

Integration

- **Understanding Transportation Choices and Perceptions** - to enhance the design and consumer acceptance of transportation systems
- **Providing Critical Information** - for making trade-offs among alternative transportation modes
- **Improving the Integration of Transportation Systems** - resulting in better use of infrastructure investments
- **Expanding System Access** - for diverse and physically challenged populations
- **Enhancing Passenger Protection** - against accidents and crime

- Enhanced product effectiveness, efficiency, comfort, convenience and user acceptance
- Reduced system development and operating costs

Participants

Participants in this Human-Centered Transportation Systems Initiative include:

- Department of Transportation
- Department of Defense
- National Aeronautics and Space Administration
- National Science Foundation

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Benefits

Benefits to transportation systems and services will include:

- Reductions in human errors affecting safety
- Increased capacity of existing transportation infrastructure

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and Technology Council
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Human-Centered Transportation Systems

*A Federal Research
and Development
Initiative*



Subcommittee on
Human-Centered
Transportation
Systems

Interagency
Coordinating
Committee on
Transportation R&D
National Science and
Technology Council

May 1996

Vision

To realize the world's safest, most responsive and competitive transportation system by considering human behavior in all aspects - now and in the future.

National Need

Government Agencies in partnership with industry and academia must work to maintain and improve the safety and productivity of U.S. transportation systems:

- Human error is involved in 60-80% of transportation accidents.
- For advanced technologies to achieve their safety and productivity potential, human factors must be fully considered.
- Competitiveness of U.S. transportation products are at risk because of a lack of emphasis on human requirements.

Initiative

The greatest challenge to transportation safety and productivity is designing technology and procedures for humans.

Today's transportation system is structurally, mechanically, and technologically sound. Now, the greatest challenge is to ensure it is fully designed for human operators, maintainers, and users.

This National Science and Technology Council (NSTC) initiative provides a way to close critical knowledge gaps and to develop human-centered methods and data.

The NSTC process brings together the major agencies and departments that sponsor human factors and behavioral R&D related to transportation to provide:

- A single national vision for human-centered transportation R&D.
- A collaborative framework and taxonomy for R&D which will be a basis for future efforts.
- R&D partnerships which result in cross-agency core programs, critical alliances, and a more focused National R&D enterprise.

Human-Centered Systems

Technology benefits are measured by how well the technology meets human needs.

This initiative employs a Human-Centered Systems approach with three principal elements:

Interfaces

- **Human-Centered Automation** - guidelines and interface concepts that lead to appropriate human/automation roles.
- **Information Management and Display** - guidelines for multi-modal controls and displays which maximize the information transfer between humans, machines, and the environment.
- **Physical Ergonomics** - data and techniques to advance state-of-the-art in workplace and protective equipment design for all people.

- **Human Performance Metrics and Models** - for transportation system assessment and design.

Operations

- **Fitness-for-Operation** - measures of and strategies for addressing fatigue, aging, work scheduling, and substance use.
- **Personnel Selection and Training** - improvements in licensing and certification.
- **Team Performance** - applications of Crew Resource Management in and between all modes of transportation.
- **Organizational Design** - applications of innovative procedures such as Computer Supported Collaborative Work (CSCW).
- **Simulator Applications** - in training, testing, certification, and licensing.