
SECTION C

ARCHITECTURE RISK OF MAPPED FUNCTIONS

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Traffic Control Data Processing

Data processing related to the real-time control of traffic. Algorithms under development include optimal control and incident detection, and the interaction of route selection and traffic control.

Traffic Control Data Processing technologies are deployed in small numbers. The basis of this technology lies in algorithm maturity. It had compatibility issues on the regional level.

Architecture risk is minimum.

Traffic Surveillance

Surveillance technologies that collect information about the status of the traffic stream. Possible technologies include loop detectors, infrared sensors, radar and microwave sensors, machine vision, aerial surveillance, closed circuit television, acoustic, in-pavement magnetic and vehicle probes.

Traffic Surveillance technologies exist in many forms today and are deployed. It is a regional compatibility issue. Risk exists across regional boundaries. The use of existing, standards-compliant equipment reduces risk sensitivity.

Architecture risk is minimum.

Vehicle Surveillance

Surveillance technologies that collect a variety of information about specific vehicles. These technologies includes weigh-in motion devices, vehicle identification, vehicle classification, and vehicle location.

Vehicle Surveillance technologies do not have a large deployment base and the technologies are still being developed. It is primarily a regional compatibility issues as well. The need for nationwide compatibility increases risk sensitivity.

Architecture risk is moderate due to compatibility in some regions.

Payment Systems

Technologies that enable electronic fund transfer between the traveler and the service provider. The

technology areas include Automated Vehicle Identification (AVI), smart cards, and electronic funds management systems. This function overlaps with the Electronic Payment user service. Payment Systems technologies are in testing and the technology maturity issues vary. It has compatibility issues on the national, regional and product levels.

Architecture risks is moderate, but standards for implementation may not exist.

Restrictions Traffic Control

Operational techniques that restrict the use of roadways according to regional goals. Techniques include HOV restrictions, parking restrictions, and road use (congestion) pricing.

Restrictions Traffic Control policies are being employed and are locally determined. Regional coordination is required.

Architecture risk is minimal

Database Processing

Technologies that manipulate and configure or format transportation-related data for sharing on various platforms. General purpose database software currently exists and is currently being adapted to transportation needs such as data fusion, maps, and travel services.

Database Processing technologies exist; immature adaptation to transportation needs. Database processing technologies are the backbone of many user services. It has compatibility issues on the national, regional, and product levels. Multiple database structures increase risk sensitivities.

Architecture risk is moderate.

Stationary Communications

Any communications technology that connects stationary sites. Technologies include fiber optics, microwave, radio and land lines.

Stationary Communications technologies are deployed and demonstrated to be effective. Existing infrastructure is available.

Architecture risk is minimal.

1-Way Mobile Communication

Any communication technology that transmits information to potentially mobile reception sites, but cannot receive information back from those sites. Possible technologies providing this function include Highway Advisory Radio, FM subcarrier spread spectrum, microwave, infrared, commercial broadcasts, and infrared or microwave beacons.

1-Way Mobile **Communications** technologies are currently deployed. Examples are currently in use and applications are being developed. It is a national and regional compatibility issue. Protocol compatibility increases standards sensitivity.

Architecture risk is minimum.

P-Way Mobile Communication

Any communications technology that transmits information to potentially mobile reception sites and allows receipt of information from those same sites. Possible technologies include cellular telephones, 2-way radio, spread spectrum microwave, infrared, and 2-way satellite.

2-Way Communications technologies currently exist and ITS are being developed. Spectrum and protocol compatibility issues exist on the national, regional and product levels. Protocol compatibility increases standards sensitivity.

Architecture risk is minimum.

Individual Traveler Interface

Devices that provide information flow to a specific traveler. Technologies meeting this functions include touch screens, keypads, graphic displays and computer voices at kiosks; keypads, computer voice, and head-up displays in vehicles; personal communications devices carried with the traveler; an audited from any phone.

Individual Traveler Interface technologies are being developed and few have been deployed. Architecture and Standards sensitivity is dependent on data complexity and human factors issues.

Architecture risk is moderate.

Variable Message Displays

Technologies that allow centrally controlled messages to be displayed or announced audibly to multiple users at a common location such as a roadside display or display board in a transit terminal. These technologies would typically be applied to

provide information on highway conditions, traffic restrictions and transit status.

Variable Message Display technologies are deployed and the technology is immature. No compatibility issues exist.

Architecture risk is moderate.

Navigation

Technologies that determine vehicle position in real time. Technologies that provide this function include GPS, LORAN, dead reckoning, localized beacons, map database matching, and cellular triangulation.

Navigation technologies are beginning to be deployed and location technologies exist. Autonomous capabilities reduce risk sensitivity.

Architecture risk is minimal.

Traffic Prediction Data Processing

Data processing relating to prediction of future traffic situation. Algorithms under development include areas such as real-time traffic prediction, and traffic assignment.

Traffic Prediction Data Processing technologies are being developed. Technologies are immature due to algorithm evolution. It has compatibility issues on the regional level. It is standards sensitive due to algorithm compatibility.

Architecture risk is minimal.

Inter-Agency Coordination

Technologies that connect travel-related facilities to other agencies such as police, emergency services provider, weather forecasters and observers, and among Traffic Management Centers (TMNS), transit operators, etc.

Inter-Agency Coordination technologies are currently deployed and are not necessarily complex. It is a regional compatibility issue. Risk exists across agency boundaries.

Architecture risk is minimum.

Routing Data Processing

Data processing related to routing of vehicles including the generation step-by-step driving instructions to a specified destination. Algorithms under development include the scheduling of

drivers, vehicles, and cargo; route selection; commercial vehicle scheduling, and route guidance.

Routing Data Processing technologies exist. The deployment base is still small and the lack of map database standards could cause compatibility problems.

Architecture risk is minimal.

Signalized Traffic Control

Technologies that allow for real-time control of traffic flow. Possible technologies include optimized traffic signals, ramp metering, reversible lane designation, and ramp/lane closures.

Signal Traffic Control technologies are deployed. There are a number of configuration and algorithm. It has compatibility issues on the cross-boundary regional level.

Architecture risk is minimal.

In-Vehicle Sensors/Devices

Technologies providing a range of sensing functions to be located within vehicles. Functions addressed by these technologies include monitoring of vehicle performance and driver performance; determination of vehicle position relative to the roadway, other vehicles, and obstacles; improvement of vision in adverse conditions; and on-board security monitoring.

In-Vehicle Sensor/Device technologies are in development and some have been deployed (vehicle performance monitoring). Overall, the technologies are immature. It has compatibility issues on the regional and product levels.

Architecture risk is moderate.

Source: National ITS Program Plan