**Sheryl**: Good morning and good afternoon to everybody. Welcome to the latest N-CATT Webinar on recovering mobility as a service today. Let's go to our PowerPoint. There we are. Okay. This webinar is brought to you by N-CATT, the National Center for Applied Transit Technology. We're going to discuss the importance of mobility as a service, which is the hot term, and it's often used to very flexibly. Let's put it that way. We're going to talk about what's happening in urban areas and promising initiatives for rural and small urban areas in the US.

We have three great presenters and I will introduce them right before each of their presentations. We have Carol Schweiger, Dwight Mengel, who's the chief transportation planner of Tompkins County and Dr. Caroline Rodier, she's a researcher at the Institute of Transportation Studies at the University of California, Davis, and let's see if we can get this screen share going, which was of course fine before we started the webinar. There we go. Excellent.

So what about N-CATT? N-CATT started up in late 2019. We are house that Community Transportation Association of America and we're funded and we work in cooperation with the Federal Transit Administration. Here you see our mission, which I think we're carrying out today, which is to talk about new technologies, new business models made possible by technology in reference primarily to small urban, rural and tribal transit systems.

And you can find us at our website, which is now live, and I won't take up any more of our precious time with this introduction. We have lots of resources and information there, and you can sign up for our newsletter where you get probably the best information. It's on a monthly basis or follow us on every kind of social media. I think we're on everything except TikTok these days.

And without further ado, I'm going to introduce Carol Schweiger, whom probably many of you are familiar with Carol has been in the field of transportation technology for over 40 years, and she is an expert on not only nobility as a service, but many of the topics that touch rural and small urban transit systems. She's nationally and internationally known. She had right wide ranging in-depth experience in systems engineering, technology strategies for public agencies, transit and paratransit technology and traveler information strategies and systems.

She's worked with over 65 transportation agencies, developing technology strategies based on needs assessments, developing technical specifications and structured processes. I won't go on anymore. We could go on an hour just with Carol's experience. She's also developed and delivered modules for NTI and she's developed been the lead instructor, excuse me for NTI and she's also authored five TCRP synthesis reports. And she authored and co-authored a couple of TCRP reports as well.

Okay. And without further ado, I will hand this over to Carol.

**Carol**: Excellent. And let's move right into the first slide, which is just giving everybody an idea of what I'm going to cover today, thanks to N-CATT for setting this webinar up and talking about such a timely subject as mobility is a service. And hopefully, by the end of the webinar, people will feel a little more comfortable about what is mobility as a service. And as you look at the outline of my presentation, I want our participants to keep two things in mind.

One, mobility is the service is not an app. That is a big misconception. And secondly, it is a little more complex under the surface. And so we're going to talk about some of the challenges associated with mobility as a service particularly in rural areas, because the original concept was for major urban areas, and it had a different set of objectives.

So now that you can kind of see what my presentation road map is, let's move to definitions. So what I put up on the screen here, which I’m not going to read all of the words to you. But mobility as a service is a concept within which in a one stop shop you can plan a trip, you can book a trip, and you can pay for your trip. And those are the three most important words that you're going to hear as we go through all the presentations today.

And I want to tell you this definition and the definition below it for mobility on demand first of all, they're very different concepts. But these are being refined in SAE J3163 which is a taxonomy of shared mobility terms. So if you Google J3163, you will see a taxonomy of shared mobility terms and we are adding mobility as a service mobility on demand a little further down shared mobility, which is an even broader concept. I think that doesn't need any definition.

At the very bottom is the federal transit administrations definition of mobility management. I want to come back to that later because frankly, in my mind, there is a direct relationship between mobility as a service and mobility management. So let me move on and here this is directly from the Federal Transit Administration. I want you to focus on really the last bullet on this slide.

Mobility is a service really doesn't exist without a very strong partnership among mobility service providers as well as private sector partners who may be actually providing them abilities services or they might be providing a technology platform and there's an obvious direct partnership with travelers. So keep that in the back of your mind as well. And I wanted to show you this very briefly that there is this thinking about supply and demand.

So what are our issues in rural areas is that our supply is perhaps not as plentiful. So our supply of mobility's services -- So in rural areas, we don't have as much of a supply of transportation, and I'm actually going to come back to this. So perhaps this chart would be a little unbalanced. Right now, we're showing a direct balance between supply and demand, demand for mobility services and supply. And I want to come back and revisit that because that's very important feature in -- okay, so, actually, I'm going to skip over this slide.

I wanted to get to this one, and this is a very simplistic way of looking at the concept of mobility as a service. And I'm just going to point out a couple of key things on his chart. So it utilizes shared assets. So, for example, if there's any kind of ride sharing and I don't mean Uber or Lyft, I mean the old carpooling, van pooling. We're going to come back to that. That is an asset that's a shared out said that can be used.

Then we have some personalized services that I think Dwight is going to cover really, really well in his concept of mobility as a service and what he will be building in Tompkins County. And then we have some facilitators. We can provide some incentives.

So here, just to wrap up, you can provide incentives for people to use mobility as a service. Up in the upper right hand corner is connected living, which I also want to focus on that is so important in role communities in terms of health care, education, entertainment, getting people to those activities that are really life activities.

We have some on demand services, but the core of mobility is a service you can see is right in the center. It's the customer. It's the person who wants to make a trip. And the other backbone of this typically is public transport which I’ve highlighted.

So let's kind of focus on some differences. I'm going to focus on what makes mobility as a service somewhat challenging in a rural environment. And that's kind of where I have the big red arrow. Although mobility is a service is more challenging in a rural environment, there are some common features in different geographic regions. So remember the definition. Part of that definition is MaaS is a one stop shop.

That's true, no matter what geography you’re in. You also want to be able to facilitate payment of a whole trip. That's common. You want to provide multimodal options for travelers and you want to consider individual preferences. And again, I think Dwight's got some great examples there, and then we have that idea about incentives for people to use it.

But you can see on the slide that there are some key things in rural areas. One challenge we have is to make transport overall efficient, and that's very hard to do particularly when you're using services like taxis and a taxi is taking one person to one location rather than using shared modes. So we really would like to as much as we can kind of focus on the shared aspect of this, and we want to make sure that we have a sufficient level of services as well. And we really need to focus on accessibility and equity.

So those are things that I think are important for folks to take a look at. So we do have this kind of lack of services in rural areas, and so sometimes in a rural area, what you might want to focus on is that first and last mile to get someone to a perhaps a public transport service, for example, and that public transport service maybe miles and miles away from the rural area. But that could be one way of providing more mobility.

And also, we want to look at things like accessibility and equity of the service. Equity might be, for example, that somebody just pays as they go and they don't purchase a subscription, which is also discussed in the concept of mobility as a service, you have a page to go option or you have a subscription option. Perhaps in the rural environment, you could have one or both of them, and we'll get to that in a bit.

This is just a slide. I'm not going to read all the words to you. I want to focus on a couple of things that I've already mentioned, but I want to reinforce them. On the right hand side of this slide, there is a relative priority of mobility services in a rural area if we're really looking at equity. And this was part of a very big study that looked at mobility equity across rural suburban and urban areas, and the relative priorities all look different.

Here, you can see something like a carpool or a van pool. That should be really a very high priority to provide that to the public. So that's why it shows up as a high priority and also people who have more efficient vehicles of their own like electric vehicles, that should be made a priority, and then public transport which may or may not be in a rural area, that should be a priority if it’s there.

So this slide is actually directly from Dwight. I am not going to take credit for it, but this goes back to our discussion about the sort of lack of supply that we might have when we're looking across all of the mobility's services that someone could use. And so Dwight's thought and I thought he put it together in a picture really well, that sort of says, well, how could we boost the mobility supply, for example?

How could we do that? We could provide some benefits for people that might drive a van pool. We're going to pay for the gas. There might be some other incentives on the driver side pretty much in rural areas, you're always looking for volunteers. There's never enough of them. So is there something we could provide them by way of incentives to maybe drive a van pool, for example.

So here's where I would like to tie together the thought about mobility management a little bit. And this is a sort of reinvention, if you will of that concept of mobility as a service. We've got our enablers, we've got our connected living, we've got all the same components that are centered around the trap work. But we can start to look at this in a mobility management sense.

So what technologies do we need because we need someone when we’re talking about the bigger mobility management picture that we face in rural tribal areas and small urban areas? We also need the partnerships and the policies that allow us to provide some of those services through a concept like mobility as a service. And we certainly have data and reporting needs. So mobility as a service starts to look a lot like our typical mobility management needs.

So one sort of food for thought for folks is when you're thinking about mobility management or mobility as a service concept, I think it's very important to actually have some guiding principles This is just an example for you of 10 guiding principles that not only guide the mobility as a service concept, but it also guides some of the policies that you might put in place for mobility's service providers, like car sharing or bike sharing system.

So I'm actually going to skip over these two slides, but I really like -- this was an interview with one of the visionaries in mobility as a service from Finland. And someone that Dwight and I have actually met before. And he's been asked yeah, so mobility as a service it’s an urban solution, and you keep telling us that it's actually possible in a rural sense.

So that first sort of bullet there. Mobility as a service is not about getting rid of cars. If you hear people say that most of them are in urban centers and what they're saying does not apply. This is not a one size fits all concept. It has to be tailored to the geography to the people who are traveling. So you can go back and take a look at these little bit later.

So somebody that's sort of a visionary and mobility as a service here in the States is from AARP and Janna, you can see her name at the bottom of the slide here. She sort of said, “Janna I really like this concept, but I'm not – again, I'm not sure it applies particularly to rural areas that tend to have a lot of demand response services.” So she sort of said, “Well, to make this work, we need to look at the challenges that we have out there now with demand responds, what are our challenges?”

You have to make reservations way in advance for a trip. That could be very inconvenient. There's often inadequate funding or the funds. You get one set of funds this month, you get another set of funds three months later, your first set of funds run out before the second one runs out. So we have a bunch of challenges. So is there actually a universal concept that we can look at? And it comes back to the concept of mobility as a service.

So here's how she pictured it. And again, I'm not going to talk through all the details, but I want you to look at the lower right-hand corner of the slide here where it says, “Community based mobility platform.” What do you see there? You see the elements of most rural services. There's volunteer drivers, there's veterans programs, there's a senior center. Then if you look at the box right above that, you've got human services that are available as well.

So I think that's a very important part of it. And the other thing that she does a very good job of is saying this platform or this concept needs to be open to everybody. We can't be using a lot of proprietary things, and that brings me to this slide which says that you may have heard that Uber just as an example, they developed what they call mobility services app and it actually is mobility as a service.

It fits the definition. But what it doesn't do is it does not give the traveler all the possible options. For example, there's no option to get Lyft on an Uber app, so we call that a walled garden. And that's just a term that says that platform is more limited in terms of the number of services that it provides.

So this is an example. It's a little more suburban than rural, but it's Dayton, Ohio. And the reason for me presenting this quickly is that they decided as a public transit agency that they should really be in control of a concept like this. So they have started to build their mobility as a service system based on an integrated payment platform. They operate a bike shared system themselves, so they've taken that on, and they want to make sure that this is an equitable system that everybody can access.

Then I wanted to give you an example from several of you might be familiar with the Michigan Mobility Challenge, which provided $8 million across many different projects in Michigan to show advanced concepts and mobility particularly for persons with disabilities. And this was a project that was called Rides A-GoGo. The demonstration is over.

It encompassed three rural transit providers, and it had a lot of lessons learned in kind of the weeds which we don't have time to get into. But I gave you a reference that you can go to and really look at. In fact, of you Google Michigan Mobility Challenge. You will come up to the Michigan DOT web page and you can click on the documents that exist.

This is another food for thought like, where do I even start thinking about mobility as a service, and this is kind of an-I think it needs timeline that says, look, we need to approach this slowly. And what are the important things that we need first before we really get too far along and we can't continue because we don't have the right building blocks. So this is their idea of building blocks, and I think it's really, really important that they started with the discussion of partnerships.

And a lot of phase 1 is based on developing those partnerships and beginning to explore how those can work together in a mobility as a service system. And I did want to make you aware of a couple of different projects that are going on right now, where in the not too distant future there will be a tool for you to use that will help you figure out the readiness of your area for a mobility as a service system. This is just one example from a couple of years ago. This is in Australia. You can't read anything on the right-hand side.

There's another one that just was developed and I'm hoping to get some information out people in the white paper on that one but that will be a tool that's available. And we can't forget -- I'm going to close things out here. We can't forget that we need to evaluate how we did on building a system. And there's some great frameworks that are being developed to evaluate. And I'm not going to read through these. You'll have access to these slides, I believe. So I'm going to end it there since I went over my time and send it back to you, Sheryl.

**Sheryl**: Okay. All right. Thank you so much, Carol. And I just want to tell everyone that Carol is the author of N-CATT white paper that's going to be coming out on mobility as a service. So you can look forward to having that within the next couple of months and we're going to go next to Dwight Mengel. Many of you may have seen Dwight at a transportation conference near you during the last few years. He's really been talking about his mobility as a service plan.

Dwight is the chief transportation planner of Tompkins County, New York, which is in and around Ithaca on he is a 30 plus year career developing community mobility services from positions in the Department of Planning, Public Works, Public Transportation and Social Services. And he directs an extensive mobility management and coordinated transportation planning program. He has been developing his current mobility as a service model for several years, and he was selected as a grantee of the Federal Transit Administration for this proposal.

And I believe he just got a phase 2 grant not too long ago to implement the MaaS program, which is scaled for a small urban and rural communities. And I'm proud to say in 2015, Dwight received theme George Drucker Memorial Award from the Community Transportation Association of America. And you will see how innovative he is. And he's very lucky to be working in an area that allows him the room to innovate.

**Dwight**: Alright, my name is Dwight Mengel talking to you from a very hot upstate New York, Tompkins County. Tompkins Counties in the Finger Lakes region of New York has about 102,000 people, 54% live within one smaller urban area the government area, 46% live in rural towns around Ithaca.

We're fortunate to be a regional growth center. We've grown in employment, economic development and population consistently since I believe like 1920. 20% of our workforce commutes from outside of the county, which is a lot, and our largest single employer is Cornell University. So we have a very diverse, economic sectors, but higher education and the health care is over 50% of all the jobs and so forth.

Mobility is a service. Everybody has their own definition. This is my simplified one, and we've been successful in that. In 2018 our county was accepted into FTA's on On-Ramp program. We were ready to work on our local MaaS concept. We received technical assistance from the shared use Mobility Center from Chicago. And we have a long history of incremental mobility innovation, and that's why we were selected for the On-Ramp program that prepared us to apply for the FTA's IMI funding last August, and we were awarded a grant in March. So let’s move on.

We have a broad family of mobility services for our community, and when I say mobility service, I mean actual mobility operators plus information services. Two unique services are EPICA Carshare and Way to Go. EPICA carshare is the oldest, largest, most successful community nonprofit car share in the state. Businesses, the public sector, nonprofit agencies use carshare to provide work related trips. In fact, they also use them to provide transportation, volunteer transportation trips to services. Carshare has a little cost membership plan for low income households.

And moving on, the Way to Go Program, which is operated by Cornell Cooperative Extension created a comprehensive community mobility education program to inform people of their mobility choices. And since Cornell Cooperative Extension has over 100 year history of their community based education and outreach in the rural areas, they have a lot of credibility in terms of their information and the Way to Go Program.

Way to go also trains employers and human service agency staff about mobility services to advise their employees and clients. And that was a critical missing piece because there are many people in every community who are advising people about their choices and what their clients are on what their choices are. And they really need to be informed so that they know where to go in where the customers are going.

So, before On-Ramp, we described our Mass idea as a single concept. After On-Ramp, we identified two phases and we're proceeding with developing phase 1. Phase one begins with multimodal trip plan. What is interesting is that right now, currently, only our public transit operator, which is called T-CAT and one of three commuter bus services stream real time location data usable by apps. Reliable trip planning will grow when more service providers publish real time data.

We are planning a new app that will evolve over time to publish and integrate all available mobility service data. At a minimum, there will be a one button phone call directly to every mobility operator in our community or a link to their app. We realized that mobility services evolve on their own time. We hope that our investment in an app may encourage faster evolution and the app is not only to be used by people on a smartphone. The app is really will be used as I will discuss later in our 24/7 call center, to answer people's questions.

So MaaS is closely allied to increasing the supply of mobility services especially in the rural areas. Way to Go works with nine volunteer driver programs to increase the number of drivers and crew coordination. We have a finger links rideshare program working regionally to increase the number of rideshare drivers to reduce the number of single driver commuters. But as what Carol mentioned, supply and increasing supply, especially if you can do it in an organized way, is really essential to broad. The last new service that we have coming on board is a pilot program with TCAT and our parent transit operator.

They have a first mile last mile pilot. They were all set to implement this in April. It's been postponed to the full. Their app, which coordinates all of the logistics between the bus operators, the paratransit operator and the customers. It has been tested, it has been field tested. It is ready to go. And so they're ready to go. So where this ends up as part of the MaaS program is that our Phase 1 project will fund TCAT’s first and last mile pilot for a second year in 2022 to better understand the feasibility of extending the services throughout the other rural towns in the county and that's what we're working on.

Customer service. Multimodal 24/7 customer service. Last fall I was recently in an extremely large urban area in Texas that did not offer 24/7 information that could be verified by a human being when you call them up. And so that's a real goal that we have to do it and we have the capacity to do it because two of our existing service providers already offered 24/7 service, and that ends up being EPICA Carshare and 211 information and referral. Our new call center will help people plan trips and recover from trip failures.

I cannot emphasize enough the ability to help people recover from failures when no matter what happens is completely essential to having people wanting to take the risk of using MaaS or other types of services. Otherwise, when things go wrong, they go really wrong. And it's very difficult to restore people's faith that they're not going to be stranded especially when they make the mistake. They miss the last bus, it's snowing and they weren't paying attention when the last bus was going to be leaving. People make mistakes all the time, and sometimes services fail to execute properly.

You need to have really multimodal customer service. And I see that as integral, as important as multimodal trip planning for the Maas service. Now, when we do our pilot, we will be testing and evaluating our objective of supporting customers of all mobility services. But we're going to have a phased approach in the growth of membership of the guaranteed ride program over time.

So we understand better in terms of what demand do we need to -- What is the demand that this could likely call for us. And how can we create supply to assist people when they have problems. The general model here was to use a triple A tight roadside emergency program, but apply it to everything else other than driving along.

So during the On-Ramp program, we learned about the Business Model Canvas and what you have before you is a Business Model Canvas of our phase 1 program. It's a useful tool for planning and documenting a project over time. It is a work in progress. It evolves throughout developing the business model. It will continue to evolve as you implement your business model and as you adapt your business model to what you are doing.

This is one of the really key organizational tools that we found to articulate and look at the key relationships and values and costs and revenues and channel and customers being served and I strongly and encourage you to Google Business Model Canvas and learn how to use it. We found it extremely important business risk.

Well, creating two phases to develop MaaS allowed us to concentrate on the work elements we understand well, and I believe we understand phase 1 well, and we would assign that a relatively low risk. We know what we want to get from our multimodal trip planning and customer service, and I'm confident that we're going to be able to organize the customer service center.

Phase 2 though, there's many unknowns. There's a lot of work that needs to be done, but we know there are potential partners to help us with that. Funding. Shortly to get to the point, the FTA awarded us $820,000 to begin developing phase 1 and we have 2 years to do it. We have 1 year to develop it and 1 year to iron it and that's where we are.

Lessons learned. We've learned from the On-Ramp program. We had a really good idea, but we needed to refine that into a successful proposal. So the first thing that we did and we didn't do it willingly, but we came to the realization we really needed to split MaaS into two phases. We needed to select a lead agency for phase 1 on which is the county's transportation planning, and we really need to keep looking to advance innovative practices in rural mobility of service delivery including everything, everything that we can do.

And from this I take some theoretical guidance from Theodore Roosevelt, who said, “Do what you can with what you have, where you are,” And that is how we began to developed phase 1 and apply to the FTA for a funding.

And the last thing is don't over promise. It is better to under promise and over deliver. And that is what we are working on. If whenever FTA comes out with another On-Ramp solicitation, if you have a good idea, I encourage you to apply. You will not only get good technical assistance to prepare you for a future funding opportunity, but you're going to learn a lot from your On-Ramp colleagues that are selected from around the country.

We had six people, six entities from around the country, and we all learn from each other. It was extremely useful. So with that, I'm going to stop and turn it over to Sheryl, and I encourage any of you to reach out and contact me if you want to have a further discussion about anything that I've presented, and we can always make a zoom meeting. So thank you very much. Thank you, Sheryl.

**Sheryl**: Thank you. Okay. If anybody has questions, please put them in the Q&A. Rachel Fictambaum has a great question. And, Rachel, we're going to wait till Caroline is done, because I think this is a question that all of our presenters will have something wonderful to say about. And our next presenter is Dr. Caroline Rodier. She's from the other side of the country from California. Caroline is a researcher at the Institute of Transportation Studies at the University of California at Davis.

And her primary areas of research include transport, land use and environmental policy analysis. Caroline was actually on our GTFS webinar about a month ago. Her current modeling research involves the travel effects of alternative new shared mobility systems including automated vehicles. And she's doing work in the rural San Joaquin Valley serving disadvantaged populations.

And she also recently authored a report on how autonomous vehicles and shared mobility can address driving challenges for people with developmental disability. So really getting to a lot of those equity and accessibility issues that were always very interested in.

**Caroline**: So the project I'm presenting today. Is Ecosystem of Shared Mobility in the San Joaquin Valley? It’s a case study that shows how MaaS can link people and their travel needs to multiple integrated mobility services. MaaS is now really becoming the backbone of a system of expanded mobility in the valley. Can you advance the screen, please? Okay, this is the overview. So I'm going to start by briefly describing the valley. The problem motivating the project and the background on the community based planning study, we used to develop our project concepts and then, finally, a more in depth discussion of our MaaS system, including next steps. So I'm going to start with some geographic background on the San Joaquin Valley. I'm sorry, I didn't tell you to advance a slide, please.

**Sheryl**: That's all right.

**Caroline**: Okay. Advance the slide to the food basket of the world. The San Joaquin Valley is California's single most productive agricultural region and one of the most productive in the world. It produces more than half of the fruits, vegetables and nuts grown in the US. In this map, you can see that the valley is dominated by agricultural lands. The small pink areas are residential and commercial lands. And so you can't see the communities in pink that our projects serves, so they don't even really show up on this map.

So just to let you know our locations are highly rural. Okay, California has classified most of the valley as economically and environmentally disadvantaged. You can see the crosshatched areas and this is related to eligibility for funding, capital trade funding for transportation and other projects. So this area has some of the worst air quality in the nation and high rates of childhood asthma. Next slide, please.

This project focuses on access poverty and emissions in the Valley. Next slide, the challenge is to rural transit service. You know, I'm sure everyone's familiar with, but I'd like to set the context for this specific pilot. We're faced with dispersed development patterns and long travel distances, which lead to low transit riderships and low fare box revenue. This ultimately leads to cuts in available transit services. So most of our pilot communities, if they're lucky, may have only one round trip a day to the nearest city in their county. Rural households living in poverty… Sorry, are you there Rural households living in poverty?

**Sheryl**: Yeah, I am.

**Caroline**: Okay, good. Low levels of transit service and the relatively high cost of personal vehicle ownership contribute to low access to opportunity. Next slide, please. In general, however, of long travel distances and lack of alternatives to the personal vehicle lead to increasing levels of auto ownership, vehicle miles travelled and emissions. Next slide, so in California, legislation requires Metropolitan Planning Agencies, or MPOs to develop land use and transportation plans to reduce greenhouse gas emissions. We have very aggressive greenhouse gas emission targets for our state.

The Valley and the MPOs within the Valley were urged to develop plans with measures that are typically applied in major urban areas, for example, transit oriented development and fixed route transit. However, the Valley was concerned about the efficacy of these urban measures in largely rural regions. And in fairness, there's not a lot of peer reviewed research on what works in rural areas and what doesn't. I love that Carol brought up the green outlining report of your green lining recommendations. I think those are good, but they're largely interesting.

However, they're largely green linings opinions. A lot of what, a lot of the suggestions that air kind of imposed or suggested to the Valley really are not based on much evidence and they really feel very frustrated by them. It tends to be kind of urban-centric attitude in California in general, since I've been developed doing research on rural areas I have become a lot more sensitive to that.

So in general, I think we need to be a lot more humble about trying things, see if they work, modifying them or doing something again because there's really not a lot of evidence for what works and what doesn't work in these areas. But anyway, as a result, we did a planning study to examine new technology and shared mobility services to meet mobility gaps and reduce emissions. Next slide, please. UC Davis led a community-based planning efforts effort in partnership with the Valley which included stakeholder engagement focus groups and data analysis.

Problems were inventoried by location and included inner city transit gaps, very high cost transit routes, obviously to the provider and services with low fare box recovery, as well as communities with very low vehicle to adult ratios. We also identified and evaluated some new technology and shared multi alternatives that look promising, and we felt like we could implement within a year. Next slide, please.

So at the conclusion of the study, we identified three pilot concepts for implementation. We secured financial support from California's Low Carbon Transportation Fund to implement the project. These pilots include an electric vehicle car sharing service, and affordable housing in the Southern Valley. The pink areas are the rural site locations, the pink areas in the circles there, a MaaS in the Northern Valley. MaaS would be implemented throughout San Joaquin and Stanislaus County and then a volunteer ridesharing service that served the areas highlighted in pink, which are highly disadvantaged urban areas, rural areas with extremely low transit service.

The MaaS platform was really envisioned to try to knit together existing and new services. As we anticipated, they would begin to expand throughout the Valley through other low carbon community-based transportation projects. So in contrast to Dwight's Ithaca area, we have very few of the types of programs that non-transit programs that provide rides to residents in these areas. Okay, next slide, please. So just really quickly. This is Miocar.

It's our round trip electric vehicle car sharing service. The vehicles can be rented for $4 an hour and $35 a day. The goal is to provide car sharing at a price point that is more affordable than owning a vehicle to highly sensitive, price sensitive populations in the areas where these services are provided. And these communities also have extremely low transit access, so the hope is by increasing their accessibility and hopefully providing an alternative to a second owned personal vehicle. And we don't have time to talk about it today, but we've seen some very different usage patterns and people's willingness to travel to actually get to these cars. They're willing to travel up to 15 miles, and they often take transit actually to get to these cars.

Okay, Vogo offers free. Next slide, Vogo now. Vogo offers free rides to residents in rural disadvantaged areas again when transit is not an option. As the volumes of rides grow, so does ride sharing volunteers provide rides with their own vehicles and are reimbursed at a per mile IRS reimbursement rate. The local nonprofit moves, recruits and trains drivers and, the Volunteer Transportation Center I think many of you in upstate New Yorker are familiar with them.

They're providing are back office dispatch, scheduling and routing service. We were really on a very tight timeline to get this going. So we drew on expertise in the US and outside of the US. Reservations can be made up to two days in advance by our MaaS system which I am going to delve into now. Next slide, please.

So now I'm going to go talk a little bit more about our MaaS system. Now that I shared kind of the background on this study. Okay, next slide, please. Okay. So I'm going to share with you kind of what our perspective was. I think it kind of jives with what Carol was talking about. But this was kind of our perception of the user system for MaaS. We envision the user wanting to know what's the best way to get from A to B by time and cost for all available modes. When will my ride arrive? Is a space available on the service I provided? Can I reserve a space and then can I pay now? Next slide, please.

Sheryl: There we go.

Caroline: There we go. Okay, this is our little interpretation of MaaS from a systems perspective, we start thinking in contrast to Carol's. Maybe I think Carol's might be better. She starts from the user, but we kind of focused on what the MaaS platform couldn't do. And then what needed to be integrated with the platform in order to answer user questions. So we see the platform as integrating different services in their data.

The smart app is the interface between questions and answers that the users might have. Okay, so moving on to the next slide. How do computers communicate? It may seem really basic, but we found that this is a key problem with practical Maas problem implementation for right now. Our vendors for our MaaS were the Kitty Company in Norway and also we worked with Trillium on the open trip planner.

So the MaaS platform needed to communicate that we contacted with. We need to communicate with mobility services via API’s data. However, we found that many service providers don't want to connect to the MaaS because of concerns about competition, protection of software secrets. And sometimes they don't even have an API or they say they don't have an API. So if there is an existing contract, it can be really tough to get them to connect to the platform.

If a service provider is willing to connect to the MaaS platform because there's no standard APIs and data structure for the integration, each integration is an expensive one off, and it can cost anywhere from $10,000 to $30,000 just on the MaaS side, not including what the vendors, what it costs to the vendor to modify their app or data structure anything or protect their secrets.

Because of these challenges, we have recommended to our program partners that they require a contractual agreement with subcontractors that they will integrate and pay for the integration with MaaS. So, I mean, if you're just starting this, it's really an important thing to start discussing with your vendors because we had a really hard time with our Dial a Ride providers, in particular. Next slide, please. I'll go through this really quickly.

So I think Carol touched on this today in the US private companies such as Uber and Lyft to use MaaS apps to promote their mobility services. In some major urban areas, transit is included in the app, users must pre-select the modes they want to use. At the time I did research on this, I couldn't find an example where they were combining many of these. The service is available in one trip, for example, e-bike to transit to ride hail from location A to B. That may have changed now. Maybe Carol can comment on that later.

So this was our grand vision of a public MaaS in the San Joaquin Valley. Next slide, please sorry about that. The open public MaaS model would include all available services. They would be combined to provide mode choices to more destinations and to minimize travel time and costs, given the user needs. So we see it as a public facing platform that may lower barriers to market entry, especially for small local providers that may pop up in some of these rural areas, and we'd like to foster those certainly and increase service supply and lower costs with more competition.

MaaS also enables the creation of individual accounts and codes that allows for promotion and potentially to facilitate application of subsidies for special groups in California. We have a lot of those. I'm sure other states and counties have those as well. Okay, next slide.

Okay, so that was the big picture, and we had to focus on what we could kind of do within a year. We were on a really tight timeline, though basically are short term goals were integration of transit services across transit agencies and between fixed routes, demand responsive transit and Vogo, our volunteer rides program. Reservations for Vogo and our Demand Responsive Transit as well a streamlining transit payments and subsidies. So today, what can Vamos do?

It does allow for transit planning across 14 transit agencies throughout San Joaquin and Stanislaus County. It provides turn by turn walking directions and real time arrival information for those agencies that have this available. So we were able to link Demand Responsive Transit to fix route transit. However, we weren't able to allow direct reservations with Demand Responsive Transit because of the issue I mentioned before. However, the information on how to reserve a trip pops up in your trip planning screen.

So we have recently integrated reservations for Vogo and that is now functional and working. And we were also able to integrate separate bicycle trip planning. But it's not integrated with transit yet. Okay, next slide, please. So these are all the transit agencies we worked with. For a number of them we did have to create the GTFS data set for them. Not all of them had it. Okay, next slide. Okay, so this is the videos I'm going to show. This little video shows Intercounty Transit trip plan from Stockton to Modesto. Those are our two San Joaquin – oops is it not working?

**Sheryl**: There we go.

**Caroline**: Okay, Stockton, in San Joaquin County to Modesto. This is a big deal, because the counties don't really coordinate. You can see the little Wi-Fi icon. This shows how you can schedule the trip with three options, and you can do it by date and time. Here are your options and she's going to show one. So here are the turn by turn directions. And this particular route suggests that you take a train and then you take a local bus. Okay. We can stop that and move to the next one.

Okay, so this shows us a trip within a city called Manteca in San Joaquin County. And this is going to illustrate the Van Gogh micro transit service and bike route and directions. Here you've got a bus and a bike route that have been deemed feasible. So Flex, that's our Van Gogh – and it tells you to download the Van Gogh app and then you can reserve there. And then this is just information about the bicycle route. Okay, we can stop it.

Okay, this slide is going to show deviated bus. Deviated shuttle bus and it’s going from Riverbank to Modesto and Stanislaus County. The little Wi-Fi icons are real time information. So here you've got Flex that pops up, and it gives you information on how to call to reserve that deviated bus. Okay, so I think we can stop that and move on to the next one in the interest of time. Okay, here's our Vogo reservation. Our volunteer transportation reservation.

**Sheryl**: Should I hit that?

**Caroline**: Yes, please. This is going from Oakdale in Stanislaus, two French Camp and Smart Community in the San Joaquin Valley. Okay, see, Vogo tops up right ahead, and you can see that the other two Transit Rides in this area took about 12 hours. So that's why you get Vogo. If someone wanted to take Transit Ride, they could take Transit for a duration of 12 hours or they could take Vogo. So it will only pop up if there are no other alternatives.

**Sheryl**: Okay.

**Caroline**: How are we doing for time? Did you anyone want to -- so next steps for Vamos. So we were funded also like Dwight from the FTA Innovated Mobility, I think I got the name wrong. I apologize. Anyway, it's FTA’s IMI. We were funded to integrate fare payment with transit planning in our app in Stanislaus and San Joaquin County. San Joaquin County Regional Transit District is the lead applicant on this.

We are also going to work on how we can standardize integration data and APIs with other mobility services that are available or will be available over the next couple of years in these regions, including car sharing, ride hailing and micro transit. And most importantly, we're conducting a lot of outreach and institutional analysis and marketing analysis to understand the feasibility of implementing MaaS with the rural collective of jurisdictions and counties because for implementing MaaS is feasible for a major city, but probably not so much for smaller rural counties, and communities. So we're hoping we can have something to say about the feasibility of this moving forward. Okay, next slide.

Okay. I'd like to just call out all our amazing project partners. I don't even think I have all of them here. Query and Trillium directly our direct consultants with our MaaS system. Okay. And if you could just forward to the next slide, that's it. Thank you. And if you have any more questions that we can't answer today, please feel to reach up to me via email. Thank you.

**Sheryl**: Okay. All right. And now you should be seeing the email addresses of all our presenters if you want to contact any one of them. We have some interesting questions to start with, so I'll go right away and again please enter those in the Q&A box if you have any questions. The first 2 questions are very much related. A question about readiness for MaaS making yourselves ready. What does that mean and how to start? And I don't know, Carol, if you want to start with that and then we'll go to Caroline and Dwight.

**Carol**: Yeah, I mean, there's so much information. It's almost like information overload. And that's why I like the question, particularly in a rural area. How do you start planning for this? A couple of the slides, I think in particular that road map slide that I had. It's really a matter of the partnerships before anything else. And I think Dwight can speak to -- He's in a county that works very well together, and they did do a lot of planning.

They sort of understood what the vision was and they were all willing to participate in moving it forward. I think, from my perspective, looking at some of these things around the world. It doesn't work if those partnerships don't exist. So I'm imagining that a lot of the rural providers have already spent a fair amount of time talking about coordinating services. That's thing one. And you've talked about that probably because you've been doing mobility management for a long time.

**Sheryl**: So mobility management is like it’s your 1.0 step to getting to MaaS, which I would say is more like 3.0?

**Carol**: Yeah, I mean again, it's the partnership thing. It's not just the sort of demand response providers then you've got to bring in whether you have a carsharing bike sharing whether there's an existing carpool or van pool, whatever and the transit. Everybody definitely needs to have a shared goal of what they're trying to do.

The other thing that I see that doesn't work very well, and I think Caroline, your examples are so good, is because of the planning that was done and willing to get out there and put something out there to see if it works. A lot of people are afraid of that. I think we need to do that because as you pointed out, we don't have a lot of great examples to go from. So that's my two cents or less.

**Sheryl**: Okay, and Caroline, do you have an answer to that?

**Caroline**: Yeah, I do. I guess we did do a lot of planning in advance, and we did the grant kind of helped from AARP helped organize us. But once we got that app and were able to show the policy makers that we had the app, it really got them moving independently, independently San Juaquin County did their fair integration plan, and independently they decided to integrate that into to the MaaS platform.

So I'm really seeing it we have eight counties and they try to work together and they do work together really well but there's no kind of overriding planning agency, and I think this is kind of giving them, like I said, it's kind of a backbone were hoping it can expand throughout the county because there isn't a lot of Intercounty travel and rail in the county. So I think it's become kind of a unifying force and every situation is different. But I wouldn't say that would work for everyone. But that's what I've worked. I've seen here and helped.

**Sheryl**: And Dwight?

**Dwight**: Caroline’s example I find incredible because they went regional. I mean, scoping and the work, it's regional as supposed to oh well start with our county and then go regional. So I applaud your bravery, collectively bravery. Mobility management and having a history of it, a successful history of it, a willingness to put money into it is completely essential, because from that from the collaboration and trust you need to move on. And I’ll just stop there.

**Sheryl**: Okay, I'm sure we have tons of possible questions, but I think we'll go a little bit longer because we still have some questions outstanding. And for Caroline, there's a question for you about how you integrated accessibility for people with disabilities into your MaaS Program or is that a work in progress?

**Caroline**: Well, right now we have in the carsharing, I can't remember what they're called, but the Driver Assist, Pedal Assist, if someone can help me? This is an operational term. But we provide those people can reserve those in advance. We don't do anything else right now. I mean, it’s what we want to do. And we're moving forward with this in the future. This was a very -- this pilot has really only run for about a year, and we have just -- But that is definitely on our radar and we will be speaking to our funders to make sure that it is front and center and if they agree to fund us for next tranche of expansion.

**Carol**: Sheryl, if I can just –

**Sheryl**: Sure.

**Carol**: It's sort of… I've been looking at the accessibility question in MaaS for several years now, and I guess the good and bad of COVID-19 is that some of the brand new MaaS platforms are not only looking at the availability of seats on vehicles, but they're also looking at the availability, for example, of accessible spaces on vehicles. And they're looking at some other issues that are so very important in accessible travels. So someone's traveling in -- They're going from a rural to an urban environment. They may be traveling to an urban environment where they need to be concerned about elevators and escalators. And so you need information on that as well. You know, again that that sort of complete trip that we're all talking about now.

So I think the good thing is we're starting to see more innovation about adding the accessibility features. The one issue that I will mention about eligibility because that's an agency by agency decision of individuals being eligible for ADA service, that's a little bit tougher nut to crack because everybody does their own eligibility process. It's not universal, which is a bummer, but we won't go there.

**Sheryl**: Right. That’s a different webinar.

**Carol**: But we need to keep those issues raised and Rachel I'm glad you asked it. Several years back, I wrote a paper about how do we bring accessibility into this and the technology has changed so much. We just need to keep that ball in the air, we need to keep asking those questions of the people who are not only providing the technology platforms but the service providers because we got a bunch of service providers out there who still refuse to basically provide accessible via goals and things like that.

**Caroline**: I do have something else to mention about the California is recently kind of following Chicago's model, where they're taxing the PUC here is taxing Uber and Lyft, the ride hailing companies. And we're hoping that that money will become a fund whereby we can purchase these vehicles and perhaps through in a MaaS app they could be made available for ride hailing or other services.

**Sheryl**: Right. And it's important to point out, I think what you both kind of alluded to, which is accessibility is not one thing. It's not just wheelchair access, its access for people with cognitive disabilities. People with sensory disabilities those all have to be taken into account, and they're not always in the kind of mainstream thought process around MaaS.

**Dwight**: Right. Yeah.

**Sheryl**: And with that, I think we will call it a day. I thank everybody for their patience with our technical difficulties. And I think we've had great information, even information from some of our participants, which I'll share as well. We will post this webinar are so anyone can access it and access the slides and the transcript and Carol's white paper, of course, when it comes out. So thank you to our presenters. You're doing such great work. And I am sure that we will have future programs highlighting what you're doing because I'm sure that you'll also learn a lot in the next year or two as things go forward.