Marcela Moreno: Welcome, everyone. We'll give a couple minutes for everyone to trickle in from the waiting room since virtual waiting room is certainly a thing now. There's couple coming through, but we can go ahead and kick it off. Welcome everyone to Collecting, Managing and Making Decisions From Data Webinar hosted by the National Center for Applied Transit Technology and our presenters Foursquare Integrated Transportation Planning. Welcome. As we all have been on Zoom for the past year now, I'm sure everyone knows, but the Q&A is our place for questions throughout this presentation. And if you have any questions or any concerns, feel free to put those in there as well and raise your hand as well is awesome. Next slide, Adam.

So, a little bit about the National Center for Applied Transit Technology. We are a Technical Assistance Center that is formed by cooperative agreement with the Federal Transit Administration and operated by the Community Transportation Association of America. We work with small agencies to navigate them through the technology landscape which is rapidly changing. We produce resources on adopting emerging technologies such as this webinar and guidebooks. We have a series coming out in the next couple of months on green energy data management, which is the webinar you're here for today, new software decision-making as well as virtual public engagement and all of those resources are on our website.

We also provide technical assistance to adopting new technologies for transit agencies through our technology strike teams and state summits and finally develop hands-on workshop on how to implement different technologies. We just finished registration for our two this spring which is on data management and then digital tools for system redesigns. So, I highly recommend signing up for our newsletter or following us on social media for when we announce our next round of workshop. So, I'm going to pass it off to Andrew for an introduction and then I can introduce myself. Hi, I'm Marcella. I'm your moderator today. I'm the transit technologist for N-CATT.

Andrew Carpenter: I am Andrew Carpenter. I'm the director of N-CATT and excited to have you all here. Thank you.

Marcela Moreno: Our presenters today from Foursquare Integrated Transportation Planning and our transit agency invitees. Adam, do you want to kick it off with the intro?

Adam Recchia: Sure. I am Adam Recchia. I am a senior transportation planner and also our data science team manager at Foursquare and the project manager for the development of the guidebook. Reinaldo, do you want to go next?

Reinaldo Germano: Sure. I'm Reinaldo Germano. I'm a senior transportation planner at Foursquare ITP and I've also worked in this guidebook as deputy project manager.

Adam Recchia: Chelsea, do you want to go next?

Chelsea Youngs: Sure. My name is Chelsea Youngs. I'm planning specialist at Carter. I am located in New York, Pennsylvania, rural northwest town and I will be talking about the GTFS builder app.

Adam Recchia: Great and Brad, do you want to introduce yourself? You're on mute right now.

Brad Rader: I'm Brad Rader, the operations supervisor at Pullman transit, a small rural agency in the great state of Washington, small town of Pullman. Sorry. You can't see me, but apparently technology hasn't reached Eastern Washington yet. I don't have a camera on my computer so.

Adam Recchia: Great. Thanks, everybody.

Marcela Moreno: All right. You guys can kick it off.

Reinaldo Germano: Thanks. On today's webinar, data collecting, managing and making decisions, we will discuss the main findings from N-CATT's data practice guidebook. This soon to be published guidebook was developed by Foursquare ITP and it's meant to be a resource for agencies seeking actionable insights from data. What is the data practices guidebook? The data practices guidebook outlines how agencies can obtain data and how to use data for planning and monitoring service, leveraging partnerships and increasing access and equity. Beginning with an overview of how agencies can obtain more and better data, the guidebook addresses the state of the practice and emerging tech trends in data collection management, data standards and open data resources.

On this foundation, the guidebook then moves on to guiding agencies on how to use data for the purposes I just mentioned. Several case studies demonstrate how small transit agencies are already implementing good data practices and Chelsea and Brad are here today to talk about two of the five case studies we have in the guidebook, where we highlight the context around the practice implementation, the resources that are needed, the results as well as lessons learned and key takeaways. Adam will expand on the role of data in the decision-making process. But one thing this guidebook and the case studies have shown is that good data practice including better data collection and management effort can help agencies maximize of data and contributing to decision-making and problem solving.

Here, we have a graph illustrating how we can go about this. So to use data to solve problems or improve our decisions, we first need to define a problem. We have an example here. Buses are running late and are overcrowded on certain trips. So, the next step we have is to identify the data that we need. Again in this case, we will be looking at bus runtime and the passenger load data. Then we move on to what we really tackle under guidebook, that is how you obtain data. So, the first step is collecting data and in this case, it would be conduct ride checks or compile APC and AVL data. But as we discussed there, once you have data every day they need some sort of treatment when it comes to step of cleaning and formatting this data.

In this case, it might be just removing some potential errors in the raw data. Then we move to how we're going to use this data. So, the first step analyzing data. Again for this example, it would be identifying trips that have high passenger loads and are late, so the level of lateness and then we visualize this data. In this case, we can build charts, floats and runtimes by trips, for example. And last step in using data is enacting changes and developing tools. So, this has a broad range of actions that you can take. You can go about in this example. First, adjusting some schedules or adding a trip or you can go as far as deploying real-time information interface so that passengers can know in advance on time buses are or how full the buses are.

Talking about this guidebook, this webinar is divided and structured around two sections. The first section is obtaining data and the following section is going to be using data. Regarding obtaining data, we're going to discuss two main things. First is how the adoption of new technology cannot only improve data collection and analysis, but also improve customer access to transit information. And, our second point here is how adopting industry data standards let agencies easily use tools that consume common datasets; so, adoption of new technologies.

New data sources can provide agencies with more data and better data. Good data allows again for a good decision-making. Understanding your agency's data sources is the first step to collecting, managing and analyzing data. Agencies use manual data sources either recorded with any paper or with electronic devices such as a smartphone, but there's a human being adding this information through this electronic device. However new technologies, they offer passive data sources which collect data automatically using installed hardware and connected devices. These sources include automatic passenger counting devices, so APC devices.

They measure the boardings and lightnings at the doors of the transit vehicles. We have automatic vehicle location devices, so AVL devices. These use GPS technology to record the vehicle location, enabling real-time monitoring of a trip or as the name say, the vehicle location. Our last example here is automatic fare collection devices. So, this includes fare boxes and customer-facing websites and mobile applications that may allow for fare transaction. Investing in these technologies will very likely increase the reliability and the amount of data collected, allowing for advances in using data to solve problems and improving decision-making. Technologies like AVL systems for example, they provide agencies with large samples of runtime of speed, on time performance data.

They greatly reduce the need for manual ride checks that provide only a small sample of the data. And, all these as you can see in the next slide have an impact in customer information. The adoption of new data technologies can also improve customer's access to information. Going back to the AVL example, agencies have used AVL data to implement online bus trackers, real-time arrival signage, texting services with real-time arrival information and helping customers in general plan trips using up-to-date information in a similar way APC systems can in some cases disseminate real-time passenger load to customers allowing them for example to know how crowded the next bus is and then making decisions about your trips.

If the data collected is established in standardized formats, it can further increase opportunities for customers and other parties to access data and develop all sorts of tools and analysis with it. So in terms of the data standards that we talked, we can move on to the next slide. Managing, analyzing and sharing transit data is easier and faster when agencies use either internal or industry wide data standards. Data standards specify which information should be included in a dataset and how this information should be formatted. They allow agencies to store and use data in a logical accessible way; helping agencies with test from internal reporting to the dissemination of data to the public using a GTFS format, for example.

So formal data standards such as GTFS real-time or GTFS-Flex, they open up new tools for the agencies to provide information to customers like Google Maps or any other sort of third party developed trip planner application. Additionally, the schedule and spatial data that is included in this data standard to GTFS. These are route alignments and stop locations. That information also allows agencies to conduct say Title VI Service Equity Analysis or an accessibility analysis using GIS software's. Even if advanced GIS analysis using GTFS feed may be now out of reach for some small transit agencies, free tools like RTAP GTFS builder enable small agencies with limited technical capabilities to take advantage of industry data standards.

RTAP GTFS builder, it provides a free framework for organizing GTFS feeds that only requires basic Microsoft Excel skills and some beginners' knowledge of Google Earth. With it, small agencies can create GTFS feeds with their existing staff and they do not need to hire an outside specialist. In 2016, Crawford County and Venango County in Pennsylvania consolidated their services merging into the Crawford area of transportation authority. The consolidation of these services required a merging of both agencies datasets, which were in different formats and to accurately merge these and to create a better inventory of stops and to improve trip planning for customers, the agency created a GTFS feed.

It was launched publicly in October of 2019. Chelsea Youngs, a planning specialist at Carter is here to discuss how Carter used our RTAP GTFS builder to create their GTFS feed including a bus stop inventory and mapping route alignments using Google Earth. Chelsea, please feel free to continue.

Chelsea Youngs: Thanks again for having me here today. Using the GTFS builder has been a huge asset to our agency. Creating a GTFS feed is easy process with overwhelming benefits. When I started this process, I had absolutely no transportation experience. Anybody can do it. National RTAP has templates and training videos available on their website and Marcy Jaffe was also a great resource whenever I had any questions throughout the process. All you really need are GPS coordinates for all of your stops; you need your schedule and route traces. You put all of this into the provided template and it produces the TXT files that you need to feed into a trip planner such as Google, Apple or Bing Maps.

We use the data collected for GTFS feed and a lot of other ways throughout the company. It has been used for a faster brochure update process. We use it for in-house public notices for when we change the routes. We have used it for a visual tool for route planning. I can use this for a quicker and easier way to do our ADA checks and our operations and maintenance department actually use it for when they do stop inventory. You have all this information about your company in accessible format. I know before Carter did not have that luxury. This process has made us become more organized and it's helped us to provide a consistent accurate information to our riders plus the way GTFS builder is made, it's very easy to update when you do have changes.

Another huge benefit has been the last people meeting in a call in for help when they are planning their trips and when they do call in, the calls are handled much more quickly because the office person handling these calls can pull up Google and help people planning where they need to go and what time. We're a rural area, so it's a pretty big. There's a lot. We have over 300 stops. We have over 20 routes and it's very difficult to be able to come up with the best trip option for rider when you don't know the area very well. So in conclusion, I'd say anybody can make a GTFS feed and you should try it because the benefits outweigh any difficulties you have during process. Thank you.

Adam Recchia: Thanks, Chelsea. Continuing with this discussion on how to use data, we're going to focus on two more points. First point being agencies can make better decisions using external data and partnerships can be key to accessing this external data. Secondly, the more data an agency has available the better it can monitor performance and also make good planning decisions. So, let's talk first about external data and partnerships. Sharing data like a GTFS feed that Chelsea was talking about with other organizations or even publicly can benefit an agency first by increasing awareness of their services and also by creating transparency with their riders.

Similarly, data collected or created by other entities can be useful to transit agencies when planning new routes or making service modifications. Some transportation data is free and widely available things like the Census Bureau datasets that you can find on their websites but some aren't. Partnerships with entities like regional planning organizations, state DOTs, businesses and even colleges and universities can really increase an agency's access to data. A good example of this regional and statewide travel demand models can provide really valuable information on the demand for certain trip connections within a larger region. Unless an agency has a partnership with these entities, it can be very difficult to access and use this data, let alone be able to interpret it because it can be very, very complicated and you likely need staff from the agency to help you interpret it.

Also, partnerships with major employers or colleges and universities can open up new types of data for agencies including where workers or students live which then allows agencies to better tailor their services to the needs of these types of groups. And lastly, agencies with limited resources can use partners for assistance with data analysis and also for decision-making; moving on to performance monitoring and decision-making. Making good planning decisions is really dependent on having good data that can back up those decisions. The cycle of planning, implementation and performance monitoring is always best supported by data.

Data can help agencies monitor ridership, schedule adherence, customer satisfaction and even financial performance. This data then can feed directly back into the planning process. For example when adjusting service levels, agencies can review performance monitoring statistics that were based on APC or ride check data to see if any of their current routes are experiencing overcrowding. And similarly, data showing declining ridership on a specific route or service would allow an agency to make the decision to perhaps reallocate its resources away from that route or service and into areas of greater need.

Data-driven planning and performance monitoring require both technology investments and staff know-how. While this data provides new insights, it also increases the level of effort required to manage and perform analysis. On that note, I am going to introduce Brad Rader, who is the operations supervisor at Pullman Transit in Washington. A little bit of background, Pullman Transit deployed a new mobile app in 2019 when it updated its AVL system and the new mobile app provides users with a trip planner, vehicle locations, estimated travel times and even passenger loads. So, it's a really cool and comprehensive app. I'm going to turn it over to Brad now who's going to talk about the process that went into implementing this new AVL system and the accompanying app.

Brad Rader: Thanks. I'm sure everybody is familiar with an RFP process. It's just a request for proposal. The first thing I would say is before you even write an RFP, you need to figure out who your audience is and what you're trying to accomplish. For example, we're in a small rural town of about 10,000 people unless WSU a major Pac-12 conference university when those students are here, our population is now 35,000, so a lot of students. We know that their students are 75% of our ridership. Knowing who is going to get the most benefit out of it, they aren't the only group we considered. But when we were looking at a company that had a good mobile app, one of the big things we wanted was the students to be able to see if a bus was full, because that's a major problem.

That would be the first thing. Before you even get to an RFP and considering riding one, it's probably best to decide what do we want out of our CAD/AVL Company, who is it going to target, because you can go through this process and get into vendors and they have all these cool add-on features and special gizmos that you don't even need. You're just trying to fulfill a specific need for your agency. Not all small agencies service university would do 5000 students. So, someone else's need might be different than our need. But once you get to the RFP, one of the things I've learned over the past is to be as specific as you can possibly get into the RFP, what you want almost each individual piece of hardware to do.

So, if you want your buses on the screen to move every one second or every three seconds or every 10 seconds, all of that needs to be in your RFP. The industry standard right now has come down quite a bit. Our first CAD/AVL, the bus moved every 10 seconds. So by the time somebody called in and said, "Where's the bus?" and you looked up on your screen and you said, "It's almost there" but it had been 10 seconds, it was already past the stop. Most CAD/AVL companies are somewhere between one and three seconds as far as real-time goes.

Be specific as far as just everything that you want this equipment to do, dispatch screen, back-in software reports, how easy is it for the end user. We put in our spare parts. I wanted a couple of each of the MDTs in the dock so I didn't have to wait on shipping when something went down. All of that is in the RFP and granted, they're going to charge you for it, but at least you have this stuff on hand and you're not waiting a week for some company in Alabama to send you another MDT and your bus is out on the road but nobody can see you're going round and round because it has a bad MDT. So, small stuff like that. Just be as specific as you can possibly be. The next thing is once you go through this process and you evaluate your RFPs and you pick a company.

This probably goes without saying, but I'll say it anyway is to call the references. I've eliminated quite a few companies that we picked as number one by calling the reference and getting some feedback from some people that had that company installed and didn't have some very nice things to say about it and we went different directions. Just like you hire somebody, I'm sure you check on the references. This is no different. Make sure you call. And so, you've gone through that process. You picked your vendor. They showed up one day and there's a whole bunch of boxes in your office and we're ready for install. This is probably one of the biggest things I would encourage anybody to do.

I was side by side with my installers when they were installing. I knew what every piece of hardware was. I knew where the wires went. I knew what they controlled what they went to. Because as soon as they're done installing and they go home to Alabama and something breaks, they don't send somebody out to fix it. They call you and give you the troubleshooting steps to do it yourself. If you have that knowledge like our current system, I don't even call their support anymore. I just do it myself because I know their system better than they do. We just had a system wide outage last week. They magically pushed out an update that all 22 of my buses were dead.

None of them would show tracking or anything and they did have to send the rep out here, but I told them how to fix the bus to get them all back online. With this great technology and all of that, somebody is going to have to work on it because it is technology. It is like buying a phone. As soon as they leave to go back home, new and better things come out. All of the hardware that I have on my buses right now, most of it is just a little over a year old and they have already improved. Most of those pieces of hardware, it will cost you money to get the new stuff installed. But just to let you know how fast this industry changes, the only thing I can compare it to is buying a cell phone and then three months later you had iPhone 11, here comes 13 and 14, but you're on a two-year contract so you can do anything.

It's the same thing with CAD/AVL. Most of it’s a five-year contract. Once you're locked in, you're locked in. The other thing I would say is make sure and most CAD/AVLs nowadays do this but we get all of our software upgrades for free most of the time. I don't even know they're doing it. They'll just send me a little reminder, "We're doing maintenance on Wednesday from midnight to 2 AM" and I'll come in the next day and there'll be some new feature on the dispatch screen or some new feature on the MDT for the driver to use. So, you have to have somebody in your agency that is willing to get a pair of pliers, a screwdriver, some wire cutters or whatever and go out and work on this stuff, because they're not going to come do it for most of the issues that you're going to have.

This technology is your greatest friend and it can also be your worst enemy, especially when it comes to data. This system will give me just anything and everything I want. It allowed us to not only know where they get on and where they get off, PDF with nice pie charts and just line after line of raw data, but you've got to have somebody like you were saying earlier. They clean it up, they go through it, they get rid of the errors, they format it. You've got to be pretty proficient in Excel to do that. You don't have to be an expert. Just keep in mind, all this data that this thing is giving you, somebody has to analyze it and in a small agency that can be tough. That's one of the 47 hats I wear. Larger agencies, they have people that just sit around and do that all day long and they spit out nice reports for you. But smaller agencies, we wear a lot of hats so we do a lot of things.

It's your best friend. It's your worst enemy. The only other thing I would caution especially smaller agencies like us is data is wonderful, but we don't make decisions based of just data. That's just one step of the process. A small town like us, we don't have the luxury of saying, "We've only picked up two riders at that stop last week. Let's just kill the stop." Those two riders that might be their only transportation to get their medication or to get their groceries. For larger agencies, they look at those numbers and say, "Make them walk an extra however many feet to the next stop because that's not worth our time."

But smaller agencies, there's a lot more that goes into it than just how many people are getting off, how many people are getting on. There's a lot of human factor involved in making those decisions. That is wonderful, but it's not the only thing that you should be making your decision upon. There's conversations and other factors to take into account. That's about it for me. Thank you.

Adam Recchia: Excellent. Thanks, Brad. That is such an important point that we're actually going to touch on in a moment here. What can you do with the Data Practices Guidebook? Each chapter of the guidebook covers the step in collecting, managing, sharing and using data and the chapters are actually largely standalone. So, we want to help you focus on what your agency needs most or what you think it needs the most. Chances are, your agency already has data and as data producers and consumers incorporating good data practices at your agency requires a wide array of strategic considerations like those listed here

Data needs. What data do we actually need to help solve the problems that we're dealing with? Collection. How should we collect this data? Do we want to procure a passive data collection system or do we want to stick with manual collection or a hybrid of the two even? Availability. Is this data already available at our agency or is it available perhaps at a different agency or entity in my region like the state DOT or the regional planning agency where your agency is located? Also granularity. How detailed should our database? So as Brad was saying, the system that they're using will give them almost seconds' worth of data. Do you want that level of granularity or do you also want more summarized data? A lot of systems especially are able to do both, so that's something to consider.

Sharing. Should we share our data? In some cases, there can be privacy concerns, I would say, but the trend at least in the transit industry is definitely towards more sharing an open data to build transparency with riders and community leaders and stakeholders. Communication. How do we communicate our data to stakeholders and the public? Resources. Do we have the resources to collect and analyze data? As Brad was saying, it would be great to get new technology but if you don't have the staff or the even the staff knowledge in certain cases to analyze and use that data, then there's really no point in collecting it in the first place. That leads right into the final point, of course, skills. What training might be required to implement data practices at our agency? So, these are really the questions that this guidebook is hoping to help agencies answer.

Data's role in the decision-making process. As Brad was saying, data does not have all the answers especially in aggregate form. Data analysis may miss key outliers that the public or stakeholders know about or there might be other reasons that are not really data oriented for making certain decisions about your service, i.e. keeping a bus stop in the system and active despite there only being two riders per day sort of the situation that Brad was talking about. This guidebook aims to show you how data can become a central part of your decision-making process, but it would of course have to still be integrated with other forms of input. So, stakeholder input, public input and even input from other agencies that may be interacting with your agency.

With that, I am going to conclude the presentation portion. So, here's the link to the end N-CATT website. As Andrew was saying at the beginning of the presentation, there's a whole number of resources that are on the website and very soon you will actually be able to download the data practices guidebook itself. Stay tuned and check back to the website. That should be up fairly soon.

Marcela Moreno: Thank you, Adam. Stay tuned our website, follow us on our channels and we'll make that announcement when it goes live hopefully in the next month or so. Thank you for everyone who participated, Brad, Chelsea. When I was at my former employer, I worked very extensively with GTFS feed, so that respect for building that out yourself that's amazing. Brad also touched and Adam too that data doesn't tell the whole story but it can point us in the right direction as we're making decisions for agency and this guidebook is going to be a really great tool for planners and operations staff to be able to be effective with using their data, knowing that at smaller agencies you often wear very many hats. We're going to move into the question and answer portion and we've got one in the box.

If you've been holding on to a question, please let us know and we'll get it answered. The first one is from Jonathan Howard and his question is, small transit agencies received their FTA funds like Sections 5310, 5311 from state DOTs. Has there been a state DOT that stands out when implementing data-driven planning such as this, that is encouraging their sub-grantees to adopt these sorts of programs?

Reinaldo Germano: I don't have an answer in terms of I can point you to one specific state DOT. But one strategy of state DOTs do use to incentivize data use is to make their data awarding process more data focused. When they request for more data to give you funding, in a way they are of course incentivizing you for advancing in your data practices. I'm pretty sure that Virginia DOT has a pretty strong data center granting process, but I must say I'm not a specialist in this so Adam you something else to contribute in terms of pointing to one agency or another. I just asked Adam something and I continued on, but it is very hard because there is a limit in terms of how much data you can demand, because the landscape is very different for small and smaller agencies.

There are small agencies like Brad was saying that have, for example, a new university nearby and as we've discussed in the guidebook, you can establish partnerships with them and work on having more in-house know-how to work with data, but it's really hard for a state DOT to set the bar too high. Adam, you can continue.

Adam Recchia: That was good. The Massachusetts Department of Transportation, they have a discretionary transit operations bond. I'm not actually sure exactly what part of federal money is utilizing for this but it's intended for the smaller agencies in the state to operate like pilot programs, so micro transit service even a new route that is serving a very specific need or even extending the span of service on a certain route into the evening, that sort of thing. In their memorandum of understanding when they fund the project, they have a list of performance indicators that they want the agency to report on.

It's not really focused on like on the data standard side, I would say like they're not demanding that you collect and organize your data in a certain way, but they are at least demanding that the way the data is reported back to the state is in a certain format with certain key performance indicators, that sort of thing. Of course with COVID sort of throwing a wrench into everything in the transit world, having worked with some of these agencies over the past year, a lot of the performance indicators that they selected just ended up being completely not representative of the service at all because of COVID and the state was very flexible as well with letting them change what their KPIs were, their key performance indicators and that sort of thing. I don't know if that helps with that question, but they demand more on the reporting side than on the data management side, I would say.

Brad Rader: Let me chime in here real quick just a couple of points. I don't know a whole lot about working with the state DOT, because unfortunately or fortunately it depends. We are one of three municipalities in the State of Washington. In other words, we are a division of the city. We're not a PTBA and we don't leave the city limits. But a lot of the data that you get from these systems directly helps you in reporting your numbers for federal grants, ridership increases, decreases and I and I would like to point out that in today in order for a small rural transit agency to go get a nice, expensive CAD/AVL system of half a million dollars or more, you don't necessarily need to go get federal or state money for that.

Most of these are financed. We financed ours. We paid for it right out of our budget. So instead of having to hand over $500,000 or $600,000, you hand over a couple $100,000 just for the hardware to be installed and they'll bill you every year for the next five years, which is a great option for someone like our agency who may not have $500,000 or $600,000 sitting in reserves or the money marked for a new bus or other things. Some of us working on these smaller budgets don't have the ability just to hand out a lump sum of money. So, it's just good for people to know that you don't have to have a big pile of money sitting in the bank to get one of these systems.

Again what Adam was saying, what the state requires you to report is not so much about ridership and some of the data that you get from these systems, but the data from these systems definitely help us when we apply through the feds for 5311 or whatever expansion grants or just the operating expense increase where you can show, "We're up 500,000 riders over last year. We need four more routes, two more buses, eight more drivers, blah, blah, blah".

Marcela Moreno: Thank you. We've got another question from Marcy Jaffe for Chelsea. Could you share how much time it took from start to end to build GTFS and then go live into Google Maps? What about annual and ongoing updates? Even through COVID adjustments, were you able to handle the GTFS updates with your other job obligations?

Chelsea Youngs: Great question. Marcy. Thank you. From start to end, it took me about four months to go through this. A big issue, though, was you have to have a partner to actually account for Google and that took about a month and a half outside of that and also GTFS was not my main focus. Like I said, I just started this job so I was learning things. During COVID, we actually had a different route set up and it was pretty easy. I just copy my existing Excel worksheets. I made the adjustments to that and I uploaded it to Google real simple. It takes into account pretty quickly. Whenever we went back to full service, I just switched to feeds again and no problem. GTFS doesn't really take me a long time anymore since I know what I'm doing now. So, just quick easy fixes here and there and it's great whenever I have to add a route, because again I know I'm doing so I can add a route in less than a day. No problem.

Brad Rader: I completely agree with Chelsea because Marcy Jaffe is my new best friend as well or she was when I started this process. Usually, she had right on the head there. It took me about four months. I'm not an Excel geek. Serving a university, it was a little tougher because our service changes so much. It could change twice in a week because of a spring break or Presidents Day or finals week or graduation week. That's what Marcy helped me tremendously with was all the different services we have and how to trick Google into thinking, "Everything's fine. Just upload the dang thing" because Google was our biggest problem.

They kept sending it back. We have two buses show up at a stop at one time and they didn't like that. It didn't match what our website said or what our brochures said. If you could see me, you'd understand why I don't have a bunch of hair left but Marcy certainly made it. She made it a lot easier and I would agree once I've got it. I'm like Chelsea. I just went through the changes, upload them and I'm done with the whole thing.

Marcela Moreno: That's great. Thank you. One point that Brad had brought up and Chelsea as well is the bus stop inventory that you have through your GTFS feed and Brad had brought up for funding, it's really great to be able to point to those data sources is evidence of people using your service and having that backbone for grant proposals. So, that's amazing. I've got another question and this could be for anyone in the group. What would you say is the best starting point for a resource constrained agency to implement some of the data practices we've discussed this afternoon?

Brad Rader: I'll chime in because we're a resource constrained agency. It's tough. Because aside from supervising the day-to-day operations and 44 employees and fixing then technology and being the HR and being the lawyer, we just wear so many hats and then you've got to start sifting through data. The one thing I can say that we've done here or maybe I've done it and I'm not sure they like it though is I won't let go of it. So, it's one person. If somebody wants data, it's me. A lot of this data I've saved over the years. If somebody wants to know what happened in 2019, I've already got it pulled up; whereas if you have five or six hands in the pot, some data might be over there or some data might be over here and I'm speaking of a smaller agencies by the way.

The bigger agencies is a whole different ballgame. Although I'm sure they would love for me to let it go so I could do other things, I've held on to that and maybe someday I'll have to let it go. We have three members in our management team, 32 drivers, 44 employees. It's been in my office and up to now it's going to stay in my office because it's just so much easier if it's one person in a smaller agency or at least that's how I feel it is.

Adam Recchia: I'll just add to that. Thanks, Brad. For resource constrained agencies, it's as often as you can use open source tools for doing different types of analysis that will help tremendously. You won't have to devote too much staff time and you won't have to go through the RFP process to hire a consultant to do it. So, the census has a number of open source tools that are hard to find and sometimes hard to use, but they are for the most part listed in this guidebook. So, you can consult the chapter on open source data and also on planning and performance monitoring as well. There's a lot of things that you can look at travel demand or travel flows between different geographies using different census data applications and also if you want to do a transit demand analysis, there's the census demographic data and there's different open source and free websites that you can even click on different demographic information you want to look at and do like a desktop demand analysis.

The other thing I would mention too is RTAP, we mentioned the GTFS builder. That's a great tool for small agencies to use to create a GTFS feed. It puts it all together for you. Like I said, you're not paying a consultant to do it and as Chelsea and Brad said. There might be a learning curve, but once you've done it that first time then it becomes a lot easier to do a second and third time and to do updates, so you can conserve resources that way. RTAP also has a couple other tools as well. They have a website builder. So, I would definitely check out the RTAP website too if I were resource constrained because they have a lot of cool free stuff as well.

Chelsea Youngs: In my experience, my best resource has just been asking people questions. I love the transportation industry because everybody's willing to help you. Some worst case scenario, you email somebody and they don't email you back, but I've met a lot of great people who point me in the right direction.

Reinaldo Germano: Going back to what Brad was saying in terms of having one person doing other data analysis or dealing with data, going beyond one person, we should have maybe agencies even with limited resources. If you establish internal standards like how internally you're dealing with data, there might be more than one person. But if more than one, different people are using a single standard that the agency has and that standard can be really a template for an Excel file or just the way that we collect data or the way that we register data is standardized across the agency. We talked about Google and I don't think Google needs any more advertisement.

But one tool that’s very interesting and help you deal with data a lot is Google My Maps. So when you go to Google Maps and go to your places, you can do pretty impressive things with Google Maps in terms of importing an Excel data and they will plot locations for you. You can have all your data, say all your bus stop but also you have survey of your customers and they have to give you an intersection where they have their destination so you can see this first mile thing. This can be very easily done in Google Maps and it takes you a little time to get used to the tool, of course, but it can be very useful.

Marcela Moreno: Awesome, thank you. That was great advice from everyone. We're about to hit three o'clock. Thank you for everyone for participating in this webinar, for presenting and for asking some really great questions on this webinar. It will be recorded and posted to our website. So, stay tuned for that. That will happen a little bit quicker than the guidebooks are probably in the next week or two. Like I was saying earlier, stay tuned on our website and communication channels for when the guidebook is finally posted. It will be really great. So, thanks everyone.