

How much should a proposal build in the uncertainty posed by the current crisis given that partnerships with public agencies might be affected?

David: First of all, we completely understand that today's environment is full of uncertainty, and some of the partnerships may be hard to flesh out. At the same time, this is a challenge that is primarily based on community and the challenges that they help with researchers to identify, and what we would love to be able to see is sufficient details that show who you plan to work with, what they plan to be doing, and how you expect to converge. Ideally, you'll be able to put together simple letters of collaboration that would be coming from your community partners, but what you need to really do is provide us and the review panels enough information that they can make a good judgement that you've coordinated with community partners and that there is a level of collaboration that they would like to see in the project should it be selected.

How will proposals be evaluated? Is it on research contribution? Potential for intervention that makes an impact? Is it contribution of the research to the impact?

David: At the end of the day, the proposals that get submitted to us for Stage 1 and Stage 2 are going to be evaluated by NSF panels. We understand that this is very different than the usual NSF research activity. We know we are not looking for sub-atomic particles, we know we're not looking for black holes. So intellectual merit and broader impact have a different meaning as we relate them to the Civic Innovation Challenge. So first of all, when we look at the ideas that you proposed, to work with your community partner, those are going to form the basis of the intellectual merit evaluation. Along with the impact that that research will have on the community. Part of the extent of the collaboration that you will have developed with your community partner, the overall perspective that you've given us on the societal impact of that plan of yours, will really help us in the evaluation of broader impact. Another thing that we want you to keep in mind is that the proposals you submit for stage 1, we know that these are not your traditional research proposal, we know that these are planning grants, so what's important for you to identify for us are: What's your plan/vision? What do you expect to be doing during the period of the bootcamp in order to flesh out your plan so that we and the panel believe, if you are awarded a planning grant, that you'd be able to successfully compete for one of the stage 2 grants.

For the Communities and Mobility track, how much emphasis is there on projects that would involve innovation in vehicle technologies? Would a project that seeks to better connect lower-income people to job center through innovative

public transit assistance and solutions fit this solicitation, even if it doesn't involve vehicle technologies?

David: I would suggest that's a great question for Mark Smith.

Mark: Yes great question. I would say we certainly want to look at that. I would say it certainly gets to some of the work that I was describing that we're doing at the DOE Vehicle Technologies Office as really looking at transportation as a system, and so looking at new mobility models, whether they involve public transit or private vehicles certainly fall into that realm and are of interest to us. In fact, we have a recently closed funding opportunity where one of the topics was looking at public transit. If you look at public transit over the years, from an efficiency standpoint, it has not gotten better as other modes of transit have improved. I think one of the reasons for that is ridership. How do you get more people to take advantage of public transit. And one could argue that right now there may be some challenges with that, but any mode of transit and anything having that systems level approach is what we want to see.

What is the bootcamp? What will I do there?

Ben: Sure. You may have seen the term bootcamp, and if you read through the solicitation, you likely saw the term "Community of Practice" so I'll talk a little about what we mean by that. So one of the things that makes the Civic Innovation Challenge unique is the effort to connect the work that's happening across different sites, and find ways to create scalable, transferrable outcomes that draw upon best practices that are emerging out of these projects. And so one of the things that MetroLab is focused on is fostering these communities of practice. And sometimes, for the stage 1 of the competition, we're referring to this as a "bootcamp", and the reason why we're describing it that way is that we see it as an opportunity to strengthen the relationships between the research institutions and the civic partners, we see it as an opportunity to connect some of the work that's emerging as part of these proposals to broader civic and policy priorities that may exist either in your community or broadly across the country. In general, we just seek to strengthen the proposals that come through in stage 2. During stage 2, the communities of practice will continue, and will actually be more focused on this idea of finding scalable, transferrable methods, because we're going to have fewer teams involved and if you read through the solicitation or as you may have seen in the webinar, stage 2 of the competition is going to involve a down selection from up to 12 teams per track to up to 4 teams per track, and during that period we're thinking about the up to 4 winners per track as a cohort that can really learn from each other, potentially adopt methods, test approaches that might have been included in different proposals, and really think of this as a collective effort. And we think that through that method this will strengthen the projects that come forward. And to add one thing of note given everything

happening in our world - you'll likely see in the solicitation that there are travel requirements and that teams are asked to budget for travel associated with activities both in stage 1 and stage 2. We're asking for teams that are working on their proposals to follow the solicitation and include the travel that is indicated there. We of course will be following public health guidance, and if we're not able to do events in person we'll be moving events to virtual, and the communities of practice, the bootcamp, and the stage 2 efforts will also include a range of activities. Either way, we're confident that even if travel isn't possible we'll still find strong ways to connect activity across the competition.

NSF describes the need for "measurable impact for communities". Can you elaborate or give an example of measurable impact?

David: So let me take that one. The answer to that is: what we want to be able to see is you go beyond the qualitative. We already know it will be better. So what we want you to think about is: how much better? So for example, we have a related program within NSF called Smart and Connected Communities. And you can read more about that on the website: [nsf.gov/cise/scc](https://www.nsf.gov/cise/scc) and you'll see the kinds of projects that we funded there. Now, those are different in that they are full blown research projects. But one thing that they typically have is an idea that we feel is going to have impact. One of those projects deals with energy saving in low income housing. And so if you think about your idea in particular, think about: what would make it a success? How would you evaluate it as a success? In the case of our Smart and Connected Communities energy and low income project, we're looking at metrics: how much will this technology have reduced the overall energy consumption? If you look now at CIVIC, think about the Community response track for example, we now have challenges with COVID. What you might think of might be: How much would it have reduced time delays in getting a number of people treated? How much could you increase ridership in transportation through some ideas that you have, or, it may be something that would reduce the cost of operations within the community and still preserve some level of patient care and response time to some factor. So again, go beyond just linking "it will be better", think "how much better". And you don't have to be precise, we're not asking for 99% prediction accuracy, we're really interested in your best guess - how much impact it will have.

In the webinar, Linda said that projects would need to achieve concrete impact that can be evaluated within 12 months. How is "concrete impact" evaluated? Do teams come up with their own measures for impact, or will review panels have their own measures and metrics for evaluation?

David: As the proposer, first of all, as you put together your proposal, we want you to think about what that concrete impact will be. Think about that as

- how do you want us to evaluate you? We're giving you the ability to define your metrics, and we would like to be able to gauge "were we successful or not?". As we go through the first stage, and then the second stage, we want to look at these as not just the government team and the research team, we're looking at this challenge as building partnerships between you, and the government team, and your community partners. So it's you and communities, you and the research side, and us in government and MetroLab as partners in this overall journey together. So in the evaluation phase of your proposals, in the first stage, the panels will look at "What did they see as success?" "Will this idea have an impact in their mind?". It's strengthened by the fact that the proposers live in a community, and our panelists live in a community as well, and our panelists will want to get themselves into that proposal, engage for themselves: "Does this idea have merit?" "Will this work in my community?" "Will this work in the community in which they proposed it?" Try to be as real, as measurable as you can, and remember that proposals are a story. Tell us a good story that is concrete and credible.

Is there a requirement about how much funding should go to local government partners?

David: We know in the first stage that planning grants are not a lot of money. And we know that the way it's been set up, it's academic partners writing the proposal, community partners will be sub-awardees and partners. So we know that, at least in the first stage, we have no hard requirement how much money goes to the community partner. But in the second stage, what we want to see is that there is sharing of the activity. And remember, communities are going to be responsible for doing the integration of these ideas into the environment and taking them from the academic world into the real world to meet these challenges. So we expect to see some funding, but no specific number. But we want to see that you've created a shared vision and shared partnership, and part of that partnership means some level of funding.

Can a city be involved in more than one proposal?

David: Yes. If you look at the solicitation in detail - the principal investigator can be in two proposals. The community can be a co-PI and it's the specific person within that community who would be the co-PI. Maybe it's the director of innovation within that community. You could also have a director of innovation in one proposal, the department of public transportation in another proposal, so what we'd like to see is active community engagement/partnerships, and if you have a question, bring us the specifics and we'll give you a precise answer.

Can city partners be PI?

David: We struggled with this question because, as you've seen in the material, communities are at the heart of the challenge. The issue we saw, is that when we make an award, we need to make it to someone who isn't necessarily a new awardee. The issue is it takes time to get qualified as an awardee. Maybe 2-3 months. We're operating at a rapid time scale relative to NSF's typical timescale. What we want is to have a running start with all teams in a particular track. In order to do that, we said, rather than trying to qualify everyone and bring in 3 months of delay, let the university partner lead as stage 1 and stage 2. Ideally a community partner is a co-PI, in stage 1, and possibly stage 2 as well.

Katy: On a related notes, you do not have to be a MetroLab Network member to be involved in the challenge

David said that "Intellectual Merit" will not be the same as usual NSF review criteria; but what will you be looking for in Intellectual Merit?

David: So, first of all, we're not looking for research ideas that go out 20 or 50 years. And this is also not simply "let me deploy this thing I've already done". There is a matter of us wanting you to identify the research question you want to answer. What vision do you have? What would you do that requires some level of research to have an impact in a year or two years downstream. We're also looking for you to lay out your plan in your proposal. Intellectual merit is not just the idea. In planning grants it especially looks for the strength of your research plan. And what is a research plan? It is you telling us the steps you will be taking inside the planning grant, and what your vision is, and what gaps do you see on your team that you'd want the boot camp and the planning grant period to help solve. One other thing would be the idea of helping us by telling us what you see as success and how you will measure that.

Does the effort require the use of a technological solution or can the project involve more social science-based efforts in support of the CIVIC themes? As one example, we have a group looking at the disconnect between SMART approaches and rural or "non-urban" community planning and governance execution. Literature shows a lack of uptake of these approaches in rural/"non-urban" communities and we are seeking to understand why.

David: This is a great question. One of the things that makes the Civic Innovation Challenge and the Smart and Connected Communities program different

is that we really like to see integrated social, technical research. As you noticed on the masthead of Civic Innovation Challenge, it includes the Computer and Information Science and Engineering directorate as well as Social, Behavioral, and Economic Sciences directorate. What we like to see is integration of both technology and social science. So technology, when one looks at a community, will impact that community in a way that we learned from several of our social sciences in an economics and cultural way. In culture, those social sciences are going to feed back and impact technology to close the loop. So we see an integrated approach that considers technology and social impact as a strong part of this program.

Is it true that nonprofits can apply, funding isn't limited to universities?

David: Yes, it can also be foundations or nonprofit research orgs

Is this opportunity open to international communities?

David: It's an interesting question. International communities can be participants in the program. What we want to see is that international community be affiliated with a US community. It is kind of like a sister community type relationship. One of the things, as we think about this, NSF traditionally doesn't fund international researchers. What would be interesting to see is if you're bringing an international community and academic partner so that we can see a leverage of that research into the US side so that we see a synergistic relationship where the US partner and the international partner are providing impact and benefit on the US side. And conversely, the US side and the international partner would provide benefit back to the international community. But traditionally, international partners cannot receive subawards. They can be partners but cannot receive funding.

When you designed this program and settled on these two tracks; what were some of the specific problems that you identified in each track that you believed worthy of being the subject of this competition?

David: Ben from MetroLab may want to talk a little about the Ideas Festival, and my other government partners may also want to weigh in.

Ben: Thanks David. I think, for context, and many of those on the line are aware of this effort or participated, but last year we ran what we called an "Ideas Competition" and we got more than 100 submissions and the call was to submit questions that could be relevant for a national research and action competition but had some relevance in the specific communities in which the respondents live or work. We got more than 100 responses from teams across the

country and we brought some of the leading responses to NSF for a workshop where we tried to understand overlap and universal themes that cut across the various submissions. The two topics/themes for the Civic Innovation Challenge really reflect that process. I'll let colleagues from DOE and DHS elaborate, but the topics are relevant to communities broadly - whether they're small or large, whether they are rural or urban, various geographies... the goal here is to find the least common denominator priorities and challenges that exist in communities and find a platform or build a platform for collaboration across those sites.

Mark: On a communities and mobility track, you're right, we don't want to be too restrictive and put people in certain lanes, and I go back to looking at transportation as a system, and transportation as a system doesn't know when it hits the city limits or county line, and the question that came up earlier about rural communities is something that we've been taking a look at as well at DOE because once you get into rural communities there are a lot of challenges around transportation and access to transportation. If you don't drive and you have a doctor's appointment and you need to get the van share that will take you there, oftentimes those need to be booked weeks in advance and they're very expensive. So maybe there's an opportunity to put in a car sharing or ride sharing program in place. That might work, but some rural areas don't even have cell access. Certain segments of the population don't even have access to a smart phone. There are a lot of different social challenges when you look at transportation systems outside of a metropolitan city. So that's why we're excited to be part of this - it's community based, broad based, and can address both rural and urban challenges and applications

Ben: There are no restrictions on population size - but we encourage you to read the solicitation for details on eligibility.

David Alexander: Many folks are familiar with the statistics out there. DHS looked at Track B from a larger national lens, and in the last 3 years nearly 3 in 4 Americans were affected by Disasters. The majority of our states and territories have nationally declared natural disasters. This precedes Covid-19 where we have a disaster that's been declared everywhere, but that underscores the fact that we see a need in how we can invest to fast track innovation into our communities and where can we nurture and accelerate that technical advancement and in some ways level the playing field with our communities. And at the same time, drive cross collaboration between key stakeholders in the communities. So that was the underlying impetus behind our interest in partnering with NSF and DOE around Track B, and we're excited about the opportunity to open up collaboration with more new and diverse sets of partners.

What type of patent or intellectual property protection will be provided to the participants if any?

David: So the answer to that is typically NSF allows you to define the intellectual property that you want to preserve. One of the things that we look for though is availability of research artifacts that would be made available to a research community that goes beyond the individual proposal. You may have some proprietary element that's used inside an algorithm but the results of that we would like to see as open and available to the research community at large.

Changing transportation patterns and behaviors often takes longer than six months. Will interim assessments of change be satisfactory, with the expectation that more definitive results will be available later?

David: The answer to that is clearly we know that some things take longer to germinate. What we want you to think of is what will you be able to measure, and essentially give us an indication of when we might see more detailed results. So it's kind of up to you to help us be able to understand the impact that your idea might have, say, in a transportation area, so that a panel will be able to evaluate it, and if you're selected for the second stage competition, then we'd be able to monitor and see the progress of your idea as it proceeds during the execution phase.

Can Stage 2 pilot technology be a rudimentary "prototype," that we know would cost more at full deployment scale, so long as it permits evaluation of effectiveness and impact?

David: We're not naïve, we expect this to be a prototype. But we also want to be able to see what would really be required to mature and sustain it. So if it's a prototype idea that potentially costs X, and then you tell us going from prototype to real implementation is \$100M, that may impact the suitability of the concept and idea.

Can you further define your understanding of "research" vs "implementation" activities and the expected balance between the two, especially in terms of the budget? And in terms of community impact, is enhanced public participation in planning processes and products a valid impact, although "on the ground" impacts will be seen later?

David: So the answer to the second question is this. So if we see advanced public participation in planning and can see that as a real impact, and it's something that you tell us and it's ready to be measured, that's great. So that

balance is really up to you. What we want to see is an idea that is simply not something that already exists. There has to be some thought in the creation or maturation of the idea into working in the real world, but there must be an idea with some element of research and risk. And how that relates to the level of budgeting in research vs implementation is really up to you. We'll consider it, but there's no clear answer on the way we want to see it.

Are you looking mostly for 1-city-1-university partnerships? Or do you encourage GROUPS of cities and GROUPS of universities to apply together?

David: First of all, we can recognize that a one on one partnership is easy to establish and maintain. A group of universities and cities could have great benefits. What you would want to tell us in your planning grant is: how are you going to manage that collaboration. Is it 2, is it 4? There are always challenges in bringing groups to closure in a fast-paced project. So what you want to be able to do is convince us that you've got great collaboration ideas and that you can work together for a single purpose and produce the impact that we'd like to see.

when the proposals are being evaluated, will extra points be provided to those proposals which include a private sector partner?

David: We don't really think of giving extra points to this or that in our evaluation. We could see that it's a plus to have a private sector partner, and it could also lead to more effective impacts downstream because someone in the private sector is engaged with carrying out the research idea or in transitioning the idea from research to reality. What you want to be able to tell us is, how you are going to be able to work with them, and specifically what are the roles of each of the partners that are going to be participating. Is it a strength? It certainly could be, but you've got to help us by showing how strong that collaboration is.

Is it recommended that teams include social scientists on the team, or can the civic partner provide that expertise?

David: You can do it both ways. Main point is that we want to be able to see that there is an impact, that there's deep community engagement and participation because these ideas impact people. So that impact can be taken from the side of the community partners, many of whom would be from a social science background, or you could bring those social sciences into the project from the academic side.

With respect to the resilience to natural disasters thrust, is the COVID-19 crisis considered a natural disaster and would an action-research project addressing resilience to this type of real-time disaster be encouraged?

David: Yes.

How do you define sustainable? Does that mean no local governmental support long term?

David: What sustainable means for us is that you don't need NSF funding to support the idea past stage 2. So it could be funded from other places, could be from the partner, could be from foundations, etc.