# INTELLIGENT TRANSPORTATION SYSTEM (ITS)

Intelligent Transportation Systems (ITS) is the application of computer, electronics, and communication technologies and management strategies in an integrated manner to provide traveler information to increase the safety and efficiency of the road transportation systems.

These systems involve vehicles, drivers, passengers, road operators, and managers all interacting with each other and the environment, and linking with the complex infrastructure systems to improve the safety and capacity of road systems.

ITS improves transportation safety and mobility and enhances global connectivity by means of productivity improvements achieved through the integration of advanced communications technologies into the transportation infrastructure and in vehicles.

ITS user services:

In order to deploy ITS, a framework is developed highlighting various services the ITS can offer to the users. A list of 33 user services has been provided in the National ITS Program Plan. The number of user services, keep changing over time when a new service is added. All the above services are divided in eight groups. The division of these services is based on the perspective of the organization and sharing of common technical functions.

The eight groups are described as follows:

1. Travel and traffic management
2. Public transportation operations
3. Electronic payment
4. Commercial vehicle operations
5. Advance vehicle control and safety systems
6. Emergency management
7. Information management
8. Maintenance and construction management

**Applications of ITS**

ITS covers variety of applications such as:

1.Monitoring traffic flow, provide information to drivers on the congestion on the road, road closures, alternative routes, weather conditions and speeds to be observed.

2.Advanced traveller information system (ATIS) gives information to highway users on traffic jams, road closures, alternative routes and weather conditions.

3. Electronic collection of toll.

4. Electronic road pricing system to decongest the city centers.

5.Traffic control on urban streets by using information on traffic flows and adjusting the signal operations to reduce congestion and delay.

6. Monitoring incidents on the road, such as vehicle breakdown and collisions.

7. Intelligent vehicle-highway system (IVHS), in which vehicles guided longitudinally and laterally by the use of electronic devices.

ITS Architecture

The ITS Architecture provides a common framework for planning, defining, and integrating intelligent transportation systems. It specifies how the different ITS components would inter- act with each other to help solving transportation problems. It provides the transportation professionals to address their needs with wide variety of options. It identifies and describes various functions and assigns responsibilities to various stake-holders of ITS. The ITS archi-tecture should be common and of specified standards throughout the state or region so that it can address solution to several problems while interacting with various agencies.

1. Interoperability - The ITS architecture should be such that the information collected, function implemented or any equipment installed be interoperable by various agencies in different state and regions.

2. Capable of sharing and exchanging information - The information by traffic operations may be useful to the emergency services.

3. Resource sharing - regional communication towers constructed by various private agencies are required to be shared by ITS operations.

Transportation planning and ITS

Transportation planning helps in shaping a well balanced transportation system that can meet future demands. Transportation planning is an iterative process which include problem identification, solution generation, analysis, evaluation and implementation. This can be integrated with ITS using computers, communication systems and software. As planning is normally made for long period, installing ITS facilities needs to be updated and one should ensure that the equipments and technologies are compatible for future improvement and expansion.

Integrating ITS into Transportation planning

Integrating ITS into transportation planning process require overcoming some obstacles and some changes in the business practices of many institutions. The major challenges in main- streaming ITS into everyday operations of transportation agencies are:

• Institutional coordination and cooperation for sharing information and data

• Technical compatibility among ITS projects

• Human resource needs and training

• Financial constraints and opportunities to involve the private sector

Most public agencies are aware of the challenges in mainstreaming ITS into transportation planning process where ITS projects are part of traditional transportation programs on local or state level to achieve the best output from transportation investments.