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Indiana Department of Transportation

Intelligent Transportation Systems

Strategic Plan

Driving Indiana's Economic Growth

March 2005

Indiana Department of Transportation

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Strategic Plan

P R E L I M I N A R Y D R A F T v.1.1

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EXECUTIVE SUMMARY

0.1. INTRODUCTION (Chapter 1)

The Indiana Department of Transportation (INDOT) Intelligent Transportation Systems (ITS) Strategic Plan documents the intentions of INDOT to deploy ITS technologies and devices throughout the Hoosier state. This plan assesses the needs of INDOT for ITS and develops strategies over the next 15 to 20 years for addressing those needs. Furthermore, the INDOT ITS Strategic Plan defines the direction INDOT will want to take, identifies ITS projects, and develops a strategy for integrating and mainstreaming ITS into the INDOT organization. Ultimately, this plan will establish the blueprint for a successful statewide ITS system.

Put simply, ITS is the application of technology to improve the safety and efficiency of the surface transportation system, saving motorists' lives, time, and money. The technology is used by operators of the transportation system to better manage the utilization of the existing infrastructure and by users (motorists) to assist them in making better travel decisions. INDOT's ITS initiative is known as TrafficWise.

The Interstate Highway System is essentially complete across the country, but the need to repair and improve the existing highway network exceeds existing funds available. Congress recognized that over a decade ago, creating a national Intelligent Vehicle / Highway Systems (IVHS) program, now known as ITS, in 1991, as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Since then, many states and metropolitan areas have recognized that ITS can be a cost-effective way to reduce congestion and improve safety. While INDOT still intends to construct new highways and add capacity to many roadways, TrafficWise offers the means to reduce congestion and increase the safety of an existing roadway.

In 1998, INDOT completed an agency-wide Strategic Plan. The INDOT Strategic Plan is comprised of a Vision, Mission, Strategic Goals, and Strategic Objectives for the department. In January 2005, INDOT adopted a new motto to reflect our agency's vital function in State Government's role in economic development and job creation in the Hoosier state: Driving Indiana's Economic Growth. The INDOT ITS Strategic Plan will support the INDOT Strategic Plan, as well as this new motto and mission.

In 2003, the U.S. Department of Transportation (USDOT) completed a Strategic Plan for Fiscal Years 2003-2008, comprised of a Vision, Mission, Strategic Objectives, Desired Outcomes, and Strategies for all modes of the Nation's transportation system. The USDOT's top priorities are to keep the traveling public safe, increase their mobility, and ensure that the Nation's transportation system enables the country's economic growth and development. In 1998, the Federal Highway Administration (FHWA) completed a Strategic Plan, comprised of a Vision, Mission, Values, Guiding Principles, Strategic Goals and Objectives, and Corporate Management Strategies. As INDOT is a partner with the USDOT, especially the FHWA, the INDOT ITS Strategic Plan will support these elements of the USDOT and FHWA Strategic Plans and the USDOT's priorities.

In a general sense, ITS can be separated into two distinct but certainly related program areas: intelligent infrastructure and intelligent vehicles. Intelligent infrastructure is generally the responsibility of public agencies that own, operate, and maintain transportation assets and is oriented to serving the transportation infrastructure needs of motorists, commercial vehicles, and transit passengers. Intelligent vehicles are generally under the auspices of private industry (most notably, vehicle manufacturers) and complement the ITS infrastructure by focusing on safety and information systems for cars, trucks, buses, and trains. The focus of this document will be on the former, not the latter.

The USDOT has stated that the six goals of the National ITS Program are as follows: Increase Transportation System Efficiency and Capacity, Enhance Mobility, Improve Safety, Reduce Energy Consumption and Environmental Costs, Increase Economic Productivity, and Create an Environment for an ITS Market. As INDOT is a partner with the USDOT, especially the FHWA, the INDOT ITS Strategic Plan will support these goals established by the USDOT.

ITS deployments across the Nation have yielded notable improvements in safety and traffic flow. In Indiana, a Purdue University Joint Transportation Research Program (JTRP) study of the Hoosier Helper Freeway Service Patrol program on the Borman Expressway (I-80/94) and I-65 in Northwest Indiana measured a Benefit/Cost ratio of 13 to 1. This illustrates the vital importance of effective and efficient incident detection and management, which results in quicker restoration of the freeway's capacity and the associated benefits to motorists, the economy, and society: improved safety, traveler mobility, and system efficiency, increased productivity, and conserved fuel / reduced environmental impact.

0.2. SYSTEM INVENTORY / TRANSPORTATION ASSESSMENT (Chapter 2)

The State Highway System that is built, owned, and operated by INDOT is comprised of 11,185 miles of Interstates, US Routes, and State Roads. The system has grown, matured, and been systematically upgraded over the years. One of the most significant, perhaps the most significant addition to the system is the Interstate System.

The Interstate System is the highest classification of all roads in the Nation, providing the highest level of mobility at high speeds for long uninterrupted distances. The lack of at-grade access and the subsequent delay with signals significantly increases the capacity of the roadway, making the Interstate System extremely attractive for travel purposes. In fact, the FHWA indicates in its *Highway Statistics 2002* document that the Interstate System carries a phenomenal 24 percent of the Nation's traffic while comprising only 1.2 percent (46,748 miles) of the Nation's 3,981,670 mile road network. Similarly, the Interstate System in Indiana carries 22 percent of all traffic statewide while comprising only 1.2 percent (1,169 miles) of the statewide total of 94,287 miles of roadway.

By nature of its full access control, the Interstate System moves high volumes of traffic but provides limited opportunities to exit the System in case of delays caused by incidents. ITS can play a key role in detecting incidents and notifying the motoring public of the incident. While some roads in INDOT's system carry more traffic than some portions of the Interstate System, their lower degree of access control enables motorists to more easily divert in case of an incident. The same can not be said about the Interstate System and other full access control facilities (freeways). Thus, the focus of INDOT's ITS investment will be on the Interstate System and other freeways due to the significant proportion and composition of traffic on the System coupled with the limited ability to divert in case of incidents on an Interstate or any other freeway.

The geometric design criteria for a new or completely reconstructed freeway in Chapter 53 of the *Indiana Design Manual* calls for Desirable Level of Service (LOS) B / Minimum LOS C for Rural Freeways and Desirable LOS B / Minimum LOS C for Urban Freeways (Minimum LOS D is allowed for urban reconstruction projects only). LOS C is sometimes referred to as "Desirable Minimum" and LOS D is sometimes referred to as "Absolute Minimum." While ITS is obviously not building new freeways or reconstructing existing ones, these policies from the *Indiana Design Manual* illustrate what is considered desirable and minimum Levels of Service on Indiana freeways. These LOS policies will serve as a basis for possible investment in ITS devices on Indiana's Interstates and freeways.

Interstates 65, 69, and 70 have the highest rural AADT and corresponding lower LOS compared with other Rural Interstates in Indiana.

While investment in ITS devices will be focused on the Interstate System and other freeways, there are arterials that approach and feed the Interstate System with significant volumes of traffic. When incidents occur on a downstream Interstate, motorists on the arterial would benefit from receiving information regarding the incident (as would motorists on the affected Interstate), as some arterial motorists would choose an alternate route and not enter the affected Interstate. Candidate arterials should generally meet the following criteria: an INDOT facility with a two-way AADT of 40,000 or greater for at least two miles approaching an Interstate that is currently fully deployed with ITS devices (vehicle detection and CCTV cameras) or is currently proposed for full deployment of ITS devices (vehicle detection and CCTV cameras). A two-way AADT of 40,000 generally corresponds to LOS C for a six lane divided arterial and LOS E for a four lane divided arterial. Six different arterials meet these criteria.

0.3. PROPOSED INDOT MAJOR CAPITAL IMPROVEMENTS (Chapter 3)

Major Capital Improvements or Expansion Projects provide a unique opportunity to implement ITS devices in a coordinated fashion with a larger project, further minimizing disruptions to the motoring public. Other noteworthy projects that do not add any significant capacity, such as Pavement Replacement, 3R (Resurface, Restore, and Rehabilitate), or 4R (Resurface, Restore, Rehabilitate, and Reconstruct) projects present a similar opportunity to incorporate ITS devices on a roadway as part of a larger project. As the focus of ITS investments in the INDOT network will be the Interstate System and other freeways, detailed information is provided in Chapter 3 regarding the proposed timing of these projects on the Interstate System and other freeways.

Detailed information is also provided in Chapter 3 regarding the proposed timing of Major Capital Improvements on INDOT arterials with a two-way AADT of 40,000 or greater for at least two miles approaching an Interstate that is currently fully deployed with ITS devices (vehicle detection and CCTV cameras) or is currently proposed for full deployment of ITS devices (vehicle detection and CCTV cameras).

A key component of INDOT's program to address safety and mobility needs is the construction of new facilities, including Interstates and freeways. Details are provided in Chapter 3 regarding projected design year AADT and projected design year LOS. Since these are new freeways, data is oriented more to the design year of the facility, not the opening year. As such, projected LOS C in 2025 or 2030 (or some other design year beyond the planning horizon of this document) does not necessarily signal the need for some ITS investment at the current time or even the near future.

0.4. EXISTING PLUS COMMITTED ITS DEPLOYMENTS (Chapter 4)

The Interstate Highway System is the backbone of the Indiana surface transportation network and a critical element in the state and national economy. Logically, traffic volumes are highest in the larger urbanized areas and, as such, INDOT has concentrated the initial deployment of ITS devices in these areas, mainly on the Interstate System. This approach is consistent with the FHWA's 1996 goal to implement ITS infrastructure in the Nation's 75 largest metropolitan areas. This investment philosophy will continue with the planned Indianapolis Area Advanced Traffic Management Systems (ATMS) deployment, currently scheduled through 2008.

INDOT has deployed an ATMS in Lake County in Northwest Indiana along I-80/94 (the Borman Expressway) from the Indiana / Illinois State Line to I-90 (the Indiana Toll Road) and along I-65 from US 30 to I-80/94 (the Borman Expressway). This ATMS consists of vehicle detection generally every ½ mile, Closed Circuit Television (CCTV) Cameras, Dynamic Message Signs (DMS), Highway Advisory Radio (HAR) Stations (with flasher notification in case of an incident), a communications system, a Traffic Management Center (TMC), 2/10 Mile Reference Markers (1/10 Mile Reference Markers on I-80/94), and the deployment of the Hoosier Helper Freeway Service Patrol (FSP), which began on a limited basis in 1991. A similar system is currently in different phases of project development in the Indianapolis area, with some devices deployed and operational, others under construction, and others still under design. A similar system in the Louisville area (including portions of Clark and Floyd Counties in Southern Indiana) known as TRIMARC (Traffic Response and Incident Management Assisting the River Cities) is in varying stages of development and deployment and is controlled by the Kentucky Transportation Cabinet with the cooperation of INDOT. DMSs are also located in Evansville and Kokomo (generally controlled by the Indianapolis TMC) and in Fort Wayne (generally controlled by the Borman TMC). The latter three locations do not have any ATMS detection or verification capabilities; activation of these DMSs only occurs when human notification takes place with the appropriate TMC.

Details regarding existing, planned, and committed ITS deployments may be found in Chapter 4. Committed is defined as either a part of the ongoing Indianapolis ATMS deployment (including proposed future Hoosier Helper Freeway Service Patrol deployments), the US 31 Kokomo deployment, or as part of the TRIMARC Strategic Plan. Information regarding the deployment of seven key ITS components is provided: 2/10 Mile Reference Markers, Highway Advisory Radio (HAR) (specifically, the segments of a route within the Area of Influence (A of I) of a HAR), Permanent Overhead Dynamic Message Signs (DMS) (specifically, the segments of a route within the Area of Influence (A of I) of an existing DMS), Hoosier Helper Freeway Service Patrol (FSP), Closed Circuit Television (CCTV), Vehicle Detection, and an information or emergency (non-911) phone system, such as 511.

0.5. ITS ARCHITECTURE / MARKET PACKAGES (Chapter 5)

The National ITS Architecture is a framework within which an ITS system can be built. The Architecture functionally defines what the pieces of the system are and the information that is exchanged between them. The Architecture is functionally oriented and not technology-specific which allows the architecture to remain effective over time. It defines what needs to be done, not how it will be done. More specifically, the National ITS Architecture provides the framework for planning, defining, and integrating ITS. The architecture defines the ITS functions (i.e., gather traffic information), the physical entities (components) or subsystems where these functions reside (i.e., the field, center, or vehicle), and the information and data flows (communications) that must be exchanged to connect these functions and physical subsystems together into an integrated system.

The National ITS Architecture essentially implements the ITS User Services. The User Services represent what the system will do from a broad scale user's perspective, be it the public or a system operator. The 33 User Services are grouped into eight Bundles for convenience. The User Services allows the process of system or project definition to begin by thinking about what high level services will be provided to address identified problems and needs. Some of the ITS User Services are too broad in nature to be convenient in planning actual deployments. In order to address these concerns and providing a more meaningful evaluation, a more detailed set of deployment-oriented ITS service building blocks were defined from the original User Services: the Market Packages.

The Market Packages provide a deployment-oriented perspective to the National ITS Architecture. Basically, they identify the pieces of the National ITS Architecture required to implement a transportation service. The National ITS Architecture development effort identified a total of 85 Market Packages that reflect the current definition of ITS and the evolving technology market. Chapter 5 contains a complete listing of these, grouped according to their respective major application areas. Market Packages that have been identified as an early deployment candidate from a national perspective due to a promising combination of low-risk implementation characteristics, developing public or private markets for the package, and tangible system or user benefits are indicated as such. This does not necessarily mean that it would be an early deployment candidate in Indiana on the INDOT system.

0.6. MARKET PACKAGE RECOMMENDATIONS (Chapter 6)

Evaluating the ITS Market Packages is not the main focus of this document. Nevertheless, comparing the Market Packages and their applicability to INDOT is still relevant to provide general direction to future ITS deployments in Indiana. This analysis takes place in terms of the Market Package's ability to support the six ITS goals as identified by the USDOT, its potential to be an early deployment, its applicability to urban or rural areas, its ability to address congestion and crash problems, and its overall benefits.

It should be noted that just because a Market Package appears to score well in terms of meeting ITS goals, is an early deployment candidate, can address congestion or safety needs, or has many benefits, it does not necessarily mean that it would be deployed by INDOT. Every state has its own unique transportation characteristics and challenges; one size does not fit all. Furthermore, the reality of organizational constraints (funding and staffing) simply does not allow ITS to be all things to all people and result in a large-scale deployment of the 85 Market Packages, nor is that approach desirable from a resource allocation perspective. The philosophy of concentrating on the key Market Packages will prevail.

Many of the 85 Market Packages are in varying stages of deployment in Indiana by a variety of jurisdictions. Some are deployed, others are scheduled for deployment. Some are deployed by the ITS function at INDOT, others are deployed by other functions at INDOT or other public agencies, while some are more a function of the private sector. Market Package recommendations are grouped based on three deployment time frames (Current or Near Term, Medium Term, Long Term or Future) and then by implementer.

0.7. ITS DEPLOYMENT RECOMMENDATIONS - BY DEPLOYMENT TYPE (Chapter 7)

The data and analysis in the first six chapters of the INDOT ITS Strategic Plan lay the foundation for the recommendations made in Chapter 7. Several key fundamentals guide and are the crux of these recommendations: ITS deployments will support INDOT's, USDOT's, and FHWA's Strategic Plans, as well as USDOT's six goals for ITS (Chapter 1); the focus of INDOT's ITS investment will be on the Interstate System and other freeways (Chapter 2); the geometric design criteria from the *Indiana Design Manual's* desirable and minimum Levels of Service on Indiana freeways will serve as a basis for investment in ITS devices on Indiana's Interstates and freeways (Chapters 2 and 3); Major Capital Improvements on INDOT Interstates and freeways and select high volume arterials intersecting the Interstate System provide opportunities to implement ITS devices in a coordinated fashion with a larger project (Chapter 3); the ongoing ATMS deployment of ITS devices in the Indianapolis area through 2008 is the main focus of the INDOT ITS deployment through 2008 (Chapter 4); the ITS Market Packages analysis provide general direction to future ITS deployments in Indiana (Chapters 5 and 6); and the philosophy of concentrating on the key Market Packages will prevail (Chapter 6).

It is important to note that the recommendations in Chapter 7 are grouped by individual deployment type. Chapter 8 summarizes all deployments chronologically. As such, the Executive Summary will provide more project-specific detail in the chronological listing from Chapter 8.

0.7.1. Full Advanced Traffic Management Systems (ATMS)

The key to providing real-time, accurate information is the ability to detect and verify incidents. While it is not practical to fully instrument the Interstate System and freeways in Indiana with a full ATMS, it is logical and possible to expand the ATMS in the two metropolitan areas that INDOT has constructed a Traffic Management Center (TMC) and has deployed or is currently deploying an ATMS: Northwest Indiana (Chicago) and Indianapolis. These metropolitan areas are by far the most populated in Indiana and have the highest freeway AADT and congestion. It should be noted that the Louisville Metropolitan Area already has a Strategic Plan as part of the TRIMARC deployment in Louisville and Southern Indiana. This area is in the process of deploying a full ATMS.

Upon completion of the following full ATMS projects, a total of 224 miles of Interstates and freeways under INDOT control (except the Indiana Toll Road) will be instrumented with a full ATMS. With the addition of the 17 miles of full ATMS either deployed or planned by TRIMARC in Southern Indiana near Louisville, this total grows to 241 miles of full ATMS on Interstates and freeways in Indiana.

- ATMS Priority 1 (Completion of Indianapolis ATMS): $18,365,000

INDOT is in the midst of a multi-year deployment of ITS devices on the Interstate System in the Indianapolis area. The completion of the Indianapolis ATMS deployment through 2008 is the main near-term focus of ITS investments in Indiana. As part of this deployment, approximately 125 cameras will be installed in phases through 2008. These cameras, placed approximately every mile, will supplement a system of vehicle detection underneath the pavement that will be placed approximately every ½ mile on high-volume and one mile on lower volume Interstates in the Indianapolis area to measure the overall flow of traffic.

- ATMS Priority 2 (Additions to the Indianapolis ATMS): $1,300,000
- ATMS Priority 3 (Additions to the Northwest Indiana ATMS): $2,750,000
- ATMS Priority 4 (ATMS Replacement with Major Capital Improvements): $20,455,000
- ATMS Priority 5 (ATMS on New Interstates / Freeways): $3,775,000

Total ATMS Estimated Cost = $46,645,000

0.7.2. Closed Circuit Television (CCTV) Cameras

The key to providing real-time, accurate information is the ability to detect and verify incidents. While it is not practical to fully instrument the Interstate System and freeways in Indiana with vehicle detection, it is logical and possible to deploy Closed Circuit Television (CCTV) cameras at strategic locations on the higher volume Interstates and freeways (rural and urban) to serve this function, as well as provide surveillance at important locations along these highways to support INDOT winter operations (snow and ice removal) and overall security surveillance. These latter two functions (supporting winter operations and security) are the primary focus of the cameras proposed at Rest Areas and Weigh Stations on low-volume Rural Interstates that do not warrant a large-scale deployment of cameras. All of these CCTV cameras would also be beneficial for traffic management purposes in case an evacuation of an area is ever required. En-route traveler information provided by Dynamic Messages Signs (DMSs) and Highway Advisory Radio (HAR) can provide motorists with real-time information regarding traffic conditions, including closures. Motorists can utilize this information to divert, delay, or even cancel their trip and avoid the closure.

Recommended CCTV camera spacing is generally every two miles in segments that are currently LOS D or worse, every three miles for LOS C, and every four miles for LOS B. While LOS B is better than the LOS C threshold for ITS investment, some segments of LOS B or better are recommended for CCTV deployment for system continuity purposes. Camera spacing in full ATMS deployment areas is generally every mile.

A total of 240 “standalone” CCTV cameras are recommended (233 of which are on the Interstate System), providing comprehensive camera coverage of I-65, I-69, and I-70. These 240 cameras are in addition to any cameras deployed as part of a full ATMS.

- CCTV Priority 1 (US 31 Kokomo System Deployment): Seven cameras (plus signal preemption system and fiber optics): $1,045,000
- CCTV Priority 2 (Rural LOS D, within DMS Area of Influence): 17 cameras, $1,275,000
- CCTV Priority 3 (Rural LOS C, within DMS Area of Influence): 40 cameras, $2,925,000
- CCTV Priority 4 (Urban LOS C, within DMS Area of Influence): 12 cameras, $825,000
- CCTV Priority 5 (Rural LOS C and B): 81 cameras, $6,000,000
- CCTV Priority 6 (Rural LOS B / System Continuity Segments): 73 cameras, $5,325,000
- CCTV Priority 7 (Rest Areas/Weigh Stations-Low AADT Interstates): 10 cameras, $675,000

Total CCTV Cameras (240) Estimated Cost = $18,070,000

0.7.3. Permanent Overhead Dynamic Message Signs (DMS)

Dynamic Message Signs (DMS) are electronic roadway devices that provide real-time, dynamic (changing, not static) motorist information, such as incident, traffic, and road condition information, emergency alerts, and other driver advisories at strategic locations on the road network, ideally in advance of a major decision point or suitable alternate routes. Motorists can utilize this information to divert, delay, or even cancel their trip and avoid the delays. Forty-Eight Permanent Overhead DMSs are located in Indianapolis, Northwest Indiana, Evansville, Fort Wayne, and Kokomo, as well as four additional DMSs as part of TRIMARC in Southern Indiana near Louisville. Approximately 50 portable DMSs are deployed statewide, with roughly half of these on the Indiana Toll Road. Twenty-three Highway Advisory Radio (HAR) stations (plus the TRIMARC HAR) are located statewide to supplement the DMSs, especially in rural areas.

Recommended urban DMS spacing is in advance of major decision points (intersecting Interstates and freeways). Recommended rural DMS spacing is generally every 30 to 40 miles, placed in advance of a suitable INDOT System roadway for diversion purposes. This rural spacing also roughly translates to a DMS every 30 to 40 minutes of travel on an instrumented Interstate.

A total of 48 new Permanent Overhead DMSs are recommended, along with the refurbishment of nine DMSs and the removal of four DMSs. Upon implementation, INDOT will operate 92 Permanent Overhead DMSs, providing extensive coverage in the two ATMS deployment areas and rural segments of I-65, I-69, and I-70. The additional five TRIMARC DMSs in Indiana, (the four existing plus one planned DMS) will result in 97 Permanent Overhead DMSs in Indiana.

- DMS Priority 1 (Additions / Upgrades to the Indianapolis ATMS): 18 new DMSs, $3,420,000
- DMS Priority 2 (Additions to the Indianapolis & NW Indiana ATMSs): 4 new DMSs and 4 refurbished DMSs, $1,280,000
- DMS Priority 3 (New Rural Interstate DMSs): 22 new DMSs and 5 refurbished DMSs, $4,830,000
- DMS Priority 4 (Additions to the Indianapolis & NW Indiana ATMSs): 4 new DMSs, $760,000
- Evansville DMSs: CCTV deployment is not recommended for the Evansville area at this time, which also precludes the installation of any additional DMSs in the Evansville area; 4 DMSs recommended for removal
- Kokomo DMSs: When US 31 is relocated, the DMSs will no longer be of great value to INDOT and should be removed at that time

Total DMS (48 new, 9 refurbished) Estimated Cost = $10,290,000

0.7.4. Static / Dynamic Travel Time Signs (TTS)

Upon the completion of the ATMS in Northwest Indiana (essentially complete) and in Indianapolis, algorithms can be developed using the vehicle detection to automatically estimate travel times to specific locations, such as major downstream interchanges or a State Line, and provide this information to the public by way of DMSs.

Nationally, some jurisdictions have used standard DMSs to convey travel time information; others use a static panel sign that has a small electronic, dynamic insert component. As INDOT has adopted the preference of leaving DMSs blank if no incidents are reported (so as to not desensitize the motoring public with a constant 24 hour per day message on a DMS), it would be desirable to implement this latter approach and save the DMSs for incidents which require an action to be taken by motorists (lane(s) closed due to crashes or maintenance, slow traffic affecting all lanes, etc.). Furthermore, the Static / Dynamic Travel Time Sign can supplement the incident information provided on the standard Overhead or Portable DMS.

These static panel with dynamic insert Travel Time Signs would provide the motorist with static shield or text referring to a downstream interchange or specific location, accompanied by static distance to that interchange or specific location to assist unfamiliar, non-commuter motorists, and a dynamic insert that changes according to the automated travel time data.

- TTS Priority 1 (Northwest Indiana ATMS): 2 new TTSs, $90,000
- TTS Priority 2 (Indianapolis ATMS – Phases 3 & 4 and I-70 East Pavement Replacement): 12 new TTSs, $600,000
- TTS Priority 3 (Indianapolis ATMS – Phase 5): 6 new TTSs, $350,000
- TTS Priority 4 (Northwest Indiana ATMS): 5 new TTSs, $480,000
- TTS Priority 5 (Indianapolis ATMS – I-465 West Leg): 4 new TTSs, $250,000
- TTS Priority 6 (Indianapolis ATMS – I-465 North and East Legs, I-465 West Leg @ 56th St / I-65): 8 new TTSs, $400,000
- TTS Priority 7 (Indianapolis ATMS – US 31 Freeway Upgrade and I-69 South): 2 new TTSs, $100,000

Total TTS (39) Estimated Cost = $2,270,000

0.7.5. Hoosier Helper Freeway Service Patrol (FSP)

The Hoosier Helper Freeway Service Patrol (FSP) serves approximately 130 miles of Indiana's busiest freeways, helping stranded motorists, removing debris from the road, or summoning help quickly in case of a crash, vehicle fire, or other emergency. The Hoosier Helpers do more than provide an extra measure of security and safety for motorists. They also keep traffic moving, and that makes them a key element in an ATMS deployment. INDOT currently has four Hoosier Helper FSP programs statewide: Northwest Indiana, Indianapolis, the Indiana portion of metropolitan Louisville, and Fort Wayne.

- Proposed Expansions of the Hoosier Helper FSP

The Hoosier Helper Freeway Service Patrol historically has been a function of INDOT's Districts in which they operate and as such is more operations-oriented versus the capital improvement/fixed device-orientation of the majority of this document. Routes and hours of the day in service are based upon need, and more significantly, availability of personnel to fill the need, a variable that is difficult to predict. Therefore, no specific implementation years are identified nor are cost estimates developed. Nevertheless, guidance is provided to assure a reasonably uniform Hoosier Helper FSP deployment on a statewide basis.

- Proposed Reductions of the Hoosier Helper FSP

I-64 from the Lanesville interchange (Exit 113) to SR 62/64 (Exit 118) is not within the deployment area of an existing or proposed full ATMS, has an AADT of only 31,290, is operating at LOS B and contiguous to a LOS C segment, and does not need to be served for system continuity (turnaround can take place at the SR 62/64 diamond interchange at Mile 118).

0.7.6. Reference Markers (1/10, 2/10, and 1/2 Mile Reference Markers)

Intermediate Enhanced Reference Location Signs, initially installed in 1998 in Indianapolis, Northwest Indiana, Southern Indiana near Louisville, Evansville, Fort Wayne, and Kokomo, are located every 2/10 of a mile in the median of Interstates (every 1/10 of a mile along the Borman Expressway (I-80/94), as well as portions of I-90 (Indiana Toll Road) and I-94 in Northwest Indiana). The 2/10 Mile Reference Markers are also placed on US 41 and some State Roads in the Evansville area and on US 31 in the Kokomo area. These signs display the direction of travel, a route shield indicating the highway the motorist is traveling, and the Mile Marker location on the highway (to 2/10 or 1/10 of a mile). At interchanges, Ramp Reference Markers are positioned along the ramps indicating which ramp a motorist is traveling within an interchange. These signs provide motorists with better location information and improved roadside assistance. Incident response teams are able to more quickly arrive on the scene of crashes, clearing debris and improving traffic flow. In an emergency, these signs serve the same purpose as the "street address" on other roads, aiding motorists and emergency response vehicles in identifying their location or destination on the highway system.

- Reference Marker Priority 1 (Current Hoosier Helper FSP Routes without Intermediate Enhanced Reference Location Signs): $150,000
- Reference Marker Priority 2 (Intermediate Enhanced Reference Location Sign (1/10 and 2/10 Mile Reference Marker) Additions to Full ATMS Areas): $604,000
- Intermediate Reference Location Signs ((½ Mile Reference Markers) on Rural Interstates): $566,000

Total Reference Markers (1/10, 2/10, and 1/2 Mile) Estimated Cost = $1,320,000

0.7.7. Fiber Optic Deployment

Recent Added Travel Lanes and Pavement Replacement projects on the Interstate System in Indiana have provided the opportunity to place conduit for future deployment of fiber optics in INDOT Right-of-Way. Ultimately, a fiber optic system along Indiana's key Interstate highways will supersede the current wireless microwave communications system component of INDOT's ITS deployment. The current practice of implementing conduit as part of larger Major Capital Improvements on the Interstate System (and fiber optics where appropriate) should continue.

0.7.8. Recommendations Summary – by Deployment Type

Advanced Traffic Management Systems (ATMS)	$46,645,000
Closed Circuit TV (CCTV) Cameras (240)	18,070,000
Dynamic Message Signs (DMS) (48 new, 9 refurbished)	10,290,000
Travel Time Signs (TTS) (39)	2,270,000
Reference Markers (1/10, 2/10, and 1/2 Mile)	1,320,000
TOTAL ESTIMATED COST	**$78,595,000**

0.8. ITS DEPLOYMENT RECOMMENDATIONS - CHRONOLOGICAL (Chapter 8)

The data and analysis in the first six chapters of the INDOT ITS Strategic Deployment Plan have laid the foundation for the recommendations made by individual deployment type in Chapter 7. Chapter 8 presents a summary of the deployment information presented in Chapter 7 in chronological order.

0.8.1. 2005 Deployments

1. Phase Two of the Indianapolis area ATMS is currently under construction and is expected to be completed in 2005
2. I-80/94 (Borman Expwy) from 0.8 km east of SR 912 (Exit 5) to 0.6 km west of Dr. Martin Luther King, Jr. Dr (Mile 11): Replace full ATMS
3. I-465 from 0.3 mile north of I-65 (Mile 20) to 0.65 mile north of 86th St (West Leg) (Mile 23): Install ATMS hardware (except the cameras and communication devices that will be part of Phase 5)
4. US 31 from SR 26 to Morgan St (2.0 miles north of US 35 / SR 22): Install cameras, plus signal preemption system and fiber optics

Total 2005 Deployments Estimated Cost = $4,635,000

0.8.2. 2006 Deployments

Note: Phases 3 and 4 of the Indianapolis ATMS will begin in 2006 and conclude in 2007

1. I-469 from I-69 (S jct) (Mile 0) to I-69 (N jct) (Mile 31): Install 2/10 Mile Reference Markers
2. I-80/94 (Borman Expwy) from Illinois State Line (Mile 0) to US 41 / Calumet Ave West Ramps (Exit 1): Replace full ATMS
3. SB I-465 (West Leg), near Mile 22.2 (79th St), south of 86th St: Install new DMS

Total 2006 Deployments Estimated Cost = $1,220,000

0.8.3. 2007 Deployments

1. Phase Three of the Indianapolis area ATMS in the northeastern and eastern portions of the Indianapolis area
2. Phase Four of the Indianapolis area ATMS in the southern portion of the Indianapolis area

Note: Phase 5 of the Indianapolis ATMS will begin in 2007 and conclude in 2008

3. I-65 from Main St (Greenwood Rd) (Exit 99) to County Line Rd (Exit 101): Full Deployment during Phase 4

4. I-65 from Whiteland Rd (CR 500N) (Exit 95) to Main St (Greenwood Rd) (Exit 99): Full Deployment during Phase 4
5. I-465 from I-65 (Exit 53) to SR 67 / Kentucky Ave (Exit 8) (South Leg): ½ Mile vehicle detection during Phase 4
6. NB I-465 (East Leg), near Mile 38.5, south of I-69: Install new DMS
7. SB I-465 (East Leg), Mile 38.2, south of I-69: Replace existing Vultron DMS and install new DMS on box truss
8. SB I-69, Mile 4.3, south of 116th St: Replace existing Vultron DMS and install new DMS on box truss
9. SB I-465 (East Leg), near Mile 46.5 (English Ave), north of US 52: Install new DMS
10. NB I-65, near Mile 108.5, south of Raymond St: Install new DMS
11. NB I-65, Mile 104.7, south of I-465 (South Leg): Replace existing Vultron DMS and install new DMS on box truss
12. I-70 at Mt. Comfort Rd (Exit 96): install mainline and ramp detection, CCTV, and relay tower
13. I-70 from I-65 (North Split) (Exit 83) to I-465 (East Leg) (Exit 90): Replace full ATMS
14. EB & WB I-70, Mile 85.7, west of Emerson Ave: Replace two existing Vultron DMSs and install two new DMSs on box trusses
15. I-70 from I-65 (North Split) (Mile 83) to I-465 (East Leg) (Mile 90): Install 1/10 Mile Reference Markers

Total 2007 Deployments Estimated Cost = $13,548,000

0.8.4. 2008 Deployments

1. The Fifth and final phase of the Indianapolis area in the northwestern and northern portions of the Indianapolis area
2. I-74 from SR 267 (Exit 66) to Raceway Rd (Hendricks / Marion County Line) (Mile 70): Full Deployment during Phase 5
3. EB & WB I-465 (North Leg), near Mile 28.2 (Township Line Rd), west of US 31: Install two new DMSs
4. NB I-465 (West Leg), near Mile 22.2 (79th St), south of 86th St: Install new DMS
5. SB I-65, near Mile 125, north of 71st St: Install new DMS
6. EB I-74, near Mile 68, east of SR 267: Install new DMS
7. EB & WB I-465, Mile 32.2, west of SR 431: Replace two existing Vultron DMSs and install two new DMSs on box trusses east of SR 431 near Mile 34.4
8. SB I-65, Mile 131.9, north of SR 334: Replace existing Vultron DMS and install new DMS on box truss
9. WB I-70, Mile 92.1, east of Post Rd: Replace existing Vultron DMS and install new DMS on box truss
10. I-69 from just north of SR 37 / 116th St (Mile 6) to SR 238 (Mile 10): Install 2/10 Mile Reference Markers
    I-70 from east of Post Rd (Mile 93) to Mt. Comfort Rd (Mile 96): Install 2/10 Mile Reference Markers

I-65 from CR 500N (Whiteland Rd) (Mile 95) to Main St (Greenwood Rd) (Mile 99): Install 2/10 Mile Reference Markers
I-65 from Main St (Greenwood Rd) (Mile 99) to 38th St / Kessler Blvd (Mile 119): Install 1/10 Mile Reference Markers
I-65 from 38th St / Kessler Blvd (Mile 119) to SR 267 (Mile 133): Install 2/10 Mile Reference Markers
I-74 from SR 267 (Mile 66) to I-465 (West Leg) (Mile 73): Install 2/10 Mile Reference Markers
I-69 from I-465 (Mile 0) to just north of SR 37 /116th St (Mile 6): Install 1/10 Mile Reference Markers
I-465 from I-65 (South Leg) (Mile 0) to east of SR 67 / Kentucky Ave (West Leg) (Mile 8) & I-465 from south of 56th St (West Leg) (Mile 19) to I-65 (South Leg) (Mile 53): Install 1/10 Mile Reference Markers
I-70 from Airport Expwy (Mile 75) to I-65 (South Split) (Mile 81) & I-70 from I-465 (East Leg) (Mile 90) to Post Rd (Mile 91): Install 1/10 Mile Reference Markers

11. WB I-80/94 (Borman Expwy), near Mile 7.9 (Chase St): Install TTS
12. WB I-80/94 (Borman Expwy), near Mile 2.6 (US 41 / SR 152 / Indianapolis Blvd WB off-ramp): Install TTS

Total 2008 Deployments Estimated Cost = $7,939,000

0.8.5. 2009 Deployments

1. I-94 from I-90 (Indiana Toll Road) (Exit 16) to SR 49 (Exit 26): Temporary Deployment (Full Deployment in the Pavement Replacement project in 2013)
2. I-94 from SR 249 (Mile 19) to SR 49 (Mile 26): Install 2/10 Mile Reference Markers
3. I-65 from US 30 (Mile 253) to I-80/94 (Borman Expwy) NW Connector Ramps (Mile 259): Install 1/10 Mile Reference Markers
4. I-80/94 (Borman Expwy) from 0.6 km west of Dr. Martin Luther King, Jr. Dr (Mile 11) to I-90 (Indiana Toll Road) (Exit 16): Replace full ATMS
5. I-65 from I-80/94 (Borman Expwy) (Exit 259 / Mile 260) to I-90 (Indiana Toll Road (Exit 262): Full Deployment
6. EB I-80/94 (Borman Expwy), near Mile 13 (Clay St), east of Central Ave: Install refurbished Vultron DMS
7. SB SR 431, north of I-465 (North Leg) between 98th St and 106th St: Install refurbished Vultron DMS
8. I-69 from SR 238 (Exit 10) to SR 9/67 (Exit 22): Install cameras
9. I-65 from SR 44 (Exit 90) to Whiteland Rd (CR 500N) (Exit 95): Install cameras
10. I-65 from SR 267 (Exit 133) to SR 32 (Exit 140): Install cameras
11. NB I-69, near Mile 3.2, north of 96th St: Install new DMS
12. SB I-69, near Mile 5.0 (116th St): Install TTS
13. NB I-465 (East Leg), near Mile 47.0 (CSX RR): Install TTS
14. SB I-465 (East Leg), near Mile 45.0 (10th St): Install TTS
15. WB I-465 (South Leg), near Mile 50.2 (CSX RR): Install TTS
16. EB I-465 (South Leg), near Mile 52.3 (9th Ave): Install TTS

17. EB I-465 (South Leg), near Mile 3.2 (east of Bluff Rd): Install TTS
18. EB I-465 (South Leg), near Mile 7.4 (Mann Rd): Install TTS
19. NB I-65, near Mile 100.0 (south of County Line Rd): Install TTS
20. SB I-65, near Mile 110.0 (south of the I-70 South Split): Install TTS
21. WB I-70, near Mile 88.1 (CSX RR): Install TTS
22. EB I-70, near Mile 83.8 (Commerce Ave): Install TTS
23. EB I-70, near Mile 73.6 (west of Lynhurst Dr): Install TTS

Total 2009 Deployments Estimated Cost = $4,113,000

0.8.6. 2010 Deployments

1. I-69 from SR 9/67 (Exit 22) to SR 32/67 (Exit 34): Install cameras
2. I-65 from US 31 (Exit 76) to SR 44 (Exit 90): Install cameras
3. I-65 from SR 32 (Exit 140) to SR 28 (Exit 158): Install cameras
4. I-70 from US 231 (Exit 41) to SR 267 (Exit 66): Install cameras
5. I-70 from Mt. Comfort Rd (Exit 96) to SR 3 (Exit 123): Install cameras
6. SB I-69, near Mile 28.3 (CR 300E), north of SR 9/109: Install refurbished Vultron DMS
7. NB I-65, near Mile 71.3 (CR 300N), south of US 31 (Exit 76): Install refurbished Vultron DMS
8. SB I-65, near Mile 160.4 (CR 1000W), north of SR 28: Install refurbished Vultron DMS
9. EB I-70, near Mile 38.6 (Poplar Grove Rd), west of US 231: Install refurbished Vultron DMS
10. WB I-70, near Mile 126.2 (SR 103), east of SR 3: Install refurbished Vultron DMS
11. EB I-465 (North Leg), near Mile 25.6 (96th St): Install TTS
12. WB I-465 (North Leg), near Mile 30.0 (west of Spring Mill Rd): Install TTS
13. NB I-465 (West Leg), near Mile 20.3 (north of Lafayette Rd): Install TTS
14. NB I-65, near Mile 107.2 (Keystone Ave): Install TTS
15. SB I-65, near Mile 122.0 (56th St): Install TTS
16. NB I-65, near Mile 114.4 (Fall Creek Pkwy): Install TTS
17. SR 912 (Cline Ave) from I-90 (W jct) to I-80/94 (Borman Expwy): Full Deployment
18. SB SR 912 (Cline Ave), near SR 312, north of I-80/94 (Borman Expwy): Install refurbished Vultron DMS
19. SR 912 (Cline Ave) from I-90 (Indiana Toll Road) (W jct) to I-80/94 (Borman Expwy): Install 2/10 Mile Reference Markers
20. NB US 31, south of I-465 (South Leg) between Edgewood Ave and Epler Ave: Install refurbished Vultron DMS

Total 2010 Deployments Estimated Cost = $5,455,000

0.8.7. 2011 Deployments

1. I-69 from I-469 (S jct) (Exit 96) to SR 1 (Exit 116): Install cameras
2. I-465 from 0.8 mile east of SR 67 / Kentucky Ave (West Leg) (Exit 8) to 0.5 mile north of 46th St (West Leg) (Mile 19): Replace temporary devices with full ATMS
3. NB & SB I-465 (West Leg), Near Mile 15, south of I-74: Install two New DMSs
4. I-465 from east of SR 67 / Kentucky Ave (West Leg) (Mile 8) to south of 56th St (West Leg) (Mile 19): Install 1/10 Mile Reference Markers
5. EB I-80/94 (Borman Expwy), near Mile 0.1 (Hohman Ave): Install TTS
6. EB I-80/94 (Borman Expwy), near Mile 7.9 (Chase St): Install TTS
7. WB I-80/94 (Borman Expwy), near Mile 13.1 (east of Clay St): Install TTS
8. WB I-94, near Mile 17.0 (east of US 20 / CSX RR) (Porter County): Install TTS
9. NB I-65, near Mile 257.1 (north of 49th Ave): Install TTS
10. I-65 from US 231 (Exit 247) to US 30 (Exit 253) (Lake County): Full Deployment

Total 2011 Deployments Estimated Cost = $7,479,000

0.8.8. 2012 Deployments

1. I-70 from 0.6 mile east of Post Road (Exit 91) to Mt. Comfort Rd (Exit 96): Replace full ATMS deployment
2. I-65 from SR 28 (Exit 158) to US 231 (Exit 193): Install cameras
3. I-65 from SR 311 (Exit 9) to US 50 (Exit 50): Install cameras
4. I-70 from SR 3 (Exit 123) to Ohio State Line (Mile 156): Install cameras
5. NB I-65, near Mile 154.4 (Manson-Colfax Rd / Abandoned RR), south of SR 28 & SB I-65, near Mile 198.8 (CR 100S), north of US 231 (Exit 193): Install two new DMSs
6. NB I-65, near Mile 8, south of SR 311 & SB I-65, near Mile 52.5 (Walnut Grove Rd), north of US 50: Install two new DMSs
7. EB I-70, near Mile 120.7 (CR 350W), west of SR 3 (Henry County) & WB I-70, 1.5 miles east of the Ohio State Line (near Ohio SR 320), east of US 40: Install two new DMSs

Total 2012 Deployments Estimated Cost = $5,215,000

0.8.9. 2013 Deployments

1. I-465 from 0.5 mile west of Allisonville Rd (North Leg) (Exit 35) to the bridge over Fall Creek (East Leg) (Mile 39): Replace full ATMS
2. I-94 from I-90 (Indiana Toll Road) (Exit 16) to SR 49 (Exit 26): Replace temporary devices with full ATMS
3. I-65 from US 50 (Exit 50) to US 31 (Exit 76): Install cameras
4. I-70 from US 41/150 (Exit 7) to US 231 (Exit 41): Install cameras
5. I-94 from SR 49 (Exit 26) to Michigan State Line (Mile 46): Install cameras

6. NB I-65, near Mile 45.3 (US 31 grade separation), south of US 50 & SB I-65, near Mile 79.1 (Bartholomew / Shelby County Line Rd), north of US 31 (Exit 76): Install two new DMSs
7. EB I-70, near Mile 9.7 (Fruitridge Ave), west of SR 46 / Future SR 641 & WB I-70, near Mile 44.9 (CR 650E), east of US 231: Install two new DMSs
8. WB I-94, near Mile 44.9 (CR 1000N), east of US 20/35: Install new DMS
9. WB I-465 (South Leg), near Mile 0.7 (Keystone Ave): Install TTS
10. WB I-465 (South Leg), near Mile 6.2 (White River): Install TTS
11. SB I-465 (West Leg), near Mile 14.6 (Abandoned RR): Install TTS
12. WB I-70, near Mile 79.0 (west end of White River bridge): Install TTS
13. EB US 36, west of I-465 (West Leg) between Girls School Rd and High School Rd: Install new DMS

Total 2013 Deployments Estimated Cost = $6,090,000

0.8.10. 2014 Deployments

1. I-465 from 0.35 mile east of US 31 / Meridian St (North Leg) (Exit 31) to 0.5 mile west of Allisonville Rd (North Leg) (Mile 35): Replace full ATMS
2. I-65 from SR 10 (Exit 230) to US 231 (Exit 247): Install cameras
3. I-69 from SR 1 (Exit 116) to SR 8 (Exit 129): Install cameras
4. I-65 from US 231 (Exit 193) to SR 10 (Exit 230): Install cameras
5. I-74 from Pleasant View Rd (Exit 101) to SR 44 (Exit 116): Install cameras
6. I-69 from SR 32/67 (Exit 34) to SR 18 (Exit 64): Install cameras
7. NB I-65, near Mile 224.5 (CR 400N / Fair Oaks Rd), south of SR 10: Install new DMS
8. NB I-65, near Mile 190.4 (Pine Grove Rd), south of US 231 (Exit 193) & SB I-65, near Mile 236.9 (205th Ave), north of SR 10: Install two new DMSs
9. NB I-69, near Mile 24.9 (Main St), south of SR 9/109 & SB I-69, near Mile 62 (CR 200S), north of US 35 / SR 22: Install two new DMSs

Total 2014 Deployments Estimated Cost = $4,850,000

0.8.11. 2015 Deployments

1. I-465 from 0.5 mile north of 46th St (West Leg) (Mile 18.5) 0.3 mile north of I-65 (West Leg) (Exit 20): Replace temporary devices with full ATMS
2. I-69 from I-465 (Exit 0) to 0.5 mile south of 96th St (Exit 3): Replace full ATMS
3. I-65 from I-865 (Exit 129) to SR 267 (Exit 133): Replace full ATMS (with possibility of extending full ATMS to US 52 (Exit 141))
4. I-70 from Illinois State Line (Mile 0) to US 41/150 (Exit 7): Install cameras
5. I-69 from SR 18 (Exit 64) to I-469 (S jct) (Exit 96): Install cameras
6. I-69 from SR 8 (Exit 129) to Michigan State Line (Mile 157): Install cameras
7. I-469 from US 30 (Exit 19) to I-69 (N jct) (Exit 31) : Install cameras
8. I-469 from I-69 (S jct) (Exit 0) to US 30 (Exit 19): Install cameras

9. NB I-69, near Mile 53.4 (CR 1050S), south of SR 26 (Grant County) & SB I-69, near Mile 99 (Lower Huntington Rd / Airport Expwy: Install two new DMSs
10. NB I-69, near Mile 113.5 (Auburn Rd), south of I-469 (N jct) & SB I-69, near Mile 157 (Lake George Rd): Install two new DMSs
11. WB I-469, near Mile 29.2, east of I-69 (N jct): Install new DMS
12. WB I-469, near Mile 1 (Lafayette Center Rd), east of I-69 (S jct): Install new DMS
13. SB I-465 (East Leg), near Mile 37.8 (71st St): Install TTS

Total 2015 Deployments Estimated Cost = $4,990,000

0.8.12. 2016 Deployments

1. I-69 from 0.5 mile south of 96th St (Exit 3) to 0.5 mile north of SR 37 / 116th St (Exit 5): Replace full ATMS
2. I-69 from 0.5 mile north of SR 37 / 116th St (Exit 5) to SR 238 (Exit 10): Replace full ATMS
3. I-65 from 0.5 mile south of Southport Rd (Exit 103) to 0.25 mile south of I-465 (South Leg) (Exit 106): Replace full ATMS
4. I-65 from Whiteland Rd (CR 500N) (Exit 95) to 0.5 mile south of Greenwood Rd (Main St) (Exit 99): Replace full ATMS
5. NB I-465 (East Leg), near Mile 42.4 (south of 38th St): Install TTS
6. WB I-465 (North Leg), near Mile 35.8 (82nd St): Install TTS
7. EB I-465 (North Leg), near Mile 31.9 (east of College Ave): Install TTS
8. I-74 at Rest Areas / Weigh Stations in Vermillion, Fountain, Hendricks, Ripley, and Dearborn Counties: Install cameras
9. I-64 at Rest Areas / Weigh Stations in Posey, Spencer, and Floyd Counties: Install cameras

Total 2016 Deployments Estimated Cost = $3,125,000

0.8.13. 2017 Deployments

1. I-65 from 0.5 mile south of Greenwood Rd (Main St) (Exit 99) to 0.5 mile south of Southport Rd (Exit 103): Replace full ATMS
2. I-70 from I-65 (North Split) (Exit 83) to Shadeland Ave (Exit 89) (Marion County): Replace full ATMS
3. NB I-465 (West Leg), near Mile 11.0 (N of Airport Expwy): Install TTS
4. SB I-465 (West Leg), near Mile 23.8 (north of 86th St): Install TTS
5. SB I-465 (West Leg), near Mile 19.2 (56th St): Install TTS
6. NB I-465 (West Leg), near Mile 16.6 (34th St): Install TTS

Total 2017 Deployments Estimated Cost = $2,150,000

0.8.14. 2018 Deployments

1. EB US 30, west of I-65, approximately 0.7 mile east of SR 55: Install new DMS
2. I-65 from the Kentucky State Line (Mile 0) to SR 60 (Mile 7): Install 1/10 Mile Reference Markers

Total 2018 Deployments Estimated Cost = $218,000

0.8.15. 2019 Deployments

1. I-465 from 0.5 mile east of US 421 / Michigan Rd (North Leg) (Mile 27) to 0.35 mile east of US 31 / Meridian St (North Leg) (Exit 31): Replace full ATMS
2. I-65 from Raymond St (Exit 109) to and including the I-70 North Split (Exit 112) (Including I-70 travelover): Replace full ATMS
3. US 31 (Freeway) from I-465 (North Leg) to SR 38: Full Deployment
4. SB US 31(Freeway), north of I-465 (North Leg), between 106th St and 116th St (Hamilton County) & SB US 31(Freeway), north of I-465 (North Leg), between 161st St and SR 32: Install two new DMSs
5. US 31 (Freeway) from I-465 (North Leg) to SR 38: Install 1/10 Mile Reference Markers

Total 2019 Deployments Estimated Cost = $4,328,000

0.8.16. 2020 Deployments

1. I-465 from 0.65 mile north of 86th St (West Leg) (Mile 24) to 0.5 mile east of US 421 / Michigan Rd (North Leg) (Mile 27): Replace full ATMS
2. I-69 from SR 144 to I-465 (South Leg): Full Deployment
3. NB I-69, south of I-465 (South Leg), between County Line Rd and Southport Rd: Install new DMS
4. I-69 from SR 144 to I-465 (South Leg): Install 1/10 Mile (north of Smith Valley Rd) and 2/10 Mile (SR 144 to Smith Valley Rd) Reference Markers

Total 2020 Deployments Estimated Cost = $2,574,000

0.8.17. 2021 Deployments

1. SB US 31 (Freeway), near Mile 135.0 (south of SR 38): Install TTS

Total 2021 Deployments Estimated Cost = $50,000

0.8.18. 2022 Deployments

1. NB I-69, near Smith Valley Rd: Install TTS

Total 2022 Deployments Estimated Cost = $50,000

0.8.19. Non Year-Specific Deployments (Intermediate Reference Location Signs (½ Mile Reference Markers) on Rural Interstates)

The deployment of Intermediate Reference Location Signs at ½ mile intervals (with a ".0" at the whole number mile locations and ".5" placed at ½ mile locations, per the MUTCD) on all Interstates outside of urban areas with Intermediate Enhanced Reference Location Signs should occur as part of sign replacement projects or during reconstruction projects and thus is not prioritized by year. The estimated cost for deployment of Intermediate Reference Location Signs at ½ mile intervals includes the cost of replacing the existing one mile signs.

Total Non Year-Specific Deployments (Intermediate Reference Location Signs (½ Mile Reference Markers)) Estimated Cost: $566,000

0.8.20. Deployments Without Designated Costs

0.8.20.1. Proposed Expansions of the Hoosier Helper FSP

The Hoosier Helper Freeway Service Patrol historically has been a function of INDOT's Districts in which they operate and as such is more operations-oriented versus the capital improvement/fixed device-orientation of the majority of this document. Routes and hours of the day in service are based upon need, and more significantly, availability of personnel to fill the need, a variable that is difficult to predict. Therefore, no specific implementation years are identified nor are cost estimates developed. Nevertheless, guidance is provided to assure a reasonably uniform Hoosier Helper FSP deployment on a statewide basis.

0.8.20.2. Fiber Optics

Recent Added Travel Lanes and Pavement Replacement projects on the Interstate System in Indiana have provided the opportunity to place conduit for future deployment of fiber optics in INDOT Right-of-Way. Ultimately, a fiber optic system along Indiana's key Interstate highways will supersede the current wireless microwave communications system component of INDOT's ITS deployment. The current practice of implementing conduit as part of larger Major Capital Improvements on the Interstate System (and fiber optics where appropriate) should continue.

0.8.21. Recommendations Summary – Chronological

2005 Deployments	$4,635,000
2006 Deployments	1,220,000
2007 Deployments	13,548,000
2008 Deployments	7,939,000
2009 Deployments	4,113,000
2010 Deployments	5,455,000
2011 Deployments	7,479,000
2012 Deployments	5,215,000
2013 Deployments	6,090,000
2014 Deployments	4,850,000
2015 Deployments	4,990,000
2016 Deployments	3,125,000
2017 Deployments	2,150,000
2018 Deployments	218,000
2019 Deployments	4,328,000
2020 Deployments	2,574,000
2021 Deployments	50,000
2022 Deployments	50,000
Non Year-Specific Deployments	566,000
TOTAL ESTIMATED COST	**$78,595,000**

CHAPTER 1 – INTRODUCTION

1.1. THE INDOT ITS STRATEGIC PLAN

The Indiana Department of Transportation (INDOT) Intelligent Transportation Systems (ITS) Strategic Plan documents the intentions of INDOT to deploy ITS technologies and devices throughout the Hoosier state. Currently, INDOT has several ITS initiatives at various stages of planning and deployment. The need exists to develop a coordinated strategic plan to integrate ITS devices into the INDOT highway system to avoid duplication of efforts and to use existing and future infrastructure wisely. This plan assesses the needs of INDOT for ITS and develops strategies over the next 15 to 20 years for addressing those needs. Furthermore, the INDOT ITS Strategic Plan defines the direction INDOT will want to take, identifies ITS projects, and develops a strategy for integrating and mainstreaming ITS into the INDOT organization. Ultimately, this plan will establish the blueprint for a successful statewide ITS system.

1.2. WHAT IS ITS?

Throughout history, technological advancements have served to improve surface transportation. Steamboats, railroads, electrified streetcars and railways, and the automobile all represented quantum leaps in technology and personal mobility and freedom. Roads have also seen similar improvements in the past 100 years: an unconnected network of unpaved rural paths evolving into the Dwight D. Eisenhower System of Interstate and Defense Highways, traffic signals, retroreflective signage, impact attenuators, etc., coupled with continual improvements in vehicle safety and convenience. ITS is the next step in the evolution of the nation's transportation system. Advances in information technology, electronics, and communications continue to revolutionize all aspects of our modern-day world…our homes, offices, schools, and our transportation network and the vehicles of conveyance that use them.

Put simply, Intelligent Transportation Systems (ITS) is the application of technology to improve the safety and efficiency of the surface transportation system, saving motorists' lives, time, and money. The technology is used by operators of the transportation system to better manage the utilization of the existing infrastructure and by users (motorists) to assist them in making better travel decisions. INDOT's ITS initiative is known as TrafficWise.

In a sense, ITS can be traced back to the first traffic signal in the 1920s. The precursor to the modern era began in the 1960s with the deployment of cameras along the John C. Lodge Freeway in Detroit that fed images into a control center to manage traffic. Today, the Interstate Highway System is essentially complete across the country, but the need to repair and improve the existing highway network exceeds existing funds available. To use simple economics, demand exceeds supply at many locations on our Nation's urban highway network and, to a lesser extent, portions of the rural highway system. Congress recognized that over a decade ago, creating a national Intelligent Vehicle / Highway Systems (IVHS) program, now known as ITS, in 1991, as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Since then, many states and metropolitan areas have recognized that ITS can be a cost-effective way to reduce congestion and improve safety. While INDOT still intends to construct new highways and add capacity to many roadways, TrafficWise offers the means to reduce congestion and increase the safety of an existing roadway.

1.3. INDOT STRATEGIC PLAN

In 1998, INDOT completed an agency-wide Strategic Plan. The INDOT Strategic Plan is comprised of a Vision, Mission, Strategic Goals, and Strategic Objectives for the department. The INDOT ITS Strategic Plan will support these four elements of the INDOT Strategic Plan.

The Vision: Proudly Moving Indiana Into The 21st Century.

The INDOT Mission Statement: We provide our customers the best transportation system that enhances mobility, stimulates economic growth, and integrates safety, efficiency and environmental sensitivity.

The Strategic Goals: Mobility, Economic Growth, Safety, Workforce, Customer Service, Resource Management, Technology and Research, and Environment.
MOBILITY: To ensure a statewide transportation system that is accessible, efficient and offers flexibility of choices.

- ECONOMIC GROWTH: To stimulate Indiana's economic growth and competitiveness.
- SAFETY: To create, promote and maintain a safe transportation system and a safe work environment.
- WORKFORCE: To foster a diverse, highly skilled, and motivated INDOT workforce.
- CUSTOMER SERVICE: To address the needs of our customers with a constant focus on better service.
- RESOURCE MANAGEMENT: To use sound business practices as stewards of the public's resources producing a safe and efficient transportation system in Indiana.
- *TECHNOLOGY AND RESEARCH: To advance technology and research to improve Indiana's transportation system.*
- ENVIRONMENT: To protect and enhance the environment, both natural and human, affected by Indiana's transportation system.

While ITS projects support all of the Strategic Goals, ITS initiatives are one of the four Strategic Objectives housed in the Technology and Research Strategic Goal.

The Strategic Objectives for Technology and Research:

1. *Optimize research and implementation of Intelligent Transportation Systems (ITS) technology.*
2. Upgrade telecommunication infrastructure to improve information availability and usefulness.
3. Implement strategic information systems.
4. Implement cost-effective research.

Four specific items are identified as part of the ITS-oriented Strategic Objective, "Optimize research and implementation of Intelligent Transportation Systems (ITS) technology." Items "b" and "c" below were specifically assigned to the ITS Program Office and associated district staff.

a. Upgrade the coordination of activities to construct, maintain, and advance the utilization of traffic signal systems.
b. Establish a basic statewide traveler information system within the next three years.
c. Establish an advanced traffic management system in Indianapolis within the next three years.
d. Utilize advanced technologies to improve commercial vehicle safety, inspection, and efficiency within the next three years.

These activities have been implemented and expansions/improvements to these systems are continually being implemented.

In January 2005, INDOT adopted a new motto to reflect our agency's vital function in State Government's role in economic development and job creation in the Hoosier state: **Driving Indiana's Economic Growth.** ITS deployments and the INDOT ITS Strategic Plan will support this new motto and mission.

1.4. UNITED STATES DEPARTMENT OF TRANSPORTATION (USDOT) STRATEGIC PLAN

In September 2003, the United States Department of Transportation (USDOT) completed a Strategic Plan for Fiscal Years 2003-2008, comprised of a Vision, Mission, Strategic Objectives, Desired Outcomes, and Strategies for all modes of the Nation's transportation system. The USDOT's top priorities are to keep the traveling public safe, increase their mobility, and ensure that the Nation's transportation system enables the country's economic growth and development. As INDOT is a partner with the USDOT, especially the Federal Highway Administration (FHWA), the INDOT ITS Strategic Plan will support these elements of the USDOT Strategic Plan and the USDOT's priorities.

The Vision: Safer, Simpler, Smarter Transportation Solutions.

The USDOT Mission Statement: To develop and administer policies and programs that contribute to providing fast, safe, efficient, and convenient transportation at the lowest cost consistent with the national objectives of general welfare, economic growth and stability, the security of the United States and the efficient use and conservation of the resources of the United States.

The Strategic Objectives: Safety, Mobility, Global Connectivity, Environmental Stewardship, and Security.

- SAFETY (top priority): Enhance public health and safety by working toward the elimination of transportation-related deaths and injuries.
- MOBILITY: Advance accessible, efficient, intermodal transportation for the movement of people and goods.
- GLOBAL CONNECTIVITY: Facilitate a more efficient domestic and global transportation system that enables economic growth and development.
- ENVIRONMENTAL STEWARDSHIP: Promote transportation solutions that enhance communities and protect the natural and built environment.
- SECURITY: Balance homeland and national security transportation requirements with the mobility needs of the Nation for personal travel and commerce.

1.5. FEDERAL HIGHWAY ADMINISTRATION (FHWA) STRATEGIC PLAN

In 1998, the Federal Highway Administration (FHWA) completed a Strategic Plan, comprised of a Vision, Mission, Values, Guiding Principles, Strategic Goals and Objectives, and Corporate Management Strategies. While the USDOT Strategic Plan lays out the broad goals for all modes of the Nation's transportation system, the FHWA Strategic Plan sets the goals and strategies for FHWA's role within the larger USDOT. As INDOT is a partner with the FHWA, the INDOT ITS Strategic Plan will support these elements of the FHWA Strategic Plan.

The Vision: Create the best transportation system in the world.

The FHWA Mission Statement: We continually improve the quality of our Nation's highway system and its intermodal connectors.

The Values: Service, teamwork, professionalism, and diversity.

The Guiding Principles: Champion FHWA initiatives, plans, and programs; assure customer satisfaction; build and strengthen partnerships; leverage technology and innovation; and improve efficiency and effectiveness through quality.

The Strategic Goals and Objectives: Mobility, Safety, Productivity, Human and Natural Environment, and National Security.

- MOBILITY: Continually improve the public's access to activities, goods, and services through preservation, improvement, and expansion of the highway transportation system and enhancement of its operations, efficiency, and intermodal connections.
    1. Preserve and enhance the infrastructure of Federal-Aid highways with emphasis on the National Highway System.
    2. Improve the operation of the highway systems and intermodal linkages to increase transportation access for all people and commodities.
    3. Minimize the time needed to return highways to full service following disasters.
- SAFETY (top priority): Continually improve highway safety.
    1. Reduce the number of highway-related fatalities and injuries.
- PRODUCTIVITY: Continuously improve the economic efficiency of the Nation's transportation system to enhance America's position in the global economy.
    1. Improve the economic efficiency of highway transportation (reduce delays).
    2. Improve the return on investment of the highway system.
- HUMAN AND NATURAL ENVIRONMENT: Protect and enhance the natural environment and communities affected by highway transportation.
    1. Enhance community and social benefits of highway transportation.
    2. Improve the quality of the natural environment by reducing highway-related pollution and by protecting and enhancing ecosystems.
- NATIONAL SECURITY: Improve the Nation's national defense mobility.
    1. Increase the capacity and operation of the highway system to support mobilization.

1.6. KEY COMPONENTS OF ITS

In a general sense, ITS can be separated into two distinct but certainly related program areas: intelligent infrastructure and intelligent vehicles. Intelligent infrastructure is generally the responsibility of public agencies that own, operate, and maintain transportation assets (roads, bridges, rail public transit Rights-of Way and rolling stock) and is oriented to serving the transportation infrastructure needs of motorists, commercial vehicles, and transit passengers. Intelligent vehicles are generally under the auspices of private industry (most notably, vehicle manufacturers) and complement the ITS infrastructure by focusing on safety and information systems for cars, trucks, buses, and trains. The focus of this document will be on the former, not the latter.

Some of the key elements of ITS in urban areas include freeway management, incident management, emergency response, traveler information, traffic signal control / arterial management, electronic toll collection, transit management, and electronic fare payment. Many of the ITS solutions in rural areas are similar to urban applications but on a smaller, more isolated scale, especially in states with reasonably high rural traffic volumes due to geographical location and population density. Indiana fits in this category. Other, more remotely populated states with lighter traffic volumes generally focus on safety and, in northern climates, weather-related rural ITS applications.

The commercial vehicle aspect of ITS is somewhat of a hybrid between intelligent infrastructure and intelligent vehicles, with the goal of making the commercial vehicle safety and regulatory system more efficient and effective, for both the truck operators and state regulatory and enforcement agencies. Some examples of commercial vehicle ITS applications include electronic clearance at weigh stations, “virtual scales” and portable scales at remote locations away from permanent weigh stations, automated administrative processes, and on-board safety monitoring systems.

The FHWA’s Intelligent Vehicle Initiative seeks to accelerate the development and availability of advanced safety and information systems applied to vehicles, with the goal of integrating driver assistance and motorist information functions to improve safety and efficiency. It covers applications for passenger vehicles, commercial vehicles, and buses, as well as emergency response and law enforcement vehicles, highway maintenance vehicles, and snowplows. Research continues on crash avoidance, in-vehicle safety, and even automated highway systems, all with active participation of the motor vehicle industry and associated component suppliers.

1.7. GOALS OF ITS

The United States Department of Transportation (USDOT) has stated that the six goals of the National ITS Program are as follows:

- Increase Transportation System Efficiency and Capacity
- Enhance Mobility
- Improve Safety
- Reduce Energy Consumption and Environmental Costs
- Increase Economic Productivity
- Create an Environment for an ITS Market

As INDOT is a partner with the USDOT, especially the FHWA, the INDOT ITS Strategic Plan will support these goals established by the USDOT.

Increase Transportation System Efficiency and Capacity
Many ITS components help optimize the efficiency of existing facilities so that mobility needs can be better met while reducing the need to construct or expand facilities, especially beyond existing Right-of-Way. The *Highway Capacity Manual* defines the capacity of a roadway as the maximum hourly rate at which vehicles can reasonably be expected to traverse a point or a uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions. Capacity is generally measured under ideal conditions for the facility, including no incidents affecting the system. An incident can range from a crash, disabled vehicle, and debris in the roadway to the less obvious, such as unscheduled (emergency) maintenance, and inclement weather. Effective incident management expedites the restoration of the ideal capacity of a facility. Likewise, traveler information assists in diverting trips away from an incident, reducing the number of vehicles attempting to pass through a restricted roadway. Both actions reduce delay to motorists. As it is estimated that more than 50% of freeway congestion is the result of incidents, ITS strategies are key components in eliminating this non-recurring congestion and restoring capacity as quickly as possible.

Enhance Mobility
Improving mobility by reducing delay and travel time is a major goal of many ITS elements. Some measures of effectiveness commonly used to evaluate mobility include the amount of delay time and the variability in travel time. Delay can be measured in several different ways, such as amount of delay per vehicle, by person-hours, or by lateness of arrival of a shipment. Reducing the variability of travel time improves the reliability of estimated arrival times that travelers or companies use to make planning and scheduling decisions that are so critical in just-in-time delivery. The unpredictability of travel time can be reduced by improving operations, expediting incident response, and providing information on delays, with the latter utilized in trip planning to help re-route motorists and commercial drivers around congested areas.

Improve Safety
The top priority of INDOT or any transportation system provider is safety. While great strides have been made over time in terms of safety improvements, it is an unfortunate reality that crashes, injuries, and fatalities are inevitable. Many ITS services aim to minimize the risk of crash occurrence. This goal focuses on reducing the number and severity of crashes, thus lessening the probability of injuries and fatalities. Typical measures of effectiveness used to quantify safety performance include the overall crash rate, fatality crash rate, and injury crash rate.

Reduce Energy Consumption and Environmental Costs
Air quality and energy impacts of ITS services are important considerations, particularly for ozone non-attainment areas. Positive impacts on the environment result from reducing delay and offering more efficient traffic flow on the highway system. Decreases in emission levels and energy consumption are measures of effectiveness for this goal area.

Increase Economic Productivity
Virtually every item produced or consumed at one point relied on an efficient transportation system along the way, be it raw materials or the finished product. ITS deployments can reduce operating costs and allow productivity improvements for commercial vehicles and others who move goods from point to point. Some applications may save time, for example using traveler information to avoid congestion or in completing regulatory processes at Weigh Stations, enabling businesses to increase their economic efficiency. For public agencies such as INDOT, ITS alternatives for transportation improvements have lower implementation costs when compared to traditional capacity enhancing improvements, as well as another source of traffic-related data. The primary measure of effectiveness for this goal area is cost savings as a result of implementing ITS.

Create an Environment for an ITS Market
Certain ITS deployments represent new goods and services that re more likely to encourage growth in the ITS and automotive industries. The success of new and/or expanded industries supporting ITS depends on an open ITS Architecture and a nonrestrictive deployment strategy to encourage participation and innovation from the private sector.

1.8. BENEFITS OF ITS

ITS deployments across the Nation have yielded notable improvements in safety and traffic flow. Here in Indiana, a Purdue University Joint Transportation Research Program (JTRP) study of the Hoosier Helper Freeway Service Patrol program on the Borman Expressway (I-80/94) and I-65 in Northwest Indiana - where Hoosier Helpers aid nearly 20,000 motorists a year - reported a measurable payoff. The study found that Hoosier Helpers make driving more efficient and safer by clearing incidents quickly and therefore reducing the associated traffic congestion delay and vehicle operating costs, as well as by reducing the number of secondary crashes - those that occur in traffic backups created by incidents. Specifically, the benefits (non-recurring congestion delay savings, secondary crash reduction, and vehicle operating cost savings) outweighed the cost of the 24 hour program by 13 to 1. In other words, this B/C ratio of 13:1 means motorists reap $13 of benefits for every $1 spent on the Hoosier Helper program.

On a related note, the *2000 Highway Capacity Manual* clearly shows the capacity reduction effects of incidents on freeways. Logically, the effect of an incident on capacity depends on the proportion of the roadway that is blocked by the incident compared with the number of lanes on the freeway. The following table shows the percentage (proportion) of capacity available on a freeway per direction during different types (magnitudes) of incidents.

PERCENTAGE OF FREEWAY CAPACITY AVAILABLE DURING AN INCIDENT

# OF LANES PER DIRECTION	SHOULDER DISABLEMENT	SHOULDER CRASH	1 LANE BLOCKED	2 LANES BLOCKED	3 LANES BLOCKED
2	0.95%	0.81%	0.35%	0.00%	Not Applicable
3	0.99%	0.83%	0.49%	0.17%	0.00%
4	0.99%	0.85%	0.58%	0.25%	0.13%
5	0.99%	0.87%	0.65%	0.40%	0.20%

Clearly, the effect of incidents on capacity is great, ranging from a disabled vehicle on the shoulder to a complete blockage (closure). It is critical to note that the number of lanes closed is not directly proportional to the number of lanes per direction. For example, one lane blocked on a two lane per direction freeway reduces capacity by 65% (not by 50%), leaving only 35% of capacity. Likewise, two lanes blocked on a four lane per direction freeway reduces capacity by 75% (not by 50%), leaving only 25% of capacity. Furthermore, the “rubbernecking” factor reduces capacity in the opposite direction of travel depending on the magnitude of the incident (and number of emergency vehicles present), with a capacity reduction ranging from 5% for a single vehicle crash with one emergency vehicle present to a 25% reduction in capacity for a multi-vehicle crash with several emergency vehicles present. This data illustrates the vital importance of effective and efficient incident detection and management, which results in quicker restoration of the freeway’s capacity and the associated benefits to motorists, the economy, and society: improved safety, traveler mobility, and system efficiency, increased productivity, and conserved fuel / reduced environmental impact.

CHAPTER 2 – SYSTEM INVENTORY / TRANSPORTATION ASSESSMENT

2.1. INTRODUCTION

The State Highway System that is built, owned, and operated by INDOT is comprised of 11,185 miles of Interstates, US Routes, and State Roads. The original intent of the system dating back to 1919 was to create a highway network that would connect every county seat and municipality with a population of over 5,000. The system has grown, matured, and been systematically upgraded over the years. One of the most significant, perhaps the most significant addition to the system is the Interstate System. The Interstate System is the highest classification of all roads in the Nation, providing the highest level of mobility at high speeds for long uninterrupted distances.

The Interstate System's roots date back to 1938, with the original designation of the System in 1947, followed by subsequent additions over time. The Interstates represented a new concept in travel: full access control, with access only at interchanges. The lack of at-grade access and the subsequent delay with signals significantly increases the capacity of the roadway, making the Interstate System extremely attractive for travel purposes. In fact, the FHWA indicates in its *Highway Statistics 2002* document that the Interstate System carries a phenomenal 24 percent of the Nation's traffic while comprising only 1.2 percent (46,748 miles) of the Nation's 3,981,670 mile road network.

The FHWA also reports that the Interstate System in Indiana comprises 1,169 miles of the 11,185 miles of highway in the State Highway System. Of the 1,169 miles of Interstate in Indiana, 852 miles are classified as Rural Interstate and 317 miles are classified as Urban Interstate. The Rural Interstates carry 24 percent of all Rural Vehicle Miles Traveled (VMT) in Indiana (National average is 25 percent). The Urban Interstates carry 20 percent of all Urban VMT in Indiana (National average is 24 percent). Collectively, the Interstate System in Indiana carries 22 percent of all VMT statewide (National average is 24 percent), while comprising only 1.2 percent of the statewide total of 94,287 miles of roadway. Thus, Indiana is reasonably close to the National averages.

In the Indianapolis area, the 116 miles of Interstates comprise only 2.7 percent of the area's 4,334 miles of roadway but the Interstates carry 34 percent of all Daily Vehicle Miles Traveled (VMT), per the FHWA. Nationally, the Interstates average only 1.6 percent of urban mileage but carry 25 percent of the Daily VMT in the largest 382 Urbanized Areas (those 50,000 or greater in population) in the Nation.

Not only are volumes an important element of Interstate statistics, but the composition of traffic is also critical. Nationally, the FHWA reports that trucks (2-axle, 6 tires or greater) represent 24 percent of vehicles on Rural Interstates (18 percent are 5-axle or greater) and 11 percent of vehicles on Urban Interstates (six percent are 5-axle or greater). More significantly, 43 percent of all Rural truck VMT takes place on the Interstate System, 37 percent of all Urban truck VMT takes place on the Interstate System, and 41 percent of all truck VMT takes place on the Interstate System.

By nature of its full access control, the Interstate System moves high volumes of traffic but provides limited opportunities to exit the System in case of delays caused by incidents. ITS can play a key role in detecting incidents and notifying the motoring public of the incident. While some roads in INDOT's system carry more traffic than some portions of the Interstate System, their lower degree of access control enables motorists to more easily divert in case of an incident. The same can not be said about the Interstate System and other full access control facilities (freeways). **Thus, the focus of INDOT's ITS investment will be on the Interstate System and other freeways due to the significant proportion and composition of traffic on the System coupled with the limited ability to divert in case of incidents on an Interstate or any other freeway.**

2.2. INTERSTATE / FREEWAY ANNUAL AVERAGE DAILY TRAFFIC (AADT) AND LEVEL OF SERVICE (LOS)

Annual Average Daily Traffic (AADT) is a 48 hour traffic count that is averaged to a 24 hour traffic count and adjusted for excess axles and seasonal fluctuations in travel. The following tables represent the current (2004) AADT for the Interstate System in Indiana (plus select segments of freeways) that has been balanced to account for year to year fluctuations in traffic counts that invariably occur. AADT projections, based upon INDOT's Travel Demand Model for 2030, which is beyond the planning horizon for this document, and projections from various project development / environmental studies, are also provided to give estimates of future traffic growth.

The *Highway Capacity Manual* defines Level of Service (LOS) as a quality measure describing operational conditions within a traffic stream (in this case an uninterrupted flow facility such as a freeway), generally in terms of speed, travel time, freedom to maneuver, and comfort and convenience. Six Levels of Service from A to F are defined, with LOS A representing the best operating conditions and LOS F the worst. The Levels of Service for freeways are generally described as:

LOS A: Free-flow operations, motorists are essentially unimpeded in their ability to maneuver in the traffic stream, and incidents are easily absorbed.

LOS B: Reasonably free-flow, the ability of motorists to maneuver is only slightly restricted, and minor incidents are still easily absorbed.

LOS C: Speeds are at or near the free-flow speed, but ability to maneuver in the traffic stream is more noticeably restricted, and while minor incidents may still be absorbed, queues may be expected to form behind any significant blockage.

LOS D: Speeds begin to decline with increasing flows, freedom to maneuver is noticeably limited, and minor incidents will created queuing since the traffic stream has little space to absorb disruptions.

LOS E: Speeds are volatile as there are very few gaps in the traffic stream, the ability to maneuver is extremely limited, and capacity is reached at the highest density value. Any incident will produce a serious breakdown in flow with extensive queues.

LOS F: Capacity is exceeded and breakdowns in flow exist.

The geometric design criteria for a **new or completely reconstructed freeway** in **Chapter 53** of the *Indiana Design Manual* calls for the following Levels of Service for Rural and Urban Freeways:

Rural Freeways: Desirable LOS B, Minimum LOS C
Urban Freeways: Desirable LOS B, Minimum LOS C (Minimum LOS D is allowed for urban reconstruction projects only). LOS C is sometimes referred to as "Desirable Minimum" and LOS D is sometimes referred to as "Absolute Minimum."

While ITS is obviously not building new freeways or reconstructing existing ones, these policies from the *Indiana Design Manual* illustrate what is considered desirable and minimum Levels of Service on Indiana freeways. **These LOS policies will serve as a basis for possible investment in ITS devices on Indiana's Interstates and freeways.**

Due to the extensive nature of data analysis required, detailed capacity analyses were not conducted for each segment of freeway on INDOT's system presented in this document. However, the Florida Department of Transportation's *2002 Quality / Level of Service Handbook* provides generalized Levels of Service based upon AADT for many facility types, including freeways, and was utilized for this analysis. This broad type of planning analysis is appropriate for use in a statewide analysis such as this. The documentation developed by Florida DOT is based upon the definitions and methodology of the *2000 Highway Capacity Manual*.

It should be noted that **the Levels of Service presented in the tables to follow take into consideration the number of lanes open to traffic at the end of 2004.** Capacity improvements in 2005 and beyond are not shown or factored for, as this document, while looking ahead, also reflects a snapshot in time to provide for statewide comparison. As such, Levels of Service in 2030 (the planning horizon for INDOT's Long Range Plan) are not provided as 2030 is beyond the planning horizon of this document, as well as the fact that many segments of Interstate in Indiana are either programmed for additional capacity, are identified in the INDOT Long Range Plan for Added Travel Lanes in the future, or are not currently identified for improvement but would nevertheless be improved by 2030.

As previously stated, **the minimum Level of Service policies for new or completely reconstructed freeways from the *Indiana Design Manual* will serve as a basis for possible investment in ITS devices on Indiana's Interstates and freeways.** It should be noted that short segments of Urban Interstates near smaller Urban Areas that are surrounded by long segments of Rural Interstate (such as at Anderson, Columbus, Lafayette, Marion, Richmond, Terre Haute, etc.) will be treated as if they are Rural Interstates, as their operating characteristics are more akin to a Rural Interstate than as an Urban Interstate in Indianapolis or Northwest Indiana. I-469 at Fort Wayne will also be treated as a Rural Interstate, as the vast majority of the route is Rural Interstate and its operating characteristics are more rural in nature compared to I-69 in the Fort Wayne area. **Segments of freeway at or below Level of Service C will be highlighted in the tables below based upon their current Level of Service as follows:**

Level of Service D, E, or F (Below Desirable Minimum LOS)

RURAL Interstates with LOS D, E, or F

URBAN Interstates / Freeways with LOS D, E, or F

Level of Service C (Desirable Minimum LOS)

RURAL Interstates with LOS C

URBAN Interstates / Freeways with LOS C

Furthermore, ***segments of Interstate that are currently fully deployed with ITS devices*** *(*vehicle detection and Closed Circuit TV Cameras (CCTV Cameras)), ***are shown in bold and italics*** *in the tables below.* Currently, only I-80/94 and I-65 in Northwest Indiana are fully deployed with ITS devices, as well as the southernmost ½ mile segment of I-65 in Jeffersonville as part of the TRIMARC deployment (Traffic Response and Incident Management Assisting the River Cites), a joint venture of the Kentucky Transportation Cabinet (KYTC) and INDOT, with KYTC the lead agency.

Finally, *segments of Interstate that are currently proposed for full deployment of ITS devices* (vehicle detection and Closed Circuit TV Cameras (CCTV Cameras)), *are shown in italics* in the tables below. This includes the Indianapolis area, the Indiana Toll Road (I-90), and portions of Southern Indiana near Louisville, as part of TRIMARC.
In addition to the tables below, maps showing current (2004) Annual Average Daily Traffic (AADT) for Interstates and Freeways statewide (in increments of 10,000), as well as maps for the metropolitan areas of Indianapolis, Northwest Indiana, Evansville, Fort Wayne, Southern Indiana near Louisville, and South Bend / Mishawaka / Elkhart, may be found at the end of this chapter. Likewise, the same series of maps depicting Level of Service (LOS) may be found at the end of this chapter after the AADT maps.

2.2.1. Interstate 64

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Illinois State Line	SR 69	14,390	A	26,370
SR 69	SR 165	11,810	A	22,210
SR 165	SR 65	12,330	A	22,470
SR 65	US 41	12,910	A	23,700
US 41	I-164 / SR 57	16,870	A	28,910
I-164 / SR 57	SR 61	15,770	A	25,590
SR 61	SR 161	13,760	A	22,890
SR 161	US 231	12,320	A	20,010
US 231	SR 162	12,510	A	21,220
SR 162	SR 145	13,170	A	21,460
SR 145	West jct SR 37	13,010	A	20,780
West jct SR 37	East jct SR 37	15,730	A	24,880
East jct SR 37	SR 66	15,790	A	25,230
SR 66	SR 135	16,670	A	26,180
SR 135	Lanesville Interchange	25,770	B	40,150
Lanesville Interchange	SR 62/64	31,290	B	48,430
SR 62/64 **	US 150 **	52,110	C	68,910
US 150 *	I-265 *	68,250	D	97,390
I-265 *	SR 111 / Spring St *	71,220	D	103,080
SR 111 / Spring St *	Kentucky State Line *	91,790	D	123,120

* - Note: I-64 from US 150 to the Kentucky State Line currently features CCTV Camera deployment with one mile spacing, but no vehicle detection, nor is it currently proposed for vehicle detection, per the TRIMARC Strategic Plan.

** - Note: I-64 from SR 62/64 to US 150 is proposed for CCTV deployment with one mile spacing, but no vehicle detection, per the TRIMARC Strategic Plan.

2.2.2. Interstate 65

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Kentucky State Line	***Court Ave***	***118,640***	***D***	***157,730***
Court Ave	***10th St***	***97,160***	***D***	***133,710***
10th St	*Brown's Station Way*	*113,990*	*D*	*166,140*
Brown's Station Way	*Eastern Blvd*	*103,390*	*C*	*153,780*
Eastern Blvd	*US 31/Lewis and Clark Pkwy*	*79,200*	*C*	*130,470*
US 31/Lewis and Clark Pkwy	*Veterans Pkwy*	*75,060*	*B*	*133,380*
Veterans Pkwy	*I-265*	*75,060*	*B*	*105,870*
I-265	*SR 60*	*73,400*	*C*	*99,420*
SR 60 *	SR 311 *	53,660	B	78,080
SR 311	Memphis Rd	40,770	C	60,380
Memphis Rd	SR 160	36,190	C	52,460
SR 160	SR 56	35,410	C	51,770
SR 56	SR 256	30,770	B	45,850
SR 256	US 31 (Exit 36)	34,480	B	49,530
US 31 (Exit 36)	SR 250	32,180	B	46,570
SR 250	US 50	33,910	B	47,100
US 50	SR 11	30,380	B	48,260
SR 11	SR 58	34,870	B	52,840
SR 58	SR 46	35,600	C	53,260
SR 46	US 31 (Exit 76)	33,640	B	49,140
US 31 (Exit 76)	SR 252	39,000	C	55,550
SR 252	SR 44	45,870	C	59,750
SR 44	Whiteland Rd (CR 500N)	54,280	D	69,020
Whiteland Rd (CR 500N)	Greenwood Rd (Main St)	61,180	E	80,940
Greenwood Rd (Main St)	County Line Rd	76,920	C	96,310
County Line Rd	*Southport Rd*	*80,290*	*C*	*100,480*
Southport Rd	*I-465 (South Leg)*	*104,280*	*E*	*133,040*
I-465 (South Leg)	*Keystone Ave*	*75,220*	*C*	*90,180*
Keystone Ave	*Raymond St*	*75,930*	*C*	*93,790*
Raymond St	*I-70 (South Split)*	*98,270*	*D*	*115,530*
Begin I-70 travel over I-65				
I-70 (South Split)	*Market St / Ohio St*	*132,410*	*D*	*161,810*
Market St / Ohio St	*I-70 (North Split)*	*153,870*	*E*	*189,570*
End I-70 travel over I-65				
I-70 (North Split)	*West St*	*126,160*	*D*	*151,390*
West St	*21st St*	*118,090*	*D*	*141,700*
21st St	*29th / 30th St*	*114,070*	*D*	*141,970*
29th / 30th St	*Dr. Martin Luther King Jr. St*	*96,060*	*D*	*125,080*
Dr. Martin Luther King Jr. St	*38th St / Kessler Blvd*	*96,740*	*D*	*127,970*
38th St / Kessler Blvd	*Lafayette Rd*	*66,510*	*C*	*101,960*
Lafayette Rd	*I-465 (West Leg)*	*53,150*	*B*	*82,560*

FROM	TO	2004 AADT	2004 LOS	2030 AADT
I-465 (West Leg)	*71st St*	*45,470*	*C*	*66,250*
71st St	*I-865*	*42,860*	*C*	*55,210*
I-865	*SR 334*	*64,020*	*E*	*83,480*
SR 334	*SR 267*	*55,500*	*D*	*75,300*
SR 267	Indianapolis Ave (Exit 138)	56,300	D	74,750
Indianapolis Ave (Exit 138)	SR 39	49,760	D	69,380
SR 39	SR 32	49,440	D	68,020
SR 32	US 52	44,020	C	65,380
US 52	SR 47	41,770	C	57,240
SR 47	SR 28	40,120	C	55,890
SR 28	SR 38 / SR 25 (South jct.)	40,510	C	55,490
SR 38 / SR 25 (South jct.)	SR 26	43,350	C	62,030
SR 26	SR 25 (North jct.)	47,020	C	70,800
SR 25 (North jct.)	SR 43	41,690	C	64,820
SR 43	SR 18	32,770	B	46,250
SR 18	US 231 (Exit 193)	30,240	B	41,040
US 231 (Exit 193)	US 24/231	32,280	B	43,110
US 24/231	US 231 (Exit 205)	29,740	B	41,340
US 231 (Exit 205)	SR 114	27,980	B	39,030
SR 114	SR 14 (CN 2004-2005)	30,550	B	40,600
SR 14 (CN 2004-2005)	SR 10	30,550	B	38,410
SR 10	SR 2	32,240	B	41,550
SR 2	US 231 (Exit 247)	34,480	B	48,750
US 231 (Exit 247)	US 30	37,640	C	59,120
US 30	***61st Ave***	***76,500***	***C***	***91,770***
61st Ave	***Ridge Rd / 37th Ave***	***79,200***	***C***	***90,080***
Ridge Rd / 37th Ave	***I-80/94 W Connector Ramp***	***81,500***	***C***	***94,450***
I-80/94 W Connector Ramp	***I-80/94 (Borman Expwy)***	***36,900***	***C***	***43,360***
I-80/94 (Borman Expwy)	15th Ave	30,510	B	41,950
15th Ave	I-90 (Indiana Toll Road)	26,190	B	40,760

* - Note: I-65 at SR 311 is proposed for CCTV deployment (one camera), but no vehicle detection, per the TRIMARC Strategic Plan.

2.2.3. Interstate 69

FROM	TO	2004 AADT	2004 LOS	2030 AADT
I-465	*82nd St*	*123,670*	*F*	*178,080*
82nd St	*96th St*	*105,540*	*E*	*162,650*
96th St	*SR 37 / 116th St*	*87,820*	*D*	*142,790*
SR 37 / 116th St	*SR 238*	*51,860*	*D*	*85,920*
SR 238	SR 13	54,000	D	72,930
SR 13	SR 38	50,460	D	68,630
SR 38	SR 9/67	48,630	D	64,890
SR 9/67	SR 9/109	44,650	C	61,400
SR 9/109	SR 32/67	38,700	C	55,680
SR 32/67	SR 332	32,170	B	48,440
SR 332	US 35 / SR 28	27,510	B	41,190
US 35 / SR 28	SR 26	29,690	B	45,390
SR 26	US 35 / SR 22	28,800	B	41,860
US 35 / SR 22	SR 18	30,220	B	41,970
SR 18	SR 5/218	25,040	B	36,940
SR 5/218	SR 5	25,530	B	39,050
SR 5	US 224	23,490	B	37,230
US 224	I-469 (South jct.)	24,510	B	39,920
I-469 (South jct.)	Lower Huntington Rd	33,660	B	55,900
Lower Huntington Rd	US 24 /Jefferson Blvd	36,850	C	61,410
US 24 / Jefferson Blvd	SR 14 / Illinois Rd	49,700	B	86,320
SR 14 / Illinois Rd	US 30/33 / SR 930	64,110	C	101,200
US 30/33 / SR 930	US 27 / SR 3	62,250	C	96,340
US 27 / SR 3	Coldwater Rd	57,620	C	95,680
Coldwater Rd	I-469 (North jct.)	57,830	C	102,010
I-469 (North jct.)	SR 1 / Dupont Rd	55,830	C	84,690
SR 1 / Dupont Rd	CR 11A	34,720	B	49,510
CR 11A	SR 8	33,290	B	46,420
SR 8	US 6	32,180	B	45,320
US 6	SR 4	30,130	B	40,180
SR 4	US 20	27,260	B	38,740
US 20	CR 200W	22,740	B	31,710
CR 200W	SR 127	21,270	A	28,290
SR 127	I-80/90 (IN Toll Rd) / SR 120	20,320	A	28,090
I-80/90 (IN Toll Rd) / SR 120	Lake George Rd	20,890	A	28,530
Lake George Rd	Michigan State Line	20,960	A	29,010

2.2.4. Interstate 70

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Illinois State Line	US 40	24,850	B	39,600
US 40	Darwin Rd	23,260	B	34,960
Darwin Rd	US 41/150	27,210	B	38,790
US 41/150	SR 46	39,530	C	51,570
SR 46	SR 59	34,210	B	53,260
SR 59	SR 243	30,450	B	46,790
SR 243	US 231	31,390	B	42,820
US 231	CR 1100W (Little Point Rd)	35,830	C	50,170
CR 1100W (Little Point Rd)	SR 39	37,880	C	54,300
SR 39	SR 267	44,860	C	66,330
SR 267	*Ronald Reagan Pkwy (Six Points Rd)*	*60,630*	*C*	*89,070*
Ronald Reagan Pkwy (Six Points Rd)	*I-465 (West Leg)*	*60,630*	*B*	*100,030*
I-465 (West Leg)	*Airport Expwy*	*48,450*	*B*	*65,430*
Airport Expwy	*Holt Rd*	*75,080*	*C*	*92,780*
Holt Rd	*Harding St*	*88,470*	*D*	*106,160*
Harding St	*West St*	*94,600*	*D*	*114,260*
West St	*McCarty St*	*95,130*	*D*	*115,530*
McCarty St	*I-65 (South Split)*	*99,230*	*C*	*125,030*
Begin I-70 travel over I-65				
I-65 (South Split)	*Market St / Ohio St*	*132,410*	*D*	*161,810*
Market St / Ohio St	*I-65 (North Split)*	*153,870*	*E*	*189,570*
End I-70 travel over I-65				
I-65 (North Split)	*Rural St / Keystone Ave*	*170,590*	*D*	*206,330*
Rural St / Keystone Ave	*Emerson Ave*	*152,080*	*E*	*182,140*
Emerson Ave	*Shadeland Ave*	*125,850*	*D*	*158,130*
Shadeland Ave	*I-465 (East Leg)*	*116,700*	*C*	*140,740*
I-465 (East Leg)	*Post Rd*	*74,840*	*B*	*90,000*
Post Rd	*Mt Comfort Rd*	*53,620*	*D*	*67,120*
Mt Comfort Rd	SR 9	43,770	C	56,020
SR 9	SR 109	36,840	C	48,540
SR 109	SR 3	31,530	B	43,440
SR 3	Wilbur Wright Rd	30,130	B	42,650
Wilbur Wright Rd	SR 1	31,400	B	43,080
SR 1	Centerville Rd	28,790	B	43,940
Centerville Rd	US 35	34,810	B	56,110
US 35	US 27	39,660	C	64,550
US 27	SR 227	41,080	C	64,280
SR 227	US 40	38,930	C	59,970
US 40	Ohio State Line	27,530	B	49,820

2.2.5. Interstate 74

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Illinois State Line	SR 63	19,320	A	27,380
SR 63	Covington Rd	18,220	A	25,750
Covington Rd	US 41	15,620	A	23,360
US 41	SR 25	15,810	A	25,860
SR 25	US 231	16,060	A	27,070
US 231	SR 32	15,510	A	24,300
SR 32	SR 75	14,950	A	24,680
SR 75	SR 39	16,280	A	26,430
SR 39	CR 275E (Pittsboro)	18,840	A	29,890
CR 275E (Pittsboro)	SR 267	20,860	A	35,590
SR 267 *	I-465 (West Leg) *	33,850	C	54,780
I-74 travels over I-465 for 20.2 miles				
I-465 (East Leg)	*Post Rd*	*36,200*	*C*	*54,450*
Post Rd	*Acton Rd*	*35,950*	*C*	*49,300*
Acton Rd	*Pleasant View Rd*	*35,390*	*C*	*48,600*
Pleasant View Rd	London Rd	34,640	B	47,950
London Rd	Fairland Rd	28,920	B	41,320
Fairland Rd	SR 9	29,880	B	40,790
SR 9	SR 44	28,340	B	40,860
SR 44	SR 244	24,510	B	37,240
SR 244	St Paul / Middletown Interch.	21,440	B	33,800
St Paul / Middletown Interch.	US 421	22,080	B	34,550
US 421	SR 3	18,410	A	32,660
SR 3	New Point - Rossburg Rd	21,790	B	36,200
New Point - Rossburg Rd	SR 229	19,720	A	33,890
SR 229	SR 101	20,750	A	36,200
SR 101	SR 1	23,800	B	36,700
SR 1	US 52	24,460	B	40,670
US 52	Ohio State Line	29,350	B	50,240

* Note: Only the three mile segment of I-74 from Raceway Road to I-465 is currently proposed for full ITS deployment. Thus, this entire seven mile segment of I-74 from SR 267 to I-465 is not depicted as proposed for full ITS deployment.

2.2.6. Interstate 80/94 (Borman Expressway)

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Illinois State Line	*US 41 / Calumet Ave*	*162,950*	*F*	*202,510*
US 41 / Calumet Ave	*US 41 / SR 152 (Indpls Blvd)*	*153,700*	*E*	*192,190*
US 41 / SR 152 (Indpls Blvd)	*Kennedy Ave*	*145,330*	*E*	*184,350*
Kennedy Ave	*SR 912 (Cline Ave)*	*136,190*	*D*	*168,520*
SR 912 (Cline Ave)	*Burr St*	*130,400*	*D*	*164,430*
Burr St	*Grant St*	*127,930*	*F*	*166,680*
Grant St	*SR 53 (Broadway)*	*125,940*	*F*	*160,940*
SR 53 (Broadway)	*I-65 S Connector Ramp*	*125,480*	*F*	*160,380*
I-65 S Connector Ramp	*I-65*	*80,880*	*C*	*109,290*
I-65	*Central Ave*	*90,920*	*C*	*112,000*
Central Ave	*US 6 / SR 51 / I-90 (Toll Rd)*	*81,710*	*D*	*105,310*
End I-94 travel over I-80				

2.2.7. Interstate 90 (Indiana Toll Road) (Including I-80 east of I-94)

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Illinois State Line	*US 12/20/41 (Indpls Blvd)*	*48,120*	*B*	*76,830*
US 12/20/41 (Indpls Blvd)	*SR 912 (Cline Ave) (W jct.)*	*39,030*	*B*	*68,090*
SR 912 (Cline Ave) (W jct.)	*US 41 (Calumet Ave)*	*31,100*	*B*	*59,060*
US 41 (Calumet Ave)	*SR 912 (Cline Ave) (E jct.)*	*30,120*	*B*	*55,220*
SR 912 (Cline Ave) (E jct.)	*Grant St*	*40,100*	*C*	*64,730*
Grant St	*SR 53 (Broadway)*	*43,180*	*C*	*65,980*
SR 53 (Broadway)	*I-65 / US 12/20*	*39,200*	*C*	*63,080*
I-65 / US 12/20	*I-80/94 (Borman Expwy)*	*32,980*	*B*	*55,400*
Begin I-80 travel over I-90				
I-80/94 (Borman Expwy)	*Willow Creek Rd*	*37,410*	*C*	*54,290*
Willow Creek Rd	*SR 49*	*26,610*	*B*	*39,060*
SR 49	*US 421*	*23,330*	*B*	*36,330*
US 421	*SR 39*	*23,420*	*B*	*37,530*
SR 39	*US 31*	*24,200*	*B*	*42,360*
US 31	*SR 933*	*26,000*	*B*	*45,300*
SR 933	*SR 23 / 331*	*25,350*	*B*	*47,500*
SR 23 / 331	*SR 19*	*26,090*	*B*	*45,410*
SR 19	*CR 17*	*25,280*	*B*	*47,910*
CR 17	*SR 15*	*25,060*	*B*	*47,820*
SR 15	*US 131 / SR 13*	*23,840*	*B*	*44,050*
US 131 / SR 13	*SR 9*	*22,960*	*B*	*40,910*
SR 9	*I-69*	*23,150*	*B*	*40,280*
I-69	*Ohio State Line*	*26,170*	*B*	*44,490*

2.2.8. Interstate 94 *

FROM	TO	2004 AADT / FRI & SUN SUMMER VOLUMES	2004 LOS / FRI & SUN SUMMER LOS	2030 AADT
End I-94 travel over I-80				
I-90 (Indiana Toll Rd)	SR 249	65,570 / 87,360	C / D	90,340
SR 249	US 20	55,250 / 77,040	C / D	82,910
US 20	SR 49	49,550 / 71,340	B / C	79,320
SR 49	US 421	41,250 / 63,040	B / C	60,310
US 421	US 20/35	38,840 / 60,630	B / C	54,850
US 20/35	Michigan State Line	30,260 / 52,050	A / B	44,010

* - Note: while I-94 generally does not have high volumes or exceptionally poor LOS on its six lanes, it does experience significant spikes in traffic on Fridays and Sundays in summer. Data from the segment from US 421 to US 20/35 indicates a 40% increase in traffic on Fridays during summer and a 48% increase in traffic on Sundays during summer compared to AADT. The average increase of these two days during the summer is 44% on I-94 between US 421 and US 20/35, an increase of 21,790 vehicles over AADT. This additional traffic is reflected in the chart above as an across the board increase of 21,790 vehicles on a Friday or Sunday during summer, with the corresponding LOS for summertime Fridays and Sundays also shown. The shading corresponds to AADT LOS, not the Friday and Sunday LOS during summer. As the table above shows, LOS deteriorates by one level on Fridays and Sundays on I-94 during the summer months.

2.2.9. Interstate 164

FROM	TO	2004 AADT	2004 LOS	2030 AADT
US 41	Green River Rd	27,830	B	37,310
Green River Rd	SR 662 / Newburgh Rd	20,090	A	33,190
SR 662 / Newburgh Rd	SR 66 (Lloyd Expwy)	20,300	A	37,480
SR 66 (Lloyd Expwy)	SR 62 (Morgan Ave)	22,550	B	48,020
SR 62 (Morgan Ave)	Lynch Rd	22,050	B	56,820
Lynch Rd	Boonville-New Harmony Rd	22,050	B	45,720
Boonville-New Harmony Rd	SR 57	20,560	A	42,300
SR 57	I-64	23,910	B	47,260

Note: I-69 will be incorporated into I-164 in the future from approximately 1.5 miles east of US 41 to I-64.

2.2.10. Interstate 265

FROM	TO	2004 AADT	2004 LOS	2030 AADT
I-64	*State St*	*49,630*	*C*	*76,580*
State St	*SR 111 (Grant Line Rd)*	*52,360*	*C*	*69,050*
SR 111 (Grant Line Rd)	*SR 311 (Charlestown Rd)*	*44,530*	*C*	*58,180*
SR 311 (Charlestown Rd)	*I-65*	*38,880*	*C*	*51,100*

2.2.11. Interstate 275

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Kentucky State Line	US 50	33,950	B	53,410
US 50	Ohio State Line	33,600	B	52,570

2.2.12. Interstate 465

FROM	TO	2004 AADT	2004 LOS	2030 AADT
I-65 (Exit 53)	US 31 / East St	93,130	D	125,220
US 31 / East St	SR 37 / Harding St	75,020	C	106,840
SR 37 / Harding St	Mann Rd	84,800	D	116,670
Mann Rd	SR 67 / Kentucky Ave	76,200	C	104,210
SR 67 / Kentucky Ave	I-70 (Exit 9)	101,690	C	136,060
I-70 (Exit 9)	Airport Expwy	101,550	D	147,630
Airport Expwy	US 40 / W Washington St	128,550	E	174,930
US 40 / W Washington St	US 36 / Rockville Rd	138,510	F	182,290
US 36 / Rockville Rd	10th St	149,470	F	192,290
10th St	I-74 / US 136 / Crawfordsville Rd	143,700	F	188,300
End I-74 travel over I-465				
I-74 / US 136 / Crawfordsville Rd	38th St	119,540	E	160,810
38th St	56th St	106,900	E	149,490
56th St	I-65 (Exit 20)	94,280	D	133,730
I-65 (Exit 20)	71st St	114,890	E	156,070
71st St	86th St	99,720	D	139,520
86th St	I-865	88,140	D	121,370
I-865	US 421 / Michigan Rd	107,180	E	139,030
US 421 / Michigan Rd	US 31 / Meridian St	119,425	E	158,130
US 31 / Meridian St	SR 431 / Keystone Ave	121,260	F	156,220
SR 431 / Keystone Ave	Allisonville Rd	134,140	F	167,980
Allisonville Rd	I-69 / SR 37	123,460	F	161,560
I-69 / SR 37	Shadeland Ave / 56th St	134,420	D	174,050
Shadeland Ave / 56th St	US 36 / SR 67 / Pendleton Pike	141,980	D	181,730
US 36 / SR 67 / Pendleton Pike	I-70 (Exit 44)	148,110	D	195,000
I-70 (Exit 44)	US 40 / E Washington St	103,110	C	141,440
US 40 / E Washington St	US 52 / Brookville Rd	90,540	D	120,280
US 52 / Brookville Rd	Shadeland Ave	82,900	D	100,110
Shadeland Ave	I-74 / US 421 / Southeastern Ave	104,240	C	128,310
Begin I-74 travel over I-465				
I-74 / US 421 / Southeastern Ave	Emerson Ave	97,400	D	122,220
Emerson Ave	I-65 (Exit 53)	108,660	E	131,400

2.2.13. Interstate 469

FROM	TO	2004 AADT	2004 LOS	2030 AADT
I-69 (S jct.)	Lafayette Center Rd	22,740	A	47,010
Lafayette Center Rd	Indianapolis Rd	21,810	A	45,790
Indianapolis Rd	SR 1	15,760	A	33,810
SR 1	Winchester Rd	17,690	A	38,330
Winchester Rd	US 27/33	17,900	A	37,670
US 27/33	Marion Center Rd	16,410	A	35,310
Marion Center Rd	Tillman Rd	14,350	A	31,160
Tillman Rd	Minnich Rd	15,650	A	34,060
Minnich Rd	US 30 / SR 930	16,410	A	35,250
US 30 / SR 930	US 24	29,090	B	51,390
US 24	SR 37	28,290	B	43,310
SR 37	Maplecrest Rd	25,570	B	43,020
Maplecrest Rd	I-69 (N jct.)	36,130	C	67,670

2.2.14. Interstate 865

FROM	TO	2004 AADT	2004 LOS	2030 AADT
I-65	*I-465*	*21,160*	*A*	*28,270*

2.2.15. US 20/31 (St. Joseph Valley Parkway)

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Michigan State Line	Cleveland Rd / Brick Rd	17,270	A	29,910
Cleveland Rd / Brick Rd	I-80/90 (Indiana Toll Road)	20,880	A	36,170
I-80/90 (Indiana Toll Road)	US 20 / Lincolnway West)	22,350	B	37,700
Begin US 20 travel over US 31				
US 20 / Lincolnway West	SR 2 / Western Ave	23,400	B	37,600
SR 2 / Western Ave	Mayflower Rd	24,030	B	35,390
Mayflower Rd	SR 23	24,710	B	38,140
SR 23	US 31 / Michigan St	28,640	B	44,030
End US 31 travel over US 20				
US 31 / Michigan St	Ironwood Dr	33,320	B	40,880
Ironwood Dr	SR 331 (W jct.)	33,460	B	41,050
SR 331 (W jct.)	SR 331 (Elm Rd/Capital Ave)	27,940	B	36,320
SR 331 (Elm Rd/Capital Ave)	SR 19 (Nappanee St)	24,840	B	30,420
SR 19 (Nappanee St)	US 33	23,210	B	31,180
US 33	CR 17	20,370	A	28,710

2.2.16. SR 62/66 (Lloyd Expressway) (Freeway Segments Only)

FROM	TO	2004 AADT	2004 LOS	2030 AADT
Fulton Ave	Main St	65,900	C	85,010
Main St	US 41	62,480	C	81,610
End SR 62 / Begin SR 66				
US 41	Weinbach Ave	63,770	C	78,850
Weinbach Ave	Boeke Rd	57,700	C	70,590
Boeke Rd	Vann Ave	64,360	C	82,190

Note: The above segments are the freeway segments of the Lloyd Expressway. However, the western terminus at Fulton Avenue and the eastern terminus at Vann Avenue are signalized intersections, as are the two ramp terminals at US 41.

2.2.17. SR 265

FROM	TO	2004 AADT	2004 LOS	2030 AADT
I-65	*SR 62*	*23,490*	*B*	*40,710*

Note: SR 265 will become I-265 when the connection across the Ohio River to I-265 in Kentucky is completed.

2.2.18. SR 912 (Cline Avenue)

FROM	TO	2004 AADT	2004 LOS	2030 AADT
I-90 (IN Toll Road) (W jct.)	US 41 (Calumet Ave)	7,130	A	9,030
US 41 (Calumet Ave)	Riley Rd	19,550	A	26,160
Riley Rd	Michigan Ave	24,670	A	31,800
Michigan Ave	US 12 / Industrial Hwy	40,910	B	51,340
US 12 / Industrial Hwy	SR 312 / Chicago Ave	43,190	C	55,410
SR 312 / Chicago Ave	I-90 (IN Toll Rd) (E jct.)	41,560	C	49,960
I-90 (IN Toll Rd) (E jct.)	US 12/20 (5th Ave)	48,750	C	58,620
US 12/20 (5th Ave)	15th Ave / 169th St	49,420	C	63,040
15th Ave / 169th St	I-80/94 (Borman Expwy)	53,240	D	69,770

Note: The non-freeway segment of SR 912 south of I-80/94 is not included in this freeway analysis.

2.3. HIGH VOLUME ARTERIALS INTERSECTING THE INTERSTATE SYSTEM

While investment in ITS devices will be focused on the Interstate System and other freeways, there are arterials that approach and feed the Interstate System with significant volumes of traffic. When incidents occur on a downstream Interstate, motorists on the arterial would benefit from receiving information regarding the incident (as would motorists on the affected Interstate), as some arterial motorists would choose an alternate route and not enter the affected Interstate. This motorist information would most likely be conveyed in the form of a Dynamic Message Sign (DMS).

Candidate arterials should generally meet the following criteria: **an INDOT facility with a two-way AADT of 40,000 or greater for at least two miles approaching an Interstate that is currently fully deployed with ITS devices** (vehicle detection and CCTV cameras) **or is currently proposed for full deployment of ITS devices** (vehicle detection and CCTV cameras). A two-way AADT of 40,000 generally corresponds to LOS C for a six lane divided arterial and LOS E for a four lane divided arterial.

2.3.1. US 30 (Northwest Indiana Area)

INTERSTATE BEING APPROACHED ON US 30	LENGTH	2004 AADT
I-65, from the west, Northwest Indiana / Merrillville	2.5 miles	40,860 – 64,520

2.3.2. US 31 (Indianapolis Area)

INTERSTATE BEING APPROACHED ON US 31	LENGTH	2004 AADT
I-465 (South Leg), from the south, Indianapolis *	8.4 miles	38,790 – 56,100
I-465 (North Leg), from the north, Indianapolis	2.8 miles	43,230 – 59,340

* While a portion of US 31's AADT is slightly below 40,000 in the middle of this 8.4 mile segment, the lengthy nature of this segment of US 31, coupled with traffic near or above the 40,000 threshold throughout, warrants consideration of potential DMS deployment.

2.3.3. US 36 (Indianapolis Area)

INTERSTATE BEING APPROACHED ON US 36	LENGTH	2004 AADT
I-465 (West Leg), from the west, Indianapolis	7.0 miles	40,980 – 62,160

2.3.4. SR 431 (Indianapolis Area)

INTERSTATE BEING APPROACHED ON SR 431	LENGTH	2004 AADT
I-465 (North Leg), from the north, Indianapolis	2.4 miles	48,370 – 83,470

2.3.5. SR 912 (Northwest Indiana Area) (Freeway)

INTERSTATE BEING APPROACHED ON SR 912	LENGTH	2004 AADT
I-80/94 (Borman Expwy), from the north, Northwest IN	5.9 miles	40,910 – 53,240

CHAPTER 3 – PROPOSED INDOT MAJOR CAPITAL IMPROVEMENTS

3.1. INTRODUCTION

The State Highway System is comprised of 11,185 miles of Interstates, US Routes, and State Roads. The system has grown, matured, and been systematically upgraded over the years; this is an ongoing process accomplished via many means, including long-range planning. In 1995, INDOT adopted a policy-oriented long-range plan entitled *Transportation in Indiana: Multimodal Plan Development for the 1990s and Beyond*. This plan is still in effect and has been supplemented by a project-specific long-range plan, adopted on March 6, 2002 and amended on November 12, 2003. The *INDOT 2000-2025 Long Range Plan* focused on identifying and prioritizing highway expansion projects. This document is currently being updated and extends the planning horizon from 2025 to 2030 as the *INDOT 2030 Long Range Plan*. Expansion Projects add additional capacity to a roadway or the network, specifically Added Travel Lanes, New Road Construction, Interchange Modifications, and New Interchange Construction projects. These Expansion Projects are sometimes referred to as Major Capital Improvements, as they often require a large investment of funds for the improvement.

Project scheduling (SPMS) information in this chapter is current as of March 3, 2005. Proposed changes as a result of meetings held March 9 and 11 to adjust INDOT's Expansion Project program are also reflected in the pages to follow.

3.2. PROPOSED INTERSTATE / FREEWAY MAJOR CAPITAL IMPROVEMENTS

Major Capital Improvements or Expansion Projects provide a unique opportunity to implement ITS devices in a coordinated fashion with a larger project, further minimizing disruptions to the motoring public. Other noteworthy projects that do not add any significant capacity, such as Pavement Replacement, 3R (Resurface, Restore, and Rehabilitate), or 4R (Resurface, Restore, Rehabilitate, and Reconstruct) projects present a similar opportunity to incorporate ITS devices on a roadway as part of a larger project.

As stated in Chapter 2, the focus of ITS investments in the INDOT network will be the Interstate System and other freeways. As such, the following tables provide information regarding the proposed timing of these projects on the Interstate System and other freeways. The proposed Ready for Contracts (RFC) date per the *INDOT 2030 Long Range Plan* (LRP) or by the proposed RFC date per INDOT's Scheduling System (SPMS) will be shown in most cases. Some projects are not in the LRP because they are not expansion projects. Projects that are merely proposed and not authorized in SPMS are indicated by "Prop." (and, in some cases, will have no CN (Construction) costs.)

A project that has been authorized in SPMS will have a more reliable RFC date than the LRP RFC date, as a schedule has been built for project development. Logically, projects that are closer to implementation will have a more reliable RFC date; projects farther out in the future are more likely to have adjustments in their RFC date due to the nature and varying complexities of project development and funding availability. Projects proposed or authorized in SPMS have a Des # (the Description Number.) Projects from the LRP not yet proposed or authorized in SPMS do not have a Des #.

It is important to note that if a project is shown in the table below it in no way reflects that INDOT will make an ITS investment in that area; that will be addressed in Chapter 7, ITS Deployment Recommendations – by Deployment Type.

Similar to the tables in Chapter 2, the ***segments of Interstate that are currently fully deployed with ITS devices*** (vehicle detection and Closed Circuit TV Cameras (CCTV Cameras)), ***are shown in bold and italics*** *in the tables below.* Currently, only I-80/94 and I-65 in Northwest Indiana are fully deployed with ITS devices, as well as the southernmost ½ mile segment of I-65 in Jeffersonville as part of the TRIMARC deployment (Traffic Response and Incident Management Assisting the River Cites), a joint venture of the Kentucky Transportation Cabinet (KYTC) and INDOT, with KYTC the lead agency.

Finally, *segments of Interstate that are* ***currently*** *proposed for full deployment of ITS devices* (vehicle detection and Closed Circuit TV Cameras (CCTV Cameras)), *are shown in italics* in the tables below. This includes the Indianapolis area, the Indiana Toll Road (I-90), and portions of Southern Indiana near Louisville, as part of TRIMARC.

3.2.1. Interstate 64

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Rest Area Modernization at the Dale (Nancy Hanks) Rest Area (EB & WB), E of US 231	9804040	$11.4		10-06
Reconstruction (3R/4R) from 0.5 mile W of SR 66 to 0.3 mile E of the Crawford/Harrison County Line	0400332	$13.9		11-07
Rehabilitation (Rubbilize & Overlay) from 0.3 mile W of the Crawford/Harrison County Line to SR 135	0066120	$18.4		11-07
New Interchange Construction at Gethsemane Rd (west of SR 135)	0401394	$15.0	2015	3-12
Interchange Modification at SR 62/64 **	0101102	$0.8		8-09
Added Travel Lanes from SR 62/64 to US 150 **		$8.0	2023	
Added Travel Lanes from US 150 to I-265 *		$20.4	2023	
Added Travel Lanes from I-265 to SR 111 / Spring St *		$11.2	2014	

* - Note: I-64 from US 150 to the Kentucky State Line currently features CCTV Camera deployment with one mile spacing, but no vehicle detection, nor is it currently proposed for vehicle detection, per the TRIMARC Strategic Plan.

** - Note: I-64 from SR 62/64 to US 150 is proposed for CCTV deployment with one mile spacing, but no vehicle detection, per the TRIMARC Strategic Plan.

3.2.2. Interstate 65

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
New Bridge Construction over the Ohio River (joint project with Kentucky)	***0201294***	***$74.0***	***2014***	***6-14***
Added Travel Lanes on the approach to the Ohio River **	***0300798***	***$158.0***	***2016***	***9-16***
Added Travel Lanes from 0.5 mile S of SR 311 to 0.5 mile N of Memphis Rd *	0300861	$68.7	2019	9-19
Interchange Modification at SR 311 *	0401027	$25.0		9-19
Interchange Modification at Memphis Rd	0401028	$25.0		9-19
New Weigh Station near the Kentucky State Line (likely north of SR 311) (NB Port of Entry)	9607500	$4.0		12-09
Added Travel Lanes from 0.5 mile N of Memphis Rd to 0.5 mile N of SR 160	0300888	$37.0	2020	9-20
Interchange Modification at SR 160	0401029	$25.0		9-20
Added Travel Lanes from 0.5 mile N of SR 160 to 0.5 mile N of SR 56	0300860	$98.6	2021	9-21
Interchange Modification at SR 56	0401030	$25.0		9-21
Added Travel Lanes from 0.5 mile N of SR 56 to 0.5 mile N of SR 256	0401040	$48.0	2023	9-23
Interchange Modification at SR 256	0401042	$25.0		9-23
Added Travel Lanes from 0.5 mile N of SR 256 to 0.5 mile N of US 31 (Exit 36)	0300874	$39.2	2023	9-23
Interchange Modification at US 31 (Exit 36)	0401198	$25.0		9-23
Added Travel Lanes from 0.5 mile N of US 31 (Exit 36) to 0.5 mile N of SR 250	0401199	$48.4	2024	9-24
Interchange Modification at SR 250	0401200	$25.0		9-24
Added Travel Lanes from 0.5 mile N of SR 250 to 0.5 mile N of US 50	0300891	$91.5	2025	9-25
Interchange Modification at US 50	0401201	$25.0		9-25
Added Travel Lanes from 0.5 mile N of US 50 to 0.5 mile N of SR 11	0401202	$72.0	2026	9-26
Interchange Modification at SR 11	0401203	$25.0		9-26
Added Travel Lanes from 0.5 mile N of SR 11 to 0.5 mile N of SR 58	0401204	$100.1	2027	9-27
Interchange Modification at SR 58	0101101	$3.0		8-09
Interchange Modification at SR 58	0401205	$25.0		9-27
Added Travel Lanes from 0.5 mile N of SR 58 to 0.5 mile N of SR 46	0300883	$45.5	2028	9-28
Interchange Modification at SR 46	0401212	$25.0		9-28
Added Travel Lanes from 0.5 mile N of SR 46 to 0.5 mile S of US 31 (Exit 76)	0401224	$72.0	2022	9-22

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from 0.5 mile S of US 31 (Exit 76) to 0.5 mile S of SR 252	0300862	$47.3	2018	9-18
Interchange Modification at US 31 (Exit 76)	0401023	$25.0		9-18
Added Travel Lanes from 0.5 mile S of SR 252 to 0.5 mile S of SR 44	0300854	$106.0	2017	9-17
Interchange Modification at SR 252	0401013	$25.0		9-17
Added Travel Lanes from 0.5 mile S of SR 44 to 0.5 mile S of Whiteland Rd (CR 500N)	0300842	$50.9	2016	9-16
Interchange Modification at SR 44	0400979	$25.0		9-16
Added Travel Lanes from 0.5 mile S of Whiteland Rd (CR 500N) to 0.5 mile S of Greenwood Rd (Main St)	0300840	$69.0	2014	9-14
Interchange Modification at Whiteland Rd (CR 500N)	0400975	$25.0		9-14
Added Travel Lanes from 0.5 mile S of Greenwood Rd (Main St) to 0.5 mile S of County Line Rd	0401037	$23.5	2015	9-15
Interchange Modification at Greenwood Rd (Main St)	0401039	$25.0		9-15
Added Travel Lanes from 0.5 mile S of County Line Rd to 0.5 mile S of Southport Rd	*0300853*	*$34.1*	*2015*	*9-15*
Interchange Modification at County Line Rd	*0401036*	*$25.0*		*9-15*
Added Travel Lanes from 0.5 mile S of Southport Rd to 0.25 mile S of I-465 (South Leg)	*0400909*	*$70.0*	*2014*	*9-14*
Interchange Modification at Southport Rd	*0400974*	*$25.0*		*9-14*
Added Travel Lanes from 0.5 mile N of I-465 (South Leg) to Raymond St		*$24.4*	*2019*	
Added Travel Lanes from Raymond St to N of the I-70 South Split (where the SB C/D joins the mainline)	*9700400*	*$48.0*	*2017*	*9-17*
Added Travel Lanes from N of the I-70 South Split (where the SB C/D joins the mainline) to S of the I-70 North Split (just N of St. Clair St)	*0201047*	*$49.6*	*2017*	*9-17*
Interchange Modification at Market St (Relocate to Washington St) (Local Project)	*0401228*	*$3.7*	*2008*	*2-10*
Added Travel Lanes from the I-70 North Split to 38th St		*$75.0*	*2020*	
Added Travel Lanes from I-865 to 0.5 mile N of SR 334	*0200903*	*$8.3*	*2013*	*8-13*
Added Travel Lanes from 0.5 mile N of SR 334 to US 52	0200904	$71.8	2013	8-13
Interchange Modification at SR 39	0200007	$12.0	2013	8-13
Added Travel Lanes from US 52 to SR 25/38		$155.0	2024	

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Interchange Modification at SR 28	0101169	$3.1	2008	9-07
Added Travel Lanes from SR 25/38 to SR 26 (as part of a longer LRP project)			2015	
Added Travel Lanes from SR 26 to the N jct with SR 25	0300896	$36.8	2015	Prop.
Interchange Modification at SR 26	9802780	$5.4	2007	6-07
Added Travel Lanes from the N jct with SR 25 to SR 43 (as part of a longer LRP project)			2015	
Interchange Modification at SR 43	9802790	$4.1	2007	1-06
Rehabilitation from 4.3 miles N of US 231 (Exit 193) (Hollingsworth Ditch) to just S of bridge over TP&W RR, 0.5 mile south of US 24/231	0300455	$9.7		11-06
Pavement Replacement from just S of bridge over TP&W RR to N of the US 24/231 interchange	0300456	$6.8		7-07
Rest Area Modernization at the Kankakee Rest Area (MM 231) (NB & SB)	0301178 0301179	$2.0		Prop.
Added Travel Lanes from US 231 to US 30 (conversion of existing pavement to three lanes per direction)		$35.0	2011	
New Interchange Construction at 109th Ave		$12.0	2011	

* - Note: I-65 at SR 311 is proposed for CCTV deployment (one camera), but no vehicle detection, per the TRIMARC Strategic Plan.

** - Note: Approximately $32 million in Right-of-Way costs are not included in the construction costs shown.

Note: Interchange Modification at I-465 (West Leg) is shown under I-465

3.2.3. Interstate 69

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
New Road / Bridge Construction placeholder for I-69 in the Evansville area		$250.0	2012	
New Road Construction placeholder for I-69 from I-64/164 to SR 64 (Section 1)		$155.6	2018	
New Road Construction placeholder for I-69 from SR 64 to US 50/150 (Section 2)		$347.2	2018	
New Road Construction placeholder for I-69 from US 50/150 to US 231 (Section 3)		$299.3	2018	
New Road Construction placeholder for I-69 from US 231 to Seymour District Line (Section 4a)		$177.8	2018	
New Road Construction placeholder for I-69 from Vincennes District Line to SR 37 SW of Bloomington (Section 4b)		$145.5	2020	
New Road Construction placeholder for I-69 from SR 37 SW of Bloomington to SR 39 (Section 5)		$263.4	2020	
New Road Construction placeholder for I-69 from SR 39 to I-465 (Section 6)		$311.3	2017	
Added Travel Lanes from 0.5 mile S of I-465 (75th St) to 0.5 mile S of 96th St	*0400305*	*$60.0*	*2013*	*9-13*
Interchange Modification at I-465 (Phase 1) (to be constructed with I-465 Added Travel Lanes)	*0400408*	*$25.0*		*9-09*
Interchange Modification at I-465 (Phase 2) (to be constructed with I-69 Added Travel Lanes)	*0400411*	*$17.1*		*9-13*
Interchange Modification at 82nd St	*0400412*	*$28.3*		*9-13*
Added Travel Lanes from 0.5 mile S of 96th St to 0.5 mile N of SR 37 / 116th St	*0400308*	*$69.2*	*2014*	*9-14*
Interchange Modification at 96th St	*0400416*	*$25.0*		*9-14*
Interchange Modification at SR 37 / 116th St	*0200228*	*$1.0*		*11-04*
Interchange Modification at SR 37 / 116th St	*0400417*	*$55.0*		*9-14*
Added Travel Lanes from 0.5 mile N of SR 37 / 116th St to 0.5 mile N of SR 238	*0400356*	*$59.0*	*2015*	*9-15*
Interchange Modification at SR 238 (Phase 1)	*9133885*	*$2.4*	*2008*	*9-07*
Interchange Modification at SR 238 (Phase 2)	*0400419*	*$20.0*		*9-15*
Added Travel Lanes from SR 238 to SR 13	0300856	$42.7	2015	Prop.
Added Travel Lanes from SR 13 to SR 38	0300843	$82.0	2015	Prop.
Added Travel Lanes from SR 38 to SR 9/67	0300863	$38.1	2015	Prop.
Added Travel Lanes from SR 9/67 to SR 9/109	0300846	$40.6	2014	Prop.
Added Travel Lanes from SR 9/109 to SR 32/67 (as part of a longer LRP project)			2014	
Interchange Modification at SR 32/67	9700420	$0.3	2009	8-08

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Rest Area Modernization at the Pipe Creek Rest Area (MM 50) (NB & SB)	9610130	$13.4		1-06
Interchange Modification at US 35 / SR 22	0401154	$1.0		Prop.
Bridge Removal from 10.9 km N of US 35 / SR 28 to 12.1 km N of US 35 / SR 28	0014000	$0.6		11-06
Added Travel Lanes from the S jct with I-469 to 1.34 miles S of the N jct with US 24		$32.8	2025	
Added Travel Lanes from 0.48 mile S of Coldwater Rd to 0.86 mile N of SR 1 / Dupont Rd	9829980	$37.2	2007	12-07
Added Travel Lanes from N of SR 1 / Dupont Rd to Gump/Hursh Rd		$18.0	2024	
New Interchange at Gump/Hursh Rd, 2.95 miles N of SR 1 / Dupont Rd		$12.0	2016	
Rest Area Modernization at the Auburn Rest Area (MM 123) (NB only)	8013770	$9.1		7-05
Interchange Modification at US 20	0300942	$3.0		12-09
Reconstruction (3R/4R) from US 20 to the Michigan State Line	0300933	$75.0		1-14
New Weigh Station near the Michigan State Line (SB Port of Entry)	9607480	$4.0		2-10

3.2.4. Interstate 70

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Pavement Replacement from the Illinois State Line to just W of the Wabash River	0400513	$29.0		9-09
Pavement Replacement from 0.18 km W of the Wabash River to 0.07 km E of SR 63	9709060	$36.5		6-06
Pavement Replacement from 0.4 mile W of US 41/150 to 0.5 mile W of SR 46/641 (Stage 1)	0400514	$23.5		12-11
Added Travel Lanes from 0.4 mile W of US 41/150 to 0.5 mile W of SR 46/641 (Stage 2)	0400515	$22.5	2020	1-18
Interchange Modification at US 41/150	9804330	$3.0		3-07
Interchange Modification at US 41/150 (to be constructed with I-70 Added Travel Lanes)	0400545	$15.0	2018	1-18
Interchange Modification at SR 46/641	0200306	$6.0		7-07
Added Travel Lanes from SR 46/641 to SR 59		$67.0	2020	
Added Travel Lanes from SR 59 to US 231		$100.0	2024	
Added Travel Lanes from US 231 to 0.75 mile W of SR 267		$140.0	2022	
Added Travel Lanes from 0.75 mile W of SR 267 to 2.2 miles E of SR 267	*9910100*	*$40.0*	*2016*	*8-16*
Interchange Modification at SR 267 (to be constructed with I-70 Added Travel Lanes	*9910400*	*$15.0*	*2016*	*8-16*
Added Travel Lanes from 2.2 miles E of SR 267 to I-465 (West Leg) (Stage 2)	*0300562*	*$30.0*	*2020*	*9-20*
Interchange Modification at Ronald Reagan Pkwy (Six Points Rd) (Stage 2)	*0300570*	*$15.0*		*8-16*
Interchange Modification at Airport Midfield Terminal Interchange (Stage 2)	*0300571*	*$5.0*		*9-20*
Interchange Modification at I-465 (Stage 2)	*0300573*	*$5.0*		*9-20*
Added Travel Lanes from I-465 (West Leg) to I-65 South Split		*$125.0*	*2025*	
Added Travel Lanes from just S of the I-65 North Split (just N of St. Clair St) to where the SB C/D splits from the WB mainline in the North Split (also includes a portion of I-65)	*0201053*	*$21.2*	*2017*	*9-17*
Pavement Replacement from the I-65 North Split to 0.25 mile E of Rural St / Keystone Ave (Part A – Stage 1)	*0400394*	*$35.3*		*11-06*
Added Travel Lanes from the I-65 North Split to Sherman Dr (Part A – Stage 2)	*0400399*	*$28.1*	*2016*	*9-16*

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Pavement Replacement from 0.25 mile E of Rural St / Keystone Ave to 0.25 mile E of Emerson Ave (Part B – Stage 1)	*0400398*	*$35.5*		*11-06*
Added Travel Lanes from Sherman Dr to 0.15 mile W of Shadeland Ave (Part B – Stage 2)	*0400400*	*$32.7*	*2016*	*9-16*
Pavement Replacement from 0.25 mile E of Emerson Ave to 0.17 mile E of I-465 (East Leg) (Part C – Stage 1)	*0401174*	*$38.1*		*11-06*
Added Travel Lanes from 0.6 mile E of Post Rd to 0.5 mile E of Mt. Comfort Rd	*0200699*	*$46.7*	*2011*	*11-11*
New Interchange Construction at German Church Rd		*$12.0*	*2016*	
Interchange Modification at Mt. Comfort Rd (Phase 2)	*9706740*	*$8.1*	*2006*	*8-06*
Added Travel Lanes from 0.5 mile E of Mt. Comfort Rd to 0.8 mile E of SR 9	0200700	$77.0	2015	11-15
Added Travel Lanes from 0.8 mile E of SR 9 to SR 3		$105.0	2022	
Pavement Replacement from RP 115+38 (SR 109) to RP 122+68 (0.4 mile W of SR 3)	0400989	$23.8		10-09
Added Travel Lanes from SR 3 to Wilbur Wright Rd (as part of a longer LRP project)			2020	
Added Travel Lanes from Wilbur Wright Rd to SR 1	0300901	$71.0	2020	Prop.
Added Travel Lanes from SR 1 to the Ohio State Line		$110.0	2021	
Rest Area Modernization at the Centerville Rest Area (MM 143) (WB Only)	9407900	$5.3		9-05
Interchange Modification at US 27	9502960	$13.6	2005	8-05

Note: Interchange Modification at I-70 (West Leg) is shown under I-465

Note: Interchange Modification at I-70 (East Leg) (Phase 2) is shown under I-465

3.2.5. Interstate 74

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
New Weigh Station near the Illinois State Line (EB Port of Entry)	9607490	$12.5		12-05
Added Travel Lanes from SR 267 to I-465 (West Leg) *		$47.2	2017	
New Interchange Construction at proposed Ronald Reagan Pkwy (Hendricks County North-South Corridor) (W of CR 1000E)	0400563	$8.0	2011	4-13
Interchange Modification at Post Rd	*0100968*	*$4.1*	*2013*	*8-13*

* - Note: Only the three mile segment of I-74 from Raceway Road to I-465 is currently proposed for full ITS deployment. Thus, this entire seven mile segment of I-74 from SR 267 to I-465 is not depicted as proposed for full ITS deployment.

3.2.6. Interstate 80/94 (Borman Expressway)

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from the Illinois State Line to the W jct with US 41 / Calumet Ave west ramps (construction by Illinois DOT)	***0100987***	***$20.5***	***2004***	***6-05***
Interchange Modification at I-65 (from 0.6 km W of Dr. Martin Luther King, Jr. Dr to Clay St)	***0065300***	***$180.0***	***2006***	***8-06***
Interchange Modification at US 6 / SR 51 / Ripley St	***9700410***	***$29.5***	***2007***	***7-07***
Pavement Replacement from E of US 6 / SR 51 / Ripley St to E of bridge over I-90 (Indiana Toll Rd) (Indiana Toll Road Project)	***0065950***	***$4.5***		***10-05***
Interchange Modification at I-90 (Indiana Toll Road) (Indiana Toll Road project)	***0065700***	***$28.9***	***2005***	***10-05***

3.2.7. Interstate 90 (Indiana Toll Road) (Including I-80 east of I-94)

The Indiana East-West Toll Road operates as part of INDOT as the Toll Road District. However, it is separately and exclusively funded by way of patron (motorist) tolls and concession fees. As such, the Toll Road District has completed *Indiana Toll Road Intelligent Transportation Systems Master Plan* (completed in December 2001), as well as other long-range planning documents. While this document did provide information for comparison purposes in Chapter 2 regarding AADT and areas planned for ITS deployment, the reader should consult Toll Road District documents for details regarding Major Capital Improvements on the Indiana Toll Road.

3.2.8. Interstate 94

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Pavement Replacement from RP 17+00 (1.0 mile E of I-90 (Indiana Toll Rd)) to RP 26+41 (0.4 mile E of SR 49)	0400930	$45.8		1-13
Pavement Replacement from RP 39+55 (0.4 mile W of US 20/35) to RP 45+75 (Michigan State Line)	0400929	$28.3		1-10
Rest Area Modernization at the Michigan City Rest Area (MM 43) (WB)	0301180	$1.0		Prop.
Bridge Replacement over Abandoned RR, 5.68 miles E of US 20/35 (0.12 mile W of the Michigan State Line)	0100331	$2.4		10-08

3.2.9. Interstate 164

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from 1.5 miles E of US 41 (junction with I-69 from south) to I-64		$72.0	2030	

Note: I-69 will be incorporated into I-164 in the future from approximately 1.5 miles east of US 41 to I-64.

3.2.10. Interstate 265 (including existing SR 265 from I-65 to SR 62)

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from I-64 to I-65 (existing I-265)		*$50.0*	*2025*	
Interchange Modification at State St	*0401133*	*$0.8*		*Prop.*
Interchange Modification at SR 111	*0401134*	*$0.8*		*Prop.*
Interchange Modification at SR 311	*0401135*	*$0.8*		*Prop.*
Added Travel Lanes from I-65 to SR 62 (existing SR 265)		*$27.0*	*2025*	
*New Road Construction from SR 62 to the Ohio River **	*0201297*	*$140.0*	*2015*	*6-15*
*New Bridge Construction over the Ohio River (joint project with Kentucky) **	*0201296*	*$87.0*	*2013*	*6-13*

* - Note: Approximately $17 million in Right-of-Way costs are not included in the construction costs shown.

Note: SR 265 will become I-265 when the connection across the Ohio River to I-265 in Kentucky is completed.

3.2.11. Interstate 275

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
None				

3.2.12. Interstate 465

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from I-65 to 0.8 mile E of SR 67 / Kentucky Ave (South Leg)		*$160.0*	*2023*	
*Added Travel Lanes from 0.8 mile E of SR 67 / Kentucky Ave to 0.5 mile N of 46th St (West Leg) **	*0300371*	*$146.0*	*2009*	*6-09*
*Interchange Modification at SR 67 / Kentucky Ave (West Leg) (to be constructed with the Interchange Modification at I-70) **	*9910900*	*$42.2*	*2008*	*6-08*
*Interchange Modification at I-70 (West Leg) (to be constructed with the Interchange Modification at SR 67) **	*9910300*	*$25.2*	*2008*	*6-08*
*Interchange Modification at Airport Expwy (West Leg) (to be constructed with the Interchange Modification at US 40) **	*9829310*	*$43.3*	*2008*	*6-08*
*Interchange Modification at US 40 / Washington St (West Leg) (to be constructed with the Interchange Modification at Airport Expwy) **	*0300417*	*$15.4*	*2008*	*6-08*
*Interchange Modification at US 36 / Rockville Rd (West Leg) (to be constructed with the Interchange Modification at 10th St) **	*9829410*	*$31.4*	*2008*	*6-08*
*Interchange Modification at 10th St (West Leg) (to be constructed with the Interchange Modification at US 36) **	*9829414*	*$30.0*	*2008*	*6-08*
*Interchange Modification at I-74 / US 136 (West Leg) (to be constructed with the Interchange Modification at 38th St) **	*9829510*	*$32.4*	*2008*	*6-08*
*Interchange Modification at 38th St (West Leg) (to be constructed with the Interchange Modification at I-74 / US 136) **	*9829610*	*$39.4*	*2008*	*6-08*
Added Travel Lanes from 0.5 mile N of 46th St to 0.3 mile N of I-65 (West Leg)	*0200003*	*$21.0*	*2013*	*5-13*
Interchange Modification at 56th St (West Leg)	*0300793*	*$15.0*		*5-13*
Interchange Modification at I-65 (West Leg)	*0200005*	*$25.0*		*5-13*
Added Travel Lanes from 0.3 mile N of I-65 to 0.65 mile N of 86th St (West Leg)	*0301064*	*$37.3*	*2004*	*Let*
Interchange Modification at 71st St (West Leg) (to be constructed with the Interchange Modification at 86th St)	*9706730*	*$16.3*	*2005*	*8-05*
Interchange Modification at 86th St (West Leg) (to be constructed with the Interchange Modification at 71st St)	*9700840*	*$12.8*	*2005*	*8-05*

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from 0.65 mile N of 86th St (West Leg) to 0.5 mile E of US 421 / Michigan Rd (North Leg)	*0400881*	*$70.0*	*2018*	*9-18*
Interchange Modification at I-865 (North Leg)	*0400882*	*$50.0*		*9-18*
Interchange Modification at US 421 / Michigan Rd (North Leg)	*0400883*	*$20.0*		*9-18*
Added Travel Lanes from 0.5 mile E of US 421 / Michigan Rd to 0.65 mile W of US 31 / Meridian St (North Leg)	*0400885*	*$54.0*	*2017*	*9-17*
Interchange Modification (and Added Travel Lanes) at US 31 / Meridian St, from 0.65 mile W of US 31 to 0.35 mile E of US 31 (North Leg)	*0400117*	*$50.0*	*2017*	*9-17*
Added Travel Lanes from 0.35 mile E of US 31 / Meridian St to 0.5 mile W of SR 431 / Keystone Ave (North Leg)	*0400304*	*$39.4*	*2012*	*9-12*
Added Travel Lanes from 0.5 mile W of SR 431 / Keystone Ave to 0.5 mile W of Allisonville Rd (North Leg)	*0400289*	*$37.0*	*2012*	*9-12*
Interchange Modification at SR 431 / Keystone Ave (North Leg)	*0400410*	*$25.0*		*9-12*
Added Travel Lanes from 0.5 mile W of Allisonville Rd to 0.5 mile W of I-69 (North Leg)	*0400286*	*$32.0*	*2011*	*9-11*
Interchange Modification at Allisonville Rd (North Leg)	*0400409*	*$25.0*		*9-11*
Added Travel Lanes from 0.5 mile W of I-69 to south end of bridge over Fall Creek) (N of 56th St) (North and East Legs)	*0400283*	*$52.0*	*2011*	*9-11*
Interchange Modification at I-70 (East Leg) (Phase 2)	*0066810*	*$9.6*	*2007*	*9-07*
Added Travel Lanes from US 40 (East Leg) to I-65 (South Leg)		*$49.0*	*2019*	

* - Note: Approximately $40 million in Right-of-Way costs are not included in the construction costs shown.

Note: Interchange Modification at I-69 (Phase 1) (to be constructed with I-465 Added Travel Lanes) is shown under I-69. Also, the Interchange Modification at I-69 (Phase 2) (to be constructed with I-69 Added Travel Lanes) is shown under I-69.

Note: Interchange Modification at I-70 (West Leg) (Stage 2) is shown under I-70.

3.2.13. Interstate 469

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Pavement Replacement from RP 5+87 (0.77 mile W of SR 1) to RP 12+42 (0.85 mile E of US 27/33)	0400603	$23.5		1-11
Pavement Replacement from RP 12+42 (0.85 mile E of US 27/33) to RP 15+46 (0.33 mile W of Tillman Rd)	0400604	$10.6		1-11

Note: The interchange with US 24 will be modified to a freeway-to-freeway interchange as part of the US 24 New Road Construction project shown under US 24.

3.2.14. Interstate 865

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
None				

3.2.15. US 20/31 (St. Joseph Valley Parkway)

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Road Reconstruction (US 31) from the W jct with US 20 to the Michigan State Line	0400228	$7.2		Prop.

3.2.16. US 24 (New Freeway from I-469 to the Ohio State Line)

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
New Road Construction at I-469 (Includes Interchange Modification at I-469) *	0200906	$30.0	2012	9-12
New Road Construction from 0.5 mile E of I-469 to 0.5 mile E of Ryan/Bruick Rd (Phase 1) *	0300291	$12.0	2009	9-09
New Interchange Construction at Ryan / Bruick Rd (to be constructed with Phase 1) *	0300297	$7.5	2009	9-09
New Road Construction from 0.5 mile E of Ryan / Bruick Rd to 0.5 mile E of Webster Rd (Phase 2) *	0300309	$12.0	2010	9-10
New Interchange Construction at Webster Rd (to be constructed with Phase 2) *	0300310	$7.5	2010	9-10
New Road Construction from 0.5 mile E of Webster Rd to 0.5 mile W of SR 101 (Phase 3) *	0200222	$20.0	2011	9-11
New Road Construction from 0.5 mile W of SR 101 to the Ohio State Line (Phase 4) *	0300314	$15.0	2008	1-08
New Interchange Construction at SR 101 (to be constructed with Phase 4) *	0300315	$7.5	2008	1-08

* - Note: Approximately $5 million in Right-of-Way costs are not included in the construction costs shown.

3.2.17. US 31 (Freeway Upgrade / New Road Construction from Indianapolis to South Bend)

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes (Freeway Upgrade) from 0.2 mile S of I-465 (North Leg) to SR 38 *	0300814	$262.3	2012	2012-2018#
New Interchange Construction at 106th St, 0.79 mile N of I-465 (North Leg) *	9804540	$10.0	2012	2012-2018#
New Interchange Construction at 116th St, 1.78 miles N of I-465 (North Leg) *	9804530	$10.0	2012	2012-2018#
New Interchange Construction at 126th St (or 131st St), 2.83 miles N of I-465 (North Leg) *	9804520	$10.0	2012	2012-2018#
New Interchange Construction at 136th St, 4.28 miles N of I-465 (North Leg) *	9804510	$10.0	2012	2012-2018#
New Interchange Construction at SR 431 *	9804410	$20.0	2012	2012-2018#
New Interchange Construction at 146th St, just N of SR 431 *	9804420	$10.5	2012	2012-2018#
New Interchange Construction at 161st St, 1.46 miles S of SR 32 *	980449D	$10.0	2012	2012-2018#
New Interchange Construction at SR 32 *	9804560	$10.0	2012	2012-2018#
New Interchange Construction at 191st St,1.59 miles N of SR 32 *	9804570	$10.0	2012	2012-2018#
New Interchange Construction at SR 38 *	9802760	$15.0	2012	2012-2018#
Freeway Upgrade from SR 38 to S of SR 26		$120.0	2021	
New Road Construction from S of SR 26 to SR 18		$130.0	2015	
Freeway Upgrade from SR 18 to the Miami / Fulton County Line		$120.0	2023	
Freeway Upgrade from the Miami / Fulton County Line to US 30		$80.0	2025	
Freeway Upgrade from US 30 to CR W4A, 2.6 miles S of US 6 **	9904310	$20.0	2015	9-15
New Interchange Construction at CR 7A, 2.0 miles N of US 30		$12.0	2015	
New Road Construction from CR W4A, 2.6 miles S of US 6 to Kern Rd, 1.2 miles S of US 20 **	9904300	$120.0	2015	9-15
New Interchange Construction at US 6		$18.0	2015	
New Road Construction at Pierce Rd (extended SR 4)		$18.0	2015	
New Interchange Construction at Kern Rd, 1.2 miles S of US 20		$18.0	2015	

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
New Road Construction from Kern Rd, 1.2 miles S of US 20 to Johnson Rd, 0.5 mile S of US 20		$20.0	2015	
Freeway Upgrade from Johnson Rd, 0.5 mile S of US 20 to US 20 **		$104.0	2015	

* - Note: Approximately $195 million in Right-of-Way costs are not included in the construction costs shown.

** - Note: Approximately $20 million in Right-of-Way costs are not included in the construction costs shown.

- Note: This project's current 2009 RFC date will change after the FHWA's Record of Decision on the Environmental Impact Statement and the establishment of a sequence of construction. However, this project will likely be constructed in the 2012-2019 time period.

Note: Interchange Modification at I-465 (North Leg) is shown under I-465

3.2.18. SR 62/66 (Lloyd Expressway)

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes (Freeway Upgrade) from 0.25 mile W of Eikhoff Rd / University Blvd to 0.25 mile W of Boehne Camp Rd (Segment 4) *	0201372	$23.0	2023	10-23
Interchange Modification at Eickhoff Rd / University Blvd *	0201373	$5.0	2023	10-23
Added Travel Lanes (Freeway Upgrade) from 0.25 mile W of Boehne Camp Rd to 0.25 mile E of Rosenberger Ave (Segment 3) *	0201368	$74.0	2015	10-15
New Interchange Construction at Boehne Camp Rd *	0201370	$25.0	2015	10-15
New Interchange Construction at Rosenberger Ave *	0201371	$25.0	2015	10-15
Added Travel Lanes (Freeway Upgrade) from 0.25 mile E of Rosenberger Ave to the W end of the Pigeon Creek bridge (Segment 2) *	0201365	$88.0	2012	3-12
Interchange Modification at Barker Ave *	0201366	$20.0	2012	3-12
New Interchange Construction at St. Joseph Ave *	0201367	$25.0	2012	3-12
Road Reconstruction (3R/4R) (Freeway Upgrade) from the E end of the Pigeon Creek bridge (Segment 1) to approx. 300' W of First Ave *	0201362	$45.0	2011	8-11
New Interchange Construction at Fulton Ave *	0201363	$25.0	2011	8-11
Interchange Modification at First Ave *	0201364	$5.0	2011	8-11
Interchange Modification at US 41 (to be constructed with a Pavement Replacement project on US 41)	0015020	$25.3	2012	6-09
New Interchange Construction at Burkhardt Rd, 1.22 miles W of I-164	9700370	$14.8	2012	3-12

* - Note: Approximately $18 million in Right-of-Way costs are not included in the construction costs shown.

Note: The Lloyd Expressway (SR 62 west of US 41 and SR 66 east of US 41) is currently a freeway from Fulton Avenue to US 41 north of downtown Evansville (signalized intersections at both termini) and from US 41 to Vann Avenue on the east side of Evansville (signalized intersections at both termini.) These projects above will upgrade the SR 62 segments of the Lloyd Expressway to a freeway on the west side of Evansville from Eikhoff Rd / University Blvd to US 41, a distance of 7.5 miles. Furthermore, the two signals at the US 41 ramp terminals will be removed as that interchange is modified. Thus, the Lloyd Expressway will be a freeway from Eikhoff Rd / University Blvd to Vann Avenue, a distance of 9.3 miles. The Interchange Modification at Burkhardt Rd will remove one signal on the Lloyd Expressway on the east side of Evansville; only four will remain on the Lloyd.

3.2.19. SR 641 (Southeast Terre Haute Bypass)

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
New Road Construction from US 41 to 0.25 mile N of existing Feree Rd (Phase 2) (Grading/Bridges) *	9138220	$27.2	2005	7-05
New Road Construction from US 41 to 0.25 mile N of existing Feree Rd (Phase 2) (Paving) *	0400857	$16.2	2007	7-06
New Interchange Construction at US 41 (Phase 2) *	0200301	$4.8	2007	7-05
New Interchange Construction at Canal Rd / McDaniel Rd (Phase 2) *	0200302	$4.0	2007	7-06
New Road Construction from 0.25 mile N of existing Feree Rd to 500 meters N of Relocated SR 46 / Riley Rd (Phase 3) *	9738400	$14.8	2007	7-06
New Interchange Construction at Relocated SR 46 / Riley Rd (Phase 3) *	0200304	$6.0	2007	7-06
New Road Construction from 500 meters N of Relocated SR 46 / Riley Rd to I-70 (Phase 4) *	0200305	$13.8	2012	7-12

* - Note: Approximately $5 million in Right-of-Way costs are not included in the construction costs shown.

Note: Interchange Modification at I-70 is shown under I-70.

3.2.20. SR 912 (Cline Avenue)

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Road Reconstruction (3R/4R) from 1.66 miles W of US 12 to 0.25 mile W of US 12	0400210	$8.3		Prop.
Pavement Replacement from 0.25 mile N of US 12 to 0.6 mile N of I-80/94	0014030	$99.9		6-09

Note: The non-freeway segment of SR 912 south of I-80/94 is not included.

3.2.21. Possible Corridors in the Distant Future

The following two corridors are identified in the *INDOT 2030 Long Range Plan* as potential "Undetermined" projects in the distant future. Considerable study and analysis will need to take place to determine the nature and scope of any improvements. Since these potential improvements are of an unknown nature and are far off in the future, no ITS improvements will be proposed at this time. However, the potential for large-scale improvements exists and ITS could certainly play a role in these Major Capital Improvements.

3.2.21.1. Central Indiana Suburban Transportation and Mobility Corridor

The Central Indiana Suburban Transportation and Mobility Study (CISTMS), currently being conducted by INDOT in cooperation with the Indianapolis Metropolitan Planning Organization (MPO), is examining transportation and mobility needs in and between the communities surrounding Indianapolis and Marion County in order to identify suburban travel needs and develop recommendations for improvements. The study focuses on broad state and local roadway corridors in Central Indiana, including SR 32 and SR 38 to the north, SR 9 to the east, SR 44 to the south, and SR 267 and SR 39 to the west. The implementation of improvements in one or more of these broad corridors could establish a portion of a circumferential roadway that could relieve a portion of (or all of) I-465. Major problems and deficiencies are being identified and solutions investigated along those corridors. The study is scheduled for completion in 2005.

The *INDOT 2030 Long Range Plan* includes a placeholder for the three districts in which $1,000,000,000 in improvements identified in this study could take place in the 2026-2030 time period.

3.2.21.2. South Suburban Expressway (Illiana Expressway)

Sporadic discussion has taken place over the years for the need for an east-west, high-type facility south of the densely populated areas in Lake and Porter Counties in Northwest Indiana and extending into Illinois towards Interstate 57 or beyond. The implementation of improvements could relieve traffic on east-west corridors in Northwest Indiana, most notably I-80/94 (the Borman Expressway), US 30, and SR 10. While extensive study would certainly be required to determine the type and scope of any improvements in this area, the *INDOT 2030 Long Range Plan* includes a placeholder for Suburban Transportation Needs for $500,000,000 in improvements around 2028.

3.3. PROPOSED MAJOR CAPITAL IMPROVEMENTS ON HIGH VOLUME ARTERIALS INTERSECTING THE INTERSTATE SYSTEM

As explained earlier in this chapter, Major Capital Improvements or Expansion Projects provide a unique opportunity to implement ITS devices in a coordinated fashion with a larger project, further minimizing disruptions to the motoring public. Other noteworthy projects that do not add any significant capacity, such as Pavement Replacement, 3R (Resurface, Restore, and Rehabilitate), or 4R (Resurface, Restore, Rehabilitate, and Reconstruct) projects present a similar opportunity to incorporate ITS devices on a roadway as part of a larger project.

While investment in ITS devices will be focused on the Interstate System and other freeways, there are arterials that approach and feed the Interstate System and other freeways with significant volumes of traffic, as discussed in Section 2.3 in Chapter 2. These arterials generally meet the following criteria: an INDOT facility with a two-way AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently fully deployed with ITS devices (vehicle detection and CCTV cameras) or is currently proposed for full deployment of ITS devices (vehicle detection and CCTV cameras).

As such, the following tables provide information regarding the proposed timing of these projects on arterials that meet the above criteria. The proposed Ready for Contracts (RFC) date per the *INDOT 2030 Long Range Plan* (LRP) or by the proposed RFC date per INDOT's Scheduling System (SPMS) will be shown in most cases. Some projects are not in the LRP because they are not expansion projects.

A project that has been authorized in SPMS will have a more reliable RFC date than the LRP RFC date, as a schedule has been built for project development. Logically, projects that are closer to implementation will have a more reliable RFC date; projects farther out in the future are more likely to have adjustments in their RFC date due to the nature and varying complexities of project development and funding availability. Projects proposed or authorized in SPMS have a Des # (the Description Number.) Projects from the LRP not yet proposed or authorized in SPMS do not have a Des #.

It is important to note that if a project is shown in the table below it in no way reflects that INDOT will make an ITS investment in that area; that will be addressed in Chapter 7, ITS Deployment Recommendations – by Deployment Type.

3.3.1. US 30 (Northwest Indiana Area)

INTERSTATE BEING APPROACHED ON US 30	LENGTH	2004 AADT
I-65, from the west, Northwest Indiana / Merrillville	2.5 miles	40,860 – 64,520

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from US 41 to 0.4 mile W of I-65		$33.0	2017	

3.3.2. US 31 (Indianapolis Area)

INTERSTATE BEING APPROACHED ON US 31	LENGTH	2004 AADT
A: I-465 (South Leg), from the south, Indianapolis	8.4 miles	38,790 – 56,100
B: I-465 (North Leg), from the north, Indianapolis	2.8 miles	43,230 – 59,340

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
A: Pavement Replacement from 1.55 miles S of I-465 (South Leg) (Beechwood Ln) to 0.39 mile N of I-465 (South Leg) (Mills Ave)	0100721	$13.0		5-09
B: Added Travel Lanes (Freeway Upgrade) from 0.2 mile S of I-465 (North Leg) to SR 38 *	0300814	$262.3	2012	2012-2018#

* - Note: This project is also shown under US 31 in Section 3.2.17, and, thus, is already a candidate for full ITS deployment.

- Note: This project's current 2009 RFC date will change after the FHWA's Record of Decision on the Environmental Impact Statement and the establishment of a sequence of construction. However, this project will likely be constructed in the 2012-2019 time period.

3.3.3. US 36 (Indianapolis Area)

INTERSTATE BEING APPROACHED ON US 36	LENGTH	2004 AADT
I-465 (West Leg), from the west, Indianapolis	7.0 miles	40,980 – 62,160

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from SR 267 to I-465 (West Leg) *	0101115	$28.4	2011	3-11

* - Note: Approximately $15 million in Right-of-Way costs are not included in the construction cost shown.

3.3.4. SR 431 (Indianapolis Area)

INTERSTATE BEING APPROACHED ON SR 431	LENGTH	2004 AADT
I-465 (North Leg), from the north, Indianapolis	2.4 miles	48,370 – 83,470

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Added Travel Lanes from 96th St to 1.1 miles S of US 31	9133595	$26.9	2007	3-07

3.3.5. SR 912 (Northwest Indiana Area) (Freeway)

INTERSTATE BEING APPROACHED ON SR 912	LENGTH	2004 AADT
I-80/94 (Borman Expwy), from the north, Northwest IN	5.9 miles	40,910 – 53,240

PROJECT DESCRIPTION AND LOCATION	DES #	CN COST (millions)	LRP RFC DATE	SPMS RFC DATE
Pavement Replacement from 0.25 mile N of US 12 to 0.6 mile N of I-80/94 *	0014030	$99.9		6-09

* - Note: This project is also shown under SR 912 in Section 3.2.20, and, thus, is already a candidate for full ITS deployment.

3.4. PROPOSED NEW INTERSTATE / FREEWAY PROJECTED AADT AND LOS

A key component of INDOT's program to address safety and mobility needs is the construction of new facilities, including Interstates and freeways. As the previous sections alluded to via the Ready for Contracts date, the following proposed new Interstates and freeways are in various stages of development; some are nearly ready for construction while others are still in the Environmental Impact Statement (EIS) or Environmental Assessment (EA) phase. The following tables provide information from various project development documents (generally from the Environmental document) regarding projected design year AADT and projected design year LOS.

It should be noted that this is a somewhat different approach than was taken in Chapter 2, where 2004 AADT and LOS were presented as the key figures for ITS investment decision making, while 2030 AADT was presented more as an indication of future traffic growth. Since these are new freeways, data is oriented more to the design year of the facility, not the opening year. As such, projected LOS C in 2025 or 2030 (or some other design year beyond the planning horizon of this document) does not necessarily signal the need for some ITS investment at the current time or even the near future. It should also be noted that some of these improvements are still in the Environmental phase of development and a Record of Decision has not yet been issued for the proposed project; thus the represented corridor may or may not be the improvement ultimately selected or constructed.

As stated in Chapter 2, the minimum Level of Service policies for new or completely reconstructed freeways from the *Indiana Design Manual* will serve as a basis for possible investment in ITS devices on Indiana's Interstates and freeways. **Segments of freeway at or below Level of Service C will be highlighted in the tables below based upon their projected (Design Year) Level of Service as follows:**

Level of Service D, E, or F (Below Desirable Minimum LOS)

RURAL Interstates with LOS D, E, or F

URBAN Interstates / Freeways with LOS D, E, or F

Level of Service C (Desirable Minimum LOS)

RURAL Interstates with LOS C

URBAN Interstates / Freeways with LOS C

3.4.1. Interstate 69

3.4.1.1. I-69 from the Kentucky State Line to I-64 (Evansville) (Alt 2)

The proposed improvement results in a four lane divided, full access control facility (freeway) from the Breathitt (formerly Pennyrile) Parkway south of Henderson, Kentucky to I-64 north of Evansville, including a new Ohio River Bridge, constructed on new alignment from the Breathitt Parkway to I-164 and on the existing I-164 from east of US 41 to I-64. The Ohio River bridge will be designed to accommodate a future six lane cross section. This information is from the I-69 Henderson to Evansville Draft Environmental Impact Statement, dated February 2004.

FROM	TO	DESIGN YEAR AADT	DESIGN YEAR LOS	DESIGN YEAR
Kentucky State Line	S jct with I-164	31,400	B	2025
S jct with I-164	Green River Rd	29,820	B	2025
Green River Rd	SR 662	30,100	B	2025
SR 662	SR 66	36,830	B	2025
SR 66	SR 62	46,860	C	2025
SR 62	Lynch Rd	55,500	C	2025
Lynch Rd	Boonville-New Harmony Rd	50,270	C	2025
Boonville-New Harmony Rd	SR 57	45,450	C	2025
SR 57	I-64	53,250	C	2025

3.4.1.2. I-69 from I-64 to I-465 (Evansville to Indianapolis) (Alt 3C)

The proposed improvement results in a four lane divided, full access control facility (freeway) from I-64 north of Evansville to SR 37 southwest of Bloomington, a six lane divided, full access control facility (freeway) from southwest of Bloomington to SR 144 at Waverly, and an eight lane divided, full access control facility (freeway) from SR 144 at Waverly to I-465 at Indianapolis, constructed on new alignment from I-64 to SR 37 at Bloomington, on the existing SR 37 alignment from SR 37 at Bloomington to just south of I-465 (South Leg), with a short segment on new alignment just south of I-465.

The Tier 1 Final Environmental Impact Statement (EIS) was completed in December 2003, followed by the Record of Decision in March 2004. The Tier 1 EIS addressed the large-scale planning and environmental issues. The six identified Sections of Independent Utility have advanced into more detailed analysis in the Tier 2 Environmental Studies, including detailed traffic analysis. Although no detailed traffic information is available at this time, the Tier 1 document states that Vehicle-Miles of Travel (VMT) on SR 37 will increase approximately 80% to 330%, as illustrated below.

FROM	TO	VMT % INCREASE	DESIGN YEAR
SR 46	SR 39	78%	2025
SR 39	SR 44	147%	2025
SR 44	Centerton Rd	113%	2025
Centerton Rd	SR 144	197%	2025
SR 144	Bluff Rd	188%	2025
Bluff Rd	I-465	327%	2025

3.4.2. Interstate 265 from SR 62 to the Kentucky State Line (Alt A-15)

The proposed improvement results in a six lane divided, full access control facility (freeway) from SR 62 in Indiana to I-71 in Kentucky, including a new Ohio River Bridge, constructed on new alignment, except for the Kentucky segment from US 42 to I-71 which follows KY 841. This information is from the Louisville – Southern Indiana Ohio River Bridges Project Final Environmental Impact Statement, dated April 2003, and Record of Decision (ROD), dated September 2003.

FROM	TO	DESIGN YEAR AADT	DESIGN YEAR LOS	DESIGN YEAR
SR 62	I-71	68,200	C	2025

3.4.3. US 24 from I-469 to the Ohio State Line (Alt D-1)

The proposed improvement results in a four lane divided, full access control facility (freeway) from I-469 to the Indiana / Ohio State Line, constructed on new alignment, except for the westernmost segment at I-469. The remainder of the highway in Ohio from the State Line to Toledo, Ohio is proposed as a four lane divided, partial access control facility with select interchanges. This information is from the US 24 Draft Environmental Impact Statement, dated July 2003.

FROM	TO	DESIGN YEAR AADT	DESIGN YEAR LOS	DESIGN YEAR
I-469	Ohio State Line	15,000 - 16,000	A	2028

3.4.4. US 31

3.4.4.1. US 31 from I-465 to SR 38 (Hamilton County) (Alt F)

The proposed improvement results in a six lane divided, full access control facility (freeway) from 96th Street (just south of I-465,North Leg) to 216th Street, 0.5 mile north of SR 38 in Hamilton County, constructed on the existing US 31 alignment. This information is from the US 31 Draft Environmental Impact Statement, dated June 2003.

FROM	TO	DESIGN YEAR AADT	DESIGN YEAR LOS	DESIGN YEAR
I-465 to 106th St	106th St	90,000	D	2025
106th St	116th St	98,000	D	2025
116th St	Carmel Dr	87,500	C	2025
Carmel Dr	136th St	74,000	C	2025
136th St	SR 431 / 146th St / 151st St	67,500	C	2025
SR 431 / 146th St / 151st St	161st St	102,700	D	2025
161st St	SR 32	87,500	C	2025
SR 32	191st St	76,700	C	2025
191st St	SR 38	65,300	C	2025
SR 38	216th St	50,400	B	2025

3.4.4.2. US 31 from South of SR 26 to North of the North Junction with US 35 (Kokomo / Howard County) (Alt G)

The proposed improvement results in a four lane divided, full access control facility (freeway) from existing US 31 south of SR 26 to existing US 31 north of the north junction with US 35 at Kokomo, constructed on new alignment. This information is from the US 31 Preliminary Alternatives Analysis and Screening Report, dated November 2003.

FROM	TO	DESIGN YEAR AADT	DESIGN YEAR LOS	DESIGN YEAR
S jct with US 31	SR 26	25,600	A	2030
SR 26	Boulevard St	25,100	A	2030
Boulevard St	US 35 / SR 22	28,400	A	2030
US 35 / SR 22	Sycamore St	29,600	B	2030
Sycamore St	N jct with US 35	36,600	B	2030
N jct with US 35	N jct with US 31	29,500	A	2030

3.4.4.3. US 31 from US 30 at Plymouth to US 20 at South Bend (Marshall and St. Joseph Counties) (Alt G-Es)

The proposed improvement results in a four lane divided, full access control facility (freeway) from US 30 at Plymouth to Kern Road and an eight lane divided, full access control facility (freeway) from Kern Road to US 20/31 at South Bend, constructed on the existing US 31 alignment from US 30 to 1.5 miles south of Michigan Road, on new alignment 1.5 miles south of Michigan Road to 0.7 mile south of US 20/31, and on the existing US 31 alignment from 0.7 mile south of US 20/31 to US 20/31. This information is from the US 31 Draft Environmental Impact Statement, dated February 2004 and the US 31 Preferred Alternative Mitigation Package, dated September 2004.

FROM	TO	DESIGN YEAR AADT	DESIGN YEAR LOS	DESIGN YEAR
US 30	CR 7th Rd Extension	33,330	B	2030
CR 7th Rd Extension	US 6	38,860	C	2030
US 6	Pierce Rd/SR 4 Extension	31,450	B	2030
Pierce Rd/SR 4 Extension	Kern Rd	33,810	B	2030
Kern Rd	US 20/31	55,520	B	2030

3.4.5. SR 62 (Lloyd Expressway)

The proposed improvement results in a six lane divided, full access control facility (freeway) from Eikhoff Road / University Boulevard to Fulton Ave / First Avenue on the West Side of Evansville, constructed on the existing SR 62 alignment. The preliminary traffic data below is from the Draft Environmental Assessment that is still being prepared.

FROM	TO	DESIGN YEAR AADT	DESIGN YEAR LOS	DESIGN YEAR
Eikhoff Rd/University Blvd	Boehne Camp Rd	66,110	C	2028
Boehne Camp Rd	Red Bank Rd	70,060	C	2028
Red Bank Rd	Rosenberger Ave	74,760	C	2028
Rosenberger Ave	St. Joseph Ave	84,210	C	2028
St. Joseph Ave	Fulton Ave	89,370	C	2028

3.4.6. SR 641 (Southeast Terre Haute Bypass)

The proposed improvement results in a four lane divided, full access control facility (freeway) from US 41 south of Terre Haute to I-70 at the existing SR 46 interchange southeast of Terre Haute, constructed on new alignment. This information is from the SR 641 Final Environmental Impact Statement, dated January 2000.

FROM	TO	DESIGN YEAR AADT	DESIGN YEAR LOS	DESIGN YEAR
US 41	Canal Rd / McDaniel Rd	30,270	B	2020
Canal Rd / McDaniel Rd	Relocated SR 46 /Riley Rd	18,950	A	2020
Relocated SR 46 /Riley Rd	I-70	14,930	A	2020

CHAPTER 4 – EXISTING PLUS COMMITTED ITS DEPLOYMENTS

4.1. INTRODUCTION

The Interstate Highway System is the backbone of the Indiana surface transportation network and a critical element in the state and national economy. Logically, traffic volumes are highest in the larger urbanized areas and, as such, INDOT has concentrated the initial deployment of Intelligent Transportation Systems (ITS) devices in these areas, mainly on the Interstate System. This approach is consistent with the Federal Highway Administration's 1996 goal to implement ITS infrastructure in the Nation's 75 largest metropolitan areas. This investment philosophy will continue with the planned Indianapolis Area Advanced Traffic Management Systems (ATMS) deployment, currently scheduled through 2008.

This chapter will focus on the existing ITS infrastructure, plus planned ITS deployments that are new to a particular area or segment of freeway. Ongoing operational-type replacements or upgrades to ITS hardware in existing deployment areas are not the theme of this chapter or the document itself.

4.2. EXISTING ITS DEPLOYMENTS

The Indiana Department of Transportation (INDOT) has deployed an Advanced Traffic Management System (ATMS) in Lake County in Northwest Indiana along Interstate 80/94 (the Borman Expressway) from the Indiana / Illinois State Line to Interstate 90 (the Indiana Toll Road) and along Interstate 65 from US 30 to I-80/94 (the Borman Expressway). This ATMS consists of vehicle detection generally every ½ mile, Closed Circuit Television (CCTV) Cameras, Dynamic Message Signs (DMS), Highway Advisory Radio (HAR) Stations (with flasher notification in case of an incident), a communications system, a Traffic Management Center (TMC), 2/10 Mile Reference Markers (1/10 Mile Reference Markers on I-80/94), and the deployment of the Hoosier Helper Freeway Service Patrol (FSP), which began on a limited basis in 1991. A similar system is currently in different phases of project development in the Indianapolis area, with some devices deployed and operational, others under construction, and others still under design. A similar system in the Louisville area (including portions of Clark and Floyd Counties in Southern Indiana) known as TRIMARC (Traffic Response and Incident Management Assisting the River Cities) is in varying stages of development and deployment and is controlled by the Kentucky Transportation Cabinet with the cooperation of INDOT. DMSs are also located in Evansville and Kokomo (generally controlled by the Indianapolis TMC) and in Fort Wayne (generally controlled by the Borman TMC). The latter three locations do not have any ATMS detection or verification capabilities; activation of these DMSs only occurs when human notification takes place with the appropriate TMC.

The following sections list **existing ITS deployments by deployment type**, then by road and direction.

4.2.1. Sections with 2/10 Mile Reference Markers

A low-tech but very important ITS deployment are the 2/10 Mile Reference Markers that are installed in Indianapolis, Northwest Indiana, Southern Indiana near Louisville, Evansville, Fort Wayne, and Kokomo. These blue signs are located every two-tenths of a mile in the median of Interstates, although they are placed every one-tenth of a mile along the heavily traveled Borman Expressway (I-80/94), as well as portions of I-90 (Indiana Toll Road) and I-94, in Northwest Indiana. The 2/10 Mile Reference Markers are also placed on US Routes and State Roads in the Evansville area since these routes are significant to the overall highway system in the area. These signs are in place on US 31 in the Kokomo area, a critical route in a region not directly served by the Interstate System.

The 2/10 Mile Reference Markers display the direction of travel, a route shield indicating the highway the motorist is traveling, and the Mile Marker location on the highway (to the tenth of a mile). At interchanges, Ramp Reference Markers are positioned along the ramps indicating which ramp a motorist is traveling within an interchange.

These Reference Markers provide motorists with better location information and improved roadside assistance. Incident response teams are able to more quickly arrive on the scene of crashes, clearing debris and improving traffic flow. In an emergency, these signs serve the same purpose as the “street address” on other roads, aiding motorists and emergency response vehicles in identifying their location or destination on the highway system. As a result, crashes are reached sooner, and stranded motorists receive assistance more quickly.

The 2/10 Mile Reference Markers also serve as a key component in the messages displayed on Dynamic Message Signs (DMS) and broadcasts heard on the Highway Advisory Radio (HAR) stations. Information regarding location of an incident or heavy traffic is shown / broadcast based on the Mile Marker location (to the tenth of a mile) on a highway.

The following sections of roadway feature 2/10 Mile Reference Markers, or 1/10 Mile Reference Markers, as indicated:

I-64
EB & WB I-64 from 4.0 miles W of US 41 to 1.5 miles E of I-164, *Mile 21 to Mile 31*
EB & WB I-64 from SR 62/64 to the Kentucky State Line, *Mile 118 to Mile 124*

I-65
NB & SB I-65 from the Kentucky State Line to Memphis Rd, *Mile 0 to Mile 16*
NB & SB I-65 from 1.0 mile S of Southport Rd to 1.2 miles S of SR 267, *Mile 102 to Mile 132*
NB & SB I-65 from 1.5 miles S of US 231 to I-90 (Indiana Toll Road), *Mile 246 to Mile 262*

I-69
NB & SB I-69 from I-465 to 1.0 mile N of SR 37 / 116th St, *Mile 0 to Mile 6*
NB & SB I-69 from 2.6 miles S of I-469 (S jct) to 2.1 miles N of I-469 (N jct), *Mile 94 to Mile 117*

I-70
EB & WB I-70 from 1.5 miles W of SR 267 to 2.3 miles E of Post Rd, *Mile 65 to Mile 93*

I-74
EB & WB I-74 from 0.3 mile W of I-465 (West Leg) to 0.3 mile E of I-465 (West Leg), *Mile 73 to Mile 73.6*
EB & WB I-74 from 0.8 mile W of I-465 (East Leg) to 1.0 mile E of Acton Rd, *Mile 92.8 to Mile 100*
Note: in addition to the above sections, the I-74 travelover on I-465 is fully covered as I-465

I-80/94 – Borman Expressway (1/10 Mile Reference Markers)
EB & WB I-80/94 from the Illinois State Line to the I-80/90 (Indiana Toll Road) interchange, *Mile 0 to Mile 15.5*

I-90 – Indiana Toll Road (1/10 Mile Reference Markers)
EB & WB I-90 from the Illinois State Line to 0.4 mile E of US 41 / Calumet Ave, *Mile 0 to Mile 5*

I-94 (1/10 Mile Reference Markers)
EB and WB I-94 from the I-80/90 (Indiana Toll Road) interchange to SR 249, *Mile 15.5 to Mile 19*

I-164
Entire length and all directions of I-164 from US 41 to I-64, *Mile 0 to Mile 21*

I-265
Entire length of EB & WB I-265 from I-64 to I-65, *Mile 0 to Mile 6.7*

I-465
Entire length and all directions of I-465 from I-65 (South Leg) to I-65 (South Leg), *Mile 0 to Mile 53.2*

US 31
NB & SB US 31 from 1.1 miles S of SR 26 to 1.0 mile N of US 35 (north jct), *Mile 157 to Mile 168*

US 41
NB & SB US 41 from the Kentucky State Line to SR 68, *Mile 0 to Mile 19*

SR 62

EB & WB SR 62 from 5.4 miles W of US 41 (south jct) to US 41 (south jct), *Mile 22.0 to Mile 27.4 (Lloyd Expwy)*

EB & WB SR 62 from US 41 (N jct) to 1.2 miles E of I-164, *Mile 28.6 to Mile 34 (Morgan Ave)*

Note: in addition to the above sections, the SR 62 travelover on US 41 is fully covered as US 41

SR 66

EB & WB SR 66 from 4.6 miles W of US 41 (north jct) to US 41 (N jct), *Mile 21 to Mile 25.6 (Diamond Ave)*

EB & WB SR 66 from US 41 (S jct) to 1.8 miles E of I-164, *Mile 27.5 to Mile 34 (Lloyd Expwy)*

Note: in addition to the above sections, the SR 66 travelover on US 41 is fully covered as US 41

4.2.2. Sections Covered by Highway Advisory Radio (Area of Influence of a HAR)

Heard at AM 530 (or AM 1610 in one instance), the Highway Advisory Radio (HAR) Stations are a statewide component of the TrafficWise system. It provides similar automated information as contained on a Dynamic Message Sign (DMS), but in greater detail than can be provided by a DMS. The HAR warns motorists of incidents, construction, heavy traffic, special events, and other circumstances such as severe weather that can affect traffic. In Northwest Indiana and in the TRIMARC area near Louisville, the HAR flashers are installed on the HAR panel signs placed in advance of the HAR transmitter that notify motorists when traffic alerts are being broadcast.

INDOT currently operates 23 Highway Advisory Radio stations statewide. Seven stations are operating in the Greenfield District, five stations in both the LaPorte and Crawfordsville Districts, four stations in the Fort Wayne District, and one station each in the Seymour and Vincennes Districts. TRIMARC operates one station in the Louisville / Southern Indiana area.

The following sections of roadway are within the Area of Influence (A of I) of a Highway Advisory Radio station:

I-64
EB & WB I-64 from the Illinois State Line to US 231, *Mile 0 to Mile 57*
EB & WB I-64 from US 150 to the Kentucky State Line, *Mile 119 to Mile 124*

I-65
NB & SB I-65 from the Kentucky State Line to SR 60, *Mile 0 to Mile 7*
NB I-65 from 1.8 miles N of SR 58 to I-90 (Indiana Toll Road), *Mile 65.5 to Mile 262*
SB I-65 from the I-80/94 Connector Ramps to the Kentucky State Line, *Mile 259 to Mile 0*

I-69
NB I-69 from 2.6 miles S of SR 238 to the Michigan State Line, *Mile 7.5 to Mile 158*
Entire length of SB I-69 from the Michigan State Line to I-465, *Mile 158 to Mile 0*

I-70
Entire length of EB I-70 from the Illinois State Line to the Ohio State Line, *Mile 0 to Mile 157*
WB I-70 from 3.0 miles W of US 35 to the Illinois State Line, *Mile 146 to Mile 0*

I-74
EB I-74 from 1.3 miles W of I-465 (West Leg) to I-465 (West Leg), *Mile 72 to Mile 73.4*
EB I-74 from 2.7 miles W of SR 9 to the Ohio State Line, *Mile 110 to Mile 171*
WB I-74 from SR 44 to I-465 (East Leg), *Mile 116 to Mile 94*
WB I-74 from I-465 (West Leg) to the Illinois State Line, *Mile 73.3 to Mile 0*
Note: in addition to the above sections, the I-74 travelover on I-465 is fully covered as I-465

I-80/94 – Borman Expressway
Entire length of EB & WB I-80/94 from the Illinois State Line to the I-80/90 (Indiana Toll Road) interchange, *Mile 0 to Mile 15.5*

I-90 – Indiana Toll Road
EB from I-69 to the Ohio State Line, *Mile 144 to 157*
WB from I-69 to US 131 / SR 13, *Mile 144 to 107*
WB from 2.0 miles E of SR 49 to the Illinois State Line, *Mile 33 to Mile 0*
Note: I-80 travels over I-90 from I-94 to the Ohio State Line

I-94
Entire length of EB & WB I-94 from the I-80/90 (Indiana Toll Road) interchange to the Michigan State Line, *Mile 15.5 to Mile 46*

I-164
Entire length, all directions of I-164 from US 41 to I-64, *Mile 0 to Mile 21*

I-265
Entire length of EB & WB I-265 from I-64 to I-65, *Mile 0 to Mile 6.7*

I-465
Entire length, ***clockwise*** I-465 from I-65 (South Leg) to I-65 (South Leg), *Mile 0 to Mile 53.2*
Counterclockwise I-465 from I-65 (South Leg) to I-865, *Mile 53.2 to Mile 24*
Counterclockwise I-465 from 0.5 mile S of I-65 (West Leg) to I-65 (South Leg), *Mile 19.4 to Mile 0*

I-469
Entire length, all directions of I-469 from both junctions with I-69, *Mile 0 to Mile 31*

US 31
NB US 31 from 0.6 mile S of SR 26 to 0.1 mile N of US 35 (N jct), *Mile 157.5 to Mile 167.1*
SB US 31 from 0.1 mile N of US 35 (N jct) to 1.0 mile S of SR 26, *Mile 167.1 to Mile 157.1*
US 41
NB & SB US 41 from the Kentucky State Line to 1.4 miles N of I-64, *Mile 0 to Mile 18.4*

SR 57
NB & SB SR 57 from US 41 to 2.0 miles north of I-64, *Mile 0 to Mile 12*

SR 62
EB & WB SR 62 from 7.4 miles W of US 41 (S jct) to 2.2 miles E of I-164, *Mile 20.0 to Mile 35*
Note: in addition to the above sections, the SR 62 travelover on US 41 is fully covered as US 41

SR 66
EB & WB SR 66 from 5.6 miles W of US 41 (N jct) to 1.8 miles E of I-164, *Mile 20 to Mile 34*
Note: in addition to the above sections, the SR 66 travelover on US 41 is fully covered as US 41

4.2.3. Sections Covered by Permanent Overhead Dynamic Message Signs (Area of Influence of at least one DMS)

These electronic signs, which can display changing messages, are the most visible part of the TrafficWise system. Installation of signs along the Borman Expressway in Gary is complete and most signs are in place in the Indianapolis area. These permanent signs, which can be controlled either from the TMC or , in Northwest Indiana only, by Hoosier Helpers, warn motorists of incidents and delays, allowing them to choose alternate routes. Dynamic Message Signs are also in place in Evansville, Fort Wayne, Kokomo and Southern Indiana near Louisville. The Southern Indiana Dynamic Message Signs are operated by TRIMARC, the ITS deployment in the Louisville / Southern Indiana area.

INDOT currently has 48 Permanent Overhead DMSs statewide under INDOT control, in addition to approximately 50 Portable DMSs statewide, including a large deployment on the Indiana Toll Road. Twenty-one Permanent Overhead Dynamic Message Signs are located in the Indianapolis area, along with twelve in the Evansville area, eleven in Northwest Indiana, two in the Fort Wayne area, and two in the Kokomo area. TRIMARC operates four Permanent Overhead DMSs in Southern Indiana.

The following sections of roadway are within the Area of Influence (A of I) of at least one Permanent Overhead Dynamic Message Sign:

I-64
EB I-64 from 3.8 miles W of US 41 to US 231, *Mile 21.2 to Mile 57*
EB I-64 from 1.0 mile W of I-265 to the Kentucky State Line, *Mile 120.7 to Mile 124*
WB I-64 from the Kentucky State Line to US 150, *Mile 124 to Mile 119*
WB I-64 from 1.6 miles E of I-164 to the Illinois State Line, *Mile 31.1 to Mile 0*

I-65
NB I-65 from the Kentucky State Line to SR 60, *Mile 0 to Mile 7*
NB I-65 from 1.3 miles S of I-465 (S Leg) to SR 28, *Mile 104.7 to Mile 158*
NB I-65 from 2.4 miles S of US 30 to I-90 (Indiana Toll Road), *Mile 250.3 to Mile 262*
SB I-65 from 0.9 mile N of I-80/94 to SR 10, *Mile 260.7 to Mile 230*
SB I-65 from 2.0 miles N of SR 334 to SR 46, *Mile 131.9 to Mile 68*
SB I-65 from 1 mile S of SR 311 to the Kentucky State Line, *Mile 8 to Mile 0*

I-69
NB I-69 from I-465 to SR 32/67, *Mile 0 to Mile 34*
NB I-69 from 2.4 miles S of I-469 (S jct) to SR 8, *Mile 94.2 to Mile 129*
SB I-69 from 2.2 miles N of I-469 (N jct) to US 224, *Mile 117.1 to Mile 86*
SB I-69 from 4.3 miles N of I-465 to I-465*, Mile 4.3 to Mile 0*

I-70
EB I-70 from 1.1 miles E of SR 267 to SR 3, *Mile 67.6 to Mile 123*
WB I-70 from 2.7 miles E of I-465 (E Leg) to SR 243, *Mile 92.1 to Mile 37*

I-74
EB I-74 from I-465 (East Leg) to SR 44, *Mile 93.8 to Mile 116*
WB I-74 from 4.9 miles E of I-465 (E Leg) to I-465 (E Leg), *Mile 98.5 to Mile 93.8*
Note: in addition to the above sections, the I-74 travelover on I-465 is fully covered as I-465

I-80/94 – Borman Expressway
EB I-80/94 from 1.3 miles E of the Illinois State Line to the I-80/90 (Indiana Toll Road) interchange, *Mile 1.3 to Mile 15.5*
Entire length of WB I-80/94 from the I-80/90 (Indiana Toll Road) interchange to the Illinois State Line, *Mile 15.5 to Mile 0*

I-94
Entire length of EB I-94 from the I-80/90 (Indiana Toll Road) interchange to the Michigan State Line, *Mile 15.5 to Mile 46*
WB I-94 from 1.7 miles E of SR 249 to the I-80/90 (Indiana Toll Road) interchange, *Mile 20.7 to Mile 15.5*

I-164
Entire length and all directions of I-164 from US 41 to I-64, *Mile 0 to Mile 21*

I-265
Entire length of EB & WB I-265 from I-64 to I-65, *Mile 0 to Mile 6.7*

I-465
Entire length and all directions of I-465 from I-65 (South Leg) to I-65 (South Leg), *Mile 0 to Mile 53.2*

I-469
Entire length and all directions of I-469 from both junctions with I-69, *Mile 0 to Mile 31*

US 30
Note: A DMS is located 1.5 miles E of I-65 on WB US 30. The Area of Influence for this sign is on I-65 and I-80/94.

US 31
NB US 31 from 0.5 mile S of SR 26 to 2.0 miles N of US 35 (N jct), *Mile 157.6 to Mile 169*
SB US 31 from 1.0 mile N of US 35 (N jct) to 1.1 miles S of SR 26, *Mile 168 to Mile 157*

US 41
NB US 41 from 1.0 mile S of I-164 to 1.4 miles N of I-64, *Mile 0.4 to Mile 18.4*
SB US 41 from 1.4 miles N of I-64 to the Kentucky State Line, *Mile 18.4 to Mile 0*

SR 57
SB SR 57 from 1.5 miles N of I-64 to US 41, *Mile 11.5 to Mile 0*

SR 62
EB SR 62 from 5.4 miles W of US 41 (S jct) to US 41 (S jct), *Mile 22.0 to Mile 27.4*
WB SR 62 from 1.4 miles E of I-164 to 7.4 miles W of US 41 (S jct), *Mile 34.2 to Mile 20*
Note: in addition to the above sections, the SR 62 travelover on US 41 is fully covered as US 41

SR 66
EB SR 66 from 4.8 miles W of US 41 (N jct) to 2.0 miles E of I-164, *Mile 20.8 to Mile 34.2*
WB SR 66 from 1.1 miles E of I-164 to US 41 (S jct), *Mile 33.3 to Mile 27.5*
Note: in addition to the above sections, the SR 66 travelover on US 41 is fully covered as US 41

Brown's Station Way (former SR 62)
Note: A DMS is located approximately 1.0 mile W of I-65 on EB Brown's Station Way (formerly SR 62) in Clarksville as part of the TRIMARC ATMS. The Area of Influence for this sign is on SB I-65.

4.2.4. Sections Covered by the Hoosier Helper Freeway Service Patrol

The Hoosier Helper Freeway Service Patrol serves approximately 130 miles of Indiana's busiest freeways in their distinctive trucks or vans, helping stranded motorists, removing debris from the road, or summoning help quickly in case of a crash, vehicle fire, or other emergency. They can change a tire, supply enough fuel to get a motorist to a service station, perhaps fix a minor mechanical problem, and summon help for the problems they can't solve. The Hoosier Helpers do more than provide an extra measure of security and safety for motorists. They also keep traffic moving, and that makes them a key element in an Advanced Traffic Management Systems (ATMS) deployment.

In Northwest Indiana, on-board computers give the Hoosier Helpers direct access to the Traffic Management Center, enabling them to give travelers immediate information about traffic conditions. They can post advisories on the Dynamic Message Signs, issue alerts via the Highway Advisory Radio system, and send out notices via personal pagers.

INDOT currently has four Hoosier Helper programs statewide. The first program began in Northwest Indiana on I-80/94 (the Borman Expressway) in August 1991 as a daytime program that expanded to 24 hour / 7 days a week service in May 1996. The current 34 mile patrol area in Northwest Indiana includes the Borman Expressway from the Illinois State Line to SR 249 and I-65 from US 231 to US 12/20, just north of the interchange with I-90, the Indiana Toll Road. The coverage on the Borman actually extends 1.5 miles into Illinois on I-80/94 (the Kingery Expressway) to Illinois Route 83 (Torrence Avenue), a logical and safe turnaround that assures complete coverage in Indiana on I-80/94. These 1.5 miles are not included in the 34 mile figure above.

The second Hoosier Helper deployment began in August 1997 in the Indianapolis area and operates during peak travel periods, specifically, weekdays from 5:30 a.m. to 7:30 p.m. and special events. Service is currently provided on 64 miles of Indianapolis area freeways: on I-65 from Southport Road to the I-70 North Split; I-69 from I-465 to 96th Street, I-70 from Harding Street to Post Road; and I-465 from US 31 on the North Leg, clockwise on the East and South Legs, to 56th Street on the West Leg.

The third Hoosier Helper deployment began serving the Indiana portion of metropolitan Louisville in May 1999 and operates weekdays and special events from 5:00 a.m. to 7:30 p.m. in the Falls City area in Southern Indiana. Service is currently provided on 30 miles of freeway in this area: on I-64 from the Lanesville interchange (Exit 113) to the Ohio River (Kentucky State Line); I-65 from the Ohio River to SR 311; I-265 from I-64 to I-65; and SR 265 from I-65 to SR 62. Hoosier Helpers do cross the Ohio River into Kentucky to turn around to assure complete coverage in Indiana on I-64 and I-65.

The fourth program is in its infancy in the Fort Wayne area, having just begun in September 2004 after implementing some limited Hoosier Helper service with regular INDOT (non-Hoosier Helper van) vehicles earlier in 2004. This program covers I-69 from the south junction with I-469 to SR 1 / Dupont Road from 2:00 p.m. to 10:00 p.m., with occasional trips made on I-469.

The following provides information regarding the total number of motorists assisted by the Hoosier Helper Freeway Service Patrol since 1996. Statistics are not available from 1991 to 1995, when the service was only provided during peak travel times in Northwestern Indiana only:

HOOSIER HELPER MOTORIST ASSISTANCE STATISTICS SINCE 1996

Year	Northwest Indiana	Indianapolis	Falls City	TOTAL
1996	13,871	N/A	N/A	13,871
1997	15,895	1,607*	N/A	17,502
1998	15,629	4,082	N/A	19,711
1999	17,902	5,937	2,749**	26,588
2000	16,726	10,077	4,168	30,971
2001	17,180	10,316	4,128	31,624
2002	20,743	10,941	4,293	35,977
2003	18,374	11,160	4,698	34,232
TOTAL	**136,320**	**54,120**	**20,036**	**210,476**

N/A - Not applicable; service not yet deployed in area
* - Partial year figure; service began Labor Day Weekend
** - Partial year figure; service began Memorial Day Weekend

The following provides information regarding the type and number of motorist assistance services provided by the Hoosier Helper Freeway Service Patrol in 2003:

2003 HOOSIER HELPER MOTORIST ASSISTANCE STATISTICS

Service Rendered	Northwest Indiana	Indianapolis	Falls City	TOTAL
Abandoned Vehicle	2,378	4,246	855	7,479
Crash	1,802	1,063	90	2,955
Called Other	1,824	180	235	2,239
Diesel Fuel	81	24	4	109
Escort/Transport Motorist	693	253	128	1,074
Fire	70	50	5	125
Gasoline	1,684	682	238	2,604
Information	592	810	81	1,483
Jump Start	756	136	82	974
Minor Repair	1,240	268	83	1,591
Nothing Required/Checked on Welfare	1,643	821	533	2,997
Debris Removal	831	792	130	1,753
Tire	2,678	1,038	309	4,025
Water	390	57	70	517
Woke Sleeping Motorist	204	33	20	257
Wrecker Called	643	288	172	1,103
Other	865	419	1,663	2,947
TOTAL	**18,374**	**11,160**	**4,698**	**34,232**

The following sections of roadway are served by the Hoosier Helper Freeway Service Patrol:

I-64
EB & WB I-64 from the Lanesville interchange to the Kentucky State Line, *Mile 113 to Mile 124*

I-65
NB & SB I-65 from the Kentucky State Line to SR 311, *Mile 0 to Mile 9*
NB & SB I-65 from Southport Rd to I-70 (N jct), *Mile 103 to Mile 112*
NB & SB I-65 from US 231 to US 12/20, *Mile 247.4 to Mile 262.2*

I-69
NB & SB I-69 from I-465 to 96th St, *Mile 0 to Mile 2.4*
NB & SB I-69 from I-469 (S jct) to SR 1, *Mile 96 to Mile 116*

I-70
EB & WB I-70 from Harding St to Post Rd, *Mile 78.6 to Mile 90.4*

I-80/94 – Borman Expressway
Entire length of EB & WB I-80/94 from the Illinois State Line to the I-80/90 (Indiana Toll Road) interchange, *Mile 0 to Mile 15.5*

I-90 – Indiana Toll Road
Entire length of EB & WB I-90 from the Illinois State Line to the Ohio State Line, *Mile 0 to Mile 157*
Note: I-80 travels over I-90 from I-94 to the Ohio State Line

I-94
EB & WB I-94 from the I-80/90 (Indiana Toll Road) interchange to SR 249, *Mile 15.5 to Mile 19*

I-265
Entire length of EB & WB I-265 from I-64 to I-65, *Mile 0 to Mile 6.7*

I-465
All directions of I-465 from I-65 (S Leg) to 56th St (W Leg), *Mile 0 to Mile 19*
All directions of I-465 from US 31 (N Leg) to I-65 (S Leg), *Mile 31 to Mile 53.2*

I-469 (Occasional Service as part of the I-69 patrol route)
Entire length and all directions of I-469 from I-69 (S jct) to I-69 (N jct), *Mile 0 to Mile 31*

SR 265/62
Entire length of EB & WB SR 265/62 from I-65 to SR 62 (E jct), *Mile 6.7 to Mile 9.3*

4.2.5. Sections Covered by Closed Circuit Television (CCTV) Cameras

Closed Circuit Television (CCTV) Cameras are used to monitor traffic conditions and to quickly investigate, locate, and determine the cause of any slowed traffic. When vehicle detecton (sensors), if installed, detect slowed traffic, operators in the TMC can direct the cameras to focus on the apparent trouble spot. The information is then relayed to the appropriate emergency responders and to the various communication tools used to provide information to motorists, such as the Dynamic Message Signs and Highway Advisory Radio.

Forty-four CCTV cameras are deployed in Northwest Indiana. Twenty-five cameras, a fraction of the total of 125 that will deployed, are currently deployed in the Indianapolis area. Ten cameras are currently deployed as part of TRIMARC in Southern Indiana near Louisville.

The following sections of roadway are covered by CCTV cameras:

I-64
EB & WB I-64 from US 150 to the Kentucky State Line, *Mile 119 to Mile 124*

I-65
NB & SB I-65 from the Kentucky State Line to SR 60, *Mile 0 to Mile 7*
NB & SB I-65 from 1.0 mile S to 0.6 mile N of Mile 106.0 camera @ I-465 (S Leg), *Mile 105.0 to Mile 106.6*
NB & SB I-65 from 1.1 miles S to 2.0 miles of Mile 113.5 camera @ West St, *Mile 112.4 to Mile 15.5*
SB I-65 from 0.4 mile N to 0.2 mile S of Mile 123.3 camera @ I-465 (West Leg), *Mile 123.7 to Mile 123.1*
NB & SB I-65 from 1.2 miles S to 1.0 mile N of Mile 127.8 camera, 0.3 mile N of the Marion/Hendricks County Line, *Mile 126.6 to Mile 128.8*
NB & SB I-65 from 1.0 mile S of US 30 to 0.7 mile N of I-80/94, *Mile 251.5 to Mile 260.5*

I-69
NB & SB I-69 from I-465 to 1.0 mile N of Mile 0.0 camera @ I-465, *Mile 0 to Mile 1.0*

I-70
EB & WB I-70 from 1.0 mile W to 0.4 mile E of Mile 74.8 camera @ Airport Expwy, *Mile 73.8 to Mile 75.2*

I-74
EB & WB I-74 from 0.8 mile W of I-465 (W Leg) to Mile 73.3 camera @ I-465 (W Leg), *Mile 72.5 to Mile 73.3*
EB & WB I-74 from 1.2 miles W to 0.8 mile E of Mile 96.0 camera @ Post Rd, *Mile 94.8 to Mile 96.8*

I-80/94 – Borman Expressway
Entire length of EB & WB I-80/94 from the Illinois State Line to the I-80/90 (Indiana Toll Road) interchange, *Mile 0 to Mile 15.5*

I-90 – Indiana Toll Road
EB & WB I-90 from 0.9 mile W to 1.0 mile E of Mile 16.7 camera @ I-65, *Mile 15.8 to Mile 17.7*

I-94
EB & WB I-94 from the I-80/90 (Indiana Toll Road) interchange to I-80/90 (Indiana Toll Road), *Mile 15.5 to Mile 16.1*

I-265
EB & WB I-265 from I-64 to 0.7 mile E of Mile 0.0 camera @ I-64, *Mile 0 to Mile 0.7*

I-465
WB & EB I-465 from 0.4 mile E to 0.5 mile W of Mile 0.0 camera @ I-65 (South Leg), *Mile 52.8 to Mile 0.5*
WB & EB I-465 from 0.9 mile E to 1.0 mile W of Mile 4.3 camera @ SR 37 (South Leg), *Mile 3.4 to Mile 5.3*
NB & SB I-465 from 0.9 mile S to 0.5 mile N of Mile 15.9 camera @ I-74 (West Leg), *Mile 15.0 to Mile 16.4*
NB/EB & WB/SB I-465 from 0.7 mile S to 1.0 mile E of Mile 24.7 camera @ I-865 (West & North Legs), *Mile 24.0 to Mile 25.7*
EB & WB I-465 from 1.0 mile W to 0.6 mile E of Mile 30.8 camera @ US 31 (North Leg), *Mile 29.8 to Mile 31.4*
EB & WB I-465 from 1.6 miles W to 0.8 mile E of Mile 36.6 camera @ I-69 (North Leg), *Mile 35.0 to Mile 37.4*

I-865
EB & WB I-865 from 0.5 mile W to 0.3 mile E of Mile 4.7 camera @ I-465, *Mile 4.2 to Mile 5.0*

4.2.6. Sections with Vehicle Detection to Monitor Traffic Flow

Vehicle detectors are used to monitor overall traffic speed. These detectors can be either magnetic microloops under the pavement or radar-like devices mounted above ground. These sensors are connected to computers in the Traffic Management Center; when slowdown in traffic is detected, the CCTV cameras are used to verify the nature of the incident. Appropriate emergency responders are then notified and a message placed on the appropriate Dynamic Message Signs and/or Highway Advisory Radio station.

Approximately 75 detection devices are in place in Northwest Indiana on I-80/94 and I-65, and two are in place on I-65 just north of the Ohio River as part of the TRIMARC deployment. The following segments feature vehicle detection devices:

I-65
NB I-65 from the Kentucky State Line to 10th St, *Mile 0 to Mile 0.5*
NB I-65 from US 30 to 0.5 mile N of I-80/94, *Mile 252.5 to Mile 260.3*
SB I-65 from I-80/94 to US 30, *Mile 259.8 to Mile 252.5*

I-80/94 – Borman Expressway
Entire length of EB & WB I-80/94 from the Illinois State Line to the I-80/90 (Indiana Toll Road) interchange, *Mile 0 to Mile 15.5*

4.2.7. Sections Covered by a Motorist Assistance / Traffic Phone Number (511, etc) (non- 911 or DUI)

Numerous traveler information phone numbers exist around the country. In an effort to streamline and simplify the myriad of numbers for motorists, the Federal Communications Commission has assigned the number "511" for transportation / travel information. INDOT is currently in the planning phase for this system, with initial deployment in the Gary-Chicago-Milwaukee (GCM) ITS Priority Corridor and ultimately across the state.

Currently, the Indiana Toll Road operates a road emergency / assistance number, "*11", which dials directly to the Toll Road's dedicated Indiana State Police District, District 11:

I-90 – Indiana Toll Road
Entire length of EB & WB I-90 from the Illinois State Line to the Ohio State Line (*11),
Mile 0 to Mile 157
Note: I-80 travels over I-90 from I-94 to the Ohio State Line

4.3. PLANNED / COMMITTED ITS DEPLOYMENTS

4.3.1. Indianapolis Area

INDOT is in the midst of a multi-year deployment of ITS devices on the Interstate System in Marion and portions of surrounding counties in the Indianapolis area. This Advanced Traffic Management System (ATMS) implementation is the main focus of the INDOT ITS deployment through 2008, essentially the near-term component of INDOT's ITS priorities.

The Indianapolis area ITS deployment began in 1997 with the commencement of the Hoosier Helper Freeway Service Patrol on a limited portion of the Interstate System. Hoosier Helpers currently patrol 64 miles of Indianapolis area Interstates during the peak travel period of 5:30 AM to 7:30 PM, Monday through Friday, with intentions on expanding this program to additional miles of freeway in the future. The 2/10 Mile Reference Markers were installed in the median of Indianapolis area Interstates in 1998 to assist motorists and emergency responders in navigation and location identification on the Interstate System.

The implementation of ITS technology in the Indianapolis area started with the installation of the initial three permanent overhead Dynamic Message Signs (DMS) in 2000, followed by the next six DMSs in 2001. These nine DMSs were supplemented by the addition of 12 DMSs in 2003, bringing the total number of permanent overhead DMSs in the Indianapolis area to 21. With the completion of the 12 "backbone" Communication Distribution Point towers in 2004 (Phase One of a five phase ATMS), INDOT has an additional 11 locations from which cameras can be used to monitor traffic and verify incidents. This significant milestone coincides with the opening of the Indianapolis Traffic Management Center. This is still just a fraction of the 125 cameras that will ultimately be installed in phases through 2008. These cameras, placed approximately every mile, will supplement a system of vehicle detection underneath the pavement that will be placed approximately every ½ mile on high-volume and one mile on lower volume Interstates in the Indianapolis area to measure the overall flow of traffic.

Phase Two of the Indianapolis ATMS is currently under construction and is expected to be completed in 2005. This will install the aforementioned vehicle detection and additional cameras along I-65 from Pleasant Run Parkway (south of the South Split) to Cold Spring Road, I-70 from west of the new Ronald Reagan Parkway (Six Points Road) interchange to Ritter Avenue, and temporary devices on the West Leg of I-465 from SR 67 / Kentucky Avenue to 56th Street.

Phase Three of the Indianapolis area ATMS deploys the vehicle detection and additional cameras in 2006-2007 in the northeastern and eastern portions of the Indianapolis area on I-70 from Ritter Avenue to Mt. Comfort Road (temporary devices from Ritter Avenue to I-465 (East Leg); furthermore, the Mt. Comfort Road devices will be installed as part of Phase Two of the Interchange Modification at that location), I-69 from I-465 to SR 238, and I-465 from the White River (North Leg) to English Avenue (East Leg).

Phase Four of the Indianapolis area ATMS deploys the vehicle detection and additional cameras in 2006-2007 in the southern portion of the Indianapolis area on I-65 from County Line Road to Pleasant Run Parkway (south of the South Split) and I-465 from English Avenue to SR 67 / Kentucky Avenue. Devices on I-74 from I-465 to Pleasant View Road were installed as part of the 2002-2003 Road Rehabilitation project from I-465 to London Road but are not yet integrated into the system.

The Fifth and final phase of the Indianapolis area ATMS deploys the vehicle detection and additional cameras in 2007-2008 in the northwestern portion of the Indianapolis area on I-65 from Cold Spring Road to SR 267, I-74 from Raceway Road to I-465 (West Leg), I-465 from 56th Street (West Leg) to the White River (North Leg), and I-865 from I-65 to I-465.

4.3.2. Kokomo Area

Three ITS elements are scheduled for deployment in 2005 in the Kokomo area on US 31 as part of a unique state-local partnership. An emergency vehicle signal preemption / priority system will be installed on US 31 from SR 26 to the north junction with US 35. Seven Closed Circuit Television (CCTV) cameras, as well as fiber optics, will be in installed on US 31 from SR 26 to Morgan Avenue, 2.0 miles north of US 35 / SR 22 (Markland Avenue). The CCTV camera images will be monitored by local law enforcement dispatchers. Incidents will be reported to the Indianapolis Traffic Management Center (TMC) for activation of the Automated Traveler Information System (ATIS) which results in messages being posted on the US 31 Dynamic Message Sign(s) DMS and Highway Advisory Radio (HAR) in the Kokomo area so motorists can seek alternate routes.

4.3.3. TRIMARC (Louisville / Southern Indiana Area)

The Advanced Traffic Management Systems (ATMS) in the Louisville area (including portions of Clark and Floyd Counties in Southern Indiana) known as TRIMARC (Traffic Response and Incident Management Assisting the River Cities) is in varying stages of development and deployment and is controlled by the Kentucky Transportation Cabinet with the cooperation of INDOT. TRIMARC updated their original July 1998 Strategic Plan in July 2003; general existing and planned deployment information may be found in the next section. Please refer to the TRIMARC Strategic Plan for specific details regarding planned ITS deployments in the Falls City area in Southern Indiana.

4.4. EXISTING PLUS COMMITTED (E+C) ITS DEPLOYMENTS

The following tables present the **existing plus committed or planned** ITS deployments statewide by route by direction (north-south roadways are listed south to north and then north to south; east-west roadways are listed west to east and then east to west. **Committed is defined as either a part of the ongoing Indianapolis Advanced Traffic Management Systems (ATMS) deployment (including proposed future Hoosier Helper Freeway Service Patrol deployments), the US 31 Kokomo deployment, or as part of the TRIMARC Strategic Plan.** Information regarding the deployment of seven key ITS components is provided: 2/10 Mile Reference Markers, Highway Advisory Radio (HAR) (specifically, the segments of a route within the Area of Influence (A of I) of a HAR), Permanent Overhead Dynamic Message Signs (DMS) (specifically, the segments of a route within the Area of Influence (A of I) of an existing DMS), Hoosier Helper Freeway Service Patrol (FSP), Closed Circuit Television (CCTV), Vehicle Detection, and an information or emergency (non-911) phone system, such as 511.

4.4.1. Interstate 64

4.4.1.1. Eastbound I-64

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Illinois State Line to 3.8 miles W of US 41 (0 to 21.2)		X					
4.0 miles W of US 41 to 1.5 miles E of I-164 (21 to 31) (DMS @ 21.2)	X	X	X				
1.5 miles E of I-164 to US 231 (31 to 57)		X	X				
US 231 to Lanesville Interchange (57 to 113) (None)							
Lanesville Interchange to SR 62/64 (113 to 118)				X			
SR 62/64 to 1.0 mile W of I-265 (118 to 120.7)	X	X		X	X		
1.0 mile W of I-265 to Kentucky State Line (120.7 to 124)	X	X	X	X	X		

4.4.1.2. Westbound I-64

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Kentucky State Line to SR 62/64 (124 to 118)	X	X	X	X	X		
SR 62/64 to Lanesville Interchange (118 to 113)				X			
Lanesville Interchange to US 231 (113 to 57) (None)							
US 231 to 1.6 miles E of I-164 (57 to 31.1)		X					
1.6 miles E of I-164 to 4.0 miles W of US 41 (31.1 to 21) (RM begin @ 31)	X	X	X				
4.0 miles W of US 41 to Illinois State Line (21 to 0)		X	X				

4.4.2. Interstate 65

4.4.2.1. Northbound I-65

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Kentucky State Line to 10th St (0 to 0.5)	X	X	X	X	X	X	
10th St to SR 60 (0.5 to 7)	X	X	X	X	X	X	
SR 60 to SR 311 (7 to 9)	X	X	X	X	X		
SR 311 to Memphis Rd (9 to 16)	X						
Memphis Rd to 1.8 miles N of SR 58 (16 to 65.5) (None)							
1.8 miles N of SR 58 to Greenwood Rd (Main St) (65.5 to 99)		X					
Greenwood Rd (Main St) to County Line Rd (99 to 100.8)		X		X			
County Line Rd to 1.0 mile S of Southport Rd (100.8 to 102)		X		X	X	X	
1.0 mile S of Southport Rd to 1.3 mile S of I-465 (S Leg) (102 to 104.7)	X	X		X	X	X	
1.3 mile S of I-465 (S Leg) to SR 334 (104.7 to 130)	X	X	X	X	X	X	
SR 334 to 1.2 miles S of SR 267 (130 to 132)	X	X	X		X	X	
1.2 miles S of SR 267 to SR 267 (132 to 133.2)		X	X		X	X	
SR 267 to SR 28 (133.2 to 158)		X	X				
SR 28 to 1.5 miles S of US 231 (Exit 247) (158 to 246)		X					
1.5 miles S of US 231 (Exit 247) to US 231 (Exit 247) (246 to 247.5)	X	X					
US 231 (Exit 247) to 2.4 miles S of US 30 (247.5 to 250.3)	X	X		X			
2.4 miles S of US 30 to US 30 (250.3 to 252.7)	X	X	X	X			
US 30 to 0.5 mile N of I-80/94 (252.7 to 260.3)	X	X	X	X	X	X	
0.5 mile N of I-80/94 to I-90 (260.3 to 262)	X	X	X	X			

4.4.2.2. Southbound I-65

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-90 to 0.9 mile N of I-80/94 (262 to 260.7)	X			X			
0.9 mile N of I-80/94 to I-80/94 (260.7 to 259.8)	X		X	X			
0.5 mile N of I-80/94 to I-80/94 Connector Ramps (260.3 to 259)	X		X	X	X	X	
I-80/94 Connector Ramps to US 30 (259 to 252.7)	X	X	X	X	X	X	
US 30 to US 231 (Exit 247) (252.7 to 247.5)	X	X	X	X			
US 231 (Exit 247) to 1.5 miles S of US 231 (Exit 247) (247.5 to 246)	X	X	X				
1.5 miles S of US 231 (Exit 247) to SR 10 (246 to 230)		X	X				
SR 10 to SR 267 (230 to 133.2)		X					
SR 267 to 1.2 miles S of SR 267 (133.2 to 132)		X			X	X	
1.2 miles S of SR 267 to SR 334 (132 to 130)	X	X	X		X	X	
SR 334 to 1.0 mile S of Southport Rd (130 to 102)	X	X	X	X	X	X	
1.0 mile S of Southport Rd to County Line Rd (102 to 100.8)		X	X	X	X	X	
County Line Rd to Greenwood Rd (Main St) (100.8 to 99)		X	X	X			
Greenwood Rd (Main St) to SR 46 (99 to 68)		X	X				
SR 46 to Memphis Rd (68 to 16)		X					
Memphis Rd to SR 311 (16 to 9)	X	X					
SR 311 to 1.0 mile S of SR 311 (9 to 8)	X	X		X	X		
1.0 mile S of SR 311 to SR 60 (8 to 7)	X	X	X	X	X		
SR 60 to Kentucky State Line (7 to 0)	X	X	X	X	X	X	

4.4.3. Interstate 69 (North of Indianapolis Only)

4.4.3.1. Northbound I-69

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-465 to 1.0 mile N of 116th St (0 to 6)	X		X	X	X	X	
1.0 mile N of 116th St to 2.6 miles S of SR 238 (6 to 7.5)			X	X	X	X	
2.6 miles S of SR 238 to SR 238 (7.5 to 10)		X	X	X	X	X	
SR 238 to SR 32/67 (10 to 34)		X	X				
SR 32/67 to 2.6 miles S of I-469 (S jct) (34-94)		X					
2.6 miles S of I-469 (S jct) to I-469 (S jct) (94 to 96.6) (DMS @ 94.2)	X	X	X				
I-469 (S jct) to SR 1 (96.6 to 116)	X	X	X	X			
SR 1 to 1.0 mile N of SR 1 (116 to 117)	X	X	X				
1.0 mile N of SR 1 to SR 8 (117 to 119)		X	X				
SR 8 to Michigan State Line (129 to 158)		X					

4.4.3.2. Southbound I-69

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Michigan State Line to 1.1 miles N of SR 1 (158 to 117.1)		X					
1.1 miles N of SR 1 to SR 1 (117.1 to 116) (2/10 RM begin @ 117)	X	X	X				
SR 1 to I-469 (S jct) (116 to 96.6)	X	X	X	X			
I-469 (S jct) to 2.6 miles S of I-469 (S jct) (96.6 to 94)	X	X	X				
2.6 miles S of I-469 (S jct) to US 224 (94 to 86)		X	X				
US 224 to SR 238 (86 to 10)		X					
SR 238 to 1.0 mile N of 116th St (10 to 6)		X		X	X	X	
1.0 mile N of 116th St to 4.3 miles N of I-465 (5 to 4.3)	X	X		X	X	X	
4.3 miles N of I-465 to I-465 (4.3 to 0)	X	X	X	X	X	X	

4.4.4. Interstate 70

4.4.4.1. Eastbound I-70

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Illinois State Line to 1.4 miles W of SR 267 (0 to 65)		X					
1.5 miles W of SR 267 to SR 267 (65 to 66.5)	X	X					
SR 267 to 1.1 miles E of SR 267 (66.5 to 67.6)	X	X		X	X	X	
1.1 miles E of SR 267 to 2.3 miles E of Post Rd (67.6 to 93) *	X	X	X	X	X	X	
2.3 miles E of Post Rd to Mt. Comfort Rd (93 to 96)		X	X	X	X	X	
Mt. Comfort Rd to SR 3 (96 to 123)		X	X				
SR 3 to Ohio State Line (123 to 157)		X					

* - Note: I-70 travel over I-65 from Mile 81 to 83 is covered as I-65

4.4.4.2. Westbound I-70

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Ohio State Line to 3.0 miles W of US 35 (157 to 146) (None)							
3.0 miles W of US 35 to Mt. Comfort Rd (146 to 96)		X					
Mt. Comfort Rd to 2.3 miles E of Post Rd (96 to 93)		X		X	X	X	
2.3 miles E of Post Rd to 1.4 miles E of Post Rd (93 to 92.1)	X	X		X	X	X	
1.4 miles E of Post Rd to SR 267 (92.1 to 66.5) *	X	X	X	X	X	X	
SR 267 to 1.5 miles W of SR 267 (66.5 to 65)	X	X	X				
1.5 miles W of SR 267 to SR 243 (65 to 37)		X	X				
SR 243 to Illinois State Line		X					

* - Note: I-70 travel over I-65 from Mile 83 to 81 is covered as I-65

4.4.5. Interstate 74

4.4.5.1. Eastbound I-74

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Illinois State Line to 3.3 miles W of I-465 (W Leg) (0 to 70) (None)							
SR 267 to 3.3 miles W of I-465 (W Leg) (66 to 70)				*			
3.3 miles W of I-465 (W Leg) to 2.3 miles W of I-465 (W Leg) (70 to 72)				*	X	X	
2.3 miles W of I-465 (West Leg) to 0.3 mile W of I-465 (W Leg) (72 to 73)		X		*	X	X	
0.3 mile W of I-465 (W Leg) to I-465 (W Leg) (73 to 73.3) (2/10 RM continue to 73.6)	X	X		*	X	X	
I-74 travels over I-465 **							
0.2 mile E of I-465 (East Leg) to 1.0 mile E of Acton Rd (93.8 to 100) (2/10 RM begin at 92.8)	X		X	*	X	X	
1.0 mile E of Acton Rd to Pleasant View Rd (100 to 101)			X	*	X	X	
Pleasant View Rd to 2.7 miles W of SR 9 (101 to 110)			X				
2.7 miles W of SR 9 to SR 44 (110 to 116)		X	X				
SR 44 to Ohio State Line		X					

* - Note: Not a regular Hoosier Helper patrol route; Hoosier Helper will respond for a confirmed incident, verified either by ATMS devices or authorized personnel.

** - Note: I-74 travel over I-465 from Mile 73.3 to 93.8 is covered as I-465

4.4.5.2. Westbound I-74

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Ohio State Line to SR 44 (None)							
SR 44 to Pleasant View Rd (116 to 101)		X					
Pleasant View Rd to 1.0 mile E of Acton Rd (101 to 100)		X		*	X	X	
1.0 mile E of Acton Rd to 0.5 mile W of Acton Rd (100 to 98.5)	X	X		*	X	X	
0.5 mile W of Acton Rd to I-465 (E Leg) (98.5 to 93.8)	X	X	X	*	X	X	
I-74 travels over I-465 **		X					
I-465 (W Leg) to 0.3 mile W of I-465 (W Leg) (73.3 to 73) (2/10 RM start at 73.6)	X	X		*	X	X	
0.3 mile W of I-465 (W Leg) to 3.3 miles W of I-465 (W Leg) (73 to 70)		X		*	X	X	
3.3 miles W of I-465 to SR 267 (70 to 66)		X		*			
SR 267 to Illinois State Line (66 to 0)		X					

* - Note: Not a regular Hoosier Helper patrol route; Hoosier Helper will respond for a confirmed incident, verified either by ATMS devices or authorized personnel.

** - Note: I-74 travel over I-465 from Mile 93.8 to 73.3 is covered as I-465

4.4.6. Interstate 80/94 (Borman Expressway)

4.4.6.1. Eastbound I-80/94 (Borman Expressway)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	1/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Illinois State Line to 1.3 miles E of Illinois State Line (0 to 1.3)	X	X		X	X	X	
1.3 miles E of Illinois State Line to I-80/90 (Toll Road) (1.3 to 15.5)	X	X	X	X	X	X	

4.4.6.2. Westbound I-80/94 (Borman Expressway)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	1/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-80/90 (Toll Road) to Illinois State Line (15.5 to 0)	X	X	X	X	X	X	

4.4.7. Interstate 90 (Indiana Toll Road) (Including I-80 east of I-94)

The Indiana East-West Toll Road operates as part of INDOT as the Toll Road District. However, it is separately and exclusively funded by way of patron (motorist) tolls and concession fees. As such, the Toll Road District has completed *Indiana Toll Road Intelligent Transportation Systems Master Plan* (completed in December 2001). Please consult this Toll Road District document for details regarding planned ITS deployments on the Indiana Toll Road.

4.4.8. Interstate 94

4.4.8.1. Eastbound I-94

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	1/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-80/90 (Toll Road) to SR 249 (15.5 to 19)	X	X	X	X			
SR 249 to Michigan State Line (19 to 46)		X	X				

4.4.8.2. Westbound I-94

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	1/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Michigan State Line to 1.7 miles E of SR 249 (46 to 20.7)		X					
1.7 miles E of SR 249 to SR 249 (20.7 to 19)		X	X				
SR 249 to I-80/90 (Toll Road) (19 to 15.5)	X	X	X	X			

4.4.9. Interstate 164

4.4.9.1. Eastbound / Northbound I-164

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
US 41 to I-64 (0 to 21)	X	X	X				

4.4.9.2. Southbound / Westbound I-164

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-64 to US 41 (21 to 0)	X	X	X				

Note: I-69 will be incorporated into I-164 in the future from approximately 1.5 miles east of US 41 to I-64.

4.4.10. Interstate 265 (including existing SR 265 from I-65 to SR 62)

4.4.10.1. Eastbound I-265 / SR 265 (East of I-65)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-64 to I-65 (I-265) (0 to 6.7)	X	X	X	X	X	X	
I-65 to SR 62 (SR 265) (6.7 to 9.3)	X	X	X	X	X	X	
Future I-265 from SR 62 to Ohio River / Kentucky State Line	X	X	X	X	X	X	

4.4.10.2. Westbound I-265 / SR 265 (East of I-65)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Future I-265 from Ohio River / Kentucky State Line to SR 62	X	X	X	X	X	X	
SR 62 to I-65 (SR 265) (9.3 to 6.7)	X	X	X	X	X	X	
I-65 to I-64 (I-265) (6.7 to 0)	X	X	X	X	X	X	

Note: SR 265 will become I-265 when the connection across the Ohio River to I-265 in Kentucky is completed.

4.4.11. Interstate 275

4.4.11.1. Northbound I-275

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Kentucky State Line to Ohio State Line (0 to 3.2) (None)							

4.4.11.2. Southbound I-275

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Ohio State Line to Kentucky State Line (3.2 to 0) (None)							

4.4.12. Interstate 465

4.4.12.1. Clockwise I-465

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-65 (S Leg) to I-65 (S Leg) (0 to 53.2)	X	X	X	X	X	X	

4.4.12.2. Counterclockwise I-465

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-65 (S Leg) to I-865 (53.2 to 24)	X	X	X	X	X	X	
I-865 to 0.5 mile S of I-65 (W Leg) (24 to 19.4)	X		X	X	X	X	
0.5 mile S of I-65 (W Leg) to I-65 (S Leg) (19.4 to 0)	X	X	X	X	X	X	

4.4.13. Interstate 469

4.4.13.1. "Northbound" I-469 (from S jct with I-69 to N jct with I-69)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-69 (S jct) to I-69 (N jct) (0 to 31)		X	X	*			

* - Note: Occasional service is provided on I-469 as part of the I-69 patrol route

4.4.13.2. "Southbound" I-469 (from N jct with I-69 to S jct with I-69)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-69 (N jct) to I-69 (S jct) (31 to 0)		X	X	*			

* - Note: Occasional service is provided on I-469 as part of the I-69 patrol route

4.4.14. Interstate 865

4.4.14.1. Eastbound I-865

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-65 to I-465 (0 to 5)	X			X	X	X	

4.4.14.2. Westbound I-865

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-465 to I-65 (5 to 0)	X			X	X	X	

4.4.15. US 20/31 (St. Joseph Valley Parkway)

4.4.15.1. Southbound / Eastbound US 20/31 (St. Joseph Valley Pkwy)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Michigan State Line to CR 17 (None)							

4.4.15.2. Westbound / Northbound US 20/31 (St. Joseph Valley Pkwy)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
CR 17 to Michigan State Line (None)							

4.4.16. US 31 (Kokomo Area)

4.4.16.1. Northbound US 31 (Kokomo Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
1.1 miles S of SR 26 to 0.6 mile S of SR 26 (157 to 157.5)	X						
0.6 mile S of SR 26 to SR 26 (157.5 to 158.1) (DMS @ 157.6)	X	X	X				
SR 26 to Morgan Ave, 2.0 miles N of US 35 / SR 22 (158.1 to 164.4)	X	X	X		X		
Morgan Ave to 0.1 mile N of US 35 (N jct) (164.4 to 167.1)	X	X	X				
0.1 mile N of US 35 (N jct) to 1.0 mile N of US 35 (N jct) (167.1 to 168)	X		X				
1.0 mile N of US 35 (N jct) to 2.0 miles N of US 35 (N jct) (168 to 169)			X				

4.4.16.2. Southbound US 31 (Kokomo Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
1.0 mile N of US 35 (N jct) to 0.1 mile N of US 35 (N jct) (168 to 167.1)	X		X				
0.1 mile N US 35 N jct) to Morgan Ave, 2.0 miles N of US 35 / SR 22 (167.1 to 164.4)	X	X	X				
Morgan Ave to SR 26 (164.4 to 158.1)	X	X	X		X		
SR 26 to 1.1 miles S of SR 26 (158.1 to 157)	X	X	X				

4.4.17. US 41 (Evansville Area)

4.4.17.1. Northbound US 41 (Evansville Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
Kentucky State Line to 1.0 mile S of I-164 (0 to 0.4)	X	X					
1.0 mile S of I-164 to 1.4 miles N of I-64 (0.4 to 18.4)	X	X	X				
1.4 miles N of I-64 to SR 68 (18.4 to 19)	X						

4.4.17.2. Southbound US 41 (Evansville Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
SR 68 to 1.4 miles N of I-64 (19 to 18.4)	X						
1.4 miles N of I-64 to Kentucky State Line (18.4 to 0)	X	X	X				

4.4.18. SR 57 (Evansville Area)

4.4.18.1. Northbound SR 57 (Evansville Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
US 41 to 2.0 miles N of I-64 (0 to 12)		X					

4.4.18.2. Southbound SR 57 (Evansville Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
2.0 miles N of I-64 to 1.5 miles N of I-64 (12 to 11.5)		X					
1.5 miles N of I-64 to US 41 (11.5 to 0)		X	X				

4.4.19. SR 62 (Evansville Area)

4.4.19.1. Eastbound SR 62 (Evansville Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
7.4 miles W of US 41 (S jct) to 5.4 miles W of US 41 (S jct) (Lloyd Expwy) (20 to 27.4)		X					
5.4 miles W of US 41 (S jct) to US 41 (S jct) (Lloyd Expwy) (22.0 to 27.4)	X	X	X				
SR 62 travels over US 41 for 1.2 miles *							
US 41 (N jct) to 1.2 miles E of I-164 (Morgan Ave) (28.6 to 34)	X	X					
1.2 miles E of I-164 to 2.2 miles E of I-164 (Morgan Ave) (34 to 35)		X					

* - Note: SR 62 travel over US 41 from Mile 27.4 to 28.6 is covered as US 41

4.4.19.2. Westbound SR 62 (Evansville Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
2.2 miles E of I-164 to 1.4 miles E of I-164 (Morgan Ave) (35 to 34.2)		X					
1.4 miles E of I-164 to US 41 (N jct) (Morgan Ave) (34.2 to 28.6) (2/10 RM begin @ 34)	X	X	X				
SR 62 travels over US 41 for 1.2 miles *							
US 41 (S jct) to 5.4 miles W of US 41 (S jct) (Lloyd Expwy) (27.4 to 22)	X	X	X				
5.4 miles W of US 41 (S jct) to 7.4 miles W of US 41 (S jct) (Lloyd Expwy) (22 to 20)		X	X				

* - Note: SR 62 travel over US 41 from Mile 28.6 to 27.4 is covered as US 41

4.4.20. SR 66 (Evansville Area)

4.4.20.1. Eastbound SR 66 (Evansville Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
5.6 miles W of US 41 (N jct) to 4.6 miles of US 41 (N jct) (Diamond Ave) (20 to 21)		X					
4.6 miles W of US 41 (N jct) to US 41 (N jct) (Diamond Ave) (21 to 25.6) (DMS @ 20.8)	X	X	X				
SR 66 travels over US 41 for 1.9 miles *							
US 41 (S jct) to 1.8 miles E of I-164 (Lloyd Expwy) (27.5 to 34) (DMS A of I ends @ 34.2)	X	X	X				

* - Note: SR 66 travel over US 41 from Mile 25.6 to 27.5 is covered as US 41

4.4.20.2. Westbound SR 66 (Evansville Area)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
1.8 miles E of I-164 to 1.1 miles E of I-164 (Lloyd Expwy) (34 to 33.3)	X	X					
1.1 miles E of I-164 to US 41 (S jct) (Lloyd Expwy) (33.3 to 27.5)	X	X	X				
SR 66 travels over US 41 for 1.9 miles *							
US 41 (N jct) to 4.6 miles W of US 41 (N jct) (Diamond Ave) (25.6 to 21)	X	X					
4.6 miles W of US 41 (N jct) to 5.6 miles W of US 41 (N jct) (Diamond Ave) (21 to 20)		X					

* - Note: SR 66 travel over US 41 from Mile 27.5 to 25.6 is covered as US 41

4.4.21. SR 912 (Cline Avenue)

4.4.21.1. Eastbound / Southbound SR 912 (Cline Avenue)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-90 (W jct) to I-80/94 (None)							

4.4.21.2. Northbound / Westbound SR 912 (Cline Avenue)

LOCATION (Mile to Mile)	EXISTING + COMMITTED ITS DEPLOYMENTS						
	2/10 RM	HAR A of I	Perm DMS A of I	Hoosier Helper FSP	CCTV	Vehicle Detection	Phone (511 or Emerg)
I-80/94 to I-90 (W jct) (None)							

CHAPTER 5 – ITS ARCHITECTURE / MARKET PACKAGES

5.1. INTRODUCTION

In a general sense, the National ITS Architecture is a framework within which an ITS system can be built. The Architecture functionally defines what the pieces of the system are and the information that is exchanged between them. The Architecture is functionally oriented and not technology-specific which allows the architecture to remain effective over time. It defines what needs to be done, not how it will be done.

More specifically, the National ITS Architecture provides the framework for planning, defining, and integrating Intelligent Transportation Systems. The architecture defines the ITS **functions** (i.e., gather traffic information), the **physical entities (components) or subsystems** where these functions reside (i.e., the field, center, or vehicle), and the **information and data flows (communications)** that must be exchanged to connect these functions and physical subsystems together into an integrated system.

The Market Packages provide a deployment-oriented perspective to the National ITS Architecture. They are tailored to fit real world transportation problems and needs. Market Packages collect together one or more Equipment Packages that work together to deliver a particular transportation service and the Architecture Flows that connect them and other important external systems. In other words, they identify the pieces of the Physical Architecture that are required to implement a particular transportation service.

More details regarding the elements of the National ITS Architecture, Version 5.0, and the ITS Market Packages may be found on the following pages.

5.2. ITS USER SERVICES

The ITS User Services, initially developed as part of the National ITS Program Planning process in the 1990s and modified over time, formed the basis for the National ITS Architecture development effort. The National ITS Architecture essentially implements the ITS User Services. The User Services represent what the system will do from a broad scale user's perspective, be it the public or a system operator. These 33 User Services are grouped into eight Bundles for convenience. The User Services allows the process of system or project definition to begin by thinking about what high level services will be provided to address identified problems and needs. The chart below provides additional information regarding the eight User Service Bundles and the associated 33 User Services.

ITS USER SERVICES	
USER SERVICE BUNDLE	**USER SERVICE**
Travel And Traffic Management	Pre-Trip Travel Information En-Route Driver Information Route Guidance Ride Matching And Reservation Traveler Services Information Traffic Control Incident Management Travel Demand Management Emissions Testing And Mitigation Highway-Rail Intersection
Public Transportation Management	Public Transportation Management En-Route Transit Information Personalized Public Transit Public Travel Security
Electronic Payment	Electronic Payment Services
Commercial Vehicle Operations	Commercial Vehicle Electronic Clearance Automated Roadside Safety Inspection On-Board Safety and Security Monitoring Commercial Vehicle Administrative Processes Hazardous Material Security and Incident Response Freight Mobility
Emergency Management	Emergency Notification And Personal Security Emergency Vehicle Management Disaster Response and Evacuation
Advanced Vehicle Safety Systems	Longitudinal Collision Avoidance Lateral Collision Avoidance Intersection Collision Avoidance Vision Enhancement For Crash Avoidance Safety Readiness Pre-Crash Restraint Deployment Automated Vehicle Operation
Information Management	Archived Data Function
Maintenance and Construction Management	Maintenance and Construction Operations

5.3. ITS ARCHITECTURE

As stated earlier, the National ITS Architecture provides the framework for planning, defining, and integrating Intelligent Transportation Systems. The architecture defines the ITS **functions** (i.e., gather traffic information), the **physical entities (components) or subsystems** where these functions reside (i.e., the field, center, or vehicle), and the **information and data flows (communications)** that must be exchanged to connect these functions and physical subsystems together into an integrated system.

5.3.1. Logical Architecture

The Logical Architecture is a broad-level tool that assists in organizing complex entities and relationships, focusing on the functional processes and information flows of a system. Developing a Logical Architecture helps identify the system functions and information flows, and guides development of functional requirements for new systems and improvements. A Logical Architecture should be independent of institutions and technology, i.e., it should not define where or by whom functions are performed in the system, nor how functions are to be implemented. The Logical Architecture of the National ITS Architecture defines a set of functions (or processes) and information flows (or data flows) that respond to the User Service requirements.

5.3.2. Physical Architecture

The Physical Architecture is the physical (versus functional) view of a system, with functions grouped together. A Physical Architecture provides a physical representation, but not a detailed design, of how the system should provide the required functionality. The Physical Architecture takes the processes (functions) identified in the Logical Architecture and assigns them to physical entities, namely subsystems in the National ITS Architecture. Development of a Physical Architecture will identify the desired communications and interactions between different transportation management organizations.

In the National ITS Architecture, the Physical Architecture is described by three layers: the Transportation Layer, the Communications Layer, and the Institutional Layer, briefly described on the next page.

5.3.2.1. Transportation Layer

The Transportation Layer of the Physical Architecture shows the relationships among the transportation management related elements. It is composed of subsystems for travelers, vehicles, Transportation or Traffic Management Centers, and field devices, as well as external system interfaces. The Transportation Layer may include field devices for traffic surveillance and motorist information dissemination, traffic signal and ramp metering controllers, Transportation Management Centers, and Emergency Management Centers.

5.3.2.2. Communications Layer

The Communications Layer of the Physical Architecture provides the communications services that connect the Transportation Layer components. This layer depicts all of the communications necessary to transfer information and data among transportation entities, traveler information and emergency service providers, and other service providers such as towing and recovery. The communications layer identifies system interface points where national Standards and communications protocols can be used.

5.3.2.3. Institutional Layer

While the Institutional Layer is not actually part of the Physical Architecture, the Physical Architecture can not be fully defined in a region without some decisions being made regarding the jurisdictional structure and working relationships that will provide a framework for ITS planning and implementation. These institutional decisions should lead to a depiction of who should communicate with whom, and what information should be communicated in the transportation and communications layers.

5.4. ITS EQUIPMENT PACKAGES

The Logical and Physical Architectures contain all of the architecture elements needed to provide the User Services. Although the formal definition of the National ITS Architecture stops there, other categorizations of the architecture elements were made for the purposes of evaluation and to better understand the deployment implications.

The term "Equipment Package" was used in the National ITS Architecture development effort to group similar functions of a particular subsystem together into a package of hardware and software capabilities for implementation purposes. Documented as part of the Physical Architecture, the Equipment Packages are associated closely with Market Packages and were used as a basis for estimating deployment costs. The National ITS Architecture defined 198 Equipment Packages.

5.5. ITS MARKET PACKAGES

Some of the aforementioned ITS User Services are too broad in nature to be convenient in planning actual deployments. Additionally, they often do not translate easily into existing institutional environments and do not distinguish between major levels of functionality. In order to address these concerns and providing a more meaningful evaluation, a more detailed set of deployment-oriented ITS service building blocks were defined from the original User Services: the **Market Packages**.

The Market Packages provide a deployment-oriented perspective to the National ITS Architecture. Market Packages are defined by groups of Equipment Packages required to work together to deliver a specified transportation service and the major architecture flows between them and other external systems. Basically, they identify the pieces of the National ITS Architecture required to implement a transportation service. Market Packages are designed to address specific transportation problems and needs and can be related back to the User Services and the Architecture Framework. This relationship between Architecture and implementation is presented using a defined set of Market Packages.

The Market Packages represent particular groupings of entities defined in the Physical Architecture that correspond to specific transportation services. The Physical Architecture is comprised of Transportation, Communications, and Institutional Layers. The Transportation Layer includes the various transportation-related centers, roadside devices, vehicle equipment, and other equipment used by travelers to access ITS services. The Communication Layer provides for the transfer of information between the Transportation Layer elements. The Institutional Layer introduces the policies, funding, working arrangements, and jurisdictional structure that support the technical layers of the Architecture. The Transportation and Communication Layers together are the Architecture Framework that coordinates overall system operation by defining interfaces between equipment which may be deployed by different procuring and operating sectors. The Architecture Framework defines what each major transportation system element does and how they interact to provide all User Services.

The National ITS Architecture development effort identified a total of 85 Market Packages that reflect the current definition of ITS and the evolving technology market. The chart on the following two pages contains a complete listing of these, grouped according to their respective major application areas.

Additional details on each Market Package follow the chart. Market Packages that have been identified as an **early deployment candidate** from a **national perspective** due to a promising combination of **low-risk implementation characteristics**, **developing public or private markets** for the package, and **tangible system or user benefits** are indicated as such. **This does not necessarily mean that it would be an early deployment candidate in Indiana on the INDOT system.**

ITS MARKET PACKAGES	
SERVICE AREA	**MARKET PACKAGE**
Archived Data Management	ITS Data Mart ITS Data Warehouse ITS Virtual Data Warehouse
Public Transportation	Transit Vehicle Tracking Transit Fixed-Route Operations Demand Response Transit Operations Transit Passenger and Fare Management Transit Security Transit Maintenance Multi-modal Coordination Transit Traveler Information
Traveler Information	Broadcast Traveler Information Interactive Traveler Information Autonomous Route Guidance Dynamic Route Guidance ISP Based Route Guidance Integrated Transportation Management/Route Guidance Yellow Pages and Reservation Dynamic Ridesharing In-Vehicle Signing
Traffic Management	Network Surveillance Probe Surveillance Surface Street Control Freeway Control HOV Lane Management Traffic Information Dissemination Regional Traffic Control Traffic Incident Management System Traffic Forecast and Demand Management Electronic Toll Collection Emissions Monitoring and Management Virtual TMC and Smart Probe Data Standard Railroad Grade Crossing Advanced Railroad Grade Crossing Railroad Operations Coordination Parking Facility Management Regional Parking Management Reversible Lane Management Speed Monitoring Drawbridge Management Roadway Closure Management

SERVICE AREA	MARKET PACKAGE
Advanced Vehicle Safety Systems	Vehicle Safety Monitoring Driver Safety Monitoring Longitudinal Safety Warning Lateral Safety Warning Intersection Safety Warning Pre-Crash Restraint Deployment Driver Visibility Improvement Advanced Vehicle Longitudinal Control Advanced Vehicle Lateral Control Intersection Collision Avoidance Automated Highway System
Commercial Vehicle Operations	Fleet Administration Freight Administration Electronic Clearance CV Administrative Processes International Border Electronic Clearance Weigh-In-Motion Roadside CVO Safety On-Board CVO and Freight Safety and Security CVO Fleet Maintenance HAZMAT Management Roadside HAZMAT Security Detection and Mitigation CV Driver Security Authentication Freight Assignment Tracking
Emergency Management	Emergency Call-Taking and Dispatch Emergency Routing Mayday Support Roadway Service Patrols Transportation Infrastructure Protection Wide-Area Alert Early Warning System Disaster Response and Recovery Evacuation and Reentry Management Disaster Traveler Information
Maintenance and Construction Operations	Maintenance & Construction Vehicle and Equipment Tracking Maintenance & Construction Vehicle Maintenance Road Weather Data Collection Weather Information Processing and Distribution Roadway Automated Treatment Winter Maintenance Roadway Maintenance and Construction Work Zone Management Work Zone Safety Monitoring Maintenance & Construction Activity Coordination

5.5.1. Archived Data Management

5.5.1.1. ITS Data Mart (AD1)

An ITS Data Mart provides an archive that houses data collected and owned by a single organization. This archive usually includes data covering a single transportation mode and one jurisdiction that is collected from an operational data store and archived for future use. This Market Package has been identified as an **early deployment** candidate from a national perspective, as it is the key to better utilizing the information collected during operation of ITS systems to enhance the quantitative support for transportation planning, research, and other analyses.

5.5.1.2. ITS Data Warehouse (AD2)

An ITS Data Warehouse includes all the data collection and management features provided by the ITS Data Mart while adding the opportunity for the collection of data from multiple agencies and data sources across modal and jurisdictional boundaries.

5.5.1.3. ITS Virtual Data Warehouse (AD3)

An ITS Virtual Data Warehouse provides the same wide access to the multimodal data from varied sources as in the ITS Data Warehouse but provides this access using enhanced interoperability between physically distributed ITS archives that are each locally managed.

5.5.2. Public Transportation

5.5.2.1. Transit Vehicle Tracking (APTS1)

Transit Vehicle Tracking monitors current transit vehicle location using an Automated Vehicle Location (AVL) System. The data may be used to determine real-time schedule adherence and update the transit system's schedule. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.2.2. Transit Fixed-Route Operations (APTS2)

Transit Fixed-Route Operations performs vehicle routing and scheduling functions, as well as automatic operator (driver / conductor) assignment and system monitoring for fixed-route and flexible-route transit services. Transit data is integrated with other modes to provide the public with integrated and personalized dynamic schedules.
This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.2.3. Demand Response Transit Operations (APTS3)

Demand Response Transit Operations performs the aforementioned vehicle routing and scheduling function as well as automatic operator assignment and system monitoring for demand-responsive transit services. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.2.4. Transit Passenger and Fare Management (APTS4)

Transit Passenger and Fare Management manages passenger loading information and fare payments on-board transit vehicles using electronic means such as a traveler card or other electronic payment device. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.2.5. Transit Security (APTS5)

Transit Security provides for the physical security of transit passengers and transit vehicle operators, with on-board video, audio, or other equipment deployed to perform surveillance and sensor monitoring in order to warn of potentially hazardous situations. Other public and non-public areas under the authority of a transit agency are also monitored with similar surveillance and sensor equipment. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.2.6. Transit Maintenance (APTS6)

Transit Maintenance supports automatic transit maintenance scheduling and monitoring via on-board condition sensors and provides for automatic scheduling of preventive and corrective maintenance. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.2.7. Multi-modal Coordination (APTS7)

Multi-modal Coordination establishes two-way communications between multiple transit and traffic agencies to improve service coordination and increasing traveler convenience at transit transfer points. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.2.8. Transit Traveler Information (APTS8)

Transit Traveler Information provides transit users at stops and on-board transit vehicles with ready access to transit information including transit stop announcements and real-time schedule displays. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.3. Traveler Information

5.5.3.1. Broadcast Traveler Information (ATIS1)

Broadcast Traveler Information collects a wide variety of information from many sources, such as traffic conditions, advisories, incidents, roadway maintenance and construction, public transportation, toll and parking, air quality, and weather and disseminates this information over a wide area via existing infrastructure and low cost user equipment such as radio or cell phones. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.3.2. Interactive Traveler Information (ATIS2)

Interactive Traveler Information provides tailored, real-time information such as traffic conditions, road construction and detours, transit services, etc. in response to a traveler request. A variety of devices may be used by the traveler to access this information (pre-trip or en-route), such as a personal computer, kiosk, or phone (511). Interactive Traveler Information relies on availability of real-time transportation data from in-field devices. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.3.3. Autonomous Route Guidance (ATIS3)

Autonomous Route Guidance relies on in-vehicle equipment to enable route planning and guidance based on static information; this information is also available to the traveler by way of personal portable devices. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.3.4. Dynamic Route Guidance (ATIS4)

Dynamic Route Guidance offers advanced route planning and guidance that is real-time in nature, embellishing the Autonomous Route Guidance Market Package with a digital receiver.

5.5.3.5. ISP Based Route Guidance (ATIS5)

Information Service Provider (ISP) Based Route Guidance offers the user pre-trip route planning and en-route turn-by-turn route guidance based upon static information or real-time conditions. Unlike the previous two Market Packages (Autonomous Route Guidance and Dynamic Route Guidance) where the user equipment determines the route, the route determination functions are performed by the Information Service Provider.

5.5.3.6. Integrated Transportation Management / Route Guidance (ATIS6)

Integrated Transportation Management / Route Guidance provides advanced route planning and guidance which is responsive to current conditions and supports collection of real-time information on routes from the probe-equipped vehicles in the network.

5.5.3.7. Yellow Pages and Reservation (ATIS7)

Yellow Pages and Reservation provides pre-trip or en-route traveler service information, such as service stations, restaurants, and lodging.

5.5.3.8. Dynamic Ridesharing (ATIS8)

Dynamic Ridesharing provides real-time ridesharing / ride matching services to travelers, including connections to transit.

5.5.3.9. In-Vehicle Signing (ATIS9)

In-Vehicle Signing supports distribution of traffic and travel advisory information, including road-rail intersection status and weather information to drivers via in-vehicle devices.

5.5.4. Traffic Management

5.5.4.1. Network Surveillance (ATMS01)

Network Surveillance includes vehicle detection and other surveillance equipment such as video (CCTV), the supporting field equipment, and the communications to transmit the collected data. This information enables operators at the Traffic Management Center (TMC) to monitor traffic and road conditions, as well as identify and verify incidents.

Network Surveillance is one of the most vital ITS deployments and provides the basic elements for traffic management. It is the foundation upon which traffic control and management systems can be implemented, as well as a critical source of information supporting real-time traveler information. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.4.2. Probe Surveillance (ATMS02)

Probe Surveillance provides the potential for a less expensive (but less comprehensive) alternative approach to Network Surveillance for monitoring conditions and identifying incidents and making the information available to travelers. Data reduction is required as a large volume of data is collected by probes. It should also be noted that video (CCTV) for verification of incidents is not available with Probe Surveillance. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.4.3. Surface Street Control (ATMS03)

Surface Street Control provides the central control and monitoring equipment, communications devices, and the signal control equipment for surface street control and/or arterial traffic management, generally within a single jurisdiction. Traffic signal control systems range from fixed-schedule control systems to fully traffic responsive systems that adjust control plans based current traffic conditions. This is a well established Market Package and has been identified as an **early deployment** candidate from a national perspective.

5.5.4.4. Freeway Control (ATMS04)

Freeway Control provides the roadway vehicle detection and video devices and communications to support ramp control (ramp metering) and lane controls for freeways, incorporating the instrumentation included in the Network Surveillance Market Package. This is also a well established Market Package that has been identified as an **early deployment** candidate from a national perspective.

5.5.4.5. HOV Lane Management (ATMS05)

High Occupancy Vehicle (HOV) Lane Management controls HOV lanes by coordinating freeway ramp meters and signals with HOV lane usage signals. HOV Lanes provide preferential treatment via reserved lanes and special bypasses at ramp meter sites during peak volume times of the day for motorists complying with the stated requirements for HOV Lane usage.

5.5.4.6. Traffic Information Dissemination (ATMS06)

Traffic Information Dissemination provides driver information using roadway devices such as Dynamic Message Signs (DMS) or Highway Advisory Radio (HAR) stations. A wide range of information can be disseminated such as incident, traffic, and road information, emergency alerts, and other driver advisories at specific locations on the road network. Careful placement of these devices provides the information in advance of key decision points in the road network where motorists can divert in light of the traveler information. The DMSs and HARs provide traffic information in an equitable fashion; every motorist passing by the device benefits from the information, not just those with in-vehicle equipment. This market package has been identified as an **early deployment** candidate from a national perspective.

5.5.4.7. Regional Traffic Control (ATMS07)

Regional Traffic Control provides for the sharing of traffic information and control among different jurisdiction's Traffic Management Centers (TMC) to support regional traffic control, especially in terms of major travel corridors. This Market Package advances the Surface Street and Freeway Control Market Packages by adding the communications links and control strategies that enable integrated multi-jurisdictional traffic control. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.4.8. Traffic Incident Management System (ATMS08)

Traffic Incident Management System manages both unplanned incidents and planned events to minimize the impact to the transportation network and improve motorist safety via video (CCTV) surveillance devices and coordination with road maintenance activities, emergency response personnel, and event promoters. Incidents are detected and verified, followed by the appropriate response, which is also monitored. Incident Management also provides information to affected travelers, most often by using the Traffic Information Dissemination Market Package but also via the Broadcast Traveler Information or Interactive Traveler Information Market Packages. Since incidents are a significant cause of congestion, this Market Package is a key **early deployment** candidate from a national perspective which is actively being implemented in many large metropolitan areas.

5.5.4.9. Traffic Forecast and Demand Management (ATMS09)

Traffic Forecast and Demand Management includes advanced algorithms and data processing and storage capabilities that support real-time travel conditions, as well as transportation planning functions such as historic and projected traffic evaluation and analysis. This Market Package also provides data that supports the implementation of Transportation Demand Management (TDM) programs.

5.5.4.10. Electronic Toll Collection (ATMS10)

Electronic Toll Collection provides toll operators with the ability to collect tolls electronically and detect and process violations. Vehicle transponders are automatically processed and the toll is deducted from the available balance; toll violators are read and electronically posted and billed to vehicle owners. The devices can also be used to collect road usage statistics for toll authorities.

This Market Package has been identified as an **early deployment** candidate from a national perspective. Electronic Toll Collection provides tangible time-saving benefits to users and is generally well accepted and widely deployed.

5.5.4.11. Emissions Monitoring and Management (ATMS11)

Emissions Monitoring and Management monitors individual (point) vehicle emissions and provides general (area-wide) air quality monitoring by way of sensors. Point emissions monitoring measures tail pipe emissions and identifies vehicles that exceed emissions standards. Area-wide monitoring measures overall air quality in terms of sectors such as vehicles, business type, etc.

5.5.4.12. Virtual TMC and Smart Probe Data (ATMS12)

Virtual Traffic Management Center (TMC) and Smart Probe Data uses vehicles as probes that are capable of measuring road conditions and providing this information to the roadway for relay to these decentralized “Traffic Management Centers” and potentially relayed to automated road signing equipment or in-vehicle signing. Each jurisdiction has the capability of accessing available road condition information.

5.5.4.13. Standard Railroad Grade Crossing (ATMS13)

A Standard Railroad Grade Crossing manages highway traffic at highway-rail intersections where train speeds are 79 miles per hour or less. The warning systems are activated by trackside equipment when a train is approaching. The equipment may also be interconnected with adjacent signalized intersections for more efficient management of highway traffic at highway-rail intersections.

This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.4.14. Advanced Railroad Grade Crossing (ATMS14)

An Advanced Railroad Grade Crossing manages highway traffic at highway-rail intersections where train speeds are greater than 79 miles per hour. This Market Package includes all of the features of Standard Railroad Grade Crossing Market Package, supplemented with additional safety features to mitigate the risks associated with higher train speeds.

5.5.4.15. Railroad Operations Coordination (ATMS15)

Railroad Operations Coordination provides for coordination between rail operations and Traffic Management Centers. Rail operators provide train and maintenance schedules that will result in highway-rail intersection closures. This information is used to develop forecast highway-rail intersection closure times and durations, allowing for implementation of traffic control strategies or providing enhanced traveler information.

5.5.4.16. Parking Facility Management (ATMS16)

Parking Facility Management provides enhanced monitoring and management of parking facilities. This Market Package collects and shares current parking lot / garage status with Information Service Providers and collects parking fees.

5.5.4.17. Regional Parking Management (ATMS17)

Regional Parking Management supports coordination between different parking facilities to enable regional parking management strategies.

5.5.4.18. Reversible Lane Management (ATMS18)

Reversible Lane Management provides for the management of reversible lane facilities via video (CCTV) surveillance, sensors that detect wrong-way vehicles, and other equipment that mitigate safety hazards associated with reversible lanes.

5.5.4.19. Speed Monitoring (ATMS19)

Speed Monitoring checks the speed of vehicles traveling through a segment of roadway that has potentially hazardous geometrics, with roadside equipment suggesting a safe driving speed if excessive speed is detected. Existing environmental conditions may be monitored and factored into the safe speed advisories that are provided to the motorist. This data can also be shared with Law Enforcement agencies if chronic excessive speed is detected. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.4.20. Drawbridge Management (ATMS20)

Drawbridge Management supports systems that manage drawbridges at rivers, canals, and other grade separated multimodal crossings via the use of control devices such as gates and warning lights, and traveler information devices such as Dynamic Message Signs at or in advance of the drawbridge. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.4.21. Roadway Closure Management (ATMS21)

Roadway Closure Management closes roadways to traffic by means of automatic or remotely controlled barriers when driving conditions are unsafe due to weather conditions, significant maintenance must be performed, and other scenarios where access to the roadway must be prohibited. Surveillance (CCTV) is needed to verify the safe activation of the closure system and traveler information systems such as Dynamic Message Signs are often included to provide closure information to motorists in the vicinity of the closure. Roadway Closure Management is currently being used on reversible lanes and HOV Lanes. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.5. Advanced Vehicle Safety Systems

5.5.5.1. Vehicle Safety Monitoring (AVSS01)

Vehicle Safety Monitoring will diagnose critical components of a vehicle and warn the driver of potential dangers. In a simple sense this Market Package already exists in vehicles in the form of vehicle warning lights on the dashboard. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.5.2. Driver Safety Monitoring (AVSS02)

Driver Safety Monitoring will determine the driver's condition and warn the driver of potential dangers.

5.5.5.3. Longitudinal Safety Warning (AVSS03)

Longitudinal Safety Warning will feature sensors that provide a longitudinal warning of potential hazards ahead or behind a vehicle, such as other vehicles, pedestrians, animals, or large pieces of debris and warns the driver of these potential hazards.

5.5.5.4. Lateral Safety Warning (AVSS04)

Lateral Safety Warning will feature safety sensors that provide a lateral warning of potential hazards to the sides of a vehicle, such as other vehicles or animals and warns the driver of these potential hazards.

5.5.5.5. Intersection Safety Warning (AVSS05)

Intersection Safety Warning will determine the probability of a collision in an equipped intersection and provide warnings to drivers in response to potentially hazardous conditions. Monitors in the roadway infrastructure assess vehicle locations and speeds near an intersection and a warning is communicated to the approaching vehicle via in-vehicle signing.

5.5.5.6. Pre-Crash Restraint Deployment (AVSS06)

Pre-Crash Restraint Deployment will provide in-vehicle sensors to detect an impending collision and deploy a pre-crash safety system.

5.5.5.7. Driver Visibility Improvement (AVSS07)

Driver Visibility Improvement will enhance the driver's visibility during difficult driving conditions using an enhanced vision system.

5.5.5.8. Advanced Vehicle Longitudinal Control (AVSS08)

Advanced Vehicle Longitudinal Control will automate the speed and headway control functions on-board the vehicle by utilizing safety and collision sensors combined with vehicle information to control the throttle and brakes, specifically addressing rear-end crashes.

5.5.5.9. Advanced Vehicle Lateral Control (AVSS09)

Advanced Vehicle Lateral Control will automate the steering control on-board the vehicle by utilizing safety and collision sensors combined with vehicle information to control the steering, specifically addressing off-road crashes.

5.5.5.10. Intersection Collision Avoidance (AVSS10)

Intersection Collision Avoidance will determine the probability of an intersection collision and provide information to approaching vehicles so that avoidance actions can be taken. This embellishes other Market Packages by adding in-vehicle equipment that can take control of the vehicle in emergency situations.

5.5.5.11. Automated Highway System (AVSS11)

An Automated Highway System will enable "hands-off" operation of a vehicle on the automated segments of the highway system by use of lateral lane holding, vehicle speed and steering control, and Automated Highway System check-in and checkout.

5.5.6. Commercial Vehicle Operations (CVO)

5.5.6.1. Fleet Administration (CVO01)

Fleet Administration provides the capabilities to manage a fleet of commercial vehicles with Automatic Vehicle Location devices and routing information for a commercial vehicle. Recommended routes are constrained by hazardous materials and height or weight restrictions. Routing changes can be made depending on changes in road conditions, with local public safety agencies notified of the route deviation if necessary. This Market Package has been identified as an **early deployment** candidate from a national perspective; many of these capabilities are being utilized and have provided tangible benefits to the trucking industry.

5.5.6.2. Freight Administration (CVO02)

Freight Administration tracks the movement and condition of cargo from source to destination. Shipments are monitored to ensure that no tampering occurs to the cargo on commercial vehicles, with alerts issued to the driver and freight managers.

5.5.6.3. Electronic Clearance (CVO03)

Electronic Clearance provides for automated clearance at weigh stations, allowing a pre-approved vehicle with a transponder to bypass weigh stations on the mainline of the highway, providing time and operational cost savings to participating carriers. The Electronic Clearance communications between the vehicle and the weigh station supports several of the other CVO Market Packages. Thus, this Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.6.4. CV Administrative Processes (CVO04)

Commercial Vehicle Administrative Processes performs administrative functions electronically, such as application, fee and tax collection, and distribution of CVO credentials, allowing for vehicles to participate in an Electronic Clearance program. This Market Package provides a basis for “paperless trucking” and supports many of the more advanced Commercial Vehicle Market Packages. As such, it has been identified as an **early deployment** candidate from a national perspective.

5.5.6.5. International Border Electronic Clearance (CVO05)

International Border Electronic Clearance provides for automated clearance at international border crossings at Canada and Mexico, supplementing the Electronic Clearance Market Package.

5.5.6.6. Weigh-In-Motion (CVO06)

Weigh-In-Motion provides for high-speed weigh-in-motion with or without Automated Vehicle Identification (AVI) capabilities, providing the equipment that can be used as a stand-alone system or to enhance the Electronic Clearance Market Package.

5.5.6.7. Roadside CVO Safety (CVO07)

Roadside Commercial Vehicle Operations Safety automates commercial vehicle safety inspections at Weigh Stations. The trucks pulled in that are participants in the Electronic Clearance program will have additional information in the transponder that offers additional safety data to support the safety inspection. This Market Package is the basis for the On-board CVO Freight Safety and Security Market Package and has been identified as an **early deployment** candidate from a national perspective.

5.5.6.8. On-Board CVO and Freight Safety and Security (CVO08)

On-Board CVO and Freight Safety and Security, an enhancement of the Roadside CVO Safety Market Package, provides for on-board commercial vehicle safety monitoring and reporting. Safety warnings and cargo breaches are reported to the driver, fleet manager, and the Weigh Station.

5.5.6.9. CVO Fleet Maintenance (CVO09)

Commercial Vehicle Operations Fleet Maintenance supports the maintenance of commercial fleet vehicles equipped with on-board monitoring and Automated Vehicle Location equipment, providing records of vehicle mileage, repairs, and safety violations.

5.5.6.10. HAZMAT Management (CVO10)

Hazardous Material (HAZMAT) Management combines Incident Management with commercial vehicle tracking to assure a coordinated response and proper treatment of HAZMAT material and incidents. This Market Package addresses a significant public safety issue associated with commercial vehicle operations and has been identified as an **early deployment** candidate from a national perspective.

5.5.6.11. Roadside HAZMAT Security Detection and Mitigation (CVO11)

Roadside Hazardous Materials Security Detection and Mitigation provides the capability to detect and classify security-sensitive Hazardous Materials on commercial vehicles. This Market Package provides the ability to verify if the driver or vehicle is permitted to transport the Hazardous Material(s), allowing for vehicle inspection if the credentials and HAZMAT information do not match, a critical need in the post-September 11th security environment we operate in. As such, this Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.6.12. CV Driver Security Authentication (CVO12)

Commercial Vehicle Driver Security Authentication provides the ability for freight management personnel to detect and disable a commercial vehicle when an unauthorized driver attempts to drive a truck. Notification can also be sent to emergency personnel to inform them of a potential commercial vehicle theft or possible hijacking.

5.5.6.13. Freight Assignment Tracking (CVO13)

Freight Assignment Tracking provides for the planning and tracking the truck, freight, and driver for consistency with the planned shipment. Deviations are detected and notification provided to freight managers. Automatic Vehicle Location technology is well established and can be used to track freight shipments. Thus, this Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.7. Emergency Management

5.5.7.1. Emergency Call-Taking and Dispatch (EM01)

Emergency Call-Taking and Dispatch provides basic public safety call-taking and dispatch services that enable rapid deployment of appropriate responders to an emergency and notification between agencies. This Market Package is the foundation of coordinated emergency management amongst the emergency service agencies and traffic management personnel and also enhances the Incident Management and Mayday Support Market Packages. As such, this Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.7.2. Emergency Routing (EM02)

Emergency Routing supports Automated Vehicle Location and routing of emergency vehicles in light of changing traffic and road conditions, in addition to traffic signal preemption priority to improve the safety and response time of emergency vehicles. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.7.3. Mayday Support (EM03)

Mayday Support allows a traveler to request emergency assistance and help the emergency center locate the user, gather information about the incident, and determine the appropriate response. The request for assistance may be manually or automatically initiated in case of a serious crash. This option is currently available on some new vehicles and this Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.7.4. Roadway Service Patrols (EM04)

Roadway (Freeway) Service Patrols monitor roads and provide aid to motorists, rapid response to incidents (flat tire, fuel, crashes, etc.) to minimize disruption to the flow of traffic. These Patrols play a key role in identifying problems on highways that frequently have incidents and enhances safety in conjunction with the Incident Management Market Package. This Market Package has been implemented in many areas nationwide and has been identified as an **early deployment** candidate from a national perspective.

5.5.7.5. Transportation Infrastructure Protection (EM05)

Transportation Infrastructure Protection includes the monitoring of critical transportation infrastructure such as bridges, tunnels, and Traffic Management Centers for potential threats using surveillance, sensors, and barriers to prevent and mitigate impact of an incident. Incidents can be natural disasters, terrorist attacks, or other incidents such as a barge hitting the superstructure of a bridge. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.7.6. Wide-Area Alert (EM06)

A Wide-Area Alert uses Traveler Information Systems to alert the public in emergency situations such as child abductions (AMBER Alerts), severe weather events, and civil emergencies, supplementing other alert systems. Alert information is disseminated to the traveling public using ITS technologies such as Dynamic Message Signs, Highway Advisory Radio, in-vehicle displays, 511, and Web sites. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.7.7. Early Warning System (EM07)

An Early Warning System monitors, detects, and reports potential and actual emergencies including natural disasters, man-made disasters, and acts of terrorism by monitoring alert systems, emergency call-taking dispatch centers, and ITS sensors and surveillance devices. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.7.8. Disaster Response and Recovery (EM08)

Disaster Response and Recovery enhances the ability of the surface transportation system to address the most severe incidents such as natural disasters, man-made disasters, and national security emergencies or terrorist attacks that require response and resources from outside the local affected area. This Market Package supports coordination of emergency response plans and information about the transportation system in the vicinity of the disaster for response personnel. Traffic control strategies, detours, and restrictions to manage traffic in and around the disaster are provided, as well as a damage assessment of road facilities and the management of the reconstruction effort, building upon the Traffic Incident Management, Transportation Infrastructure Protection, and Early Warning System Market Packages. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.7.9. Evacuation and Reentry Management (EM09)

Evacuation and Reentry Management supports evacuation and reentry of the general public from and back into a disaster area, including anticipated disasters, such as a hurricane, or disasters that take place with little or no warning, such as a terrorist attack, coordinating plans among key emergency and transportation agencies. Transportation agencies implement special traffic control strategies to maximize capacity, such as reversible lanes, shoulder use, closures, signal priority, as well as the use of public transportation. This market package has been identified as an **early deployment** candidate from a national perspective.

5.5.7.10. Disaster Traveler Information (EM10)

Disaster Traveler Information is the information component of Evacuation and Reentry Management Market Package, providing disaster-related traveler information to the general public. Information from multiple sources is provided with real-time disaster and evacuation information using established ITS traveler information systems, such as Dynamic Message Signs and Highway Advisory Radio. This Market Package keeps the public informed about damage to the transportation system, detours and closures in effect, traffic restrictions, real-time information on traffic conditions, and transit schedules, expanding the Traveler Information Market Packages that provide information on a day-to-day basis. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.8. Maintenance and Construction Operations

5.5.8.1. Maintenance & Construction Vehicle and Equipment Tracking (MC01)

Maintenance and Construction Vehicle and Equipment Tracking monitors the location of maintenance and construction vehicles and other equipment to determine the progress of their activities, as well as ensuring the correct roads are being plowed or repaired. Automatic Vehicle Location technology is proven and in use by many agencies and as such, this Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.8.2. Maintenance & Construction Vehicle Maintenance (MC02)

Maintenance and Construction Vehicle Maintenance supports automatic vehicle maintenance scheduling and monitoring via on-board condition sensors and provides for automatic scheduling of preventive and corrective maintenance. In a simple sense this Market Package already exists in vehicles in the form of vehicle warning lights on the dashboard. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.8.3. Road Weather Data Collection (MC03)

Road Weather Data Collection collects current road and weather conditions using data from sensors deployed on and near the roadway, or on maintenance or construction vehicles. This Market Package is in place in many northern climates and is usually known as Road Weather Information Systems (RWIS) and has been identified as an **early deployment** candidate from a national perspective.

5.5.8.4. Weather Information Processing and Distribution (MC04)

Weather Information Processing and Distribution builds upon the Road Weather Data Collection Market Package by processing and distributing the weather data and hazard information such as snowy or icy road conditions so corrective actions can be implemented. The road condition and current temperature updates can be used by system operators to more effectively deploy road plowing / salting resources, issue general traveler advisories, and issue location-specific warnings to drivers using the Traffic Information Dissemination Market Package. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.8.5. Roadway Automated Treatment (MC05)

Roadway Automated Treatment automatically treats a roadway or bridge segment with anti-icing chemicals based on weather conditions. This Market Package includes the detecting sensors, the treatment, and Traveler Information Systems devices such as Dynamic Message Signs.

5.5.8.6. Winter Maintenance (MC06)

Winter Maintenance supports winter road maintenance including snow plow operations and salt / anti-icing treatments by monitoring weather forecasts and conditions to schedule the appropriate winter maintenance activities and monitor these activities. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.8.7. Roadway Maintenance and Construction (MC07)

Roadway Maintenance and Construction supports many services for scheduled and unscheduled routine maintenance and construction on a roadway, such as pothole and guardrail repair, crack sealing, repair and maintenance of traffic control devices, sweeping, mowing, debris removal, etc. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.8.8. Work Zone Management (MC08)

Work Zone Management directs the activity in work zones and supports the control of traffic in the work zone with Portable Dynamic Message Signs. Work zone speeds and delays are provided to motorists and to assist in providing a safe work environment for the crew. This Market Package has been identified as an **early deployment** candidate from a national perspective.

5.5.8.9. Work Zone Safety Monitoring (MC09)

Work Zone Safety Monitoring includes systems that improve stationary and moving work zone crew safety and reduce crashes in work zones by detecting vehicle intrusions and warns crew workers and drivers of imminent hazards. Crew movements are also monitored so the crew can be warned of movement beyond the safe zone.

5.5.8.10. Maintenance & Construction Activity Coordination (MC10)

Maintenance and Construction Activity Coordination supports coordinating activities to reduce the impact to the transportation system, coupled with the dissemination of maintenance and construction information to motorists and centers. This Market Package has been identified as an **early deployment** candidate from a national perspective.

CHAPTER 6 – MARKET PACKAGE RECOMMENDATIONS

6.1. EVALUATION AND RECOMMENDATION OF ITS MARKET PACKAGES

Evaluating the ITS Market Packages is not the main focus of this document. Nevertheless, comparing the Market Packages and their applicability to INDOT is still relevant to provide general direction to future ITS deployments in Indiana. This analysis takes place in the sections to follow in terms of the Market Package's ability to support the six ITS goals as identified by the USDOT, its potential to be an early deployment, its applicability to urban or rural areas, its ability to address congestion and crash problems, and its overall benefits. **The basis for this analysis is the *National ITS Architecture Market Packages* document; dated October 2003 and prepared for the FHWA, as well as the National ITS Architecture, Version 5.0.**

As stated in Chapter One, the USDOT has stated that the six goals of National ITS Program are Increase Transportation System Efficiency and Capacity, Enhance Mobility, Improve Safety, Reduce Energy Consumption and Environmental Costs, Increase Economic Productivity, and Create an Environment for an ITS Market. These goals are generally consistent with the Strategic Goals identified in INDOT's 1998 Strategic Plan: Mobility, Economic Growth, Safety, Workforce, Customer Service, Resource Management, Technology and Research, and Environment. The Market Packages are ranked according to their ability to support the six USDOT ITS goals, with "1" indicating the goal is marginally satisfied, "2" indicating the goal is mostly satisfied, and "3' indicating the goal is completely satisfied. These rankings are then totaled, with a maximum score of 18.

Of the 85 Market Packages, 50 have been identified as an early deployment candidate from a national perspective based upon the Market Package's ability to meet three general criteria. First, the Market Package should perform an enabling function, i.e. it should be the foundation or basis of more advanced Market Packages. Secondly, the Market Package should be feasible, i.e. it can be implemented with existing technology. Finally, it should have an established benefit, having been successfully implemented in other locations with tangible benefits. Put another way, a Market Package is an Early Deployment candidate from a national perspective due to a promising combination of low-risk implementation characteristics, developing public or private markets for the package, and tangible system or user benefits.

There are 36 Market Packages that are more applicable as an urban area deployment and 31 Market Packages that are more applicable as a rural area deployment. These are indicated with a "Y" for yes in the tables to follow.

A Market Package will address a variety of transportation problems. The two problems that INDOT can most effectively address are traffic congestion and crashes and their associated injuries and fatalities. Market Packages that have the greatest ability to address these two transportation problems are indicated with a "Y" for yes in the tables.

The Market Package benefits listed are generalized projected benefits. It should be noted that many Market Packages depend upon the deployment of other Market Packages and the implementation of several related Market Packages usually generates greater benefits than those deployed in isolation.

It should also be noted that just because a Market Package appears to score well in terms of meeting ITS goals, is an early deployment candidate, can address congestion or safety needs, or has many benefits, it does not necessarily mean that it would be deployed by INDOT. Every state has its own unique transportation characteristics and challenges; one size does not fit all. Furthermore, the reality of organizational constraints (funding and staffing) simply does not allow ITS to be all things to all people and result in a large-scale deployment of the 85 Market Packages, nor is that approach desirable from a resource allocation perspective. The philosophy of concentrating on the key Market Packages will prevail.

Many of the 85 Market Packages are in varying stages of deployment in Indiana by a variety of jurisdictions. Some are deployed, others are scheduled for deployment. Some are deployed by the ITS function at INDOT, others are deployed by other functions at INDOT or other public agencies, while some are more a function of the private sector.

Market Package recommendations are grouped based on three deployment time frames (Current or Near Term, Medium Term, Long Term or Future) and then by implementer:

[Time Frame] Market Packages (Implementation Primarily by ITS)

[Time Frame] Market Packages (Implementation by ITS and Others at INDOT)

[Time Frame] Market Packages (Implementation by ITS and Others Outside of INDOT)

[Time Frame] Market Packages (Implementation by Primarily by Others at INDOT, with ITS Support)

[Time Frame] Market Packages (Implementation Primarily by Others Outside of INDOT, with ITS Info / Support)

[Time Frame] Market Packages (Implementation by Others at INDOT)

[Time Frame] Market Packages (Implementation by Others Outside of INDOT)

Unlikely / Unneeded Market Packages

Please note that since technology changes and future needs and resources are difficult to predict, it is possible that some of the Medium and Long Term / Future deployments may not come to fruition.

6.1.1. Archived Data Management

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
ITS Data Mart	2	2	2	2	2	3	13	Y					-Improved planning and traffic data -Reduced data collection effort required
ITS Data Warehouse	2	2	2	2	2	3	13						-Improved planning and traffic data -Reduced data collection effort required -Improved data sharing between agencies
ITS Virtual Data Warehouse	2	2	2	2	2	3	13						-Improved planning and traffic data -Reduced data collection effort required -Improved data sharing between agencies

Current / Near Term Market Packages (Implementation by ITS and Others at INDOT): The **ITS Data Mart** houses data collected and owned by a single jurisdiction and is the key to better utilizing the information collected during operation of ITS systems to enhance the quantitative support for transportation planning, research, and other analyses. This is especially critical in urban areas on high-volume, multi-lane freeways where traffic data collection is very difficult. The Program Development Division's Traffic Statistics Section would benefit greatly from this information, as would others in INDOT who utilize traffic data.

Long Term / Future Market Packages (Implementation by ITS and Others Outside of INDOT): The **ITS Data Warehouse** includes all the data collection and management features provided by the ITS Data Mart while adding the opportunity for the collection of data from multiple agencies and data sources across modal and jurisdictional boundaries. The **ITS Virtual Data Warehouse** provides the same wide access to the multimodal data from varied sources as in the ITS Data Warehouse but provides this access using enhanced interoperability between physically distributed ITS archives that are each locally managed. Both are embellishments of the base, single jurisdiction ITS Data Mart Market Package.

6.1.2. Public Transportation

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
Transit Vehicle Tracking	1	2		1	1	1	6	Y	Y	Y			-Improvement in on-time performance -Reduced in-field supervision
Transit Fixed-Route Operations	1	2		1	1	1	6	Y	Y	Y	Y		-Improved productivity
Demand Response Transit Operations	1	2		1	1	1	6	Y	Y	Y	Y		-Improved productivity -More efficient routing and scheduling
Transit Passenger and Fare Management					2	1	3	Y	Y				-Improved customer convenience -Improved data collection and fare processing -Reduced cash handling losses
Transit Security			2			1	3	Y	Y				-Improved response time to incidents -Improved record of incidents
Transit Maintenance					1	1	2	Y	Y				-Improved scheduling -Reduction in repair costs
Multi-modal Coordination	1	1			1		3	Y	Y		Y		-Improved travel times with signal priority
Transit Traveler Information	1	2	1		1	1	6	Y		Y	Y		-Improved mobility -Enhanced attractiveness of transit as alternative mode of transportation -Improved traveler experience with knowledge of real-time schedules

Market Packages (Implementation by Others Outside of INDOT): While the **Transit Vehicle Tracking, Transit Fixed-Route Operations, Demand Response Transit Operations, Transit Passenger and Fare Management, Transit Security, Transit Maintenance, Transit Traveler Information,** and **Multi-modal Coordination** Market Packages may be desirable and have tangible benefits, deployment is not the responsibility of INDOT. INDOT's Public Transit Section within the Multi-Modal Transportation Division provides federal and state transit funding administration and technical assistance to the numerous public transportation agencies across Indiana. It is these agencies who would have the responsibility of implementing these Market Packages, with the cooperation and support of INDOT. Thus, no recommendation is made in terms of time frame for deployment.

6.1.3. Traveler Information

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
Broadcast Traveler Information	1	2		1		3	7	Y	Y				-Reduced travel time for user -Increased speed of trip for user -Some benefits for non-user
Interactive Traveler Information	2	3		1		3	9	Y	Y				-Reduced travel time for user -Increased speed of trip for user -Some benefits for non-user -Greater benefits for long trip and unfamiliar traveler
Autonomous Route Guidance	2	3				3	8	Y		Y			-Reduced travel time for user -Increased speed of trip for user -Some benefits for non-user -Greater benefits for long trip and unfamiliar traveler
Dynamic Route Guidance	2	3	1	1		3	10				Y		-Reduced travel time for user -Increased speed of trip for user -Some benefits for non-user -Greater benefits for long trip and unfamiliar traveler
ISP Based Route Guidance	2	3	1	1		3	10				Y		-Reduced travel time for user -Increased speed of trip for user -Some benefits for non-user -Greater benefits for long trip and unfamiliar traveler
Integrated Transportation Management / Route Guidance	3	3	1	2		2	11						-Reduced travel time for user -Increased speed of trip for user -Some benefits for non-user -Greater benefits for long trip and unfamiliar traveler
Yellow Pages and Reservation	1					2	3			Y			-Reduced trip length as a result of not searching for destination -Greater benefits for unfamiliar traveler
Dynamic Ridesharing	2	1		1		1	5				Y		-Increased vehicle occupancy -Improved mobility
In-Vehicle Signing		1	1			3	5			Y		Y	-Improved safety

Current / Near Term Market Packages (Implementation Primarily by ITS): **Interactive Traveler Information** provides real-time information such as traffic conditions, road construction and detours, etc. in response to a traveler request via a personal computer, kiosk, or phone (511). Real-Time traffic information (overall traffic speeds and video) is currently available to the public on the TrafficWise Web site, www.trafficwise.org, for I-65 and I-80/94 (the Borman Expressway) in Northwest Indiana and will expand to include the Indianapolis area in the next few years. In addition, INDOT is currently studying the need for and strategy to implement the 511 traveler information phone service in Northwest Indiana as part of the Gary-Chicago-Milwaukee ITS Priority Corridor, with this serving as the basis for wider deployment across Indiana.

Current / Near Term Market Packages (Implementation by ITS and Others Outside of INDOT): **Broadcast Traveler Information** collects a wide variety of information from many sources, such as traffic conditions, advisories, incidents, roadway maintenance and construction, weather, etc. and disseminates this information over a wide area via existing infrastructure and low cost user equipment such as radio or cell phones. This is the most basic of the Traveler Information Market Packages and is currently in place with traffic and weather reports on the radio, television, etc. The quality of information will improve as real-time traffic becomes more readily available.

Current / Near Term Market Packages (Implementation by Others Outside of INDOT): **Autonomous Route Guidance** relies on in-vehicle equipment to enable route planning and guidance based on static information; this information is also available to the traveler by way of personal portable devices. This service is currently available on some vehicles, with greatest application to rental car fleets.

Long Term / Future Market Packages (Implementation Primarily by Others Outside of INDOT, with ITS Info / Support): **Dynamic Route Guidance** offers advanced route planning and guidance that is real-time in nature, embellishing the Autonomous Route Guidance Market Package with a digital receiver. **ISP Based Route Guidance** offers the user pre-trip route planning and en-route turn-by-turn route guidance based upon static information or real-time conditions. Unlike the Autonomous Route Guidance and Dynamic Route Guidance Market Packages where the user equipment determines the route, the route determination functions are performed by the Information Service Provider. **Integrated Transportation Management / Route Guidance** provides advanced route planning and guidance which is responsive to current conditions and supports collection of real-time information on routes from the probe-equipped vehicles in the network. Others outside of INDOT are the lead, with support of ITS real-time traffic information. **In-Vehicle Signing** supports distribution of traffic and travel advisory information, including road-rail intersection status and weather information to drivers via in-vehicle devices. Others outside of INDOT are the lead with these Market Packages, with support of ITS real-time traffic information.

Long Term / Future Market Packages (Implementation by Others Outside of INDOT): **Yellow Pages and Reservation** provides pre-trip or en-route traveler service information, such as service stations, restaurants, and lodging. **Dynamic Ridesharing** provides real-time ridesharing / ride matching services to travelers, including connections to transit. Others outside of INDOT are responsible for implementation of these Market Packages.

6.1.4. Traffic Management

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
Network Surveillance	1	1		1		1	4	Y	Y			Y	-Supports other Traffic Management services (indirect benefits)
Probe Surveillance	1	1		1		2	5	Y	Y		Y		-Supports other Traffic Management services (indirect benefits)
Surface Street Control	2	3	2	2		1	10	Y	Y		Y		-Reduced travel time, VMT, fuel consumption, and emissions -Improved safety at intersections -Increase in trip speed -High B/C ratio
Freeway Control	2	3	1	2		1	9	Y	Y		Y		-Reduced travel time, fuel consumption, and emissions -Increased speeds during congested peaks and freeway throughput
HOV Lane Management	1	2		1		1	5		Y		Y		-Reduced travel time -Increased lane carrying capacity -Increased use of transit and carpooling -Greater benefits in areas with serious congestion and limited route options
Traffic Information Dissemination	2	1		1		1	5	Y	Y			Y	-Quantitative benefits difficult to measure; benefits dependent upon motorists response to information -Greater benefits where alternate routes are available
Regional Traffic Control	3	3	2	3		1	12	Y	Y		Y		-Benefits difficult to measure -Greater benefit in areas with multiple jurisdictions
Traffic Incident Management System	2	2	2	3		1	10	Y	Y		Y		-Reduced incident response times and incident related delay to motorists -High B/C ratio -Greater benefit in areas with high number of incidents and delays
Traffic Forecast and Demand Management	2	2				1	5				Y		-Reduced data collection cost
Electronic Toll Collection					2	1	3	Y	Y		Y		-Reduced peak hour congestion at toll plazas, toll plaza operation costs, and incidents and emissions -Traffic surveillance capabilities
Emissions Monitoring and Management				3		2	5						-Improved air quality -Greater benefit in non-attainment areas

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
Virtual TMC and Smart Probe Data	1	1		1	1	1	5			Y	Y		-Reduced incident notification time and infrastructure operating costs -Supports other Traffic Management services
Standard Railroad Grade Crossing			3			1	4	Y	Y	Y		Y	-Reduced RR grade crossing crashes -RR trackside equipment can be monitored
Advanced Railroad Grade Crossing			3			1	4		Y	Y		Y	-Reduced RR grade crossing crashes -RR trackside equipment can be monitored
Railroad Operations Coordination	1	1		1		1	4		Y	Y	Y		-Reduced travel time, VMT, fuel consumption, and emissions -Improved safety at RR crossings -Increase in trip speed -Greater benefits in large areas with significant train activity
Parking Facility Management	2			1	1		4		Y				-Reduced administrative costs and queues at entrances and exits
Regional Parking Management	2	1		1			4						-Reduced travel time, fuel consumption, and emissions related to search of parking facilities
Reversible Lane Management	2	1		1			4		Y		Y		-Improved safety -Increased lane carrying capacity -Reduced travel time -Greater benefits in areas with a large directional split in traffic
Speed Monitoring	2	1	3			1	7	Y	Y	Y		Y	-Improved safety -Reduced speeding violations -Greater benefits in areas with steep grades and approaching work zones
Drawbridge Management	2	2	1		1		6	Y		Y	Y		-Improved traveler information
Roadway Closure Management	1	2		1		1	5	Y		Y		Y	-Reduced secondary crashes and travel time -Greater benefits in hurricane-prone areas and high population areas

Current / Near Term Market Packages (Implementation Primarily by ITS): **Network Surveillance** includes vehicle detection and other surveillance equipment such as video (CCTV), the supporting field equipment, and the communications to transmit the collected data to monitor traffic and road conditions, as well as identify and verify incidents. Network Surveillance is one of the most vital ITS deployments and provides the basic elements for traffic management. This Market Package has been implemented in Northwest Indiana, is being implemented in the Indianapolis area and as part of the TRIMARC deployment in Southern Indiana near Louisville. **Traffic Information Dissemination** provides driver information using roadway devices such as Dynamic Message Signs (DMS) or Highway Advisory Radio (HAR) stations. A wide range of information can be disseminated such as incident, traffic, and road information, emergency alerts, and other driver advisories at specific locations on the road network. This Market Package has been deployed statewide: Forty-Eight Permanent Overhead DMSs are located in Indianapolis, Northwest Indiana, Evansville, Fort Wayne, and Kokomo, as well as four additional DMSs as part of TRIMARC in Southern Indiana near Louisville. Approximately 50 portable DMSs are deployed statewide, with roughly half of these on the Indiana Toll Road. Twenty-three HAR stations (plus the TRIMARC HAR) are located statewide to supplement the DMSs, especially in rural areas. A **Traffic Incident Management System** manages both unplanned incidents and planned events to minimize the impact to the transportation network and improve motorist safety via video (CCTV) surveillance devices and coordination with road maintenance activities, emergency response personnel, and event promoters. Incidents are detected and verified, followed by the appropriate response and notification to motorists. Since incidents are a significant cause of congestion, this Market Package is actively being implemented in many large metropolitan areas in the Nation. This Market Package has been implemented in Northwest Indiana, and is being implemented in the Indianapolis area, as well as the TRIMARC deployment in Southern Indiana near Louisville.

Current / Near Term Market Packages (Implementation by Primarily by Others at INDOT, with ITS Support): **Probe Surveillance** provides the potential for a less expensive (but less comprehensive) alternative approach to Network Surveillance for monitoring conditions and identifying incidents and making the information available to travelers. This Market Package is intended for deployment by the Indiana Toll Road. **Surface Street Control** provides the central control and monitoring equipment, communications devices, and the signal control equipment for surface street control and/or arterial traffic management, generally within a single jurisdiction. This is a well established Market Package; INDOT District Traffic Sections, as well as several municipalities, have implemented this technology.

Current / Near Term Market Packages (Implementation by Others at INDOT): **Electronic Toll Collection** provides toll operators with the ability to collect tolls electronically and detect and process violations. The devices can also be used to collect road usage statistics for toll authorities. Electronic Toll Collection provides tangible time-saving benefits to users and is generally well accepted and widely deployed; it will be deployed on the Indiana Toll Road.

Medium Term Market Packages (Implementation Primarily by ITS): **Speed Monitoring** checks the speed of vehicles traveling through a segment of roadway that has potentially hazardous geometrics, with roadside equipment suggesting a safe driving speed if excessive speed is detected. This Market Package could be utilized in high crash areas where excessive speed is often a contributing factor to a crash.

Medium Term Market Packages (Implementation by ITS and Others at INDOT): **Traffic Forecast and Demand Management** includes advanced algorithms and data processing and storage capabilities that support real-time travel conditions, as well as transportation planning functions such as historic and projected traffic evaluation and analysis. The data in this Market Package would be beneficial to the Environment, Planning, and Engineering Division's Long-Range Transportation Planning Section, as well as the Traffic Statistics Section of the Program Development Division.

Medium Term Market Packages (Implementation by ITS and Others Outside of INDOT): **Regional Traffic Control** provides for the sharing of traffic information and control among different jurisdiction's Traffic Management Centers (TMC) to support regional traffic control, especially in terms of major travel corridors. This Market Package has been implemented in Northwest Indiana between the Borman TMC and the Indiana Toll Road (a within INDOT implementation as the Toll Road is the Toll Road Division of INDOT), and could be pursued in other areas between a TMC and surface street control centers, as no other agencies operate separate TMCs at this time.

Medium Term Market Packages (Implementation by Others Outside of INDOT): **Standard Railroad Grade Crossing** manages highway traffic at highway-rail intersections where train speeds are 79 miles per hour or less. The equipment may also be interconnected with adjacent signalized intersections for more efficient management of highway traffic at highway-rail intersections.

Long Term / Future Market Packages (Implementation Primarily by ITS): **Freeway Control** provides the roadway vehicle detection and video devices and communications to support ramp control (ramp metering) and lane controls for freeways, incorporating the instrumentation included in the Network Surveillance Market Package. This is a well established Market Package in other parts of the country; it remains to be seen if it would be implemented in Indiana. The Purdue University Joint Transportation Research Program will be conducting a ramp metering study entitled *Cost Effectiveness Analysis of Ramp Metering and High Occupancy Vehicle Facilities: a Synthesis Study*.

Long Term / Future Market Packages (Implementation by Others Outside of INDOT): **Emissions Monitoring and Management** monitors individual (point) vehicle emissions and provides general (area-wide) air quality monitoring by way of sensors. This Market Package would be applicable in air quality non-attainment areas. **Advanced Railroad Grade Crossing** manages highway traffic at highway-rail intersections where train speeds are greater than 79 miles per hour. This Market Package includes all of the features of Standard Railroad Grade Crossing Market Package, supplemented with additional safety features to mitigate the risks associated with higher train speeds. This would only be implemented if non-grade separated High Speed Rail were to be implemented in Indiana. **Parking Facility Management** provides enhanced monitoring and management of parking facilities. This Market Package collects and shares current parking lot / garage status with Information Service Providers and collects parking fees. **Regional Parking Management** supports coordination between different parking facilities to enable regional parking management strategies.

Unlikely / Unneeded Market Packages: **HOV Lane Management** controls HOV lanes by coordinating freeway ramp meters and signals with HOV lane usage signals. There are no existing or planned HOV lanes on the Interstate System in Indiana. **Virtual TMC and Smart Probe Data** uses vehicles as probes that are capable of measuring road conditions and providing this information to the roadway for relay to these decentralized "TMCs" and potentially relayed to automated road signing equipment or in-vehicle signing. While the Probe Surveillance Market Package is planned for the Indiana Toll Road, this base Market Package is not anticipated elsewhere on the INDOT system; thus the need for this advanced Market Package does not exist. **Railroad Operations Coordination** provides for coordination between rail operations and TMCs. Rail operators provide train and maintenance schedules that will result in highway-rail intersection closures. Deployment of this Market Package is unlikely as the focus of INDOT's ITS investment will be on full access control facilities that do not have a direct interface with railroad operations. **Reversible Lane Management** provides for the management of reversible lane facilities via video (CCTV) surveillance, sensors that detect wrong-way vehicles, and other equipment that mitigate safety hazards associated with reversible lanes. There are no existing or planned Reversible Lanes on the Interstate System in Indiana. **Drawbridge Management** supports systems that manage drawbridges at rivers, canals, and other grade separated multimodal crossings via the use of control devices such as gates and warning lights, and traveler information devices such as Dynamic Message Signs at or in advance of the drawbridge. While there are a few drawbridges on the INDOT system in Northwest Indiana, they are not on full access control facilities, the focus of INDOT's ITS investment. **Roadway Closure Management** closes roadways to traffic by means of automatic or remotely controlled barriers when driving conditions are unsafe due to weather conditions, significant maintenance must be performed, and other scenarios where access to the roadway must be prohibited. Surveillance (CCTV) is needed to verify the safe activation of the closure system and traveler information systems such as Dynamic Message Signs are often included to provide closure information to motorists in the vicinity of the closure. Roadway Closure Management is currently being used on reversible lanes and HOV Lanes. As there are no existing or planned HOV lanes on the Interstate System in Indiana, and complete closures due to weather are somewhat isolated occurrences, there is limited need for this Market Package.

6.1.5. Advanced Vehicle Safety Systems

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
Vehicle Safety Monitoring			3			3	6	Y				Y	-Reduced vehicle maintenance cost -Reduced breakdown and crash rates
Driver Safety Monitoring			3			3	6			Y		Y	-Reduced crash rates
Longitudinal Safety Warning			3			3	6			Y		Y	-Reduced backing and rear-end crashes
Lateral Safety Warning			3			3	6			Y		Y	-Reduced lane / roadway departure crashes
Intersection Safety Warning			3			3	6					Y	-Reduced intersection crashes
Pre-Crash Restraint Deployment			3			3	6			Y		Y	-Reduced crash severity
Driver Visibility Improvement			3			3	6					Y	-Reduced night and impaired visibility-related crashes
Advanced Vehicle Longitudinal Control	2	1	3			3	9					Y	-Improved lane capacity -Reduced rear-end and backing crashes
Advanced Vehicle Lateral Control	2	1	3			3	9			Y	Y	Y	-Reduced lane / roadway departure crashes
Intersection Collision Avoidance			3			3	6					Y	-Reduced intersection crashes
Automated Highway System	3	3	3			3	12				Y	Y	-Significant improvement in lane capacity -Improved safety and environmental benefits

Current / Near Term Market Packages (Implementation by Others Outside of INDOT): **Vehicle Safety Monitoring** diagnoses critical components of a vehicle and warns the driver of potential dangers. In a simple sense this Market Package already exists in vehicles in the form of vehicle warning lights on the dashboard. The vehicle manufacturers are the lead on this Market Package. While **Driver Safety Monitoring, Longitudinal Safety Warning,** and **Lateral Safety Warning** are desirable Market Packages and have tangible benefits, deployment is not the responsibility of INDOT. The vehicle manufacturers are the lead on these Market Packages.

Long Term / Future Market Packages (Implementation by Others Outside of INDOT): While **Intersection Safety Warning, Pre-Crash Restraint Deployment, Driver Visibility Improvement, Advanced Vehicle Longitudinal Control, Advanced Vehicle Lateral Control, Intersection Collision Avoidance,** and **Automated Highway System** are desirable Market Packages and have tangible benefits (the more sophisticated ones have very significant benefits), deployment is not the responsibility of INDOT. The vehicle manufacturers are the lead on these Market Packages.

It should be noted the Indiana Toll Road has implemented a simplified version of the **Lateral Safety Warning** Market Package on a ten mile segment of the Toll Road from Mile 132 to 142 in Northeast Indiana with recurring vehicle / deer crashes. Sensors detect an animal near the roadway and activate flashers on the roadway, providing a warning to motorists. The more advanced version of this Market Package would have in-vehicle signage / warning devices to alert a motorist of potential danger along the roadway, a vehicle-manufacturer responsibility.

6.1.6. Commercial Vehicle Operations

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
Fleet Administration		3	1		3	2	9	Y				Y	-Improved CV productivity and loaded miles
Freight Administration		3			3	2	8					Y	-Difficult to measure, but benefits most likely for HAZMAT carriers
Electronic Clearance	2	3			3	2	10	Y					-Improved weigh station clearance time and CV productivity -Reduced public and private administrative costs
CV Administrative Processes					2	1	3	Y					-Significant reduction in public and private administrative costs -Reduced tax evasion and HAZMAT incidents
International Border Electronic Clearance	2	3			3	2	10						-Improved border clearance time and CV productivity -Reduced public and private administrative costs
Weigh-In-Motion	2	3			3	2	10						-Improved weighing time and CV productivity -Reduced public and private administrative costs
Roadside CVO Safety	1	2	2		2	2	9	Y					-Reduced inspection times and CV crashes
On-Board CVO and Freight Safety and Security			3		2	2	7					Y	-Reduced CV crashes
CVO Fleet Maintenance	1		2		2	1	6						-Improved vehicle productivity -Reduced CV crashes
HAZMAT Management	1		2		2	1	6	Y	Y				-Improved response to HAZMAT incidents -Reduced CV crashes
Roadside HAZMAT Security Detection and Mitigation			1			1	2	Y					-Improved detection of security-related HAZMAT
CV Driver Security Authentication			1			1	2						-Quick detection of unauthorized operator of a CV
Freight Assignment Tracking			1			1	2	Y					-Improved freight tracking and routing

Current / Near Term Market Packages (Implementation Primarily by Others at INDOT, with ITS Support): **Weigh-In-Motion** provides for high-speed weigh-in-motion with or without Automated Vehicle Identification (AVI) capabilities, providing the equipment that can be used as a stand-alone system or to enhance the Electronic Clearance Market Package. Weigh-in-Motion exists in Indiana, implemented at approximately 50 locations by the Traffic Statistics Section of the Program Development Division. It also exists as a key component of three Virtual Weigh Station sites in Indiana (I-65 in Lake County, US 24 in Allen County, and SR 1 in Dearborn County) and will be expanded across Indiana as a new tool to enforce commercial vehicle legal weight limits and help preserve INDOT's investment in pavements.

Current / Near Term Market Packages (Implementation Primarily by Others Outside of INDOT, with ITS Info / Support): **Electronic Clearance** provides for automated clearance at weigh stations, allowing a pre-approved vehicle with a transponder to bypass weigh stations on the mainline of the highway, providing time and operational cost savings to participating carriers. The Pre-Pass system is partially implemented in Indiana, with the critical Weigh-in-Motion scales Market Package the missing element.

Current / Near Term Market Packages (Implementation by Others Outside of INDOT): While **Fleet Administration, CV Administrative Processes, Roadside CVO Safety,** and **Freight Assignment Tracking** are desirable Market Packages and have tangible benefits, deployment is not the responsibility of INDOT. The Commercial Vehicle Enforcement Division of the Indiana State Police, the Indiana Department of Revenue, and the Commercial Vehicle industry are the lead on these Market Packages.

Medium Term Market Packages (Implementation Primarily by Others Outside of INDOT, with ITS Info / Support): **HAZMAT Management** combines Incident Management with commercial vehicle tracking to assure a coordinated response and proper treatment of HAZMAT material and incidents. This Market Package addresses a significant public safety issue associated with commercial vehicle operations and INDOT / ITS would be involved in the response.

Medium Term Market Packages (Implementation by Others Outside of INDOT): While **Freight Administration, On-Board CVO and Freight Safety and Security, CVO Fleet Maintenance, Roadside HAZMAT Security Detection and Mitigation,** and **CV Driver Security Authentication** are desirable Market Packages and have tangible benefits, deployment is not the responsibility of INDOT. The Commercial Vehicle Enforcement Division of the Indiana State Police, the Indiana Department of Revenue, and the Commercial Vehicle industry are the lead on these Market Packages.

Unlikely / Unneeded Market Packages: **International Border Electronic Clearance** provides for automated clearance at international border crossings at Canada and Mexico. As Indiana is not on an international border, this Market Package is not needed.

6.1.7. Emergency Management

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
Emergency Call-Taking and Dispatch	1		3	1	2	1	8	Y	Y	Y			-Reduced response times -Greater benefits in areas with multiple jurisdictions
Emergency Routing	1		3	1	2	1	8	Y	Y				-Difficult to measure, but benefits greater with signal preemption
Mayday Support			3		1	2	6	Y		Y		Y	-Improved call routing and response times -Greater benefits in rural areas
Roadway Service Patrols	1		3	1	2	1	8	Y	Y	Y			-Reduced incident response times and incident related delay to motorists -High B/C ratio -Greater benefit in areas with high number of incidents and delays
Transportation Infrastructure Protection			1			1	2	Y	Y				-Reduced potential for attacks on critical infrastructure -Reduced response times -Greater benefit in areas with long bridges and tunnels
Wide-Area Alert		1				1	2	Y	Y			Y	-Increased public awareness of particular alert -Reduced response time in locating abducted children
Early Warning System		1				1	2	Y	Y			Y	-Improved detection of security threats -Greater benefit in areas vulnerable to attacks
Disaster Response and Recovery	1		1	1			3	Y	Y		Y		-Reduced response times -Improved transportation network restoration time -Greater benefit in areas vulnerable to attacks
Evacuation and Reentry Management	1	1					2	Y	Y	Y		Y	-Improved mobility during an evacuation -Reduced deaths as a result of evacuating unsafe areas -Greater benefit in areas vulnerable to attacks
Disaster Traveler Information	1	1					2	Y	Y			Y	-Improved motorist information to assist with route selection -Greater benefits where alternate routes are available

Current / Near Term Market Packages (Implementation Primarily by ITS): **Roadway (Freeway) Service Patrols** monitor roads and provide aid to motorists, rapid response to incidents (flat tire, fuel, crashes, etc.) to minimize disruption to the flow of traffic, and play a key role in identifying problems on highways that frequently have incidents. This Market Package has been implemented in many areas nationwide including Indiana. The Hoosier Helper Freeway Service Patrol has been implemented in four areas of the state. The first program began in Northwest Indiana in August 1991 as a daytime program that expanded to 24 hour / 7 days a week service in May 1996. In Northwest Indiana, on-board computers give the Hoosier Helpers direct access to the Traffic Management Center, enabling them to give travelers immediate information about traffic conditions. The second Hoosier Helper deployment began in August 1997 in the Indianapolis area and operates during peak travel periods and special events. The third Hoosier Helpers deployment began serving the Indiana portion of metropolitan Louisville in May 1999 and operates during peak travel periods and special events. The fourth program is in its infancy in the Fort Wayne area, having just begun in September 2004 after implementing some limited Hoosier Helper service with regular INDOT (non-Hoosier Helper van) vehicles earlier in 2004. **Transportation Infrastructure Protection** includes the monitoring of critical transportation infrastructure such as bridges, tunnels, and Traffic Management Centers for potential threats using surveillance, sensors, and barriers to prevent and mitigate impact of an incident. Incidents can be natural disasters, terrorist attacks, or other incidents such as a barge hitting the superstructure of a bridge. The Purdue University Joint Transportation Research Program (JTRP) is conducting a study entitled *Synthesis of Best Practices in Transportation Security* that will address these issues. This Market Package has more potential as additional video surveillance is deployed. A **Wide-Area Alert** uses Traveler Information Systems to alert the public in emergency situations such as child abductions (AMBER Alerts), severe weather events, and civil emergencies, supplementing other alert systems. Alert information is disseminated to the traveling public using ITS technologies such as Dynamic Message Signs, Highway Advisory Radio, in-vehicle displays, 511, and Web sites. This Market Package has already been implemented in Indiana by use of DMSs. **Disaster Traveler Information** is the information component of Evacuation and Reentry Management Market Package, providing disaster-related traveler information to the general public. Information from multiple sources is provided with real-time disaster and evacuation information using established ITS traveler information systems, keeping the public informed about damage to the transportation system, detours and closures in effect, traffic restrictions, and real-time information on traffic conditions. This Market Package could be implemented if need be via the use of custom messages on Dynamic Message Signs.

Current / Near Term Market Packages (Implementation Primarily by Others Outside of INDOT, with ITS Info / Support): **Emergency Call-Taking and Dispatch** provides basic public safety call-taking and dispatch services that enable rapid deployment of appropriate responders to an emergency and notification between agencies. This Market Package is the foundation of coordinated emergency management amongst the emergency service agencies and traffic management personnel and has been implemented in Indiana. A prime example is the co-location of Indiana State Police District 52 dispatch personnel and Indianapolis TMC operators side by side in the Communications Center.

Current / Near Term Market Packages (Implementation by Others Outside of INDOT): **Mayday Support** allows a traveler to request emergency assistance and help the emergency center locate the user, gather information about the incident, and determine the appropriate response. The deployment of this Market Package is led by vehicle manufacturers and supported by emergency response personnel.

Medium Term Market Packages (Implementation Primarily by Others Outside of INDOT, with ITS Info / Support): **Emergency Routing** supports Automated Vehicle Location and routing of emergency vehicles in light of changing traffic and road conditions, in addition to traffic signal preemption priority to improve the safety and response time of emergency vehicles. This Market Package has more potential as additional vehicle detection and video surveillance is deployed. An **Early Warning System** monitors, detects, and reports potential and actual emergencies including natural disasters, man-made disasters, and acts of terrorism by monitoring alert systems, emergency call-taking dispatch centers, and ITS sensors and surveillance devices. This Market Package has more potential as additional vehicle detection and video surveillance is deployed. **Disaster Response and Recovery** enhances the ability of the surface transportation system to address the most severe incidents such as natural disasters, man-made disasters, and national security emergencies or terrorist attacks that require response and resources from outside the local affected area by supporting coordination of emergency response plans and information about the transportation system in the vicinity of the disaster for response personnel with traffic control strategies, detours, and restrictions to manage traffic in and around the disaster are provided. The Purdue University Joint Transportation Research Program (JTRP) is conducting a study entitled *Emergency Earthquake Routes* that will address the emergency assistance routes in Southwest Indiana, a support function in this Market Package. **Evacuation and Reentry Management** supports evacuation and reentry of the general public from and back into a disaster area for anticipated or unanticipated disasters by coordinating plans among key emergency and transportation agencies, with transportation agencies implementing special traffic control strategies to maximize capacity, such as reversible lanes, shoulder use, closures, signal priority, etc. The Purdue University JTRP is conducting a study entitled *Primary Emergency Routes for Transportation Security* that will address the emergency routing needs of the Indianapolis area, a support function in this Market Package. This Market Package has more potential as additional vehicle detection and video surveillance is deployed.

6.1.8. Maintenance and Construction Operations

	1 = Goal marginally satisfied 2 = Goal mostly satisfied 3 = Goal completely satisfied						Max =18	Y = Yes					
MARKET PACKAGE	Increase Transp Sys Efficiency & Capacity	Enhance Mobility	Improve Safety	Reduce Energy Consump & Environ Costs	Increase Economic Productivity	Create Environment for an ITS Market	TOTAL FOR THE SIX ITS GOALS	National Early Deployment Candidate	Applicable for Urban Deployment	Applicable for Rural Deployment	Addresses Traffic Congestion Problems	Addresses Crash Problems	**BENEFITS**
Maintenance and Construction Vehicle and Equipment Tracking		1	2		2	1	6	Y		Y	Y		-Accurate vehicle location and verification of location of work to be performed
Maintenance and Construction Vehicle Maintenance			2	1	2		5	Y		Y			-Reduced vehicle maintenance costs -Reduced crash and vehicle breakdown rates
Road Weather Data Collection	2	1	3		2	1	9	Y		Y		Y	-Improved safety by providing pre-trip and en-route information -Improved road maintenance efficiency
Weather Information Processing and Distribution	2	1	3		2	2	10	Y		Y		Y	-Improved safety by providing pre-trip and en-route information -Improved road maintenance efficiency
Roadway Automated Treatment	1	1	3			1	6			Y		Y	-Improved safety on bridges -Reduced crashes
Winter Maintenance	2	3	3	1	2		11	Y		Y	Y		-Increased throughput on roadway -Reduced crashes
Roadway Maintenance and Construction	1	1	1	1			4	Y	Y	Y			-Reduced ITS device failures -Improved safety by removing debris from roadway
Work Zone Management	1			1	1		3	Y	Y	Y			-Reduced crashes -Reduced congestion with traffic diversion
Work Zone Safety Monitoring	1		3	1	1	2	8			Y		Y	-Improved work crew safety -Reduced crashes in work zones
Maintenance and Construction Activity Coordination	1	1		1	1		4	Y		Y	Y		-Reduced impact to the roadway network -Improved traveler information

Current / Near Term Market Packages (Implementation by ITS and Others at INDOT):
Work Zone Management directs the activity in work zones and supports the control of traffic in the work zone with Portable Dynamic Message Signs. Work zone speeds and delays are provided to motorists and to assist in providing a safe work environment for the crew. This Market Package has been implemented in a basic sense with work zone information provided via Portable DMSs and will have more potential as additional vehicle detection and video surveillance is deployed.

Current / Near Term Market Packages (Implementation by Primarily by Others at INDOT, with ITS Support): **Road Weather Data Collection** collects current road and weather conditions using data from sensors deployed on and near the roadway, or on maintenance vehicles. This will be deployed on Hoosier Helper Freeway Service Patrol vehicles in the near future. **Weather Information Processing and Distribution** builds upon the Road Weather Data Collection Market Package by processing and distributing the weather data and hazard information such as snowy or icy road conditions so corrective actions can be implemented. The road condition and current temperature updates can be used by system operators to more effectively deploy road plowing / salting resources, issue general traveler advisories, and issue location-specific warnings to drivers using the Traffic Information Dissemination Market Package. This Market Package is in place in many northern climates, including 31 Road Weather Information Systems (RWIS) sites in Indiana, with intentions of making this information available to the public via the Internet in the near future. **Winter Maintenance** supports winter road maintenance including snow plow operations and salt / anti-icing treatments by monitoring weather forecasts and conditions to schedule the appropriate winter maintenance activities and monitor these activities. This Market Package is currently in use in Indiana with the RWIS sites and INDOT's subscription to a transportation-oriented weather forecasting service during winter weather months. **Roadway Maintenance and Construction** supports many services for scheduled and unscheduled routine maintenance and construction on a roadway, such as pothole and guardrail repair, crack sealing, repair and maintenance of traffic control devices, sweeping, mowing, debris removal, etc. This Market Package has been implemented in a basic sense with the use of routine maintenance schedules. **Maintenance & Construction Activity Coordination** supports coordinating activities to reduce the impact to the transportation system, coupled with the dissemination of maintenance and construction information to motorists and centers. This Market Package has been implemented in a basic sense and will have more potential as additional vehicle detection and video surveillance is deployed.

Current / Near Term Market Packages (Implementation by Others at INDOT): **Maintenance & Construction Vehicle and Equipment Tracking** monitors the location of maintenance and construction vehicles and other equipment to determine the progress of their activities, as well as ensuring the correct roads are being plowed or repaired.

Current / Near Term Market Packages (Implementation by Others Outside of INDOT): **Maintenance & Construction Vehicle Maintenance** supports automatic vehicle maintenance scheduling and monitoring via on-board condition sensors and provides for automatic scheduling of preventive and corrective maintenance. In a simple sense this Market Package already exists in vehicles in the form of vehicle warning lights on the dashboard. Vehicle manufacturers are the lead on this Market Package.

Medium Term Market Packages (Implementation by Primarily by Others at INDOT, with ITS Support): **Roadway Automated Treatment** automatically treats a roadway or bridge segment with anti-icing chemicals based on weather conditions. This Market Package includes the detecting sensors, the treatment, and Traveler Information Systems devices such as Dynamic Message Signs. This is currently being tested by the LaPorte District.

Long Term / Future Market Packages (Implementation by Others at INDOT): **Work Zone Safety Monitoring** includes systems that improve stationary and moving work zone crew safety and reduce crashes in work zones by detecting vehicle intrusions and warns crew workers and drivers of imminent hazards. Crew movements are also monitored so the crew can be warned of movement beyond the safe zone.

CHAPTER 7 – ITS DEPLOYMENT RECOMMENDATIONS – **BY DEPLOYMENT TYPE**

7.1. INTRODUCTION

The data and analysis in the previous six chapters of the INDOT ITS Strategic Plan have laid the foundation for the recommendations made in this chapter. Several key fundamentals guide and are the crux of these recommendations:

- ITS deployments will support INDOT's Strategic Plan, USDOT's Strategic Plan, FHWA's Strategic Plan, and USDOT's six goals for ITS (Chapter 1).
- The focus of INDOT's ITS investment will be on the Interstate System and other freeways due to the significant proportion and composition of traffic on the System coupled with the limited ability to divert in case of incidents on an Interstate or any other freeway (Chapter 2).
- The geometric design criteria from the *Indiana Design Manual* dictate what is considered desirable and minimum Levels of Service on Indiana freeways. This will serve as a basis for investment in ITS devices on Indiana's Interstates and freeways (Chapters 2 and 3).
- Major Capital Improvements (Expansion Projects and major Pavement Replacement Projects) on INDOT Interstates and freeways and select high volume arterials intersecting the Interstate System provide an opportunity to implement ITS devices in a coordinated fashion with a larger project (Chapter 3).
- The ongoing ATMS deployment of ITS devices on the Interstate System in Marion and portions of surrounding counties in the Indianapolis area through 2008 is the main focus of the INDOT ITS deployment through 2008, essentially the near-term component of INDOT's ITS deployment priorities. Other near-term elements include the US 31 Kokomo deployment and upcoming Indiana projects in the TRIMARC Strategic Plan (Chapter 4).
- Although evaluating the ITS Market Packages was not the main focus of this document, the analysis provided general direction to future ITS deployments in Indiana (Chapters 5 and 6).
- Organizational constraints (funding and staffing) simply do not allow ITS to be all things to all people and result in a large-scale Statewide ITS deployment. The philosophy of concentrating on the key Market Packages will prevail (Chapter 6).

It is important to note that the **recommendations in this chapter are grouped by individual deployment type.** Chapter 8 summarizes all deployments *chronologically*.

As with any highway project, the deployment dates are subject to change due to a variety of circumstances, including but not limited to funding constraints, staffing and workload constraints, delays to the larger projects that some of these ITS deployments are a component of, technology changes, etc. Similarly, the estimated costs are subject to change due to changes in technology and the fact that they are very preliminary in nature. Furthermore, some components will likely go up in cost over time, while some components, particularly the technological ones, are likely to go down in the future.

7.2. FULL ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS)

The Interstate Highway System and freeways are the backbone of the Indiana surface transportation network and a critical element in the state and national economy. Traffic volumes continue to increase on Indiana's Interstates and freeways, resulting in increased exposure to the potential for crashes. Due to its fully access controlled nature and volume of traffic it serves, a crash or incident that results in lane closures and even the complete closure of an Interstate or freeway in one or both directions has the greatest detrimental effect on the motoring public in terms of delay and user cost.

The key to providing real-time, accurate information is the ability to detect and verify incidents. While it is not practical to fully instrument the Interstate System and freeways in Indiana with a full Advanced Traffic Management System (ATMS), it is logical and possible to expand the ATMS in the two metropolitan areas that INDOT has constructed a Traffic Management Center (TMC) and has deployed or is currently deploying an ATMS: Northwest Indiana (Chicago) and Indianapolis. These metropolitan areas are the most populated in Indiana and have the highest freeway AADT and congestion.

Furthermore, Northwest Indiana real-time traffic condition information is available on the Internet at the TrafficWise Web site, www.trafficwise.org, and will be available in the Indianapolis area in the future, a key pre-trip motorist information tool; additions to the system will provide the public with additional valuable traveler information. Motorists can utilize this information to divert, delay, or even cancel their trip and avoid the delays. A full ATMS deployment (Vehicle Detection, Closed Circuit Television (CCTV) Cameras, and Communications) serves these functions, as well as provide surveillance at important locations along these highways to support winter operations (snow and ice removal) and overall security surveillance.

Northwest Indiana is part of the Chicago Metropolitan Area (2000 population of 9,098,316; 3rd in the Nation); Lake County (the core of INDOT's ITS investment in Northwest Indiana) had a 2000 population of 484,564; the 118th most populous county in the Nation). The Indianapolis Metropolitan Area had a population of 1,525,104 in 2000 (34th in the Nation); Marion County (the core of INDOT's ITS investment in Central Indiana) had a 2000 population of 860,454, the 50th most populous county in the Nation. It is logical to have and expand a full ATMS in these large Metropolitan Areas. Other urbanized areas in Indiana are significantly less populated compared to Northwest Indiana (Chicago) and Indianapolis. The Fort Wayne Metropolitan Area (390,156; 116th in the Nation) with Allen County as the core (331,849; 176th in the Nation), Evansville Metropolitan Area (342,815; 133rd in the Nation) with Vanderburgh County as the core (171,922; 316th in the Nation), and South Bend-Mishawaka Metropolitan Area (316,663; 145th in the Nation) with St. Joseph County as the core (265,559; 208th in the Nation) are much less populated. It should be noted that the Louisville Metropolitan Area had a 2000 population of 1,161,975 (43rd in the Nation) is not addressed since this area already has a Strategic Plan as part of the TRIMARC deployment in Louisville and Southern Indiana. This area is in the process of deploying a full ATMS. Additional details may be found in the table on the next page.

Metropolitan Area	2000 Population	U.S. Rank	Core Indiana County	2000 Population	U.S. Rank
Chicago (IL, IN, WI) 14 Counties: Illinois: Cook, DeKalb, DuPage, Grundy, Kane, Kendall, Lake, McHenry, Will Indiana: Lake, Porter, Newton, Jasper Wisconsin: Kenosha	9,098,316	3	Lake	484,564	118
Indianapolis 10 Counties: Marion, Boone, Brown, Hamilton, Hancock, Hendricks, Johnson, Morgan, Putnam, Shelby	1,525,104	34	Marion	860,454	50
Louisville (KY, IN) 13 Counties: Kentucky: Jefferson, Bullitt, Henry, Meade, Nelson, Oldham, Shelby, Spencer, Trimble Indiana: Clark, Floyd, Harrison, Washington	1,161,975	43	N/A	N/A	N/A
Fort Wayne 3 Counties: Allen, Wells, Whitley	390,156	116	Allen	331,849	176
Evansville (IN, KY) 6 Counties: Indiana: Vanderburgh, Gibson, Posey, Warrick Kentucky: Henderson, Webster	342,815	133	Vanderburgh	171,922	316
South Bend - Mishawaka (IN, MI) 2 Counties: Indiana: St. Joseph Michigan: Cass	316,663	145	St. Joseph	265,559	208
Elkhart - Goshen 1 County Elkhart	182,791	205	Elkhart	182,791	299
South Bend - Mishawaka - Elkhart - Goshen (IN, MI) * *3 Counties:* *Indiana: St. Joseph, Elkhart* *Michigan: Cass*	*499,454 **	*90 **	*St. Joseph **	*265,559 **	*208 **

N/A - While Clark and Floyd Counties are more populous than Harrison and Washington Counties, one county does not dominate the Indiana portion of the Louisville metro area in the same manner that Lake County dominates the Indiana portion of the Chicago metro area.

* - In recognition that the South Bend-Mishawaka and Elkhart-Goshen Metropolitan Areas, while divided separately for U.S. Census purposes, act as one large metropolitan area, this row illustrates this area's population and U.S. rank as a combined area for informational purposes only.

The priorities for full ATMS deployment are based on the following criteria:

1) Continuation of the Indianapolis ATMS
2) Addition to the Indianapolis ATMS (can be incorporated into design plans)
3) Addition to the existing Northwest Indiana ATMS
4) Current (2004) Interstate or Freeway Level of Service (LOS) (a function of traffic and number of lanes)
5) Major Capital Improvement in area
6) High / moderate growth area

Upon completion of the following full ATMS projects, a total of **224 miles of Interstates and freeways under INDOT control** (except the Indiana Toll Road) **will be instrumented with a full ATMS.** With the addition of the 17 miles of full ATMS either deployed or planned by TRIMARC in Southern Indiana near Louisville, this total grows to 241 miles of full ATMS on Interstates and freeways in Indiana.

The **estimated cost** for deployment is as follows (except where currently programmed):

$50,000 per mile for a **temporary ATMS** with side fire radar vehicle **detection every mile**
$100,000 per mile for a **full ATMS** with **one mile** vehicle **detection** (4 lanes)
$125,000 per mile for a **full ATMS** with **½ mile** vehicle **detection** (4 lanes)
$125,000 per mile for a **full ATMS** with **one mile** vehicle **detection** (6 lanes)
$150,000 per mile for a **full ATMS** with **½ mile** vehicle **detection** (6 lanes)
$150,000 per mile for a **full ATMS** with **one mile** vehicle **detection** (8 lanes)
$175,000 per mile for a **full ATMS** with **½ mile** vehicle **detection** (8 lanes)
$200,000 per mile for a **full ATMS** with **½ mile** vehicle **detection** (10 lanes)
$225,000 per mile for a **full ATMS** with **½ mile** vehicle **detection** (12 lanes)

7.2.1. ATMS PRIORITY 1 (Completion of Indianapolis ATMS)

INDOT is in the midst of a multi-year deployment of ITS devices on the Interstate System in Marion and portions of surrounding counties in the Indianapolis area. The completion of the Indianapolis Advanced Traffic Management System (ATMS) deployment through 2008 is the main near-term focus of ITS investments in Indiana. As part of this deployment, approximately 125 cameras will be installed in phases through 2008. These cameras, placed approximately every mile, will supplement a system of vehicle detection underneath the pavement that will be placed approximately every ½ mile on high-volume and one mile on lower volume Interstates in the Indianapolis area to measure the overall flow of traffic.

Please note that Section 7.2.2 (ATMS Priority 2) recommends additional segments for inclusion in the ATMS Phase 2 through Phase 5 segments identified below.

1. **Phase Two** of the **Indianapolis area ATMS** (Des # 0200604) is **currently under construction** and is expected to be completed **in 2005**. Phase 2 installs vehicle detection and additional cameras along I-65 from Pleasant Run Parkway (south of the I-70 South Split) to Cold Spring Road, I-70 from SR 267 to Ritter Avenue, and temporary devices on the West Leg of I-465 from SR 67 / Kentucky Avenue to 56th Street. Phase 2 cost: **$3,590,000 (let)**. Full Deployment (vehicle detection every ½ mile, CCTV every mile) will be incorporated into the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) in 2011.

2. **Phase Three** of the **Indianapolis area ATMS** (Des # 0200605) deploys the vehicle detection and additional cameras **in 2006-2007** in the **northeastern and eastern** portions of the **Indianapolis** area on I-70 from Ritter Avenue to Mt. Comfort Road (temporary devices from Ritter Avenue to I-465 (East Leg); furthermore, the Mt. Comfort Road devices will be installed as part of Phase 2 of the Interchange Modification (Des # 9706740) at that location), I-69 from I-465 to SR 238, and I-465 from the White River (North Leg) to English Avenue (East Leg). Estimated Phase 3 cost: **$5,200,000.**

3. **Phase Four** of the **Indianapolis area ATMS** (Des # 0200607) deploys the vehicle detection and additional cameras **in 2006-2007** in the **southern** portion of the **Indianapolis** area on I-65 from County Line Road to Pleasant Run Parkway (south of the South Split) and I-465 from English Avenue to SR 67 / Kentucky Avenue. Devices on I-74 from I-465 to Pleasant View Road were installed as part of the 2002-2003 Road Rehabilitation project from I-465 to London Road but are not yet integrated into the system. Estimated Phase 4 cost: **$4,200,000**, plus the additional costs identified in Items 5, 6, and 7 in the next section.

4. **The Fifth and final phase** of the Indianapolis area ATMS (Des # 0200606) deploys the vehicle detection and additional cameras **in 2007-2008** in the **northwestern and northern** portions of the **Indianapolis** area on I-65 from Cold Spring Road to SR 267, I-74 from Raceway Road to I-465 (West Leg), I-465 from 56th Street (West Leg) to the White River (North Leg) (except for devices in the 71st Street / 86th Street area that will be installed as part of the 2004-2006 Added Travel Lanes / Interchange Modification project (ATMS deployment Des # 0400418, let in 2004; the cameras and communication devices will still be part of Phase 5), and I-865 from I-65 to I-465. Estimated Phase 5 cost: **$5,375,000**, plus the additional costs identified in Item 8 in the next section.

ATMS Priority 1 total: $18,365,000

7.2.2. ATMS PRIORITY 2 (Additions to the Indianapolis ATMS)

The following four segments are directly adjacent to or within segments of Interstate that are currently being designed for full ATMS deployment in Indianapolis (Section 7.2.1) and are recommended for inclusion in their respective Phase deployment as follows:

5. **I-65 from Main St (Greenwood Rd) (Exit 99) to County Line Rd (Exit 101) (Johnson County)**
   LOS C, AADT = 76,920, six lanes, high growth area. **Recommendation: Full Deployment during Phase 4 in 2006-2007** (vehicle detection every ½ mile, CCTV every mile). Estimated cost: **additional $300,000 in Phase 4.**

6. **I-65 from Whiteland Rd (CR 500N) (Exit 95) to Main St (Greenwood Rd) (Exit 99) (Johnson County)**
   LOS E, AADT = 61,180, four lanes, high growth area. **Recommendation: Full Deployment during Phase 4 in 2006-2007** (vehicle detection every mile, CCTV every mile). Estimated cost: **additional $400,000 in Phase 4.**

7. **I-465 from I-65 (Exit 53) to SR 67 / Kentucky Ave (Exit 8) (South Leg) (Marion County)**
   LOS C-D, AADT = 75,020 – 93,130, six lanes, medium growth area. **Recommendation: ½ Mile vehicle detection during Phase 4 in 2006-2007** in lieu of the one mile vehicle detection currently proposed. This ½ spacing better supports the Travel Time Signs proposed in Section 7.5. Estimated cost: **additional $200,000 in Phase 4.**

8. **I-74 from SR 267 (Exit 66) to Raceway Rd (Hendricks / Marion County Line) (Mile 70) (Hendricks County)**
   LOS C, AADT = 33,850, four lanes, high growth area. **Recommendation: Full Deployment during Phase 5 in 2007-2008** (vehicle detection every mile, CCTV every mile). Estimated cost: **additional $400,000 in Phase 5.**

ATMS Priority 2 total: $1,300,000

7.2.3. ATMS PRIORITY 3 (Additions to the Northwest Indiana ATMS)

9. **I-94 from I-90 (Indiana Toll Road) (Exit 16) to SR 49 (Exit 26) (Porter County)**
   Weekday LOS C / Summer Friday and Sunday LOS D from I-90 to US 20 (Exit 22); Weekday LOS B / Summer Friday and Sunday LOS C from US 20 to SR 49, Weekday AADT = 49,550 – 65,570 / Summer Friday and Sunday AADT = 71,340 – 87,360, six lanes, high growth area, Interstate 94 experiences significant spikes in traffic on Fridays and Sundays during the summer months, increasing traffic by approximately 22,000 vehicles per day and lowering LOS by one across the board (B deteriorates to C and C deteriorates to D). **Recommendation: Temporary Deployment in 2009** (temporary vehicle detection (side-fire radar) every mile, CCTV every mile). Estimated cost: **$500,000**. This recommendation is based upon need and because this area is programmed for Pavement Replacement in 2013, which would result disruption of under-pavement vehicle detection, if placed. Full Deployment (vehicle detection every mile, CCTV every mile) is recommended for incorporation into the Pavement Replacement project in 2013.

10. **I-65 from I-80/94 (Borman Expwy) (Exit 259 / Mile 260) to I-90 (Indiana Toll Road (Exit 262) (Lake County)**
    LOS B, AADT = 26190 – 30,510, four lanes. While LOS B does not call for a "standalone" project of merit, it is logical to implement full detection on this segment as this is a short, two mile segment that is part a larger **system** that provides motorists and TMC operators with traffic information; I-65 provides the access from to and from the Indiana Toll Road (I-90) and can be used by certain trips to divert from I-80/94 or I-90. A similar situation exists in Indianapolis: I-865 is not a candidate for full detection on its own, but it is a small part of a larger system and is planned for full detection. **Recommendation: Full Deployment** (vehicle detection every ½ mile, CCTV every mile) **in 2009** in anticipation of the NB I-65 Mile 257.2 Travel Time Sign proposed in Section 7.5.4 in 2011. The ½ mile vehicle detection is recommended to better support the proposed travel time information. Estimated cost: **$250,000.**

11. **SR 912 (Cline Ave) from I-90 (W jct) to I-80/94 (Borman Expwy) (Lake County)**
    LOS A-D, AADT = 7,130 – 53,240, four and six lanes. SR 912 is essentially two separate roads: the lower volume (AADT of 7,130 – 40,910), newer (completed in the mid-1980s), six lane freeway from its western terminus at I-90 to just north of US 12 and the higher volume (AADT of 41,560 – 53,240), older (completed in stages during the 1960s), four lane freeway from just north of US 12 to I-80/94. The lower volume, newer, six lane segment is currently operating at an acceptable LOS A and B. The higher volume, older, four lane segment is currently operating at LOS C and D. **Recommendation: Full Deployment** (vehicle detection every mile, CCTV every mile) **during the proposed SR 912 Road Reconstruction project (Des # 0400210) from 1.66 miles west of US 12 to 0.25 mile west of US 12** (construction date not yet determined) **and during the Pavement Replacement project (Des # 0014030) from 0.25 mile north of US 12 to 0.6 mile north of I-80/94 in 2010.** While the lower volume, acceptable LOS segment is not a "standalone" project of merit, it is logical to implement full detection on this segment as this is a small part a larger **system** that provides motorists and TMC operators with traffic information; SR 912 can be used by certain trips to divert from I-80/94 or I-90. A similar situation exists in Indianapolis: I-865 is not a candidate for full detection on its own, but it is a small part of a larger system and is planned for full detection. Estimated cost: **$1,250,000.**

12. **I-65 from US 231 (Exit 247) to US 30 (Exit 253) (Lake County)**
    LOS C, AADT = 37,640, four lanes, high growth area, new interchange planned at 101st Avenue or 109th Avenue. **Recommendation: Full Deployment** (vehicle detection every mile, CCTV every mile) **during a proposed Added Travel Lanes project** (converting the existing pavement to three lanes per direction) identified in the INDOT Long Range Plan **in 2011**. Estimated cost: **$750,000.**

ATMS Priority 3 total: $2,750,000

7.2.4. ATMS PRIORITY 4 (ATMS Replacement with Major Capital Improvements)

Interstates that currently feature a full ATMS (or are proposed for a full ATMS) that are reconstructed in such a manner that the pavement is replaced (Added Travel Lanes or Pavement Replacement projects) will require a redeployment of ATMS hardware. Some of the projects below replace full ATMS deployments, while others replace temporary devices that were deployed in recognition that a Major Capital Improvement was programmed in the near future. It should be noted that while this is ATMS Priority 4 for categorization purposes, the earlier deployments below actually take place before many deployments in the previous sections.

13. **I-80/94 (Borman Expwy) from 0.8 km east of SR 912 (Exit 5) to 0.6 km west of Dr. Martin Luther King, Jr. Dr (Mile 11) (Lake County)**
    Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the ongoing Added Travel Lanes project (Des # 9910800) **in 2005.** Project was let in 2004.

14. **I-80/94 (Borman Expwy) from Illinois State Line (Mile 0) to US 41 / Calumet Ave West Ramps (Exit 1) (Lake County)**
    Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the upcoming Added Travel Lanes project (Des # 0100987) **in 2006.** The project to install this full ATMS is programmed (Des # 0300994), with an estimated cost of **$880,000.**

15. **I-70 at Mt. Comfort Rd (Exit 96) (Hancock County)**
    The Mt. Comfort Road devices that were originally part of Phase 3 (mainline and ramp detection, CCTV, and relay tower) will be installed as part of Phase 2 of the Interchange Modification project (Des # 9706740) **in 2007.** Estimated cost: **$250,000.**

16. **I-70 from I-65 (North Split) (Exit 83) to I-465 (East Leg) (Exit 90) (Marion County)**
    Replace full ATMS deployment west of Ritter Avenue and install new full ATMS to replace temporary ATMS east of Ritter Avenue as part of the I-70 Pavement Replacement project (Des #s 0400394, 0400398, and 0401174) **in 2007.** Estimated cost: **$1,450,000.**

17. **I-80/94 (Borman Expwy) from 0.6 km west of Dr. Martin Luther King, Jr. Dr (Mile 11) to I-90 (Indiana Toll Road) (Exit 16) (Lake County)**
    Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the upcoming Interchange Modification / Added Travel Lanes projects at I-65, US 6 / SR 51 (Ripley Street), and I-90 (Indiana Toll Road) (Des # 0065300, 9700410, and 0065700, respectively) **in 2009.** Estimated cost: **$1,000,000.**

18. **I-465 from 0.8 mile east of SR 67 / Kentucky Ave (West Leg) (Exit 8) to 0.5 mile north of 46th St (West Leg) (Mile 19) (Marion County)**
Replace temporary devices placed as part of Phase 2 **with full ATMS** deployment (vehicle detection every ½ mile, CCTV every mile) as part of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) **in 2011.** The project to install this full ATMS is programmed (Des # 0300908) for **$5,000,000.**

19. **I-70 from 0.6 mile east of Post Road (Exit 91) to Mt. Comfort Rd (Exit 96) (Marion and Hancock Counties)**
Replace full ATMS deployment (vehicle detection every mile, CCTV every mile) as part of the Added Travel Lanes project (Des # 0200699) **in 2012.** Estimated cost: **$625,000.**

20. **I-465 from 0.5 mile west of Allisonville Rd (North Leg) (Exit 35) to the bridge over Fall Creek (East Leg) (Mile 39) (Marion County)**
Replace full ATMS (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes projects (Des #s 0400286 and 0400283) **in 2013.** Estimated cost: **$900,000.**

21. **I-94 from I-90 (Indiana Toll Road) (Exit 16) to SR 49 (Exit 26) (Porter County)**
Replace temporary devices that were deployed in 2009 and replace **with full ATMS** (vehicle detection every mile, CCTV every mile) as part the Pavement Replacement project (Des # 0400930) **in 2013.** Estimated cost: **$1,250,000.**

22. **I-465 from 0.35 mile east of US 31 / Meridian St (North Leg) (Exit 31) to 0.5 mile west of Allisonville Rd (North Leg) (Mile 35) (Hamilton and Marion Counties)**
Replace full ATMS (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes projects (Des #s 0400304 and 0400289) **in 2014.** Estimated cost: **$900,000.**

23. **I-465 from 0.5 mile north of 46th St (West Leg) (Mile 18.5) 0.3 mile north of I-65 (West Leg) (Exit 20) (Marion County)**
Replace temporary devices that were deployed as part of Phase 2 and replace **with full ATMS** (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes project (Des # 0200003) **in 2015.** Estimated cost: **$300,000.**

24. **I-69 from I-465 (Exit 0) to 0.5 mile south of 96th St (Exit 3) (Marion County)**
Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes project (Des # 0400305) **in 2015.** Estimated cost: **$675,000.**

25. **I-65 from I-865 (Exit 129) to SR 267 (Exit 133) (Boone County)**
    Replace full ATMS deployment (vehicle detection every mile, CCTV every mile) as part of the Added Travel Lanes projects (Des #s 0200903 and 0200904) **in 2015.** The northern terminus of the Added Travel Lanes project is US 52; if traffic volumes and Level of Service warrant, then the possibility exists to extend the full ATMS deployment north to US 52 (Exit 141). Estimated cost: **$500,000;** an extension northward to US 52 would increase the estimated cost to $1,500,000.

26. **I-69 from 0.5 mile south of 96th St (Exit 3) to 0.5 mile north of SR 37 / 116th St (Exit 5) (Marion and Hamilton Counties)**
    Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes project (Des # 0400308) **in 2016.** Estimated cost: **$600,000.**

27. **I-69 from 0.5 mile north of SR 37 / 116th St (Exit 5) to SR 238 (Exit 10) (Hamilton County)**
    Replace full ATMS deployment (and enhance vehicle detection to every ½ mile, CCTV every mile) as part of the Added Travel Lanes project (Des # 0400356) **in 2016.** Estimated cost: **$600,000.**

28. **I-65 from 0.5 mile south of Southport Rd (Exit 103) to 0.25 mile south of I-465 (South Leg) (Exit 106) (Marion County)**
    Replace full ATMS (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes project (Des # 0400909) **in 2016.** Estimated cost: **$600,000.**

29. **I-65 from Whiteland Rd (CR 500N) (Exit 95) to 0.5 mile south of Greenwood Rd (Main St) (Exit 99) (Johnson County)**
    Replace full ATMS (vehicle detection every mile, CCTV every mile) as part the Added Travel Lanes project (Des # 0300840) **in 2016.** Estimated cost: **$500,000.**

30. **I-65 from 0.5 mile south of Greenwood Rd (Main St) (Exit 99) to 0.5 mile south of Southport Rd (Exit 103) (Johnson and Marion Counties)**
    Replace full ATMS (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes projects (Des #s 0401037 and 0300853) **in 2017.** Estimated cost: **$700,000.**

31. **I-70 from I-65 (North Split) (Exit 83) to Shadeland Ave (Exit 89) (Marion County)**
    Replace full ATMS as part of the Added Travel Lanes project (Des #s 0400399 and 0400400) **in 2017.** Estimated cost: **$1,250,000.**

32. **I-465 from 0.5 mile east of US 421 / Michigan Rd (North Leg) (Mile 27) to 0.35 mile east of US 31 / Meridian St (North Leg) (Exit 31) (Marion and Hamilton Counties)**
    Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes projects (Des #s 0400885 and 0400117) **in 2019.** Estimated cost: **$900,000.**

33. **I-65 from Raymond St (Exit 109) to and including the I-70 North Split (Exit 112) (Including I-70 travelover) (Marion County)**
    Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes projects (Des #s 9700400, 0201047, and 0201053) **in 2019.** Estimated cost: **$900,000.**

34. **I-465 from 0.65 mile north of 86th St (West Leg) (Mile 24) to 0.5 mile east of US 421 / Michigan Rd (North Leg) (Mile 27) (Marion and Boone Counties)**
    Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes project (Des #s 0400881) **in 2020.** Estimated cost: **$675,000.**

Note: The Stage 2 Added Travel Lanes projects programmed for construction in 2017 and 2021 on I-70 from SR 267 to I-465 (West Leg) are placeholders for possible projects to add a fourth lane per direction on the mainline in case the need exists at that time; the project may or may not occur at that time and, as such, is not included here.

ATMS Priority 4 total: $20,455,000

7.2.5. ATMS PRIORITY 5 (ATMS on New Interstates / Freeways)

35. **US 31 (Freeway) from I-465 (North Leg) to SR 38 (Hamilton County)**
Design Year LOS C-D, Design Year AADT = 65,300 – 102,700, six lanes, high growth area. **Recommendation: Full Deployment** (vehicle detection every ½ mile, CCTV every mile) **is recommended for incorporation into the Freeway Upgrade project in 2019.** This project's current 2009 RFC date will change after the FHWA's Record of Decision on the Environmental Impact Statement and the establishment of a sequence of construction. However, this project will likely be constructed in the 2012-2019 time period. Estimated cost: **$2,100,000.**

36. **I-69 from SR 144 to I-465 (South Leg) (Johnson and Marion Counties)**
Specific Design Year LOS and Design Year AADT are not available at this time but will be determined during the current Tier 2 Environmental studies. However, the Tier 1 Environmental study identified eight lanes in this high growth area. **Recommendation: Full Deployment** (vehicle detection every ½ mile in the northern segments (likely north of Smith Valley Road); every mile in the southern segments, CCTV every mile) **is recommended for incorporation into the Freeway Upgrade project in 2020.** Estimated cost: **$1,675,000.**

ATMS Priority 4 total: $3,775,000

Total ATMS ESTIMATED COST = $46,645,000

7.3. CLOSED CIRCUIT TELEVISION (CCTV) CAMERAS

As previously mentioned, the Interstate Highway System is the backbone of the Indiana surface transportation network and a critical element in the state and national economy. Traffic volumes continue to increase on Indiana's Interstates, including Rural Interstates, with several routes carrying a minimum of 30,000 vehicles per day at its lowest volume rural segment and upwards to 60,000 vehicles per day at its highest volume rural segment. Increasing traffic on Indiana's Rural Interstates results in increased exposure to the potential for crashes. Due to its fully access controlled nature and volume of traffic it serves, a crash or incident that results in lane closures or even the complete closure of an Interstate highway in one or both directions has the greatest detrimental effect on the motoring public in terms of delay and user cost. Interstate closures in rural areas can be particularly problematic due to the greater distances between interchanges and lack of alternative routes compared with urban areas. Furthermore, motorists tend to anticipate free-flow traffic on Rural Interstates; sudden queues caused by an Interstate closure can create a serious safety hazard and result in secondary crashes, further compounding the problem.

The key to providing real-time, accurate information is the ability to detect and verify incidents. While it is not practical to fully instrument the Interstate System and freeways in Indiana with vehicle detection, it is logical and possible to deploy Closed Circuit Television (CCTV) cameras at strategic locations on the higher volume Interstates and freeways (rural and urban) to serve this function, as well as provide surveillance at important locations along these highways to support INDOT winter operations (snow and ice removal) and overall security surveillance. These latter two functions (supporting winter operations and security) are the primary focus of the cameras proposed at Rest Areas and Weigh Stations on low-volume Rural Interstates that do not warrant a large-scale deployment of cameras. All of these CCTV cameras would also be beneficial for traffic management purposes in case an evacuation of an area is ever required. En-route traveler information provided by Dynamic Messages Signs (DMSs) and Highway Advisory Radio (HAR) can provide motorists with real-time information regarding traffic conditions, including closures. Motorists can utilize this information to divert, delay, or even cancel their trip and avoid the closure.

It should be noted that INDOT has a contract with MAGTECH Services to secure cellular carriers to locate their towers within INDOT Right-of-Way. In return, INDOT receives lease payments from the cell phone companies and the opportunity to place ITS field devices (most notably, CCTV cameras) on the tower for the purposes listed above. The sites on the Interstate System are included in the pages to follow with the proposed adjacent cameras. However, the cost per camera site is not included in the cost estimates, as INDOT does not incur a financial outlay to deploy these cameras; the cost to the cellular carriers to install the cameras is deducted from the lease payments. Furthermore, these cameras are either currently deployed or will be deployed in advance of the deployments described in the pages to follow.

The five priorities for Interstate and freeway CCTV Camera deployment are based on the following criteria, with **Current Level of Service** (a function of traffic and number of lanes) **the primary priority ranking tool,** with additional emphasis placed on rural segments and segments within the Area of Influence of an existing Overhead DMS:

1) **Current (2004) Interstate or Freeway Level of Service (LOS)**

Further **secondary priority** is also provided *within* each of the five priorities, listed from highest to lowest within a particular priority.

2) AADT
3) Proximity to existing ITS deployment (within an Area of Influence of an existing Overhead DMS - improved traveler information)
4) High / moderate growth area
5) Cameras needed to support a new Overhead DMS
6) System continuity

Recommended CCTV camera spacing is generally every two miles in segments that are currently LOS D or worse, every three miles for LOS C, and every four miles for LOS B. While LOS B is better than the LOS C threshold for ITS investment, some segments of LOS B or better are recommended for CCTV deployment for system continuity purposes. Camera spacing in full ATMS deployment areas is generally every mile.

A total of 240 "standalone" CCTV cameras are recommended (233 of which are on the Interstate System), providing comprehensive camera coverage of I-65, I-69, and I-70. These 240 cameras are in addition to any cameras deployed as part of a full ATMS.

The recommended locations have not been field checked to verify availability of power or ideal sight lines. More detailed analysis will be required to determine optimum locations for the CCTV cameras. Nevertheless, the recommended locations are generally near bridges and cutoff roads, as power lines are generally located along public road right-of-way. CCTV cameras should also be placed upstream of the proposed Overhead Dynamic Message Signs (refer to Section 7.4 for details) to enable viewing of a DMS to verify message content and overall operation of the device for maintenance purposes.

The **estimated cost** for deployment is **$75,000 per CCTV site**, except where currently programmed.

7.3.1. CCTV PRIORITY 1 (US 31 Kokomo System Deployment)

Seven cameras (plus signal preemption system and fiber optics) as follows:

1. **US 31 from SR 26 to Morgan St (2.0 miles north of US 35 / SR 22) (Howard Counties) (7 cameras)**
   AADT = 33,110 – 46,580, four lanes (non-freeway), within DMS area of influence, moderate growth area, key component of programmed three part ITS deployment. **Install cameras** at SR 26, Alto Road, Lincoln Road, Hoffer Street, US 35 / SR 22 (Markland Avenue), Sycamore Street, and Morgan Street **in 2005.**

Three ITS elements are programmed and committed for deployment in 2005 in the Kokomo area on US 31 as part of a unique state-local partnership. An emergency vehicle signal preemption / priority system (Des # 0010530) will be installed on US 31 from SR 26 to the north junction with US 35 (estimated cost: $183,000). Seven Closed Circuit Television (CCTV) cameras (Des # 0010520) (estimated cost: $350,000), as well as fiber optics (Des # 9801360) (estimated cost: $512,000), will be in installed on US 31 from SR 26 to Morgan Avenue, 2.0 miles north of US 35 / SR 22 (Markland Avenue). Total system estimated cost: **$1,045,000**, of which $350,000 is allocated to the CCTV cameras.

CCTV Priority 1 total: $1,045,000

7.3.2. CCTV PRIORITY 2 (Rural LOS D, within DMS Area of Influence)

Seventeen cameras as follows:

2. **I-69 from SR 238 (Exit 10) to SR 9/67 (Exit 22)**
   (Hamilton and Madison Counties) (8 cameras)
   AADT = 48,630 – 54,000, four lanes, within DMS area of influence, high growth area near Fishers / Indianapolis; moderate growth area near Pendleton / Anderson. **Install cameras** near Cyntheanne Road, SR 13, CR 800W, CR 600W, SR 38, Old SR 132, CR 400W, and SR 9/67 **in 2009.** Estimated cost: **$600,000.**

3. **I-65 from SR 44 (Exit 90) to Whiteland Rd (CR 500N) (Exit 95)**
   (Johnson County) (4 cameras)
   AADT = 54,280, four lanes, within DMS area of influence, moderate growth area. **Install cameras** near SR 44, CR 100N, CR 300N, and CR 350E **in 2009.** Estimated cost: **$300,000.**

4. **I-65 from SR 267 (Exit 133) to SR 32 (Exit 140)**
   (Boone County) (5 cameras)
   AADT = 49,440 – 56,300, four lanes, within DMS area of influence, moderate growth area. **Install cameras** near Whitestown Road, where Indianapolis Road shifts westward away from the R/W fence, Indianapolis Road, SR 39, and SR 32 **in 2009.** Estimated cost: **$375,000.**

CCTV Priority 2 total: $1,275,000

Note: There are no segments of Rural LOS D outside of an Area of Influence of an existing Overhead DMS, which would have been CCTV Priority 3 if segments existed.

7.3.3. CCTV PRIORITY 3 (Rural LOS C, within DMS Area of Influence)

Forty cameras as follows:

5. **I-69 from SR 9/67 (Exit 22) to SR 32/67 (Exit 34)**
   (Madison and Delaware Counties) (5 cameras)
   AADT = 38,700 – 44,650, four lanes, within DMS area of influence, moderate growth area, final set of cameras needed to support a new DMS. **Install cameras** near Main Street, SR 9/109, CR 300E, Abandoned RR, and SR 32/67 **in 2010.** Estimated cost: **$375,000.**

6. **I-65 from US 31 (Exit 76) to SR 44 (Exit 90)**
   (Bartholomew, Shelby, and Johnson Counties) (7 cameras)
   AADT = 39,000 – 45,870, four lanes, within DMS area of influence, moderate growth near Franklin and Columbus, final set of cameras needed to support a new DMS. **Install cameras** near *US 31 (MAGTECH site)*, CR 800N, Bartholomew / Shelby County Line Road, SR 252, Shelby / Johnson County Line Road, CR 400S, and Greensburg Road **in 2010.** Estimated cost: **$450,000.**

7. **I-65 from SR 32 (Exit 140) to SR 28 (Exit 158)**
   (Boone and Clinton Counties) (8 cameras)
   AADT = 40,120 – 44,020, four lanes, within DMS area of influence, moderate growth near Lebanon, final set of cameras needed to support a new DMS. **Install cameras** near US 52 / Lafayette Avenue, CR 300N, SR 47, NB Lebanon Rest Area, SB Lebanon Rest Area, CR 350W, Manson-Colfax Road / Abandoned RR, and SR 28 **in 2010.** Estimated cost: **$600,000.**

8. **I-70 from US 231 (Exit 41) to SR 267 (Exit 66)**
   (Putnam, Morgan, and Hendricks Counties) (9 cameras)
   AADT = 35,830 – 44,860, four lanes, within DMS area of influence, moderate growth area near Plainfield / Indianapolis, final set of cameras needed to support a new DMS. **Install cameras** near US 231, CR 650E, CR 1000E, CR 1100W (Little Point), Lake Valley Road, Hazelwood Road, SR 39, CR 525E, and Plainfield Rest Area **in 2010.** Estimated cost: **$675,000.**

9. **I-70 from Mt. Comfort Rd (Exit 96) to SR 3 (Exit 123) (Hancock and Henry Counties) (11 cameras)**
   AADT = 31,530 – 43,770, four lanes, within DMS area of influence, moderate growth area near Greenfield / Indianapolis, final set of cameras needed to support a new DMS. **Install cameras** near CR 400W, CR 200W, Fortville Pike, SR 9, Greenfield Rest Area, CR 850E, CR 1050E, SR 109, Kennard Road, CR 350W, and SR 3 **in 2010.** Estimated cost: **$825,000.**
   Note: I-70 from Mt. Comfort Road to SR 109 (19 miles) is LOS C. The eight mile segment of I-70 from SR 109 to SR 3 is LOS B. However, deploying an additional three cameras in this segment provides the verification support for deployment of a new DMS on WB I-70 east of SR 3. This completes the CCTV deployment to support new DMS installation on the key, high-volume Interstates (I-65, I-69, and I-70) at approximately 30 miles / minutes outside of and approaching Indianapolis.

CCTV Priority 3 total: $2,925,000

7.3.4. CCTV PRIORITY 4 (Urban LOS C, within DMS Area of Influence)

Twelve cameras as follows:

10. **I-69 from I-469 (S jct) (Exit 96) to SR 1 (Exit 116) (Allen County) (12 cameras)**
    AADT = 33,660 – 64,110, within DMS area of influence (both directions), high growth area. **Install cameras** near I-469 (S jct), Lower Huntington Road / Airport Expressway, US 24, Covington Road, SR 14, Leesburg Road, US 30/33 / SR 930, US 27 / SR 3, *Coldwater Road (MAGTECH site)*, Auburn Road, I-469 (N jct), and SR 1 **in 2011.** Estimated cost: **$825,000.**
    Note: Two of the eight segments in this portion of I-69 are LOS B. However, system continuity dictates that all cameras should be deployed at once to better enhance the traveler information provided on the two I-69 DMSs and two HAR stations approaching Fort Wayne.

CCTV Priority 4 total: $825,000

Note: There are a few segments of Urban LOS C (most notably the freeway segments of the SR 62/66 Lloyd Expressway in Evansville) that are isolated in nature and as such are not an integral part of the *interstate* nature of travel that takes place on the Interstate System, nor is it connected to any other large-scale proposed CCTV deployments. Therefore, CCTV deployment is not recommended for these Urban LOS C segments.

7.3.5. CCTV PRIORITY 5 (Rural LOS C and B)

Eighty-one cameras as follows:

11. **I-65 from SR 28 (Exit 158) to US 231 (Exit 193)**
    (Clinton, Tippecanoe, and White Counties) (15 cameras)
    AADT = 30,240 – 47,020, four lanes, moderate to high growth area near Lafayette, cameras needed to support two new DMSs. **Install cameras** near CR 1000W (Clinton-Tippecanoe County Line), CR 900E, Wyndotte Road, SR 25/38, CR 100S / McCarty Lane, SR 26, CR 350E / Eisenhower Road, SR 25, SR 43, CR 725N, CR 100W, Morehouse Road, SR 18, Pine Grove Road, and US 231 **in 2012.** Estimated cost: **$1,125,000.**
    Note: 20 miles of LOS C (SR 28 to SR 43); 15 miles of LOS B (SR 43 to US 231).

12. **I-65 from SR 311 (Exit 9) to US 50 (Exit 50)**
    (Clark, Scott, and Jackson Counties) (17 cameras)
    AADT = 30,770 – 40,770, four lanes, moderate growth area near Sellersburg / Louisville, Scottsburg, and Seymour, cameras needed to support two new DMSs. **Install cameras** south of SR 311 (to monitor DMS operation), and near SR 311 (in lieu of proposed TRIMARC camera), St. Joe Road, Perry Crossing Road, Ebenezer Church Road, Memphis Road, Biggs Road, SR 160, Henryville Rest Area, Clark / Scott County Line Road, Leota Road, SR 56, SR 256, US 31 (Exit 36), *SR 250 (MAGTECH site)*, US 31(Grade Separation), and US 50 **in 2012.** Estimated cost: **$1,200,000.**
    Note: 20 miles of LOS C (SR 311 to SR 56); 21 miles of LOS B (SR 56 to US 50).

13. **I-70 from SR 3 (Exit 123) to Ohio State Line (Mile 156)**
    (Henry and Wayne Counties) (15 cameras)
    AADT = 28,790 – 41,080, four lanes, moderate growth area near Richmond, cameras needed to support two new DMSs, completes Indianapolis to Ohio CCTV coverage on I-70 (system continuity). **Install cameras** near SR 103, CR 400E, Wilbur Wright Road, Old SR 1, SR 1, Washington Road, Centerville Rest Area, Centerville Road, Richmond Weigh Station, US 35, US 27, SR 227, Reservoir Road, US 40, and Ohio SR 320 (to monitor DMS operation; will require agreement with State of Ohio.) **in 2012.** Estimated cost: **$1,125,000.**
    Note: 7 miles of LOS C (US 35 to US 40); 26 miles of LOS B (SR 3 to US 35; US 40 to Ohio State Line).

14. **I-65 from US 50 (Exit 50) to US 31 (Exit 76)**
(Jackson and Bartholomew Counties) (11 cameras)
AADT = 30,380 – 35,600, four lanes, moderate growth area near Seymour and Columbus, cameras needed to support two new DMSs, completes Louisville to Indianapolis CCTV coverage on I-65 (system continuity). **Install cameras** near Seymour Weigh Station, Walnut Grove Road, SR 11, CR 950S, CR 625S, SR 58, CR 200S, SR 46, CR 300N, NB Columbus Rest Area, and SB Columbus Rest Area **in 2013.** Estimated cost: **$825,000.**
Note: 4 miles of LOS C (SR 58 to SR 46); 22 miles of LOS B (US 50 to SR 58; SR 46 to US 31).

15. **I-70 from US 41/150 (Exit 7) to US 231 (Exit 41)**
(Vigo, Clay, and Putnam Counties) (13 cameras)
AADT = 30,450 – 39,530, four lanes, moderate growth area near Terre Haute, cameras needed to support two new DMSs, completes Terre Haute to Indianapolis CCTV coverage on I-70 (system continuity). **Install cameras** near US 41/150, Fruitridge Avenue, SR 46 / Future SR 641, Hyde Road, SR 42, SR 59, Harmony Road, Clay / Putnam County Line Road, Manhattan Road, John Grey Road, SR 243 (two cameras due to wide, tree-filled median, and Poplar Grove Road **in 2013.** Estimated cost: **$975,000.**
Note: 4 miles of LOS C (US 41/150 to SR 46); 30 miles of LOS B (SR 46 to US 231).

16. **I-94 from SR 49 (Exit 26) to Michigan State Line (Mile 46)**
(Porter and LaPorte Counties) (10 cameras)
Weekday AADT = 30,260 – 41,250 / Summer Friday and Sunday AADT = 52,050 – 63,050, six lanes, within DMS area of influence, moderate growth area near Chesterton and Michigan City, cameras needed to support a new DMS, completes Illinois to Michigan CCTV coverage on I-94 (system continuity). **Install cameras** near Chesterton Weigh Station, Brown Road (CR 500E), Porter / LaPorte County Line Road, US 421, CR 400N, Bleck Road, US 20/35, Warnke Road, Michigan City Rest Area, and CR 1000N **in 2013.** Estimated cost: **$750,000.**
Note: Weekday: 14 miles of LOS B (SR 49 to US 20/35); 6 miles of LOS A (US 20/35 to Michigan State Line). Summer Friday and Sunday: 14 miles of LOS C (SR 49 to US 20/35); 6 miles of LOS B (US 20/35 to Michigan State Line).

CCTV Priority 5 total: $6,000,000

7.3.6. CCTV PRIORITY 6 (Rural LOS B / System Continuity Segments)

Note: While LOS B is doesn't meet the pure criteria of possible ITS investments in LOS C or worse areas, **system continuity** is critical to providing consistent and comprehensive traveler information to motorists in a particular Interstate corridor. Similarly, some segments below are within the Area of Influence of an existing Overhead Dynamic Message Signs.

Seventy-three cameras as follows:

17. **I-65 from SR 10 (Exit 230) to US 231 (Exit 247)**
    (Jasper, Newton, and Lake Counties) (7 cameras)
    AADT = 32,240 – 34,480, four lanes, within DMS area of influence, moderate to high growth area near Crown Point, final set of cameras needed to support a new DMS. **Install cameras** near SR 10, Demotte Rest Area, CSX RR, 205th Avenue, *SR 2 (MAGTECH site)*, Lowell Weigh Station, and 153rd Avenue **in 2014.** Estimated cost: **$450,000.**

18. **I-69 from SR 1 (Exit 116) to SR 8 (Exit 129)**
    (Allen and DeKalb Counties) (6 cameras)
    AADT = 33,290 – 34,720, four lanes, within DMS area of influence, high growth area near Fort Wayne; moderate growth area near Auburn. **Install cameras** near Union Chapel Road, Gump / Hursh Road (with proposed new interchange), Allen / DeKalb County Line Road, Auburn Rest Area, CR 11A, and SR 8 **in 2014.** Estimated cost: **$450,000.**

19. **I-65 from US 231 (Exit 193) to SR 10 (Exit 230)**
    (White and Jasper Counties) (11 cameras)
    AADT = 27,980 – 32,280, four lanes, cameras needed to support two new DMSs, completes Indianapolis to Gary CCTV coverage on I-65 (system continuity). **Install cameras** near Wolcott Rest Area, CR 100S, US 24/231, US 231 (Exit 205), SR 16, CR 700S, SR 114, CR 200S, SR 14, CR 400N (Fair Oaks Road), and CSX RR **in 2014.** Estimated cost: **$825,000.**

20. **I-74 from Pleasant View Rd (Exit 101) to SR 44 (Exit 116)**
    (Shelby County) (5 cameras)
    AADT = 28,340 – 34,640, four lanes, within DMS area of influence, moderate growth area near Shelbyville. **Install cameras** near London Road, CR 400W, Fairland Road, SR 9, and SR 44 **in 2014.** Estimated cost: **$375,000.**

21. **I-69 from SR 32/67 (Exit 34) to SR 18 (Exit 64)**
    (Delaware and Grant Counties) (12 cameras)
    AADT = 27,510 – 32,170, four lanes, cameras needed to support two new DMSs. **Install cameras** near CR 400S, CR 100S, SR 332, US 35 / SR 28, CR 950N, Pipe Creek Rest Area, CR 1050S, SR 26, CR 700S, US 35 / SR 22, CR 200S, SR 18 **in 2014.** Estimated cost: **$900,000.**

22. **I-70 from Illinois State Line (Mile 0) to US 41/150 (Exit 7) (Vigo County) (3 cameras)**
AADT = 23,260 – 27,210, four lanes, moderate growth area near Terre Haute, completes Illinois to Indianapolis CCTV coverage on I-70 (system continuity). **Install cameras** near West Terre Haute Weigh Station (US 40 interchange is visible), Clear Creek Rest Area, and Darwin Road **in 2015.** Estimated cost: **$225,000.**

23. **I-69 from SR 18 (Exit 64) to I-469 (S jct) (Exit 96) (Grant, Huntington, Wells, and Allen Counties) (8 cameras)**
AADT = 23,490 – 25,530, four lanes, cameras needed to support two new DMSs, completes Indianapolis to Fort Wayne CCTV coverage on I-69 (system continuity). **Install cameras** near CR 400N / CSX RR, SR 5/218, SR 5, Warren Weigh Station, CR 300S, US 224, NB Markle Rest Area, and SB Markle Rest Area (NB DMS at Mile 94.2 is visible) **in 2015.** Estimated cost: **$600,000.**

24. **I-69 from SR 8 (Exit 129) to Michigan State Line (Mile 157) (DeKalb and Steuben Counties) (10 cameras)**
AADT = 20,320 – 32,180, four lanes, moderate growth areas near Auburn and Angola, cameras needed to support two new DMSs, completes Indianapolis to Michigan CCTV coverage on I-69 (system continuity). **Install cameras** near CR 27, US 6, CR 10, SR 4, Angola Rest Area, US 20, CR 200W, SR 127, I-80/90 (Toll Road), and Lake George Road **in 2015.** Estimated cost: **$750,000.**
Note: Note: 21 miles of LOS B (SR 8 to CR 200W); 7 miles of LOS A (CR 200W to Michigan State Line). For system continuity purposes, it is reasonable to deploy cameras in the LOS A area.

25. **I-469 from US 30 (Exit 19) to I-69 (N jct) (Exit 31) (Allen County) (4 cameras)**
AADT = 28,290 – 36,130, four lanes, within DMS area of influence, high / moderate growth area, cameras support existing and proposed DMSs on I-69, system continuity. **Install cameras** near US 30, US 24, SR 37, and *Maplecrest Road (MAGTECH site)* **in 2015.** Estimated cost: **$225,000.**
Note: Note: 2 miles of LOS C (Maplecrest Road to I-69 (N jct)); 10 miles of LOS B (US 30 to Maplecrest Road).

26. **I-469 from I-69 (S jct) (Exit 0) to US 30 (Exit 19) (Allen County) (7 cameras)**
AADT = 14,350 – 22,740, four lanes, within DMS area of influence, cameras support existing and proposed DMSs on I-69, system continuity. **Install cameras** near Indianapolis Road, SR 1, Winchester Road, US 27/33, Marion Center Road, Tillman Road, and Minnich Road **in 2015.** Estimated cost: **$525,000.**
Note: All 19 miles are LOS A. For the reasons listed above, plus with the likely increase in *interstate* traffic upon the completion of the US 24 Fort Wayne to Toledo corridor, it is reasonable to deploy cameras in this area.

CCTV Priority 6 total: $5,325,000

7.3.7. CCTV PRIORITY 7 (Rest Areas/Weigh Stations-Low AADT Interstates)

The previous six CCTV priorities focused on higher volume Interstates with a primary purpose of providing real-time, accurate traffic information and the ability to detect and verify incidents. The cameras below provide this function, but by virtue of being on lower volume Interstates provide surveillance at important locations to support INDOT winter operations (snow and ice removal) and overall security surveillance. These latter two functions (supporting winter operations and security) are the primary focus of the cameras proposed at Rest Areas and Weigh Stations on low-volume Rural Interstates that do not warrant a large-scale deployment of cameras.

27. **I-74 (Vermillion, Fountain, Hendricks, Ripley, and Dearborn Counties) (7 cameras)**
    Install cameras in 2016 near:
    Spring Creek Rest Area (Mile 1.5); AADT = 19,320
    Proposed Port of Entry (POE) Weigh Station (Mile 2.7); AADT = 19,320
    Veedersburg Weigh Station (Mile 18.5) (if Mile 2.7 POE not built); AADT = 15,810
    Waynetown Rest Area (Mile 22.4); AADT = 15, 810
    Lizton Rest Area (Mile 56.4); AADT = 16,280
    Batesville Rest Area (Mile 151.5); AADT = 20,750
    West Harrison Weigh Station (Mile 170.5); AADT = 29,530
    Estimated cost: **$525,000.**

28. **I-64 (Posey, Spencer, and Floyd Counties) (3 cameras)**
    Install cameras in 2016 near:
    Black River Rest Area (Mile 7.5); AADT = 11,810
    Dale (Nancy Hanks) Rest Area (Mile 58.0); AADT = 12,510
    Georgetown Rest Area (MAGTECH site) (Mile 114.8); AADT = 31,290
    Estimated cost: **$150,000.**

CCTV Priority 7 total: $675,000

Total CCTV Cameras (240) ESTIMATED COST = $18,070,000

7.4. PERMANENT OVERHEAD DYNAMIC MESSAGE SIGNS (DMS)

Dynamic Message Signs (DMS) are electronic roadway devices that provide real-time, dynamic (changing, not static) motorist information, such as incident, traffic, and road condition information, emergency alerts, and other driver advisories at strategic locations on the road network, ideally in advance of a major decision point or suitable alternate routes. Motorists can utilize this information to divert, delay, or even cancel their trip and avoid the delays. Forty-Eight Permanent Overhead DMSs are located in Indianapolis, Northwest Indiana, Evansville, Fort Wayne, and Kokomo, as well as four additional DMSs as part of TRIMARC in Southern Indiana near Louisville. Approximately 50 portable DMSs are deployed statewide, with roughly half of these on the Indiana Toll Road. Twenty-three Highway Advisory Radio (HAR) stations (plus the TRIMARC HAR) are located statewide to supplement the DMSs, especially in rural areas.

The **priorities for DMS deployment closely mirror the full ATMS and CCTV deployment priorities and recommendations** in the previous sections. The full ATMS deployment recommendations were based on the following criteria: continuation of the Indianapolis ATMS, additions to the Indianapolis ATMS (can be incorporated into design plans), additions to the existing Northwest Indiana ATMS, current (2004) Interstate or Freeway Level of Service (LOS) (a function of traffic and number of lanes), a Major Capital Improvement in area, and location in a high / moderate growth area. The CCTV recommendations were based on the following criteria, with current LOS (a function of traffic and number of lanes) the primary priority ranking tool, with additional emphasis placed on rural segments and segments within the Area of Influence of an existing Overhead DMS. Further secondary priority was also provided *within* each of the priorities, specifically AADT, proximity to existing ITS deployment, high / moderate growth area, cameras needed to support a new Overhead DMS, and system continuity.

Recommended urban DMS spacing is in advance of major decision points (intersecting Interstates and freeways). **Recommended rural DMS spacing is generally every 30 to 40 miles, placed in advance of a suitable INDOT System roadway for diversion purposes.** This rural spacing also roughly translates to a DMS every 30 to 40 minutes of travel on an instrumented Interstate.

A total of 48 new Permanent Overhead DMSs are recommended, along with the refurbishment of nine DMSs and the removal of four DMSs. Upon implementation, INDOT will operate 92 Permanent Overhead DMSs, providing extensive coverage in the two ATMS deployment areas and rural segments of I-65, I-69, and I-70. The additional five TRIMARC DMSs in Indiana, (the four existing plus one planned DMS (SR 60 on-ramp to SB I-65)) will result in **97 Permanent Overhead DMSs in Indiana.**

The recommended locations have not been field checked to verify availability of power or ideal sight lines. More detailed analysis will be required to determine optimum locations for the DMSs. Nevertheless, the recommended locations are generally near bridges and cutoff roads, as power lines are generally located along public road right-of-way. All DMSs shall be placed on a box truss over the travel lanes. CCTV cameras should also be placed upstream of the proposed DMSs on Interstates (refer to Section 7.3 for details) to enable viewing of a DMS to verify message content and overall operation of the device for maintenance purposes.

The **estimated cost** for deployment is **$190,000 per each new DMS on a new box truss** and **$130,000 per each refurbished Vultron DMS on a new box truss.**

7.4.1. DMS PRIORITY 1 (Additions / Upgrades to the Indianapolis ATMS)

Eighteen new DMSs as follows:

1. **SB I-465 (West Leg), near Mile 22.2 (79th St), south of 86th St (Marion County)**
   Install new DMS in 2006 at end of ongoing I-465 Northwest Fast Track Added Travel Lanes / Interchange Modification project (Des #s 0301064, 9706730, and 9700840). The DMS will provide traveler information for motorists entering the I-465 West Leg Added Travel Lanes / Interchange Modification project to the south (Accelerate 465), as well as before the I-65 decision point. Estimated cost: **$190,000.**

2. **NB I-465 (East Leg), near Mile 38.5, south of I-69 (Marion County)**
   Install new DMS in 2007 during Phase 3 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 3 deployment area, as well as before the I-69 decision point. Estimated cost: **$190,000.**

3. **SB I-465 (East Leg), Mile 38.2, south of I-69 (Marion County)**
   Replace existing Vultron DMS and install new DMS on box truss in 2007 during Phase 3 of the Indianapolis ATMS. The new DMS will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 3 and 2 deployment areas, as well as before the I-70 decision point. Estimated cost: **$190,000.**

4. **SB I-69, Mile 4.3, south of 116th St (Hamilton County)**
   Replace existing Vultron DMS and install new DMS on box truss in 2007 during Phase 3 of the Indianapolis ATMS. The new DMS will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 3 and 2 deployment areas, as well as before the I-465 decision point. Estimated cost: **$190,000.**

5. **SB I-465 (East Leg), near Mile 46.5 (English Ave), north of US 52 (Marion County)**
   Install new DMS in 2007 during Phase 4 of the Indianapolis ATMS. The new DMS will provide traveler information for motorists entering the Phase 4 deployment area, as well as before the I-74 and I-65 decision points. Estimated cost: **$190,000.**

6. **NB I-65, near Mile 108.5, south of Raymond St (Marion County)**
   Install new DMS in 2007 during Phase 4 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 4 and 2 deployment areas, as well as before the two I-70 decision points (South and North Splits). Estimated cost: **$190,000.**

7. **NB I-65, Mile 104.7, south of I-465 (South Leg) (Marion County)**
   Replace existing Vultron DMS and install new DMS on box truss in 2007 during Phase 4 of the Indianapolis ATMS. The new DMS will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 4, 3 and 2 deployment areas, as well as before the I-465 decision point. Estimated cost: **$190,000.**

8. **EB & WB I-70, Mile 85.7, west of Emerson Ave (Marion County)**
   Replace two existing Vultron DMSs and install two new DMSs on box trusses in 2007 during the Pavement Replacement project on I-70 (Des # 0400398). The new DMSs, located slightly downstream of the existing DMS in each direction, will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 2, 3 and 4 deployment areas, as well as before the I-465 (EB) and I-70 North Split (WB) decision points. Estimated cost: **$380,000.**

9. **EB & WB I-465 (North Leg), near Mile 28.2 (Township Line Rd), west of US 31 (Marion County)**
   Install two new DMSs in 2008 during Phase 5 of the Indianapolis ATMS. The DMSs will provide traveler information for motorists in the Phase 5, 3, and to a small extent, Phase 2 deployment areas, as well as before the I-865 / I-65 North (WB) and the future US 31 Freeway (EB) decision points. Estimated cost: **$380,000.**

10. **NB I-465 (West Leg), near Mile 22.2 (79th St), south of 86th St (Marion County)**
    Install new DMS in 2008 during Phase 5 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 5 and, to a small extent, Phase 3 deployment areas, as well as before the I-865 decision point. Estimated cost: **$190,000.**

11. **SB I-65, near Mile 125, north of 71st St (Marion County)**
    Install new DMS in 2008 during Phase 5 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 5, 2, 4 and, to a small extent, Phase 3 deployment areas, as well as before the I-465 decision point. This DMS will supplement the SB I-65 DMS north of SR 334 (Mile 131.9), allowing that DMS to feature less information on the West and South Legs of I-465. Estimated cost: **$190,000.**

12. **EB I-74, near Mile 68, east of SR 267 (Hendricks County)**
    Install new DMS in 2008 during Phase 5 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 5, 2, and 4 deployment areas, as well as before the I-465 decision point. This DMS should be placed west of the proposed Ronald Reagan Parkway (North-South Corridor) in Hendricks County, providing for a local diversion route in advance of I-465. Estimated cost: **$190,000.**

13. **EB & WB I-465, Mile 32.2, west of SR 431 (Marion County)**
    Replace two existing Vultron DMSs and install two new DMSs on box trusses east of SR 431 near Mile 34.4 in 2008 during Phase 5 of the Indianapolis ATMS. The new DMSs, east of SR 431, will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 3 and 5 deployment areas. These DMSs are relocated east of SR 431 to provide for a diversion route (SR 431) in advance of the proposed US 31 freeway north of I-465 (which is recommended for full ATMS deployment) (WB), and closer to the I-69 decision point (EB). Estimated cost: **$380,000.**

14. **SB I-65, Mile 131.9, north of SR 334 (Boone County)**
    Replace existing Vultron DMS and install new DMS on box truss in 2008 during Phase 5 of the Indianapolis ATMS. The new DMS will provide improved readability in this medium volume corridor and traveler information for motorists in the Phase 5, 3 and 2 deployment areas, as well as before the I-865 decision point. Estimated cost: **$190,000.**

15. **WB I-70, Mile 92.1, east of Post Rd (Marion County)**
    Replace existing Vultron DMS and install new DMS on box truss in 2008 during Phase 5 of the Indianapolis ATMS. The new DMS will provide improved readability in this medium volume corridor and traveler information for motorists in the Phase 3, 2, 4, and 5 deployment areas, as well as before the I-465 decision point. Estimated cost: **$190,000.**

DMS Priority 1 total: $3,420,000

7.4.2. DMS PRIORITY 2 (Additions to the Indianapolis & NW Indiana ATMSs)

Four new DMSs and **four refurbished DMSs** as follows:

16. **EB I-80/94 (Borman Expwy), near Mile 13 (Clay St), east of Central Ave (Lake County)**
    Install refurbished Vultron DMS in 2009 during the I-80/94 Added Travel Lanes / Interchange Modification project near I-65 (Des # 0065300). The DMS will provide traveler information for motorists in the current Borman ATMS area and entering the 2009 temporary (and 2013 permanent) ATMS deployment on I-94 from I-90 (Indiana Toll Road) to SR 49, as well as Toll Road information. The DMS is in advance of the I-90 (Indiana Toll Road) decision point. Estimated cost: **$130,000.**

17. **SB SR 431, north of I-465 (North Leg) between 98th St and 106th St (Hamilton County)**
    Install refurbished Vultron DMS in 2009 during the SR 431 Added Travel Lanes project (Des # 9133595). The DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the Phase 5 and 3 deployment areas, as well as before the I-465 decision point. Keystone Avenue and other local roadways are available as diversion routes off of I-465. Estimated cost: **$130,000.**

18. **NB I-69, near Mile 3.2, north of 96th St (Hamilton County)**
    Install new DMS in 2009 to provide traveler information to motorists in conjunction with deployment of eight CCTV cameras from SR 238 to SR 9/67 in 2009, as well as the 2007 Phase 3 deployment area northward to SR 238. The DMS is in advance of the SR 37 decision point / diversion route. Estimated cost: **$190,000.**

19. **NB & SB I-465 (West Leg), Near Mile 15, south of I-74 (Marion County)**
    Install two New DMSs in 2011 during the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465). The DMSs will provide traveler information for motorists in the Phase 2, 5, and 4 deployment areas, as well as before the I-74 and I-65 (NB) and I-70 (SB) decision points. Estimated cost: **$380,000.**

20. **SB SR 912 (Cline Ave), near SR 312, north of I-80/94 (Borman Expwy) and I-90 (Indiana Toll Road) (Lake County)**
    Install refurbished Vultron DMS in 2010 during the SR 912 Pavement Replacement project (Des # 0014030). The DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the Borman Expressway ATMS, as well as the proposed SR 912 and Indiana Toll Road ATMS deployment areas. The DMS is in advance of the I-90 (Toll Road) and I-80/94 (Borman) decision points. Estimated cost: **$130,000.**

21. **NB US 31, south of I-465 (South Leg) between Edgewood Ave and Epler Ave (Marion County)**
    Install refurbished Vultron DMS in 2010 during the US 31 Pavement Replacement project (Des # 0100721). The DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the Phase 4, 2, and 3 deployment areas, as well as before the I-465 decision point. East Street and other local roadways are available as diversion routes off of I-465. Estimated cost: **$130,000.**

22. **EB US 36, west of I-465 (West Leg) between Girls School Rd and High School Rd (Marion County)**
    Install new DMS in 2013 during the US 36 Added Travel Lanes project (Des # 0101115). The DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the Phase 2, 4, and 5 deployment areas, as well as before the I-465 decision point. Rockville Road and other local roadways are available as diversion routes off of I-465. Estimated cost: **$190,000.**

DMS Priority 2 total: $1,280,000

7.4.3. DMS PRIORITY 3 (New Rural Interstate DMSs)

Twenty-two new DMSs and **five refurbished DMSs** as follows:

23. **SB I-69, near Mile 28.3 (CR 300E), north of SR 9/109 (Madison County)**
    Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of five CCTV cameras from SR 9/67 to SR 32/67 in 2010, as well as the deployment of eight CCTV cameras from SR 238 to SR 9/67 in 2009 and the 2007 Phase 3 deployment area from I-465 to SR 238. The DMS is in advance of the SR 109 and SR 9/67 diversion routes. Estimated cost: **$130,000.**

24. **NB I-65, near Mile 71.3 (CR 300N), south of US 31 (Exit 76) (Bartholomew County)**
    Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of six CCTV cameras from US 31 (Exit 76) to SR 44 in 2010, as well as the deployment of four CCTV cameras from SR 44 to Whiteland Road in 2009 and the 2007 Phase 4 deployment area from Whiteland Road to I-465 (South Leg). The DMS is in advance of the US 31 diversion route. Estimated cost: **$130,000.**

25. **SB I-65, near Mile 160.4 (CR 1000W), north of SR 28 (Clinton County)**
    Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of eight CCTV cameras from SR 32 to SR 28 in 2010, as well as the deployment of five CCTV cameras from SR 267 to SR 32 in 2009 and the 2008 Phase 5 deployment area from I-865 to SR 267. The DMS is in advance of the SR 28 / US 52 diversion routes. Estimated cost: **$130,000.**

26. **EB I-70, near Mile 38.6 (Poplar Grove Rd), west of US 231 (Putnam County)**
    Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of nine CCTV cameras from US 231 to SR 267 in 2010, as well as the 2005 Phase 2 deployment area from SR 267 to I-465 (West Leg). The DMS is in advance of the US 231 / US 40 diversion routes. Estimated cost: **$130,000.**

27. **WB I-70, near Mile 126.2 (SR 103), east of SR 3 (Henry County)**
    Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of 11 CCTV cameras from Mt. Comfort Road to SR 3 in 2011, as well as the 2007 Phase 3 deployment area from I-465 (East Leg) to Mt. Comfort Road. The DMS is in advance of the SR 3 / US 40 diversion routes. Estimated cost: **$130,000.**

28. **NB I-65, near Mile 154.4 (Manson-Colfax Rd / Abandoned RR), south of SR 28 (Clinton County)**
    SB I-65, near Mile 198.8 (CR 100S), north of US 231 (Exit 193) (White County)
    Install two new DMSs in 2012 to provide traveler information to motorists in conjunction with the deployment of 15 CCTV cameras from SR 28 to US 231(Exit 193) in 2012. The NB DMS is in advance of the SR 28 / US 52 diversion routes; the SB DMS is in advance of the US 231 / US 52 diversion routes. Estimated cost: **$380,000.**

29. **NB I-65, near Mile 8, south of SR 311 (Clark County)**
    SB I-65, near Mile 52.5 (Walnut Grove Rd), north of US 50 (Jackson County)
    Install two new DMSs in 2012 to provide traveler information to motorists in conjunction with the deployment of 17 CCTV cameras from SR 311 to US 50 in 2012. The NB DMS is in advance of the SR 311 / US 31 diversion routes; the SB DMS is in advance of the US 50 / US 31 diversion routes. The NB DMS, while in the TRIMARC deployment area, would be installed and controlled by INDOT as the DMS serves motorists leaving the TRIMARC deployment area and into INDOT controlled area. Estimated cost: **$380,000.**

30. **EB I-70, near Mile 120.7 (CR 350W), west of SR 3 (Henry County)**
    WB I-70, 1.5 miles east of the Ohio State Line (near Ohio SR 320), east of US 40 (Preble County, Ohio)
    Install two new DMSs in 2012 to provide traveler information to motorists in conjunction with the deployment of 15 CCTV cameras from SR 3 to the Ohio State Line in 2012. The EB DMS is in advance of the SR 3 / US 40 diversion routes; the WB DMS is in advance of the US 40 diversion route. The WB DMS, while in Ohio, would be installed and controlled by INDOT and will require an agreement with the State of Ohio. The placement in Ohio is necessary as the US 40 interchange is immediately west of the State Line. These DMSs complete the Indianapolis to Ohio DMS deployment on I-70. Estimated cost: **$380,000.**

31. **NB I-65, near Mile 45.3 (US 31 grade separation), south of US 50 (Jackson County)**
    SB I-65, near Mile 79.1 (Bartholomew / Shelby County Line Rd), north of US 31 (Exit 76) (Bartholomew County)
    Install two new DMSs in 2013 to provide traveler information to motorists in conjunction with the deployment of 11 CCTV cameras from US 50 to US 31 (Exit 76) in 2013. The NB DMS is in advance of the US 50 / US 31 diversion routes; the SB DMS is in advance of the US 31 diversion route. These DMSs complete the Louisville to Indianapolis DMS deployment on I-65. Estimated cost: **$380,000.**

32. **EB I-70, near Mile 9.7 (Fruitridge Ave), west of SR 46 / Future SR 641 (Vigo County)**
WB I-70, near Mile 44.9 (CR 650E), east of US 231 (Putnam County)
Install two new DMSs in 2013 to provide traveler information to motorists in conjunction with the deployment of 13 CCTV cameras from US 41/150 to US 231 in 2013. The EB DMS is in advance of the SR 46 / US 40 diversion routes; the WB DMS is in advance of the US 231 / US 40 diversion routes. The placement of the EB DMS east of US 41/150 instead of west of US 40 near the Illinois State Line is logical since US 40 will be relinquished to local jurisdictions from I-70 to SR 46 upon completion of SR 641 from US 41 to I-70; this location is in advance of a state facility. Eastbound motorists west of this DMS can receive traveler information via the HAR at Mile 1. These DMSs complete the Illinois to Indianapolis DMS deployment on I-70. Estimated cost: **$380,000.**

33. **WB I-94, near Mile 44.9 (CR 1000N), east of US 20/35 (LaPorte County)**
Install new DMS in 2013 to provide traveler information to motorists in conjunction with the deployment of 10 CCTV cameras from SR 49 to the Michigan State Line in 2013, as well as the 2013 permanent ATMS deployment from I-90 (Indiana Toll Road) to SR 49, replacing the temporary 2009 deployment. The DMS is in advance of the US 20 diversion route. This DMS completes the Illinois to Michigan DMS deployment on I-94. Estimated cost: **$190,000.**

34. **NB I-65, near Mile 224.5 (CR 400N / Fair Oaks Rd), south of SR 10 (Jasper County)**
Install new DMS in 2014 to provide traveler information to motorists in conjunction with the deployment of seven CCTV cameras from SR 10 to US 231 (Exit 247) in 2014, as well as the 2011 ATMS deployment from US 231 (Exit 247) to US 30. The DMS is in advance of the SR 10 diversion route. Estimated cost: **$190,000.**

35. **NB I-65, near Mile 190.4 (Pine Grove Rd), south of US 231 (Exit 193) (White County)**
SB I-65, near Mile 236.9 (205th Ave), north of SR 10 (Lake County)
Install two new DMSs in 2014 to provide traveler information to motorists in conjunction with the deployment of 11 CCTV cameras from US 231 (Exit 193) to SR 10 in 2014. The NB DMS is in advance of the US 231 diversion route; the SB DMS is in advance of the SR 10 diversion route. These DMSs complete the Indianapolis to Gary DMS deployment on I-65. Estimated cost: **$380,000.**

36. **NB I-69, near Mile 24.9 (Main St), south of SR 9/109 (Madison County)**
    SB I-69, near Mile 62 (CR 200S), north of US 35 / SR 22 (Grant County)
    Install two new DMSs in 2014 to provide traveler information to motorists in conjunction with the deployment of 12 CCTV cameras from SR 32/67 to SR 18 in 2014. The NB DMS is in advance of the SR 9 and SR 67 diversion routes; the SB DMS is in advance of the US 35 / SR 22 diversion route and a recurring winter weather problem area. Estimated cost: **$380,000.**

37. **NB I-69, near Mile 53.4 (CR 1050S), south of SR 26 (Grant County)**
    SB I-69, near Mile 99 (Lower Huntington Rd / Airport Expwy (Allen County)
    Install two new DMSs in 2015 to provide traveler information to motorists in conjunction with the deployment of eight CCTV cameras from SR 18 to I-469 (south junction) in 2015. The NB DMS is in advance of the SR 26 diversion route and a recurring winter weather problem area; the SB DMS is in advance of the I-469 diversion route. These DMSs complete the Indianapolis to Fort Wayne DMS deployment on I-69. Estimated cost: **$380,000.**

38. **NB I-69, near Mile 113.5 (Auburn Rd), south of I-469 (N jct) (Allen County)**
    SB I-69, near Mile 157 (Lake George Rd) (Steuben County)
    Install two new DMSs in 2015 to provide traveler information to motorists in conjunction with the deployment of 10 CCTV cameras from SR 8 to the Michigan State Line in 2015, as well as the deployment of five CCTV cameras from SR 1 to SR 8 in 2014. The NB DMS is in advance of the I-469 decision point / SR 1 diversion routes; the SB DMS is in advance of the I-80/90 (Toll Road) decision point / SR 120 / SR127 diversion routes. These DMSs complete the Indianapolis to Michigan DMS deployment on I-69. Estimated cost: **$380,000.**

39. **WB I-469, near Mile 29.2, east of I-69 (N jct) (Allen County)**
    Install new DMS in 2015 to provide traveler information to motorists in conjunction with the deployment of four cameras from US 30 to I-69 (north junction in 2015, as well as the deployment of 10 CCTV cameras on I-69 from SR 8 to the Michigan State Line in 2015, five CCTV cameras from on I-69 from SR 1 to SR 8 in 2014, and 12 CCTV cameras I-69 from I-469 (south junction) to SR 1 in 2011. The DMS is in advance of the I-69 decision point. Estimated cost: **$190,000.**

40. **WB I-469, near Mile 1 (Lafayette Center Rd), east of I-69 (S jct) (Allen County)**
    Install new DMS in 2015 to provide traveler information to motorists in conjunction with the deployment of seven cameras from I-69 (south junction) to US 30 in 2015, as well as the deployment of seven CCTV cameras on I-69 from SR 18 to I-469 (south junction) in 2015, and 12 CCTV cameras I-69 from I-469 (south junction) to SR 1 in 2011. The DMS is in advance of the I-69 decision point. Estimated cost: **$190,000.**

DMS Priority 3 total: $4,830,000

7.4.4. DMS PRIORITY 4 (Additions to the Indianapolis & NW Indiana ATMSs)

Four new DMSs as follows:

41. **EB US 30, west of I-65, approximately 0.7 mile east of SR 55 (Lake County)**
    Install new DMS in 2018 during the proposed Added Travel Lanes project on US 30, currently identified in the INDOT Long Range Plan. This DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the I-65 ATMS deployment area in advance of the I-65 decision point and SR 53 diversion route. Estimated cost: **$190,000.**

42. **SB US 31(Freeway), north of I-465 (North Leg), between 106th St and 116th St (Hamilton County)**
    SB US 31(Freeway), north of I-465 (North Leg), between 161st St and SR 32 (Hamilton County)
    Install two new DMSs in 2019 during the Freeway Upgrade project on US 31 (Des # 0300814). The southern DMS between 106th and 116th Streets will provide traveler information for motorists in the US 31 ATMS deployment area and Phase 5 and 3 deployment areas, as well as before the I-465 decision point. This DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The northern DMS between 161st Street and SR 32 will provide traveler information for motorists in the US 31 ATMS deployment area, as well as before the SR 431 decision point / diversion route. Estimated cost: **$380,000.**

43. **NB I-69, south of I-465 (South Leg), between County Line Rd and Southport Rd (Marion County)**
    Install new DMS in 2020 during the proposed Road Construction project on I-69. The DMS will provide traveler information for motorists in the I-69 ATMS deployment area and Phase 4 and 2 deployment areas, as well as before the I-465 decision point.
    Note: Additional DMSs are likely in the proposed I-69 corridor between Evansville and Indianapolis; decisions can be made after the completion of the Tier 2 Environmental studies currently underway. Estimated cost: **$190,000.**

DMS Priority 4 total: $760,000

7.4.5. Evansville DMSs

As stated in Chapter 2, the focus of INDOT's ITS investment will be on the Interstate System and other freeways due to the significant proportion and composition of traffic on the System coupled with the limited ability to divert in case of incidents on an Interstate or any other freeway. The majority of the facilities in the Evansville area within the Areas of Influence of the 12 existing Dynamic Message Signs are not full access control highways (freeways). As such, an incident on these roads can be avoided by diverting at any at-grade intersection. Furthermore, incident notification in the Evansville area relies on human, generally non-INDOT personnel, interaction with the Indianapolis Traffic Management Center (TMC); notification can be inconsistent.

While the 3.8 mile, full access control portion of the SR 62/66 Lloyd Expressway in Evansville currently operates at LOS C, it is not an integral part of the *interstate* nature of travel that takes place on the Interstate System, nor is it connected to any other large-scale proposed CCTV camera deployments. No other segments of freeway in the Evansville area are currently operating at LOS C or worse. Therefore, **CCTV deployment is not recommended for the Evansville area at this time, which also precludes the installation of any additional DMSs in the Evansville area.** The possibility does exist for some CCTV and corresponding DMS deployment in the future in Evansville, dependent upon the findings of the Tier 2 Environmental studies currently being conducted for the proposed I-69 corridor between Evansville and Indianapolis.

The 12 Dynamic Message Signs in the Evansville area still have functional life remaining. However, some are redundant in nature or located on routes that are either low-volume or placed in advance of a non-freeway that is not a part of the National Highway System (NHS) (I-164, US 41, and the SR 62/66 Lloyd Expressway are on the NHS). Four DMSs meet these criteria and are recommended for removal; the devices can be used for parts for the eight remaining 16-character Vultron DMSs which are unique in the INDOT statewide deployment of DMSs. The **four DMSs recommended for removal are as follows:**

- **DMS #5, WB SR 62, Mile 34.4 (east of I-164):** Placed in advance of Morgan Avenue, a non-freeway / non-NHS route; moderately low-volume facility (2004 AADT of 15,540 at the DMS location).
- **DMS #6, EB SR 66, Mile 20.8 (west of Evansville):** Placed in advance of Diamond Avenue, a non-freeway / non-NHS route; low-volume facility (2004 AADT of 11,970 at the DMS location).
- **DMS #9, WB SR 66, Mile 31.4 (west of I-164):** Redundant and duplicative of a DMS located only 1.8 miles upstream WB SR 66 at Mile 33.2, east of I-164.
- **DMS #12, SB SR 57, Mile 11.5 (north of I-64):** Somewhat redundant and duplicative of a downstream DMS on SB I-164 at Mile 13.3; low-volume facility (2004 AADT of 10, 250 at the DMS location).

7.4.6. Kokomo DMSs

As stated in Chapter 2 and above, the focus of INDOT's ITS investment will be on the Interstate System and other freeways due to the significant proportion and composition of traffic on the System coupled with the limited ability to divert in case of incidents on an Interstate or any other freeway. US 31 in Kokomo is not a full access control freeway, but is does currently feature two DMSs oriented towards traffic entering Kokomo. As such, an incident on US 31 can be avoided by diverting at any at-grade intersection. Furthermore, incident notification in the Kokomo area relies on human, generally non-INDOT personnel, interaction with the Indianapolis Traffic Management Center (TMC); notification can be inconsistent. Seven CCTV cameras are scheduled to be installed in 2005 on US 31 in the Kokomo area to supplement the human notification which currently takes place.

The two Kokomo DMSs also have functional life remaining and **should remain in service at this time**. Their functionality is enhanced by the CCTV camera coverage that is scheduled for implementation in 2005 from SR 26 to Morgan Avenue. Ultimately, the proposed relocation of US 31 as a freeway will result in the "state traffic" or long-distance, through trips moving to the relocated US 31. **When US 31 is relocated, the DMSs** will no longer be of great value to INDOT and **should be removed**, as the existing US 31 should be relinquished to local jurisdictions.

Total DMS (48 new, 9 refurbished) ESTIMATED COST = $10,290,000

7.5. STATIC / DYNAMIC TRAVEL TIME SIGNS (TTS)

Upon the completion of the Advanced Traffic Management Systems (ATMS) in Northwest Indiana (essentially complete) and in Indianapolis, algorithms can be developed using the vehicle detection to automatically estimate travel times to specific locations, such as major downstream interchanges or a State Line, and provide this information to the public by way of Dynamic Message Signs (DMS).

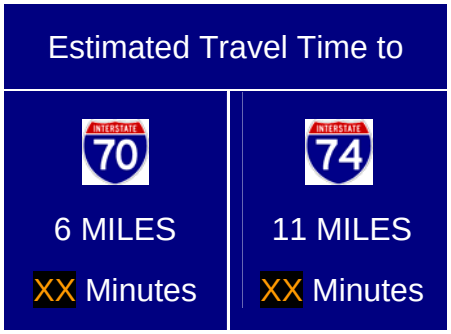
Nationally, some jurisdictions have used standard DMSs to convey travel time information; others use a static panel sign that has a small electronic, dynamic insert component. As INDOT has adopted the preference of leaving DMSs blank if no incidents are reported (so as to not desensitize the motoring public with a constant 24 hour per day message on a DMS), it would be desirable to implement this latter approach and save the DMSs for incidents which require an action to be taken by motorists (lane(s) closed due to crashes or maintenance, slow traffic affecting all lanes, etc.). Furthermore, the Static / Dynamic Travel Time Sign can supplement the incident information provided on the standard Overhead or Portable DMS.

These static panel with dynamic insert Travel Time Signs would provide the motorist with static shield or text referring to a downstream interchange or specific location, **accompanied by static distance to that interchange or specific location** to assist unfamiliar, non-commuter motorists, and a dynamic insert that changes according to the automated travel time data.

An example from New York State is presented below on the left. Please note that this sign does not feature the **distance to the interchange**; this **should be added as shown on the proposed Indiana Travel Time sign below on the right to assist the unfamiliar motorist.** Commuters or familiar motorists will know from previous experience the normal, free-flow time to reach a specific destination; an unfamiliar motorist can use the distance information and simple math…for example, a destination five miles away should be reached in approximately five minutes under free-flow conditions. Furthermore, the sign used in Indiana should **have a maximum of <u>two</u> destinations** to compensate for the extra mileage information provided to motorists. These examples may be found in color at the end of this chapter.

New York State Example

Proposed Indiana Example



Just as with all ITS information presented to the public, accuracy of the travel time information is absolutely essential to maintain credibility. Deployment of these Static / Dynamic Travel Time Signs should not take place until the algorithms developed to estimate the travel times are accurate and reliable.

The priorities for Static / Dynamic Travel Time Signs are based on the following criteria:

1) Sign is within or immediately upstream from the deployment area of an existing or proposed full **ATMS with vehicle detection generally every ½ mile**
2) ATMS vehicle detection produces accurate and reliable travel time algorithms (presumed to be devices that are in service and well calibrated)
3) Current (2004) Interstate or Freeway Level of Service (LOS) (a function of traffic and number of lanes)

In most locations, these Travel Time Signs may be placed on an overhead balanced cantilever ("butterfly") on the median barrier wall (similar to Interchange Sequence Signs) if a full-width inside shoulder is available to provide a safe parking location for service / repair purposes. If a full-width inside shoulder is not available, the Travel Time Sign may be placed on a box truss, preferably with another panel sign for an upcoming or adjacent exit that is currently on an overhead sign structure to better utilize a box truss and reduce the number of overhead box trusses. The recommended locations have not been field checked to verify nearby signage, power, or ideal sight lines. More detailed analysis will be required to determine optimum locations for the TTSs.

The **estimated cost** for deployment is **$50,000 each** ($65,000 for the special Northwest Indiana TTS) **on a new overhead balanced cantilever ("butterfly")** and **$100,000 each** ($115,000 for the special Northwest Indiana TTS) **on a new box truss.** A TTS on an existing box truss is estimated at $40,000 each.

7.5.1. TRAVEL TIME SIGN (TTS) PRIORITY 1 (Northwest Indiana ATMS)

Two new TTSs as follows:

1. **WB I-80/94 (Borman Expwy), near Mile 7.9 (Chase St) (Lake County)**
   Install TTS in 2008 after the completion of the upcoming Added Travel Lanes project on I-80/94 from I-294 / Illinois Route 394 to the west ramps at US 41 / Calumet Avenue (Des # 0100987 for the Indiana segment) and after developing / calibrating the algorithms needed to support the TTS in 2007. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: State Line 8 miles, I-294 11 miles. Sign will require data from Illinois sensors on WB I-80/94 (Kingery Expwy) in Illinois. Estimated cost: **$50,000.**

2. **WB I-80/94 (Borman Expwy), near Mile 2.6 (US 41 / SR 152 / Indianapolis Blvd WB off-ramp) (Lake County)**
   Install TTS in 2008 after the completion of the upcoming Added Travel Lanes project on I-80/94 from I-294 / Illinois Route 394 to the west ramps at US 41 / Calumet Avenue (Des # 0100987 for the Indiana segment) and after developing / calibrating the algorithms needed to support the TTS in 2007. TTS may be located on an existing box truss. Downstream destination: I-294 5 miles. Sign will require data from Illinois sensors on WB I-80/94 (Kingery Expwy) in Illinois. Estimated cost: **$40,000.**

TTS Priority 1 total: $90,000

7.5.2. TRAVEL TIME SIGN (TTS) PRIORITY 2 (Indianapolis ATMS – Phases 3 & 4 and I-70 East Pavement Replacement)

Twelve new TTSs as follows:

3. **SB I-69, near Mile 5.0 (116th St) (Hamilton County)**
   Install TTS in 2009 after the completion of Phase 3 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destination: I-465 5 miles. Estimated cost: **$50,000.**

4. **NB I-465 (East Leg), near Mile 47.0 (CSX RR) (Marion County)**
   Install TTS in 2009 after the completion of Phases 3 and 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 3 miles, I-69 10 miles. Estimated cost: **$50,000.**

5. **SB I-465 (East Leg), near Mile 45.0 (10th St) (Marion County)**
   Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-74 4 miles, I-65 8 miles. Estimated cost: **$50,000.**

6. **WB I-465 (South Leg), near Mile 50.2 (CSX RR) (Marion County)**
   Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 3 miles, SR 37 7 miles (in anticipation of future I-69). Estimated cost: **$50,000.**

7. **EB I-465 (South Leg), near Mile 52.3 (9th Ave) (Marion County)**
   Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-74 3 miles, I-70 8 miles. Estimated cost: **$50,000.**

8. **EB I-465 (South Leg), near Mile 3.2 (east of Bluff Rd) (Marion County)**
   Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 3 miles, I-74 7 miles. Estimated cost: **$50,000.**

9. **EB I-465 (South Leg), near Mile 7.4 (Mann Rd) (Marion County)**
   Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: SR 37 3 miles (in anticipation of future I-69), I-65 7 miles. Estimated cost: **$50,000.**

10. **NB I-65, near Mile 100.0 (south of County Line Rd) (Johnson County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-465 6 miles, I-70 10 miles. Estimated cost: **$50,000.**

11. **SB I-65, near Mile 110.0 (south of the I-70 South Split) (Marion County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-465 4 miles, Greenwood 10 miles. Estimated cost: **$50,000.**

12. **WB I-70, near Mile 88.1 (CSX RR) (Marion County)**
    Install TTS in 2009 after the completion of the I-70 Pavement Replacement projects from the I-65 North Split to I-465 (East Leg) (Des # 0400394, 0400398, and 0401174) and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 5 miles, I-465 15 miles. Estimated cost: **$50,000.**

13. **EB I-70, near Mile 83.8 (Commerce Ave) (Marion County)**
    Install TTS in 2009 after the completion of the I-70 Pavement Replacement projects from the I-65 North Split to I-465 (East Leg) (Des # 0400394, 0400398, and 0401174) and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destination: I-465 5 miles. Estimated cost: **$50,000.**

14. **EB I-70, near Mile 73.6 (west of Lynhurst Dr) (Marion County)**
    Install TTS in 2009 after the completion of the I-70 Pavement Replacement projects from the I-65 North Split to I-465 (East Leg) (Des # 0400394, 0400398, and 0401174) and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 7 miles, I-465 15 miles. Estimated cost: **$50,000.**

TTS Priority 2 total: $600,000

7.5.3. TRAVEL TIME SIGN (TTS) PRIORITY 3 (Indianapolis ATMS – Phase 5)

Six new TTSs as follows:

15. **EB I-465 (North Leg), near Mile 25.6 (96th St) (Hamilton County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: US 31 5 miles, I-69 11 miles. Estimated cost: **$50,000.**

16. **WB I-465 (North Leg), near Mile 30.0 (west of Spring Mill Rd) (Hamilton County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-865 5 miles, I-65 S 10 miles. Estimated cost: **$50,000.**

17. **NB I-465 (West Leg), near Mile 20.3 (north of Lafayette Rd) (Marion County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-865 4 miles, US 31 10 miles. Estimated cost: **$50,000.**

18. **NB I-65, near Mile 107.2 (Keystone Ave) (Marion County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 3 miles, I-465 16 miles. Estimated cost: **$50,000.**

19. **SB I-65, near Mile 122.0 (56th St) (Marion County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 10 miles, I-465 16 miles. Estimated cost: **$50,000.**

20. **NB I-65, near Mile 114.4 (Fall Creek Pkwy) (Marion County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on a new box truss with the existing 29th Street / 30th Street exit sign that is currently located on a double mast arm cantilever on the right. Downstream destination: I-465 8 miles. Estimated cost: **$100,000.**

TTS Priority 3 total: $350,000

7.5.4. TRAVEL TIME SIGN (TTS) PRIORITY 4 (Northwest Indiana ATMS)

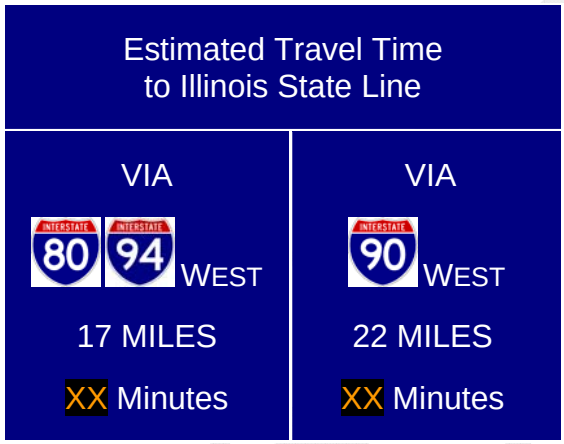
Five new TTSs as follows:

21. **EB I-80/94 (Borman Expwy), near Mile 0.1 (Hohman Ave) (Lake County)**
Install TTS in 2011 after the completion of upcoming Interchange Modification / Added Travel Lanes projects on I-80/94 at I-65, US 6 / SR 51 (Ripley Street), and I-90 (Indiana Toll Road) (Des # 0065300, 9700410, and 0065700, respectively) and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on a new box truss with the US 41 / Calumet Avenue exit sign that is currently located on a double mast arm cantilever on the right. Downstream destinations: SR 912 5 miles, I-65 S 11 miles. Estimated cost: **$100,000.**

22. **EB I-80/94 (Borman Expwy), near Mile 7.9 (Chase St) (Lake County)**
Install TTS in 2011 after the completion of upcoming Interchange Modification / Added Travel Lanes projects on I-80/94 at I-65, US 6 / SR 51 (Ripley Street), and I-90 (Indiana Toll Road) (Des # 0065300, 9700410, and 0065700, respectively) and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on a new box truss with the Grant Street exit sign that is currently located on a double mast arm cantilever on the right. Downstream destinations: I-65 S 3 miles, I-90 8 miles. Estimated cost: **$100,000.**

23. **WB I-80/94 (Borman Expwy), near Mile 13.1 (east of Clay St) (Lake County)**
Install TTS in 2011 after the completion of the upcoming Interchange Modification / Added Travel Lanes project on I-80/94 at I-65 (Des # 0065300) and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on a new box truss with the I-65 exit sign that is currently located on a double mast arm cantilever on the right. Downstream destinations: SR 912 8 miles, State Line 13 miles. Estimated cost: **$100,000.**

The following two proposed Travel Time Signs are unique in that they provide estimated travel times to a common downstream destination (the Illinois State Line) via two different routes: I-80/94 (Borman Expressway) and I-90 (Indiana Toll Road). These signs will require data from the Indiana Toll Road to be integrated into the Borman Traffic Management Center. The following is an example of the proposed general sign layout (although the cardinal direction "WEST" would be positioned higher to the right of the shields) for the proposed WB I-94 Travel Time Sign at Mile 17.0. This example may be found in color at the end of this chapter.



24. **WB I-94, near Mile 17.0 (east of US 20 / CSX RR) (Porter County)**
Install TTS in 2011 after the completion of upcoming Interchange Modification / Added Travel Lanes projects on I-80/94 at I-65, US 6 / SR 51 (Ripley Street), and I-90 (Indiana Toll Road) (Des # 0065300, 9700410, and 0065700, respectively), after deployment of vehicle detection / electronic toll collection devices on the Indiana Toll Road west of I-80/94, and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destination: Illinois State Line via I-80/94 17 miles, via I-90 22 miles. Estimated cost: **$65,000.**

25. **NB I-65, near Mile 257.1 (north of 49th Ave) (Lake County)**
Install TTS in 2011 after the completion of upcoming Interchange Modification / Added Travel Lanes projects on I-80/94 at I-65 (Des # 0065300), after deployment of vehicle detection / electronic toll collection devices on the Indiana Toll Road west of I-65, and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on a new box truss with the Ridge Road exit sign that is currently located on a double mast arm cantilever on the right. Downstream destination: Illinois State Line via I-80/94 14 miles, via I-90 22 miles. Estimated cost: **$115,000.**

TTS Priority 4 total: $480,000

7.5.5. TRAVEL TIME SIGN (TTS) PRIORITY 5 (Indianapolis ATMS – I-465 West Leg)

Four new TTSs as follows:

26. **WB I-465 (South Leg), near Mile 0.7 (Keystone Ave) (Marion County)**
    Install TTS in 2013 after the completion of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) and after developing / calibrating the algorithms needed to support the TTS in 2012. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: SR 37 3 miles (in anticipation of future I-69), I-70 8 miles. Estimated cost: **$50,000.**

27. **WB I-465 (South Leg), near Mile 6.2 (White River) (Marion County)**
    Install TTS in 2013 after the completion of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) and after developing / calibrating the algorithms needed to support the TTS in 2012. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 3 miles, I-74 10 miles. Estimated cost: **$50,000.**

28. **SB I-465 (West Leg), near Mile 14.6 (Abandoned RR) (Marion County)**
    Install TTS in 2013 after the completion of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) and after developing / calibrating the algorithms needed to support the TTS in 2012. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 5 miles, SR 37 10 miles (in anticipation of future I-69). Estimated cost: **$50,000.**

29. **WB I-70, near Mile 79.0 (west end of White River bridge) (Marion County)**
    Install TTS in 2013 after the completion of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) and after developing / calibrating the algorithms needed to support the TTS in 2012. TTS may be located on a new box truss with the existing Harding Street exit sign that is currently located on a double mast arm cantilever on the right. Downstream destination: I-465 6 miles, Airport 9 miles (new access point). Estimated cost: **$100,000.**

TTS Priority 5 total: $250,000

7.5.6. TRAVEL TIME SIGN (TTS) PRIORITY 6 (Indianapolis ATMS – I-465 North and East Legs, I-465 West Leg @ 56th St / I-65)

Eight new TTSs as follows:

30. **SB I-465 (East Leg), near Mile 37.8 (71st St) (Marion County)**
    Install TTS in 2015 after the completion of the Added Travel Lanes project (Des # 0400283) from 0.5 mile west of I-69 to Fall Creek and after developing / calibrating the algorithms needed to support the TTS in 2014. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 6 miles, I-74 11 miles. Estimated cost: **$50,000.**

31. **NB I-465 (East Leg), near Mile 42.4 (south of 38th St) (Marion County)**
    Install TTS in 2016 after the completion of the Added Travel Lanes projects (Des #s 0400304, 0400289, 0400286, and 0400283) from 0.35 mile east of US 31 to Fall Creek and after developing / calibrating the algorithms needed to support the TTS in 2015. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-69 5 miles, US 31 11 miles. Estimated cost: **$50,000.**

32. **WB I-465 (North Leg), near Mile 35.8 (82nd St) (Marion County)**
    Install TTS in 2016 after the completion of the Added Travel Lanes projects (Des #s 0400304, 0400289, 0400286, and 0400283) from 0.35 mile east of US 31 to Fall Creek and after developing / calibrating the algorithms needed to support the TTS in 2015. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: US 31 5 miles, I-865 11 miles. Estimated cost: **$50,000.**

33. **EB I-465 (North Leg), near Mile 31.9 (east of College Ave) (Hamilton County)**
    Install TTS in 2016 after the completion of the Added Travel Lanes projects (Des #s 0400304, 0400289, 0400286, and 0400283) from 0.35 mile east of US 31 to Fall Creek and after developing / calibrating the algorithms needed to support the TTS in 2015. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-69 5 miles, I-70 12 miles. Estimated cost: **$50,000.**

34. **NB I-465 (West Leg), near Mile 11.0 (N of Airport Expwy) (Marion County)**
    Install TTS in 2017 after the completion of the I-465 Added Travel Lanes project from 0.5 mile north of 46th Street to 0.3 mile north of I-65 (Des # 0200003) and after developing / calibrating the algorithms needed to support the TTS in 2016. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-74 5 miles, I-65 9 miles. Estimated cost: **$50,000.**

35. **SB I-465 (West Leg), near Mile 23.8 (north of 86th St) (Marion County)**
Install TTS in 2017 after the completion of the I-465 Added Travel Lanes project from 0.5 mile north of 46th Street to 0.3 mile north of I-65 (Des # 0200003) and after developing / calibrating the algorithms needed to support the TTS in 2016. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 S 4 miles, I-74 8 miles. Estimated cost: **$50,000.**

36. **SB I-465 (West Leg), near Mile 19.2 (56th St) (Marion County)**
Install TTS in 2017 after the completion of the I-465 Added Travel Lanes project from 0.5 mile north of 46th Street to 0.3 mile north of I-65 (Des # 0200003) and after developing / calibrating the algorithms needed to support the TTS in 2016. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-74 3 miles, I-70 10 miles. Estimated cost: **$50,000.**

37. **NB I-465 (West Leg), near Mile 16.6 (34th St) (Marion County)**
Install TTS in 2017 after the completion of the I-465 Added Travel Lanes project from 0.5 mile north of 46th Street to 0.3 mile north of I-65 (Des # 0200003) and after developing / calibrating the algorithms needed to support the TTS in 2016. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 3 miles, I-865 8 miles. Estimated cost: **$50,000.**

TTS Priority 6 total: $400,000

7.5.7. TRAVEL TIME SIGN (TTS) PRIORITY 7 (Indianapolis ATMS – US 31 Freeway Upgrade and I-69 South)

Two new TTSs as follows:

38. **SB US 31 (Freeway), near Mile 135.0 (south of SR 38) (Hamilton County)**
Install TTS in 2021 after the completion of the US 31 Freeway Upgrade from I-465 (North Leg) to SR 38 (Des # 0300814) and after developing / calibrating the algorithms needed to support the TTS in 2020. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: SR 431 6 miles, I-465 11 miles. Estimated cost: **$50,000.**

39. **NB I-69, near Smith Valley Rd (Johnson County)**
Install TTS in 2022 after the completion of I-69 from SR 144 to I-465 (South Leg) and after developing / calibrating the algorithms needed to support the TTS in 2021. TTS location is dependent upon the southern beginning of ½ mile vehicle detection (currently proposed to begin at Smith Valley Road) and may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destination: I-465. Estimated cost: **$50,000.**

TTS Priority 7 total: $100,000

Total TTS (39) ESTIMATED COST = $2,270,000

7.6. HOOSIER HELPER FREEWAY SERVICE PATROL (FSP)

The Hoosier Helper Freeway Service Patrol (FSP) serves approximately 130 miles of Indiana's busiest freeways, helping stranded motorists, removing debris from the road, or summoning help quickly in case of a crash, vehicle fire, or other emergency. They can change a tire, supply enough fuel to get a motorist to a service station, perhaps fix a minor mechanical problem, and summon help for the problems they can't solve. The Hoosier Helpers do more than provide an extra measure of security and safety for motorists. They also keep traffic moving, and that makes them a key element in an Advanced Traffic Management Systems (ATMS) deployment.

In Northwest Indiana, on-board computers give the Hoosier Helpers direct access to the Traffic Management Center, enabling them to give travelers immediate information about traffic conditions. They can post advisories on the Dynamic Message Signs, issue alerts via the Highway Advisory Radio system, and send out notices via personal pagers.

INDOT currently has four Hoosier Helper FSP programs statewide. The first program began in Northwest Indiana on I-80/94 (the Borman Expressway) in August 1991 as a daytime program that expanded to 24 hour / 7 days a week service in May 1996. The current 34 mile patrol area in Northwest Indiana includes the Borman Expressway from the Illinois State Line to SR 249 and I-65 from US 231 to US 12/20, just north of the interchange with I-90, the Indiana Toll Road. The coverage on the Borman actually extends 1.5 miles into Illinois on I-80/94 (the Kingery Expressway) to Illinois Route 83 (Torrence Avenue), a logical and safe turnaround that assures complete coverage in Indiana on I-80/94. These 1.5 miles are not included in the 34 mile figure above.

The second Hoosier Helper deployment began in August 1997 in the Indianapolis area and operates during peak travel periods, specifically, weekdays from 5:30 a.m. to 7:30 p.m. and special events. Service is currently provided on 64 miles of Indianapolis area freeways: on I-65 from Southport Road to the I-70 North Split; I-69 from I-465 to 96th Street, I-70 from Harding Street to Post Road; and I-465 from US 31 on the North Leg, clockwise on the East and South Legs, to 56th Street on the West Leg.

The third Hoosier Helper deployment began serving the Indiana portion of metropolitan Louisville in May 1999 and operates weekdays and special events from 5:00 a.m. to 7:30 p.m. in the Falls City area in Southern Indiana. Service is currently provided on 30 miles of freeway in this area: on I-64 from the Lanesville interchange (Exit 113) to the Ohio River (Kentucky State Line); I-65 from the Ohio River to SR 311; I-265 from I-64 to I-65; and SR 265 from I-65 to SR 62. Hoosier Helpers do cross the Ohio River into Kentucky to turn around to assure complete coverage in Indiana on I-64 and I-65.

The fourth program is in its infancy in the Fort Wayne area, having just begun in September 2004 after implementing some limited Hoosier Helper service with regular INDOT (non-Hoosier Helper van) vehicles earlier in 2004. This program covers I-69 from the south junction with I-469 to SR 1 / Dupont Road from 2:00 p.m. to 10:00 p.m., with occasional trips made on I-469.

7.6.1. Proposed Expansions of the Hoosier Helper FSP

The Hoosier Helper Freeway Service Patrol historically has been a function of INDOT's Districts in which they operate and as such is more operations-oriented versus the capital improvement/fixed device-orientation of the majority of this document. Routes and hours of the day in service are based upon need, and more significantly, availability of personnel to fill the need, a variable that is difficult to predict. Therefore, no specific implementation years are identified nor are cost estimates developed. Nevertheless, guidance is provided to assure a reasonably uniform Hoosier Helper FSP deployment on a statewide basis. The Hoosier Helper FSP may be expanded to areas that meet at least three of the following criteria:

1) Segment is within the deployment area of an existing or proposed full **ATMS**
2) Segment is a full access control facility (**freeway**)
3) Segment currently has an **AADT greater than 75,000**
4) Segment is currently operating at or is contiguous to segments operating at **LOS D or worse**
5) Segment needs to be served for **system continuity** / patrol routing purposes

The following segments of freeway are not currently served by the Hoosier Helper FSP but meet at least three of the above criteria and are recommended for implementation:

- **I-65 from CR 500N (Whiteland Rd) (Exit 95) to Main St (Greenwood Rd) (Exit 99)** (ATMS, freeway, LOS D or worse)
- **I-65 from Main St (Greenwood Rd) (Exit 99) to Southport Rd (Exit 103)** (ATMS, freeway, AADT 75,000+, contiguous to LOS D or worse)
- **I-65 from the I-70 North Split (Exit 112) to 38th St (Exit 119)** (ATMS, freeway, AADT 75,000+, LOS D or worse)
- **I-65 from 38th St (Exit 119) to Lafayette Rd (Exit 121)** (ATMS, freeway, contiguous to LOS D or worse)
- **I-65 from Lafayette Rd (Exit 121) to 71st St (Exit 124)** (ATMS, freeway, system continuity)
- **I-65 from 71st St (Exit 124) to I-865 (Exit 129)** (ATMS, freeway, contiguous to LOS D or worse)
- **I-65 from I-865 (Exit 129) to SR 267 (Exit 133)** (ATMS, freeway, LOS D or worse)

- **I-69 from 96th St (Exit 3) to SR 37 / 116th St (Exit 5)** (ATMS, freeway, AADT 75,000+, LOS D or worse)
- **I-69 from SR 37 / 116th St (Exit 5) to SR 238 (Exit 10)** (ATMS, freeway, LOS D or worse)

- **I-70 from Airport Expwy (Exit 75) to Holt Rd (Exit 77)** (ATMS, freeway, AADT 75,000+, contiguous to LOS D or worse)
- **I-70 from Holt Rd (Exit 77) to Harding St (Exit 78)** (ATMS, freeway, AADT 75,000+, LOS D or worse)
- **I-70 from Post Rd (Exit 91) to Mt. Comfort Road (Exit 96)** (ATMS, freeway, LOS D or worse)

- **I-465 from 56th St (West Leg) (Exit 19) to US 31 (North Leg) (Exit 31)** (ATMS, freeway, AADT 75,000+, LOS D or worse)

It should be noted that while I-70 from SR 267 to the Airport Expressway does not meet three of the criteria at this time, it is very likely that it will in the near future (especially the segments from SR 267 to I-465 (West Leg)) due to high growth in the area and the completion of the new Midfield Terminal at Indianapolis International Airport in 2008. Therefore, it should be considered for deployment of the Hoosier Helper FSP.

7.6.2. Eligible Segments Not Recommended for Hoosier Helper FSP

The following segments of freeway are not currently served by the Hoosier Helper FSP and meet at least three of the above criteria, **but only on Friday and Sunday in summer.** As such, they are not recommended for Hoosier Helper FSP deployment; however a Hoosier Helper can respond for a confirmed incident:

- **I-94 from SR 249 (Exit 19) to US 20 (Exit 22)** (ATMS, freeway, AADT 75,000+ (Friday and Sunday in Summer only), LOS D or worse (Friday and Sunday in Summer only)

- **I-94 from US 20 (Exit 22) to SR 49 (Exit 26)** (ATMS, freeway, contiguous to LOS D or worse (Friday and Sunday in Summer only)

The following segment of freeway is not currently served by the Hoosier Helper FSP but meets at least three of the above criteria. However, it is a **short segment (approximately one mile)** and as such, it is not logical to deploy the Hoosier Helper FSP on one mile of roadway; however a Hoosier Helper can respond for a confirmed incident.

- **SR 912 from 15th Avenue / 169th Street to I-80/94** (ATMS, freeway, LOS D)

7.6.3. Proposed Reductions of the Hoosier Helper FSP

The following segment of freeway is currently served by the Hoosier Helper FSP but does not meet at least three of the criteria in Section 7.6.1:

- **I-64 from the Lanesville interchange (Exit 113) to SR 62/64 (Exit 118)**

This segment only meets one of the criteria: it is a full access control facility (freeway). It is not within the deployment area of an existing or proposed full ATMS, has an AADT of only 31,290, is operating at LOS B and contiguous to a LOS C segment, and does not need to be served for system continuity (turnaround can take place at the SR 62/64 diamond interchange at Mile 118).

7.7. REFERENCE MARKERS (1/10, 2/10, & 1/2 MILE REFERENCE MARKERS)

The *2003 Manual on Uniform Traffic Control Devices* (MUTCD) identifies four types of Reference Markers. Reference Markers are placed on freeways to provide a means for identifying the location of incidents and crashes, assist road users in estimating their location and progress, and aid in highway maintenance. The first and most basic Reference Markers are Reference Location Signs (Mile Marker signs), which indicate a whole number reference for the location. These signs are already in place on Indiana Interstates. The next level of Reference Markers are **Intermediate Reference Location Signs** (below at left), which augment the Reference Location Signs by also showing the tenth of a mile with a decimal point. **Intermediate Reference Location Signs at ½ mile intervals** (including a ".0" at the whole number mile location signs, per the MUTCD) **are recommended for all Interstates outside of urban areas** with Intermediate Enhanced Reference Location Signs (see next paragraph). The Intermediate Reference Location Signs will enhance the ability to locate incidents, which becomes more critical as Closed Circuit Television (CCTV) Cameras and Dynamic Message Signs (DMS) are deployed on the higher volume Rural Interstates in Indiana, as well as provide more frequent location identification to assist road users in estimating their location and progress in rural, isolated segments of Interstate.

Intermediate Enhanced Reference Location Signs (below at right), the most detailed level of Reference Markers, indicate cardinal direction, the route, and location to the tenth of a mile with a decimal point, an augmentation of the Enhanced Reference Location Signs, which indicate cardinal direction, the route, and location by whole number only. Color examples of the two signs below may be found at the end of this chapter.

Intermediate Reference Location Sign

Intermediate Enhanced Reference Location Sign

Intermediate Enhanced Reference Location Signs, initially installed in 1998 (and approaching the end of their service life) in Indianapolis, Northwest Indiana, Southern Indiana near Louisville, Evansville, Fort Wayne, and Kokomo, are located every 2/10 of a mile in the median of Interstates (every 1/10 of a mile along the Borman Expressway (I-80/94), as well as portions of I-90 (Indiana Toll Road) and I-94 in Northwest Indiana). The 2/10 Mile Reference Markers are also placed on US 41 and some State Roads in the Evansville area and on US 31 in the Kokomo area.

The existing signs display the direction of travel, a route shield indicating the highway the motorist is traveling, and the Mile Marker location on the highway (to 2/10 or 1/10 of a mile). At interchanges, Ramp Reference Markers are positioned along the ramps indicating which ramp a motorist is traveling within an interchange. These signs provide motorists with better location information and improved roadside assistance. Incident response teams are able to more quickly arrive on the scene of crashes, clearing debris and improving traffic flow. In an emergency, these signs serve the same purpose as the "street address" on other roads, aiding motorists and emergency response vehicles in identifying their location or destination on the highway system. The Intermediate Enhanced Reference Location Signs also serve as a key component in the messages displayed on Dynamic Message Signs and broadcasts heard on the Highway Advisory Radio stations. Information regarding location of an incident or heavy traffic is shown / broadcast based on a highway's Mile Marker location (to the tenth of a mile).

The priorities for deploying **additional** Intermediate Enhanced Reference Location Signs (1/10 or 2/10 Mile Reference Markers) are based on the following criteria:

1) Current Hoosier Helper Freeway Service Patrol area route without Intermediate Enhanced Reference Location Signs
2) Implementation of Full ATMS (Temporary or Permanent) on segment

To improve Reference Marker sign visibility and freeway location identification for motorists, Hoosier Helper Freeway Service Patrol personnel, and TMC personnel, the **Intermediate Enhanced Reference Location Signs with 1/10th mile spacing (1/10 Mile Reference Markers) should be deployed on segments of freeway five miles in length or greater with a current (2004) AADT of 75,000 or greater.**

The **estimated cost** for deployment of Intermediate Enhanced Reference Location Signs with 1/10th mile spacing (1/10 Mile Reference Markers) is **$4,000 per mile.** The **estimated cost** for deployment of Intermediate Enhanced Reference Location Signs with 2/10th mile spacing (2/10 Mile Reference Markers) is **$2,000 per mile**, except where currently programmed. The **deployment of Intermediate Reference Location Signs at ½ mile intervals** (with a ".0" at the whole number mile locations and ".5" placed at ½ mile locations) **on all Interstates outside of urban areas with Intermediate Enhanced Reference Location Signs should occur as part of sign replacement projects or during reconstruction projects** and thus is not prioritized. The **estimated cost** for deployment of Intermediate Reference Location Signs at ½ mile intervals (including replacing the existing one mile signs) is **$800 per mile.**

7.7.1. REFERENCE MARKER PRIORITY 1 (Current Hoosier Helper FSP Routes without Intermediate Enhanced Reference Location Signs)

1. **I-469 from I-69 (S jct) (Mile 0) to I-69 (N jct) (Mile 31) (Allen County)**
   Install 2/10 Mile Reference Markers in 2006. The 31 miles of I-469 are currently served occasionally by the I-69 Hoosier Helper route. The project to install these 2/10 Mile Reference Markers is programmed (Des # 0401317) and also includes Emergency Detour signage for I-69 and I-469 in Allen County. Estimated cost: **$150,000.**

Reference Marker Priority 1 total: $150,000

7.7.2. REFERENCE MARKER PRIORITY 2 (Intermediate Enhanced Reference Location Sign (1/10 and 2/10 Mile Reference Marker) Additions to Full ATMS Areas)

2. **I-70 from I-65 (North Split) (Mile 83) to I-465 (East Leg) (Mile 90) (Marion County)**
   Install 1/10 Mile Reference Markers in 2007 on this seven mile segment of I-70 as part of the I-70 Pavement Replacement project (Des #s 0400394, 0400398, and 0401174). AADT is 116,700 – 170,590. This deployment replaces the existing 2/10 Mile Reference Markers on this segment. Estimated cost: **$28,000.**

3. **I-69 from just north of SR 37 / 116th St (Mile 6) to SR 238 (Mile 10) (Hamilton County)**
   Install 2/10 Mile Reference Markers in 2008 on this four mile segment of I-69 to support the Phase 3 ATMS deployment in 2007. Estimated cost: **$8,000.**

   I-70 from east of Post Rd (Mile 93) to Mt. Comfort Rd (Mile 96) (Marion and Hancock Counties)
   Install 2/10 Mile Reference Markers in 2008 on this three mile segment of I-70 to support the Phase 3 ATMS deployment in 2007. Estimated cost: **$6,000.**

   I-65 from CR 500N (Whiteland Rd) (Mile 95) to Main St (Greenwood Rd) (Mile 99) (Johnson County)
   Install 2/10 Mile Reference Markers in 2008 on this four mile segment of I-65 to support the Phase 4 ATMS deployment in 2007. Estimated cost: **$8,000.**

   I-65 from Main St (Greenwood Rd) (Mile 99) to 38th St / Kessler Blvd (Mile 119) (Johnson and Marion Counties)
   Install 1/10 Mile Reference Markers in 2008 on this 20 mile segment of I-65 to support the Phase 4 ATMS deployment in 2007. AADT is 75,220 – 153,870. This deployment replaces the existing 2/10 Mile Reference Markers from Mile 102 to Mile 119. Estimated cost: **$80,000.**

   I-65 from 38th St / Kessler Blvd (Mile 119) to SR 267 (Mile 133) (Marion, Hendricks, and Boone Counties)
   Install 2/10 Mile Reference Markers in 2008 on this 14 mile segment of I-65 to support the Phase 5 ATMS deployment in 2008. This deployment replaces the existing 2/10 Mile Reference Markers from Mile 119 to Mile 132. Estimated cost: **$28,000.**

   I-74 from SR 267 (Mile 66) to I-465 (West Leg) (Mile 73) (Hendricks and Marion Counties)
   Install 2/10 Mile Reference Markers in 2008 on this seven mile segment of I-74 to support the Phase 5 ATMS deployment in 2008. This deployment replaces the existing 2/10 Mile Reference Markers near Mile 73. Estimated cost: **$14,000.**

I-69 from I-465 (Mile 0) to just north of SR 37 /116th St (Mile 6) (Marion and Hamilton Counties)
Install 1/10 Mile Reference Markers in 2008 on this six mile segment of I-69. AADT is 87,820 – 123,670. This deployment replaces the existing 2/10 Mile Reference Markers on this segment. Estimated cost: **$24,000.**

I-465 from I-65 (South Leg) (Mile 0) to east of SR 67 / Kentucky Ave (West Leg) (Mile 8) (Marion County)
I-465 from south of 56th St (West Leg) (Mile 19) to I-65 (South Leg) (Mile 53) (Marion, Boone, and Hamilton Counties)
Install 1/10 Mile Reference Markers in 2008 on these eight and 34 mile segments of I-465, respectively. AADT is 75,020 – 93,130 and 82,900 – 148,110, respectively. This deployment replaces the existing 2/10 Mile Reference Markers on these segments. The missing segment from east of SR 67 to south of 56th Street is the I-465 West Leg Added Travel Lanes project (Accelerate 465) (Des # 0300371). Estimated cost: **$168,000.**

I-70 from Airport Expwy (Mile 75) to I-65 (South Split) (Mile 81) (Marion County)
I-70 from I-465 (East Leg) (Mile 90) to Post Rd (Mile 91) (Marion County)
Install 1/10 Mile Reference Markers in 2008 on these six and one mile segments of I-70, respectively. AADT is 75,080 – 99,230 and 74,840, respectively. This deployment replaces the existing 2/10 Mile Reference Markers on these segments. The missing segment from the I-65 North Split to I-465 (East Leg) is the I-70 Pavement Replacement project (Des #s 0400394, 0400398, and 0401174). Estimated cost: **$28,000.**

Item 3 total: $364,000

4. **I-94 from SR 249 (Mile 19) to SR 49 (Mile 26) (Porter County)**
Install 2/10 Mile Reference Markers in 2009 on this seven mile segment of I-94 to coincide with temporary ATMS deployment in 2009 on I-94 from I-90 (Indiana Toll Road) to SR 49. The permanent ATMS deployment is proposed for 2013. Estimated cost: **$14,000.**

I-65 from US 30 (Mile 253) to I-80/94 (Borman Expwy) NW Connector Ramps (Mile 259) (Lake County)
Install 1/10 Mile Reference Markers in 2009 on this six mile segment of I-65. AADT is 76,500 – 81,500. This deployment replaces the existing 2/10 Mile Reference Markers on this segment. Estimated cost: **$24,000.**

Item 4 total: $38,000

5. **SR 912 (Cline Ave) from I-90 (Indiana Toll Road) (W jct) to I-80/94 (Borman Expwy) (Lake County)**
   Install 2/10 Mile Reference Markers in 2010 on this 10 mile segment of SR 912 to coincide with ATMS deployment as part of the Pavement Replacement project (Des # 0014030) and proposed Road Reconstruction project (Des # 0400210) on SR 912. Estimated cost: **$20,000.**

6. **I-465 from east of SR 67 / Kentucky Ave (West Leg) (Mile 8) to south of 56th St (West Leg) (Mile 19) (Marion County)**
   Install 1/10 Mile Reference Markers in 2011 on this 11 mile segment of I-465 as part of the I-465 West Leg Added Travel Lanes project (Accelerate 465) (Des # 0300371). AADT is 101,550 – 149,470. This deployment replaces the existing 2/10 Mile Reference Markers on this segment. Estimated cost: **$44,000.**

7. **I-65 from the Kentucky State Line (Mile 0) to SR 60 (Mile 7) (Clark County)**
   Install 1/10 Mile Reference Markers in 2018 on this seven mile segment of I-65 to coincide with the Added Travel Lanes (Des # 0300798) and New Bridge Construction (Des # 0201294) projects approaching the Ohio River, or as part of the next sign project on this segment of I-65. AADT is 73,400 – 118,640. This deployment replaces the existing 2/10 Mile Reference Markers on this segment and is located in the TRIMARC deployment area. Estimated cost: **$28,000.**

8. **US 31 (Freeway) from I-465 (North Leg) to SR 38 (Hamilton County)**
   Install 1/10 Mile Reference Markers in 2019 on this 12 mile segment of US 31 to coincide with the ATMS deployment as part of the Freeway Upgrade project (Des # 0300814). Projected AADT is 65,300 – 102,700. Estimated cost: **$48,000.**

9. **I-69 from SR 144 to I-465 (South Leg) (Johnson and Marion Counties)**
   Install 1/10 Mile (north of Smith Valley Rd) and 2/10 Mile (SR 144 to Smith Valley Rd) Reference Markers in 2020 on this 10 mile segment of I-69 to coincide with the ATMS deployment as part of the Freeway Upgrade project. Specific Design Year AADT is not available at this time but will be determined during the current Tier 2 Environmental studies. However, the Tier 1 Environmental study identified eight lanes in this high growth area. Estimated cost: **$34,000** ($28,000 for seven miles of 1/10 RM north of Smith Valley Road; $6,000 for three miles of 2/10 RM from SR 144 to Smith Valley Road).

Reference Marker Priority 2 total: $604,000

Intermediate Enhanced Reference Location Signs (1/10 and 2/10 Mile Reference Markers) total: $754,000

7.7.3. INTERMEDIATE REFERENCE LOCATION SIGNS ((½ Mile Reference Markers) on Rural Interstates)

The **deployment of Intermediate Reference Location Signs at ½ mile intervals** (with a ".0" at the whole number mile locations and ".5" placed at ½ mile locations, per the MUTCD) on all Interstates outside of urban areas with Intermediate Enhanced Reference Location Signs **should occur as part of sign replacement projects or during reconstruction projects and thus is not prioritized by year.** The **estimated cost** for deployment of Intermediate Reference Location Signs at ½ mile intervals **includes the cost of replacing the existing one mile signs.**

I-64 (108 of 123 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 0 to Mile 21 and from Mile 31 to Mile 118. Estimated cost: **$86,000.**

I-65 (192 of 262 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 16 to Mile 95 and from Mile 133 to Mile 246. Estimated cost: **$154,000.**

I-69 (124 of 157 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 10 to Mile 94 and from Mile 117 to Mile 157. Estimated cost: **$99,000.**

I-70 (125 of 156 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 0 to Mile 65 and from Mile 96 to Mile 156. Estimated cost: **$100,000.**

I-74 (137 of 171 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 0 to Mile 66 and from Mile 100 to Mile 171. Estimated cost: **$110,000.**

I-94 (19 of 29 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 26 to Mile 45. Estimated cost: **$15,000.**

I-275 (3 of 3 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 0 to Mile 3. Estimated cost: **$2,000.**

Intermediate Reference Location Signs (½ Mile Reference Markers) total: $566,000

Total Reference Markers (1/10, 2/10, and 1/2 Mile) ESTIMATED COST = $1,320,000

7.8. FIBER OPTIC DEPLOYMENT

Recent Added Travel Lanes and Pavement Replacement projects on the Interstate System in Indiana have provided the opportunity to place conduit for future deployment of fiber optics in INDOT Right-of-Way. Ultimately, a fiber optic system along Indiana's key Interstate highways will supersede the current wireless microwave communications system component of INDOT's ITS deployment. Other INDOT divisions, most notably the Systems Technology Division, will benefit from a statewide fiber optic deployment.

The INDOT 2000-2025 Long Range Plan identifies numerous Added Travel Lanes projects on the Interstate System that will provide an opportunity to implement conduit and ultimately, fiber optics on a significant portion of the Interstate System. Many of these projects have been programmed into SPMS. Pavement Replacement projects and Road Reconstruction projects where Added Lanes are not planned for also provide an opportunity for conduit and fiber optic deployment.

The current practice of implementing conduit as part of larger Major Capital Improvements on the Interstate System (and fiber optics where appropriate) should continue. Projects are listed by road in Chapter 3, but are not repeated here due to the quantity and changing nature of projects, coupled with the overall low cost of this deployment.

7.9. SUMMARY / CONCLUSION

The preceding pages outlined ITS recommendations and provided preliminary cost estimates for field-oriented devices for the next 15-20 years grouped by individual deployment type. *Chapter 8 summarizes all deployments chronologically*. The following summarizes the estimated costs:

Advanced Traffic Management Systems (ATMS)	$46,645,000
Closed Circuit TV (CCTV) Cameras (240)	18,070,000
Dynamic Message Signs (DMS) (48 new, 9 refurbished)	10,290,000
Travel Time Signs (TTS) (39)	2,270,000
Reference Markers (1/10, 2/10, and 1/2 Mile)	1,320,000
TOTAL ESTIMATED COST	**$78,595,000**

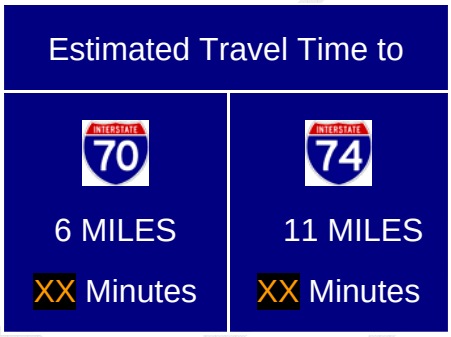
Predicting the future is a difficult task. As with any highway project, the deployment dates in this document are subject to change due to a variety of circumstances, including but not limited to funding constraints, staffing and workload constraints, delays to the larger projects that some of these ITS deployments are a component of, technology changes, etc. Similarly, the estimated costs are subject to change due to changes in technology and the fact that they are very preliminary in nature. Furthermore, some components will likely go up in cost over time, while some components, particularly the technological ones, are likely to go down in the future. As such, this Strategic Plan will be updated periodically to adapt to changing needs and priorities on INDOT's system, as well as the invariable changes to the overall INDOT program of highway improvements over time.

Finally, this document focused on the deployment of the primary field-oriented devices, what might traditionally be called "projects" at INDOT. Nevertheless, there are many other ITS activities underway or planned in the future at INDOT, including, but certainly not limited to, 511 travel information deployment, commercial vehicle / virtual weigh station coordination, statewide Highway Advisory Radio (HAR) flasher installation, field device maintenance, Gary-Chicago-Milwaukee ITS Priority Corridor coordination, Incident Management plan development, etc. Some of these activities are studied elsewhere (such as 511 deployment) or are reasonably well-defined so as to not need direction from the Strategic Plan. Regardless, all are important elements of ITS technologies and strategies which are utilized to save motorists lives, time, and money.

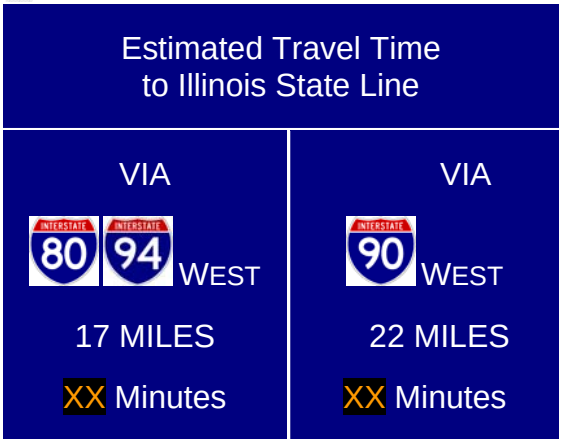
EXAMPLES OF STATIC / DYNAMIC TRAVEL TIME SIGNS (TTS)

New York State Example

Proposed Indiana Example (SB I-465 at Mile 37.8)



Two proposed Travel Time Signs are unique in that they provide estimated travel times to a common downstream destination (the Illinois State Line) via two different routes: I-80/94 (Borman Expressway) and I-90 (Indiana Toll Road). The following is an example of the proposed general sign layout (although the cardinal direction "WEST" would be positioned higher to the right of the shields) for the proposed WB I-94 Travel Time Sign at Mile 17.0.



EXAMPLE OF INTERMEDIATE REFERENCE LOCATION SIGN

EXAMPLE OF INTERMEDIATE ENHANCED REFERENCE LOCATION SIGN

CHAPTER 8 – ITS DEPLOYMENT RECOMMENDATIONS – **CHRONOLOGICAL**

8.1. INTRODUCTION

The data and analysis in the first six chapters of the INDOT ITS Strategic Deployment Plan have laid the foundation for the recommendations made by individual deployment type in Chapter 7. **Please refer to Chapter 7 for specific details regarding the individual deployments, especially in regards to the determination of priority.**

This chapter presents a **summary** of the deployment information presented in Chapter 7 (ITS Deployment Recommendations – by Deployment Type) **in chronological order.**

As with any highway project, the deployment dates are subject to change due to a variety of circumstances, including but not limited to funding constraints, staffing and workload constraints, delays to the larger projects that some of these ITS deployments are a component of, technology changes, etc. Similarly, the estimated costs are subject to change due to changes in technology and the fact that they are very preliminary in nature. Furthermore, some components will likely go up in cost over time, while some components, particularly the technological ones, are likely to go down in the future.

8.2. 2005 DEPLOYMENTS

1. **Phase Two** of the **Indianapolis area ATMS** (Des # 0200604) is **currently under construction** and is expected to be completed **in 2005**. Phase 2 installs vehicle detection and additional cameras along I-65 from Pleasant Run Parkway (south of the I-70 South Split) to Cold Spring Road, I-70 from SR 267 to Ritter Avenue, and temporary devices on the West Leg of I-465 from SR 67 / Kentucky Avenue to 56th Street. Phase 2 cost: **$3,590,000 (let)**. Full Deployment (vehicle detection every ½ mile, CCTV every mile) will be incorporated into the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) in 2011.

2. **I-80/94 (Borman Expwy) from 0.8 km east of SR 912 (Exit 5) to 0.6 km west of Dr. Martin Luther King, Jr. Dr (Mile 11) (Lake County)**
   Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the ongoing Added Travel Lanes project (Des # 9910800) in **2005.** Project was **let** in 2004.

3. **I-465 from 0.3 mile north of I-65 (Mile 20) to 0.65 mile north of 86th St (West Leg) (Mile 23) (Marion County)**
   Install ATMS hardware (Des # 0400418) (except the cameras and communication devices that will be part of Phase 5) as part of the ongoing 71st Street / 86th Street Added Travel Lanes / Interchange Modification project in **2005.** Project was **let** in 2004.

4. **US 31 from SR 26 to Morgan St (2.0 miles north of US 35 / SR 22) (Howard County) (7 cameras)**
   AADT = 33,110 – 46,580, four lanes (non-freeway), within DMS area of influence, moderate growth area, key component of programmed three part ITS deployment. **Install cameras** at SR 26, Alto Road, Lincoln Road, Hoffer Street, US 35 / SR 22 (Markland Avenue), Sycamore Street, and Morgan Street **in 2005.**

Note: Three ITS elements are programmed and committed for deployment in 2005 in the Kokomo area on US 31 as part of a unique state-local partnership. An emergency vehicle signal preemption / priority system (Des # 0010530) will be installed on US 31 from SR 26 to the north junction with US 35 (estimated cost: $183,000). Seven Closed Circuit Television (CCTV) cameras (Des # 0010520) (estimated cost: $350,000), as well as fiber optics (Des # 9801360) (estimated cost: $512,000), will be in installed on US 31 from SR 26 to Morgan Avenue, 2.0 miles north of US 35 / SR 22 (Markland Avenue). Total system estimated cost: **$1,045,000**, of which $350,000 is allocated to the CCTV cameras.

Total 2005 Deployments ESTIMATED COST = $4,635,000

8.3. 2006 DEPLOYMENTS

Note: Phases Three and Four of the Indianapolis ATMS will begin in 2006 and conclude in 2007. Details may be found in Section 8.4 (2007 Deployments).

1. **I-469 from I-69 (S jct) (Mile 0) to I-69 (N jct) (Mile 31) (Allen County)**
   Install 2/10 Mile Reference Markers in 2006. The 31 miles of I-469 are currently served occasionally by the I-69 Hoosier Helper route. The project to install these 2/10 Mile Reference Markers is programmed (Des # 0401317) and also includes Emergency Detour signage for I-69 and I-469 in Allen County. Estimated cost: **$150,000.**

2. **I-80/94 (Borman Expwy) from Illinois State Line (Mile 0) to US 41 / Calumet Ave West Ramps (Exit 1) (Lake County)**
   Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the upcoming Added Travel Lanes project (Des # 0100987) **in 2006.** The project to install this full ATMS is programmed (Des # 0300994), with an estimated cost of **$880,000.**

3. **SB I-465 (West Leg), near Mile 22.2 (79th St), south of 86th St (Marion County)**
   Install new DMS in 2006 at end of ongoing I-465 Northwest Fast Track Added Travel Lanes / Interchange Modification project (Des #s 0301064, 9706730, and 9700840). The DMS will provide traveler information for motorists entering the I-465 West Leg Added Travel Lanes / Interchange Modification project to the south (Accelerate 465), as well as before the I-65 decision point. Estimated cost: **$190,000.**

Total 2006 Deployments ESTIMATED COST = $1,220,000

8.4. 2007 DEPLOYMENTS

1. **Phase Three** of the **Indianapolis area ATMS** (Des # 0200605) deploys the vehicle detection and additional cameras **in 2006-2007** in the **northeastern and eastern** portions of the **Indianapolis** area on I-70 from Ritter Avenue to Mt. Comfort Road (temporary devices from Ritter Avenue to I-465 (East Leg); furthermore, the Mt. Comfort Road devices will be installed as part of Phase 2 of the Interchange Modification (Des # 9706740) at that location), I-69 from I-465 to SR 238, and I-465 from the White River (North Leg) to English Avenue (East Leg). Estimated Phase 3 cost: **$5,200,000.**

2. **Phase Four** of the **Indianapolis area ATMS** (Des # 0200607) deploys the vehicle detection and additional cameras **in 2006-2007** in the **southern** portion of the **Indianapolis** area on I-65 from County Line Road to Pleasant Run Parkway (south of the South Split) and I-465 from English Avenue to SR 67 / Kentucky Avenue. Devices on I-74 from I-465 to Pleasant View Road were installed as part of the 2002-2003 Road Rehabilitation project from I-465 to London Road but are not yet integrated into the system. Estimated Phase 4 cost: **$4,200,000,** plus the additional costs identified in Items 3, 4 and 5 below.

Note: Phase Five of the Indianapolis ATMS will begin in 2007 and conclude in 2008. Details may be found in Section 8.5 (2008 Deployments).

3. **I-65 from Main St (Greenwood Rd) (Exit 99) to County Line Rd (Exit 101) (Johnson County)**
   LOS C, AADT = 76,920, six lanes, high growth area. **Recommendation: Full Deployment during Phase 4 in 2006-2007** (vehicle detection every ½ mile, CCTV every mile). Estimated cost: **additional $300,000 in Phase 4.**

4. **I-65 from Whiteland Rd (CR 500N) (Exit 95) to Main St (Greenwood Rd) (Exit 99) (Johnson County)**
   LOS E, AADT = 61,180, four lanes, high growth area. **Recommendation: Full Deployment during Phase 4 in 2006-2007** (vehicle detection every mile, CCTV every mile). Estimated cost: **additional $400,000 in Phase 4.**

5. **I-465 from I-65 (Exit 53) to SR 67 / Kentucky Ave (Exit 8) (South Leg) (Marion County)**
   LOS C-D, AADT = 75,020 – 93,130, six lanes, medium growth area. **Recommendation: ½ Mile vehicle detection during Phase 4 in 2007** in lieu of the one mile vehicle detection currently proposed. This ½ spacing better supports the Travel Time Signs proposed in Chapter 7's Section 7.5. Estimated cost: **additional $200,000 in Phase 4.**

6. **NB I-465 (East Leg), near Mile 38.5, south of I-69 (Marion County)**
   Install new DMS in 2007 during Phase 3 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 3 deployment area, as well as before the I-69 decision point. Estimated cost: **$190,000.**

7. **SB I-465 (East Leg), Mile 38.2, south of I-69 (Marion County)**
   Replace existing Vultron DMS and install new DMS on box truss in 2007 during Phase 3 of the Indianapolis ATMS. The new DMS will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 3 and 2 deployment areas, as well as before the I-70 decision point. Estimated cost: **$190,000.**

8. **SB I-69, Mile 4.3, south of 116th St (Hamilton County)**
   Replace existing Vultron DMS and install new DMS on box truss in 2007 during Phase 3 of the Indianapolis ATMS. The new DMS will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 3 and 2 deployment areas, as well as before the I-465 decision point. Estimated cost: **$190,000.**

9. **SB I-465 (East Leg), near Mile 46.5 (English Ave), north of US 52 (Marion County)**
   Install new DMS in 2007 during Phase 4 of the Indianapolis ATMS. The new DMS will provide traveler information for motorists entering the Phase 4 deployment area, as well as before the I-74 and I-65 decision points. Estimated cost: **$190,000.**

10. **NB I-65, near Mile 108.5, south of Raymond St (Marion County)**
    Install new DMS in 2007 during Phase 4 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 4 and 2 deployment areas, as well as before the two I-70 decision points (South and North Splits). Estimated cost: **$190,000.**

11. **NB I-65, Mile 104.7, south of I-465 (South Leg) (Marion County)**
    Replace existing Vultron DMS and install new DMS on box truss in 2007 during Phase 4 of the Indianapolis ATMS. The new DMS will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 4, 3 and 2 deployment areas, as well as before the I-465 decision point. Estimated cost: **$190,000.**

12. **I-70 at Mt. Comfort Rd (Exit 96) (Hancock County)**
    The Mt. Comfort Road devices that were originally part of Phase 3 (mainline and ramp detection, CCTV, and relay tower) will be installed as part of Phase 2 of the Interchange Modification project (Des # 9706740) in **2007.** Estimated cost: **$250,000.**

13. **I-70 from I-65 (North Split) (Exit 83) to I-465 (East Leg) (Exit 90) (Marion County)**
    Replace full ATMS deployment west of Ritter Avenue and install new full ATMS to replace temporary ATMS east of Ritter Avenue as part of the I-70 Pavement Replacement project (Des #s 0400394, 0400398, and 0401174) **in 2007.** Estimated cost: **$1,450,000.**

14. **EB & WB I-70, Mile 85.7, west of Emerson Ave (Marion County)**
    Replace two existing Vultron DMSs and install two new DMSs on box trusses in 2007 during the Pavement Replacement project on I-70 (Des # 0400398). The new DMSs, located slightly downstream of the existing DMS in each direction, will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 2, 3 and 4 deployment areas, as well as before the I-465 (EB) and I-70 North Split (WB) decision points. Estimated cost: **$380,000.**

15. **I-70 from I-65 (North Split) (Mile 83) to I-465 (East Leg) (Mile 90) (Marion County)**
    Install 1/10 Mile Reference Markers in 2007 on this seven mile segment of I-70 as part of the I-70 Pavement Replacement project (Des #s 0400394, 0400398, and 0401174). AADT is 116,700 – 170,590. This deployment replaces the existing 2/10 Mile Reference Markers on this segment. Estimated cost: **$28,000.**

Total 2007 Deployments ESTIMATED COST = $13,548,000

8.5. 2008 DEPLOYMENTS

1. **The Fifth and final phase** of the **Indianapolis area ATMS** (Des # 0200606) deploys the vehicle detection and additional cameras **in 2007-2008** in the **northwestern and northern** portions of the **Indianapolis** area on I-65 from Cold Spring Road to SR 267, I-74 from Raceway Road to I-465 (West Leg), I-465 from 56th Street (West Leg) to the White River (North Leg) (except for devices in the 71st Street / 86th Street area that will be installed as part of the 2004-2006 Added Travel Lanes / Interchange Modification project), and I-865 from I-65 to I-465. Estimated Phase 5 cost: **$5,375,000,** plus the additional costs identified in Item 2 below.

2. **I-74 from SR 267 (Exit 66) to Raceway Rd (Hendricks / Marion County Line) (Mile 70) (Hendricks County)**
   LOS C, AADT = 33,850, four lanes, high growth area. **Full Deployment is recommended during Phase 5 in 2008** (vehicle detection every mile, CCTV every mile). Estimated cost: **additional $400,000 in Phase 5.**

3. **EB & WB I-465 (North Leg), near Mile 28.2 (Township Line Rd), west of US 31 (Marion County)**
   Install two new DMSs in 2008 during Phase 5 of the Indianapolis ATMS. The DMSs will provide traveler information for motorists in the Phase 5, 3, and to a small extent, Phase 2 deployment areas, as well as before the I-865 / I-65 North (WB) and the future US 31 Freeway (EB) decision points. Estimated cost: **$380,000.**

4. **NB I-465 (West Leg), near Mile 22.2 (79th St), south of 86th St (Marion County)**
   Install new DMS in 2008 during Phase 5 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 5 and, to a small extent, Phase 3 deployment areas, as well as before the I-865 decision point. Estimated cost: **$190,000.**

5. **SB I-65, near Mile 125, north of 71st St (Marion County)**
   Install new DMS in 2008 during Phase 5 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 5, 2, 4 and, to a small extent, Phase 3 deployment areas, as well as before the I-465 decision point. This DMS will supplement the SB I-65 DMS north of SR 334 (Mile 131.9), allowing that DMS to feature less information on the West and South Legs of I-465. Estimated cost: **$190,000.**

6. **EB I-74, near Mile 68, east of SR 267 (Hendricks County)**
   Install new DMS in 2008 during Phase 5 of the Indianapolis ATMS. The DMS will provide traveler information for motorists in the Phase 5, 2, and 4 deployment areas, as well as before the I-465 decision point. This DMS should be placed west of the proposed Ronald Reagan Parkway (North-South Corridor) in Hendricks County, providing for a local diversion route in advance of I-465. Estimated cost: **$190,000.**

7. **EB & WB I-465, Mile 32.2, west of SR 431 (Marion County)**
   Replace two existing Vultron DMSs and install two new DMSs on box trusses east of SR 431 near Mile 34.4 in 2008 during Phase 5 of the Indianapolis ATMS. The new DMSs, east of SR 431, will provide improved readability in this high volume corridor and traveler information for motorists in the Phase 3 and 5 deployment areas. These DMSs are relocated east of SR 431 to provide for a diversion route (SR 431) in advance of the proposed US 31 freeway north of I-465 (which is recommended for full ATMS deployment) (WB), and closer to the I-69 decision point (EB). Estimated cost: **$380,000.**

8. **SB I-65, Mile 131.9, north of SR 334 (Boone County)**
   Replace existing Vultron DMS and install new DMS on box truss in 2008 during Phase 5 of the Indianapolis ATMS. The new DMS will provide improved readability in this medium volume corridor and traveler information for motorists in the Phase 5, 3 and 2 deployment areas, as well as before the I-865 decision point. Estimated cost: **$190,000.**

9. **WB I-70, Mile 92.1, east of Post Rd (Marion County)**
   Replace existing Vultron DMS and install new DMS on box truss in 2008 during Phase 5 of the Indianapolis ATMS. The new DMS will provide improved readability in this medium volume corridor and traveler information for motorists in the Phase 3, 2, 4, and 5 deployment areas, as well as before the I-465 decision point. Estimated cost: **$190,000.**

10. **I-69 from just north of SR 37 / 116th St (Mile 6) to SR 238 (Mile 10) (Hamilton County)**
    Install 2/10 Mile Reference Markers in 2008 on this four mile segment of I-69 to support the Phase 3 ATMS deployment in 2007. Estimated cost: **$8,000.**

    I-70 from east of Post Rd (Mile 93) to Mt. Comfort Rd (Mile 96) (Marion and Hancock Counties)
    Install 2/10 Mile Reference Markers in 2008 on this three mile segment of I-70 to support the Phase 3 ATMS deployment in 2007. Estimated cost: **$6,000.**

I-65 from CR 500N (Whiteland Rd) (Mile 95) to Main St (Greenwood Rd) (Mile 99) (Johnson County)
Install 2/10 Mile Reference Markers in 2008 on this four mile segment of I-65 to support the Phase 4 ATMS deployment in 2007. Estimated cost: **$8,000.**

I-65 from Main St (Greenwood Rd) (Mile 99) to 38th St / Kessler Blvd (Mile 119) (Johnson and Marion Counties)
Install 1/10 Mile Reference Markers in 2008 on this 20 mile segment of I-65 to support the Phase 4 ATMS deployment in 2007. AADT is 75,220 – 153,870. This deployment replaces the existing 2/10 Mile Reference Markers from Mile 102 to Mile 119. Estimated cost: **$80,000.**

I-65 from 38th St / Kessler Blvd (Mile 119) to SR 267 (Mile 133) (Marion, Hendricks, and Boone Counties)
Install 2/10 Mile Reference Markers in 2008 on this 14 mile segment of I-65 to support the Phase 5 ATMS deployment in 2008. This deployment replaces the existing 2/10 Mile Reference Markers from Mile 119 to Mile 132. Estimated cost: **$28,000.**

I-74 from SR 267 (Mile 66) to I-465 (West Leg) (Mile 73) (Hendricks and Marion Counties)
Install 2/10 Mile Reference Markers in 2008 on this seven mile segment of I-74 to support the Phase 5 ATMS deployment in 2008. This deployment replaces the existing 2/10 Mile Reference Markers near Mile 73. Estimated cost: **$14,000.**

I-69 from I-465 (Mile 0) to just north of SR 37 /116th St (Mile 6) (Marion and Hamilton Counties)
Install 1/10 Mile Reference Markers in 2008 on this six mile segment of I-69. AADT is 87,820 – 123,670. This deployment replaces the existing 2/10 Mile Reference Markers on this segment. Estimated cost: **$24,000.**

I-465 from I-65 (South Leg) (Mile 0) to east of SR 67 / Kentucky Ave (West Leg) (Mile 8) (Marion County)
I-465 from south of 56th St (West Leg) (Mile 19) to I-65 (South Leg) (Mile 53) (Marion, Boone, and Hamilton Counties)
Install 1/10 Mile Reference Markers in 2008 on these eight and 34 mile segments of I-465, respectively. AADT is 75,020 – 93,130 and 82,900 – 148,110, respectively. This deployment replaces the existing 2/10 Mile Reference Markers on these segments. The missing segment from east of SR 67 to south of 56th Street is the I-465 West Leg Added Travel Lanes project (Accelerate 465) (Des # 0300371). Estimated cost: **$168,000.**

I-70 from Airport Expwy (Mile 75) to I-65 (South Split) (Mile 81) (Marion County)
I-70 from I-465 (East Leg) (Mile 90) to Post Rd (Mile 91) (Marion County)
Install 1/10 Mile Reference Markers in 2008 on these six and one mile segments of I-70, respectively. AADT is 75,080 – 99,230 and 74,840, respectively. This deployment replaces the existing 2/10 Mile Reference Markers on these segments. The missing segment from the I-65 North Split to I-465 (East Leg) is the I-70 Pavement Replacement project (Des #s 0400394, 0400398, and 0401174). Estimated cost: **$28,000.**

Item 10 total: $364,000

11. **WB I-80/94 (Borman Expwy), near Mile 7.9 (Chase St) (Lake County)**
Install TTS in 2008 after the completion of the upcoming Added Travel Lanes project on I-80/94 from I-294 / Illinois Route 394 to the west ramps at US 41 / Calumet Avenue (Des # 0100987 for the Indiana segment) and after developing / calibrating the algorithms needed to support the TTS in 2007. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: State Line 8 miles, I-294 11 miles. Sign will require data from Illinois sensors on WB I-80/94 (Kingery Expwy) in Illinois. Estimated cost: **$50,000.**

12. **WB I-80/94 (Borman Expwy), near Mile 2.6 (US 41 / SR 152 / Indianapolis Blvd WB off-ramp) (Lake County)**
Install TTS in 2008 after the completion of the upcoming Added Travel Lanes project on I-80/94 from I-294 / Illinois Route 394 to the west ramps at US 41 / Calumet Avenue (Des # 0100987 for the Indiana segment) and after developing / calibrating the algorithms needed to support the TTS in 2007. TTS may be located on an existing box truss. Downstream destination: I-294 5 miles. Sign will require data from Illinois sensors on WB I-80/94 (Kingery Expwy) in Illinois. Estimated cost: **$40,000.**

Total 2008 Deployments ESTIMATED COST = $7,939,000

8.6. 2009 DEPLOYMENTS

1. **I-94 from I-90 (Indiana Toll Road) (Exit 16) to SR 49 (Exit 26) (Porter County)**
   Weekday LOS C / Summer Friday and Sunday LOS D from I-90 to US 20 (Exit 22); Weekday LOS B / Summer Friday and Sunday LOS C from US 20 to SR 49, Weekday AADT = 49,550 – 65,570 / Summer Friday and Sunday AADT = 71,340 – 87,360, six lanes, high growth area, Interstate 94 experiences significant spikes in traffic on Fridays and Sundays during the summer months, increasing traffic by approximately 22,000 vehicles per day and lowering LOS by one across the board (B deteriorates to C and C deteriorates to D). **Temporary Deployment is recommended in 2009** (temporary vehicle detection (side-fire radar) every mile, CCTV every mile). Estimated cost: **$500,000**. This recommendation is based upon need and because this area is programmed for Pavement Replacement in 2013, which would result disruption of under-pavement vehicle detection, if placed. Full Deployment (vehicle detection every mile, CCTV every mile) is recommended for incorporation into the Pavement Replacement project in 2013.

2. **I-94 from SR 249 (Mile 19) to SR 49 (Mile 26) (Porter County)**
   Install 2/10 Mile Reference Markers in 2009 on this seven mile segment of I-94 to coincide with temporary ATMS deployment in 2009 on I-94 from I-90 (Indiana Toll Road) to SR 49. The permanent ATMS deployment is proposed for 2013. Estimated cost: **$14,000.**

3. **I-65 from US 30 (Mile 253) to I-80/94 (Borman Expwy) NW Connector Ramps (Mile 259) (Lake County)**
   Install 1/10 Mile Reference Markers in 2009 on this six mile segment of I-65. AADT is 76,500 – 81,500. This deployment replaces the existing 2/10 Mile Reference Markers on this segment. Estimated cost: **$24,000.**

4. **I-80/94 (Borman Expwy) from 0.6 km west of Dr. Martin Luther King, Jr. Dr (Mile 11) to I-90 (Indiana Toll Road) (Exit 16) (Lake County)**
   Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the upcoming Interchange Modification / Added Travel Lanes projects at I-65, US 6 / SR 51 (Ripley Street), and I-90 (Indiana Toll Road) (Des # 0065300, 9700410, and 0065700, respectively) **in 2009.** Estimated cost: **$1,000,000.**

5. **I-65 from I-80/94 (Borman Expwy) (Exit 259 / Mile 260) to I-90 (Indiana Toll Road (Exit 262) (Lake County)**
   LOS B, AADT = 26190 – 30,510, four lanes. While LOS B does not call for a "standalone" project of merit, it is logical to implement full detection on this segment as this is a short, two mile segment that is part a larger **system** that provides motorists and TMC operators with traffic information; I-65 provides the access from to and from the Indiana Toll Road (I-90) and can be used by certain trips to divert from I-80/94 or I-90. A similar situation exists in Indianapolis: I-865 is not a candidate for full detection on its own, but it is a small part of a larger system and is planned for full detection. **Full Deployment is recommended** (vehicle detection every ½ mile, CCTV every mile) **in 2009** in anticipation of the NB I-65 Mile 257.2 Travel Time Sign proposed in Section 7.5.4 in 2011. The ½ mile vehicle detection is recommended to better support the proposed travel time information. Estimated cost: **$250,000.**

6. **EB I-80/94 (Borman Expwy), near Mile 13 (Clay St), east of Central Ave (Lake County)**
   Install refurbished Vultron DMS in 2009 during the I-80/94 Added Travel Lanes / Interchange Modification project near I-65 (Des # 0065300). The DMS will provide traveler information for motorists in the current Borman ATMS area and entering the 2009 temporary (and 2013 permanent) ATMS deployment on I-94 from I-90 (Indiana Toll Road) to SR 49, as well as Toll Road information. The DMS is in advance of the I-90 (Indiana Toll Road) decision point. Estimated cost: **$130,000.**

7. **SB SR 431, north of I-465 (North Leg) between 98th St and 106th St (Hamilton County)**
   Install refurbished Vultron DMS in 2009 during the SR 431 Added Travel Lanes project (Des # 9133595). The DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the Phase 5 and 3 deployment areas, as well as before the I-465 decision point. Keystone Avenue and other local roadways are available as diversion routes off of I-465. Estimated cost: **$130,000.**

8. **I-69 from SR 238 (Exit 10) to SR 9/67 (Exit 22)**
   (Hamilton and Madison Counties) (8 cameras)
   AADT = 48,630 – 54,000, four lanes, within DMS area of influence, high growth area near Fishers / Indianapolis; moderate growth area near Pendleton / Anderson. **Install cameras** near Cyntheanne Road, SR 13, CR 800W, CR 600W, SR 38, Old SR 132, CR 400W, and SR 9/67 **in 2009.** Estimated cost: **$600,000.**

9. **I-65 from SR 44 (Exit 90) to Whiteland Rd (CR 500N) (Exit 95) (Johnson County) (4 cameras)**
   AADT = 54,280, four lanes, within DMS area of influence, moderate growth area. **Install cameras** near SR 44, CR 100N, CR 300N, and CR 350E **in 2009.** Estimated cost: **$300,000.**

10. **I-65 from SR 267 (Exit 133) to SR 32 (Exit 140) (Boone County) (5 cameras)**
    AADT = 49,440 – 56,300, four lanes, within DMS area of influence, moderate growth area. **Install cameras** near Whitestown Road, where Indianapolis Road shifts westward away from the R/W fence, Indianapolis Road, SR 39, and SR 32 **in 2009.** Estimated cost: **$375,000.**

11. **NB I-69, near Mile 3.2, north of 96th St (Hamilton County)**
    Install new DMS in 2009 to provide traveler information to motorists in conjunction with deployment of eight CCTV cameras from SR 238 to SR 9/67 in 2009, as well as the 2007 Phase 3 deployment area northward to SR 238. The DMS is in advance of the SR 37 decision point / diversion route. Estimated cost: **$190,000.**

12. **SB I-69, near Mile 5.0 (116th St) (Hamilton County)**
    Install TTS in 2009 after the completion of Phase 3 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destination: I-465 5 miles. Estimated cost: **$50,000.**

13. **NB I-465 (East Leg), near Mile 47.0 (CSX RR) (Marion County)**
    Install TTS in 2009 after the completion of Phases 3 and 4 of the Indianapolis and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 3 miles, I-69 10 miles. Estimated cost: **$50,000.**

14. **SB I-465 (East Leg), near Mile 45.0 (10th St) (Marion County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-74 4 miles, I-65 8 miles. Estimated cost: **$50,000.**

15. **WB I-465 (South Leg), near Mile 50.2 (CSX RR) (Marion County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 3 miles, SR 37 7 miles (in anticipation of future I-69). Estimated cost: **$50,000.**

16. **EB I-465 (South Leg), near Mile 52.3 (9th Ave) (Marion County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-74 3 miles, I-70 8 miles. Estimated cost: **$50,000.**

17. **EB I-465 (South Leg), near Mile 3.2 (east of Bluff Rd) (Marion County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 3 miles, I-74 7 miles. Estimated cost: **$50,000.**

18. **EB I-465 (South Leg), near Mile 7.4 (Mann Rd) (Marion County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: SR 37 3 miles (in anticipation of future I-69), I-65 7 miles. Estimated cost: **$50,000.**

19. **NB I-65, near Mile 100.0 (south of County Line Rd) (Johnson County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-465 6 miles, I-70 10 miles. Estimated cost: **$50,000.**

20. **SB I-65, near Mile 110.0 (south of the I-70 South Split) (Marion County)**
    Install TTS in 2009 after the completion of Phase 4 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-465 4 miles, Greenwood 10 miles. Estimated cost: **$50,000.**

21. **WB I-70, near Mile 88.1 (CSX RR) (Marion County)**
    Install TTS in 2009 after the completion of the I-70 Pavement Replacement projects from the I-65 North Split to I-465 (East Leg) (Des # 0400394, 0400398, and 0401174) and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 5 miles, I-465 15 miles. Estimated cost: **$50,000.**

22. **EB I-70, near Mile 83.8 (Commerce Ave) (Marion County)**
    Install TTS in 2009 after the completion of the I-70 Pavement Replacement projects from the I-65 North Split to I-465 (East Leg) (Des # 0400394, 0400398, and 0401174) and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destination: I-465 5 miles. Estimated cost: **$50,000.**

23. **EB I-70, near Mile 73.6 (west of Lynhurst Dr) (Marion County)**
    Install TTS in 2009 after the completion of the I-70 Pavement Replacement projects from the I-65 North Split to I-465 (East Leg) (Des # 0400394, 0400398, and 0401174) and after developing / calibrating the algorithms needed to support the TTS in 2008. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 7 miles, I-465 15 miles. Estimated cost: **$50,000.**

Total 2009 Deployments ESTIMATED COST = $4,113,000

8.7. 2010 DEPLOYMENTS

1. **I-69 from SR 9/67 (Exit 22) to SR 32/67 (Exit 34)**
   (Madison and Delaware Counties) (5 cameras)
   AADT = 38,700 – 44,650, four lanes, within DMS area of influence, moderate growth area, final set of cameras needed to support a new DMS. **Install cameras** near Main Street, SR 9/109, CR 300E, Abandoned RR, and SR 32/67 **in 2010.** Estimated cost: **$375,000.**

2. **I-65 from US 31 (Exit 76) to SR 44 (Exit 90)**
   (Bartholomew, Shelby, and Johnson Counties) (7 cameras)
   AADT = 39,000 – 45,870, four lanes, within DMS area of influence, moderate growth near Franklin and Columbus, final set of cameras needed to support a new DMS. **Install cameras** near *US 31 (MAGTECH site)*, CR 800N, Bartholomew / Shelby County Line Road, SR 252, Shelby / Johnson County Line Road, CR 400S, and Greensburg Road **in 2010.** Estimated cost: **$450,000.**

3. **I-65 from SR 32 (Exit 140) to SR 28 (Exit 158)**
   (Boone and Clinton Counties) (8 cameras)
   AADT = 40,120 – 44,020, four lanes, within DMS area of influence, moderate growth near Lebanon, final set of cameras needed to support a new DMS. **Install cameras** near US 52 / Lafayette Avenue, CR 300N, SR 47, NB Lebanon Rest Area, SB Lebanon Rest Area, CR 350W, Manson-Colfax Road / Abandoned RR, and SR 28 **in 2010.** Estimated cost: **$600,000.**

4. **I-70 from US 231 (Exit 41) to SR 267 (Exit 66)**
   (Putnam, Morgan, and Hendricks Counties) (9 cameras)
   AADT = 35,830 – 44,860, four lanes, within DMS area of influence, moderate growth area near Plainfield / Indianapolis, final set of cameras needed to support a new DMS. **Install cameras** near US 231, CR 650E, CR 1000E, CR 1100W (Little Point), Lake Valley Road, Hazelwood Road, SR 39, CR 525E, and Plainfield Rest Area **in 2010.** Estimated cost: **$675,000.**

5. **I-70 from Mt. Comfort Rd (Exit 96) to SR 3 (Exit 123) (Hancock and Henry Counties) (11 cameras)**
   AADT = 31,530 – 43,770, four lanes, within DMS area of influence, moderate growth area near Greenfield / Indianapolis, final set of cameras needed to support a new DMS. **Install cameras** near CR 400W, CR 200W, Fortville Pike, SR 9, Greenfield Rest Area, CR 850E, CR 1050E, SR 109, Kennard Road, CR 350W, and SR 3 **in 2010.** Estimated cost: **$825,000.**
   Note: I-70 from Mt. Comfort Road to SR 109 (19 miles) is LOS C. The eight mile segment of I-70 from SR 109 to SR 3 is LOS B. However, deploying an additional three cameras in this segment provides the verification support for deployment of a new DMS on WB I-70 east of SR 3. This completes the CCTV deployment to support new DMS installation on the key, high-volume Interstates (I-65, I-69, and I-70) at approximately 30 miles / minutes outside of and approaching Indianapolis.

6. **SB I-69, near Mile 28.3 (CR 300E), north of SR 9/109 (Madison County)**
   Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of five CCTV cameras from SR 9/67 to SR 32/67 in 2010, as well as the deployment of eight CCTV cameras from SR 238 to SR 9/67 in 2009 and the 2007 Phase 3 deployment area from I-465 to SR 238. The DMS is in advance of the SR 109 and SR 9/67 diversion routes. Estimated cost: **$130,000.**

7. **NB I-65, near Mile 71.3 (CR 300N), south of US 31 (Exit 76) (Bartholomew County)**
   Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of six CCTV cameras from US 31 (Exit 76) to SR 44 in 2010, as well as the deployment of four CCTV cameras from SR 44 to Whiteland Road in 2009 and the 2007 Phase 4 deployment area from Whiteland Road to I-465 (South Leg). The DMS is in advance of the US 31 diversion route. Estimated cost: **$130,000.**

8. **SB I-65, near Mile 160.4 (CR 1000W), north of SR 28 (Clinton County)**
   Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of eight CCTV cameras from SR 32 to SR 28 in 2010, as well as the deployment of five CCTV cameras from SR 267 to SR 32 in 2009 and the 2008 Phase 5 deployment area from I-865 to SR 267. The DMS is in advance of the SR 28 / US 52 diversion routes. Estimated cost: **$130,000.**

9. **EB I-70, near Mile 38.6 (Poplar Grove Rd), west of US 231 (Putnam County)**
   Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of nine CCTV cameras from US 231 to SR 267 in 2010, as well as the 2005 Phase 2 deployment area from SR 267 to I-465 (West Leg). The DMS is in advance of the US 231 / US 40 diversion routes. Estimated cost: **$130,000.**

10. **WB I-70, near Mile 126.2 (SR 103), east of SR 3 (Henry County)**
    Install refurbished Vultron DMS in 2010 to provide traveler information to motorists in conjunction with the deployment of 11 CCTV cameras from Mt. Comfort Road to SR 3 in 2011, as well as the 2007 Phase 3 deployment area from I-465 (East Leg) to Mt. Comfort Road. The DMS is in advance of the SR 3 / US 40 diversion routes. Estimated cost: **$130,000.**

11. **EB I-465 (North Leg), near Mile 25.6 (96th St) (Hamilton County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: US 31 5 miles, I-69 11 miles. Estimated cost: **$50,000.**

12. **WB I-465 (North Leg), near Mile 30.0 (west of Spring Mill Rd) (Hamilton County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-865 5 miles, I-65 S 10 miles. Estimated cost: **$50,000.**

13. **NB I-465 (West Leg), near Mile 20.3 (north of Lafayette Rd) (Marion County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-865 4 miles, US 31 10 miles. Estimated cost: **$50,000.**

14. **NB I-65, near Mile 107.2 (Keystone Ave) (Marion County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 3 miles, I-465 16 miles. Estimated cost: **$50,000.**

15. **SB I-65, near Mile 122.0 (56th St) (Marion County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 10 miles, I-465 16 miles. Estimated cost: **$50,000.**

16. **NB I-65, near Mile 114.4 (Fall Creek Pkwy) (Marion County)**
    Install TTS in 2010 after the completion of Phase 5 of the Indianapolis ATMS and after developing / calibrating the algorithms needed to support the TTS in 2009. TTS may be located on a new box truss with the existing 29th Street / 30th Street exit sign that is currently located on a double mast arm cantilever on the right. Downstream destination: I-465 8 miles. Estimated cost: **$100,000.**

17. **SR 912 (Cline Ave) from I-90 (W jct) to I-80/94 (Borman Expwy) (Lake County)**
    LOS A-D, AADT = 7,130 – 53,240, four and six lanes. SR 912 is essentially two separate roads: the lower volume (AADT of 7,130 – 40,910), newer (completed in the mid-1980s), six lane freeway from its western terminus at I-90 to just north of US 12 and the higher volume (AADT of 41,560 – 53,240), older (completed in stages during the 1960s), four lane freeway from just north of US 12 to I-80/94. The lower volume, newer, six lane segment is currently operating at an acceptable LOS A and B. The higher volume, older, four lane segment is currently operating at LOS C and D. **Recommendation: Full Deployment** (vehicle detection every mile, CCTV every mile) **during the proposed SR 912 Road Reconstruction project (Des # 0400210) from 1.66 miles west of US 12 to 0.25 mile west of US 12** (construction date not yet determined) **and during the Pavement Replacement project (Des # 0014030) from 0.25 mile north of US 12 to 0.6 mile north of I-80/94 in 2010.** While the lower volume, acceptable LOS segment is not a "standalone" project of merit, it is logical to implement full detection on this segment as this is a small part a larger **system** that provides motorists and TMC operators with traffic information; SR 912 can be used by certain trips to divert from I-80/94 or I-90. A similar situation exists in Indianapolis: I-865 is not a candidate for full detection on its own, but it is a small part of a larger system and is planned for full detection. Estimated cost: **$1,250,000.**

18. **SB SR 912 (Cline Ave), near SR 312, north of I-80/94 (Borman Expwy) and I-90 (Indiana Toll Road) (Lake County)**
    Install refurbished Vultron DMS in 2010 during the SR 912 Pavement Replacement project (Des # 0014030). The DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the Borman Expressway ATMS, as well as the proposed SR 912 and Indiana Toll Road ATMS deployment areas. The DMS is in advance of the I-90 (Toll Road) and I-80/94 (Borman) decision points. Estimated cost: **$130,000.**

19. **SR 912 (Cline Ave) from I-90 (Indiana Toll Road) (W jct) to I-80/94 (Borman Expwy) (Lake County)**
    Install 2/10 Mile Reference Markers in 2010 on this 10 mile segment of SR 912 to coincide with ATMS deployment as part of the Pavement Replacement project (Des # 0014030) and the proposed Road Reconstruction project (Des # 0400210) on SR 912. Estimated cost: **$20,000.**

20. **NB US 31, south of I-465 (South Leg) between Edgewood Ave and Epler Ave (Marion County)**
    Install refurbished Vultron DMS in 2010 during the US 31 Pavement Replacement project (Des # 0100721). The DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the Phase 4, 2, and 3 deployment areas, as well as before the I-465 decision point. East Street and other local roadways are available as diversion routes off of I-465. Estimated cost: **$130,000.**

Total 2010 Deployments ESTIMATED COST = $5,455,000

8.8. 2011 DEPLOYMENTS

1. **I-69 from I-469 (S jct) (Exit 96) to SR 1 (Exit 116) (Allen County) (12 cameras)**
   AADT = 33,660 – 64,110, within DMS area of influence (both directions), high growth area. **Install cameras** near I-469 (S jct), Lower Huntington Road / Airport Expressway, US 24, Covington Road, SR 14, Leesburg Road, US 30/33 / SR 930, US 27 / SR 3, *Coldwater Road (MAGTECH site)*, Auburn Road, I-469 (N jct), and SR 1 **in 2011.** Estimated cost: **$825,000.**
   Note: Two of the eight segments in this portion of I-69 are LOS B. However, system continuity dictates that all cameras should be deployed at once to better enhance the traveler information provided on the two I-69 DMSs and two HAR stations approaching Fort Wayne.

2. **I-465 from 0.8 mile east of SR 67 / Kentucky Ave (West Leg) (Exit 8) to 0.5 mile north of 46th St (West Leg) (Mile 19) (Marion County)**
   Replace temporary devices placed as part of Phase 2 **with full ATMS** deployment (vehicle detection every ½ mile, CCTV every mile) as part of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) **in 2011.** The project to install this full ATMS is programmed (Des # 0300908) for **$5,000,000.**

3. **NB & SB I-465 (West Leg), Near Mile 15, south of I-74 (Marion County)**
   Install two New DMSs in 2011 during the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465). The DMSs will provide traveler information for motorists in the Phase 2, 5, and 4 deployment areas, as well as before the I-74 and I-65 (NB) and I-70 (SB) decision points. Estimated cost: **$380,000.**

4. **I-465 from east of SR 67 / Kentucky Ave (West Leg) (Mile 8) to south of 56th St (West Leg) (Mile 19) (Marion County)**
   Install 1/10 Mile Reference Markers in 2011 on this 11 mile segment of I-465 as part of the I-465 West Leg Added Travel Lanes project (Accelerate 465) (Des # 0300371). AADT is 101,550 – 149,470. This deployment replaces the existing 2/10 Mile Reference Markers on this segment. Estimated cost: **$44,000.**

5. **EB I-80/94 (Borman Expwy), near Mile 0.1 (Hohman Ave) (Lake County)**
   Install TTS in 2011 after the completion of upcoming Interchange Modification / Added Travel Lanes projects on I-80/94 at I-65, US 6 / SR 51 (Ripley Street), and I-90 (Indiana Toll Road) (Des # 0065300, 9700410, and 0065700, respectively) and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on a new box truss with the US 41 / Calumet Avenue exit sign that is currently located on a double mast arm cantilever on the right. Downstream destinations: SR 912 5 miles, I-65 S 11 miles. Estimated cost: **$100,000.**

6. **EB I-80/94 (Borman Expwy), near Mile 7.9 (Chase St) (Lake County)**
   Install TTS in 2011 after the completion of upcoming Interchange Modification / Added Travel Lanes projects on I-80/94 at I-65, US 6 / SR 51 (Ripley Street), and I-90 (Indiana Toll Road) (Des # 0065300, 9700410, and 0065700, respectively) and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on a new box truss with the Grant Street exit sign that is currently located on a double mast arm cantilever on the right. Downstream destinations: I-65 S 3 miles, I-90 8 miles. Estimated cost: **$100,000.**

7. **WB I-80/94 (Borman Expwy), near Mile 13.1 (east of Clay St) (Lake County)**
   Install TTS in 2011 after the completion of the upcoming Interchange Modification / Added Travel Lanes project on I-80/94 at I-65 (Des # 0065300) and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on a new box truss with the I-65 exit sign that is currently located on a double mast arm cantilever on the right. Downstream destinations: SR 912 8 miles, State Line 13 miles. Estimated cost: **$100,000.**

8. **WB I-94, near Mile 17.0 (east of US 20 / CSX RR) (Porter County)**
   Install TTS in 2011 after the completion of upcoming Interchange Modification / Added Travel Lanes projects on I-80/94 at I-65, US 6 / SR 51 (Ripley Street), and I-90 (Indiana Toll Road) (Des # 0065300, 9700410, and 0065700, respectively), after deployment of vehicle detection / electronic toll collection devices on the Indiana Toll Road west of I-80/94, and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destination: Illinois State Line via I-80/94 17 miles, via I-90 22 miles. Estimated cost: **$65,000.**

9. **NB I-65, near Mile 257.1 (north of 49th Ave) (Lake County)**
   Install TTS in 2011 after the completion of upcoming Interchange Modification / Added Travel Lanes projects on I-80/94 at I-65 (Des # 0065300), after deployment of vehicle detection / electronic toll collection devices on the Indiana Toll Road west of I-65, and after developing / calibrating the algorithms needed to support the TTS in 2010. TTS may be located on a new box truss with the Ridge Road exit sign that is currently located on a double mast arm cantilever on the right. Downstream destination: Illinois State Line via I-80/94 14 miles, via I-90 22 miles. Estimated cost: **$115,000.**

10. **I-65 from US 231 (Exit 247) to US 30 (Exit 253) (Lake County)**
    LOS C, AADT = 37,640, four lanes, high growth area, new interchange planned at 101st Avenue or 109th Avenue. **Full Deployment is recommended** (vehicle detection every mile, CCTV every mile) **during a proposed Added Travel Lanes project** (converting the existing pavement to three lanes per direction) identified in the INDOT Long Range Plan **in 2011**. Estimated cost: **$750,000.**

Total 2011 Deployments ESTIMATED COST = $7,479,000

8.9. 2012 DEPLOYMENTS

1. **I-70 from 0.6 mile east of Post Road (Exit 91) to Mt. Comfort Rd (Exit 96) (Marion and Hancock Counties)**
   Replace full ATMS deployment (vehicle detection every mile, CCTV every mile) as part of the Added Travel Lanes project (Des # 0200699) **in 2012.** Estimated cost: **$625,000.**

2. **I-65 from SR 28 (Exit 158) to US 231 (Exit 193)**
   (Clinton, Tippecanoe, and White Counties) (15 cameras)
   AADT = 30,240 – 47,020, four lanes, moderate to high growth area near Lafayette, cameras needed to support two new DMSs. **Install cameras** near CR 1000W (Clinton-Tippecanoe County Line), CR 900E, Wyndotte Road, SR 25/38, CR 100S / McCarty Lane, SR 26, CR 350E / Eisenhower Road, SR 25, SR 43, CR 725N, CR 100W, Morehouse Road, SR 18, Pine Grove Road, and US 231 **in 2012.** Estimated cost: **$1,125,000.**
   Note: 20 miles of LOS C (SR 28 to SR 43); 15 miles of LOS B (SR 43 to US 231).

3. **I-65 from SR 311 (Exit 9) to US 50 (Exit 50)**
   (Clark, Scott, and Jackson Counties) (17 cameras)
   AADT = 30,770 – 40,770, four lanes, moderate growth area near Sellersburg / Louisville, Scottsburg, and Seymour, cameras needed to support two new DMSs. **Install cameras** south of SR 311 (to monitor DMS operation), and near SR 311 (in lieu of proposed TRIMARC camera), St. Joe Road, Perry Crossing Road, Ebenezer Church Road, Memphis Road, Biggs Road, SR 160, Henryville Rest Area, Clark / Scott County Line Road, Leota Road, SR 56, SR 256, US 31 (Exit 36), *SR 250 (MAGTECH site)*, US 31(Grade Separation), and US 50 **in 2012.** Estimated cost: **$1,200,000.**
   Note: 20 miles of LOS C (SR 311 to SR 56); 21 miles of LOS B (SR 56 to US 50).

4. **I-70 from SR 3 (Exit 123) to Ohio State Line (Mile 156)**
   (Henry and Wayne Counties) (15 cameras)
   AADT = 28,790 – 41,080, four lanes, moderate growth area near Richmond, cameras needed to support two new DMSs, completes Indianapolis to Ohio CCTV coverage on I-70 (system continuity). **Install cameras** near SR 103, CR 400E, Wilbur Wright Road, Old SR 1, SR 1, Washington Road, Centerville Rest Area, Centerville Road, Richmond Weigh Station, US 35, US 27, SR 227, Reservoir Road, US 40, and Ohio SR 320 (to monitor DMS operation; will require agreement with State of Ohio.) **in 2012.** Estimated cost: **$1,125,000.**
   Note: 7 miles of LOS C (US 35 to US 40); 26 miles of LOS B (SR 3 to US 35; US 40 to Ohio State Line).

5. **NB I-65, near Mile 154.4 (Manson-Colfax Rd / Abandoned RR), south of SR 28 (Clinton County)**
   SB I-65, near Mile 198.8 (CR 100S), north of US 231 (Exit 193) (White County)
   Install two new DMSs in 2012 to provide traveler information to motorists in conjunction with the deployment of 15 CCTV cameras from SR 28 to US 231(Exit 193) in 2012. The NB DMS is in advance of the SR 28 / US 52 diversion routes; the SB DMS is in advance of the US 231 / US 52 diversion routes. Estimated cost: **$380,000.**

6. **NB I-65, near Mile 8, south of SR 311 (Clark County)**
   SB I-65, near Mile 52.5 (Walnut Grove Rd), north of US 50 (Jackson County)
   Install two new DMSs in 2012 to provide traveler information to motorists in conjunction with the deployment of 17 CCTV cameras from SR 311 to US 50 in 2012. The NB DMS is in advance of the SR 311 / US 31 diversion routes; the SB DMS is in advance of the US 50 / US 31 diversion routes. The NB DMS, while in the TRIMARC deployment area, would be installed and controlled by INDOT as the DMS serves motorists leaving the TRIMARC deployment area and into INDOT controlled area. Estimated cost: **$380,000.**

7. **EB I-70, near Mile 120.7 (CR 350W), west of SR 3 (Henry County)**
   WB I-70, 1.5 miles east of the Ohio State Line (near Ohio SR 320), east of US 40 (Preble County, Ohio)
   Install two new DMSs in 2012 to provide traveler information to motorists in conjunction with the deployment of 15 CCTV cameras from SR 3 to the Ohio State Line in 2012. The EB DMS is in advance of the SR 3 / US 40 diversion routes; the WB DMS is in advance of the US 40 diversion route. The WB DMS, while in Ohio, would be installed and controlled by INDOT and will require an agreement with the State of Ohio. The placement in Ohio is necessary as the US 40 interchange is immediately west of the State Line. These DMSs complete the Indianapolis to Ohio DMS deployment on I-70. Estimated cost: **$380,000.**

Total 2012 Deployments ESTIMATED COST = $5,215,000

8.10. 2013 DEPLOYMENTS

1. **I-465 from 0.5 mile west of Allisonville Rd (North Leg) (Exit 35) to the bridge over Fall Creek (East Leg) (Mile 39) (Marion County)**
   Replace full ATMS (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes projects (Des #s 0400286 and 0400283) **in 2013.** Estimated cost: **$900,000.**

2. **I-94 from I-90 (Indiana Toll Road) (Exit 16) to SR 49 (Exit 26) (Porter County)**
   Replace temporary devices that were deployed in 2009 and replace **with full ATMS** (vehicle detection every mile, CCTV every mile) as part the Pavement Replacement project (Des # 0400930) **in 2013.** Estimated cost: **$1,250,000.**

3. **I-65 from US 50 (Exit 50) to US 31 (Exit 76)**
   (Jackson and Bartholomew Counties) (11 cameras)
   AADT = 30,380 – 35,600, four lanes, moderate growth area near Seymour and Columbus, cameras needed to support two new DMSs, completes Louisville to Indianapolis CCTV coverage on I-65 (system continuity). **Install cameras** near Seymour Weigh Station, Walnut Grove Road, SR 11, CR 950S, CR 625S, SR 58, CR 200S, SR 46, CR 300N, NB Columbus Rest Area, and SB Columbus Rest Area **in 2013.** Estimated cost: **$825,000.**
   Note: 4 miles of LOS C (SR 58 to SR 46); 22 miles of LOS B (US 50 to SR 58; SR 46 to US 31).

4. **I-70 from US 41/150 (Exit 7) to US 231 (Exit 41)**
   (Vigo, Clay, and Putnam Counties) (13 cameras)
   AADT = 30,450 – 39,530, four lanes, moderate growth area near Terre Haute, cameras needed to support two new DMSs, completes Terre Haute to Indianapolis CCTV coverage on I-70 (system continuity). **Install cameras** near US 41/150, Fruitridge Avenue, SR 46 / Future SR 641, Hyde Road, SR 42, SR 59, Harmony Road, Clay / Putnam County Line Road, Manhattan Road, John Grey Road, SR 243 (two cameras due to wide, tree-filled median, and Poplar Grove Road **in 2013.** Estimated cost: **$975,000.**
   Note: 4 miles of LOS C (US 41/150 to SR 46); 30 miles of LOS B (SR 46 to US 231).

5. **I-94 from SR 49 (Exit 26) to Michigan State Line (Mile 46) (Porter and LaPorte Counties) (10 cameras)**
   Weekday AADT = 30,260 – 41,250 / Summer Friday and Sunday AADT = 52,050 – 63,050, six lanes, within DMS area of influence, moderate growth area near Chesterton and Michigan City, cameras needed to support a new DMS, completes Illinois to Michigan CCTV coverage on I-94 (system continuity). **Install cameras** near Chesterton Weigh Station, Brown Road (CR 500E), Porter / LaPorte County Line Road, US 421, CR 400N, Bleck Road, US 20/35, Warnke Road, Michigan City Rest Area, and CR 1000N **in 2013.** Estimated cost: **$750,000.**
   Note: Weekday: 14 miles of LOS B (SR 49 to US 20/35); 6 miles of LOS A (US 20/35 to Michigan State Line). Summer Friday and Sunday: 14 miles of LOS C (SR 49 to US 20/35); 6 miles of LOS B (US 20/35 to Michigan State Line).

6. **NB I-65, near Mile 45.3 (US 31 grade separation), south of US 50 (Jackson County)**
   SB I-65, near Mile 79.1 (Bartholomew / Shelby County Line Rd), north of US 31 (Exit 76) (Bartholomew County)
   Install two new DMSs in 2013 to provide traveler information to motorists in conjunction with the deployment of 11 CCTV cameras from US 50 to US 31 (Exit 76) in 2013. The NB DMS is in advance of the US 50 / US 31 diversion routes; the SB DMS is in advance of the US 31 diversion route. These DMSs complete the Louisville to Indianapolis DMS deployment on I-65. Estimated cost: **$380,000.**

7. **EB I-70, near Mile 9.7 (Fruitridge Ave), west of SR 46 / Future SR 641 (Vigo County)**
   WB I-70, near Mile 44.9 (CR 650E), east of US 231 (Putnam County)
   Install two new DMSs in 2013 to provide traveler information to motorists in conjunction with the deployment of 13 CCTV cameras from US 41/150 to US 231 in 2013. The EB DMS is in advance of the SR 46 / US 40 diversion routes; the WB DMS is in advance of the US 231 / US 40 diversion routes. The placement of the EB DMS east of US 41/150 instead of west of US 40 near the Illinois State Line is logical since US 40 will be relinquished to local jurisdictions from I-70 to SR 46 upon completion of SR 641 from US 41 to I-70; this location is in advance of a state facility. Eastbound motorists west of this DMS can receive traveler information via the HAR at Mile 1. These DMSs complete the Illinois to Indianapolis DMS deployment on I-70. Estimated cost: **$380,000.**

8. **WB I-94, near Mile 44.9 (CR 1000N), east of US 20/35 (LaPorte County)**
   Install new DMS in 2013 to provide traveler information to motorists in conjunction with the deployment of 10 CCTV cameras from SR 49 to the Michigan State Line in 2013, as well as the 2013 permanent ATMS deployment from I-90 (Indiana Toll Road) to SR 49, replacing the temporary 2009 deployment. The DMS is in advance of the US 20 diversion route. This DMS completes the Illinois to Michigan DMS deployment on I-94. Estimated cost: **$190,000.**

9. **WB I-465 (South Leg), near Mile 0.7 (Keystone Ave) (Marion County)**
   Install TTS in 2013 after the completion of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) and after developing / calibrating the algorithms needed to support the TTS in 2012. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: SR 37 3 miles (in anticipation of future I-69), I-70 8 miles. Estimated cost: **$50,000.**

10. **WB I-465 (South Leg), near Mile 6.2 (White River) (Marion County)**
    Install TTS in 2013 after the completion of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) and after developing / calibrating the algorithms needed to support the TTS in 2012. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 3 miles, I-74 10 miles. Estimated cost: **$50,000.**

11. **SB I-465 (West Leg), near Mile 14.6 (Abandoned RR) (Marion County)**
    Install TTS in 2013 after the completion of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) and after developing / calibrating the algorithms needed to support the TTS in 2012. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 5 miles, SR 37 10 miles (in anticipation of future I-69). Estimated cost: **$50,000.**

12. **WB I-70, near Mile 79.0 (west end of White River bridge) (Marion County)**
    Install TTS in 2013 after the completion of the I-465 West Leg Added Travel Lanes / Interchange Modification project (Des # 0300371) (Accelerate 465) and after developing / calibrating the algorithms needed to support the TTS in 2012. TTS may be located on a new box truss with the existing Harding Street exit sign that is currently located on a double mast arm cantilever on the right. Downstream destination: I-465 6 miles, Airport 9 miles (new access point). Estimated cost: **$100,000.**

13. **EB US 36, west of I-465 (West Leg) between Girls School Rd and High School Rd (Marion County)**
    Install new DMS in 2013 during the US 36 Added Travel Lanes project (Des # 0101115). The DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the Phase 2, 4, and 5 deployment areas, as well as before the I-465 decision point. Rockville Road and other local roadways are available as diversion routes off of I-465. Estimated cost: **$190,000.**

Total 2013 Deployments ESTIMATED COST = $6,090,000

8.11. 2014 DEPLOYMENTS

1. **I-465 from 0.35 mile east of US 31 / Meridian St (North Leg) (Exit 31) to 0.5 mile west of Allisonville Rd (North Leg) (Mile 35) (Hamilton and Marion Counties)**
   Replace full ATMS (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes projects (Des #s 0400304 and 0400289) **in 2014.** Estimated cost: **$900,000.**

2. **I-65 from SR 10 (Exit 230) to US 231 (Exit 247)**
   (Jasper, Newton, and Lake Counties) (7 cameras)
   AADT = 32,240 – 34,480, four lanes, within DMS area of influence, moderate to high growth area near Crown Point, final set of cameras needed to support a new DMS. **Install cameras** near SR 10, Demotte Rest Area, CSX RR, 205th Avenue, *SR 2 (MAGTECH site)*, Lowell Weigh Station, and 153rd Avenue **in 2014.** Estimated cost: **$450,000.**

3. **I-69 from SR 1 (Exit 116) to SR 8 (Exit 129)**
   (Allen and DeKalb Counties) (6 cameras)
   AADT = 33,290 – 34,720, four lanes, within DMS area of influence, high growth area near Fort Wayne; moderate growth area near Auburn. **Install cameras** near Union Chapel Road, Gump / Hursh Road (with proposed new interchange), Allen / DeKalb County Line Road, Auburn Rest Area, CR 11A, and SR 8 **in 2014.** Estimated cost: **$450,000.**

4. **I-65 from US 231 (Exit 193) to SR 10 (Exit 230)**
   (White and Jasper Counties) (11 cameras)
   AADT = 27,980 – 32,280, four lanes, cameras needed to support two new DMSs, completes Indianapolis to Gary CCTV coverage on I-65 (system continuity). **Install cameras** near Wolcott Rest Area, CR 100S, US 24/231, US 231 (Exit 205), SR 16, CR 700S, SR 114, CR 200S, SR 14, CR 400N (Fair Oaks Road), and CSX RR **in 2014.** Estimated cost: **$825,000.**

5. **I-74 from Pleasant View Rd (Exit 101) to SR 44 (Exit 116)**
   (Shelby County) (5 cameras)
   AADT = 28,340 – 34,640, four lanes, within DMS area of influence, moderate growth area near Shelbyville. **Install cameras** near London Road, CR 400W, Fairland Road, SR 9, and SR 44 **in 2014.** Estimated cost: **$375,000.**

6. **I-69 from SR 32/67 (Exit 34) to SR 18 (Exit 64)**
   (Delaware and Grant Counties) (12 cameras)
   AADT = 27,510 – 32,170, four lanes, cameras needed to support two new DMSs. **Install cameras** near CR 400S, CR 100S, SR 332, US 35 / SR 28, CR 950N, Pipe Creek Rest Area, CR 1050S, SR 26, CR 700S, US 35 / SR 22, CR 200S, SR 18 **in 2014.** Estimated cost: **$900,000.**

7. **NB I-65, near Mile 224.5 (CR 400N / Fair Oaks Rd), south of SR 10 (Jasper County)**
   Install new DMS in 2014 to provide traveler information to motorists in conjunction with the deployment of seven CCTV cameras from SR 10 to US 231 (Exit 247) in 2014, as well as the 2011 ATMS deployment from US 231 (Exit 247) to US 30. The DMS is in advance of the SR 10 diversion route. Estimated cost: **$190,000.**

8. **NB I-65, near Mile 190.4 (Pine Grove Rd), south of US 231 (Exit 193) (White County)**
   SB I-65, near Mile 236.9 (205th Ave), north of SR 10 (Lake County)
   Install two new DMSs in 2014 to provide traveler information to motorists in conjunction with the deployment of 11 CCTV cameras from US 231 (Exit 193) to SR 10 in 2014. The NB DMS is in advance of the US 231 diversion route; the SB DMS is in advance of the SR 10 diversion route. These DMSs complete the Indianapolis to Gary DMS deployment on I-65. Estimated cost: **$380,000.**

9. **NB I-69, near Mile 24.9 (Main St), south of SR 9/109 (Madison County)**
   SB I-69, near Mile 62 (CR 200S), north of US 35 / SR 22 (Grant County)
   Install two new DMSs in 2014 to provide traveler information to motorists in conjunction with the deployment of 12 CCTV cameras from SR 32/67 to SR 18 in 2014. The NB DMS is in advance of the SR 9 and SR 67 diversion routes; the SB DMS is in advance of the US 35 / SR 22 diversion route and a recurring winter weather problem area. Estimated cost: **$380,000.**

Total 2014 Deployments ESTIMATED COST = $4,850,000

8.12. 2015 DEPLOYMENTS

1. **I-465 from 0.5 mile north of 46th St (West Leg) (Mile 18.5) 0.3 mile north of I-65 (West Leg) (Exit 20) (Marion County)**
   Replace temporary devices that were deployed as part of Phase 2 and replace **with full ATMS** (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes project (Des # 0200003) **in 2015.** Estimated cost: **$300,000.**

2. **I-69 from I-465 (Exit 0) to 0.5 mile south of 96th St (Exit 3) (Marion County)**
   Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes project (Des # 0400305) **in 2015.** Estimated cost: **$675,000.**

3. **I-65 from I-865 (Exit 129) to SR 267 (Exit 133) (Boone County)**
   Replace full ATMS deployment (vehicle detection every mile, CCTV every mile) as part of the Added Travel Lanes projects (Des #s 0200903 and 0200904) **in 2015.** The northern terminus of the Added Travel Lanes project is US 52; if traffic volumes and Level of Service warrant, then the possibility exists to extend the full ATMS deployment north to US 52 (Exit 141). Estimated cost: **$500,000;** an extension northward to US 52 would increase the cost to $1,500,000.

4. **I-70 from Illinois State Line (Mile 0) to US 41/150 (Exit 7)**
   (Vigo County) (3 cameras)
   AADT = 23,260 – 27,210, four lanes, moderate growth area near Terre Haute, completes Illinois to Indianapolis CCTV coverage on I-70 (system continuity). **Install cameras** near West Terre Haute Weigh Station (US 40 interchange is visible), Clear Creek Rest Area, and Darwin Road **in 2015.** Estimated cost: **$225,000.**

5. **I-69 from SR 18 (Exit 64) to I-469 (S jct) (Exit 96)**
   (Grant, Huntington, Wells, and Allen Counties) (8 cameras)
   AADT = 23,490 – 25,530, four lanes, cameras needed to support two new DMSs, completes Indianapolis to Fort Wayne CCTV coverage on I-69 (system continuity). **Install cameras** near CR 400N / CSX RR, SR 5/218, SR 5, Warren Weigh Station, CR 300S, US 224, NB Markle Rest Area, and SB Markle Rest Area (NB DMS at Mile 94.2 is visible) **in 2015.** Estimated cost: **$600,000.**

6. **I-69 from SR 8 (Exit 129) to Michigan State Line (Mile 157)**
   (DeKalb and Steuben Counties) (10 cameras)
   AADT = 20,320 – 32,180, four lanes, moderate growth areas near Auburn and Angola, cameras needed to support two new DMSs, completes Indianapolis to Michigan CCTV coverage on I-69 (system continuity). **Install cameras** near CR 27, US 6, CR 10, SR 4, Angola Rest Area, US 20, CR 200W, SR 127, I-80/90 (Toll Road), and Lake George Road **in 2015.** Estimated cost: **$750,000.**
   Note: Note: 21 miles of LOS B (SR 8 to CR 200W); 7 miles of LOS A (CR 200W to Michigan State Line). For system continuity purposes, it is reasonable to deploy cameras in the LOS A area.

7. **I-469 from US 30 (Exit 19) to I-69 (N jct) (Exit 31)**
   (Allen County) (4 cameras)
   AADT = 28,290 – 36,130, four lanes, within DMS area of influence, high / moderate growth area, cameras support existing and proposed DMSs on I-69, system continuity. **Install cameras** near US 30, US 24, SR 37, and *Maplecrest Road (MAGTECH site)* **in 2015.** Estimated cost: **$225,000.**
   Note: Note: 2 miles of LOS C (Maplecrest Road to I-69 (N jct)); 10 miles of LOS B (US 30 to Maplecrest Road).

8. **I-469 from I-69 (S jct) (Exit 0) to US 30 (Exit 19)**
   (Allen County) (7 cameras)
   AADT = 14,350 – 22,740, four lanes, within DMS area of influence, cameras support existing and proposed DMSs on I-69, system continuity. **Install cameras** near Indianapolis Road, SR 1, Winchester Road, US 27/33, Marion Center Road, Tillman Road, and Minnich Road **in 2015.** Estimated cost: **$525,000.**
   Note: All 19 miles are LOS A. For the reasons listed above, plus with the likely increase in *interstate* traffic upon the completion of the US 24 Fort Wayne to Toledo corridor, it is reasonable to deploy cameras in this area.

9. **NB I-69, near Mile 53.4 (CR 1050S), south of SR 26 (Grant County)**
   SB I-69, near Mile 99 (Lower Huntington Rd / Airport Expwy (Allen County)
   Install two new DMSs in 2015 to provide traveler information to motorists in conjunction with the deployment of eight CCTV cameras from SR 18 to I-469 (south junction) in 2015. The NB DMS is in advance of the SR 26 diversion route and a recurring winter weather problem area; the SB DMS is in advance of the I-469 diversion route. These DMSs complete the Indianapolis to Fort Wayne DMS deployment on I-69. Estimated cost: **$380,000.**

10. **NB I-69, near Mile 113.5 (Auburn Rd), south of I-469 (N jct) (Allen County)**
    SB I-69, near Mile 157 (Lake George Rd) (Steuben County)
    Install two new DMSs in 2015 to provide traveler information to motorists in conjunction with the deployment of 10 CCTV cameras from SR 8 to the Michigan State Line in 2015, as well as the deployment of five CCTV cameras from SR 1 to SR 8 in 2014. The NB DMS is in advance of the I-469 decision point / SR 1 diversion routes; the SB DMS is in advance of the I-80/90 (Toll Road) decision point / SR 120 / SR127 diversion routes. These DMSs complete the Indianapolis to Michigan DMS deployment on I-69. Estimated cost: **$380,000.**

11. **WB I-469, near Mile 29.2, east of I-69 (N jct) (Allen County)**
    Install new DMS in 2015 to provide traveler information to motorists in conjunction with the deployment of four cameras from US 30 to I-69 (north junction in 2015, as well as the deployment of 10 CCTV cameras on I-69 from SR 8 to the Michigan State Line in 2015, five CCTV cameras from on I-69 from SR 1 to SR 8 in 2014, and 12 CCTV cameras I-69 from I-469 (south junction) to SR 1 in 2011. The DMS is in advance of the I-69 decision point. Estimated cost: **$190,000.**

12. **WB I-469, near Mile 1 (Lafayette Center Rd), east of I-69 (S jct) (Allen County)**
    Install new DMS in 2015 to provide traveler information to motorists in conjunction with the deployment of seven cameras from I-69 (south junction) to US 30 in 2015, as well as the deployment of seven CCTV cameras on I-69 from SR 18 to I-469 (south junction) in 2015, and 12 CCTV cameras I-69 from I-469 (south junction) to SR 1 in 2011. The DMS is in advance of the I-69 decision point. Estimated cost: **$190,000.**

13. **SB I-465 (East Leg), near Mile 37.8 (71st St) (Marion County)**
    Install TTS in 2015 after the completion of the Added Travel Lanes project (Des # 0400283) from 0.5 mile west of I-69 to Fall Creek and after developing / calibrating the algorithms needed to support the TTS in 2014. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-70 6 miles, I-74 11 miles. Estimated cost: **$50,000.**

Total 2015 Deployments ESTIMATED COST = $4,990,000

8.13. 2016 DEPLOYMENTS

1. **I-69 from 0.5 mile south of 96th St (Exit 3) to 0.5 mile north of SR 37 / 116th St (Exit 5) (Marion and Hamilton Counties)**
   Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes project (Des # 0400308) **in 2016.** Estimated cost: **$600,000.**

2. **I-69 from 0.5 mile north of SR 37 / 116th St (Exit 5) to SR 238 (Exit 10) (Hamilton County)**
   Replace full ATMS deployment (and enhance vehicle detection to every ½ mile, CCTV every mile) as part of the Added Travel Lanes project (Des # 0400356) **in 2016.** Estimated cost: **$600,000.**

3. **I-65 from 0.5 mile south of Southport Rd (Exit 103) to 0.25 mile south of I-465 (South Leg) (Exit 106) (Marion County)**
   Replace full ATMS (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes project (Des # 0400909) **in 2016.** Estimated cost: **$600,000.**

4. **I-65 from Whiteland Rd (CR 500N) (Exit 95) to 0.5 mile south of Greenwood Rd (Main St) (Exit 99) (Johnson County)**
   Replace full ATMS (vehicle detection every mile, CCTV every mile) as part the Added Travel Lanes project (Des # 0300840) **in 2016.** Estimated cost: **$500,000.**

5. **NB I-465 (East Leg), near Mile 42.4 (south of 38th St) (Marion County)**
   Install TTS in 2016 after the completion of the Added Travel Lanes projects (Des #s 0400304, 0400289, 0400286, and 0400283) from 0.35 mile east of US 31 to Fall Creek and after developing / calibrating the algorithms needed to support the TTS in 2015. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-69 5 miles, US 31 11 miles. Estimated cost: **$50,000.**

6. **WB I-465 (North Leg), near Mile 35.8 (82nd St) (Marion County)**
   Install TTS in 2016 after the completion of the Added Travel Lanes projects (Des #s 0400304, 0400289, 0400286, and 0400283) from 0.35 mile east of US 31 to Fall Creek and after developing / calibrating the algorithms needed to support the TTS in 2015. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: US 31 5 miles, I-865 11 miles. Estimated cost: **$50,000.**

7. **EB I-465 (North Leg), near Mile 31.9 (east of College Ave) (Hamilton County)**
   Install TTS in 2016 after the completion of the Added Travel Lanes projects (Des #s 0400304, 0400289, 0400286, and 0400283) from 0.35 mile east of US 31 to Fall Creek and after developing / calibrating the algorithms needed to support the TTS in 2015. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-69 5 miles, I-70 12 miles. Estimated cost: **$50,000.**

8. **I-74 (Vermillion, Fountain, Hendricks, Ripley, and Dearborn Counties) (7 cameras)**
   Install cameras in 2016 near:
   Spring Creek Rest Area (Mile 1.5); AADT = 19,320
   Proposed Port of Entry (POE) Weigh Station (Mile 2.7); AADT = 19,320
   Veedersburg Weigh Station (Mile 18.5) (if Mile 2.7 POE not built); AADT = 15,810
   Waynetown Rest Area (Mile 22.4); AADT = 15, 810
   Lizton Rest Area (Mile 56.4); AADT = 16,280
   Batesville Rest Area (Mile 151.5); AADT = 20,750
   West Harrison Weigh Station (Mile 170.5); AADT = 29,530
   Estimated cost: **$525,000.**

9. **I-64 (Posey, Spencer, and Floyd Counties) (3 cameras)**
   Install cameras in 2016 near:
   Black River Rest Area (Mile 7.5); AADT = 11,810
   Dale (Nancy Hanks) Rest Area (Mile 58.0); AADT = 12,510
   Georgetown Rest Area (MAGTECH site) (Mile 114.8); AADT = 31,290
   Estimated cost: **$150,000.**

Total 2016 Deployments ESTIMATED COST = $3,125,000

8.14. 2017 DEPLOYMENTS

1. **I-65 from 0.5 mile south of Greenwood Rd (Main St) (Exit 99) to 0.5 mile south of Southport Rd (Exit 103) (Johnson and Marion Counties)**
   Replace full ATMS (vehicle detection every ½ mile, CCTV every mile) as part the Added Travel Lanes projects (Des #s 0401037 and 0300853) **in 2017.** Estimated cost: **$700,000.**

2. **I-70 from I-65 (North Split) (Exit 83) to Shadeland Ave (Exit 89) (Marion County)**
   Replace full ATMS as part of the Added Travel Lanes project (Des #s 0400399 and 0400400) **in 2017.** Estimated cost: **$1,250,000.**

3. **NB I-465 (West Leg), near Mile 11.0 (N of Airport Expwy) (Marion County)**
   Install TTS in 2017 after the completion of the I-465 Added Travel Lanes project from 0.5 mile north of 46th Street to 0.3 mile north of I-65 (Des # 0200003) and after developing / calibrating the algorithms needed to support the TTS in 2016. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-74 5 miles, I-65 9 miles. Estimated cost: **$50,000.**

4. **SB I-465 (West Leg), near Mile 23.8 (north of 86th St) (Marion County)**
   Install TTS in 2017 after the completion of the I-465 Added Travel Lanes project from 0.5 mile north of 46th Street to 0.3 mile north of I-65 (Des # 0200003) and after developing / calibrating the algorithms needed to support the TTS in 2016. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 S 4 miles, I-74 8 miles. Estimated cost: **$50,000.**

5. **SB I-465 (West Leg), near Mile 19.2 (56th St) (Marion County)**
   Install TTS in 2017 after the completion of the I-465 Added Travel Lanes project from 0.5 mile north of 46th Street to 0.3 mile north of I-65 (Des # 0200003) and after developing / calibrating the algorithms needed to support the TTS in 2016. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-74 3 miles, I-70 10 miles. Estimated cost: **$50,000.**

6. **NB I-465 (West Leg), near Mile 16.6 (34th St) (Marion County)**
   Install TTS in 2017 after the completion of the I-465 Added Travel Lanes project from 0.5 mile north of 46th Street to 0.3 mile north of I-65 (Des # 0200003) and after developing / calibrating the algorithms needed to support the TTS in 2016. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: I-65 3 miles, I-865 8 miles. Estimated cost: **$50,000.**

Total 2017 Deployments ESTIMATED COST = $2,150,000

8.15. 2018 DEPLOYMENTS

1. **EB US 30, west of I-65, approximately 0.7 mile east of SR 55 (Lake County) Install new DMS in 2018** during the proposed Added Travel Lanes project on US 30, currently identified in the INDOT Long Range Plan. This DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The DMS will provide traveler information for motorists in the I-65 ATMS deployment area in advance of the I-65 decision point and SR 53 diversion route. Estimated cost: **$190,000.**

2. **I-65 from the Kentucky State Line (Mile 0) to SR 60 (Mile 7) (Clark County) Install 1/10 Mile Reference Markers in 2018** on this seven mile segment of I-65 to coincide with the Added Travel Lanes (Des # 0300798) and New Bridge Construction (Des # 0201294) projects approaching the Ohio River, or as part of the next sign project on this segment of I-65. AADT is 73,400 – 118,640. This deployment replaces the existing 2/10 Mile Reference Markers on this segment and is located in the TRIMARC deployment area. Estimated cost: **$28,000.**

Total 2018 Deployments ESTIMATED COST = $218,000

8.16. 2019 DEPLOYMENTS

1. **I-465 from 0.5 mile east of US 421 / Michigan Rd (North Leg) (Mile 27) to 0.35 mile east of US 31 / Meridian St (North Leg) (Exit 31) (Marion and Hamilton Counties)**
   Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes projects (Des #s 0400885 and 0400117) **in 2019.** Estimated cost: **$900,000.**

2. **I-65 from Raymond St (Exit 109) to and including the I-70 North Split (Exit 112) (Including I-70 travelover) (Marion County)**
   Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes projects (Des #s 9700400, 0201047, and 0201053) **in 2019.** Estimated cost: **$900,000.**

3. **US 31(Freeway) from I-465 (North Leg) to SR 38 (Hamilton County)**
   Design Year LOS C-D, Design Year AADT = 65,300 – 102,700, six lanes, high growth area. **Recommendation: Full Deployment** (vehicle detection every ½ mile, CCTV every mile) **is recommended for incorporation into the Freeway Upgrade project in 2019.** This project's current 2009 RFC date will change after the FHWA's Record of Decision on the Environmental Impact Statement and the establishment of a sequence of construction. However, this project will likely be constructed in the 2012-2019 time period. Estimated cost: **$2,100,000.**

4. **SB US 31(Freeway), north of I-465 (North Leg), between 106th St and 116th St (Hamilton County)**
   SB US 31(Freeway), north of I-465 (North Leg), between 161st St and SR 32 (Hamilton County)
   Install two new DMSs in 2019 during the Freeway Upgrade project on US 31 (Des # 0300814). The southern DMS between 106th and 116th Streets will provide traveler information for motorists in the US 31 ATMS deployment area and Phase 5 and 3 deployment areas, as well as before the I-465 decision point. This DMS meets the criteria of an INDOT facility with an AADT of 40,000 or greater for at least two miles approaching an Interstate or freeway that is currently deployed with a full ATMS (or is proposed for such). The northern DMS between 161st Street and SR 32 will provide traveler information for motorists in the US 31 ATMS deployment area, as well as before the SR 431 decision point / diversion route. Estimated cost: **$380,000.**

5. **US 31 (Freeway) from I-465 (North Leg) to SR 38 (Hamilton County)**
   Install 1/10 Mile Reference Markers in 2019 on this 12 mile segment of US 31 to coincide with the ATMS deployment as part of the Freeway Upgrade project (Des # 0300814). Projected AADT is 65,300 – 102,700. Estimated cost: **$48,000.**

Total 2019 Deployments ESTIMATED COST = $4,328,000

8.17. 2020 DEPLOYMENTS

1. **I-465 from 0.65 mile north of 86th St (West Leg) (Mile 24) to 0.5 mile east of US 421 / Michigan Rd (North Leg) (Mile 27) (Marion and Boone Counties)**
   Replace full ATMS deployment (vehicle detection every ½ mile, CCTV every mile) as part of the Added Travel Lanes project (Des #s 0400881) **in 2020.** Estimated cost: **$675,000.**

2. **I-69 from SR 144 to I-465 (South Leg)**
   (Johnson and Marion Counties)
   Specific Design Year LOS and Design Year AADT are not available at this time but will be determined during the current Tier 2 Environmental studies. However, the Tier 1 Environmental study identified eight lanes in this high growth area. **Recommendation: Full Deployment** (vehicle detection every ½ mile in the northern segments (likely north of Smith Valley Road); every mile in the southern segments, CCTV every mile) **is recommended for incorporation into the Freeway Upgrade project in 2020.** Estimated cost: **$1,675,000.**

3. **NB I-69, south of I-465 (South Leg), between County Line Rd and Southport Rd (Marion County)**
   Install new DMS in 2020 during the proposed Road Construction project on I-69. The DMS will provide traveler information for motorists in the I-69 ATMS deployment area and Phase 4 and 2 deployment areas, as well as before the I-465 decision point.
   Note: Additional DMSs are likely in the proposed I-69 corridor between Evansville and Indianapolis; decisions can be made after the completion of the Tier 2 Environmental studies currently underway. Estimated cost: **$190,000.**

4. **I-69 from SR 144 to I-465 (South Leg) (Johnson and Marion Counties)**
   Install 1/10 Mile (north of Smith Valley Rd) and 2/10 Mile (SR 144 to Smith Valley Rd) Reference Markers in 2020 on this 10 mile segment of I-69 to coincide with the ATMS deployment as part of the Freeway Upgrade project. Specific Design Year AADT is not available at this time but will be determined during the current Tier 2 Environmental studies. However, the Tier 1 Environmental study identified eight lanes in this high growth area. Estimated cost: **$34,000** ($28,000 for seven miles of 1/10 RM north of Smith Valley Road; $6,000 for three miles of 2/10 RM from SR 144 to Smith Valley Road).

Total 2020 Deployments ESTIMATED COST = $2,574,000

8.18. 2021 DEPLOYMENTS

1. **SB US 31 (Freeway), near Mile 135.0 (south of SR 38) (Hamilton County) Install TTS in 2021** after the completion of the US 31 Freeway Upgrade from I-465 (North Leg) to SR 38 (Des # 0300814) and after developing / calibrating the algorithms needed to support the TTS in 2020. TTS may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destinations: SR 431 6 miles, I-465 11 miles. Estimated cost: **$50,000.**

Total 2021 Deployments ESTIMATED COST = $50,000

8.19. 2022 DEPLOYMENTS

1. **NB I-69, near Smith Valley Rd (Johnson County)**
   Install TTS in 2022 after the completion of I-69 from SR 144 to I-465 (South Leg) and after developing / calibrating the algorithms needed to support the TTS in 2021. TTS location is dependent upon the southern beginning of ½ mile vehicle detection (currently proposed to begin at Smith Valley Road) and may be located on an overhead balanced cantilever (butterfly) on the median barrier wall. Downstream destination: I-465. Estimated cost: **$50,000.**

Total 2022 Deployments ESTIMATED COST = $50,000

8.20. NON YEAR-SPECIFIC DEPLOYMENTS (Intermediate Reference Location Signs (½ Mile Reference Markers) on Rural Interstates)

The **deployment of Intermediate Reference Location Signs at ½ mile intervals** (with a ".0" at the whole number mile locations and ".5" placed at ½ mile locations, per the MUTCD) on all Interstates outside of urban areas with Intermediate Enhanced Reference Location Signs **should occur as part of sign replacement projects or during reconstruction projects and thus is not prioritized by year.** The **estimated cost** for deployment of Intermediate Reference Location Signs at ½ mile intervals **includes the cost of replacing the existing one mile signs.**

I-64 (108 of 123 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 0 to Mile 21 and from Mile 31 to Mile 118. Estimated cost: **$86,000.**

I-65 (192 of 262 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 16 to Mile 95 and from Mile 133 to Mile 246. Estimated cost: **$154,000.**

I-69 (124 of 157 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 10 to Mile 94 and from Mile 117 to Mile 157. Estimated cost: **$99,000.**

I-70 (125 of 156 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 0 to Mile 65 and from Mile 96 to Mile 156. Estimated cost: **$100,000.**

I-74 (137 of 171 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 0 to Mile 66 and from Mile 100 to Mile 171. Estimated cost: **$110,000.**

I-94 (19 of 29 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 26 to Mile 45. Estimated cost: **$15,000.**

I-275 (3 of 3 miles)
Install Intermediate Enhanced Reference Location Signs (½ Mile Reference Markers) from Mile 0 to Mile 3. Estimated cost: **$2,000.**

Total Non Year-Specific Deployments (Intermediate Reference Location Signs (½ Mile Reference Markers)) **ESTIMATED COST: $566,000**

8.21. DEPLOYMENTS WITHOUT DESIGNATED COSTS

8.21.1. Proposed Expansions of the Hoosier Helper FSP

The Hoosier Helper Freeway Service Patrol historically has been a function of INDOT's Districts in which they operate and as such is more operations-oriented versus the capital improvement/fixed device-orientation of the majority of this document. Routes and hours of the day in service are based upon need, and more significantly, availability of personnel to fill the need, a variable that is difficult to predict. Therefore, no specific implementation years are identified nor are cost estimates developed. Nevertheless, guidance is provided to assure a reasonably uniform Hoosier Helper FSP deployment on a statewide basis.

The following segments of freeway are not currently served by the Hoosier Helper FSP but meet at least three of the criteria in Section 7.6.1 in Chapter 7 and are recommended for implementation:

- **I-65 from CR 500N (Whiteland Rd) (Exit 95) to Main St (Greenwood Rd) (Exit 99)** (ATMS, freeway, LOS D or worse)
- **I-65 from Main St (Greenwood Rd) (Exit 99) to Southport Rd (Exit 103)** (ATMS, freeway, AADT 75,000+, contiguous to LOS D or worse)
- **I-65 from the I-70 North Split (Exit 112) to 38th St (Exit 119)** (ATMS, freeway, AADT 75,000+, LOS D or worse)
- **I-65 from 38th St (Exit 119) to Lafayette Rd (Exit 121)** (ATMS, freeway, contiguous to LOS D or worse)
- **I-65 from Lafayette Rd (Exit 121) to 71st St (Exit 124)** (ATMS, freeway, system continuity)
- **I-65 from 71st St (Exit 124) to I-865 (Exit 129)** (ATMS, freeway, contiguous to LOS D or worse)
- **I-65 from I-865 (Exit 129) to SR 267 (Exit 133)** (ATMS, freeway, LOS D or worse)

- **I-69 from 96th St (Exit 3) to SR 37 / 116th St (Exit 5)** (ATMS, freeway, AADT 75,000+, LOS D or worse)
- **I-69 from SR 37 / 116th St (Exit 5) to SR 238 (Exit 10)** (ATMS, freeway, LOS D or worse)

- **I-70 from Airport Expwy (Exit 75) to Holt Rd (Exit 77)** (ATMS, freeway, AADT 75,000+, contiguous to LOS D or worse)
- **I-70 from Holt Rd (Exit 77) to Harding St (Exit 78)** (ATMS, freeway, AADT 75,000+, LOS D or worse)
- **I-70 from Post Rd (Exit 91) to Mt. Comfort Road (Exit 96)** (ATMS, freeway, LOS D or worse)

- **I-465 from 56th St (West Leg) (Exit 19) to US 31 (North Leg) (Exit 31)** (ATMS, freeway, AADT 75,000+, LOS D or worse)

It should be noted that while I-70 from SR 267 to the Airport Expressway does not meet three of the criteria at this time, it is very likely that it will in the near future (especially the segments from SR 267 to I-465 (West Leg)) due to high growth in the area and the completion of the new Midfield Terminal at Indianapolis International Airport in 2008. Therefore, it should be considered for deployment of the Hoosier Helper FSP.

8.21.2. Fiber Optics

Recent Added Travel Lanes and Pavement Replacement projects on the Interstate System in Indiana have provided the opportunity to place conduit for future deployment of fiber optics in INDOT Right-of-Way. Ultimately, a fiber optic system along Indiana's key Interstate highways will supersede the current wireless microwave communications system component of INDOT's ITS deployment. Other INDOT divisions, most notably the Systems Technology Division, will benefit from a statewide fiber optic deployment.

The INDOT 2000-2025 Long Range Plan identifies numerous Added Travel Lanes projects on the Interstate System that will provide an opportunity to implement conduit and ultimately, fiber optics on a significant portion of the Interstate System. Many of these projects have been programmed into SPMS. Pavement Replacement projects and Road Reconstruction projects where Added Lanes are not planned for also provide an opportunity for conduit and fiber optic deployment.

The current practice of implementing conduit as part of larger Major Capital Improvements on the Interstate System (and fiber optics where appropriate) should continue. Projects are listed by road in Chapter 3, but are not repeated here due to the quantity and changing nature of projects, coupled with the overall low cost of this deployment.

8.22. SUMMARY / CONCLUSION

The preceding pages chronologically outlined ITS recommendations and provided preliminary cost estimates for field-oriented devices for the next 15-20 years. *Chapter 7 grouped deployments by deployment type and provided greater detail*, especially in regards to the determination of priority. The following summarizes the estimated costs:

2005 Deployments	$4,635,000
2006 Deployments	1,220,000
2007 Deployments	13,548,000
2008 Deployments	7,939,000
2009 Deployments	4,113,000
2010 Deployments	5,455,000
2011 Deployments	7,479,000
2012 Deployments	5,215,000
2013 Deployments	6,090,000
2014 Deployments	4,850,000
2015 Deployments	4,990,000
2016 Deployments	3,125,000
2017 Deployments	2,150,000
2018 Deployments	218,000
2019 Deployments	4,328,000
2020 Deployments	2,574,000
2021 Deployments	50,000
2022 Deployments	50,000
Non Year-Specific Deployments	566,000
TOTAL ESTIMATED COST	**$78,595,000**

Predicting the future is a difficult task. As with any highway project, the deployment dates in this document are subject to change due to a variety of circumstances, including but not limited to funding constraints, staffing and workload constraints, delays to the larger projects that some of these ITS deployments are a component of, technology changes, etc. Similarly, the estimated costs are subject to change due to changes in technology and the fact that they are very preliminary in nature. Furthermore, some components will likely go up in cost over time, while some components, particularly the technological ones, are likely to go down in the future. As such, this Strategic Plan will be updated periodically to adapt to changing needs and priorities on INDOT's system, as well as the invariable changes to the overall INDOT program of highway improvements over time.

Finally, this document focused on the deployment of the primary field-oriented devices, what might traditionally be called “projects” at INDOT. Nevertheless, there are many other ITS activities underway or planned in the future at INDOT, including, but certainly not limited to, 511 travel information deployment, commercial vehicle / virtual weigh station coordination, statewide Highway Advisory Radio (HAR) flasher installation, field device maintenance, Gary-Chicago-Milwaukee ITS Priority Corridor coordination, Incident Management plan development, etc. Some of these activities are studied elsewhere (such as 511 deployment) or are reasonably well-defined so as to not need direction from the Strategic Plan. Regardless, all are important elements of ITS technologies and strategies which are utilized to save motorists lives, time, and money.