



THE ART CENTER SUMMIT

Systems, Cities & Sustainable Mobility

February 5–7, 2008

Within the next 20 years, five billion people—representing 60 percent of the world’s population—will reside in cities. To meet the needs and aspirations of an increasingly urban society, design will play a crucial role in helping to anticipate and create the solutions which will enable these complex systems to function sustainably.

The second in a series of five Summits, *Systems, Cities & Sustainable Mobility* focused on the big picture: the broad systems thinking and systems integration needed to create a better future for society.

These proceedings are a summary of what happened at the second Summit—another ground-breaking event following the inaugural Summit in 2007.

Sustainable Mobility: Inspired by Design

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TUESDAY, FEBRUARY 5, 2008

- 8:30–5:00 pm **Pre-Summit: Sustainability By Design**
- 5:30–7:00 pm **Summit Opening Reception**
Colors, Materials and Trends Exploration Lab, Hillside Campus
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WEDNESDAY, FEBRUARY 6, 2008

All presentations and activities were held at Art Center's South Campus (except where noted).

- 7:30–8:30 am **Registration / Continental Breakfast**
- 8:30–10:15 am **Art Center Welcome: Conference Overview**
David Muyres / Nate Young
Morning Keynote: My Other Car is a City
Alex Steffen
Systems Thinking Applied: Cities
Gary Lawrence
- 10:15–10:30 am **Morning Break**
- 10:30 am–12:15 pm **The Designer's Challenge**
Henrik Fisker
Introduction to Art Center's Mobility Vision Integration Process (mVIP)
Lloyd Walker / Udaya Patnaik
Session 1: Demonstration of mVIP
Lloyd Walker
- 12:15–1:00 pm **Lunch**
- 1:00–1:30 pm **Visualizing Future Cities**
Martin Tillman
- 1:30–2:45 pm **Panel Discussion: Mobility as the Driver for City Planning**
Gordon Feller, Moderator
Scott Bernstein / William Browning / Martin Wachs, Ph.D.
- 2:24–3:15 pm **Afternoon Break**
- 3:15–4:15 pm **Five-Minute Pitch Sessions**
Fast-paced presentations of sustainable mobility perspectives and inventions, ranging from the feasible to the strategic
Peter Treadway, Treadway Update
Steve Fambro, CEO, Aptera
Raul-David Poblano, MIT Media Lab—Robo Scooter
Student Mobility Study, Johnson Controls, Inc. sponsored project
Andréa White, Bikestation
Lindsay Smith, Where the Rubber Meets the Road

WEDNESDAY, FEBRUARY 6, 2008 (continued)

- 4:15–4:45 pm **The Green Economy Drives New Corporate Systems**
Hannah Jones
- 4:45–5:00 pm **Closing Remarks**
David Muyres / Andy Ogden
- 5:00–6:00 pm **Shuttle Transportation to Hillside Campus**
- 6:00–7:00 pm **Evening Reception**
Student Dining Room, Hillside Campus
- 7:00–9:00 pm **Evening Keynote Program**
Ahmanson Auditorium, Hillside Campus
- Art Center’s Sustainable Mobility Commitment**
Richard Koshalek / Nate Young
- Summit Highlight Reel**
Art Center Graduate Film Students
- Special Address**
John Mizroch
- Keynote Introduction**
Stuart Townsend
- Keynote: Design, Society and Mobility**
Paul Hawken
-

THURSDAY, FEBRUARY 7, 2008

- 7:00–8:00 am **Continental Breakfast**
- 8:00–10:15 am **Welcome Back: Overview**
David Muyres / Udaya Patnaik
- The \$2,500 Car Dilemma**
V. Sumantran, Ph.D.
- Rethinking Vehicle and Systems Architecture**
A Conversation with Gordon Murray
- Panel Discussion: The New Systems Driving Sustainable Mobility**
Mark Goodstein, Moderator
Christer Lindström / Dan Sturges / V. Sumantran, Ph.D.
- 10:15–10:30 am **Morning Break**
- 10:30–12:00 am **Coordination in the Future Urban**
Jan Chipchase
- Session 2: mVIP Future Scenario Application**
Lloyd Walker

THURSDAY, FEBRUARY 7, 2008 (continued)

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|---------------|--|
| 12:00–1:00 pm | Lunch |
| 1:00–1:30 pm | Mobility: Inevitable Paradigm Shifts Ahead
Hazel Henderson |
| 1:30–2:30 pm | Panel Discussion: 21st Century Strategies
Jayne Poynter, Moderator
Peter Bishop, Ph.D.
Axel Friedrich, Ph.D.
Freeman Thomas, Ph.D. (Honorary) |
| 2:30–2:50 pm | Designing a Future
Geoff Wardle |
| 2:50–3:00 pm | Closing Remarks
David Muyres |
| 7:30–10:30 pm | Alumni for Green Afterparty
South Campus, Wind Tunnel and Rooftop
<i>Open to all Summit Attendees and All Art Center alumni.</i> |

To change everything, where do you begin? You start by learning as much as you can.

The 2008 Pre-Summit, *Sustainable by Design*, took that to heart and presented a roster of speakers with expertise in the areas of systems, cities and sustainable mobility. Below are just some of the issues addressed by the designers, scientists, engineers, planners and business leaders.

The morning opened with Art Center professor Heidrun Mumper-Drumm suggesting that design practice, conducted using a comprehensive, lifecycle based model, can create products and services that meet sustainability goals. Joel Makower of Greener World Media looked at the trends and issues surrounding sustainability and saw opportunities for businesses, which include sustainability as a core value.

System

Our keynote speaker, professor and author Dr. Stuart Cowan, led the discussion of 'systems' by defining what systems are and describing the properties that govern them. The presentation on systems was continued by Dr. Rob Thompson of Art Center and Jet Propulsion Laboratory, who spoke about energy and the economic flows that activate and sustain them.

Cities

Sustainable cities were discussed by Scott Bernstein of the Center for Neighborhood Technology, who described transportation technology projects introduced in Chicago, which are now seeing wider application throughout the United States. Arup's Erin McConahey looked at 'Mini, Micro and Macro' systems within the context of buildings. She emphasized that to design sustainable systems, it must be done by intent.

Mobility

How nature moves and how biomimicry can inform and inspire design was the topic undertaken by Environmental Chemist Dr. David Hammond. Art Center's Geoff Wardle looked at how design and designers are crafting mobility solutions, while artist and Art Center professor Claude Willey looked at how mobility development is uneven and often leaves entire populations and communities without ready access to mobility.

On topics closely related to systems, cities and sustainable mobility, Jayne Poynter of Paragon Space Development examined how measurements and metrics were being used to foster sustainable mobility. John Paul Kusz of the Center for Sustainable Enterprise and IIT Stuart School of Business spoke specifically about new sustainable design requirements. Lorrie Vogel of Considered Products, Nike, gave the audience a look into how Nike was developing a sustainable design process and applying metrics.

The day concluded with a panel discussion among Dr. Stuart Cowan, Gordon Feller of the Urban Age Institute and Art Center's Transportation Design Chair Stewart Reed and moderated by Joel Makower. Following the presentations, the speakers and audience were invited to a reception in Art Center's ground-breaking Colors, Materials and Trends Exploration Laboratory [CMTEL] with the lab's Director Karen Hofmann.

My Other Car is a City

Alex Steffen

Wednesday, February 6, 2008, Morning Session

“Our future is broken, and the single biggest cause of this crisis is our vision of prosperity.”—Alex Steffen

Selected Quotes:

We are seeing the first signs of collapse in ecosystems all around the world, not 10 years from now, not 20 years from now, but today. Places like China, India, Brazil, Mexico, South Africa or Russia are industrial giants in the making. These are people who are quickly gaining the ability to choose a model of prosperity. If they follow in our footprints, we are cooked. Business as usual will lead to a global Somalia.

Sustainable development is possible. It is possible to hit a place where our ecological footprint is small enough and our prosperity is large enough that there’s real happiness in the long term. But we need to invent a model of prosperity that actually fits within that footprint. We need to create one-planet lives that are really bright and green, both sustainable and prosperous. By 2030 we need to have invented and began deploying a one-planet life on a wide scale.

The fact is that good urban design dematerializes trips, infrastructure, healthcare costs and all sorts of other things. We know that *where* we build trumps *what* we build. We know that if 60 percent of new developments were more compact, even modestly, we would emit 85 million fewer metric tons of tailpipe CO₂ each year by 2030. We have the opportunity to really make it work for us, because we are going to be building or rebuilding about half of our built environment by 2030.

We need millions of people embracing innovation. We need a mass movement dedicated to focusing the nation on how unthinkable bad the future will be based on what we are making today, but also energizing people to understand that what we could replace our broken future with could be unimaginably good. We know that we can build a bright green future; it is within our technological capacity to deliver sustainable prosperity.

We can’t build what we can’t imagine. We must get out there and be a movement of the mind. We need people who are interested in sustainability to be out there articulating what they imagine to be possible. And I think we need to imagine that possibility as beautiful. We all need help from one another, and we all need to help our fellow citizens understand the system in which we are now mired, and how that system could change. That means that we need stories and compelling examples. We need to be reminded of the kind of people we actually want to be.

Systems Thinking Applied: Cities

Gary Lawrence

Wednesday, February 6, 2008, Morning Session

“Sustainability will happen. The question is whether we achieve it gracefully, or we achieve it through systems collapse.”

—Gary Lawrence

Selected Quotes:

Sustainability is a political issue that has technical barriers and technical attributes. Sustainability is a political idea—not a partisan idea—because it has to do with people’s willingness to choose an alternative to what their expectations are today. What we try to do in creating ecological cities is to make it as easy as possible for people to choose an alternative way to live while also meeting their expectations for happiness and some level of prosperity.

One of the challenges for all of us in the design profession is to not get stuck on the notion that we know the future. As the science gets better and better, we are probably going to find out—as we found out throughout human history—that the things about which we were the most certain end up being the things that are not true.

Sustainability can be and should be the most robust of all possible risk management frameworks, because it deals with issues in depth, it deals with issues in breadth, it deals with issues at their intersection and it deals with issues through time. And if you combine all those things, particularly the opportunity to leverage benefits across systems, you get better outcomes much more rapidly. The siloed approach we take to most of the decisions we are making today will be our downfall.

The basic impulse we find in our social science research that shapes people’s willingness to choose a more sustainable life have to do with nostalgia, fear and aspiration. And unless you are dealing with community design that takes those issues head on, there’s no chance that people are going to choose a more sustainable way. Economics alone won’t work.

The basic question for an ecological city is a basic question for almost every other thing we do: Are we designing the stage in which life is going to get played out without understanding the meaning of the play? There’s a principle in China called the barrel principle—a bucket will only hold as much water as the shortest plank. Oftentimes in ecological city planning, culture is left out—and culture is the shortest plank.

The Designer's Challenge

Henrik Fisker

Wednesday, February 6, Morning Session

"We have to change our mindset. The question I get most often is, 'How many miles per gallon does this vehicle get?' It's irrelevant. What's relevant is, how we use that vehicle, and how the vehicle is intended to be used."—Henrik Fisker

Selected Quotes:

We need to take a different point of view in creating environmentally friendly products. Until now, we have often talked about how we need to sacrifice certain things to help the environment. If we really want to have a majority of the population join us and use these products, we have to create products that are so desirable and exciting that people simply go out and buy them—not because they are forced to, not because there's some rules and regulations, but because they want these products.

I have not experienced a time in my career in which I was able to change the layout of a vehicle from the ground up and decide where the different components should go. I think that's very rare, I don't even know if it really happens. Designing the Fisker has been different. With this drive train you are not sacrificing anything. We were able to create a very strong body structure, which is also a very light. I wanted a vehicle that consumers would appreciate and want to buy regardless of what technology was in this vehicle. What drives most of us to buy any vehicle above \$12,000 is a certain amount of irrational thinking.

People want a sexy-looking environmental car and it must be one they can afford. So it's for people who can afford an \$80,000 car.

We are starting a wave, and I think that as designers, it's important that we stand up, take a risk and help move this wave along. It's very clear that part of this will be how people perceive these new technologies. As designers, we have a huge responsibility in how we package this technology, how we make the package desirable and even more desirable than the cars we have today.

The future looks very bright for us. I think it's the first time that we seriously have a chance to change the car industry into something positive where we have sexy, good-looking fast cars, but with a dramatic, positive change on the environment.

Mobility as the Driver for City Planning

Scott Bernstein/William Browning/Martin Wachs, Ph.D./Gordon Feller, moderator

Wednesday, February 6, Morning Session

“In order to have cities with sustainable and prosperous neighborhoods that can support the kinds of social, economic and technological changes occurring today, then we must rethink the transportation industry.”—Gordon Feller

Selected Quotes:

Transportation research shows that if we can achieve the Vehicle Miles Traveled reductions, it's worth as much as, even more than, clean cars and fuels. There are deep synergies possible through more efficient cities with transit and transit-oriented development. In the 1950s, we built our current transit system in pursuit of speed. The previous system, built before WWI, was built around accessibility and economic development.

Transit-oriented development is about location, efficiency and a good mix of choices. It's about creating and capturing value, and creating a place where people want to be. We are going to have to make some tough economic choices about how much money goes into building better communities that reduce demand, and how much goes into the vehicles.—**Scott Bernstein**

Sustainability involves effectively relating transportation to urban form. It involves increases in density rather than increased developmental footprints. It also requires increasing the mix of activities in space while coordinating transportation and land use.

We should rationalize our charges and fees for travel. When thinking about the design of new cars, highways and neighborhoods, we should also think about the design of new financing systems to enhance and encourage those kinds of cars, neighborhoods and communities.

The motor fuel tax is obsolete. For a greener future, we should internalize the externalities and charge for the pollution that people cause—and that means changing the basis of charging and paying for our transportation system.—**Martin Wachs**

I am fascinated by the Fisker automobile, but for reasons different than most people. As great as it is, as sexy and as fast as it is, like every other car, it spends 90 to 95 percent of its time sitting still. So why am I excited? Because it's got a big battery sitting in it!

If I have 57 Fiskers, I have a one-megawatt battery array. I have plug-in hybrids and the ability to do real-time transactions between that vehicle of charge, discharge or neutral.

So while you are thinking, “sexy car,” I am thinking, “power plant.” And I am also thinking, “What can I do with this thing, and what are its implications on the urban fabric?”—**Bill Browning**

The Green Economy Drives New Corporate Systems

Hannah Jones

Wednesday, February 6 Afternoon Session

“If you told me 10 or 15 years ago that we would be talking today about things like a green economy, I would have told you that you were delusional.”—Hannah Jones

Selected Quotes:

Your business model is going to be severely threatened if you think that you can continue to be a growth company on more than a hundred dollars per barrel of oil, on carbon taxes, on climate change disruptions, on workflows being disrupted or on power shortages. But climate change is also about water; it's about poverty; it is Darfur.

I challenge you to be thinking about how you can be a source of innovation and growth. How can your team become an innovation team? How can you help the company grow by incubating new products and services, or helping grow new markets? You have to be in a culture where failure is allowed, and where it's all about innovation. We need to elevate ourselves to see this as a whole and apply systems thinking. We need to apply that thinking to everything we do. How do we move our entire team away from being where the problem is to prototyping the future? How do we start to influence the very creation of what the design in the future could look like?

We try to bring our business acumen to the table in our partnerships and to say, “Hey, we don't know anything about your world, but what we can do is look at it through the lens of design, innovation, business and marketing, and maybe we can bring something new to the table by collaborating together.”

Designers are beginning to realize that they have a key role to play in being architects for change, not just within business models but also in terms of environmental and social change. I think there are two things that we need to be doing: farming and hunting. There's “How do we make things so that they are less bad?” That's the farming. And then there's the innovation piece. That's the hunting.

I have no idea what the future looks like, but we have to be collectively doing that disruptive thought process—that's the hunting, and that's where the schools need to come in, to help us be disruptive and help us prototype the future. We have to be prototyping the future, because that's when people's fear leaves them and they are willing to walk towards it.

Day One Closing Remarks

Andy Ogden

Wednesday, February 6, Afternoon Session

“Good designers have the ability to imagine complex future scenarios, to visualize them and then develop those visions into realities.”—Andy Ogden

Selected Quotes:

Today we can see that the designer’s ability to create greater desire in consumers to consume more and more often is directly connected to the problems we are facing. Now we can, and want, to be part of creating appropriate solutions. The challenge of achieving environmentally responsible design is at the center of our critical discourse, and it’s affecting everyone’s creative perspective.

How can the next generation of designers help? Designers are great sensors. If you put them out in an environment they have abilities that will pick up on what’s going on, and they have an intuitive sense for finding and solving problems. Designers generally look to make things better. Good designers understand how to use broadly applicable creative methodologies. They employ design and systems thinking to reliably increase the value of innovation.

The ability to rapidly visualize abstract ideas can accelerate a project team from talk to action. Designers speak, read and communicate meaning through stories and designed experiences in a language of form, material, texture, color, temperature, light and sound. Prototyping the future, and creating a common understanding of it, will be critical to moving companies and organizations forward with more sustainable solutions.

Sometimes the value that designers bring to a team is that they can take complex things and find a way to make them simple enough for everyone to understand. Designers ultimately have the potential power and responsibility to direct their knowledge to move us towards a sustainable path. By helping optimize new and more sustainable technologies for human needs, thereby creating the most desirable solutions, they can motivate change at a faster rate.

Ultimately, we believe that designers with breadth and depth in the human dimension, who know how to work in the overlaps with the other areas, will be the design partners of choice for sustainable innovation. Most importantly, we know we have a lot to learn, and we believe that we have to continually get smarter about what needs to be done and what we can do as a College.

A View from the Bridge

John Mizroch, Principal Deputy Assistant Secretary, Office of Energy Efficiency and Renewable Energy (EERE), US Department of Energy

Wednesday, February 7, Evening Session

“In the second half of the 20th century, the most important things that happened are not the Cold War, the fall of Communism, the invention of television, computers or the Internet. It’s the unprecedented increase in population and rapid urbanization. ”

—John Mizroch

Selected Quotes:

I think energy is the most important problem facing America and the world today. It is defined by two different issues that have come together to form an imperative. The first issue is energy security and the other is climate change.

Energy security is largely defined by the fact that there are eight countries in the world that control about 80 percent of the world’s oil. And America’s economy is largely dependent on liquid transportation fuels. It behooves us to diversify. My mission is to displace petroleum.

Consider this data: In 1950 there were approximately 2.2 billion people in the world. In 2000 there were 6 billion people in the world. In 1950, there were 190 cities of a million or more people. In 1990 there were 900 cities of a million or more people. In 1950 there were 70 million vehicles of all types in the world. Today, there are about 900 million vehicles, but that’s about to change rather dramatically.

What do we do on the size, rate and scale that is going to make a difference? The answer—which is not a simple answer—is technology development, finance and policy. On the technology side, the good news is that we have, or will soon have, the technology to solve almost all these problems. On the finance side, there’s probably better news. No country on earth does better at financing things than the U.S. and, as we all know, the world is awash with money. But it’s on the policy side where we need to have a discussion and get things right.

Over the last couple of decades, the office of EERA (Energy Efficiency and Renewable Energy) has been responsible for the underpinnings—the scientific underpinnings—of solar, photovoltaic, wind turbines, nickel hydride metal battery, geothermal heat pumps, and we helped invent the LEEDS system with the U.S. Green Building Council.

My advice is first, embed sustainability in all aspects of your work and then keep stretching the definition of sustainability. Second, compromise as little as possible. Everybody has to compromise, but if you’re the innovators and the thought leaders, try to compromise as little as possible. The third thing is to think big, because as big as you think, it will never be big enough. The problems we’ve got to solve are enormous. But they are solvable.

Design, Society and Mobility

Paul Hawken

Wednesday, February 6, Evening Keynote

“The meta question for all of us is this: Which civilization are you a designer for? The one that’s dying, or the one that we are trying to create?”—Paul Hawken

Selected Quotes:

My definition of good design is: good design removes stress from a system. Collapse also removes stress from a system. So there’s two ways we can do this. And obviously the preferred way is through design. Design is critical, it’s at the center. What’s important is that we ground ourselves in our designs, in our image of the future, in a practical understanding of what we face. This isn’t positive or negative—it’s critical. Otherwise we are in denial, and denial produces bad designs.

The past is not going to provide us with a lot of answers in terms of what we have to do from this point on. Change is going to happen through imagination. It’s going to happen because people re-imagine what is possible.

I think collectively we are forming urban arks. We are gathering in these urban arks, lowering our footprint, to wait it out. To wait out peak oil, peak water, peak forest, peak fish, peak food, peak soil—peak everything. This is a collective attempt to survive together. Together, not separately, but as community. The movement of people to cities is a kind of collective wisdom. We are doing something. We are not helpless, we are not hopeless. We are not waiting for someone else to do things for us. This is us, addressing the salient issues of our time, and it’s a brilliant strategy.

So, is it not the job or the opportunity of a designer to design the means, the wherewithal, literally the tools—both social and actual—for the people who are moving to those cities to green themselves? When we talk about design, it is about who we are and who we can be, it’s not about objects.

I think a natural system’s economy, which depends upon and builds upon biological flows, is not just the economy we are moving towards; it’s the economy for the next century, the century after that and the century after that. It’s not just a fix. There’s no fixes here, but a real evolution.

The gift of all the problems is that we cannot solve those problems and be the same people we were when we created them. In other words, we are going to be a completely different civilization and culture when we get there. The answers to our problems are gratefully and fortunately sitting next to you. And you meet the people around the world who care about this and who are doing things about it and if it doesn’t make you weep, then you don’t have a heart. We don’t need more heroes; we just need human beings, as imperfect and wonderful as they are.

The \$2,500 Car Dilemma

V. Sumantran, Ph.D.

Thursday, February 7, Morning Session

“If we apply the same intelligence that goes into individual product designs to addressing mobility solutions and systems, we will have a lot of opportunity.”—V. Sumantran, PH.D.

Selected Quotes:

I don't want to talk about a specific car or value. It goes beyond a particular car or a company. It's more about an approach to design and transportation solutions.

Mobility is a critical component of economic development. As one traces economies over decades and across the globe, one finds an inevitable correlation. Increased economic development demands more mobility to get that economic activity executed, and increased mobility enables increased economic growth and output. How do we address this demand for mobility that is rapidly outstripping the ability of infrastructure to keep up?

This is the environment in which one is looking to find better, safer and more dignified mobility solutions. The challenge for designers has been to place an intelligent, effective solution where this need exists. There are huge opportunities that exist if one is able to configure a system on product to address this market. The “\$2,500 car” that finally showed up was not bad.

The architecture and the concepts of designing in this manner involve a number of principles. It starts with effective functional mapping. The first thing is eliminate what is unnecessary. Often times we burden the system with more function than users really need. It is important to pare down to the bare requirements for the system. Secondly is to do functional consolidation; doing absolutely nothing more than what is necessary. Finally is creative industrial design: simple, elegant and cheap. But often, we need high tech to also be low cost.

What did this exercise teach us? The Japanese taught us the concept of *muda* or waste. How do you take out waste in product design and still come up with the leanest, most functional and intelligent solution? You can do the same thing when talking about transportation systems. We have to look at our light rail systems, buses and the railway systems. If we bring this *muda* thinking to product and system design, we will make considerable headway in affordable and sustainable mobility solutions.

Rethinking systems and Vehicle Architecture

Gordon Murray

Thursday, February 7, Morning Session

“Big car companies have to get shaken up and start embracing new ways of thinking and designing.”—Gordon Murray

Selected Quotes:

Getting people to think differently from a design point of view is an issue. Another issue is finding what incentives you give the public to change. We all know that we need to change, and fairly quickly. I think we need to attack it on two fronts. We need to stir up the motor industry and get them thinking a little more laterally, looking from a clean sheet of paper point of view on future vehicle designs. And we need to motivate local authorities and governments to give more incentives for people to change.

I think the most difficult challenge for traditional car designers to overcome doesn't actually have anything to do with car design at all. It's breaking out of the system and the mold that they have been formed into over the years by our industry. I think the vehicle designer has a massive part to play in the future, and I am sure we will get support as designers and design teams in increasing quantities from governments and other agencies as pressures build.

I would like to see more effort put into public transportation, and I don't think there's anywhere near enough work done on the design of infrastructure. Design has to lead infrastructure. I don't think we, as designers, are paying anywhere near enough attention to public transportation and design.

It really needs some clear thinking and some better direction from governments. In my experience, governments are ill-informed by the wrong pressure groups for the wrong reasons. We need more solid scientific and engineering input to the authorities and governments that are trying lead and set policy. I don't think you have hope in getting a consensus across the world—let alone even in one country—until that happens.

Panel Discussion: The New Systems Driving Sustainable Mobility

Dan Sturges/Christer Lindström/V. Sumantran, Ph.D./Mark Goodstein, moderator

Thursday, February 7, Morning Session

“There will be problems, and for every big company not addressing the problem, there will be someone who says, ‘Wait a minute, let me take a crack at that.’”—V. Sumantran, Ph.D.

Selected Quotes:

There are three elements that cause mobility problems. There is fuel efficiency, the amount of gas that it takes to move a car forward; there is people efficiency, which is things like vehicle occupancy and vehicle weight; and there’s the number of miles you need to travel to get from place to place. We are effectively doing nothing about the last two. Beyond these, the final issue in this debate is land use.—**Mark Goodstein**

How do we think about transportation? An important aspect of my work is to model these systems in virtual worlds. So my future work will model a city like Pasadena, virtually. We’ll model the entire demand of the city, its people, its travel patterns, its economic models, and put different scenarios with variable amounts of taxes, cars, and large- and small-scale transfer systems. We will then make it available for the public, to see what happens.—**Christer Lindström**

The most efficient trip you can make is a trip you don’t actually make. If we don’t address the demand, we are only kidding ourselves. Once we reduce demand, how do we make the systems—both the system itself and system components such as cars, bikes and trains—as efficient as possible?—**V. Sumantran, Ph.D.**

We are starting a company to create commercial solutions for the future we envision. We’re starting by developing the technology and systems to essentially rent small electric vehicles, electric scooters and electric bikes at train stations or in downtown urban areas. We’re installing our first systems later this year near Seattle.—**Dan Sturges**

I see the future of transportation becoming more intelligent and multimodal. No longer does every vehicle meet every need we have. This is presenting some profound new ways to organize mobility. We’ve heard a lot about occupancy and capacities and how to make a car incredibly efficient, but if only 20 percent of the seats are filled, it remains inefficient.—**Dan Sturges**

It’s a question about passion and determination. You can learn from American history—if there is something that can be done, Americans do it. I don’t see large obstacles, especially not with the people in this country, because you’ve shown many times that you can do quite amazing things in a very short time frame. It has much more to do with willpower than actual decision or policy-making.—**Christer Lindström**

Coordination in the future urban

Jan Chipchase

Thursday, February 7, Morning Session

*“6.6 billion people on the planet
3.1 billion cellular subscribers
70+ languages supported on cell phones
16 cellular phones sold per second by Nokia
426,000 cellphones retired per day in the U.S.”—Jan Chipchase*

Selected Quotes:

I work for Nokia design. The data above helps us recognize the speed at which the cellular infrastructure goes into the world.

I am part of a team that conducts exploratory design research. We go out into the world and try and figure out why people do the things that they do, and how they do them. We use the information that we gather to inform and inspire the design process, and basically challenge what we think we know in the company.

What does it mean when your primary point of contact, that thing that you give out to people, is mobile? What happens when your primary form of identity is mobile, not just in terms of what you give out, but in terms of what you feel for yourself? When you were growing up, you probably gave out a home or office address. What does it mean when it turns into something like a mobile phone number? If you think of these devices as your primary form of identity, when you start multiplying those identities, you get all sorts of kind of wonderful opportunities.

There's a trend toward recommendation systems: an extrapolation of what you already know through services like Amazon. Imagine having that level of information available to you in your handset based on 15, 20 years of data from a few million people who are similar to you in your context. How does that affect your decision-making process?

There's so much knowledge about everyday life that we need to bring back into the company. One thing we do is look at places where people who have very little manage to do a lot, and live and strive and survive. Something I have learned from one of our designers is the extent to which people in very low-income communities are just as aspirational as anyone else.

We are going to see a huge growth in the status casting of objects and services, letting people know that something is available. And it could be the seat in a taxi, or a book on a library shelf.

Think of all the possibilities that are enabled as objects become smaller, more powerful and more mobile. Think of all the services and everything else that this makes possible. They are powerful, and they go around the world very, very quickly.

Mobility: Inevitable Paradigm Shift Ahead

Hazel Henderson

Thursday, February 7 Afternoon Session

“Most of us think of money as just there. We don’t realize that money can be designed well or designed badly. We need to redesign our money systems to make them more sustainable.”

—Hazel Henderson

Selected Quotes:

I have been calling for a design revolution for many years, and design revolutions are really fun because everybody can get involved. Art Center is very importantly focusing beyond product design to the design of whole systems.

So let’s look at the design tasks that face us when we think beyond mobility. My friend, Bruce Mau, says, “It’s not about the future of design, but about designing our global future.”

We have to redesign our infrastructure. That requires redesigning our tax code and those obsolete economic textbooks that overvalue property rights while undervaluing amenity rights. And what we mean by amenity rights are all of the global commons that we share: the right to clean air and water, the right to bio-diversity and all of those vital common global resources—which if we don’t take care of, we end up disrupting our climate, which is what we have done now.

I have been calling our economy “the new attention economy,” where people’s attention and time is just as valuable as money. Our economies are shifting from material goods to services. The U.S. economy now is 70 percent services. I like to think if you really look very deeply into economic processes, the three modes of resource used that we all share are basically our information, matter and energy.

To get to all these human hardware systems that we need to redesign for our common future, we must redesign the software. That is our money system. Most of us think of money as just “there.” We don’t realize that money can be designed well or badly. We need to redesign our money systems to make them more sustainable—right now they are at the root of driving unsustainability.

Are we humans up for this design revolution? Yes. I see the evolution of human awareness on our planet everywhere I go. Actually, I think that this design revolution is well underway, and I am sure that you are all going to be part of it. And so I would say that design is now the best career ever.

21st Century Strategies

**Peter Bishop, Ph.D./Axel Friedrich, Ph.D./Freeman Thomas, Ph.D. (Honorary)
Jayne Poynter, moderator**

Thursday, February 7, Afternoon Session

“Every biological species has one or more critical resources that shape its behavior and ecology. We are obviously the children of a petroleum society. We are about to reverse one of the major disruptive changes in recent human history: the arrival of petroleum as the highest density, most usable liquid fuel ever known to human civilization.”—Peter Bishop

Selected Quotes:

How do we deal with this huge challenge of climate change and sustainable development? It seems quite difficult to figure out. On what do we all agree? Where are the things we all can say, “Yes, that’s exactly what we should be doing.”—**Jayne Poynter**

We will have a problem going from one era to another. We wish we could go from success to success, but every chasm involves a down slope and an upslope. We have a chasm in front of us, and the only thing we can control is its depth. How deep will we go? One of the ways to raise the chasm’s bottom is through innovation—and that’s where design comes in.—**Peter Bishop**

The role of business is in innovation, in creating products and services that people can sell and buy. The role of government in the context of sustainability is only one thing: to internalize the cost of environmental services. The other component is leadership. Leaders are people who convince large groups of people to accept short-term dissatisfaction and pain in return for long-term satisfaction and security. That’s a very tough sell. We need our leaders to convince people to act now before the disruption—before the crisis—occurs.—**Peter Bishop**

The environment is a collective good. Therefore, the government has to set the rules for the use of the environment, and citizens and consumers must allow the government to do so. Then, they must pay the price, which is going to be expensive. New transportation systems, carbon sequestration, carbon capture, taxes—it is going to be an expensive world.—**Axel Friedrich**

I think the problem is more in America. The infrastructure and the government are disorganized; there’s no common standard for all 50 states. There’s no common standard that goes around the world. So if you start to develop a new vehicle, wouldn’t it be great to have a standard that would be accepted around the world?—**Freeman Thomas**

It’s through innovation from industry and leadership in government. Both work together to tell the public—both the public as consumer and public as citizen—that we need to do something now to prevent something far worse from happening down the road.—**Peter Bishop**

Tools for Envisioning the Future: The Mobility Vision Integration Process

By Clark Kellogg, Partner, Collective Invention, LLC

Wednesday, February 6, Morning Session

Thursday, February 7, Afternoon Session

The day after Art Center's first Sustainable Mobility conference in 2007, half a dozen people, mostly conference organizers, met and asked, "What did we see? What happened here? How did it go?" Conversations like this are usually called a debrief session, but this was different. It became about designing the future. One of the striking realizations from the first Summit was how many different disciplines were present. This was exciting in many ways, and many concerned, committed people were eager to change things. But everyone didn't speak the same language, and certainly didn't use the same work processes. There was much shared inspiration, but few shared tools.

Those in the debrief meeting were from different disciplines. But we had one thing in common: We all knew how to create never-before-seen futures. Out of that meeting came an idea that went on to become the Mobility Vision Integration Process (mVIP). From that point, Lloyd Walker, Andy Ogden, Geoff Wardle and Dave Muyres developed the mVIP, which was introduced at this year's Summit, *Systems, Cities & Sustainable Mobility* and was used during the break-out sessions by small teams working to envision future mobility and transportation solutions.

The mVIP tool is a sophisticated deck of cards that lead groups through a scenario-based, problem-solving sequence using real-world conditions and variables. It organizes groups, gathers knowledge and insight, frames in discussion, stimulates new ideas and drives groups toward new solutions. Compared to most card games, this one is a sure bet.

Lloyd Walker introduced the mVIP tool to the 2008 Summit audience on Wednesday morning. Participants broke into small groups and tried it out. Based on feedback from that session, the development team made adjustments before the next day's break-out session, when the mVIP tool was again put to the test. They'd been working like that for a year; think and do, create and adjust, rapid prototyping. It was the same idea all the Summit speakers had about sustainable mobility, and the mVIP team was doing it.

Everyone left the Summit with an mVIP deck. Created to work with any group, it builds a common platform of language, process and outcomes, allowing people from wildly different disciplines to work together productively. During the Summit's two short sessions, it generated over 100 new solution concepts for sustainable mobility dilemmas. And, it's beautifully designed as well. But then, isn't this the case for all good tools?

The mVIP tool deck is available from the Summit Web site.

Summing Up

Geoff Wardle

Thursday, February 7, Afternoon Session

“The word sustainability may go out of fashion in the next few months or years, but the issues will not. Sustainability is here to stay, and we have to embed it in everything that we do.”

—Geoff Wardle

Selected Quotes:

We have heard many times that it is important as designers to bring our passion to whatever it is we are designing. Today, we are entering an era where we have to make that passion spread over a lot more activities. We have to harness that passion in trying to solve much more complex problems. If we want a sustainable future, life is going to be more complicated. It's going to be more complicated for designers as well. We have to take on a lot more responsibility for putting knowledge, wisdom and good judgment from many other disciplines into our designs.

One of the things we as designers can do to help this transformation process is to do research about how to make better mobility. We need to do a very good job in capturing that information and those good ideas from many disciplines. And we need to do a great job of showing people how things might be in the future. If we are going to be taken seriously as a design resource, we have to start wrestling with these big issues. We have to roll up our sleeves and make things, get our hands dirty to see if design solutions really work, and show people how a sustainable world might work.

One of the major obstacles in providing truly sustainable mobility—or sustainable anything else—is that we live in a culture where we are no longer sure what is truth, and what is not. We live in a culture where there is spin on everything. We have marketing spin, we have political spin, and we have corporate spin. To succeed, we have to be able to speak to each other with honesty and understand that each of us is telling the truth, that there are no hidden agendas. We need to think a lot about ethics and the way we conduct our businesses and lives.

Representing 14 countries, a diverse group of designers, engineers, scientists, product planners, government officials and educators gathered for the second Summit. The following is a listing of this influential group that convened to debate and redefine the future of transportation and mobility.

Stefan Klein	Professor	Academy of Fine Arts & Design, Slovakia
Dan Chau	Design Director	Addis Creson
John Creson	Executive Creative Director	Addis Creson
Jennifer Regan	Project Coordinator, Sustainability Programs	AEG Administration
William Wright	Director of Gov't & Public Affairs	AIA Los Angeles
Steve Fambro	CEO & Founder	Aptera Motors Inc.
Reed Schmidt	Creative Director	Aptera Motors Inc.
Gary Lawrence	Urban Strategies Leader	ARUP
Erin McConahey	Associate Principal in Mechanical Engineering	ARUP
Jae Min	Chief Designer	Audi Design Center California
Chris Sawyer	Executive Editor	Automotive Design & Production
Heather Walker	Sustainability Program Manager	Autodesk
Stuart Cowan, Ph.D.	General Partner	Autopoiesis LLC & Sustainable Systems Design LLC
Mark Vaughn	Staff Writer	AutoWeek
Harald Belker	Entertainment Designer, Visualizer	Belker Design
Andrea White	Executive Director	Bikestation
Brad Cracchiola	Senior Engineer	BMW Group/Designworks USA
Verena Kloos	President	BMW Group/Designworks USA
Joachim Kolling	Director	BMW Group/Designworks USA
Richard Pelletier	Senior Designer	BMW Group/Designworks USA
Kevin Rivera	Marketing Operations Manager	BMW Group/Designworks USA
Michael Scully, Sr.	Automotive Strategist	BMW Group/Designworks USA
Alan Anderson	Chief Engineer, Director, Concept Center	Boeing Commercial Airplanes
Wing Cheung	Design Engineer	Boeing Commercial Airplanes
Stephen Stephenson	Senior Manager, OD Engineering & Product Integrity	Boeing Commercial Airplanes
Bonnie Powers	Design Strategist	Independent Consultant
Carol Carmichael, Ph.D.	Senior Counselor for External Relations	California Institute of Technology
John Boesel	President & CEO	CALSTART
Fred Silver	Vice President	CALSTART
William Chergosky	Interior Chief Designer	Calty Design Research, Inc.
Joo Lee	Media Relations & Communications Coordinator	Calty Design Research, Inc.
Joseph Simpson	Freelance Writer	Car Design News
Shigeru Nagata	Writer	Car Styling
Scott Bernstein	President and Founder	Center for Neighborhood Technology
Hilary Bradbury-Huang	Professor	Center for Sustainable Cities
Timothy Anness	Director/Studio	Chrysler LLC
Alan Barrington	Designer	Chrysler LLC
Ghassan Dirani	Manager/Interior	Chrysler LLC
Kevin Verduyn	Director	Chrysler LLC

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Bill Bogaard	Mayor	City of Pasadena
Richard Bruckner	Director of Planning and Development	City of Pasadena
Eric Duyshart	Economic Development Manager	City of Pasadena
Alice Sterling	Green City Coordinator	City of Pasadena
Greg Greeson	CEO	Collectic Home
Clark Kellogg	Partner	Collective Invention
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Mardi de Veuve Alexis	Director of Communications	Consulate General of Sweden/ Los Angeles
Anna Carin Thomer	Consul—Business Promotion and Investments	Consulate General of Sweden/ Los Angeles
Ellen Starr	Summit Project Manager	Consultant
Claude Willey	Artist, Activist, Urban Ecology	CSUN Urban Studies and Planning
Paul Young	Writer	Design 21
Stephanie Sun	Writer	Designing Your Future
Betsy Nathane	Creative Director	Econ One
Carrie Norton	Director of Business Development	EI Solutions
Pat Kelly	Founder	eie-(Entrepreneurs & Innovators for the Environment)
Eli Attia	Architect	Eli Attia Architect
Noa Attia	Architect	Eli Attia Architect
Andrew Beebe	President	Energy Innovations
Hazel Henderson	Author and Founder (Video)	Ethical Markets Media, LLC
David Hammond, Ph.D.	Independent Chemist	Environmental Chemist
Loic Jacqueson	Eco-Design Director	Faurecia
Dana Lowell	Director, Adv. Business Development	Faurecia
Howard Meehan	Artist/Sculpture	Firefly Studio
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Reggie Acosta	Designer	Ford Motor Company
Fairuz Arabo	Strategic Color & Materials Designer	Ford Motor Company
Matt Edwards	Designer	Ford Motor Company
Shelby Faulhaber	Studio Operations Coordinator	Ford Motor Company
Andrei Markevich	Designer	Ford Motor Company
Jeff Nield	Designer	Ford Motor Company
Freeman Thomas	Design Director, North American Strategic Design	Ford Motor Company
David Woodhouse	Chief Designer	Ford Motor Company
Steve Anderson	Designer	General Motors
Frank Saucedo	Design Director	General Motors
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Adam Smith	Senior Product Manager	Google
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Stan Kong	Faculty	Pasadena City College & Art Center College of Design
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Ken Montler	CEO	Porteon Electric Vehicles
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Justus Stewart	Writer	Worldchanging
Andrew Steele	Chief Operating Officer	Wrightspeed

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Udaya Patnaik, Partner, Jump Associates

Geoff Wardle, Director, Advanced Mobility Research, Art Center College of Design

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Ron Cogan, Editor, *Green Car Journal*

Doug Frasher, Strategic Design Chief, Volvo Monitoring and Concept Center, Volvo Car Corporation

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Lloyd Walker, Principal, Precurve, LLC

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Thomas K. Feegel, Principal, Brand Neutral

Karen Solomon, CEO, Opportunity Green

Student Exhibitions

We would like to thank Art Center students who have displayed their work at the Summit. For more information, go to artcenter.edu/summit.

Summit Highlight Reel

Special thanks to the Art Center Film and Broadcast Cinema Department for their 2008 highlight reel of the Summit. A complete list of participant names can be viewed online at artcenter.edu/summit.

Special Performances

Abraham Tetenbaum, Writer, Director, Producer

The Caruso Top Hats

Pre-Summit Presenters

Scott Bernstein, President and Founder, Center for Neighborhood Technology

Stuart Cowan, Ph.D., Professor, Portland State University; Coauthor, *Ecological Design*

Gordon Feller, CEO, Urban Age Institute

David Hammond, Ph.D., Environmental Chemist

John Paul Kusz, Founder, Associate Director, Center for Sustainable Enterprise, IIT Stuart School of Business

Joel Makower, Environmental Strategist; Cofounder, Green World Media, Inc.

Erin McConeahey, Associate Principal in Mechanical Engineering, ARUP

Jane Poynter, President, Paragon Space Development Corporation; Crewmember, Biosphere 2

Stewart Reed, Chair, Transportation Design, Art Center College of Design

Claude Willey, Artist, Professor, Urban Studies and Planning Department, California State University, Northridge and Art Center College of Design

Rob Thompson, Ph.D., Senior Technical Staff, Jet Propulsion Laboratory; Art Center College of Design Faculty