Welcoming Remarks

Mortimer L. Downey, *U.S. Department of Transportation*
Bruce M. Alberts, *National Academy of Sciences and National Research Council*
Gloria J. Jeff, *Federal Highway Administration*

Mortimer L. Downey

I congratulate the student essay contest winners, Ana Martinez and Maalik Russell, from North Hollywood High School in Los Angeles County, California. If they represent the kind of professionals our industry can expect to see, we will be in good shape for at least another half-century.

For a long time, those of us in transportation have talked about the revolutionary changes our industry was undergoing—changes generated by new technologies; new partnerships; new concepts, such as intermodalism; and new priorities, such as environmental quality. These factors are combining with larger social and economic transformations to change how we make decisions, how we set priorities, and how we allocate resources. They are changing how we form partnerships within and outside our industry and the nature of those relationships. To make the most of these changes and to ensure that our transportation system continues to provide mobility and opportunity for Americans, we must have an educational community capable and willing to prepare the next generation of transportation professionals.

Last year, as part of preparations for reauthorization of surface transportation programs, many of us at the U.S. Department of Transportation (DOT) traveled the country meeting with transportation officials, business professionals, and others to talk about what was most needed for the transportation systems of the 21st century. The answer should not have surprised us—it was not new technologies, or more money, or any of the other important things you might expect. Instead, what we heard was that the key need was people—or, to be more specific, well-educated, well-trained people who can help to design, build, operate, and maintain the advanced transportation systems this nation will need for economic success. Many of us have long recognized the need for enhanced education and training and for new and different programs to support these initiatives. That need has been especially true in intermodal areas. For example, 3 years ago the National Commission on Intermodal Transportation recommended that we "expand the intermodal focus of research, education, and technology development efforts." Robert Krebs, who delivers the Keynote Address at this conference, chaired that commission and oversaw the preparation of these recommendations. His commission urged that we in DOT

> draw on the resources of TRB and others to define and coordinate intermodal research and education needs, . . . conduct outreach to the mode-oriented programs of the nation's universities to develop new ways of training the next generation of transportation professionals, . . . encourage the development of intermodal course modules and case studies, . . . and use the University Transportation Centers to take the lead on curriculum reform to provide stronger training in intermodal transportation.

As will be evident at this conference, DOT has acted on those recommendations and has made significant

progress in each of these areas. For example, the Federal Highway Administration of DOT provided the support for TRB to organize this conference, and DOT staff have worked with TRB standing committees and other transportation organizations to help define intermodal research needs.

This conference is but one aspect of DOT outreach efforts, not only to universities, but also to junior colleges, high schools, and grade schools. You will see evidence of this during the conference. Conference sessions will feature case studies focusing on various aspects of intermodal transportation operations and planning, including supply chain management, intermodal partnerships, data and information systems, logistics, transit operations, and intelligent transportation system (ITS) technologies. There also will be presentations on the status not only of university and other academic programs but also of private-sector and public agency education and training programs.

As evident in the displays featuring University Transportation Centers from around the country, curriculum reform and development also are under way. The plenary sessions and breakout discussion groups will provide an opportunity to become familiar with and to suggest further refinements and improvements to intermodal transportation programs and curricula.

Transportation is an industry that offers tremendous career opportunities for today's young people, *if* they are aware of them and *if* they can obtain the knowledge and skills demanded by potential employers. Accordingly, this conference will highlight partnerships and innovative programs being developed between educational institutions, business interests, and public agencies to help ensure that the transportation industry has the workforce it needs for the future. Here, too, DOT is involved.

One of the most visible crosscutting efforts is the Professional Capacity-Building Program for ITS Deployment. ITS is the application of advanced information and communications technologies to transportation. We need professionals to train technicians to design, work with, and deploy these new technologies that are making travel safer and more efficient. This program was established to develop educational and training initiatives for colleges and universities, to give them the resources they need to create curricula for this new world.

We recognize that the intensive training required for many transportation professions means that it is never too early to start, and that is why we are also closely involved with the TransTech and Transportation Careers Academy programs. These programs introduce and begin training high school and junior college students for careers in transportation, and I am pleased to be able to share the head table this evening with students and educators from these programs. Their students are getting a jump start on our profession, and we look forward to seeing the results in coming years.

Finally, DOT is involved with the Garrett A. Morgan Technology and Transportation Futures Program, which seeks to build partnerships between and within the transportation and education communities. This program has been a top priority of Secretary Slater's, and President Clinton felt so strongly about it that he announced it himself last May. It is appropriate that this technology education program, which may make a greater difference in the lives of our children than any of our other initiatives, is named after the man who was truly the grandfather of transportation technology—the man who invented the automated traffic signal—Garrett Morgan.

This new initiative will challenge at least 1 million students to develop their math, science, and technology skills to prepare for careers in transportation, and it will foster lifetime learning. We have made a good start; as Secretary Slater announced recently, the Garret Morgan program in its infancy has already touched the lives of 250,000 children across America. Although that is impressive, it is only a start. This fall, we sponsored a roundtable bringing together business, academic, and government leaders to take us to the next step.

That is also a purpose of this conference. It challenges us—as teachers, as researchers, as public officials, as businessmen and -women, as parents and concerned members of our communities—to determine what we need to do to help prepare our students for the future, and then to provide opportunities in schools and workplaces across America.

Over the next few days we want to identify existing and new opportunities to build partnerships between the transportation, education, business, and labor communities to ensure that we have a workforce that is ready for the 21st century and to create opportunity for the next generation of Americans.

We need your help and your ideas and your leadership to make these intermodal education programs a continuing reality throughout America and to work together for what really matters: our children, and their future.

Bruce M. Alberts

It is a privilege to be here to discuss my favorite subject—education. As President of the National Academy of Sciences, I also serve as Chairman of the National Research Council, of which the Transportation Research Board (TRB), the host of this conference, is the oldest and largest unit.

All of you know better than I that transportation is a major activity in this country; some estimate that it may directly or indirectly employ as many as one out of every seven people. Transportation offers tremendous opportunities for young people in terms of careers and a vision for their future. Part of our job is to make young people aware of the opportunities in the world of work and to help them gain the knowledge and higher level of skills demanded by today's employers.

This conference will highlight partnerships and other innovative programs that have been developed between educational institutions, private-sector transportation entities, and public agencies—programs designed to help ensure that the transportation industry has the workforce it needs for the future and to motivate and provide a vision for many of our young people today.

TRB developed this conference in response to a request from the Federal Highway Administration of the U.S. Department of Transportation. I would like to recognize Gloria Jeff, Acting Federal Highway Administrator, whose agency is the sponsor for the conference, and Kelley Coyner, Acting Administrator of the DOT Research and Special Programs Administration, who has worked hard to promote the Department's efforts in the area of transportation education. I also want to offer special thanks to Chair Michael Meyer and other members of the steering committee, as well as TRB staff, who planned this conference.

This morning I will briefly discuss how this conference fits into a broader context of what the Academy is doing in the area of education. I do not have to tell you that there is nothing more important for the future of this nation than the education we provide to our children. I also do not have to tell you that we have not been doing an adequate job. I do not think we can or will ever be completely satisfied with our schools, and I am not sure we should be. What I do think is that we are at a crucial time in terms of educational opportunities.

We live in an increasingly technical society. Employers tell us they cannot hire most of our high school graduates because the students lack necessary skills and training. If that is true and it remains true, both the country and those high school graduates are going to be severely disadvantaged. Our society is becoming ever more technical at a faster and faster pace. People who do not understand this society, who do not have the skills or ability to be productive in this society, become alienated; that is a very destructive phenomenon, both for the people themselves and for the country.

I am especially aware of studies carried out over the last 10 years, one of which involved 20,000 students and their families in Wisconsin and California. The study looked at the attitudes that middle-class middle school children—sixth to tenth graders—have toward school. The study was summarized in a book by Lauren Steinberg called *Beyond the Classroom*. What this study shows is that nearly 40 percent of the kids who are in school today in that crucial age range are what Steinberg calls "disengaged." They are in school because they have to be in school and do not take their education at all seriously but focus more attention on athletics and social activities. They are not motivated by what they are being taught and therefore are in a situation in which they are not going to learn much.

How can we get out of this dilemma? In 1989, the governors of the 50 states, led by now President Bill Clinton (then Governor of Arkansas), recognizing that we were not doing well enough in our kindergarten through twelfth grade system, called for national education standards in the major disciplines. The task of preparing the first-ever national science education standards fell to the National Academy of Sciences and National Research Council, largely because nobody else was willing to take on the task. It was very difficult forging a consensus, first, among scientists of all kinds—geologists, chemists, biologists, and others who think that their field needs more emphasis—and, second, among the scientists and the science teachers and educators. For example, teachers and educators understand that we do not take fourth graders and try to teach them about molecules and atoms because conceptually it does not mean anything to them yet. In other words, it must be recognized that there is an appropriate way and time to teach things.

The final results of the study were released in 1996 in a 250-page report.[1] This was the most difficult study the

[1] *National Science Education Standards*. National Academy Press, Washington, D.C., 1996. Available via the Internet at http://www.nap.edu/readingroom, or call the National Academy Press (800-624-6242).

NRC has ever undertaken and was written by literally thousands of people. A year before the final report was released, a full draft went out to 40,000 people across the nation and an estimated 2,000 sets of comments were sent back, many of which were incorporated into the final document. This report is a national "grass roots" document—not a federal government document—and it represents the best vision of what we can do in our schools.

There are three bottom lines relevant to the task you have before you in this conference. First, science and scientific thinking are for all students, not just for those who might be scientists or engineers. They should be taught starting in kindergarten and continue to be taught in every year of school. Science must become a core subject as it is in many other countries.

Second, and I think this is extremely important, science today is not the science that most parents—many of you—remember learning in school, which was to learn all the parts of the cell, regurgitate them on a ditto sheet, and then go on to the next month and learn all the parts of a flower and all the parts of a plant and regurgitate that on another test, and so on. That is not what we regard as science anymore. *Science is learning how to solve problems. Science is inquiry—being faced with real-world kinds of problems and offering hands-on curricula that motivate kids, no matter what their background.* To motivate children to learn this kind of science, we need to connect it to their real world; that is, they have to see that it has some meaning, both in terms of their future and in terms of what they see around them on a daily basis. That is where this conference becomes particularly relevant: transportation is everywhere and offers an effective and practical means for helping children recognize the relevance of science.

Third, we need to connect science to math, to social sciences, to history, so that we have a rich texture in which science is embedded across all these boundaries. Again, transportation is a wonderful way to do that.

I still remember what we used to call "story problems" in mathematics class: two trains are coming toward each other; where will they meet? That is transportation, but it is not a very meaningful problem. It is not the kind of problem people deal with in the real world. We should give them a problem such as finding the shortest truck route to deliver these goods—a problem that requires examining alternatives and also illustrates jobs done by real people. Having someone from the transportation industry come in and talk about how they route trucks, how different transportation alternatives are considered, helps connect students to the concepts they are learning. For many of us, math and science education was completely different. It was rarely connected to the real world and involved more rote memorization and drills. Such methods may still work for some students, but I doubt that they work for the majority.

We have a great opportunity before us. The Academy has a special website called RISE, which just recently came online. Basically, it provides resources to people who are interested in helping their schools on matters relating to science and engineering education, and it connects to lots of other resources and lots of other people and other programs. The kinds of materials produced from a conference such as this are among the things that can be shared on the web and contribute to a community of people across America who are professionals, who are working to help our teachers do a better job and help our students be better prepared for the world of work tomorrow.

Gloria J. Jeff

Education is a subject about which I have a great deal of passion and a great deal of professional and personal interest. Many of you have had a chance to listen to my various conversations, dialogues, and "sermons on the mount" about what we must do to change the way we address transportation, and clearly intermodalism is at the top of the list. It is interesting to look at the audience and see people who represent all modes of transportation, as well as a variety of academic institutions, approaches, and philosophies about how to move people and goods.

The objective of this conference is one that I feel is critical: to examine the education and training needs related to the concept of intermodal transportation, a term not lightly spoken these days nor one necessarily universally known, in spite of efforts to come up with definitions of "intermodalism" and "multimodalism." We continue in the industry to struggle with those defini-

tions, in part depending on whether you are on the goods movement side of the table or on the passenger movement side. As we examine education and training needs, I am confident that we will manage to agree on some type of definition and then move forward.

We at the Federal Highway Administration initiated this conference because what *we* do not know about intermodalism could fill several libraries, and we recognized that we are not unique in the public sector or, for that matter, in the transportation sector. It became important, therefore, to begin examining ways to train and encourage a generation of transportation professionals and not a generation of highway engineers, transit planners, naval architects, marine engineers, and, to some extent, logistics specialists, who are only concerned with how to get a box from Point A to Point B, without recognizing that the overall transportation system also involves the movement of people. It is important to bring the very best minds together and begin to address the question of how to create a training and educational system that creates transportation professionals who understand the interconnectedness of transportation, not just individual modal approaches.

In his second term, President Clinton has challenged the nation by stating that he will make education his highest priority, with a call for literacy and math competency. Interestingly, we in transportation are in a position to respond to that in a variety of different ways. Within DOT and at the direction of Secretary Slater, we have stepped up to the challenge by creating the Garrett A. Morgan Technology and Transportation Futures Program. You will hear more about it during the conference.

Secretary Slater perhaps captured it best when he talked about what we need to have in the 21st century:

> An integrated transportation system that is international in its reach; that is intermodal in its form; that is intelligent in its character; and that is inclusive in its fundamental nature.

With those sets of challenges before us, we clearly begin to see what characteristics an intermodal transportation education and training initiative must include.

It must be international. We must recognize that we can no longer talk about what we produce in this country as being self-contained. Products are moving in and out of this country from various parts of the world and become either interim products or final products that are produced and sent to markets worldwide. To meet the demands of our domestic markets, we get goods and parts from all over the world. For example, Hecht's had a sale this weekend. I seriously doubt that many of the customers recognize that in order for Hecht's to have those goods available for the sale, numerous intermodal transportation connections were required. Few customers recognize that this is a fundamental part of everyday life here and throughout a changing world. The reason the grocery stores can offer a variety of products and produce regardless of the season or place of origin, that clothing and retail establishments can have the latest fashions and a host of manufactured products, and that information can be transmitted almost instantaneously is because of concepts such as just-in-time delivery, worldwide distribution and communications systems, and so forth. We no longer function as individual, uniquely defined nations but rather as an international marketplace. Not only must we better understand how we move goods in that context, but we also must learn lessons on how to move people.

It must be intermodal. Transportation education programs need to encompass intermodalism because it has become increasingly critical that we understand not only how we move from this mode to that mode, but also how we integrate those movements so that (*a*) we have a system that is both safe and efficient and productive and flexible in responding to the needs for goods movement and (*b*) we have a system in which we offer people choices and flexibility in their personal movements. We must recognize the interconnectedness so that there is no penalty and so that one day in the future when we design our models, there will be no built-in penalties every time there is a passenger transfer. We must find ways to give them more intelligent choices—training the professional to begin to look for those choices becomes an important part.

It must lead to the development of an intelligent system. The system must be intelligent because the reality is that we no longer can simply say, "Send the truck out" and have it get there, or "Send off the railcar" and know where it is, or "Track the goods that are in the container." Kenneth Wykle, the nominee for Federal Highway Administrator, is going to be very helpful in getting DOT to focus more attention on how to make the system intelligent. With his background in intermodal transport, he brings a perspective we have not had before—that of the *user*. The agency has had those who administered the program, those who were responsible as shippers or carriers, but I think this is the very first time that a user is sitting at the helm, and it will help us begin to recognize how the system can meet the needs of the user—it can become more intelligent through the application of advanced technologies.

It must be inclusive. The President likes to talk about the fact that we cannot afford to waste a single American. In transportation, we cannot afford to neglect any mode, to pass up any opportunity to deal with transportation and recognize its complexities and the contribution it makes to individual economies. We can no longer let the railroads or public transit operate in a vacuum. We can no longer let highways be the "big kid

on the block" who does whatever he wants, with little consideration to the impact on other modes. We can no longer overlook issues of port and airport access. We must be inclusive in the decision-making process, inclusive of the parties who are involved and inclusive of those who are affected, because we need to have the full spectrum of experiences, life-styles, and needs represented in the decision-making process. Without these experiences, we find ourselves making assumptions based on a limited point of view. We need that multiplicity because most of the best ideas for advancing technology, for advancing the future of transportation, do not come from a single point of view but from the give-and-take of many points of view and reasoned discussion.

For those of you who have spent time focusing on the whole issue of quality, you know that there is a lot of discussion about the achievement of quality when you have synergy within the team, and that synergy is not a function of the majority's beating down the minority but rather of where the ideas come together. In most instances, better ideas come out of individual viewpoints that have been hammered out together. It is that kind of inclusiveness that needs to be a part of looking at education and training in the future.

The charge to the attendees here is to take the preceding four characteristics to heart, to spend time not only listening to others and using this as a wonderful opportunity to network, but also recognizing that to make America what it needs to be, to make this world what it needs to be, a new type of transportation professional needs to be created. This conference is the beginning of an effort to create the future transportation professional; 20 to 30 years down the road, people will look back and recognize that this was the beginning. You can be proud to say that you were a part of it.