



● Art Center College of Design

THE ART CENTER SUMMIT

Designing Sustainable Mobility

February 7–8, 2007

To better understand sustainability and how it relates to design and mobility, Art Center College of Design developed a series of five annual participatory Summits. This crucial dialogue began with the first Summit, *Designing Sustainable Mobility*, held at Art Center February 7–8, 2007.

Representing 11 countries, a diverse group of 100 designers, engineers, scientists, product planners, government officials and leading educators gathered to debate and redefine the future of transportation and mobility. Their goal was to discover how designers and other creative-minded people could play a role in advancing the sustainability dialogue.

The conversation has just begun. These proceedings are a summary of what happened at this ground-breaking event.

Sustainability—its time is now.

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Sustainability: No Time to Wait

“Following the first Summit, two things became clear: We were dealing with an enormous systems integration challenge, and that our enthusiastic audience was hungry for solutions.”

Dave Muyres

Vice President, Educational Initiatives, Art Center College of Design

Art Center College of Design is fully committed to making design a key element in addressing complex sustainability issues. We are in constant dialogue with experts from various fields, who advise and inform us as we fully integrate sustainability into our educational and research activities. Art Center’s Sustainability Summits are part of this discourse.

Building upon Art Center’s legacy in the field of transportation design, it is natural to establish sustainable mobility—perhaps the most challenging sustainability issue of our time and for the future—as the basis of our focus.

The creative processes used by the design community can produce success, because the design process emphasizes the multi-disciplinary interaction required for sustainable mobility solutions. This type of interaction empowers designers to present complex solutions to the policymakers; it also enables cultural change agents who are not necessarily conversant with the issues related to sustainability.

After our first Summit in 2007, *Designing Sustainable Mobility*, we realized that it would take more than one Summit to arrive at a meaningful point of view on this enormous subject. We are committed to hosting four additional Summits, each focusing on a different aspect of sustainable mobility. After all five Summits have concluded, we will be able to act with more authority, establishing a significant protocol to guide designers, professionals and public decision-makers who are striving for sustainable mobility solutions.

Following the first Summit, two things became clear: We were dealing with an enormous systems integration challenge, and that our enthusiastic audience was hungry for solutions.

As a result, in planning the second Summit, *Systems, Cities & Sustainable Mobility*, we decided that considering sustainable mobility in the context of systems thinking and urban environments was the next logical step in the overall discussion. As is now the case with *Designing Sustainable Mobility*, the results of *Systems, Cities & Sustainable Mobility* will be published in an easily accessible online format, allowing interested parties and influential educators, members of government and business leaders to gain insight into the debates surrounding sustainability in the 21st century.

Tuesday, February 6, 2007

8:30–5:00 pm	Pre-Summit: Sustainability By Design
5:30–7:00 pm	Summit Opening Reception Hosted by Honda and Milliken Colors, Materials and Trends Exploration Lab, Hillside Campus

Wednesday, February 7, 2007

7:30–8:30 am	Registration / Continental Breakfast
8:30–10:00 am	Art Center Welcome: Conference Overview David Muyres / Nate Young Keynote: The Environmental Challenge Christopher Flavin Design and the Sustainable Mobility Challenge Christopher E. Bangle
10:00–10:15 am	Morning Break
10:15 am–12:00 pm	Panel Discussion: Been There, Done That: A Historical Look at How Innovators Have Met the Challenge John Paul Kusz, Moderator Jay Baldwin / Paul MacCready / Budd Steinhilber Interactive Shareout Udaya Patnaik / Jump Facilitators
12:00–1:00 pm	Lunch
1:00–1:45 pm	Out of Oil: The Need for Change, and a “What Next?” David Goodstein
1:45–2:00 pm	Afternoon Break
2:00–3:30 pm	Entrepreneurial Insight into Meeting the Sustainability Challenge Dean Kamen / Stan Kong Five-Minute Pitch Sessions Fast-paced presentations of sustainable mobility perspectives and inventions, ranging from the feasible to the strategic
3:30–4:00 pm	Afternoon Break
4:00–5:00 pm	Interactive Shareoute Udaya Patnaik / Jump Facilitators Closing Comments David Muyres / Nate Young
5:00–6:00 pm	Transportation to Hillside Campus

Wednesday, February 7, 2007

- 5:30–7:00 pm **Evening Reception**
Hosted by Johnson Controls, Inc.
- 7:00–9:00 pm **Keynote Event, Ahmanson Theater**
Art Center's Sustainable Mobility Commitment
Richard Koshalek / Nate Young
- Summit Highlight Reel**
Art Center Graduate Film Students
- Keynote Introduction**
Ed Begley Jr.
- Keynote: The Need to Move Forward Is Now**
Robert F. Kennedy Jr.
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Thursday, February 8, 2007

- 7:30–8:30 am **Continental Breakfast**
- 8:30–10:30 am **Overview and Perspective: Shareout/Discussion**
Udaya Patnaik
- Sizing Up the Challenge**
Amory Lovins
- Industry Panel: Today's Industry Looks Forward**
Bill Breen, Moderator
Christopher Bangle / John Boesel / Larry Erickson / Ben Knight
- 10:30–10:45 am **Morning Break**
- 10:45 am–12:00 pm **Panel Discussion: Creating New Business Models and Incentives that Drive Innovation in Sustainability**
Joel Makower, Moderator
Mark Goodstein / Ben Schwegler / Dan Sturges
- 12:00–1:00 pm **Boxed Lunch**
Activity: Create a Vision for the Future
daya Patnaik / Jump Facilitators
- 1:00–2:00 pm **Final Synthesis**
Udaya Patnaik
- Closing Comments**
id Muyres / Nate Young
- 2:00 pm **Green Car Journal**
A ride-and-drive session for attendees featuring alternative fuel vehicles from leading global manufacturers.

Pre-Summit: Sustainability By Design

“Scientists, educators and experts in various fields participated in the Pre-Summit. They were led by Art Center faculty member Geoff Wardle, who initiated the process by focusing on sustainable mobility, emphasizing that ‘innovation is not the same as invention—innovation is applied invention.’”

Heidrun Mumper-Drumm

Graphic Designer; Adjunct Associate Professor, Art Center College of Design

Art Center presented a one-day, intensive introduction to the topic of sustainability for Summit participants and for interested Art Center faculty and students on February 5, 2007, the day preceding the Summit. *Sustainability By Design* provided an overview of the concepts, science, design methods and areas of concern related to sustainability.

Scientists, educators and experts in various fields participated in the Pre-Summit. They were led by Art Center faculty member Geoff Wardle, who initiated the process by focusing on sustainable mobility, emphasizing that “innovation is not the same as invention—innovation is applied invention.”

Speakers presenting on topics related to design generally agreed with Arizona State University professor Braden Allenby’s assertion that “sustainable design is good design,” and with Art Center Adjunct Associate Professor Heidrun Mumper-Drumm, who maintained that sustainability should be produced “by design and by designers.”

Speakers encouraged educators and practitioners to expand their vision of design, while at the same time recognizing that, as Allenby stated, “every improvement has a flip side. For example, saving energy saves money, which allows more money to be used for consumption.”

Allenby concluded the day on a contemplative note, pointing out that global climate change is dangerously oversimplifying issues, pushing out equally pressing concerns. “We are putting our eggs in one basket,” he said. “If this issue [climate change] is shot down, [that] position weakens irreversibly.”

Following this successful Pre-Summit, Art Center decided to make this sustainability primer a fixture of all upcoming Summits.

The Summit Proceedings: Selected Quotes from Key Presentations

February 7, 2007

Morning Keynote: The Environmental Challenge

Chris Flavin

“The challenge of sustainable transportation design is not just about automobiles; ultimately it is about coming up with a more diverse and more robust transportation system.”

Selected Quotes:

“On a fundamental level, we got to where we are today by relying on fossil fuels for the vast majority of the energy we need. This is clearly a system that is in the process of failing. It will destroy the human economy, and ultimately human society, in the 21st century if we don’t get a handle on it very soon.”

“Our transportation system is unsustainable for several different reasons. Ultimately it won’t work environmentally, but frankly it does not work economically or in terms of national security, either, because of our dependence on oil.”

“I believe that the failure over the last three decades of the world-leading American automobile industry to lead the way towards a more sustainable automobile will go down as one of the most tragic failures in U.S. business history. The technology capability clearly exists in this country, yet time after time, as new technologies have come along to reinvent the steel-bodied, internal combustion-driven automobile, the United States automobile industry has, in some cases, attempted to lead, but in all cases, ultimately failed to provide leadership. We have seen the leadership position being taken up by companies in Japan and other parts of the world.”

“The automobile is going to be reinvented over the next decade; I have little doubt about that. It needs to be reinvented and the competitive pressures are there to do so, but I also think it is terribly important that the U.S. play a leadership role in this reinvention.”

“It is a brave statement to get up and say that the first part of overcoming an addiction is to admit you have a problem. Yes, we have a problem in the design community, but more importantly, we have a problem as a human species. Unless we all work together—and work a lot harder than we have in the past—it will indeed be too late.”

February 7, 2007

Morning Session: Design and the Sustainable Mobility Challenge

Chris Bangle

“There is a look to the steam age, the age of electricity, and the atomic age. What is the look of the hybrid age, or the hydrogen age? What is the look of the sustainable age? It will have a look, and it will come from us.”

Selected Quotes:

“What does sustainable mean? Think of it like a temple with three pillars: in the middle is the ecological pillar, on the right is the social pillar and on the left is the economic sustainability pillar. The issue of sustainability goes far beyond studio walls. It reaches into the real world, because what we do ensures that our workers will have a job tomorrow. That is also a form of sustainability, and it means that we have responsibility to these workers.”

“These are the scary corridors that design does not want to go down, industry does not want to go down, and the connoisseurs do not want us to go down.”

“Cars are an expression of us. Why is the automotive industry the largest industry in the world? Why do so many people buy automobiles? Many just need their vehicles to take them from point A to B, but what really drives the industry is the sense that people are using their vehicles to project themselves into the world. These projections are avatars. Our biggest challenge is to get through with our meaning and grab on to those pillars with these avatars. Why the avatars? That is what people want. Why the pillars? That is what sustainability is.”

“What is our job? Our job in the industry is to ask the right questions, and to make sure our companies are asking the right questions. First of all, it is about people, it is about life, it is about added value—do not forget that when designing sustainable mobility. Secondly, do not ignore the enormous potential of reuniting industry and humanism. A new ethic of industrial humanism could be a fantastic way to make an authentic future.”

February 7, 2007

Morning Session: Panel Discussion

Been There, Done That: A Historical Look at How Innovators Have Met the Challenge

Paul MacCready / Jay Baldwin / Budd Steinhilber / John Paul Kusz, Moderator

“Ninety-two percent of humans do not currently have a car. Eight percent of the Earth’s human population is creating these problems that we’re talking about.” —Jay Baldwin

Selected Quotes:

“The best gasoline engines used in everyday driving are about 25 percent efficient. The rest of the power they make is essentially thrown away. A lot of that ends up smog and greenhouse gas. If I was the Grand Wazoo and could wave my magic wand to instantly change every vehicle in Los Angeles into a Prius, what would be different about getting back to wherever you drove here from? The answer is not much.” —Jay Baldwin

“I want to stress not individual transportation products, but what I call system design. It’s much more important that these products we design fit into a cohesive, overall view of transportation. If you’re going to design transportation systems, focus on the outcome, not the output. The product is transportation. We get too involved with the technology, and forget our real challenge.” —Bud Steinhilber

“Optimism often replaces realism in the designer category. Don’t become so fascinated with your design that you forget about the realistic assessments that you need to deal with. These are very important: reliability, flexibility, adaptability and robustness.” —Bud Steinhilber

“Airplanes are efficient. Function determines design. Cars, on the other hand, are marketed more like toys. We all tend to respond to this marketing approach.” —Paul MacCready

“When we think about automotive transportation, we find a need for huge efforts to get rid of gasoline, natural gas and coal products. These are resources that we extract from the planet that have a lot of pollution associated with them. Unfortunately, this problem isn’t going to be solved by just a few conferences and setting goals of 10 percent improvement in 20 years and so on.” —Paul MacCready

“This is serious, and should be approached like we approached World War II—we changed the whole economy and got the war won quickly. This is the sort of approach we need in the car arena.” —Paul MacCready

“I think as long as we have our present car industry, we’re going in the wrong direction. The people designing cars should be dealing with efficiency, not the jazzy devices. This doesn’t fit the current standards, but it fits what the car industry should have.” —Paul MacCready

February 8, 2007

Morning Session: Panel Discussion

Creating New Business Models and Incentives That Drive Innovation in Sustainability

Mark Goodstein / Dan Sturges / Ben Schwegler / Joel Makower, Moderator

“The car industry right now is a monoculture. It’s like a forest with one kind of tree.”—Dan Sturges

Selected Quotes:

“Historically, the only method that’s been truly successful in solving congestion is congestion pricing. So, absent financial mechanisms that truly incentivize people to get out of vehicles, nothing will happen. The good news is that communities change. And they change rapidly—far more rapidly than people are willing to believe is possible.” —*Ben Schwegler*

“You get people to stop smoking with a patch for smokers; now we need a patch for drivers. I believe that a gas tax is probably a good idea. It’s a stimulus response: Make it more expensive to drive and people will make better choices. Who would want to buy a \$50,000 new car, drive it on the freeway, and only go three miles an hour?” —*Dan Sturges*

“Most people don’t realize that Lindbergh flew across the Atlantic because of a prize. And in the year after he flew across the Atlantic, the number of airplanes, airports and airplane stocks rose dramatically. Lindbergh created the aerospace industry. There are many examples of prizes having this sort of impact.” —*Mark Goodstein*

“We have embarked on a tremendous experiment for which there is no control group. We are going to see all of the underwater civil engineering work that my colleagues have done over the past five centuries quite soon. We’ll have a huge opportunity to build complete new cities. I would like to see the dialogue about what these cities might look like to start now. Interestingly enough, there’s nothing about public policy that will enable us to actually move this discussion forward. It’s going to have to be the choices that are presented by the private sector that does it.” —*Dan Sturges*

“I think the crucial point is that this conversation needs to continue. It needs to continue both within this forum and in many other kinds of forums, with larger groups of new kinds of people and new kinds of players who aren’t yet part of this conversation.” —*Joel Makower*

February 7, 2007

Afternoon Session: Entrepreneurial Insight into Meeting the Sustainability Challenge

Dean Kamen and Stan Kong, Moderator

“Big car companies make 50 million of the same thing and tell you that you should use it on the highway, you should use it on streets and you should use it in Tokyo. That’s a nonsensical, 21st century proposition. It’s a 19th century solution to a 21st century problem.”—Dean Kamen

Selected Quotes:

“I would argue that if Henry Ford came back today and went into the parking lot to have a look around, he’d say, ‘It’s a car; not much has changed—but I see it now has cup holders.’”

“The designer is the highest-level, big-picture thinker—synthesizing all available technologies in order to come up with new solutions to problems. The rest of it then goes down to the various engineering disciplines. When we first started working with the automotive industry, the word ‘designer’ was used in almost the exact opposite way.”

“Henry Ford did not invent the car, the gasoline engine or the wheel. When you look at these things that changed the way in which we live, I would argue that it wasn’t the technology that made the difference in any instance. It was a systems integration solution that made the difference.”

“The pieces are not what is wrong. It’s pretty easy to see that cars are about the best design, highest performance and best value that people can get per pound. Go buy a PC and a car. The PC won’t last very long even if you take good care of it. But you can beat the hell out of your car and it just keeps going. Cars are incredibly reliable, safe and cheap. They are remarkably good at everything they do, but they are a beautiful answer to the wrong problem.”

“I’m begging you as designers to not just think about the cup holder, but also about the ramifications and unintended consequences of the large systems you’re playing with. The system called mobility, and if it’s done correctly, it is by far the system that will have the most impact on energy, sustainability, quality of life, health—you name it. It’s a huge opportunity. This is an exciting time for people who are tinkering with the biggest, most complex system that the world plays with, on a huge scale.”

February 7, 2007

Evening Keynote Address: The Need to Move Forward Is Now

Robert F. Kennedy Jr. / Introduced by Ed Begley Jr.

“Environmentalists bring the voice of future generations into the political process. We say we are advocates for the future, and we demand an accounting. We want to know what you’re doing with the things that don’t belong to you; with the things that belong to our children.”—Robert F. Kennedy Jr.

Selected Quotes:

“I’m really happy to speak to you, our designers. We have all the solutions that we need to solve the environmental destruction that’s going on now. We just have to give the proper incentives to get this to marketplace. We need the political will so we can give people an economical reward for good behavior. That’s what we want: an economical system to punish bad behavior and reward good behavior. That’s what we need to design.”

“If we raise fuel economy standards in this country by 2.6 mpg, we’ll conserve more energy than we imported from Iraq and Kuwait combined at our highest point of importation. If we raise fuel economy standards by 7.6 mpg, we could eliminate 100 percent of Persian Gulf oil imported into this country.”

“If we want to meet our obligation as a generation, as a civilization and as a nation—which is to create communities for our children that provide them with the same opportunities for enrichment, good health and prosperity as our parents’ communities—then we’ve got to start protecting our infrastructure. The air we breathe, the water we drink, the wildlife, the fisheries, the public lands that enrich us, that connect us to our past, that provide contacts to our communities—these are ultimately the source of our values and our virtues, and our character as a people.”

“What politicians invariably say is, ‘Well, the time has come in our nation’s history where we have to choose between economic prosperity and environmental protection.’ That is a false choice. In 100 percent of situations, good environmental policy is identical to good economic policy. Environmental injury is deficit spending. It’s a way of loading the cost of our generation’s prosperity onto the backs of our children.

“The worst thing that can happen to the environment is if it becomes the province of a single political party. I don’t think there’s any such thing as Republican children and Democratic children. But you can’t talk honestly about the environment, in any context today, without speaking critically of our current President. This is the worst environmental White House that we’ve had in American history.”

February 8, 2007

Morning Session: Sizing Up the Challenge

Amory Lovins

“Remember Marshall McLuhan’s remark that only puny secrets need protection—great discoveries are protected by public incredulity. It’s your move.”

Selected Quotes:

“We would like public policy to support, and not distort, business logic. Over the next few decades, this journey beyond oil comes with a much stronger economy and can be led by business for profit, rather than forced by public policy. If we deal with the whole system efficiently, we can save a magnitude in fuel, and make things look as beautiful and exciting as they do now.”

“Seven-eighths of the fuel energy you feed into a car never makes it to the wheels. It is lost in the engine, idling, driveline and accessories. Of the one-eighth of that fuel energy that does get to the wheels, half of it either heats the tires and road or heats the area pushing aside; only the last six percent accelerates the car and then heats the brakes when you stop. Since only five percent of the mass you are accelerating is actually you, and 95 percent is the car, only five percent of six percent or three-tenths percent of the fuel energy actually ends up moving the driver. This is not very gratifying after 120 years of devoted engineering effort.”

“The revolution goes something like this: You can double efficiency with a good, hybrid vehicle that’s driven properly. If you make it ultralight and otherwise improve the platform physics and design integration, you re-double the efficiency. If you run it on E-85, you quadruple the oil efficiency. If you make it a good plug-in hybrid, you roughly re-double efficiency in oil again, and this could work economically if you have an appropriate vehicle-to-grid function.”

“Competition like we have not seen since the 1920s is sweeping the industry, and it will change the managers’ minds or the managers themselves—whichever comes first. I have no doubt this is going to happen, but what are we waiting on to get this done? We are the people we have been waiting for, and if you think all of this is too good to be true, just remember Marshall McLuhan’s remark that only puny secrets need protection—great discoveries are protected by public incredulity. It’s your move.”

February 8, 2007

Morning Session: Industry Panel

Today's Industry Looks Forward

Chris Bangle / John Boesel / Larry Erickson / Ben Knight / Bill Breen, Moderator

“Silicon Valley and the venture capital community have entered the business of sustainability. When you begin to see the design community also come in, it’s like the cavalry arriving. It’s a very exciting development. Silicon Valley is seeing investment opportunities in cars. This is a rapidly changing landscape and a tremendous opportunity for designers to do some systems engineering.”

—John Boesel

Selected Quotes:

“The upcoming generation of car design students is being asked to think past some of the existing dogmas that have been building over the past 10 years. The last decade has produced students who generally understand the industry exactly as it was. To solve some of these problems, we’re going to need designers who have the courage to look at reforming things. That means that they are going to need a much broader set of experiences.” —Chris Bangle

“There’s a change in the way the design process happens. It’s more interactive, and it’s more about the meaning or the underlining root of what is going on.” —Larry Erickson

“The mathematical model used to be: You get to fill a plant, which takes 250,000 units, with little variation. But today the market is segmenting into tiny pieces, every one of which is an opportunity. As we talk about how we work with designers, and how this community gets designers to move through the issues of sustainability, we need to consider the question: How do we get designers to do the right job?” —Larry Erickson

“From a design perspective, I am seeing great opportunities to develop integrated transit systems that could be well-fitted into the whole land-use effort. I’m also seeing opportunities for new mobility companies to arise. We have about a decade to move on this issue and make some very significant progress.” —John Boesel

“Sustainability is going to mean progress, in technology but also in lifestyle. I believe that depends on values. You look into psychographics and you look at a shift of values. Hopefully, it includes climate change and doing something about it as a value, soon.” —Ben Knight

February 7, 2007

Afternoon Session: Out of Oil: The Need for Change and a "What Next?"

David Goodstein

"I think our civilization might very well collapse because it's so dependent on oil, and there's no oil in our future. If we are to substitute something for oil, it will have to come from a long list of possibilities, and we should try all of them."

Selected Quotes:

"Let's start with some myths about energy: Three dollars a gallon is too much to pay for gasoline—three dollars a gallon is about 75 cents a liter. We gladly pay twice that much for bottled drinking water. The fact is that gasoline is just about the cheapest liquid you can buy in the United States—and that is a big part of the problem."

"The amount of oil available for extraction from the Earth—like the amount of any natural resource—starts at zero, rises to a peak that will never be exceeded, and declines back to zero. We will be in trouble not when we pump the last drop of oil, but when we reach the peak—the halfway point. We are very close to the halfway point now, which means that we are very close to running out of oil."

"Another myth: Hydrogen is not a fuel—it's a way of storing and transporting fuel. You use fuel to make hydrogen. Today fossil fuels are used to make hydrogen. It requires about six gallons of gasoline equivalent to make enough hydrogen to replace one gallon of gasoline. So, hydrogen is not the solution—it's part of the problem."

"Fusion is the type of nuclear energy that we haven't yet harnessed. It's been '25 years away' for the past 50 years...and it's still 25 years away. But, if we ever conquer it, it would be the solution to the problem because every gallon of seawater contains enough deuterium to substitute for 300 gallons of gasoline. It's a possible solution. But we have not yet managed the technology or the physics to achieve it."

"In the past 100 years, the concentration of carbon dioxide in the atmosphere has increased from 280 parts per million to 380 parts per million. The concentration of methane has just about doubled. And if temperature follows that trend, the results will be catastrophic. We are conducting an uncontrolled experiment with the climate of the only planet we have. It is a very, very foolish thing to be doing."

Collective Conversations: Facilitated Invention in Small Groups

Clark Kellogg, President, Kellogg Consulting

One of the highlights of *Designing Sustainable Mobility* was the break-out sessions that enabled participants to hold critical conversations about sustainable futures. Nine “rooms” surrounded the conference commons at Art Center’s South Campus Wind Tunnel, each furnished with tables, chairs, three-sided partitions and plenty of drawing tools. Every break-out area had a facilitator to guide the work and conversation. Group participants began by recalling their first awareness of the need for sustainable thinking. Over the course of the two days, they moved into large-scale systems thinking, developing a new paradigm for engaging with sustainable mobility.

Experts learned from novices. Students worked with industry leaders. Green tech worked alongside big steel. Academics joined industrialists. One of the enduring memories I took away from the Summit was standing in the middle of the commons, looking around at the nine intense conversations taking place simultaneously.

During the sessions I remember thinking, “This isn’t typical conference stuff—this is different. These people are talking as if it really matters.” And it did. Some of those conversations have led to new alliances, new research, and, in one case, a new company.

The Fulcrum of Design: An Overview

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

“At Art Center, we teach designers to contribute far more to these innovative transportation solutions than just hardware, services and communication systems.”

The developed economies of the world have established an expectation of ubiquitous personal mobility and freight transportation enabled by a century of cheap energy. This has caused serious ecological degradation, urban congestion, human health issues and rapid depletion of finite energy sources.

As developing economies aspire to the same levels of mobility as the rest of us, our global community faces a serious challenge. During the first Art Center Summit, *Designing Sustainable Mobility*, we recognized what an enormous and complex systems integration problem confronts the design of a sustainable future.

Solving this problem will be daunting. Yet at the same time we are presented with tremendous opportunities to break some historically bad habits and create innovative, smarter ways to mobilize ourselves and to deliver the goods we need to maintain the global economy. Change is possible.

However, it is not just science, technology or astute business philosophies that will provide the solution. The populations of the world must be inspired to embrace change. To do this, we will need to see that change will improve what we already experience. This is where the role of the designer comes into play.

Creating sustainable transportation, particularly in urban environments, will be a truly multi-disciplinary activity. Engineers, sociologists, urban planners, scientists, architects, industrial designers, environmental designers, manufacturers, economists and philosophers will have to work together to make change happen.

At Art Center, we teach designers to contribute far more to these innovative transportation solutions than just hardware, services and communication systems. To succeed, we will need to transform designers into more comprehensive and forward-looking professionals—to enable them to become balancers of complex systems, using sustainability as their fulcrum.

To help our design students (as well as professional designers and other creative people) come to terms with dealing with complexity, Andy Ogden, Lloyd Walker and I have been developing a creative tool that we are calling the Vision Integration Project (VIP), a project inspired by the first Sustainable Mobility Summit. A card-based activity, VIP requires users to rapidly assimilate a wide variety of random scenarios from which they have to respond with an economically sustainable, design-based solution. We will be demonstrating the VIP to our 2008 Summit attendees, and hope you will enjoy the experience.

Representing 11 countries, a diverse group of designers, engineers, scientists, product planners, government officials and educators gathered for the first Summit. The following is a listing of this rich and influential group that convened to debate and redefine the future of transportation and mobility.

Alan Anderson, Chief Engineer, The Boeing Company
Alexander Klatt, Creative Director, BMW DesignworksUSA
Alice Sterling, Green City Coordinator, City of Pasadena
Amory Lovins, CEO, Rocky Mountain Institute
Andrea Repass, Senior Manager of Accounts Planning, The Designory
Andréa White, Executive Director, Bikestation
Andrew Gartrell, Design Specialist, Nokia Corporation
Andrew MacLachlan, Senior Strategic Planner, Calty Design
Barbara Hocksma, Director, Design and Marketing, Milliken
Ben Knight, Vice President, Honda R&D Americas
Ben Thompson, Senior Graphic Designer, Sony Design Center
Bill Boggard, Mayor, City of Pasadena
Bill Breen, Senior Projects Editor, Fast Company
Brigid O’Kane, Associate Professor of Design, University of Cincinnati
Bruno Conte, Designer, Honda Motorcycle R&D
Budd Steinhilber, Industrial Designer, Environmentalist
Carol Carmichael, Senior Counselor for External Relations, Faculty Associate, Engineering and Applied Science, California Institute of Technology
Charles Allen, Senior Vice President/General Manager, Honda R&D Americas, Inc.
Charlie Baker, Group Vice President, Engineering, Johnson Controls, Inc.
Cherng Tong, Manager, Land Transport Authority
Chris Green, Principal Designer, Frog Design
Christopher Chapman, Director, BMW DesignworksUSA
Christopher E. Bangle, Director of BMW Group Design, BMW Group
Christopher Flavin, President, Worldwatch Institute
Clark Kellogg, President, Kellogg Consulting/Communication by Design
Craig Vetter, Designer, Vetter Design Works
Dale Murray, Professor, University of Cincinnati
Dan Hallada, Senior Research Analyst, Honda R&D Americas, Inc.
Dan Russian, Director of Development, Milliken
Dan Sturges, Mobility Entrepreneur; President, Intrago, LLC
Dana Lowell, Director, Advanced Business Development, Faurecia
Dave Marek, Division Director, Advanced Design, Honda R&D Americas
David Browne, Faculty, Coventry University
David Busch, Principal Designer, Johnson Controls Inc.
David Goodstein, Vice Provost Professor of Physics and Applied Physics, California Institute of Technology

David Haupt, President, IXO, Inc.
David Wagner, Fuel Cell Engineering Manager, Ford Motor Company
David Woodhouse, Chief Designer, Ford Motor Company
Dean Kamen, Inventor, Founder, DEKA Research & Development Corporation
Derek Gratz, President and CEO, WestLink Innovation Network
Doug Field, CTO, Segway, Inc.
Doug Frasher, Strategic Design Chief, Volvo Monitoring & Concept Center
Duncan Burns, Design Specialist, Nokia Design
Elena Golebiowski Ajdelsztajn, New Business Director, Indio da Costa Design de Produtos
Eric Duyshart, Economic Development Manager, City of Pasadena
Eric F.M. Winter, Director, Development, Alcoa Inc.
Eric Seider, Packaging Designer, Jakks Pacific
Eric Weber, Graduate Student, Massachusetts Institute of Technology
Fred Silver, Vice President, WestStart-CALSTART
Freeman Thomas, Design Director, Ford Motor Company
Gary Fitzgerald, Creative Director, BMW DesignworksUSA
George P. Nassos, Director, Center for Sustainable Enterprise; Director, Environmental Management Program, IIT Stuart School of Business
Gordon Feller, CEO, Urban Age Institute
Harris Silver, Founder, Citystreets
Hedi Alavi, Designer, Honda Access
Ichiro Hatayama, General Manager, Nissan Motor Company, Ltd.
Imre Molnar, Dean, College for Creative Studies
Indio da Costa, CEO/Chief Designer, Indio da Costa Design de Produtos
Jay Baldwin, Hot-Rodder, Inventor, Industrial Designer
Jay Frankhouse, Partner, Fuel D
Jaycie Chitwood, Senior Strategic Planner, Toyota Motor Sales, U.S.A.
Jeff Deacon, Design Modeler, Nokia Design Center
Jeff DeBoer, Vice President, Sundberg-Ferar, Inc.
Joe Simpson, TITLE, Royal College of Art
Joel Makower, Co-Founder, Clean Edge, Inc.
Johan Vissers, Principal Designer, Johnson Controls Germany
John Barratt, President, Teague
John Boesel, President, WestStart-CALSTART
John Owen, Faculty, Coventry University
John Waters, Team Leader, Rocky Mountain Institute
John-Rhys Newman, Senior Design Manager, Nokia
Joseph Hebenstreit, Principal Engineer, Frog Design
Judi Schweitzer, Owner, Schweitzer+Associates, Inc.
Karen Kukurin, Deputy Director, Governor Schwarzenegger's Los Angeles Office
Karen L. Hill, TITLE, The Boeing Company
Ken Dowd, Vice President, Teague
Kevin Crook, Principal, Kevin L. Crook Architects
Ki Nam, CEO, T3 Motion
Kuni Ito, Faculty, College for Creative Studies

Lance Charles, CEO, WhoEarth Development Corporation
Linda Adams, Secretary for Environmental Protection, California Environmental Protection Agency
Lorcan O’Herlihy, Principal, Lorcan O’Herlihy Architects
Margo Beylen, Manager of Materials Design, American Honda Motor Co.
Mark Charmer, Director, Movement Design Bureau
Mark Goodstein, Executive Director, Automotive X-Prize
Mary Fraser, Marketing Manager, Sustainability, BASF Corporation
Michael Arny, President, Leonardo Academy
Michael Brylawshi, Senior Consultant, Rocky Mountain Institute
Michael Warsaw, Executive Director, Industrial Design and Marketing N.A., Johnson Controls, Inc.
Neil Brooker, President, T3 Motion
Nicholas Barker, Vice President of Corporate Design, Datascope Corporation
Nino Senoadi, Senior Industrial Designer, Teague
Norihiro Furuhashi, President/CEO, MILAI Corporation
Orrin Shively, Executive Director, Creative and New Business Development, Walt Disney Imagineering Research & Development
Paul MacCready, PhD., Founder and Chairman, AeroVironment, Inc.
Peter Montero, Design Strategy/Research, Hyundai-KIA America Technical Center, Inc.
Philip Tsiaras, Research Analyst, Honda Motorcycle R&D
Rashni Bansal, President, Ridelinks Inc.
Raul-David “Retro” Poblano, Research Assistant, Smart Cities
Rebecca Fitzgerald, Manager, Blue Sky, Johnson Controls, Inc.
Richard Bruckner, Director of Planning, City of Pasadena
Rick Duffy, Vice President, Design, Herman Miller, Inc.
Rob Huber, Vice President of Advanced Marketing and Design, Faurecia
Robert F. Hunter, Student, University of Cincinnati
Robert F. Kennedy Jr., Author, Environmental Activist; Senior Attorney, Natural Resources Defense Council
Scott Craig, Manager, Toyota Motor Sales, U.S.A.
Scott Waters, Director, Industrial Design, Segway, Inc.
Stan Kong, Design Consultant; Faculty Member, Art Center College of Design
Stephen Moore, Consultant, International Energy
Steve Anderson, Designer, General Motors
Steve Ellis, Manager, Fuel Cell Marketing, American Honda Motor Co.
Steve Fambro, CEO, Accelerated Composites
Steven Bishop, Design for Sustainability, IDEO
Sunil Paul, Co-Founder, Spring Ventures
Suzanne Hunt, Biofuels Project Manager, Worldwatch Institute
Tim Cunningham, AFV Consultant, American Honda Motor Co.
Tim Dummer, Director, General Electric
Tim Maxwell, Mechanical Engineering Professor, Texas Tech University
Tim Parsey, Vice President, Lifestyle Design, Mattel Brands
Tisha Johnson, Strategic Design Manager, Milliken

Todd Summe, Division Manager, Product Design and Analysis, Alcoa Inc.

Tom Arbisi, Design Specialist, Nokia Design

Tori Clive, Forward Planner, Pacific Century Group

Vahid Mehrinfar, Executive Principal, Vahid Associates

W.W. "Chip" Harper, CEO, Harrison Walker & Harper, LP

Whitney Pitkanen, Project Manager, WestStart-CALSTART

William Bullock, Program Coordinator, Industrial Design, University of Illinois at
Urbana-Champaign

William Harkness, Research and Development Design Engineer, The Boeing Company

Yanta Lam, Professor, The Hong Kong Polytechnic University School of Design

Continuing the Discussion in 2008

Within the next 20 years, five billion people—representing 60 percent of the world's population—will reside in cities. Moreover, the growth of human population is expected to continue. Communities of people will live, work, play and move within increasingly layered and complex systems. Meeting the needs and aspirations of these growing urban societies is our challenge. Design will play a crucial role in helping to anticipate and create the solutions which will enable these multi-faceted and interlinked systems to function and be sustainable.

Building on the outcome of the first Summit, the 2008 Summit, *Systems, Cities & Sustainable Mobility*, will look at this bigger picture—the urban landscape in which people move. What are the mobility needs across the planet? How does one design pleasurable, safe, efficient and environmentally sound mobility solutions for communities? How can design encourage people to choose sustainable modes of transportation? How can new systems be designed and incorporated into existing environments? How should the design process integrate with cross-disciplinary systems and teams? The 2008 Summit will explore these questions and others.

Systems, Cities & Sustainable Mobility will again gather an influential group of visionaries, business-people, urban planners and government leaders for an examination of the relationships between mobility systems, cities and people. Held at Art Center on February 6–7, 2008, the Summit will feature a mix of presentations, discussions and brainstorming sessions, with an emphasis on the critical role designers play in the future of mobility and urban planning.

The one-day Pre-Summit, *Sustainability by Design*, will take place on February 5 and will provide an overview of sustainability concepts and practices. Both events will examine the networks that contribute to functional mobility, as well as study how these systems work on different scales and in different environments, from urban skyscrapers to mega-cities.

Art Center will also share and demonstrate its Vision Integration Process (VIP) through presentations and interactive sessions. Inspired by the first Summit, this process is a unique method for creating complex, future scenarios for framing solutions. Developed by Art Center's Advanced Mobility Research and Graduate Industrial Design Programs, the VIP promises to be a groundbreaking tool.

The goal of the 2008 Summit is to inspire and enable attendees to collectively create new ways to achieve sustainable mobility through design. Registration for the 2008 Summit is now open. For more information, visit artcenter.edu/summit.

Art Center College of Design: Building Sustainability

Since its founding in 1930, Art Center College of Design has cultivated an international reputation for preparing artists and designers to be creative leaders. Now entering its 78th year, Art Center has been guided by its fourth president, Richard Koshalek, since 1999. His philosophy is that design must operate as a force for good in the world—economically, socially and culturally—and that Art Center alumni will be the change agents of the future.

A commitment to sustainability is one of the core values propelling Art Center in this direction. Increasingly, classroom and studio instruction, sponsored projects, initiatives and student organizations are addressing sustainability as a framework for design. The College is committed to equipping its students with the design skills, innovative tools, and knowledge they need to make a difference in the larger world.

Summit Director

David Muyres, Vice President, Educational Initiatives, Art Center College of Design

Program

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

Heidrun Mumper-Drumm, Adjunct Associate Professor, Art Center College of Design

Udaya Patnaik, Partner, Jump Associates LLC

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

Summit Sponsors

Presenting Sponsors: Johnson Controls, Honda/Milliken

Supporting Sponsors: Faurecia, T3 Motion

Additional Support: Green Car Journal, Mohawk Fine Papers, Paper Graphics Ink, Typecraft Wood & Jones,

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Dave Busch, Principal Designer, Johnson Controls, Inc.

Ron Cogan, Editor, Green Car Journal

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

Mark Goodstein, Executive Director, Automotive X-Prize

Suzanne Hunt, Biofuels Project Manager, Worldwatch Institute

Jon Faiz Kayyem, Managing Partner, Efficiency Capital Ltd.

Clark Kellogg, President, Kellogg Consulting

Dana Lowell, Director, Advanced Business Development, Faurecia/Westworks

James Moed, Jump Associates LLC

Debra Deanne Olson, President, The Global Green Company

Eric Schumaker, Exterior Design Manager, Honda Auto Design, Honda R&D Americas, Inc.

Dan Sturges, President, Intrago, LLC

Celia Weinstein, Summit Planning

Summit Advisory Team: Art Center College of Design

Marianna Amatullo, Director, International Initiatives; Director, Designmatters

Michael Berman, Senior Vice President, Chief Technology Officer

Mark Breitenburg, Dean, Undergraduate Education

Erica Clark, Senior Vice President, International Initiatives

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Rich Haluschak, Controller

Richard Koshalek, President

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Andy Ogden, Chair, Graduate Industrial Design

Scarlett Osterling, Senior Vice President, Institutional Advancement

Stewart Reed, Chair, Transportation Design

Marty Smith, Chair, Product Design

David Walker, Dean, Public Programs

Nate Young, Executive Vice President, Chief Academic Officer

Summit Team: Art Center Staff and Consultants

Nick Agid, Instructor, Foundation

Vahé Alaverdian, Associate Photographer, Photo Services

Kristine Bowne, Assistant Director, Alumni Relations

Elizabeth Collins, Officer, Corporate Relations

Matthew DeBord, Director, Editorial Services

Ellie Eisner, Senior Production Manager, Design Office
Jean-Philippe Fontaine, Administrative Assistant, Educational Initiatives
Oliver Galace, OS X System Administrator, Information Technology
Jered Gold, Director, Internal Communications and Community Relations
Christine Hanson, Director, External Communications and Media Relations
Karen Hofmann, Director, Color, Materials and Trends Exploration Laboratory
Gwen Hourihan, Manager, Special Events
Michelle Katz, Consultant, Intellectual Property
Kristin Keller, Educational Support, Change Design
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Lisa Mayeda, Senior Associate Director, Corporate Relations
Kyle Maynard, Media Services Coordinator, Educational Technology
Robert Peterson, Chair, Broadcast Cinema
Ron Pierce, Art Center Faculty, Foundation
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Annie Rothschild, Director, Purchasing and Support Services
Kati Rubinyi, Educational Program Support
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Steve Sieler, Director, Design Office
Chuck Spangler, Web Designer, Design Office
Ellen Starr, Summit Coordinator, E* Events
Julie Suhr, Editor, Julie Suhr Communications
JoJo Tardino, Director, Special Events
Rachael Tiede, Executive Assistant to Chief Academic Officer

Organizations

Art Center Eco-Council
City of Pasadena
Summit Volunteers
Worldwatch Institute

Pre-Summit Presenters

Braden Allenby, Ph.D., Professor, Arizona State University
Jay Baldwin, Inventor, Industrial Designer
Ann Burdick, Acting Chair, Graduate Media Design Program, Art Center College of Design
Mary Fraser, Marketing Manager, BASF
Karen Hofmann,
Suzanne Hunt, Biofuels Project Manager, Worldwatch Institute
John Paul Kusz, Founder/Associate Director, Center for Sustainable Enterprise, IIT Stuart School of Business
Heidrun Mumper-Drumm, Graphic Designer; Adjunct Associate Professor, Art Center College of Design
David Muyres, Vice President, Educational Initiatives, Art Center College of Design
Andy Ogden, Chair, Graduate Industrial Design
Tapio Schneider, Ph.D., Assistant Professor, Environmental Science and Engineering, California Institute of Technology
Stephanie Sigg, Creative Officer, International Rescue Committee; Art Center College of Design Liaison to the United Nations
Rob Thompson, Ph.D., Jet Propulsion Laboratory; Faculty, Art Center College of Design
Geoff Wardle, Director, Advanced Mobility Research, Graduate Industrial Design, Art Center College of Design
Philip White, Assistant Professor, Industrial Design, Arizona State University
Nate Young, Executive Vice President, Chief Academic Officer, Art Center College of Design

Main Summit Presenters

Robert F. Kennedy Jr., Keynote Speaker; Author; Environmental Activist; Senior Attorney, Natural Resources Defense Council
Linda S. Adams, Secretary for Environmental Protection, California
Jay Baldwin, Inventor, Industrial Designer

Christopher E. Bangle, Director, BMW Group Design, BMW Group
Ed Begley Jr., Actor; Environmentalist
John Boesel, President, WestStart-CALSTART
Bill Breen, Senior Projects Editor, Fast Company
Larry Erickson, Chief Designer, Ford Motor Company, SVC Design Studio
Christopher Flavin, President, Worldwatch Institute
David L. Goodstein, Ph.D., Vice Provost; Professor, Physics and Applied Physics, California Institute of Technology
Mark Goodstein, Executive Director, Automotive X-Prize
Dean Kamen, Inventor, Founder, DEKA Research & Development Corporation
Ben Knight, Vice President, Honda R&D Americas, Inc.
Stan Kong, Design Consultant/Design Educator, Art Center College of Design
Richard Koshalek, President, Art Center College of Design
John Paul Kusz, Founder/Associate Director, Center for Sustainable Enterprise, IIT Stuart School of Business
Amory B. Lovins, CEO, Rocky Mountain Institute
Paul MacCready, Ph.D., Founder/Chairman, AeroVironment, Inc.
Joel Makower, Co-founder, Clean Edge, Inc.
David Muyres, Vice President, Educational Initiatives, Art Center College of Design
Udaya Patnaik, Partner, Jump Associates, LLC
Ben Schwegler, Ph.D., Vice President, Chief Scientist, Walt Disney Imagineering Research and Development
Budd Steinhilber, Industrial Designer, Environmentalist; Co-designer, Tucker Automobile
Dan Sturges, Mobility Entrepreneur; President, Intrago, LLC
Nate Young, Executive Vice President, Chief Academic Officer, Art Center College of Design

Five-Minute Pitch Sessions Participants

Honda Milliken Project: "Nashville" Student Team
Anne Burdick: Acting Chair, Graduate Media Design Program, Art Center College of Design
Peter Treadway: Designer/Entrepreneur; Alumnus, Art Center College of Design
Andy Ogden: Chair, Graduate Industrial Design, Art Center College of Design
MIT Media Lab: Raul-David Pablano, Researcher, MIT, The Media Laboratory; Eric F. Weber, Visiting Scholar, MIT, The Media Laboratory

Summit Visualizers: Advisors

David Tillinghast, Faculty, Illustration Department, Art Center College of Design
Adam Mednick, Student, Product Design, Art Center College of Design

Summit Visualizers: Students

Derek Howard, Product Design
Aya Morton, Illustration
Rich Overcash, Transportation Design
Justin Pichetrungsi, Entertainment Design
Shae Shatz, Entertainment Design

Exhibition

Designing Sustainability, South Campus Gallery

Art Center Student Designers Showing Individual Projects

Jonathan Abarbanel
Xiaoxue (Snow) Dong
Juan-David Quiñones
Lydia Chan
Sarah Kang
Meirav Shitrit
Kira Churnakoses
Christine Lau
John Wheeler

Honda/Milliken Funded Educational Project Students

Jonathan Abarbanel
Kambiz Ahmadi
Mihyun Bae
Adam Bonnier
Harim Choi
Yu Sun Choi
Michelle Constantine
Tatiana Gorunov
Travis Greenstreet
Nari Huh
Lakesha Johnson
Jeffrey Jones
Si Kim
Sandra Kwon
Ji-Young Lee
Jae Nam
David Olsen
Leon Paz
Roxana Towry
Carl Uggla
Paul Vela
John Wheeler
Jang Yoon
Joel Zuercher

Art Center Faculty Advisors

Fridolin Beisert
Karen Hofmann
Heidrun Mumper-Drumm
Brian Boyl
Tisha Johnson
Tracy Stone
Barton Choy
John Krsteski
David Tillinghast
Gloria Fowler
James Meraz
Randal Wilson
Cory Grosser
Marcello Mezzera

Summit Highlight Reel

Robert Peterson, Chair, Broadcast Cinema
Monte Bramer, Faculty, Supervising Editor
Christopher Gehl, Staff, Camera Supervisor
David Sanders, Staff, Camera Operator
Cameron Blake, Graduate Student Director
Stefan Silvers, Student Director, Photography
Graduate Film Students