old. They'd been placed in... Well, almost 27. They had been placed in service in 1887 with the redevelopment of the mall on Fourth Street. None of them had any exhaust after treatment. Though they had served downtown well, looking back to a time when Louisville civilians got around the city on a network of street cars, they were no longer manufactured. They were expensive to maintain. And we were serving the densest part of the community with the dirtiest vehicles in our fleet, which really irritated Barry.

Geoffrey Hobin:

So initially we took a look at converting them into hybrids. We worked with Cummins, actually, and they came down and went over the trolley and designed a system. We even got a quote for doing that. But that concept didn't satisfy Barry. He wasn't very keen. He felt it was time to change our perspective from backward to forward looking. And so we decided to apply for funds from the FTA's Clean Fuels Program for the purchase of five electric buses. When we received that award, Barry managed to acquire an equal award from Kentucky's CMAQ program: congestion, mitigation, air quality funding, and those dollars were flexed.

Geoffrey Hobin:

So we were able to actually do a procurement that resulted in the purchase of 10 new electric buses. We created a request for proposals. We received four. We had a team of TARC folks, mainly from our maintenance department, but from all of the departments that would have ownership in these vehicles, including transportation, of course, and evaluated the offerings and in fact, test drove three buses. Though the entire evaluation team unanimously agreed on the choice or the selection, there was a lot of trepidation about taking this big step.

Andrew Carpenter:

What was the trepidation?

Geoffrey Hobin:

Ah-ha! Well, none of the companies that we received bids from had a lot of experience producing electric vehicles. There were very few in service in America at the time. We knew that Foothills had the first three that Proterra had built. I think Proterra actually built those three at their Colorado location before they moved to Greenville, South Carolina. So, those 10 vehicles that we ordered when we in fact selected Proterra were 10 of the first 50 that they built. So it was a little bit, if not bleeding edge, it was cutting edge. We had a lot of insecurity about composite buses. We'd never used a composite vehicle before or a vehicle with a composite frame body. We had never used rooftop air-conditioning. We had never used disc brakes, let alone electric drive and high-voltage batteries. There was a lot new and untested, really.

Carrie Butler:

If I could add in a perspective. I was not at TARC at the time in 2015, but I was at a kind of a sister-brother agency in Lexington, still in Kentucky. We had a similar experience just maybe a year or so behind TARC. It won a Low-No award and had multiple capital projects happening at the same time. One was the biggest capital project that Lextran, the transit agency I was with at the time, had gone through, which was building a brand new headquarters and campus. So we were simultaneously planning and building a new headquarters, which included our administrative offices as well as our garage and maintenance facility and incorporating compressed natural gas and electric vehicles into the fleet. At the time, we really debated about can we do this? And Lextran is not, is a small ops as kind of we say in the industry, but felt it was important to move forward with a fleet diversification strategy with CNG and a portion of electric vehicles and clean diesel and a few hybrids in the fleet.

Carrie Butler:

So, I mean, I think, I'll say it can be done. Even with the cutting edge or bleeding edge or sort of the trepidation, I have found it to be a really worthwhile endeavor and especially the ability to reach out to and connect with other transit agencies who have the experience and can share information. So I would say that is if people are a little fearful, trepidation, concerned, you can do it. It's worth it.

Geoffrey Hobin:

Absolutely.

Marcela Moreno:

Definitely. Being an early adopter comes with so much adventure, is one way to put it. I guess one follow-up question to that is how did you all handle that trepidation within your agency? Because I can

imagine people are coming at it from different lenses, whether they're working in like ops or maintenance.

Carrie Butler:

I'll say that at Lextran, we had so many things happening. We just went through it. So, I mean, almost like survive in advance. We might have said that a couple times back in the day. We just really were... I mean, we were excited for the opportunity and it was like, "This is happening. All these changes are happening." I think TARC had, and Geoffrey can speak to this a little bit more, but I think TARC had probably a broader sustainability commitment, had worked on some of that. I mean, I can't remember the timeline of that, but I believe there was a sustainability commitment or plan in the 2000s?

Geoffrey Hobin:

Yeah. Yeah. We were getting into that. We were in a non-attainment area and we were at the time for... I think we still had an issue with particulate matter, and certainly that's very important here. There's a lot of health-related issues, especially in the historic, more dense downtown and west-end portions of Louisville, associated with air pollution, asthma, emphysema, lung cancer even. So, that was one of the driving forces. I had a thought though. Carrie, you were talking about...

Carrie Butler:

The environmental management system?

Carrie Butler:

how did you kind of work through-

Geoffrey Hobin:

One of the reasons we selected Proterra was because they were a fully American company. We had no doubt, or we had a considerable degree of confidence that we would be able to acquire parts. They had located not long before in Greenville, South Carolina. And we used that relative proximity. It's a seven, eight-hour drive from here to travel there a lot. Proterra, to their credit at the time, new company, significant capital investment in the firm, FTA's backing, they did a lot of handholding. They had a technician here for over two years and we visited, I don't know how many times we visited, but we would look at the buses on the production line. We would go over them. And I say "we" with a little bit of a tongue in the cheek. Our maintenance director at the time, Jim Barrett, spent a lot of time going very thoroughly over the buses and pointing out issues, things that just didn't make sense, things that he knew would become a maintenance issue. And to their credit at the time, Proterra, the engineering staff, managed to make some changes.

Geoffrey Hobin:

So all of that helped us acquire a little bit of confidence. We were very pragmatic when we implemented and very careful about selecting the sites for the charge stations, for instance. And there was a lot of stakeholder input in those. And we had... Our maintenance training manager was sort of the site manager on the ground at the time. So we had a lot of input from maintenance and a lot of user buy-in. All of that helped.

Marcela Moreno:

Thank you for sharing that. I think that's something that a lot of leadership at transit agencies has to think through. Either that, or just kind of dive in and see how it goes.

Marcela Moreno:

So, I'm going to change gears a little bit to funding. Funding for green vehicles is often a puzzle of different sources from different places. Could you speak to some of the different funding sources that you've used to fund the electrification of your fleet or any future plans for other alternative fuel vehicles?

Carrie Butler:

Well, it's been... The Low or No Emissions Program as well as the congestion, mitigation, air quality program have been the two primary sources. So Low-No and CMAQ, as we say. You know, across the business, lots of acronyms as a lot of transit folks know. And the really exciting thing about electrification and grant opportunity is there's a lot more now. There is more money in the Low-No Program, and there are a number of other components, the Bus and Bus Facilities, 5339 is expanded and grown. So I think there just... It's more than just the Low-No and CMAQ now with the passage of the Infrastructure Investment and Jobs Act. So, that's really exciting, but I think the Low-No has been the most significant and it's really great that it's being expanded.

Geoffrey Hobin:

Yeah. We've also used 5339 or Section 5339 formula funds to incrementally fund a couple of the purchases. As I mentioned before, the program ended with the FAST Act, but the Obama Administration had a Clean Fuels Program. That was the first award we used.

Carrie Butler:

Well, and there was the TIGGER.

Geoffrey Hobin:

Yes!

Carrie Butler:

Transit investments generating greenhouse gas emissions reductions.

Marcela Moreno:

That's a fun acronym.

Geoffrey Hobin:

That was my favorite acronym.

Carrie Butler:

It's my favorite acronym! It was so much better than TIGER.

Marcela Moreno:

TIGGER. It's a lot friendlier, a lot happier.

Carrie Butler:

Mm-hmm (affirmative). Yes.

Marcela Moreno:

Were you all able to take advantage of some of the Volkswagen settlement funds for your vehicles as well?

Geoffrey Hobin:

Yeah, we absolutely were. We were fortunate in, oh, well... we used the VW settlement funds that were allocated to Kentucky, a portion of them that we received from the state, to match our most recent purchase of clean diesel buses. We acquired a very significant award from the Bus and Bus Facilities discretionary program to acquire what ended up being 47 buses. That was important for emissions reductions because the buses they replaced were all placed in service between 2000 and 2004 and didn't have after-treatment or very little other than catalytic converter. They did not have particulate filters. They did not have selective catalytic reduction. So we, by acquiring the new buses with the aid of VW settlement funds, we have made a significant reduction in emissions, but it's not electrification.

Carrie Butler:

Well, and I might make a comment just to kind of round out the discussion on funding and the mention of the VW settlement is that's what can make it a little bit challenging for agencies is when you don't know where the funding is coming from or how much the funding is going to be. It can be hard to plan, and then agencies know they want to go in a direction of either a diverse fleet or a fully electric fleet or fuel cell CNG, but it's hard to make some of those programmatic changes when you don't know where things are coming from. So we're grateful, extremely grateful for a five-year bill. It's better than a three-year bill. But even then it's this sort of specter of "Well, that bill will run out. Will there be another one?" Can always make it a challenge,.

Carrie Butler:

But I think tying back to the idea of just moving forward or at least having a concept is really key. I feel that way, especially now, because I regret maybe not being quite as far along with some other projects as I wish we'd be. TARC is in a good spot for electrification. We have a fleet transition plan already underway. We know a lot more about the technology, both onboard the bus and with the chargers; feel confident we can move forward in that. But sort of on the other corridor, planning, study side we're not exactly as far along as I would like to be, to just immediately take advantage of... Or, you know, to access some of the funds that are coming through the Jobs Act or bipartisan infrastructure law. I think that's the other buzzword I've heard it being called right now.

Andrew Carpenter:

Related to that, and choosing the different type of fuel or propulsion system, I guess you could say, and using your different funding sources to determine how you do that... First off, congrats on the FY21 Low-No Award. But then with all of that in mind, when you're choosing to apply for any of these awards, 5339, Low-No, or just using an unexpected pot of money such as the VW settlement, how does TARC choose the type of project to pursue for funding? How do you choose batteries versus diesel versus investing in hydrogen or other fuels like that?

Marcela Moreno:

Andrew loves to talk about hydrogen.

Carrie Butler:

Then I'm going to have Geoffrey go for this question because this is kind of an internal debate about hybrid, electric, and fuel cell. So, I'm going to defer to the hydrogen fuel cell fanatics in the crowd.

Geoffrey Hobin:

I don't think I can be considered quite a fanatic just yet, but okay.

Andrew Carpenter:

An enthusiast.

Geoffrey Hobin:

In this particular case, with the FY21 opportunity for low or no emissions vehicle funding, we had been down the hybrid road. We had up until very recently 33 hybrids in our fleet of 225 buses. But we have just begun replacing the oldest of those. We didn't see much advantage to acquiring any additional hybrids. You do reduce emissions, certainly. You do increase your fuel efficiency, absolutely. But while you're doing that, you are retaining all of the issues associated with diesel power, whether it's a parallel system or a series system, whether you're just producing energy to store in the onboard energy storage system, the batteries; or you're actually powering the bus, you're providing some mode of power in addition to the electric drive. The diesel engine requires all of that exhaust after-treatment and all of the issues that go along with that.

Geoffrey Hobin:

I mean, one of the great advantages of electric buses is that they have literally, what, less than a 10th the number of moving parts. If you can eliminate the diesel engine or any internal combustion engine, you eliminate a great deal of maintenance. I guess, in addition to that, or in addition to that consideration of hybrid buses, and there wasn't a great deal of consideration to purchase hybrid buses anymore... All of our 15 electric buses that we had acquired in 2014 and '15 were limited onboard capacity. And I mean energy capacity, so less than a 100 kilowatt hours, fast charge, on-route charging only, and limited therefore in the service that we could utilize them on.

Geoffrey Hobin:

We knew we wanted at some point to take a leap into extended-range electric buses. When we saw this opportunity, we also saw that there was an opportunity to electrify a route, and we can talk about that more in the next whatever other questions you might have. So, I think those were the two primary considerations: acquiring extended-range buses and acquiring a sufficient number of those buses to electrify one route where we could do so without any range concerns, if that makes sense.

Carrie Butler:

The other thing I wanted to mention is a transit cooperative research panel, TRB, Transportation Research Board guidebook that Geoffrey and I worked on with another panel... I'll give the title. It's the TCRP Project J-11, task 33. And the name of it is the Guidebook for Deploying Zero Emission Transit buses. It was a great panel. I think the outcome, the book, was actually very helpful and can help. We intended the guidebook to be very instructive. The panel was comprised of early adopters who had been

down the road and had done any number of different types of vehicle types and broke it into what we hope to be a very useful and instructive guide for the things that you have to talk about because, I mean, we could spend the next eight hours talking about the decision points and utility companies and where you're getting your power from, and how much do you want to invest in your garage.

Carrie Butler:

But as Geoffrey was talking, I was reminded of that guidebook. So a shameless plug for a panel that we were both on. But, we really intended for that guidebook and through... The Center for Transportation Excellence was the primary researcher on it, primary investigator on it, really wanted it to be easy to break out so that if you were like, "Well, we totally understand the utility side, but what's the policy implications?" You can go to that particular section.

Marcela Moreno:

I think it's really important to have resources like that, just so you can think through all of these questions and just be able to prepare as best as you can, knowing that there's always going to be surprises along the way but taking in what other folks, especially early adopters, where I would imagine the road was the bumpiest. It's like, "How can we learn from their process and take that into consideration as we're putting together planning documents or doing training and all of those things."

Marcela Moreno:

That brings me to the next question, which as the Low-No grant is competitive, when applying what were some of the key pieces of information that you were trying to convey while demonstrating the needs of TARC? What sorts of supporting documentation helped tell your story?

Carrie Butler:

I'll start. I think I find writing grants, and I'm not the primary author of grants, and I would have to give a lot of credit to Geoffrey and his team for their work to win these awards. But I think in the concepting phase, you've sort of got an idea of what you want to achieve or what you're trying to get out of it. But, I think in that rationale, or why you would do it, the selling points of your grant, that's where I would say it's really important to understand your writers, the community in which you operate and what makes sense for the community there. Geoffrey talked a little bit about that, the specific impact on neighborhoods with these trolleys back in the late 90s or early 2000s for TARC.

Carrie Butler:

And we were in a non-attainment zone here in Louisville, you know, that. There can also be an aspect of is this more of an economic development tool? Is this about jobs or a better way for people to get to school or work, more of the traditional transit reasons. So, I think that's what I would say is important to think about is the agency may have a strategy of electrification or sustainability strategy, but how does that tie into other more broader community goals or state goals, things like that.

Geoffrey Hobin:

Yeah. I'll just add that in general, anytime you're applying for a competitive award, you just should pay as much attention as you can to the areas emphasized in the NOFO, in the Notice of Funding Opportunity, that the agency or the administration, in this case the FTA, and the FTA research specifically, are highlighting. In this case, it was benefits to EJ communities, environmental justice communities. So, we had... In this case, our planning department did a great job investigating those



routes that we serve that had the highest percentages of what you could call EJ demographics, right? They were in areas where health impacts were high. They were low-income areas; they were high percentage minority areas. They presented a wonderful set of graphics that we could attach to the award that demonstrated that and demonstrated our ability to electrify one of those routes with Low-No Program support.

Carrie Butler:

I think the other aspect of if you think about a sustainability project, investments that you're making in transit are always going to be more sustainable. The most sustainable commute trip or transportation trip you can take, probably walking, maybe biking, but then transit. So, if you're electrifying your fleet or reducing emissions on your fleet, you're making a sustainable trip even more sustainable.

Carrie Butler:

And then there is the aspect of maintenance on electric motors that is completely different than a diesel engine. So, there's a selling point, I think, to be made that there's a tremendous business case for electrification that's sort of internal, how we work on the vehicles in the shop. And in some cases, depending on the utility or the cost of the energy source and the related price of diesel or CNG or whatever your competitive fuel is, it can also be a tremendous financial benefit that you're saving money with the fuel type. Certainly on a per trip or per passenger energy cost, it is electricity, in our case here in Kentucky, is the way to go. So a lot, any number of reasons that we should get more Low-No awards.

Marcela Moreno:

I almost see like an infographic of a skyline of Louisville, people on the street, that's like, "Who are all of the people that benefit from electrification?" And you can kind of point it out and be like, "The person walking on a sidewalk who doesn't have to breathe in diesel fumes, the utility off in the corner because they're getting more business." All of the clean energy advocates just really rallying behind a cause tells a really good story.

Geoffrey Hobin:

That's absolutely right, Marcela. In fact, we almost always partner with our local Air Pollution Control District. In one case, or maybe more than one, we've had letters of support from the executive director of that APCD that not only refer to our attainment or lack of attainment status for ozone; and in the past, particulate matter, but the importance in a congested area where there's a great deal of pedestrian activity to remove or eliminate tailpipe emissions. Right? Because it's right in the pedestrian environment. That's spot on.

Andrew Carpenter:

But related to that, and everyone involved in that infographic is in the application process, and I think you touched on this, but how closely do you work with other partners in the area? You mentioned the Air Pollution District or was that the correct term for them? How closely did you work with them or the power company. Then similarly, when you began installing charging infrastructure, what was that relationship like with the utility in particular?

Carrie Butler:

Charging infrastructure is an excellent question. I know that's not exactly what you were wanting to get at, but that is another one that probably has a couple, at least a good hour or two on the type, location, but certainly partnering there. One of the Low-Nos that I worked on before at Lextran partnered with the University of Kentucky and a shuttle service that we had on campus there. It didn't end up working the way that we wanted it to. Again, we didn't get the full award that we'd asked for. We got a little bit, so we sort of had to pivot. So University of Kentucky was a partner there, and I thought it was one of the best ones because I thought it was just a really great idea. But it didn't, as I said, it didn't get funded the whole way.

Carrie Butler:

But I think those types of partnerships where maybe the agency or the transit authority already has worked with that partner before on something, I think those are kind of a natural next step, rather than trying to sell a new person or a new partner on a new technology. I think where you have that already existing working relationship, and then you're expanding from there. And then Geoffrey, I know that TARC had... Well, I guess both parking authorities sort of supported the electric charging station, interestingly enough, but TARC had this charger was in the parking garage, I believe.

Geoffrey Hobin:

Yeah. From 2015 or 2014. Yeah. We acquired a long-term lease for the nominal fee of a dollar a year from the parking authority here to locate one of our, the charger equipment in the garage and the charger itself in the right-of-way of course. I wanted to mention too, that it's helpful and maybe even advisable to seek input from consultants that have some expertise in the area, at least until agencies acquire more expertise of their own.

Geoffrey Hobin:

So, in the past, I know Carrie worked with the Center for Transportation and the Environment, CTE-

Carrie Butler:

Yes. Yes.

Geoffrey Hobin:

-the guys that wrote the guidebook. And for this past round, we worked with CALSTART. They helped us identify our needs and manage and create the application. But we also, in terms of support, we have partnerships with our mayor's office and support from our congressman and the directors of... and the staff in some cases of the Urban League, the local... We have a workforce investment organization here called Kentuckiana Works, Catholic charities in addition to the Air Pollution Controlled District, and also the manufacturers you partner with, if in fact you choose to partner with manufacturers. So we had support from in this case from Novabus and from BAE systems. All of them are helpful

Andrew Carpenter:

In the applications, do the reviewers look for those partnerships to be well-established or is that a critical component or less so?

Carrie Butler:

I always find the more that your grant application can demonstrate that you've thought about this. I mean, they understand some of these are pilots. They understand that these are first time deployments, but that it is not just a sort of, "Well, we think we want an electric bus so we wrote a grant." If there's a reason for it, again, and we kind of pointed to some of the benefits that they can... It's not just one thing, there's lots of different things.

Carrie Butler:

But I think that helps when you're able to show that there's a purpose for your agency, not just trying to buy an electric bus or... But I don't... Yeah. Maybe one day when I go work at FTA, I'll be able to comment on why some get picked and why I don't... I mean, I think some of it is they just have so many more applications than they have funds for. I mean, some of these numbers... We were on a call the other day and it's like 10,000 applications, and 800 get picked. I mean, I'm not even quite sure how they review all the applications. There's a tremendous desire to go down this path, which is why it's such good news that there's more programmatic funding for it.

Geoffrey Hobin:

Yeah. And I'll just add, again, this is a little redundant, but read the NOFO. They're going to tell you, in this case the folks at FTA research, what they're looking for and whether letters of support or letters of commitment from partners are important or required even. Typically, there will be a point person in the department at the FTA, and often they're very responsive and they invite inquiry. So, you can send them an email and ask, "Hey, I'm thinking about including this. Should I?" And they'll let you know. Absolutely.

Marcela Moreno:

Around the application time for the time that I was working on a Low-No grant, I remember the webinars being immensely helpful, especially the presenter usually calls out what that particular focus is. So when I was applying, it was opportunity zones and being able to call out how this would impact them. It's that caveat that changes every couple of years or every eight years. It depends. ~~I know that it is 1:19, so I want to be conscious of wrapping up early.~~ What advice do you all have for small urban, rural, and tribal transit agencies planning on applying for the Fiscal Year '22 Low-No funding?

Carrie Butler:

I sincerely mean the guidebook could be really helpful. It really helps break out all the things to consider. The other thing that I would say, and some of this is just because I've worked with Geoffrey for a long time and Louisville and Lexington were close... They're an hour away, hour-and-a-half away. But talking to other agencies, and I think especially for small, urban, rural agencies or tribal organizations, if there is a way to partner with a close-by agency, or maybe even not. I know some of our rural agencies are fairly, they're farther away from each other than one might think. But that might be an opportunity to really share, or maybe even partner on a grant where you can get maybe some economies of scale or some efficiencies by working together.

Carrie Butler:

Because I can say from an agency standpoint, Lextran benefited greatly by having TARC go first. We really learned a lot from them. I will always be grateful for that. Even some things about snow and ice and just the first winter. It's like, "Wait a second. We didn't quite think about how this is going to work." So I think talking to other, seeing if there are some possible ways to partner with other agencies that

make sense would be good. I think that guidebook, kind of thinking through your strategy, would be helpful.

Geoffrey Hobin:

I imagine that everybody who is listening to this podcast is going to be aware that one of the wonderful things about our industry is how absolutely willing our colleagues and other agencies are to share information. In 25 years, I have not come across a single individual who was like, "I really don't want to tell you that because that's mine," you know?

Carrie Butler:

Even for competitive awards like this, even for discretionary competitive grants. I mean, maybe not right when you're writing the grant, "Oh, can you, you know..." I think people have some pride of authorship or ownership. But in general, I'm with you, Geoffrey. I don't think I've ever asked or inquired about something where it was like, "No, we're not going to tell you that." Just...

Geoffrey Hobin:

Yeah.

Geoffrey Hobin:

And in the same way, everybody, I believe in the country, every agency, whether it's small, urban, rural, or tribal, belongs to some representative body, right? They are constituents of somebody in government, somebody who should represent them. They should be able to reach out to them for advice, help, support, other opportunities that they might know of for funding. In the same way, if you're in a small urban or... Whether you're in a city or not, you will have a regional body, either a metropolitan planning organization or an area development district that may have helpful information. In our case, our MPO, our planning organization, produced an environmental justice report that supported our findings and that we attached to this recent application. There are plenty of resources. It might take some time to unearth them. It's perhaps intelligent in preparation. I mean, if you know you're going to apply for FY22 Low-No funding, just start exploring those relationships if you don't already have them.

Carrie Butler:

One comment, is when there was some discussion here about the VW settlement funds, there was a lot of, there was some competition for the VW settlement funds here. It was like different fuel types, propane, electric, I don't remember fuel cell getting too much press. But there was some talk about like, "Well, let's get everybody one electric bus. Let's make sure every county has one electric bus or," some sort of almost like a pilot for one bus in every county. I would say that may not be the most effective way to go about it. I think forcing it or putting one new strange vehicle type for everybody is probably not the best way to go. But, if there are some sort of regional partnerships, I think that can make a lot of sense because as we mentioned, the charging infrastructure, utility cost, all the considerations you have to make, one bus might be more trouble than it's worth.

Marcela Moreno:

Yeah. It's right-sizing. When the technology is ready for an agency versus "do this now," because I think even electric cutaways have been only recently introduced to the market. And that's what so many agencies are running in rural counties. So to, I guess...

Carrie Butler:

I'm so glad you brought that up because that is really the next... That is something that I've been keeping an eye out for. I really think that is going to be an interesting market, but I think it's like an interesting test case for the manufacturers because they run all day in a very different type of environment. So really, that's something that... I don't know, maybe she just gave us an idea for our next Low-No, is some electric cutaways for our on-demand service.

Geoffrey Hobin:

Well, and it is a market that's emerging.

Carrie Butler:

Emerging market. Thank you.

Geoffrey Hobin:

There was an agency in Michigan that used this most recent Low-No opportunity to acquire some cutaway type electric vehicles. It's a little more challenging, I think, because range issues are more constricted because the buses aren't as big, and you can't get as much energy storage on them. But yeah. Cool point.

Carrie Butler:

But maybe that's where there's a blend of the personal electric vehicle market and the electric vehicle charging infrastructure on the consumer side where this gets really well-blended.

Marcela Moreno:

Well, that's a good point... Yeah. I could see that being another place where there's going to be a lot of early adopters working out all of the fine details. Maybe five or seven years from now, that's going to be something that a significant amount of Low-No funds are going to.

Andrew Carpenter:

What's interesting about that is even three years ago, the general consensus was like, "Hmm, cutaways aren't really... There's not much on the horizon for them." And now this year, all of a sudden, there's at least two agencies getting the Low-No funding for cutaways. So I think the change has been pretty quick, and seeing where that goes will be interesting. Well, in that case, and then I wonder if Geoff's hydrogen enthusiasm might play into this. What's next for TARC?

Geoffrey Hobin:

You're going to get me in trouble, Andrew.

Carrie Butler:

No! No. No, the FY21 Low-No award, the electrification of our Hill Street route is next in addition to some extended range vehicles. I'll let Geoffrey talk a little bit more about the electrification of the Hill Street route project. But, what I'm excited about is once we take delivery of these two, the extended range from GILLIG and then the Novabuses as the most recent Low-No award, we will have four or five different types of electric vehicles. We'll have opportunity charge, extended range; Novabuses, which are essentially extended range but different battery pack. I mean, as crazy as that sounds, we don't

really want to be a test ground, but we are. That really gives us an opportunity to put these vehicles, put the rubber of the road as they say, to know what makes sense where. Then we're going to feel very comfortable as we move forward into a broader program.

Carrie Butler:

And we have this zero emission or electrification, zero emission bus fleet transition plan going on, which is a little bit more focused on our facilities and how do we store these, how do we charge these overnight. But Geoffrey, if you'll... I'm really proud of our grant and what we did for this one. I'm just excited for it to get underway.

Geoffrey Hobin:

So there's a lot of things coming together in the next 18 months. One is that strategic plan that Carrie mentioned. We're going to learn a lot, and it will help us determine the type of infrastructure, the type of vehicle, the timeline, the financial strategies, the training plan, all of that we want to have a much better idea about. We'll be able, with that plan and with our experience, both the experience we've already acquired and the experience we're going to acquire in the next 12 to 18 months with these different types of vehicles, to make a much more informed decision about what vehicles we purchase over the next 15 or 20 years. Right? It could be that we will diversify the electric fleet, substantially. Folks have gone in that direction, I think intelligently because it improves the resilience of a fleet if you have more than one type of drive or fuel system, if I can call energy, electricity, a fuel system.

Geoffrey Hobin:

And then, yeah, just go after those Low-No bucks. I mean, there's 5 billion dollars in IAJA for the Low-No Program over the next five years.

Andrew Carpenter:

That's a lot of buses.

Geoffrey Hobin:

It's a tremendous opportunity. The administration absolutely wants to electrify transit, not just as a demonstration of its effectiveness, but because it will make a substantial difference in areas served by transit in, if not a very great or an incremental impact on our climate goals, especially given the recent completion of the COP26 program, but air quality.

Andrew Carpenter:

Right.

Carrie Butler:

Well, it's a 50% reduction by 2030 and net zero by 2050. So those are the stated goals of the Biden-Harris Administration and DOT. So your earlier question about how we got into transit, I can say I got into the realm of urban and regional planning and went in this direction because I felt a tremendous, I don't know if it was inspiration or motivation, to be involved in environmental work. I mean, that was more time ago than I would care to say on a podcast, but I certainly felt that was sort of what motivated me personally and professionally, to be a good steward of our environment. That's kind of how I frame it too, is I think we should be good to stewards of where we live no matter what.

Carrie Butler:

I think my personal viewpoint is whether there's climate deniers or science or whatever, all these sort of objections you hear, I'd like to have clean water to drink and swim and interact with. I'd like to have clean air. So I think reducing pollution, whether it's air quality or water quality, just makes sense to me generally. And that's kind of where I got into this. So for me, professionally and personally, the more that I know we're doing to improve and to be good stewards of where we are, is personally meaningful to me. I'm grateful to have had these opportunities professionally to do that.

Marcela Moreno :

I 100% agree. That is also why I went into urban planning. I studied environmental and health planning, and then eventually made my way to transit because it's one way you can make a huge impact to the environment, to health, to economic opportunity for people. It touches on everything. I wish they said that more in planning school, to be honest, might have found my way to transit a lot quicker. But it's true. It's one way that agencies can do their part in meeting those goals. Whether or not your beliefs are in climate change or whatever it may be, I think everyone can agree that they don't enjoy breathing in diesel fumes. So that's a big one...

Marcela Moreno:

Okay, cool. So thank you all for joining us. This has been a really fun episode to record, and I'm glad that you all shared so many helpful resources and tips as people will be embarking over the next five years for this \$5 billion bucket. I'm excited to see how that changes fleets over the next couple of years. I know that Andrew and I will be in Louisville in May. So, we hope to see some of these changes that you all have talked about. Do you all have any parting words?

Carrie Butler:

Well, I was really just going to tell everybody you don't really need to apply for any Low-No awards, just let TARC apply and win all the Low-No awards. But I don't know that that was the point of... No, don't apply for any! Nobody else apply.

Geoffrey Hobin:

I-

Geoffrey Hobin:

I want to, if I might Marcela, I just want to hearken back to something Carrie alluded to earlier.

Marcela Moreno:

Oh, yeah.

Geoffrey Hobin:

Two things, actually. One is reducing emissions from transit fleets is very, very important, both as an example and a model and because it works. There's a lot of reasons to go there. But our greatest impact is not from greening our fleet. It is from shaping our communities so that transit is the most viable option. At least in portions of our communities, getting people out of their cars into buses, into trains, or bike-on people. I'm a cyclist. I commute to work as much as I can on my bike, on bicycles. That is still the

most efficient machine for transportation ever invented. See, I can get 20 miles on a bowl of oatmeal. Do that in a vehicle... With that I'll stop blathering.

Marcela Moreno:

That was a good mic drop... Yeah.

Geoffrey Hobin:

But we enjoyed it too. This was fun.

Carrie Butler:

Yeah. Thank you. Thanks for having us so much.

Marcela Moreno:

Yeah. Thank you.