## Sustainable Transportation on Campus and in the Community

Keynote Address: "Sustainable Transportation Principles and Practices" Don Forbes, Vice-President, HNTB Corporation, Chicago, Illinois September 22, 2005

For those of you who saw in the program that my wife, Jean actually goes first, we talked about it and decided to flip-flop. My job was largely to give you the context of the conversation and then Jean will prompt your thinking of how to hold the conversation.

With that, let's talk about some of the things that seem to matter in terms of sustainable transportation. Two purposes: one is to provide a deeper understanding of opportunities that we have for sustainable practices, the second is to provide a context (for) including those sustainable practices or applications into planning and designing the construction and operations of transportation facilities. Therefore the focus will not necessarily be on the modes, because what we found was that modes tend to represent positions, you know, buses versus cars. And you lose an opportunity to really gain an understanding about the important things, which really are, what are the principles that should guide our decision-making? What are the things that we value as a community?

Then, once you agree on those as a community, finding the commonality among how to make the various modes, pedestrians, bikes, buses, cars work together is a much easier thing. SO, we'll focus on value-based themes. We'll look at sustainability at three levels. What I would term the global level, and then transportation systems, community level, the guidelines that might be helpful to you to consider it at that level, and then the community and neighborhood level. Sustainable development largely comes from the work of Carl Heinrich Robert, one of the principle architects of what's known as "The Natural Step Process": sustainable development is that development which meets the needs of the present without compromising the ability of future generations to meet their own needs. In a similar vein, sustainable transportation, therefore, becomes the ability to meet the needs of current society to move freely, gain access, communicate trade and establish relationships, without compromising the ability of future generations to meet their own needs.

\*The Natural Step Process defines what it calls forced systems conditions for truly sustainable living:

\*One is that substances from the earth's crust must not be systematically increased in the biosphere, the biosphere means that envelope around the planet in which we all work. Substances from the earth's crust- that basically means mining, the things that you mine, don't accumulate in the biosphere.

\*Number two is similar but states the same case for the things we actually manufacture and use, that those shouldn't continue to accumulate.

\*Condition number three, that the physical basis for productivity and diversity of nature must not be systematically or systemically diminished.

\*And finally number four, the one that on a day to day basis relates most just to human interaction- and that is a fair and equitable distribution of resources to meet human needs.

Some quick thoughts about those: one and two, on a local level, relatively speaking, are indirect impacts. Certainly you can make a difference when you talk about

the kinds of resources that you use on your streets, roads, and modes of transportation, but relatively indirect. Impact's very local when it comes to biodiversity and habitat. But certainly, you can directly impact the notion of equitable distribution of resources within your own community. It's important to remember, that even though the impacts might be indirect, they still matter. I like the expression that no snowflake actually believes it's responsible for the avalanche. Everything you do matters.

The approach that we're going to take as we go through this is to look across left to right when we start looking at particular approaches. Consider every strategy as we move left to right and I'll explain, you know, the left to right movement. Sometimes it relates to things that are more sustainable or less sustainable, sometimes it means to [inaudible] transportation, and in each case you must look at techniques and applications.

So, what does sustainable transportation look like at the highest level, or principle level? Well, Jean and I have discovered through the work that we've done over the last decade or so, that there are really three guiding principles, if you will. First and foremost, most obvious is to meet mobility need. Second, there needs to be an asset to the community, and third to be compatible with the natural and built environments. Any one of those by themselves make a great deal of sense, so it'd be hard to argue. Those of you who work in transportation understand that in any given situation, it's the tradeoff among these three, the dynamic tension, if you will, that is the hard part of finding good solutions. So, in a very real sense that's your job is to find what works best that fits all three of those: mobility needs, community asset, natural and built environment.

Here's what we're going to do now is to look through those, we're going to do what, again, we discovered seems to make sense in other communities that we've worked, and that is for any given principle, you ought to be able to explain to you own community what does that mean, what's the evidence and how would you achieve it? So we're going to walk through each one of these that way.

## Mobility needs

Evidenced by solutions that are safe, convenient for users, technically credible, financially feasible.

How could you achieve that? I'll give you some of the ways.

Evaluate attributes of any given mode or solution that could define or eliminate modal gaps that would tend to diminish the vitality of any given mode.

Practice common sense and flexible application of design standards. Let's continue to move along.

On the community level here are some evidenced by indicators and also achieved by indicators:

Stakeholder endorsement, human needs that are met by the fair use of natural resources, so the trickle down to this TNS and Natural Step Condition Four. How can you achieve that? One of the ways might be engaging the community early and maintaining a productive involvement through design, construction and maintenance of the facility. Include all stakeholders, even the ones that you typically don't hear from.

I recognize I'm going fairly quickly, but I think there are handouts, you have some of the details, and again, my notion here is to give you some context so you can begin to bring your own conversation in the community.

Some of the things you can look at in terms of the natural and built environment:

Community and stakeholder endorsement could be one way to establish the compatibility

Regulatory agency acceptance might be another. You can achieve that through- minimize your taking of natural resources, your intrusion on the environment.

Looking quickly at some of the strategies and techniques. When it comes to mobility we look first from left to right in terms of what we would class as decreasing efficiency and use of natural resources so, the

\*First thing you'd want to do is minimize the growth of mobility to man. If you can find a way to meet the need without building an additional infrastructure, doesn't that make sense?

\*Continuing on, left to right, shift the demand from road capacity solutions to other modes,

\*Third, maximize the efficiency of the existing system, and

\*If all else fails and sometimes it does, then you need to add additional system capacity.

Techniques.

\*Minimizing the growth- Telecommuting might be one way to do that. Land use transportation development would be another way.

\*When it comes to shifting demand- Encourage carpooling over single occupant vehicles and provide commute options such as bus transit.

\*In terms of maximizing the efficiency of the existing system, you could look at the better ties to signals so you move traffic through efficiently in a given area and looking at controlling the access so you maintain the [inaudible] of that road.

\*And finally, adding to the capacity, the one we typically think of first, adding new alignments, travel lanes, and new interchanges.

By the way, Michael, you'll let me know how I'm doing on time, but, I actually came to this realization as early as about 1991 when I was director of the Oregon DOT, and discovered that even though I was in the highway business, I was also in the other modal business, but I had one dollar for every four dollars defined highway needs so I just simply couldn't get to this last box very readily. So we had to be wise about how we proceeded, and that seemed to help us a lot. We could find other ways to take care of things, and not necessarily always look at new construction as the way to do business.

Some of the things you can do in terms of strategies, relative to being an asset to the community, this tends to wind up better, I think, in terms of project phases. You look at planning, project selection, get the community appropriated early during the planning phase, then during construction, those things that you commit to while you're designing you honor in the construction phase. And then even as you go forward during the maintenance and operations, you continue to communicate with the community to ensure that you're continuing to do the job that you committed to do. Understanding community input during planning:

Balance the adequacy of interest of various people in the community and Seek to align the values with your defined transportation policy and solutions.

During the construction phase, your job- jumping to the very last one-

Evaluate proposed change orders against principles and commitments you made with the community, so if a contractor comes and wants to do something differently, great. If it saves money, saves time, why wouldn't you do it? Well, you might not do it if it violates the commitment you made to your community.

And finally, on the maintenance side, continue to talk to people in the community. How are we doing? Are we maintaining it the way we said we were going to do?

When it comes to natural built environment, the way that we've suggested is that you look at the way- how you might do the least intrusive stuff first and then to the most intrusive, and by least intrusive I mean, in ways you can actually enhance what's there. If not enhance, at least try to avoid or minimize impact. And finally, if you have to have impacts, how can you mitigate to minimize those impacts.

In terms of enhancing the environment, seek to minimize demand before selecting an alternative that could potentially negatively impact the existing natural built environment. Makes sense. If in fact, you have to have some amount of impact, can you do such things as traffic calming, landscape and visual screens.

And finally, in terms of projects that go forward and need to truly have impacts, can you wetland bank, provide sound walls. Show sensitivity to relocation of people or stored property.

Some of the things that we learned on the community level, and actually, I borrowed these from a group and I don't even remember their names, they're in the greater Vancouver, B.C. area when I came to the redevelopment of one of the communities out there. Some of the things that they discovered that mattered that led to more sustainable solutions is to the extent that you can

\*Create centers- opportunities for people to live, shop and work in close proximity dramatically reduces your infrastructure costs.

\*Connect the flows, drainage, watershed, greenways, streets. Cul-de-sacs were a great 1950's invention, but they really inhibit the ability to move freely, however you choose to do it, walk, bike, or cars within an urban setting.

\*Layer the systems. So if you've got greenways, for example, can you also, I mean, if the greenway makes sense to you, put it along a stream. But can you also include pedestrian and bicycle paths so you get the maximum benefit out of anything that you do. Which leads to number four which is the

\*Economy of effort, employing those guidelines- those first three guidelines leads you to recognizing that you have finite resources and they must be conserved.

Last of your slides here, land use and transportation are intricately tied. In fact, you can't escape that. The only thing you can do in transportation is decide if your going to be proactive- be involved in the planning phase where you can help create cost effective infrastructure- or willing to accept the consequences of someone else do the land use planning and you try to play catch up.

Jean and I just came from a two-day workshop sponsored by the Federal Highway Administration on what they call Advanced Research. The idea was, what should they be looking at in the longer-term frame, not necessarily applied research, but longer term, that can have the greatest leverage. One of the topics that came to the top after two days of in-depth conversation was this notion of land use and transportation and how much it matters when you come to infrastructure as well as sustainability.

Two quick examples- I've had the opportunity, and actually privilege, to live in both Atlanta and Chicago, two fundamentally different communities. Atlanta's one that was largely driven by the developer community, and at least historically, had very poor public policy relative to how it developed. I worked in an office that was in the- had among the greatest concentration of commercial office space in the city. It was outside the city, but the greatest concentration. I physically could not walk two blocks to the bank. There were no sidewalks. I had to walk in a four lane street. Bus transit was almost nonexistent for use because, again, there were no sidewalks. I literally found places- and I didn't have time to take pictures, I apologize- where there's a bus kiosk that said this is where you stand to pick up the bus in a four lane, five lane section. You had to walk in the traffic lane to take the bus. That's Atlanta. It's a wonderful place, but, you know, from a perspective of quality of life and sustainable practices, they've got a long ways to go.

Chicago, either through planning or happenstance, is truly at the other end of the spectrum. We live in what are called villages- towns, they'd be called out here, there you call them villages- in Chicago. About every one to three miles there's a village center. We walk downtown to go to any number of restaurants. I walk downtown- I drive a Porsche, I love cars- I walk downtown to take the bus to go to work, or the train to go to work because I don't want to drive. So the development pattern in Chicago is a fundamentally different development pattern. It makes an enormous difference in terms of the options that I have, the things that I can choose to do, and the way I choose to live.

At a local level, the number of access breaks in a road. If you're talking about investment in a road, the fewer number of driveways and access breaks, you preserve the investment in that road. So, it's one of those things that- and we can talk about this laterbut tends to degrade over time because people forget what the road was there to do, which was to move things efficiently and it becomes a means to other ends. I understand we're going to be taking questions later in the morning so please hold your questions, I'll be glad to address them later on. Thank you.