

**Remarks by Grant Oliphant, President, The Heinz Endowments
Metro 21: Smart Cities Institute Launch
March 2, 2018**

Good morning. The Heinz Endowments has been a proud supporter and partner of Carnegie Mellon for many, many years and I'm so pleased to have been invited here today as Metro21 takes its next step with the launch of the Smart Cities Institute.

CMU's role in this community over the past decades has been invaluable and its economic impact nearly incalculable. 30 years ago the word "Pittsburgh" was inseparable from the word "steel", but today "steel" has been replaced by "technology" and "innovation". CMU has been at the forefront of that shift. Our universities are the competitive advantage that has spurred the revitalization I've seen in the 27 years I've lived in Pittsburgh and they are the foundation that the new economy is being built upon.

Not only are more people coming to Pittsburgh from every corner of the world to get an education at CMU, but more and more of them are choosing to stay here after graduation and make Pittsburgh their home. To build their businesses, raise their families, and contribute to making this a better city and region for all of us.

And the partnership between The Heinz Endowments and CMU has only deepened over the years. Today we have active grants to at least ten CMU teams and departments working on projects as varied as visualizing air pollution, mapping the spread of artificial intelligence technologies, prototyping affordable modular homes, researching early childhood brain development, and creating pathways to STEM fields for African American girls.

The willingness of CMU faculty and staff to co-develop projects like these with us and other members of the community is one of this university's greatest strengths and it is at the core of what makes Metro21 so special. This effort started with Henry Hillman's innovative vision for Traffic21 back in 2009 and has grown into a robust partnership and the new Institute that we're celebrating today.

One of the unique aspects of Metro21 has been its intentional focus on breaking down barriers between departments and disciplines and fostering a holistic and interdisciplinary approach to identifying and solving problems. I believe that a big part of CMU's success stems from this sort of integrated approach — the bridges you build here between departments and the new collaborations and breakthroughs that come from that. Collaboration between roboticists, policy analysts, business students, engineers, and others has reframed issues in ways that can radically change how we might address them.

This is the promise I see in Metro21, and I'm excited that you're not only continuing in this spirit but doubling down on it with the launch of this new Institute. But as we embark on this new venture, I'd like to offer up three thoughts—one a point of affirmation, the second a profound

caution, and the third a challenge to everyone in this room—faculty, staff, students, corporate partners, and the rest of us who are engaged in various ways.

The first point, the point of affirmation, is simply to underscore the importance of an Institute like this. Cities and regions are increasingly the labs and proving grounds of human society. As Bruce Katz from Brookings has pointed out, national and even state governments are locked in dysfunction and paralysis. But at a regional level in places like Pittsburgh we still find the spirit and resolve to address the challenges that hinder us.

We know, however, that the challenges facing cities -- whether it's failing infrastructure, multigenerational poverty, or planning for climate change -- can't be boiled down to one technological or policy solution. They require systems-thinking and systems-approaches that bring together the expertise of many toward common goals.

Commerce today increasingly thinks in terms of global scale and too quickly dismisses local community as a small-scale commodity. But as we have seen play out endlessly in recent years, human society still functions at a local scale. We may buy your product and download your app and everyone in the world may be linked on your social media platform, but what we care about in the end is what's happening around us. Here is where we can still see past differences, find common ground, build effective government, solve epic challenges, and prove that democracy still works.

No small stakes. If we really want to reinvent the future in a positive way, we have to prove we can do it here, wherever here is. And you've built the platform to allow that to happen, here.

But now, and this is my second point, please allow me to offer a caution.

We all know that technology is changing rapidly and that these changes are having profound impacts on our daily lives. We also know that Pittsburgh and CMU are at the epicenter of many of the technologies that will reshape our economy and our built environment in the coming decades. Driverless vehicles will dramatically shift how our cities are constructed; automation and artificial intelligence will change the face of entire industries and workforces; complex algorithms will alter how resources are allocated and how the macro-economy functions.

But the key fact is that none of these things happen in a vacuum and they are not value neutral. There are moral and ethical choices that get baked into the DNA of these technologies and to the ways in which they are deployed.

The ethicist Nick Bostrom offered a wonderful allegory for this. He asked us to imagine an artificial intelligence designed to produce as many paperclips as possible -- The Paperclip Maximizer. Eventually this AI would come to the conclusion that the humans who built it could get in the way of its ability to produce paperclips. We use too much stuff that could instead be used to make paperclips. We might turn the machine off or reprogram it. And going even further, we are made up of atoms that could be put to more productive use in paperclips. So you end up

with a technology that started with a totally innocuous goal but eventually leads to a future where there are no humans and a lot of paperclips.

If that sounds far-fetched, you aren't paying attention—and I know you are. We saw a real-world example of this cautionary tale several weeks ago when the stock market fell by historic levels over the course of several days. The postmortem analysis found that a formula baked into the algorithms that drive stock trades and sales tells these systems to sell when workers' wages go up, assuming that this is bad for the businesses that employ them.

So this collapse was driven in part by something that I'd think we'd all assume to be a good thing -- more money in workers' pockets. That may be logical from a profit maximization perspective. But it makes you wonder what ethics, what intentionality, was behind this design. It certainly isn't a formula that is good for the vast majority of people in this country. Yet it was there, and humans put it there. The technology itself didn't make this decision; we did. And thus can technology magnify inequality.

Now you may interpret this as my questioning the fundamentals of unbridled capitalism. Correct. But this happens over and over—this process of designing technology and algorithms to maximize one goal in ways that can have world-changing unforeseen consequences. And not in some theoretical future, but right now.

Think about social media and the last election. Algorithms that optimize for clicks and engagement fueled filter bubbles and drove the spread of toxic fake news in ways profitable for the platforms but staggeringly destructive for American democracy and unity. As a result of simple programming decisions, Russian attacks on our election could be delivered not by missile or drone but by our own hands, click by mindless, seemingly inconsequential click.

Here's the point: On an increasingly crowded, warming, hyper-connected planet, we are running out of time and space for profit-motive stripped of humanity in the design of our technology. We simply cannot afford indifference to social consequences, because the costs are too sudden and too high and so potentially catastrophic—to people, communities, countries and, yes, even to business itself.

As the long-time technology guru Tim O'Reilly told a group of foundations meeting in Miami earlier this month, "We are living inside an algorithmic society that is optimizing the wrong things." How do we start optimizing for the right things? The technologies we're creating must not only have ethics baked into their design, but the technologists who are creating them need to have a foundation in ethics baked into them too. And this is a critical role that CMU and Metro21 can help play.

So that brings me to my third point, the challenge. For CMU, I would ask you to double down on your commitment to serve the public good and to instill in your faculty, staff, and students a deep sense of responsibility commensurate to the weightiness of the work happening on this campus and its potential impacts on our world. You're at the epicenter of the creation and

application of these technologies so let's be sure we're also at the epicenter of making them work for the many, not just the few.

To the corporate partners in this room, I would ask you to internalize how important this work is for your own success. Metro21 certainly needs your support, your resources, and your participation, but you also need the sort of comprehensive approach that Metro21 represents. An increasingly unstable, inequitable, anti-democratic society is ultimately a formula for collapse, not profitability. This institute isn't a charity—it's an investment in your own future.

To all of us here, I would just say this: We have, right now, today, all of the resources, the brainpower, and the technology to build a world that works for everyone. We no longer have to relegate ourselves to a Malthusian frame of scarcity and competition for resources. But what is often missing is the intentionality to train ourselves to think in the frame of abundance and common well-being as we do our work.

How is what we're building going to make life better for a single mom in Homewood? How is what we're designing going to create a better future for an out-of-work coal miner in Greene County? How is what we're proposing going to change the life trajectory of a little girl growing up in public housing? How is it going to make our cities more functional, our communities more equitable, our society more democratic?

As those stewarding the next generation of leaders in government, technology, and business and everyone in the room has a sacred responsibility to ask these questions of ourselves. A responsibility that I feel slipping away all too often in our current morass of deep and pervasive inequality and failing institutions. The bottom line is that we have everything we need to build the world we want—we just have to decide that we're going to do it.

I don't pose this challenge to you lightly, and I don't want to suggest that you're not already thinking in these ways. But I want to push you to put it at the forefront of everything you're doing. To make it foundational.

We're living through unstable and challenging times and the rapid deployment of momentarily profitable but longitudinally ill-conceived new technologies could lead to further destabilization and fear. We're seeing it in elections, we're seeing it in our economy, and we're feeling it in our national psyche. People have a deep sense that as these technologies become integrated into our lives there are going to be clear winners and losers and a lot of people assume that they're going to be the losers.

So let's prove them wrong. Let's use this platform you've built to help to restore trust in science, in expertise, in policy and governance. Let's show the world that we can build technology and the systems to apply it that will make all of our lives better, regardless of the color of our skin, the place we live, or how much money we have in our bank accounts. I pose this challenge to you because I know you can pull it off. And The Heinz Endowments will continue to be a strong partner as you do. Thank you.