TRANSPORTATION & PUBLIC UTILITIES COMMITTEE

COMMITTEE MEETING

~ MINUTES ~

Thursday, May 5, 2022 **4:00 PM** **Remote Meeting**

The transportation and public utilities committee will meet to discuss municipal broadband.

Attendee Name	Present	Absent	Late	Arrived
Burhan Azeem	☑	☐	☐	
Marc C. McGovern	☑	☐	☐	
Patricia Nolan	☑	☐	☐	
Paul F. Toner	☑	☐	☐	
Quinton Zondervan	☑	☐	☐	

A communication was received from Chief Information Officer, Information Technology Patrick McCormick, transmitting a presentation regarding 21st Century Broadband for the City of Cambridge from ctc technology & energy.

CAMBRIDGE CITY COUNCIL

TRANSPORTATION & PUBLIC UTILITIES COMMITTEE

COUNCILLOR BURHAN AZEEM, CHAIR

COMMITTEE MEETING

TRANSCRIPT OF PROCEEDINGS

MAY 05, 2022

04:00 PM, SULLIVAN CHAMBER

The Transportation and Public Utilities Committee will meet to discuss municipal broadband.

CITY CLERK ANTHONY WILSON: Councillor Azeem, the time of the meeting has arrived and you have a quorum. [audio break]

COUNCILLOR BURHAN AZEEM: Thank you, everyone. Uh, I mean--[audio break].

CITY CLERK ANTHONY WILSON: One second. [audio break]

COUNCILLOR BURHAN AZEEM: Apologies for the tech--technical issues. Give me one moment. I call this meeting of the Transportation and Public Utilities Committee to order. Call of the meeting is to discuss municipal broadband, pursuant to Chapter 20 of the Acts of 2021, accorded by the Massachusetts General Assembly and approved by the Governor.

The City is authorized to use remote participations and--and meetings of the Cambridge City Council. To watch the meetings, please tune in to channel 2022--22 or visit the Open Meeting at the City's website. Today's meeting will be conducted in a hybrid format. If you would like to participate or provide public comment, please sign at Cambridgema.gov/publiccomment to sign up. We will not be

allowing any additional public comment sign up after 4:30 today. With all of the--with that, all of today's votes will be by roll call.

Mr. Clerk, can we take roll call of members present?

City Clerk Anthony Wilson called the roll:

Councillor Marc C. McGovern – Present

Councillor Patricia M. Nolan – Present

Councillor Paul F. Toner – Present

Councillor Quinton Y. Zondervan – Present

Councillor Burhan Azeem – Present

Present-5, Absent-0. Quorum established.

COUNCILLOR BURHAN AZEEM: So--so the purpose of today's meeting will be to discuss the city's municipal broadband feasibility study. Um, with that, I believe that the city and Lee in particular have prepared a presentation for tonight. With that, I would like to hand it over to Lee for the presentation. After the presentation we will be holding [inaudible] for public comment. Thank you.

LEE GIANETTI: Thank you, Mr. Chair. Through you to the Committee, thank you for having us here this afternoon. We are excited to be able to provide you with a update on the 21st century broadband project that has been underway.

Joining me from the city is Pat McCormick, the city's Chief Information Officer; Kathy Watkins, the City Engineer; and, um, in a minute, our consultants CTT--CTC Technology and, uh, the Rebel Group will introduce themselves.

Um, as you know, the city has been working on municipal broadband for a number of years. And we're particularly excited to be here today to give you a status update on where this project, um, is. We had a great meeting yesterday with Upgrade Cambridge, um, so we are looking forward to a robust discussion with the committee today. We have the project team, who is directly doing the work that's here, and they are looking forward to, uh, engaging with you in any of your questions.

So with that, I will turn it over to CTC to kick off the presentation. And, Dave, if you want to go through and do some introductions, that'd be fantastic.

DAVID TALBOTT: Sure. Good afternoon, everyone, and it's a pleasure to be here today. Thank you very much. Uh, I'll just briefly introduce the consulting team here today. I'm Dave Talbott, Director of Research Services at CTC Technology and Energy. We also had the pleasure of doing

the Digital Equity Study, which wrapped up last year. And I'll just introduce our president, Joanne Hovis, next.

JOANNE HOVIS: Hi, good afternoon, and thank you. I'm--I'm president of the CTC and I'm--I'm very honoured to be here. I will--rather than doing a round robin of all of our introductions, um, I--let me just say that, that our project managers here with us today, as it is, Mala Goodrich, who is one of the civic technology analysts working on the project and our [clears throat] colleague and collaborator Zach Karson from Rebel Group, um, which is doing the in-depth financial analysis and the project finance analysis, um, in partnership with, um, our engineers and, um, and business and--business analysts and strategists working on some of the other elements.

Um, we're really delighted to be here and to give you this, um, interim update about our work so far and the analysis we have done. I will just start by saying that, um, there is considerable additional work yet to be done, including much of the data collection. So we do not have, uh, recommendations to present to you. But what we do have is a in-depth set of frameworks that we would like to share based on modeling and we are doing based on best practices

around the world and, um, and knowledge of how such networks have been deployed and structured in the most successful, uh, environments around the world.

Um, let me hand it to my colleague, Dave. He will, um, describe some of the methodology of what we're doing and then we can dive in, in more detail on the actual tasks.

DAVID TALBOTT: Thanks very much, Joanne. And my colleague Mala Goodrich is going to queue up the slide deck. And I'll start with the first couple of slides, just to tell you what some of the tasks are that we are working on. And, and then I hand it back to Joanne and Zach to, to dig into some of the later slides, where we will go into some detail on the business modeling work and options that they've been developing.

Um, so the overview is of course to give you the tools, data and analyses to support informed decision-making on this topic. Um, we have been doing the baseline analysis of, of existing infrastructure in Cambridge. We've done site surveys where we've reviewed, you know, what, what the condition of infrastructure is for--which informs the design and cost estimation process. We're doing an analysis of the current market conditions, which have

changed quite a bit in the last few years, thanks to federal programming and, in part, the introduction of a new provider in the city to some extent.

We are doing the business and ownership models which we're going to go through today. Uh, and we are getting input from stakeholders in the community, including through a residential survey to get a sense of a willingness to change or adopt a new provider and at what price points for symmetrical, meaning same download and upload fibre service, and through engagement with, um, the business community through various business organizations in Cambridge, and working very closely with Pat McCormick and Lee Gianetti, including regular meetings to guide the project. The financial analysis comes after we have the cost estimation numbers to, to plug into the models.

If you could go to the next slide, please, Mala. Yeah, so I sort of already mentioned these things that we've, we've already been--done a lot of site surveys to inform the design and cost estimation with as much specificity as possible, going down, you know, as many streets as possible in the city, and also understanding, um, you know, the affordable housing sites and where those are located for

potential prioritization in, you know, that for, for the--for everyone to consider. And I've, I've mentioned these other, these other elements already, coordinating with the Housing Authority, which of course, as you know, is a separate entity, but has also done some innovative things already, and coordinating this effort with their, with their good efforts to date.

If you want to go to the next slide, Mala. So I might, might pass it here to Joanne, just, I just want to reiterate that it's a real pleasure to be working in the City and with the City team, having worked closely on the Digital Equity Study, concluding last year, and having been working in, in, in Cambridge for many years, myself, it's a real honor to do this, to do this work. So with that, I'll just hand it to Joanne to carry a few of these slides. And then she'll hand it to Zach Karson from the Rebel Group, our, our partners in this effort to, to go into more detail on some of the business modeling work.

JOANNE HOVIS: Thank you, Dave. [clears throat] Um, an overview of the infrastructure that underlies the internet, the, the actual physical infrastructure and the tasks is provided here in, in graphic form to help us to explain the

way we think about, not just the elements of the network that would be part of a municipal effort around broadband in Cambridge, but also the various elements that might require, um, or might prudently be assigned in different ways to different parties, different sources of funding, different types of financing and so on, to get to the best possible outcome that leads to the best financial outcomes for the city, but also critically maximizes the outcomes with respect to the city's public policy goals for broadband. Um, and, and what I mean, when I say, the elements is, we encourage you to think, um, the way network engineers, but also network planners do about the components of the network, in what we might say, are three levels.

First, there is the actual physical infrastructure. This is the piece that is something like the public works functionality of the city, the passive infrastructure, and that is the conduit under the ground, the fiber that goes in that conduit, or the fiber that goes on utility poles, together with things like cabinets, and hub buildings and so on; the physical infrastructure of a broadband communications network. We call that the passive

infrastructure. It's called passive because their--it does not require electricity.

It's really the pieces of the network that are the physical elements. Um, and that is the first piece of how we think about this. Um, by the way, our engineers, as Dave said, are deeply engaged in looking at what the cost of building that passive infrastructure would be in Cambridge. And this is a very significant effort with--looking at 100% of the streets in order to develop estimates. Even for planning purposes, we want the best possible estimates obviously. And this is particularly critical in the current moment, because the enormous amount of, both public and private capital, flowing into the fibre to the home market in the current moment, has created incredible stress on both materials and labor.

That is then also compounded, of course, by supply chain issues around the materials. So the numbers are evolving and changing at all times. They are in many cases going to be dramatically different than they were even just two years ago or 12 months ago. And we're going through a pretty considerable--pretty significant engineering analysis in order to build the best estimates possible. So

that's a passive infrastructure that's--or what we might call outside plant and how that gets built and then how it gets maintained.

On top of that passive infrastructure is what we call active infrastructure and active, in this case, just means that it requires electricity to be activated in order to actually, um, enable that dark fiber network, um, to be lit; go from dark to lit with electricity and to carry communication signals. And the active infrastructure as a physical matter is the equipment, the, the, um, pieces of very sophisticated telecommunications equipment that turn a dark network into a lit network. And the staffing around that is network engineers, [clears throat] and be the, the part of the--when Zach presents to you the different structuring models for what the business model would look like, the active infrastructure is the procurement of that equipment, maintenance of the equipment, and then the operations of the equipment, a very sophisticated part of the network.

Then, sitting on top of that and the way this is generally modelled by broadband thinkers and broadband engineers, is the actual provision of services. Um, and we

separate that out because, while in many cases, one entity will do all of these things; they are different functions with different staff, different kinds of capabilities and we think about them as potentially requiring different approaches that the provision of services, um, using the passive and active infrastructure to deliver broadband internet services to homes and businesses throughout the community, to deliver customer service to do all of the pieces around marketing and sales, billing and collections and so on. That is the third big bucket of functionality, um, that we think about when we, uh, develop the scope elements for the various business model structures.

Um, and let me ask Mala for the next slide, please. And what Zach will do now is, um, share with you, based on those three different categories, the passive infrastructure, the active infrastructure, and the service provision functionality, the different models that we have developed for how a municipal effort in Cambridge could be structured, and how they might facilitate and align with the maximized your public policy goals and your financial goals. Let me now turn it over to my colleague, Zach.

ZACHARY KARSON: Thank you so much, Joanne. And thank

you to the Council for, for having us here to have the opportunity to present. And so here, I'll go through some of these, these business models. And just to reiterate a little bit of what Joanne said, thinking about the, the different business models, through the lens of these different scope elements of a fiber network is really critical to identifying and distinguishing the key sort of factors that, that differentiate the business models and, and how they affect Cambridge's public policy goals.

So, you know, all, all three of these different scope elements have very different cost structures, risk structures, different types of market parties that would potentially play a role, and thinking through what, what the proper, uh, role of the public sector is versus the private sector and how you contract for these different scope elements is critical to making sure that Cambridge gets the best value possible, maximizes the value of competition and, and picks the business model that, that works best for Cambridge.

So I'll, I'll quickly run through the, the differences of these, of these four models. The first model is what's most commonly seen in municipal broadband, in which the

city, uh, has control or runs all three of the scope elements. So the city would fund and finance and maintain the dark fiber network and the city would also, itself, provide and maintain and operate the active infrastructure and provide service to the subscribers. So that could be either through a municipal broadband department or the city could outsource, um, some of those services.

But the key in, in terms of thinking about what is that outsourcing look like is that the city is still taking all of the risks associated with collecting revenue from subscribers. So it is not passing on any of that risks to the, to the party that would be outsourced and running the services of the broadband network.

In the second model, the city would be, uh, transferring that operational and revenue risk to an Internet Service Provider. Either one or multiple providers that would be responsible for sort of the active infrastructure layer and the service provision layer of the network. The city would still be funding, financing and maintaining the dark fiber or the fiber that's actually in the ground. Um, and then in the third model, a key distinguishing factor here is that you have a different

contractor that is solely providing the active infrastructure so you could have a competitive procurement in which one, uh, ISP contractor is selected to provide that active infrastructure and, and operate the network-- operate the infrastructure and then multiple and other Internet Service Providers would be allowed to provide a service on that network. Or there could be an open market of ISPs that are allowed to compete on the network, provided that they meet certain conditions, um, set by the city. And that third model, as well, the city would be funding, financing and maintaining the passive infrastructure.

And then the fourth model is, is what is in the, in the public infrastructure world more considered a typical public-private partnership. And Rebel Group, um, is a firm that specializes in public-private partnerships across infrastructure sectors. So we do a lot of work in broadband, but also other sectors that is transportation, social infrastructure. And we brought some of those best practices from the broader P3 world to broadband in terms of thinking about innovative ways that you can structure, contractually, the three scope elements of a broadband

network.

So in this case, um, what we call hybrid funding, financing is really, there's some private financing that would be provided for, uh, the passive infrastructure network, depending on the business case, of the, of the broadband network, whether or not it is financially and economically feasible for a private sector party to recoup its investment in the entire network, solely through subscriber revenues. Public funding may not be needed.

However, it's important to note that, if that were to be the case, there is an argument to be made that this is the network would already be built, because there would be a private sector, um, business case to do so. So it's our hypothesis that, at this point, um, the--some public funding would likely be needed, um, to, to make the business case positive for a private sector company. And so that's what hybrid funding and financing refers to here.

And then there's three different scope –, um, sorry, three different sub-models within model four, depending on how you structure the past--the contracts that are, that are handed over to a private P3 developer. So essentially, the city would be offloading a lot of the risks to a

private P3 broadband developer, who would then have subcontracts for passive infrastructure, active infrastructure and service provision. How you structure some of that risk transfer can, can vary in models A, B, and C. But I won't go into the--quite that level of detail for this presentation.

And so, Mala, if you can go to the next slide. So this diagram shows--or sorry, these four diagrams show the four different business models, how the different contractual relationships and financial flows would work. Um, I won't again go into details of each one of these, but each one is also available in the appendix of the report. So you can review those and see how the, the financial flows and the contractual structures differ across the four different models.

Next slide. So, um, at this stage in the process, as Joanne mentioned, without, um, having completed all of the costs data gathering, um, we've been doing, uh, this business models analysis and more of a qualitative analysis in terms of comparing the different business models. And so what we've done is looking at the broadband task force's objectives, we wanted to assess how the different--the

choice of business model affects whether or not, or the sorry--the degree to which, um, the city's uh, uh, objectives are met. And so all of the business models that we've identified do meet and align with the city's objectives to a degree and that's why they were chosen and that's why they're being evaluated. So we have identified the four business models that we believe best meet the city's objectives. But still, within that, we'd like to sort of further assess how each individual objective--the degree to which that is met.

So if you look at the, the list here of the, the objectives that were identified by the broadband task force, um, just simply providing a symmetrical gigabit fiber networks, we believe if meets the goals or can be structured to meet the goals of affordability and equity, supporting entrepreneurs and small business and promoting innovation and excellence.

In other words, all of--you can structure the contractual provisions such that those goals can be met in any of the four business models identified here. So on, uh, affordability, for example, through means testing and preferential pricing, you can, um, ensure that the private-

-any private sector provider, even in models, two, three and four are meeting those affordability objectives by providing, uh, pricing to low income subscribers that is meeting the needs that and the policy objectives of the city. And that's something that, that I think, Joanne and the rest of the CTC, CTC team can, can speak to at greater length. Um, and so in addition to the broadband objectives that are described here, we also added two additional goals that we thought were critical to evaluate. And those are public ownership and minimizing the city's financial risk.

So if you'll go to the next slide, Mala. So public ownership, what we looked at is, does the business model allow the public sector to retain long term ownership of-- at a minimum passive infrastructure or the dark fiber. Um, all of the models, to some degree, provide for public ownership, the public-private partnership model, um, still provides for a long term public ownership, but is less --, um, provides less public ownership to a degree than the fully municipal model, for example.

And you'll see that in the next slide. On local control, the question is does the business model allow the city to incorporate some key public policy goals into the

contracts with private partners. For example, it could set price benchmarks for the private partners to ensure that sort of anti-competitive monopoly behavior was kept in check.

The next one on choice and competition, pretty simple. That is, does the, um, choice of business model lend itself to increased competition for subscribers. So simply providing an alternative to the incumbent provider, of course, does introduce more competition, but the question here is, is the degree of additional competition beyond that. And then finally, on minimizing financial risk, um, does the business model serve to minimize the long term risk to the city as the owner of the dark fiber network.

Next slide. So we've done a very high level qualitative assessment here to compare how the four different business models score on those four different objectives. I won't stay too long on this slide. This is really just to show that we've, you know, done this thinking about the trade-offs, um, of the different business models in terms of, for example, local control on one hand, and minimizing risk on the other hand.

As you, for example, handoff more control to a private

sector entity, um, uh, you're also allowing them to take more risks, and vice versa. So there is a bit of a, um, direct relationship between some of these, um, factors. And, as you can see here, um, the highest scoring on, on this sort of qualitative assessment is on model one and model three and if you sort of tally up the Harvey balls, but, um, this is just one sort of crude way to, to look at how the different business models meet the different objectives. Once we have more data on both the cost and the revenue side, we'll be doing a great, great amount more of, of quantitative analysis to see how these different models compare.

Next slide. And so another layer to comparing the business models is the risk allocation. I've already touched on this, uh, to some degree in the overview, but there's a different risk allocation of the different scope elements, depending on the business model chosen. Um, in the fully municipal model or model one, the city takes on the revenue risk and the operating risks. That may be very challenging for a city that doesn't have an existing utility structure in place and has not done municipal broadband before. We've seen this done in, in other

jurisdictions, but often times, there's sort of some existing entity in place that is, that is used to op, operating a, an enterprise like a broadband enterprise.

For models two and three, there are some differences in, in both of those cases, operating risks and revenue risks are transferred. But there's a difference in terms of have, having that active infrastructure contractor in place, um, taking on more of the operating risk in model 3, and that'll, that reduces some of the barriers to entry for Internet Service Providers to compete, um, on the service provision layer of the network.

And finally, in that, in the public-private partnership model, which is model four, the hybrid model, there's enhanced risk transfer through long term private financing. In other words, the private sector partner has some skin in the game. Um, and that does provide value to the city. Um, however, as, as I'll discuss in, in the next slide, um, we do believe that the value of private financing here is most relevant for the second and third-- the active infrastructure and the service provision components of the fiber network. So typically, the value of having private sector financing and, and that risk transfer

that comes with having private sector financing is most relevant when you can--are most valuable, I should say, when you can optimize, uh, costs over the lifecycle of an asset and really have, um, that direct relationship between how the asset is built and how it's maintained.

For a dark fiber network, uh, the passive infrastructure, there's not a whole lot of maintenance needs. And the, the construction of the network is, is fairly straightforward; it does not really affect how the asset is maintained and so there's less of a, a, a risk transfer--less of a value to that private risk transfer. And so in that case, the public funding, Cambridge being a, a AAA rated municipality with a low cost of borrowing, um, is most likely to be the, the optimized way for, for Cambridge to finance the passive infrastructure network. And I'll speak to that a little bit more on the next slide.

If you can go to the next one, Mala. So, um, there's a variety of way in--of ways in which municipal broadband networks have been funded and financed across the US and across the world. And the reason, um, we're talking about funding, even in the case of a public-private partnership, is that we're not necessarily sure that a broadband fiber

to the premises, broadband network in Cambridge, would be able to be paid for entirely through subscriber revenues. And without, um, sufficient subscriber revenues to pay for the, the upfront costs and ongoing operational costs of the network, some public funding would be needed to, to subsidize the gap, the funding gap of, of--to make the network financially feasible. And some sources of, of public funding that we've seen in other places to, to fill that funding gap, are general property tax, sales tax, utility fees, special assessment districts, of course, existing budget or capital funds.

And then another interesting one, which I think may be very relevant for Cambridge is in-kind support; ways to make building a broadband network in the city or the municipality cheaper in some way by providing access to rights of way data, um, tax incentives, etc.

Anything that can reduce the overall costs of building a, a fiber network will reduce the amount of public funding that may be needed. And then of course, grant funding. There's a variety of programs. And Joanne can also speak a little bit to the IIJA and potential opportunities there. Um, some of these sources can be used to repay financing

that's taken out for the upfront capital investment of the project. And we've been having an, an--I can also pass back to Pat and Lee at some point to discuss the discussions that we've had with the City's finance team. We've been making sure that as we go through this business models, evaluation analysis, where we're keeping a sort of broad and inclusive approach and, and looking at all the, the funding and financing options that are on the table for the City of Cambridge. So we've already had several meetings to ensure that these discussions are not taking place in a vacuum. And that when we look at these different business models, and some of the different contractual and funding and financing structures, that we're not discussing options that, that would not actually be possible, um, for the City of Cambridge.

So what we're working towards, um, in terms of looking at the financial analysis and the numbers that are going to be coming in, and this business models analysis is getting to a point where the city can, can truly make an informed decision of what is feasible, based on a really robust set of, um, analyses that, that this team has already performed. And so with that, I'll, I'll pass back to the

CTC team.

DAVID TALBOTT: Thank you, Zach. Um, in terms of the structure of the council meeting, Lee or Pat or--do we have questions or dialogue that you want to have?

LEE GIANETTI: We can turn it back over to the chair in a minute. Mr. Chair, thank you for this opportunity. As Zach had just mentioned, we've been doing a, a internally a very collaborative approach to this--to this process. So we've had the finance team, bond counsel, legal has been involved. Early in the stages, we're bringing all the relevant partners together so we can have the discussions while the planning is taking place, versus where I think with the broadband taskforce, a lot of feedback came after the analysis was done. So that is something that we're doing, um, very differently.

And as we had mentioned, we met with Upgrade Cambridge yesterday. So as we think about beginning to engage stakeholders, um, how we can bring them in early in the –- early in the process to be able to help best inform how we are moving, um, forward, both in terms of a gut check on the work that's being done, but also how we're going to be able to engage the various stakeholders that are involved

with this.

So with that, I think we'll turn it back over to you, Mr. Chair, and we look forward to the discussion.

COUNCILLOR MARC C. MCGOVERN: Thank you, Lee, um, Patrick, and to the rest of the city staff, and CTC for the prelim -- preliminary work that you've shared with us so far. And I am glad that we got these technical, um, issues worked out. In terms of the structure of the council meeting, Lee or Pat, or do we have questions or dialogue that you want to have?

LEE GIANETTI: We can turn it back over to the chair in a minute. Mr. Chair, thank you for this opportunity. As Zach had just mentioned, you've been doing a--internally a very collaborative approach to this, to this process. So we've had the finance team, bond counsel, legal has been involved. Early in the stages, we're bringing all the relevant partners together so we can have the discussions while the planning is taking place, versus where I think with the broadband taskforce, a lot of feedback came after the analysis was done. So that is something that we're doing very differently.

And as we had mentioned, we met with upgrade Cambridge

yesterday. So as we think about beginning to engage stakeholders, um, how we can bring them in early in the pot--early in the process to be able to help best inform how we are moving forward both in terms of a gut check on the work that's being done, but also how we're going to be able to engage the various stakeholders that are involved with this.

So with that, I think we'll turn it back over to you, Mr. Chair, and we look forward to the discussion.

COUNCILLOR BURHAN AZEEM: Thank you, uh, Lee, um, Patrick, and to the rest of the city staff and CGT--CTC, for the plenim--preliminary work that you've shared with us so far. And I'm glad we got these technical, uh, issues worked out. Um, with that I would like to take this moment to, um, go to public comment. And then after public comment, we can come back and have a series of questions. And I'm sure the rest of the committee also has questions they would like answered. So with that, Mr. Clerk, can we go to public comment?

CITY CLERK ANTHONY WILSON: First individual in public comment it's Saul Tannenbaum.

SAUL TANNENBAUM: Can you hear me now?

CITY CLERK ANTHONY WILSON: We can hear you, please go ahead.

PUBLIC COMMENT

Saul Tannenbaum, address not provided, spoke on how broadband should not be viewed vis-à-vis financial risk as it is a public utility with a social value. He insisted that this was an investment in Cambridge's future and its residents. He wound up by reiterating that it should be looked at as an investment, and not entirely for the financial return, and value should be attached to the benefits it provides to everybody who lives there.

Roy Russel, address not provided, while insisting that CTC and the Rebel Group were on the right track, asserted that he would have been happy to see them present some numbers. He also asserted that public outreach was required for the process to be effective in getting the support of the residents and the businesses. He highlighted that sans public outreach some earlier programs had failed. He went on to highlight the need and the responsibility to educate the residents and businesses so that they take an informed decision. In closing, he urged the Chair to have more such meetings and assured Upgrade Cambridge would extend its

support through the process.

Paul Weaver, address not provided, said that affordability was the key factor. He also underscored the importance of planning and funding. He wanted the City to incorporate any plans to tear up streets so that wouldn't be a need to redo that later.

CITY CLERK ANTHONY WILSON: There are no further public speakers.

COUNCILLOR BURHAN AZEEM: Thank you, Mr. Clerk. Thank you, Mr. Clerk. Um, on that, uh, motion I--On that, I would like to make a motion to close public comment. Could we do a roll call?

City Clerk Anthony Wilson called the roll:

Councillor Marc C. McGovern – Yes

Councillor Patricia M. Nolan – Yes

Councillor Paul F. Toner – Yes

Councillor Quinton Y. Zondervan – Absent

Councillor Burhan Azeem--Yes

Yes-4, No=0, Absent-1. Motion Passed.

COUNCILLOR BURHAN AZEEM: Thank you, Mr. Clerk. And thank you for everyone who participated in public comment. Um, I wanted to take this time I wanted to take this time

to ask a few questions of city staff and CTC, as well as then go to members of the committee with any questions they have and any other city councillors present. Um, so the first question I have is around the timeline for the completion of the study. I was wondering if we had an estimate for when the different phases of the study might be completed and when we might have more, uh, results in numbers.

LEE GIANETTI[?]: Estimated completion will be this fall.

COUNCILLOR BURHAN AZEEM: Great. Thank you. Um, there was also a question about like minimizing risk, and there are places where there's more risk. And so we might want to have a private industry partners. I was wondering if places where we have, uh, larger risks is also places where private industry partners might want to charge a premium because of that risk. And if taking on some of that risk, uh, uh, on the part of the city might lower cost in those places.

JOANNE HOVIS: And, Mr. Chair, I think that is exactly right. That's a very accurate framework for understanding elements of risk and, and how they work generally. There's,

there's also a different set of elements to though, which is that there are some kinds of risks that are easier or more efficient for some parties to bear than others. So an example of that might be marketing and sales and 24/7 customer service and, um, changing pricing and products and services in real time to react to market conditions. That might be a set of risks that equate to market or revenue risk that the private sector can adapt to an address, certain private sector entities that might have expertise in that area can do so better than some cities.

Um, conversely, in our experience, many cities manage construction risk and risk around costs of deploying and maintaining infrastructure much more ably than some private companies do. And an example of that, I think one that speaks quite loudly, is the fact that Google, um, one of the world's largest and most successful companies, when it entered the fiber business, it really stumbled, and where it stumbled was in engineering and construction of fiber infrastructure in the public rights of way. And this was not for lack of trying and not for lack of spending, it just turned out not to be a core competency.

Um, in some places, where Google is the tenant on a

network that was built in and is owned by a city, that network was deployed faster and more cost-effectively than Google was able to do itself so that is one illustration, but in that case, there was a certain kind of risk that in some cities is managed more efficiently and better by the city.

So when, when we look at risk, and we look at the assignment of risk, we're looking at a range of different factors, how it gets priced, who can manage it best, um, how it is most efficiently assigned, but also to what degree that element of risk meets the public policy priorities of the city, um, and that functionality does, as opposed to some of the priorities of the private sector. And is there a risk, I think most consequentially, if there's a private role of that private role, then undercutting the public policy priorities. And it's this complex mix of different factors.

And it's one of the reasons why we will model a potential municipal effort for you with the data around the cost estimates, using a number of these different models. So you can compare them to each other and see what the financial risk elements look like, but also the other kinds

of risks and which ones you might want the city to undertake, and which ones you might want to, uh, shift over to the private sector.

COUNCILLOR BURHAN AZEEM: Thank you for that. Um, there were several business models shown in the presentation today. Um, I was wondering if they were static in that once City Council makes a decision, we're stuck with those business models? Or if we can switch between them to take the ones that were the most difference I think. So if we started with the first business model, where the city owns most of the assets, could we then go to business model like four and could we do the reverse as well?

JOANNE HOVIS: There's certainly a good amount of flexibility, depending on the timeline in which the decisions are made to shift models. Um, but the core underlying physical infrastructure is the same regardless. But once the city enters into certain kinds of contracts, there's obviously a cost associated with departing those contracts and there's costs associated with shifts and models. Um, but I, I certainly think that during this planning phase, nothing should be off the table and, and a

full set of implications for each of the--each of the models should be shared, that if, if the--one of the considerations or one of the interests is in testing the models, that's something we can consider, as we do the analysis of what would the cost be to move from certain models to others.

I think there's some that are not, where that wouldn't be possible, but others where it would be enough. I'll share another example of this, perhaps just based on my own experience, the city of Tacoma, Washington, which is the sister city near Seattle in Washington State, um, built and operated a municipal network for many years was actually built in the late 1990s and operated by the city until just two years ago. And, um, in part, because of some financial challenges associated with it, the city then shifted over to a municipal ownership with private operations model so going to a public-private collaboration model from a municipal model. Um, so it's not at all unprecedented, or inconceivable, but it does come with its own set of costs.

COUNCILLOR BURHAN AZEEM: Wonderful, thank you. Um, there was mentioning of how we would get funding and whether we would want, um, private industry to do some of

the financing. And then there was also made mention of the city's bond rating, and how, you know, we have a very strong bond rating and can finance things at a low interest rate. I was wondering where you, or how you draw the line in that if the city has a lower bond rating overall, uh, why would it not make sense for the city to fund most of the project? Where are the trade offs with, you know, letting the private, private sector do some of the financing of it?

ZACHARY KARSON: Jump in with that one, Joanne. So, as I mentioned during the presentation, private financing comes with, uh, some benefits, largely related to the risk transfer that's associated with private company having some skin in the game and, and operating the asset that they financed. Um, the, the low cost of, of public financing relative to private financing, means that private financing is only justified if there is a significant risk transfer and lifecycle cost optimization associated with the assets that are being financed. And so for the passive infrastructure, the dark fine--dark fiber network, we really don't see that, that level of, of lifecycle cost optimization given the, the maintenance needs of that

asset, and how that relates to the other scope elements of the network.

And so our, our sort of hypothesis and the way that we've been thinking about it is that, if private financing were to play a role, it would be most useful at the active infrastructure and service provision layers of the fiber network. And that given the city's low cost of financing and AAA rating, um, you know, did have--it would have the opportunity, if it's so decided that it was--that that was the prudent course of action and, and it's sort of bonding and capital program, um, that it could use public fund--public general obligation bonds, or some form of general obligation-backed bonds, um, to, to take advantage of that low cost, and, and, and high rating to finance some of the passive infrastructure.

JOANNE HOVIS: If I can add, um, just a few words to amplify what Zach just said, when you think about the passive infrastructure, which is the core infrastructure out in the rights of way, um, that is conduit, fiber optic cable, cabinets and so on. These are very long term assets, if well-maintained, they will be 30, 40, 50-year assets and the conduit, if that is the way the network gets built,

underground conduit is probably a 100-year asset. That is the kind of infrastructure that the city is not only able to build, but also to maintain. And that makes a lot of sense for public investment in many cases. Um, the, the active infrastructure is the electronics, and that is the equipment that requires replacement, depending on which kind of electronics it is, in some cases, it'll be every three to five years. In some cases, it's seven to 10 years, some of it might be 11 or 12 years, but not much longer than that. And there is constant lifecycle change for that equipment, the equipment that we will be buying five years from now will be different and more sophisticated than the equipment that we might buy for a network in the current moment.

And the risks around equipment selection, maintenance, and operations and so on, are, as Zach pointed out, in that at that passive layer, that might be a very appropriate area of risk for a private sector company that is dealing with that all the time very familiar with it, adapted and able to manage those kinds of risks, would not then require the city to go out to bond again, every five or seven or nine years on this kind of equipment. That's it--the

working hypothesis that's not a conclusion. We're working through a range of different models, but that's one reason why we might think about this somewhat differently, again, with the thought process in mind that would that differentiation compromise the city's public policy goals. If so, then there's a cost associated with it that one might not want to take. But so long as the city, the city's public policy goals for the broadband network can be secured through this mix of different approaches then might it be something that you would want to consider. And our work over the next few months is to lay those scenarios out with some hard numbers so that you can look at them and compare them to each other.

COUNCILLOR BURHAN AZEEM: Thank you. Um, I'm certainly looking forward to seeing a lot of the different models that come out. Up to this point, I think a lot of the technical risks that —- or a lot of the risks that we've been talking about has been technical in nature around equipment. Um, one comment that you made during the presentation was that, um, subscriber revenue might not be enough and we might need to look at other sources of revenue. Um, I wanted to ask a specific question about

that, presumably, you know, we have Comcast and some other providers in the area, and they make profit based on subscriber revenue. I was curious as to why you believe that subscriber revenue would not be enough in this case, and specifically, does that have to do with the uptake number, is there a number at which if a certain percent of the city did choose to buy the municipal option, it would be profitable on subscriber revenue alone?

JOANNE HOVIS: Yes, that is the case. And that is one of the numbers we will hopefully be able to report to you based on certain kinds of assumptions in the model. And the cost estimates that our engineers are developing now, both for capital and operating costs, will enable us to, um, program the financial model effectively to tell us how much revenue would be necessary for the network to pay for itself on an ongoing basis. Um, and that volume of revenues is a function of the number of customers and the average revenue per user or in industry language, ARPU, Average Revenue Per User per customer.

Um, and we will be able to estimate what that should be in order for the network to achieve positive cash flow and effectively pay for itself so that it's paying off all

of the associated obligations, including debt service. But we, we would not, um, take it as an absolute given that this will necessarily happen. We would also not take it as a given that it would not happen. Um, it is, um, the fact that the city is an operator of a communications network in Cambridge would be competing with Comcast, would be competing with the modest amounts of infrastructure that Verizon has in Cambridge, and it is very modest, that would be competing with Starry, which is a fixed wireless provider, providing, um, residential services in some parts of the city and with the mobile wireless, um, providers, as well as with the new low earth orbit satellite companies.

Now, I will say that if the city builds and operates a fiber to the home network, it will have the best network, it will be better than any of the ones I just mentioned. But that doesn't mean that the city will necessarily or any entity that built fiber, the premises in Cambridge would necessarily get most of the revenues or get sufficient revenues to satisfy its needs; it would still be a somewhat competitive market, even if the other services were not as good, not comparable, there is still that competitive factor at work. And, and that is some of what Zach is

referring to when he talks about market risk and revenue risk.

And so some of the scenarios we are looking at is, with that market and revenue risk be something that the city wants to assume for itself. And if it prefers not to, is there a way to transfer that particular risk to companies that are adept at navigating market, while still seeking through them the structure that is developed to secure the city's broadband public policy goals?

COUNCILLOR BURHAN AZEEM: Wonderful. Um, and I promise to the other members of the committee, I will yield, I have two more questions. Um, what is the--one of the things that you've mentioned in terms of other sorts of revenue sources was in-kind support. I was wondering if you could elaborate on that point in that what sorts of in-kind support in terms of regulation changes would make it, um, easier for the city to install municipal broadband?

JOANNE HOVIS: Um, so, um, I don't want to overstate the importance of this, but there are elements in which city policies, in, um, any given city, can in some case be optimized and the city can effectively organize itself to, um, maximize with regard to, um, reducing costs to the

greatest extent possible and, um, facilitating and streamlining. These are not massive factors. The, the business case on a broadband network is not in any way transformed by these matters. But there are, um, mechanisms by which outcomes can potentially be improved. And I, I say that as a general matter, based on national experience, not anything specific yet with regard to Cambridge. Zach, is there anything you would want to add to that that I've missed?

ZACHARY KARSON: No, that's a good summary.

COUNCILLOR BURHAN AZEEM: My last question before I yield and, um, is that--I was wondering what you think, given the conversation we've had is, if the city does choose to do municipal broadband, um, in any of the four ways that you've mentioned, what do you think are the most concrete benefits that residents of the city should expect from a municipal broadband option?

JOANNE HOVIS: Um, the, the key and critical factor, I think, is that what you do not have in Cambridge right now, but is emerging in many communities throughout the country, including many of the great counterpart university cities throughout the country is ubiquitous fibre to the premises

on a citywide basis. And you have a pretty robust cable broadband network that is operated by Comcast, but you don't have, um, fibre to the premises and, and that is the broadband infrastructure of the future. And, um, whether it's provided by the city or another entity, it is certainly something that we think is very desirable.

Um, the, the other, um, element that I think is a very important one is that unfortunately because Verizon has not invested extensively in Cambridge, Comcast has almost had the field clear and an effective monopoly in much of Cambridge for a long period of time. I also live in a Comcast Verizon market and just outside Washington, DC in Bethesda, Maryland, and Verizon upgraded its infrastructure in my county in my city to fibre to the premises and gives Comcast a real run for its money. There is much more meaningful competition in many markets that are Verizon and Comcast than there is in Cambridge and you've not had that.

The addition of another robust wire line network, such as the one that is contemplated here, or one that might be built by a private company at some point, um, would bring an element of competition that you unfortunately do not currently have.

COUNCILLOR BURHAN AZEEM: Thank you for that. I'll now open it to other councillors, particularly on those--on the committee for the questions. I see. Councillor Zondervan and then we can go to Councillor Nolan afterwards. Councillor Zondervan, you have the floor.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, Mr. Chair, and through you, thanks to the staff and consultants for this very informative presentation. Um, you know, a lot of the conclusions are, are trade-offs that you've presented, are, are of course not, not new. And, and a lot of them are not new to me. So I'm kind of shifting in my chair going well, why don't we build it already? [laughs] So, is there, is there any city in, in the country that has implemented broadband, municipal broadband and, and suffered serious financial losses as a result?

JOANNE HOVIS: Um, so, um, the answer to that is, yes. And fewer than, um, those who oppose municipal broadband, like to say, and there's a lot of distortive and inaccurate ad, advocacy material out there that claims that municipal broadband networks consistently fail and, um, and have cost overruns and require all kinds of backstops from the city and so on. Much of it, quite frankly, is distortive and

paid for by self-interested entities, who would prefer not to face any competition at all. Um, so I want to put that very large caveat on this. Um, but there have certainly been municipal networks that have struggled financially and there have been implications for that. There have also been private sector networks that have struggled financially or have failed financially because they are--our system works in a way that we test new models, and we test business strategies. But there have definitely been financial challenges.

Um, I will say, though, as someone who has worked in the space since the advent of the commercial Internet, that I don't know of any city that built broadband, and even if they struggled financially, with the, the actual broadband network, they recognized and appreciated all the positive externalities that flowed from that network, the economic development and vitality and education and health care and equity benefits that came from the network.

But those benefits don't accrue to the broadband business enterprise necessarily. The broadband business enterprise is generally, um, judged based on its financial statements, and, um, there is no guarantee about how that

will work out in a public or in a private context. Um, but there--there's certainly, I think, some challenging stories out there about broadband networks that have struggled both public and private.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you. I mean, what I'm hearing you say, is that while the, the network itself, if you sort of isolate its accounting, may not have paid for itself. Overall, the, the municipality that implemented it didn't really regret doing so.

JOANNE HOVIS: I can't speak for all of them, but I think that, um, there are many, who, in some cases, even sold their networks to private entities in order to, um, mitigate against financial risk and have recognized that they've seen all kinds of other benefits from having those networks.

COUNCILLOR QUINTON Y. ZONDERVAN: Right. Thank you. And, and so in that vein, what's, what's the downside of at least implementing a dark fiber network tomorrow, like, what, what would be the, the, the risk to the city? I mean, if we put fiber under the roads, worst, worst case, if we couldn't figure out how to use it, we could sell it off, and we'd still recover most of the, most of the costs,

presumably.

JOANNE HOVIS: Those financial implications are what we are analyzing for you. And then we will be able to put that data in front of you, and you'll be able to make public policy decisions based on that.

COUNCILLOR QUINTON Y. ZONDERVAN: Thanks. So when, when can we expect that information?

JOANNE HOVIS: We'll be concluding this work over the next few months with the final documents delivered in the fall. Um, and, and this is not a delayed or a slow process. It, it's a significant engineering and financial advisory effort in order to analyze this right, analyze it well, so that you've got an high quality information and data by which to make decisions.

COUNCILLOR QUINTON Y. ZONDERVAN: Great, thank you so much for your work. I look forward to the report. Thank you, Mr. Chair.

COUNCILLOR BURHAN AZEEM: Thank you, Councillor Zondervan. To Councillor Nolan and then Councillor McGovern.

COUNCILLOR PATRICIA M. NOLAN: Thank you, Chair Azeem, and to the team for working on this. Couple comments I want

to highlight, uplift, reiterate and then 1,000% endorse the notion that was said in public comment about we have to stop thinking of broadband and internet is anything other than an essential infrastructure that absolutely must be provided to every single resident, business and entity in in, in the city. Um, understood that we haven't yet figured out what the model would be, but it's really important not to think of it as a loss, but to think of it as an investment and to provide crucial services.

As a result of us not having done this five or six years ago, we have to spend a lot of, not just money, but time and energy and loss of learning for a whole slew of residents across the city during the pandemic when, um, students had no access to their learning. So I just want to say, that that's how I look at it too, as an essential infrastructure that, that we need to make sure every resident and, and small businesses access to, um, and that another comment made in public comment about the, the need for community input. I, I do want to hear more about what if--what will be the community outreach and inclusion, not just a survey, but how is it that we're going to ensure that the great breadth of experience, knowledge and

expertise in this community will be included from a few different perspectives, small businesses, what they're using, what their needs are. I know what the digital equity study, we did outreach into a subset of our residents and we have some data on that. I don't know if we have the wider set of data for residents in other areas of the city and in other economic circumstances, some of whom also are constrained by very high internet bills, which are not something anybody can live without, but also making use of their rich expertise of the institutional players from Google to Microsoft to MIT and Harvard, you know, how is it that they are being included in this effort similar to us right now, before there's any, um, final recommendation so that we know we're getting the best of online so that's my first question.

LEE GIANETTI: I'm happy to start on that one through Mr. Chair to Councillor Nolan. We're in the process right now of building out the stakeholder engagement plan. It was something we had mentioned to our Councillor Azeem that the timing of this hearing is really appropriate to be able to, be able to get some input from the council. One of the questions that Upgrade Cambridge posed to us yesterday was,

you know, "How could they help?" And what we really asked for is like, figuring out how we can partner together in terms of outreach, they mentioned, you know, they have huge access to networks. So we can take a very deep dive into beginning to engage the community. Obviously, we talked a little bit about the survey that we'll be going to residents.

We're also now in planning for how we're reaching out to businesses. Those include both large businesses, small businesses, um, and we're going to be looking at how we reach out to different communities, whether it's through any of our affordable housing communities, how we can work with our resident associations to start to get input. But I think something we heard from Upgrade Cambridge, and we've also heard from the council is like, how do we start having these dialogues publicly to get information out there, um, in terms of small stakeholder engagement, not necessarily related to this project. We have the door-to-door teams that are going out through DHSP and the police department will be dropping flyers about the federal benefit programs that are available to people start pushing out information. So we are starting to develop the stakeholder engagement,

which we know is important to the council. So we look forward to hearing from some of you if you have very specific ideas on what you would like to see us, um, doing.

And one final point that I just kind of want to make before I forget related to what we're going to have the final deliverable be--the deliverable to be; we're not looking to provide a yes/no, whether the city should or shouldn't be doing it, it's really providing the specifics and the information that the council and the administration will need to have an informed discussion about where you go next, and what decision you want to make. Um, there's obviously many different pathways that can take, um, no matter how you want to look at risk, there is risk involved, but we want to give you the information and to be able to make an informed decision and say, this is the direction to go in.

So I just want to frame it a little bit that way in terms of the report, we're not looking at a binary Yes or No, should you be doing them. It's really to say, these are the pathway you can take, here's all the information you need in order to make an informed decision. And I don't know if CTC or Pat has anything to add to the stakeholder

engagement piece.

PATRICK MCCORMICK: No, through the chair that I think that's summarized well, Lee, thanks.

COUNCILLOR PATRICIA M. NOLAN: Yep. Well,[laughs] I will say, that's good to hear, Lee, because we, we didn't specify, we didn't want and we were exceedingly clear that we were not expecting a yes/no, we were expecting a yes, you can do it and here's how. Now, you may choose not to do it based on a range of circumstances. But it is, it is we worked pretty hard to make sure that that was going to be that that was the charge. So I'm glad to hear that that's what we will, we will be having.

Um, I do--I, I understand this is early on in the process, but I was pretty surprised at the lack of numbers because I just feel like what was presented was almost something that was just already laid out in the RFP. So I hope there's been a lot more work done on the numbers, and you're just not presenting them because they're not final, because it was, again, the models are pretty much what I would have expected and, and, knew from, you know, two years ago when we were all discussing various kinds of models. So I understand what kind of setting the stage for

a new council.

But I really hope that if you've been working really hard that you actually have done a lot more than just was shown and that you're just not ready to show the, the numbers because it's--I would have--at this point, given that it's many months after the RFP was awarded, expected us to be further along in that data collection and analysis.

Um, I, I do want to--I have another question and when I see our, our city engineer on the call and I'd like to understand, are we actually moving forward with something the council has talked about before, which is anytime we are ripping up the street, that we are laying the, the fiber in or ensuring there's conduit in the street for an eventual, whoever is deploying that fiber, whether it's a municipal or someone else, to make sure that we take advantage of the fact that as we tear up streets, I mean, I know we, we actually have a--there's a law in place about ensuring that when polling conduit, I think there's a lot of meetings that there is capacity, but I want to make sure that since my understanding is close to 90% of the cost of laying the fiber is actually ripping up the street. That if

that is even remotely near what it is that anytime we're ripping up the street if for 10% we can put down fiber that will eventually be used somehow even if we don't know how yet if that's been done.

KATHERINE WATKINS: So three Mr. Chair, um, so there's a couple of different answers to that, Councillor Nolan. So one is, certainly as part of our large sewer separation projects such on River Street and particularly the main corridors, where you don't have utility poles and you're really thinking about as a trunk main, um, we are looking at that and so I know, Paul mentioned the port, and we're starting to look at it in the port, we're not at that level of detailed planning at the port.

River Street, we are adding conduit along River Street. Um, you know, we want to have this balance of really making sure there's a good chance of the, the conduit being used. And so we're really excited for this process to really, um, sort of come out with more clear recommendations that we can really build into these future capital projects.

But certainly on River Street, we're including it, um, certainly in the port, we started having conversations with

folks, and we're just not there yet either in terms of our design, in terms of the port, and then also in terms of this process, so the timing is coming together in terms of that next large capital project.

COUNCILLOR PATRICIA M. NOLAN: Okay, thank you. And through you, Chair Azeem, to, to engineer Watkins. Um, I would find it hard to believe that it wouldn't get you somehow, especially on major corridors. And, and it's, it's certainly been a priority of the Council for many years that that should happen. So I think the expectation is it really should happen anytime it possibly can. Um, and I understand you know, you're working with, with a lot of different variables, but it seems that it is something that we, we can and should move, move forward on anytime that we have those, those streets open. Um, I was one other thing I was gonna follow up on. On the presentation that you didn't show on the, that appendix, it did mention the Whip City Fiber model is one of the models for the first one with, with municipal broadband.

Can you just talk some about examples of municipal broadbands that there's been a number, of course, that have been quite successful. And as has, has also been mentioned,

there have been some that have perhaps transitioned into something else that what was mentioned Seattle, but there's certainly a number of others that have been quite successful. Chattanooga is the poster child. Chattanooga had an installed municipal light plant as I believe. So what other models of municipal broadband are out there to think about as we move forward on this process that we're not started with a municipal light?

JOANNE HOVIS: Um, Councillor, the great majority of municipally-operated fibre to the premises network across the United States have been built and operated by municipal electric utilities. Um, that is a distinguishing factor just in that it's a, an easier path forward in a variety of ways because of existing capabilities and, and ownership of assets on and in many cases mission. And Chattanooga is very much that Chattanooga, Chattanooga's electric power board is the entity that built the fabric of the premises network, initially for a smart grid purposes, and then for service to the public. And that's a city that's very much distinguished itself, and has an international reputation for that great success.

There are cities that have been very successful as

well, who are not municipal electric utilities, and do not own the electric distribution infrastructure, um, under a range of different models, including the ones that we are analyzing in considerable depth for you through this process. Um, so an example of that would be that, under the second model that Zach put in front of you, the city of Westminster, Maryland is a city that's not a public power utility. But built and owns an underground fiber and conduit asset that passes every single home, business and institution in the city, and has a long term lease arrangement with a private entity that pays for access to that asset and provides services to the public with certain parameters and contractual arrangement in place that protect the city's public policy goals. So the city is in the public works business and private sector is in the equipment provision and service provision business. Um, that is an example. I hope that is responsive to your question.

And the, the third model that Zach described, um, it has been, um, tested and undertaken in a range of different communities in suburban and rural Utah in a multi-entity effort called Utopia, that is 17 separate cities working in

consortium together, where the, um, services provided by multiple private entities competing over a network that is funded, operated and owned by the cities. Um, and I can provide additional examples gladly if you would like. Those are examples of entities that have developed some very innovative approaches that are not actually municipal electric utilities.

COUNCILLOR PATRICIA M. NOLAN: Thanks, right. That's exactly why I asked because I'm aware that most of them are electric utilities, which we don't currently have. We do own our own water supplier. There are cities that have taken advantage of that, we have--right away we are supplying water to every single entity in the city through a municipally-owned utility. What about that as a model? Or is--is that included in our planning?

JOANNE HOVIS: That has not really proven to be, um, a catalyzing factor or aligned with--we don't see any patterns of cities using the fact that they are the water utility for a city as leverage for developing a broadband network. The electrical infrastructure lends itself to deployment of broadband infrastructure in ways that other kinds of utility infrastructure do not. So it--it's really

not been a factor that we have seen. The one way in which it, it could have impact is that there have been a couple of cities that have pledged their water utility revenues to support revenue bonds, to support the construction of a broadband entity, so that as a tool for not using 100% general obligation bonds. But it--no, it could be like any other revenue source. In that case, the actual water infrastructure is not itself really aligned with what one needs in order to operate a broadband network.

COUNCILLOR PATRICIA M. NOLAN: Okay, thanks. I was hoping we could just put those fibers right through our water network. And because they do serve every single home, it is utility and I don't think there's that many densely populated cities like us that have that kind of network, I could be wrong, but most cities around us use the MWRA, they may not own it as, as much in most rural communities have--don't have a networked water supply. They, they rely on groundwater and a different distribution system for water. So I was thinking it might be a way to be really innovative. Um, and those are my question for now, Chair Azeem, I yield.

COUNCILLOR BURHAN AZEEM: Thank you, Councillor Nolan.

I want to go to Councillor McGovern next

COUNCILLOR MARC C. MCGOVERN: Thank you, Mr. Chair. Um, I'm calling in on my phone so my camera's off. I apologize for that. Um, just a couple of thoughts. Initially, first, you know, I just want to reiterate that, you know, as we all know that we have one provider, you know, in the city right now with Comcast. And that's not-- that hasn't been from a lack of trying on the city's part to try and get another provider to come here, which has not happened, which to me just reinforces the fact that if we are going to have competition, if we're going to provide another service to people, um, it--we're going to have to do it ourselves in, in, in some way. Because it's, it can't, imagine that after all these years of trying to get other providers in here, magically, that's going to happen. So I fully support moving forward with municipal broadband in one shape or another.

Um, you know, we heard in both in public comments and then a few folks mentioned it in, in the meeting around community outreach, and, and I'm going to, you know, there's community outreach in terms of keep getting input from people, but there's also what's the output and how are

we going to explain, um, municipal broadband and why it's important to people. Um, because whatever the cost is going to be, it's probably not going to be cheap. We know that. And I can certainly first see, you know, Comcast laying out a campaign or, you know, others saying, "Well, gee, if it's $150 million, that money could be used for A, B, and C, why would we do it? Why would we use it for municipal broadband?"

And I know, coming from out of the four councillors who have spoken so far, I am probably the one that this conversation is least in my wheelhouse of knowledge, right? And so I'm probably more like, most of the people in, in, in Cambridge, this can get very--we can get very much in the weeds and very--it could be very complicated.

So as we communicate with people, I want to make sure that we are, you know, explaining things in a way that the average person can understand, the average person can sort of see the benefits of this, how it's going to make a difference, you know, in their lives and why it's important, as we move forward and, and, and explain, explain what it is we choose to do.

Um, Councillor Zondervan had mentioned--had asked the

question about are there municipalities that were, you know, this didn't work. Um, and there are some. And as we think about that, one question I would have is, have those municipalities--what is, what is the comparison to Cambridge not only in terms of, you know, size, but, you know, we are the innovation hub of, of, you know, some people say the world and you can look at what's in Kendall Square, there's got to be a way that we can leverage those companies as either financial partners or contracts with them to use municipal broadband over whatever else they're using, you know, to help offset the cost.

And so when we look at those other, some people will say, "Well, it didn't work here, it didn't work here," but I'm not sure those places have the same type of, um, not just financial wealth of Cambridge, but the, the companies here in our city that we might be able to partner with in a different way. So I hope people are thinking about that, and how to bring them to the table and, and, um, you know, get some, you know, either financial, you know, uh, help from them, or what have you.

So, those are just some of my thoughts. Again, I, I, I think this is--I'm really excited that this is happening,

um, you know, it's not going to something--it's not going to be something that happens overnight. So I do think while we're talking about municipal broadband and how that's going to unroll, when, when it does, um, I also do want to make sure that we're talking about what we can do in the short term to help folks to--who don't have access to affordable internet.

Um, you know, we saw that with COVID and kids in school, and, you know, saying, that we have a 10-year plan to introduce municipal broadband would be great. And, and that's, or whatever that is, but we, you know, we have kids and, and people in our communities right now who need something immediately so I also don't want to lose sight of that, of that as well.

Um, Mr. Chair, I actually, um, have to take off for another meeting. Um, I don't think we're voting anything tonight, so I don't think my presence is, you know, required. And I think you still have a quorum without me. So those are my thoughts. Thank you, again, for the presentation and I look forward to moving forward on this, these projects. Thank you.

COUNCILLOR BURHAN AZEEM: Thank you, Councillor

McGovern. Um, I, you know, wanted to reiterate a few things. There's a comment made about public, or public participation in community meetings and how, um, that could be implied, uh, incorporated into the study. I think that Councillor Nolan made great points around, uh, reaching out to, you know, public housing, um, reaching out to other entities, uh, through which, um, we can reach large members of the community, whether that's up--partnering with Upgrade Cambridge, going to other parts of the community and just letting them know that this is going on, um, and how they can participate, um, and just having community, uh, meetings that can be publicly advertised, that they can be--have a pretty positive attractive.

Up until this point we've been mostly just waiting on the study until--now makes sense to have more public participation. We should advertise that properly and allow, um, our very active citizen--citizenry to do some of the work of getting more people involved and active and, uh, caring as well as the city taking active role in making sure we are reaching out to particularly lower-income residents, or residents who typically do not participate in the public process.

Um, I also wanted to reiterate what Councillor McGovern said, in that, I think that there's two steps, there's public comment now, as we're--or public participation now, as we figure out what sort of business models we want to do, what the technical details might look like. Um, and I think that there's a place there for advocates and for people who have a lot of interest in municipal finance and the technical details of municipal broadband.

I think, um, large part of the public response will come in once we have some options from the study and so I would love to see as part of the study and the results, uh, a lot of the benefits laid out of municipal broadband, you know, what the different options are, what that means in terms of like, if the city assumes risk, what that liability of the city, but also benefits that can be in terms of lowering costs, in terms of quality. And also what the future proofing might be in that, you know, having high speed broadband is gray now, um, but also, you know, hopefully internet speeds continue getting faster and how this sets us up for a great future.

And also, ideally what we can do for public at large,

in terms of both in public settings and also in other places provide--being able to provide internet access in a way that just makes living in the city nicer and easier so you get around the city and have great access to Wi-Fi.

I think a lot of those benefits that we could potentially provide as part of this program, um, and how it can make the amenities of the city much nicer are things that we really would want to highlight. And I think that a lot of the public participation will also come in once the study is completed, um, and we try selling some of the different options to our constituencies and try to persuade them of the benefits and see the response. I think having those benefits in hand and really thinking critically and hard about what the different business models and the different risk hazards means towards those benefits will have a really big impact.

Um, I wanted to make one more round to any other city councillors and questions that they may have. I think Councillor Zondervan has his hand raised. Councillor Zondervan, you have the floor.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, Mr. Chair. And I'll—I'll have to leave soon as well, but just

wanted to reiterate the--some of the urgency, you know, Councillor McGovern, Councillor Nolan all referred to that as well. Um, in my first term four years ago, I submitted a policy order asking the city to, to start putting in conduit, um, with major projects and to, to begin anticipating municipal broadband. So, you know, this conversation has been a, a long time coming and that policy order also asked to address digital equity, which, you know, we did the study and, and there's some projects underway, but, but overall, there's still a long way to go in terms of addressing that issue, so.

And again, you know, I, I look forward to the, to the report, but I hope that we can move quickly because we've been studying this issue for a long time and I think people are eager to see some, some implementation. Thank you, Mr. Chair.

COUNCILLOR BURHAN AZEEM: Thank you, Councillor Zondervan. I think Councillor Nolan has a quick question and then I will introduce the motion to adjourn with some final thoughts. Thank you. Councillor Nolan.

COUNCILLOR PATRICIA M. NOLAN: Thank you. Do I just do it? [audio break] Thank you. Yes, my quick question was to

reiterate that I hope when these models come out, we are not afraid to be innovative and creative, and while we want to build on other people's successes, we would love to be a new model like Chattanooga that ends up being the model looked to for around the world for actually providing internet and municipal broadbands to every single citizen and small business in the, in the country.

So I urge us all not to be limited by what's out there, but to use the creativity of all of the resources in Cambridge to solve this issue that is so critical, but could be really exciting.

COUNCILLOR BURHAN AZEEM: Thank you, Councillor Nolan. Um, I just wanted to end with--this is in my mind the first of –- the start of the public process. So as we are getting more resolved and as we start to getting a little more details, I will be working with city staff and our consultants to make sure that we have, uh, more public meetings and awareness. And both in this committee, um, both later in the fall, hopefully once we get results, but in the between time, more public input beforehand. And, of course, once the results come out, a lot of more public comment as we make decisions around which direction we want

to do and implement municipal broadband.

I am really excited for all of the benefits proposed. I think in terms of having much faster internet, much more reliable internet, having much lower cost, um, and being able to provide internet in places in the public realm where it is not available right now, um, are all really big benefits that I see. Um, and so I am really excited for this and I look forward to having, uh, more meetings and more hearings and really doing a lot of the work to get this ball rolling and to start building.

Um, and with that I would like to introduce a moment -- motion to adjourn today's meeting. Could we take a roll call on that, um, Mr. Clerk?

City Clerk Anthony Wilson called the roll:

COUNCILLOR MARC C. MCGOVERN – Absent

COUNCILLOR PATRICIA M. NOLAN - Yes

COUNCILLOR PAUL F. TONER - Absent

COUNCILLOR QUINTON Y. ZONDERVAN - Yes

COUNCILLOR BURHAN AZEEM - Yes

Yes-3, No-0, Absent-2. Motion Passed.

COUNCILLOR BURHAN AZEEM: Thank you, everyone.

The Cambridge City Council Transportation and Public

Utilities Committee adjourned at approximately 05:40 p.m.

C E R T I F I C A T E

I, **Kanchan Mutreja**, a transcriber for Datagain, do hereby certify: That said proceedings were listened to and transcribed by me and were prepared using standard electronic transcription equipment under my direction and supervision; and I hereby certify that the foregoing transcript of the proceedings is a full, true, and accurate transcript to the best of my ability.

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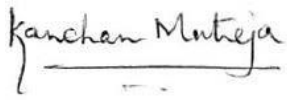

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