

ITS4US PMESP Training Session Transcript (04-06-21)

Speaker: Murat Omay

Hi good afternoon everyone on the East Coast and good morning to everyone on the West Coast. My name is Murat Omay and in the next slide you can see my title and the office that I work for.

I work at the FTA Research Office and more specifically I am with the mobility innovation group under the research office.

One of my responsibilities at the FTA is the development of mobility performance metrics, which is very relevant to this topic that we will discuss today and that is one of the reasons why I volunteered to lead the performance measurement and evaluation support task, or PMES for short of this demonstration program.

And today we will talk about the overall PMES planning activities. The PMES plan template that was distributed to you earlier and a few performance measurement strategies and scopes.

Along with the highlights and constraints, experimental design considerations, data collection and evaluation activities.

So, it's going to be a full agenda and in the next slide we'll see the outline of today's session, which primarily mimics the sections of the PMES plan template that was sent to you.

So yeah, as a refresher I'm going to just spend a few minutes on the program overview to remind everyone, or if you didn't have the opportunity to join us in the previous trainings or kickoff sessions, you'll have an understanding of the program and then we will go over to the sections of the plan, the PMES plan, and then I'll conclude it with some resources and a Q&A session, hopefully to bring more insight.

So, let's move on to the next slide program overview and then the following slide where we have the high-level summary of the complete trip ITS4US program here on the slide and I don't want to spend too much time.

There's an abundance of information about this. We've discussed already, but it is a multi-modal effort that is important, and it is led by the ITS Joint Program Office and supported by the FTA, the Federal Highway Administration, and the Secretary Office to OST.

And there are multiple partners involved in this initiative and the common vision is developing and deploying the innovative and integrated complete trip project.

It's to support seamless travel for all users.

That is the common vision and you will also note that the figure on this slide, that is we conduct during the ATTRI program stages, and it depicts some of the trip steps or the links that are essential for the complete trip concept that we discuss throughout this program and other programs in the USDOT.

Covering their pre-trip activities all the way to completing that trip beyond the you know destination which is the return trip is the key for the ITS4US deployment program.

So, in the next slide we have a list of the goals of the program and I hope that would be a good refresher for everyone as well.

Here are the five goals.

I will not go over them in detail and repeat what you already know, but it's important to highlight that the goals follow a logical sequence of events from discovery to identification to solution development to performance measurement and transfer of knowledge.

And in the next slide you'll see the selected sites and their geographic locations.

As you can see, we have a good diversity as far as geographies of the sites that are involved and for the phase one recipients.

This map shows the recipients from across the country, and just as a background we had 35 applications and selected the five sites that you see on your screen and you are hopefully one of them.

And in the next slide will go with the three phases of the deployment program and as an overall reminder there are three deployment phases and one post deployment phase, and the participants are currently in the first phase.

As you know, that phase is the concept development phase where we are developing the ideas and they're getting ready for the design phase and then in the later phases, two and three, the design, testing and evaluation phases are going to follow.

And then finally, during the operations and maintenance phase, the deployments are expected to sustain operation for at least five years after the program is completed.

The first two phases are expected to be up to 12 months, where the third phase where the deployment and evaluation is expected to be minimum 18 months.

And so that being said, I will jump into the overview in the next slide.

The overview of the performance measurement and evaluation support plan because we already covered the program overview, let's focus on the primary purpose of this training session.

So, in the next slide, let's go back and differentiate between the two main components of task 5, the first part being the performance measurement.

And the second part being the independent evaluation support and I will take the liberty to go over each a little bit in detail so that we can understand the difference and the focus of our activities according to the objectives.

So, performance measurement is a site driven activity focused specifically on ensuring that deployed system can create the correct data and insight to measure the critical impacts.

So basically, performance measurement is intended to be an ongoing and integral part during and beyond the conclusion of the ITS4US deployment period versus evaluation light extent further than that and the performance measurement provides the mechanisms for each site.

Let's talk about your own success and performance improvements and the impact your deployment has made for the communities that it serves.

So, there is a, uh, locality. And there's a local emphasis in performance measurement versus the evaluation.

On the other hand, is a broader activity to measure the accomplishment of the ITS4US program against its goals.

So, there is the programmatic aspect of it. So, evaluation is an independent and program driven activity. And, uh, it is typically undertaken by a third party.

In our case, it will be the Volpe Center that will be the independent evaluation team and the evaluation also builds from the site performance measurements.

So, there is an aspect of coordination between the two parts of this. But evaluation doesn't duplicate what we do under the performance measurement activities.

Instead, it seeks to assess the impacts made by the ITS4US program within and beyond the funded sites so that it has a regional and ultimately a national emphasis and goals.

So, performance measurement would be a valuable source. More resource for future deployers.

So, because they're going to depend on the results that you provide and their investment decisions will be based on the results reported by the by the sites versus the evaluation independent evaluation part.

Which is important to inform the USDOT regarding the return on investment and the value of the project for the industry or the projects for the industry. So, there is a potential for policy informing the policy when it comes to independent evaluation.

So, deliverables under this task will include Draft Performance Measurement plan and revised final version based on the USDOT comments.

And these documents will be due for submittal in 26 weeks and 35 weeks after the kickoff meeting and a public webinar will also be required.

We're going to talk about this in a few minutes and the purpose of the webinar is to convey each site plan to the broader stakeholder community and the public and that webinar is to be scheduled around 38 weeks after the kickoff.

And so, in the in the next slide talking about these deliverables and everything on the next slide. We're going to look at this overall schedule. As you can see the deployment schedule.

So, for all the task and task like is highlighted in yellow and we can see that it runs concurrent with the collapse task which we will understand in a in a few slides.

The importance of running this concurrent and cohesively with the ConOps activities and it concludes with the determination of the system requirement.

So, in the next slide will touch on some of those the some of the interdependencies between these tasks and activities.

As I mentioned between the ConOps and Performance measurement plan.

So, the plan will have the interdependencies.

Obviously all these tasks are designed in a sequence and then they are structured to help insert dependencies as outputs or inputs throughout the project and I'm not going to go over each of these interdependencies or dependencies, but I'm going to highlight a few key lines that are relevant to our topic here. The performance management.

So, one of the things that is important is the scenarios and the use cases of high interest that we're going to develop during the ConOps phases and we should be transferring them to task 5 for development of performance measurement and evaluation objectives and strategies.

So in other words, the use cases are going to be foundational to determine our strategies to measure the performance which performance groups on clusters that we were going to focus, how we're going to determine the metrics to measure it, or indicators to measure those performance groups and how are we going to set the targets? And things in that nature.

So, there are going to be all dependent on the use cases or other scenarios that we developed under the collapse.

And then also the data management plan under task three.

To accommodate the modifications that might be required in case of changes because you know these the MP need to consider adaptability, especially, you know in the era of new technologies or emerging technologies or even policies, right?

We need to build enough flexibility and or you know other things that are like in the events where obtaining data becomes challenging due to unforeseen circumstances that we could not identify when we were working with constraints and confounding factors.

So those are the two that I would highlight as far as interdependencies, but there are many smaller, less impactful interdependencies.

So, in the next slide we'll talk about the components of a typical performance measurement plan.

And I will not go into detail here, because they are already built into this webinar.

We will talk about them in detail in the upcoming slides, but here we have the major components of the performance measurement plan, along with a brief description.

So, you can kind of go with those descriptions under runtime, and these components need to be coordinated together to define a robust plan to assess and report performance identified.

In the priority scenario, so the cohesiveness and coordination between these components is again emphasized.

And I also would like to emphasize that engaging the scenarios developed under the ConOps or, you know, during the concept stages, would be a great value.

Or help in structuring your performance measurement plans and carrying out the activities under the components outlined in this slide.

Because as we mentioned, those are going to be the greatest input that is going to shape the direction of your performance management plan.

And that being said, let's move on to the next slide and discuss the actual PMES plant structure and the components that are going to feed into that.

So, here's a brief depiction of what the PMES plant structure looks like and they will walk through each of these sections.

But I wanted to highlight that the process pretty much follows the sequencing of a logic model.

I don't know if you can pick it there, but you know there are the activities.

There are the resources, there's the data, then then the outputs outcomes and the impacts and the reporting process.

So, it kind of like simulates a logic model.

And the scenarios developed under the ConOps phase will be the major input as we discuss for the performance planning activities and after the scenarios and their objectives are defined.

The plan starts with setting the goals and targets and the objectives for performance.

Measurements so in the in the next section of your plan in the performance measures and targets, you will describe the conceptual performance measures and targets.

When I say conceptual, I mean unconstrained at this point without layering in the potential confounding factors constraints.

It is good to start with concepts that are unconstrained and then we have to also develop well defined approaches to target to actually to target setting.

So, when I mean target setting, I want to clarify that there are two types of target setting that I will refer to during these slides, one of them is to set the target to increase, decrease uh, you know enhance, you know those kind of activities for certain performance measures that we identify.

Try and the other type is to actually set the targets for user centric performance metrics, which are pretty much the innovative metrics that we're going to discuss in a few slides where you have to set the targets of the units of measures.

And how you're going to actually obtain the data for those targets and how you're going to calculate the results and things in that nature.

So, we'll talk about in the next section of your plan you actually talk about the confounding factors and mitigation approaches, and that's where we discussed the potential confounding factors that might impede or interfere with our performance measurement strategies and plans.

And obviously, we also need to discuss them and mitigation strategy, which I will refer to as a model consisting of three parts, one part being the avoidance, the second part being minimization.

And the third part being mitigation, so this avoidance, minimization, mitigation based approach would help us to describe how such confounding factors will be alleviated.

Once the strategies and objectives are developed than the you know the targets are set and constraints are identified.

We expect to move on to the system deployment impact analysis design section to discuss the details of the methodologies and the methods and.

And the details of the experimental design and this section is also expected to discuss any constraints and challenges and other factors so that those factors can be an integral part of the experimental design.

So, in other words, listing the factors is one part of the task, but also mitigation measures, is another part, but then also designing the experiment.

And the analysis to compensate for those factors is also a part of the task.

Then the we move on to the Section 6 the support to independent and independent evaluation effort.

So, this is not a direct output.

Post the previous sections or what you've done so far, but it is a supporting output.

And I would look at it almost like an important consideration that are going to interconnect the performance measurement.

Uh, strategies and outcomes into the evaluation efforts.

So, it is almost like the mapping process of the tool uh, to independent activities again.

Those efforts will be carried out by the wealthy center, so it's not going to be your responsibility, but your responsibility will be to coordinate and support the activity so that they are successful and also the rationale behind Section 6 is feedback.

So, to actually help everyone to think through each strategy its performance measurement strategy that you are developing and understand fully.

What you can do and that you cannot do and what falls under performance measurement that falls under evaluation.

So, it is a good exercise to be aware of the independent evaluation activities.

And the final functional section is the data collection and sharing plan where the data needs based on data collection, deployment, data collection, data quality and data sharing as well as data concerns are discussed in detail and you know in this case.

In addition to the baseline and deployment data, uh data collection needs also need to include the cost data for independent evaluation and lessons learned purposes.

So that there is a clear benefit cost analysis that can be performed.

And finally, the last section is performance reporting and schedule and it will include a discussion about the structure of your anticipated reporting activities and the schedule.

So, task 5.

So, in the next few slides I'll go over some of the work that we have completed at the FTA while developing the mobility performance metrics.

I hope that you know it will be useful in your concept and target development stages.

These are to serve as your guidelines, not requirements, but I'll be happy to work with.

Each side to go over the details of this model that we developed and on the as I said, I am hoping that it's going to be useful for everyone.

So, in the next slide we see the model that we used to, so it has it's pretty simple, so it has several layers starting with the core which is the user right? We call them user centric indicators than the three lowers as Tier one, two, and three.

Tier 1 being the system centric indicators, Tier 2 being the regional, Tier 3 being the national and the You know that you can see that logical progression there.

So, the idea here was to differentiate between user centric and user focused and based on our research which is almost in its third year now, we discovered that many of the performance measurement strategies cover user focused.

Months looking from outside in for an agency or service provider deciding what the user might need and I'm providing a service according to that, you know, presumed need versus user centric is looking from inside out and as you know, the name implies it is what the user actually needs so when we look at those you know user focused on user centric approaches.

We see some differences and so we were lucky to kind of develop this simple model to understand which metrics are focused on the.

You know system side of things which are focused on the user side of things and which are on the regional and national levels which you know as you can appreciate when you come to regional and national levels, you are pretty much talking about impacts, not purely performance so.

Uh, and this is also beneficial for you know, understanding different resolutions of data and analysis are needed so you know in national economic outlook is going to require a different granularity.

Data granularity and resolution when it's compared to say wait time for a traveler, right?

So, you know the precision is going to be different. The resolution is going to be different, so this model is helpful to differentiate between those in the next slide.

We'll see the model, the description of the model that we developed.

For these conceptual performance metrics, and you know, again, I hope that this will be helpful, but yeah, so without getting too much into detail, I want to make a reference to a report that we have published so you can see the details in that report. If you Google FTA. Report 152.

You will see that in the reference list and then understand the details of how we did that.

But we first captured the trip stages as pre-trip and post trip, but you can expand on that for the purpose of what we're doing.

Those three words would be sufficient and then we don't pose the question from the traveler perspective rather than the system perspective, and in this example you can see that on the top example, how long will my total journey time be?

Versus if the system was asking the question would be like what do we think?

It's their appropriate, you know, joining time so you know to illustrate the difference, I'm giving oversimplified examples to illustrate the differences, but I hope you can understand.

We then, uh, identify the metric that would capture the performance of the traveler.

Uh desires or the travelers interested, along with the possible unit of measurement and a description or a rough calculation of how we would arrive to measure that particular performance need, and then these conceptual metrics.

Then we underwent the data assessment phase, where we assessed the credibility of data to develop such metrics along with the constraints and the actions that would be needed to remove those constraints we identified, and finally a similar process was applied for the policy side of things, and then they, you know they all went under policy assessment to understand any policy barriers and potential actions that would be necessary to alleviate those policy impacts.

And then finally in the last phases we developed a prioritized list of user centric metrics and based on the you know data assessment and policy assessment and we interviewed transit agencies to assess the relevancy of such metrics.

And after we established the relevancy, we called the feasibility analysis stage then.

Then we surveyed user groups to document the delta between the factors they consider to be important and their satisfaction level with those factors.

So, the greater the gap between the importance and satisfaction, the more emphasis the metric should get because it is important.

I mean, obviously if something is important and you're not satisfied with it, it makes sense to tackle that as a priority to increase customer satisfaction.

That's an unknown marketing tool, so uh, in the final stages we, uh, contact conducted focus groups to set some of the targets that are non-existing today in the in the current mobility environments such as wait times.

You know we say we might say reducing the wait time is a good thing.

Improvement, but by how much?

And what are we basing that you know how much on is also important, so we ask people to understand what is unacceptable, wait time for an urban user.

What is an acceptable wait time for a frequent user, what is an acceptable wait time for a rule user and things in that nature?

So, we had the different strategies to do that in our focus groups.

We also have other metrics such as availability of options. How do you measure that?

How do you measure the impact of options on travelers, you know?

Travel time of convenience or seamless travel experience and we took it up a notch and we also looked at the Accessibility of those options and which we're going to discuss in a few minutes because just because you have the options available on a smartphone doesn't mean that everybody has access to it.

So I think it is beneficial if you set up a structure similar to this in the early stages so that you know you can evaluate these concepts and you can capture them when designing your system or when you know gathering user needs from stakeholders during those stages.

So this comes in handy and I said earlier that I can make myself available to discuss the details of how we came up with this and then in the next slide I will look at some of the performance perspectives to consider while developing your PMES plans.

So in this slide you can see some of the aspects that we can consider when developing performance measures for your project, and you know, considering that we are focusing on underserved communities, you know these are some of the initial ones that you know we think is important.

That are important to consider special considerations, temporal perspective, economic, physiological, social, and some other considerations.

As I mentioned in the previous slide.

You know performance associated with access to options rather than the availability of options, so that is important.

Or you know technology requirements of your projects for user interaction or access to the solutions that you're providing more solutions and the performance.

To capture the needs of the social technologically challenged populations as much.

As the people who do not have such challenges, you know access to technology, data plans and another example is, you know, unbanked underbanked populations.

Another example is the barriers that are associated with infrastructure.

You'll see that are not within your control.

You know these could be digital deserts, or you know technology deserts as some would call them.

So, these are all considerations that are important to keep in mind while you're developing these performance measurement strategies.

While you're developing motion indicators and targets, keep in mind that there's always flexibility in your selections because each project will be aiming to address different types of barriers, but it is important to her constant communication with the with the team and with the other sides.

To coordinate similar, you know metrics or targets because hey, we don't want to reinvent the wheel and be we don't want to be redundant.

And see if we want to learn from each other sites experience.

So, there is also a you know the comparative learning experience for us, and that doesn't mean that you might try to measure the same performance using an approach insight.

And we're not saying that we should find 1 uniform approach.

What we're saying is we would be actually aware of that, and then it would be interesting to see which one is more effective.

So, there is also some exploratory component when it comes to performance measurement strategies.

So, in the next slide we will talk about the yeah, some of the constraints while developing our metrics and targets.

It's important to fully document any known or anticipated constraints, and these constraints might be in obtaining or processing or analyzing the necessary data.

There's no one category for that.

Also, the requirements for the resolution and granularity that would be necessary for such data to actually perform the analysis.

And the evaluations that you are planning to undertake.

For example, you know if your performance measure includes a temporal travel, improvements on a bus line for a certain gender specific age group.

Obviously, your data has to be reflective of the granularity requirements of the task.

So, you know so, so, or as such specific performance sets, you cannot perform the analysis, right?

In this case, you need to know the time of day, the weather conditions, or other external factors and the temporal conditions, the gender, the age of the user, and the mode that he or she is using.

After console there there's this whole granularity that is needed in order to be more specific, so keep that in mind.

The more specific you get, the more demanding your data needs are going to be. And you know some of the potential constraints.

It will be considered in Section 5 in the system deployment impact analysis design and the experimental design should be able to address those constraints.

And we're going to go over them in the in the upcoming slide.

Yeah, and also, another potential strategy is an initial feasibility analysis.

It would be very valuable at this stage to assist you guys in systematically examining the potential for successfully obtaining the data.

As you plan it, for each of these Performance measurement task or strategies or elements that you have so you know if there is enough interest, we will also convene with the team and look at the feedback from you.

If there's enough interest, we can include the feasibility analysis discussion as a roundtable topic in one of the upcoming roundtables, because that would help us and you to eliminate many of the unnecessary steps or surprises if you do the correct feasibility analysis.

So, in the next slides we'll go over to the confounding factors and the potential constraints.

Yeah, so obviously those factors are the external factors which can distort the validity of experimental findings if you don't control for them.

So here are some of the examples of construction zone change in travel demand change in economy and all that.

You know, changing economic conditions such as a recessionary where the periods would have an impact on the VMT and change in, you know, gas prices with increase or decrease of their VMT depending on you know if the change was upward down or like other transportation or land use projects being developed or deployed concurrently with your project, but most likely affected.

It would also affect the supply side of things.

Change the travel patterns or even create induced demand so those are the factors that we need to be aware.

And I mean the examples that I have here are generic examples, but they should give you an idea of the range of confounding factors and you know there's no limit to it.

There's no limit to your creativity to consider each one of them, but as I mentioned in the performance measurement details, the more specific you are with your performance measurement strategy or target.

The more data that you will need, the granularity of the data. Similar to here, the more confounding factors that you discover.

You know, the more barriers that they're going to be for your deployment, and then the you need to spend a considerable amount of time to develop the mitigation measures for each of those confounding factors.

And they need to be identified and considered in the early stages, obviously.

And no surprises in Midway, so that you know, we can also start thinking about the mitigation measures.

And in the next slide we'll see how that avoidance, minimization, and mitigation type of model that I discussed would work for your confounding factors analysis.

So, you know, obviously, we need to spend considerable amount of time on the on these.

Work on finding the factors and the mitigation approaches and when you are developing the approach is to alleviate the impacts, you know, avoidance comes with a cost.

Minimization comes with our costs and mitigation comes with a cost, so perhaps it would be, uh, beneficial to develop these factors and the constraints and then obviously listed the risks that are associated with.

And then how they would lead into what type of ambiguous findings they might lead, and then they probably have three columns to discuss the avoidance strategies, minimization strategies, mitigation strategies as they are applicable.

And then that would also give you a good idea to have it, you know, if not quantitative, maybe a qualitative cost analysis.

To understand the mitigation measures and the you know the poster to project and then that would be very valuable for your decision-making process going forward.

Which strategy which one of the three strategies is going to be useful?

And obviously we need to combine that with the technical aspects of it, and because if you have certain objectives and if you're trying to, you know, reach those objectives and goals, even if uh, avoidance strategy is the most expensive strategy, or you know it cannot be alleviated with experimental design, then you know those are case by case basis.

We need to evaluate them.

And you know, as a possible solution, as I mentioned, you can consider feasible methods to isolate the effect of each confinement factor and then the, as I mentioned, accurately estimate the impact of the deployment on the system and individual.

Travel around performance measures.

So that you know, we also understand the importance of the eliminating those confounding factors.

So, in other words, not every confounding factor is going to have the same emphasis for avoidance or minimization, or mitigation.

And obviously a good example of strategy is the use of appropriate experimental design, and you know, statistical techniques.

So that leads me into my recommendation that the, you know, whatever expertise you have in house when it comes to statistical techniques analysis or you know, experimental design, this is the time to engage those resources early on in the in the process so that you know some of the costly confounding factors or constraints can be eliminated by just using these statistical techniques or methods.

So, you know, as I mentioned, consider listing all identified factors, potential impacts, and the appropriate measures for you know, avoidance, minimization, and mitigation along with potential results of each strategy.

These are all good for your internal decision-making processes.

And also consider revisiting this list periodically to include updates or changes and those updates or changes can be something learned from another site or from the literature or from any other development in the research.

You know, there are many reasons why we are revisiting these factors and the strategies are important, so next we will look at the system deployment impact analysis design, which is basically the core of the experimental design in the next slide.

Yes so.

One of the key principles and analysis designers to capture the use case is considered by circle of stakeholders where the deployment is expected to have the most impact in achieving target performance goals.

I'm going to keep repeating this in many different locations.

The greatest impact of the deployment so it is good to make a note of that, because if we try to capture all the performance measures that we are trying to capture, then you know these are not.

Well, within the scope of the time that is allowed for us to complete these projects.

So, some of the factors to be considered and I keep mentioning this, the selected use cases or scenarios should be considered by stakeholders where enabling technologies are expected to have the greatest impact in the deployment.

Other factors should also be considered that affect feasibility of successful measurement, such as confounding factors, data sources, experimental design challenges, participant requirements, etc.

But particularly specifically, for emerging or less tested technologies.

A critical consideration is understanding the potential threats too, and the confidence in the planned application or component to work as planned in the deployment.

So, in other words, you know it is part of the risk analysis as well, but you know if the plan to a component or application does not function or perform as expected.

Obviously without that deployed capability performance assessment cannot proceed.

You know that's going to come to a hard stop there considered any potential changes to the system while transitioning from.

Phase two to phase three.

And because you know there might be changes from the you know design and testing phase to actual you know evaluation phase it changes adjustments, modifications, whatever you want to call it.

They're not major, but that might have an impact, so we need to record those changes that could affect the analysis.

So, with that, then the next will spend some time on the experimental design.

I know here in the next slide.

Yep, there we.

We know a lot about these.

Obviously, we are researchers and you know we deal with these on a regular basis.

But there are three basic types.

As well, no right the nonexperimental.

Designing the quasi experimental and the randomized or you know an experimental design so you know they're all different.

The strength of evidence and then what that we collect.

Therefore, there's a difference in the confidence of the results.

Obviously depending on the strength with the evidence that we collect, so you know as a reminder, non-experimental design is where we based the results purely on observations, they're descriptive results, and so it avoids direct manipulation of the conditions.

So, because it's observational, the before after design is technically one of the most commonly used nonexperimental designs.

Were in a before after design we measured the conditions before and after an intervention to observe the difference between the two conditions, and understand if any change or changes occurred, and then the perhaps you know also measured the direction of the change as well and the.

Obviously, the evaluation results from randomized or quasi experimental design.

There are more desirable because they are more reliable than the non-experimental designs, but you know with within the non-experimental design, if you're going to actually deploy that you know before master design.

Build to more reliable and meaningful results when compared to other types of non-experimental designs such as you know there's different variations like after only evaluations with the you know only just to see if there was a target met or not.

Besides looking at the before conditions, so I mean these before after types of designs are primarily, you know, in safety process or operational improve.

Once the congestion mitigation types of projects, yeah, you know the tendency is always to lean towards a non-experimental design before after design, but one thing of caution is that in such designs, external factors and confounding factors play a great role.

So, because of that, those factors need to be very carefully considered.

So, but there are also benefits of before/after design, which you can continue.

You can replicate even after the project is over, even after the program is over and you can actually replicate it in other areas as well.

So, at a minimum, when you are dealing with your experimental design you know you should include the following components.

In your PMES plans, the approach, obviously how we're going to design while you're going to design while you're selecting the certain experimental design or analysis methodologies and methods, and you know you should include the detailed performance measures, the locations time series before after approach and control and treatment approaches.

Survey interview focus group approaches, modeling, and simulation tools. If you're going to use any.

And what data are needed, and you know how you know data will be processed and the performance will be measured using these approaches that you describe.

You should also include the required participants, how they will be identified and recruited to replicate the use cases in the collapse scenarios and so that you can address the objectives of the use cases and scenarios developed under the ConOps.

And you know, just some examples that comes to mind is urban users versus rural users. Frequent users versus infrequent users. Commuters versus recreational users and things of that nature.

So, we need to kind of identify goals.

And then the yeah, you need to get into details of the sample size determinations and if there are needs for surveys, interviews or focus groups, and if there are where you know the methods and that you will use in those surveys, I don't know like a visual preference versus stated preference surveys.

You know whatever is going to be more suitable for your research activity, and then finally description of the pre deployment or baseline conditions and the data that will be used in assessing the impact of the deployment.

So that is also important.

So, in the next slide we'll talk about a summary table, but I think it's very useful to put all this together. It is, you know, basically what we discussed thus far.

This is extracted from the PMES plan template that was distributed to you it is pretty self-explanatory, but the purpose is to provide a snapshot of the key and supporting elements of your performance measures, right?

You can see what we suggested in the template.

You can group the performance measures by use case and then list all these elements, but then make sure that we have a table for each performance measure that you consider and obviously this is the summary table.

The text that leads to each of these elements needs to be discussed in the in the text in detail so that we have a full understanding of you know what went behind all these elements that are included in the table.

So, let's move on to the independent evaluation support part of this task.

So, in the next slide, please.

So, this will be a supporting task for you, so I'll go over the independent evaluation scope with the major activity so that you have a very good understanding of what they will be doing and then you know that would hopefully help you when you're writing the IE support section so that you know you will have an understanding of the scope of the wealthy folks.

So, the scope of their scope includes coordinating with the deployment sites which is used in the concept development phase to understand how these efforts can support a broader program evaluation effort.

And in particular from the performance measurement, planning and institutional financial planning.

The independent reviewer reported performance measurement results, in particular to mobility gains by underserved populations resulting from the deployment.

Conducting interviews with the federal team site, key personnel, and other stakeholders.

Assess financial and institutional frameworks resulting from each deployment.

Review the documented lessons learned and estimate potential of each deployment to be replicated.

Uh, you know if it can be replicated across the nation and potentially the total benefit of this national replication so that.

This is roughly the scope that the independent evaluation team is going to have.

So, when you're developing your performance measurement plans and the independent evaluation support part of your PMES plan, it is good to keep these in mind.

Anda also, on the slide you see all the documents that are going to be reviewed by the IE team so that they can provide feedback and input.

So that we have at the end, we have cohesiveness between the two activities, performance measurement and validation.

So next we will go over the process and then and quickly and then the schedule some synchronization with the rest of the deployment activities so that you know it is also in in your mind the top portion of this figure is the overall deployment schedule.

From the bottom portion is the schedule in relation to the deployment schedule.

So basically, IE will have two parts, one of them is the planning phase and then the second part is actually the execution phase.

So, part one is to initiate the planning phase of the IE process and it will cover approximately 25 months and during phase one of the deployment the scheduled effort will be ramped up.

As you can imagine it will slowly transition from planning to the execution activity is approximately midway of phase two of the deployment.

As you can see in that figure. Part 2 is expected to be approximately 30 months.

Starting midway of the deployment phase two and it will conclude roughly then deployment phase two phase three, I'm sorry also, concludes and unsurprising that the.

The majority of the evaluation activities will occur in phase three after the deployment.

And so, again, I'm going to keep emphasizing coordination for the IE activity is very important, and we expect everyone to provide full support for a successful evaluation process, and so with that we covered the planning side of the performance measurement.

Independent evaluation, so in the next slide we'll get into the data collection and data sharing and topics a little.

Uh, based on the data needs that are going to be identified in section five of your PMES plan.

Uh, you're expected to define and develop a plan for the required data to be collected, right?

And, uh, and so in this section, you know we will discuss how data will be collected, how it will be sanitized when necessary or stored and shared and you're also we expect you to discuss constraints and risks along with some of the preliminary mitigation or risk management strategies to scope the performance measures at a system level.

And there are individual impact levels.

And at a minimum, the data to be collected include the baseline data.

Obviously, deployment data and their cost data for independent evaluation purposes on their own purposes.

And we also expect to see a discussion about the other data that will be collected from outside sources, such as you know, survey interviews.

Environment, although the situational data and you know for any other data that is included, so this is the place to discuss the details of that and the section also needs to discuss the details about the approaches that will be used to check the data quality and how this.

Quality measure will be built into the system or performance measurement approaches as well so that the overall integral quality is maintained.

So, in the next slide, we'll go over the data sharing frameworks.

It should include a description of the performance measurement data to be generated and transmitted to the core, including the frequency of the updates of the such reporting.

The framework should also describe which data and results will be shared, which with each planned group and the.

In this case the groups are, you know your internal independent evaluation team, public internal to your partnership, project partnerships.

So obviously for the timing and frequency for sharing data and results with each group is going to be different, so it should be also discussed in this section if there are any different frequencies or reporting, or you know constraints the framework.

It is also expected to be consistent with the task three report to data management plan and the task 8 document, the human user approval plan, so that any sensitive data that is handled that is part of this is handled appropriately, and according to the data management plan.

So, I also want to remind everyone that while working on your data sharing framework it's important to remember that we have a definition of open data, so it reads consistent with federal policy.

The DMP, data management plan, will contain a plan to provide public access to data collected or created through the project, making it open for use unless a specific privacy, confidentiality, security, or other valid restriction is identified and documented.

So that is important so that when you're developing these plans, keep that in mind that there is this public access part of it.

So now we covered the data part.

Let's move on to the reporting requirements.

Uh, in the next slide

Yes, the requirements call for sites to routinely and publicly report their deployment's performance against the baseline measurements and the set targets that you develop during the project.

So, it is important that you are aware of that again, so that there's going to be this routine process to a reporting of the performance part.

And so we also expect you know certain discussions in this plan, which is how performance measure results will be conveyed to the, you know, reporting their processes, dashboards, and any barriers.

Or you know illustrations of plans reporting formats.

For summaries, dashboards, or tables you know how you're planning to, you know, show this in the public domain and discussions on the periodic reports and the you know the their updates weekly or monthly basis, and then maybe just an outline of the final performance impact analysis.

Supporting which elements are going to be included there on all that? So, let's move on to the references on resources, and then we'll actually jump into the Q&A session.

So, in this slide, here is a list of resources and I encourage you to scan these resources before our roundtable on Performance Measurement and human use, which will focus on task eight and nine. I believe so that you can ask questions and you know you might have an opportunity.

To talk to the authors of these reports or people you know who managed to the production of those reports.

So, it is beneficial if you can scan through them and then other than that, we'll have a Q&A session now.

But you know, after the references we had our contact information here, just in case you have any further questions, or you want to follow up with any comments or what have you. But that pretty much concludes the technical part of what I have, and I will now open it up for questions.