PRESENTING IBI GROUP'S GLOBAL PRACTICE

Toll Services & Systems

IBI

INFRASTRUCTURE INTELLIGENCE BUILDINGS

Toll Services & Systems

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Defining the cities of tomorrow

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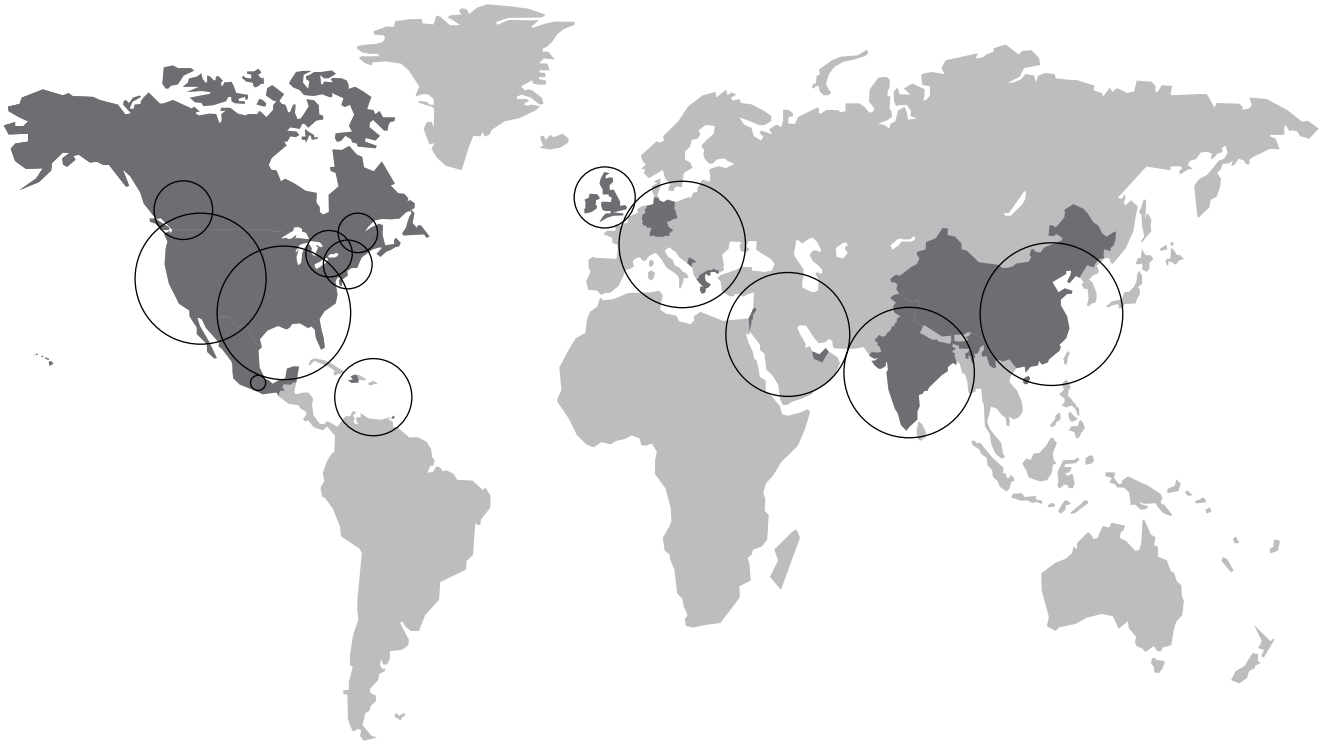

Our Firm

Defining the cities of tomorrow.

We are a global team of dedicated and experienced architects, engineers, planners, designers, and technology professionals who share a common desire – to help our clients create livable, sustainable, and advanced urban environments.

From high-rises to industrial buildings, schools to state-of-the-art hospitals, transit stations to highways, airports to toll systems, bike lanes to parks, we design every aspect of a truly integrated city for people to live, work, and play.

Our collaborative and combined approach focuses not only on creating the best solutions today, but also determining the right solutions for tomorrow.

We believe cities in the future must be designed with intelligent systems, sustainable buildings, efficient infrastructure, and a human touch.

IBI – Defining the cities of tomorrow.

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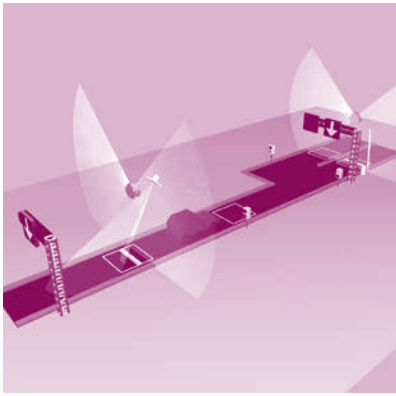
INNOVATIVE CONCEPTS

ECONOMICALLY EFFICIENT

OPERATIONALLY PRACTICAL



TECHNOLOGICALLY FEASIBLE

Toll Services & Systems Expertise

IBI Group offers our public and private sector clients a complete range of tolling related consulting services: research and development, feasibility analysis, preliminary engineering and cost estimation, detailed design for operations, systems, and facilities, system procurement, implementation oversight, and operations advice.

IBI Group is also a toll system integrator; developing, implementing, and supporting revenue collection application software for back office, customer service, host, and toll zone systems that incorporate a wide range of toll devices and technologies from vendors in North America, Europe, and South Asia.

Our system implementations enable all aspects of toll operations, providing:

Roadside solutions including electronic toll collection using on board devices and/or image capture of vehicle license plates; self-serve toll collection using automatic payment machines or coin machines; and attended toll collection using cash, credit/debit, smart card, and electronic payment options; and

Back-office solutions including managing transponders/ smartcards, setting up accounts, creating statements and mailings, interfacing with external financial services such as banks, credit processors, and cash transfer companies, tracking payments, identifying delinquent accounts, and processing images.

IBI

PANYNJ AET FEASIBILITY STUDY

NEW YORK & NEW JERSEY, UNITED STATES

CLIENT PORT AUTHORITY OF NEW YORK & NEW JERSEY

1

The Port Authority of New York and New Jersey (PANYNJ), like many toll agencies around the world, has been closely observing the early adopters of All-Electronic Tolling (AET). Removing in-lane cash payment can result in fewer delays, reduced emissions, and lower operating costs. However, not every change under AET is a benefit – an increased number of video transactions, and a heightened reliance on license plate identification and post-travel customer invoicing suggest that the business case for AET should be closely examined.

Leading a multi-consultancy team, IBI Group examined the operational, financial and customer impacts of moving to AET. The project deliverables included an AET Concept of Operations, which describes how PANYNJ's tolling business would operate in a cashless environment; a financial model, which examines net financial impact of moving to AET; customer focus groups and surveys to understand the likely customer response to AET; and a legal review to examine the extent to which existing legislation supports AET.

TOLL SERVICES & SYSTEMS

All-Electronic Tolling/Open Road Tolling

Projects for which IBI Group assisted clients with technical, operational, and economic evaluation of potential implementation or changeover to All-Electronic Tolling or the similar concepts of Open Road Tolling and Free Flow Tolling.

IBI

STATEWIDE TOLLING FEASIBILITY

CONNECTICUT, UNITED STATES

CLIENT CONNECTICUT OFFICE OF POLICY AND MANAGEMENT

The Connecticut Office of Policy and Management wanted to understand how tolling and congestion pricing could be implemented in Connecticut to address funding issues and tackle rising congestion. A multi-consultant team defined 10 possible AET/ORT implementation options including converting HOV to HOT lanes, express lane tolling, truck only tolling, pricing highways as a function of their congestion, and tolling all vehicle miles traveled in the state. IBI Group was responsible for defining the roadside and back office components needed to implement each option, along with the likely costs of such a deployment. IBI Group also designed the implementation tasks and timelines for each option and potential privacy issues faced by its users.

US-301 TOLLING APPROACH

DELAWARE, UNITED STATES

The Delaware Department of Transportation is planning to build a new US-301 as a limited access toll highway generally in the same corridor as the existing highway. The new US-301 will provide an alternate route to I-95. The plan includes a single mainline toll plaza near the Maryland border, as well as ramp plazas at three interchange locations. As a sub-consultant, IBI Group prepared a comprehensive business case analysis comparing Open Road Tolling (including lay-by cash plazas) with All-Electronic Tolling. This work included assessment of the suitability of various technology options, ramp and mainline toll layouts, and image toll billing concepts. We also contributed to the capital cost estimates. IBI Group utilized its detailed Transaction Flow Model to assess financial operations in terms of the potential revenue, cost, and leakage associated with ORT and AET toll options. Subsequently, IBI Group has assisted the project group with preparation and presentation of the US-301 project to financing agencies.

CLIENT DELAWARE DEPARTMENT OF TRANSPORTATION,

HUMBER BRIDGE TOLL SYSTEM REPLACEMENT

ENGLAND, UNITED KINGDOM

The Humber Bridge is a two-lane dual carriageway suspension bridge across the Humber Estuary, located in Yorkshire. The bridge was opened to traffic on June 24 1981. Tolls are levied on vehicles crossing the bridge in both directions and will continue to be levied until the debt for construction of the bridge has been re-paid. In June 2010, the Humber Bridge Board approved the upgrade of the existing toll collection system to include free flow tolling. IBI Group is responsible for the design and specification of the toll collection aspects of this upgrade. The implementation includes Open Road Tolling with lay-by plaza for attended toll collection.

IBI Group's responsibilities included:

- Development of technical and operational requirements for free flow tolling options;
- Analysis of options to modify the current classification scheme to make it suitable for free flow tolling;
- Consideration of options for a temporary/back-up toll collection system which could be used in advance of the full toll system upgrade coming on-line; and
- Participation in the detailed design and procurement.

CLIENT THE HUMBER BRIDGE BOARD

HIGHWAY 407 EAST

ONTARIO, CANADA

IBI Group provided advisory services for identification of key performance indicators and performance measurement targets to Infrastructure Ontario for Highway 407 East Toll Operation. IBI Group's extensive North American experience with toll system performance based contracts was used to develop an appropriate set of criteria for Highway 407 East. Over 600 KPI for roadside, customer service and back office were investigated, grouped and consolidated. We also provided preliminary advice to Ontario regarding its role and responsibilities as toll facility owner and its interface with the contracted operator.

407 ETR

ONTARIO, CANADA

IBI Group provided services for the original Highway 407 project in three independent areas. We assisted the Ministry of Transportation of Ontario with the preparation of traffic and toll revenue estimates using a variety of toll levels and tolling strategies.

This included an origin destination survey to obtain travel data from approximately 20,000 travellers in the Highway 407 corridor. We provided direct consulting advice to the design-build consortium on the toll collection systems and opportunities to combine toll technology with traffic management systems. Finally, IBI Group developed an early registration database application to enable transponder distribution in advance of the full toll system implementation.

CLIENTS INFRASTRUCTURE ONTARIO
MINISTRY OF TRANSPORTATION OF ONTARIO (MTO)
407 ETR

MERSEY GATEWAY TOLL SYSTEM ADVISORY SERVICES

ENGLAND, UNITED KINGDOM

CLIENT HALTON BOROUGH COUNCIL

The £600 million Mersey Gateway is a proposed six-lane bridge over the River Mersey in Northwest England (near Liverpool). It is to be financed with public and private sector funds and operated as a concession. IBI Group has provided a range of tolling advisory services to Halton Borough Council, the promoters of the project. These have included: reviewing the initial bridge designs from a tolling operations perspective; assessment of different tolling options for the bridges; assessment of the capital and operating costs of different tolling options; revenue and revenue loss projections; and detailed consideration of the financial and non-financial impacts of adopting free-flow tolling.

M-50 BARRIER-FREE TOLLING

IRELAND

The M-50 motorway is the primary route around Dublin, Ireland. It carries 100,000 vehicles per day with two lanes in each direction and is heavily congested for large parts of the day. Historically, the toll plaza was a major contributor to this congestion. Thus, the National Roads Authority (NRA) replaced the plaza with a barrier-free tolling system. The NRA commissioned IBI Group to help procure a private sector company to carry out a range of enforcement activities targeted at anyone who does not pay the appropriate charge in response to receiving a notice issued by the operator Bet Eire Flow. The role of this private sector Enforcement Service Provider (ESP) includes dealing with toll payment violations assigned to vehicles registered inside and outside Ireland. IBI Group supported the NRA as it prequalified six consortia to tender for the role of the ESP. IBI Group prepared the complete tender documentation and specifications, and assisted in the tender evaluation and selection of the ESP.

CLIENT NATIONAL ROADS AUTHORITY (NRA)

FLORIDA MANAGED LANES
FLORIDA, UNITED STATES
CLIENT STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

2

Florida DOT is expanding its managed lane program on I-95 and is implementing additional managed lanes on I-75 (for 20 miles connecting SR-826 in Miami Lakes to I-595 in Weston) and reversible lanes on I-595 (for 11 miles connecting I-75 in Weston to I-95 in Fort Lauderdale). IBI Group created the software specifications for the initial phase of the I-95 Express Lanes System, which consists of a single toll segment in each direction in Miami-Dade County and defines toll rates that are based on time of day and day of week. Subsequently, FDOT commissioned IBI Group to design, develop and deploy an enhanced, fully dynamic, next generation version of the Express Lanes Software that will be used to manage traffic on I-95, I-595, and I-75. The "next generation" version of the Express Lanes software will be truly dynamic; recalculating express lanes segment and trip tolls at configurable intervals based on real-time traffic data received from field detectors. Time of Day, Day of Week, and Manual modes of operation will also be available. The software will determine the travel time from upstream dynamic signs displaying toll amount and status to the toll zones and will manage message display, including timing, on all dynamic signs in the system. There will be advanced, express lanes-specific, automatic response plan generation functionality.

TOLL SERVICES & SYSTEMS

Managed Lanes

Projects related to the planning, design, and/or implementation of special purpose highway lane operation, including: High Occupancy/Toll Lanes, Express Lanes, and Managed Motorways.

IBI

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SR-91 EXPRESS LANES

CALIFORNIA, UNITED STATES

The SR-91 Express Lanes are internationally recognized as a leading-edge example of open-road tolling (ORT) and congestion pricing. As part of an on-going program of improvements to the operation of the corridor, the Orange County Transportation Authority (OCTA) reviewed opportunities for more advanced forms of value pricing based on changing traffic conditions and to enhance the travel time and traffic monitoring on the facility.

IBI Group conducted a study to assist OCTA in evaluating value pricing (including dynamic pricing) options for the SR-91 Express Lanes, assisted OCTA in successfully applying for FHWA Value Pricing Pilot Program funds and lead a cross-departmental team providing support on the planning and design phases, including:

- Developing requirements and recommendations for advanced travel time and speed monitoring systems;
- Developing methodologies and rule sets for moving from schedule-based time of day pricing to near real-time dynamic pricing based on current traffic conditions; and
- Developing a pilot program for testing the proposed dynamic pricing approaches that integrate with the existing toll systems.

CLIENT ORANGE COUNTY TRANSPORTATION AUTHORITY (OCTA)

MANAGED MOTORWAYS

ENGLAND, UNITED KINGDOM

Managed Motorways refers to the combined use of dynamic speed control and hard shoulder running to provide additional highway capacity without the need for road widening. Dynamically set speed limits (with enforcement cameras) create smoother traffic flow and a reduced risk of accidents. The Managed Motorway is monitored through full CCTV coverage and densely spaced traffic sensors. The Highways Agency is progressing with an ambitious program of Managed Motorways deployment that could lead to 650 km of Controlled Motorways (dynamic speed limits) and Hard Shoulder Running (opening of the hard shoulder in peak hours) operational by 2025, with some of the early schemes operational in 2012. The scale of the Managed Motorway programme will set a new standard for highway operation in the UK and will transform drivers' perceptions of the highway environment. IBI Group is the Technical Advisor to the Highways Agency's Operations Programme Office for Managed Motorways deployment. Our services have included:

- Development of an Operational Cost Model to be used by the Highways Agency Board to review project feasibility;
- Development of an Issues Report outlining Operational and Technological issues that are critical for success;
- Development of rules defining how Managed Motorways will be operated and maintained;
- Revisions to the Highways Agency's Project Control Framework which is being used to guide the development of Managed Motorways projects;
- Liaison activities between Managed Motorway program related work streams and the Operations Program Office; and,
- General advice on Operations / Technology related matters to the Operations Program Office.

CLIENT HIGHWAYS AGENCY

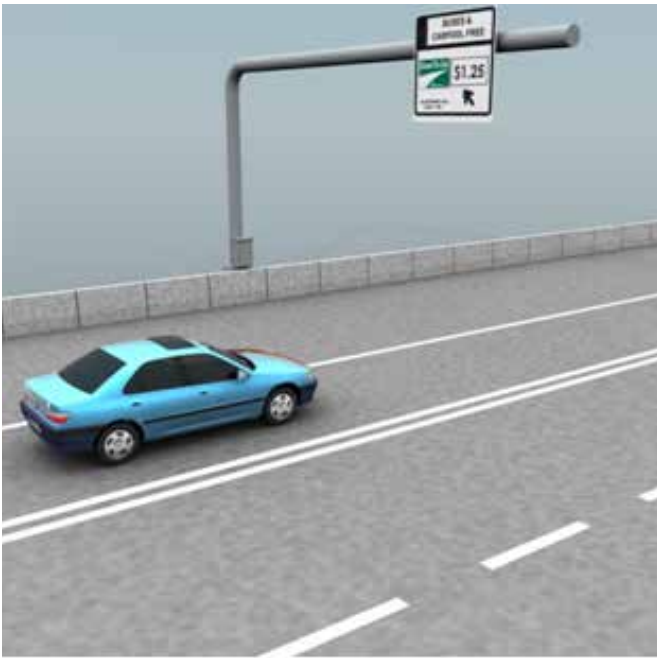
LOS ANGELES COUNTY EXPRESSLANES

CALIFORNIA, UNITED STATES

Los Angeles Metro and Caltrans District 7 are working together on a demonstration project where existing carpool lanes on the I-10 and I-110 freeways in Los Angeles County are converted to High Occupancy Toll (HOT) Lanes – branded ExpressLanes – allowing single occupant vehicles to be charged for the use of the HOV lanes. The project goal is to improve mobility and provide congestion relief on the I 10 and I-110 corridors through the introduction of congestion pricing along with transit improvements.

Both of these facilities present significant challenges in terms of available capacity, physical constraints, and anticipated implementation timelines. IBI Group led the conceptual design of the ITS field infrastructure, tolling infrastructure improvements, back office system requirements, and operations. Tasks included the conceptual design of a fiber optic Ethernet network, tolling infrastructure design, Variable Message Signs, CCTV camera systems, and electrical design and permitting, and coordination with electrical service providers. The project included the preparation of plans, specifications and construction costs estimates and the development of contract documents for a Design Build Operate Maintain (DBOM) Request for Proposal.

CLIENT LOS ANGELES METRO AND CALTRANS DISTRICT 7



SR-167 HIGH OCCUPANCY/TOLL LANES

WASHINGTON, UNITED STATES

The SR-167 HOT Lanes pilot project implemented a HOT Lane system along a congested segment of SR-167 between Auburn and Renton in Washington State. IBI Group was part of the consultant team that developed the Concept of Operations and was then retained to develop the plans, specifications and estimates for the ITS and toll infrastructure elements of the pilot.

IBI Group served as the Owner's Engineer for the implementation of the tolling system and the interface to the existing statewide tolling customer service back office. The pilot has been expanded to include three new tolling zones and IBI Group is responsible for developing plans, specifications, and estimates for the ITS, tolling and communications infrastructure elements in these zones.

CLIENT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

3

TFL – LONDON CONGESTION CHARGING

ENGLAND, UNITED KINGDOM
CLIENT TRANSPORT FOR LONDON

IBI Group has been retained by Transport for London (TfL) in a number of areas related to toll and traffic management systems, including the London Congestion Charging Scheme. For the Congestion Charging scheme, IBI Group services included strategy development, change management, governance, program management, and management of existing infrastructure, including testing of emerging technologies.

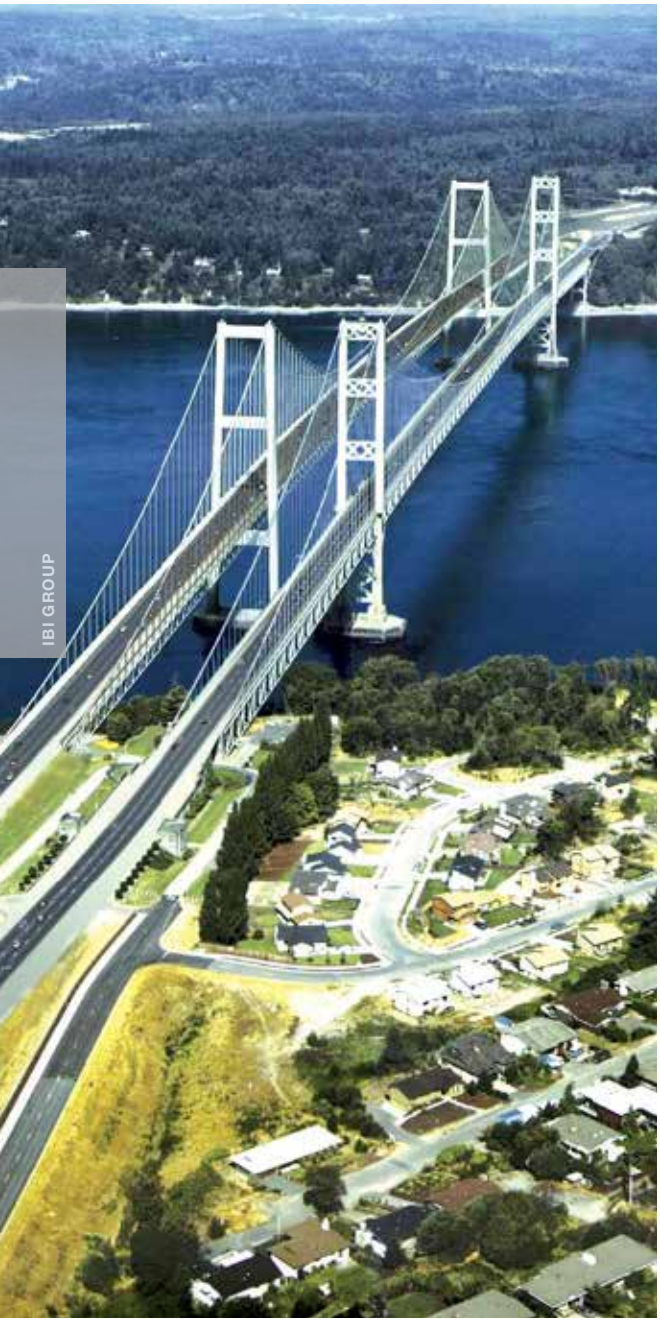
TOLL SERVICES & SYSTEMS

Owner's Engineer

Projects for which IBI Group provided planning, design, and/or implementation oversight services on behalf of the project owner.

NEW BRIDGE FOR THE ST. LAWRENCE CORRIDOR – ITS, TOLLING, ELECTRICAL, AND LIGHTING
QUÉBEC, CANADA
CLIENT INFRASTRUCTURE CANADA

The Government of Canada is proceeding with an expedited schedule for a new bridge across the St. Lawrence River at Montréal, replacing the ageing Champlain Bridge. IBI Group was commisssioned to conduct preliminary studies and prepare technical requirements to identify options for the implementation and operation of Intelligent Transportation Systems, tolling systems, lighting systems, and related electrical systems for this critical transportation link in the Montréal region. Extensive stakeholder consultation was a primary component of the preliminary studies.



IBI GROUP

RE-INTRODUCING TOLLS TO WASHINGTON STATE

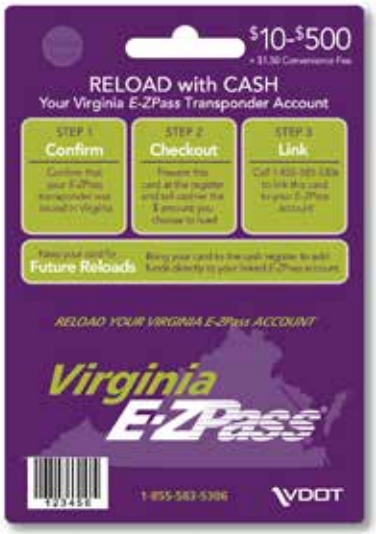
WASHINGTON, UNITED STATES

IBI Group is working for the Washington State Department of Transportation (WSDOT) as the Owner's Engineer for the implementation of toll collection, after many years without any toll facilities in the state. Projects include:

- Overseeing Customer Service Center (CSC) Implementation: Program management, system implementation and operations oversight for new Statewide CSC back office and facilities;
- Overseeing Electronic Toll Collection (ETC) Implementation: Design, testing and installation oversight for Tacoma Narrows Bridge (TNB) ETC system;
- Implementing HOT Lanes: Toll system integration and enforcement expertise for the SR-167 High Occupancy/Toll (HOT) Lanes Pilot Project; and
- Planning Future Toll Facilities and Technologies: Answering the questions of where, when and how future pricing projects and the latest technologies can benefit Washington.

Additionally, IBI Group has provided ITS and tolling field infrastructure design services for I-5 Everett HOV Design-Build, SR520 Floating Bridge Replacement, and I-5 HOV Expansion.

CLIENT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION



VDOT ON-CALL TOLL CONSULTING SERVICES

VIRGINIA, UNITED STATES

IBI Group has supported VDOT for a decade; completing a wide variety of tolling related task orders covering technical design, benefit cost analysis, testing, conceptual design, financial feasibility review, project management, procurement, marketing, and operations oversight. As well as being responsive to VDOT requests, we have been proactive in identifying current risks and opportunities leading to implementation of service improvements and cost savings.

IBI Group supports VDOT's state-wide E-ZPass and violation processing operation which services all toll facilities within the state. This support includes needs analysis, specifications development, procurement support, and monitoring of the transition process between contractors. We have managed expansion of the program to provide regional interoperability, HOT lanes processing, retail tag distribution, and a cash replenishment network. Other tasks include: toll system testing and validation; performance requirements development; maintenance and operations requirements for public-private partnerships; traffic and revenue study peer review; All-Electronic Tolling system specifications and financial analysis; plaza layout traffic modeling and design; and next generation tolling analysis for the state legislature.

CLIENT VIRGINIA DEPARTMENT OF TRANSPORTATION

TAMAR BRIDGE AND TORPOINT FERRY

ENGLAND, UNITED KINGDOM

CLIENT TAMAR BRIDGE & TORPOINT FERRY JOINT COMMITTEE

The Tamar Bridge on the A38 at Plymouth was the first major suspension bridge to be constructed in the UK after the Second World War. Nearby, Torpoint Ferry provides an alternate crossing between the local communities. They are operated by a joint committee which decided to replace the fully manual toll / fare collection systems with a common system enabling transponder based electronic collection at both facilities. Ferry attendants use hand-held RF readers to process vehicle transactions during the short crossing. IBI Group provided: detailed design of toll / fare collection systems for bridge and ferry; detailed design of a new toll plaza, all civil and highway infrastructure, and all communications systems; selection of a contractor for systems and highway design; and oversight services for supervision of construction, installation, commissioning, and integration by the contractor.

DELDOT TOLLING SERVICES

DELAWARE, UNITED STATES

CLIENT DELAWARE DEPARTMENT OF TRANSPORTATION

On-Call Toll Consultant – IBI Group completed a detailed assessment of existing systems in order to define a strategy for upgrades to the system. Partial and full system upgrade options were assessed from a financial, operations and maintenance perspective.

I-95 Newark ORT Conversion – IBI Group advised the overall project design engineers on the toll procurement approach, contract documents, interoperability with E-ZPass Group transponder technology and transition from existing system to open road tolling, oversight of the construction of the ORT facilities, and upgrade of existing toll plazas. IBI Group prepared the toll system RFQ and RFP material, engineering cost estimates for the tolling elements of the Contract, and a review of the ORT design, equipment, system, and software testing regime. We also provided implementation oversight and operational support during transition to the new ORT system.

4

FIVE TOLL ROADS IN CHILE

SANTIAGO AREA, CHILE

CLIENT CANADA PENSION PLAN INVESTMENT BOARD

IBI Group toll and ITS experts travelled to Chile to investigate operations at 5 toll roads; conducting a toll collection system and interoperability review, a CCTV network and related traffic management system review, and SCADA tunnel system review. The experts met with the toll and ITS operations management and operations teams, observed operations and systems, and reviewed available site documentation; and prepared reports to our client regarding good practices both on operations and maintenance, potential risks and mitigation measures, and replacement schemes as applicable.

TOLL SERVICES & SYSTEMS

Concessionaire Support

Projects for which IBI Group provides toll, traffic management, and traveller information system planning, design, and operational advice to companies preparing to bid on concession or P3 projects.

SH-130 SEGMENTS 5 AND 6

TEXAS, UNITED STATES

CLIENT CINTRA

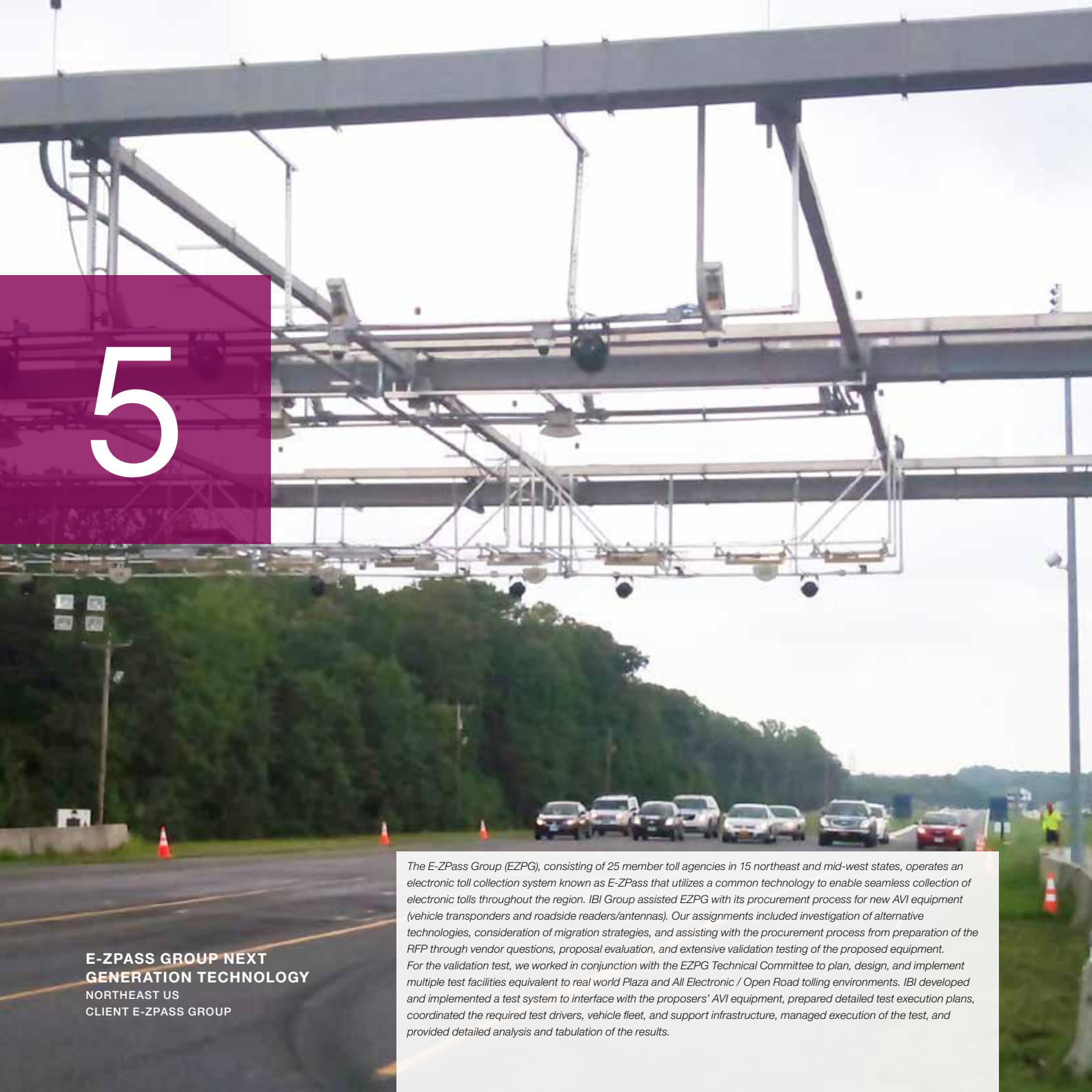
The SH-130 (Segments 5 and 6) project is the first concession within the Comprehensive Development Agreement (CDA) to provide and manage infrastructure within the TTC-35 corridor. IBI Group assisted CINTRA-Zachry in preparing a formal proposal to be appointed concessionaire for these motorway segments. As the first concession within the CDA, the SH-130 (Segments 5 and 6) project set the scene for future works within the corridor.

I-635 (LBJ FREEWAY) MANAGED LANES

TEXAS, UNITED STATES

The goal of this project along I-635 in Dallas, Texas was to finance, construct, operate, and maintain a 10-mile corridor of frontage road, general purpose, and tolled managed lanes. IBI Group developed the tolling and traffic management concept of operations and the conceptual design for what was the first concession based managed lane project in Texas. The work included defining the requirements for dynamically pricing the managed lanes to ensure that required average speed of 50 mph is achieved. An integrated traffic and tolling system was defined. The traffic management system includes active traffic management components of lane use controls, cameras, traffic sensors, dynamic message signs, and roadway weather information sensors. The tolling system is based on a non-stop cashless approach that incorporates discounted tolls for HOV users of the managed lanes, transponder reading, video transactions, video auditing, and real time enforcement support. Back office customer support systems and services were also addressed. Conceptual design and detailed cost estimates were prepared.

CLIENT CINTRA



5

E-ZPASS GROUP NEXT GENERATION TECHNOLOGY

NORTHEAST US

CLIENT E-ZPASS GROUP

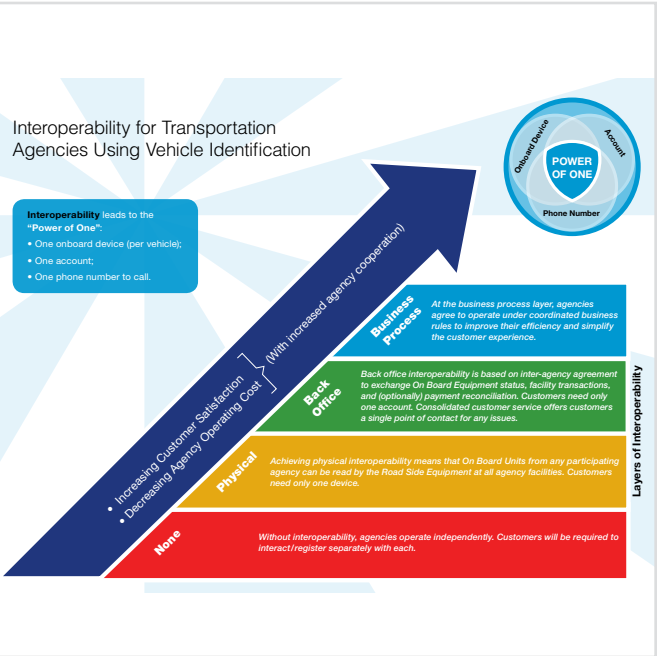
The E-ZPass Group (EZPG), consisting of 25 member toll agencies in 15 northeast and mid-west states, operates an electronic toll collection system known as E-ZPass that utilizes a common technology to enable seamless collection of electronic tolls throughout the region. IBI Group assisted EZPG with its procurement process for new AVI equipment (vehicle transponders and roadside readers/antennas). Our assignments included investigation of alternative technologies, consideration of migration strategies, and assisting with the procurement process from preparation of the RFP through vendor questions, proposal evaluation, and extensive validation testing of the proposed equipment.

For the validation test, we worked in conjunction with the EZPG Technical Committee to plan, design, and implement multiple test facilities equivalent to real world Plaza and All Electronic / Open Road tolling environments. IBI developed and implemented a test system to interface with the proposers' AVI equipment, prepared detailed test execution plans, coordinated the required test drivers, vehicle fleet, and support infrastructure, managed execution of the test, and provided detailed analysis and tabulation of the results.

TOLL SERVICES & SYSTEMS

Technology Assessment

Projects in which IBI Group researches and/or evaluates toll related technology.



RFID INTEROPERABILITY BEST PRACTICE GUIDELINES

BRITISH COLUMBIA, CANANDA

The Greater Vancouver Regional RFID Working Group includes eleven toll, commercial vehicle, port, border, and parking agencies, as well as Transport Canada. Typical agency applications for Automatic Vehicle Identification (commonly via a Radio Frequency IDentification device) include: verifying commercial vehicle credentials; granting vehicle access to facilities; and assigning vehicle charges for use of facilities. As use of these applications grows, so does the overlap of customers, and correspondingly, the potential benefits of interoperability. IBI Group was retained to review and document present initiatives and opportunities related to AVI, focussing on RFID technologies; and then produce a best practice guideline document that will be of assistance to similar agencies across Canada.

Major activities included: an introductory workshop with the Working Group; preparation of technical reports covering working group background, vehicle identification and back-office interoperability technologies and processes, and migration strategies; and preparation of the Interoperability Guideline document. A full range of interoperability scenarios was documented, e.g. multi-protocol On-Board Units or Roadside Equipment; and multiple back-offices with peer to peer or clearinghouse type connections. The resulting Interoperability Guideline document has been well received as an understandable presentation of technical information in a format suitable for those new to the subject.

CLIENT METRO VANCOUVER RFID INTEROPERABILITY WORKING GROUP

WSDOT TRANSPONDER STUDY

WASHINGTON, UNITED STATES

The Washington State Department of Transportation (WSDOT) commissioned a study of Automatic Vehicle Identification (AVI) and electronic payment technology to assist in its selection of AVI technology to use as part of the electronic toll collection (ETC) system for the Tacoma Narrows Bridge (TNB). The recommended technology was to be compatible with other WSDOT initiatives that use AVI technology, i.e. Washington State Ferries electronic fare collection system, WSDOT Commercial Vehicle Information Systems and Networks (CVISN) program, the WSDOT High Occupancy/Toll (HOT) Lanes demonstration project, and other systems using vehicle-based electronic payment and AVI technology. The analysis compared TNB and other stakeholder requirements against feasible AVI technologies to develop a recommendation that met these varied needs in a cost effective manner.

This assignment enhanced our understanding of ETC system requirements with special insights into the System Integrator's accuracy and performance standards. It required detailed assessment of current and future AVI technology and balancing of competing and complimentary statewide stakeholder requirements for AVI technology, including those of the System Integrator. IBI Group demonstrated its ability to marshal technical resources in a cost effective manner to meet the contracted schedule. We also provided professional review services relating to the design and construction of toll collection infrastructure for this design-build project.

CLIENT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

6

GUADALAJARA-COLIMA HIGHWAY TOLL SYSTEM SUPPLY & MAINTENANCE AND ETC OPERATION

GUADALAJARA-COLIMA, MEXICO

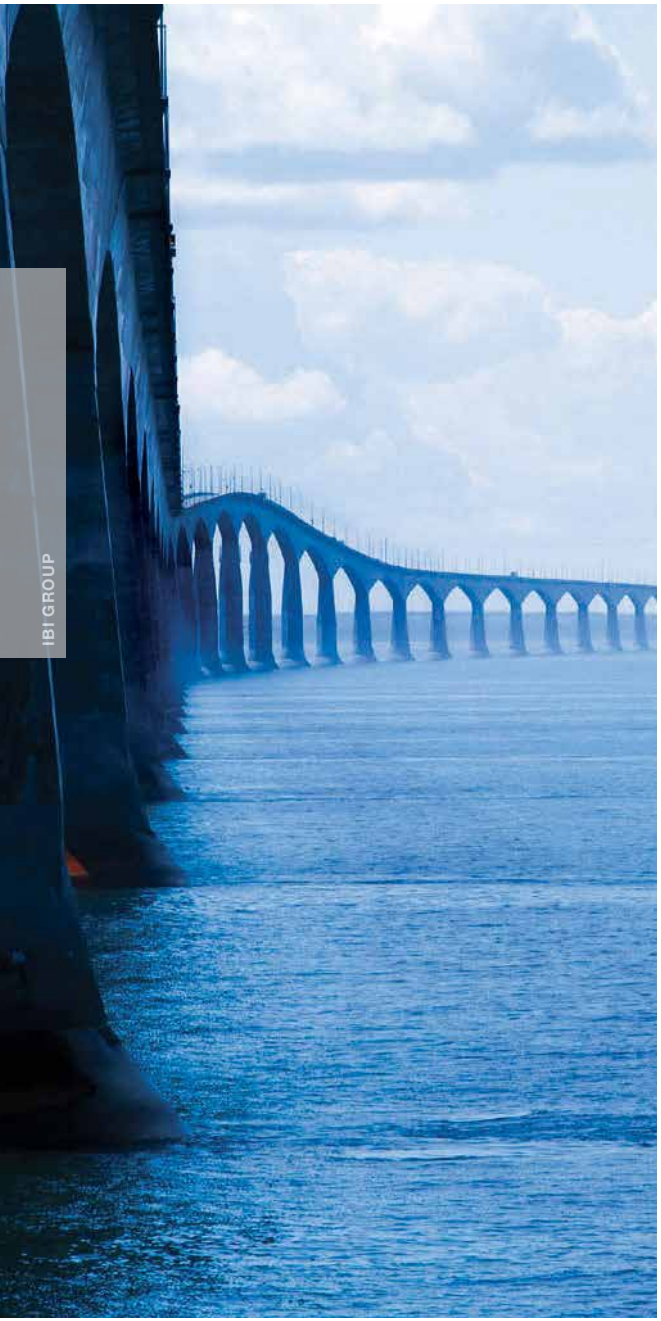
CLIENT BANOBRAS

As part of a consortium, IBI Group was commissioned by the concessionaire (Banobras – the Mexican Bank of Public Works) to supply, install, and maintain a state-of-the-art toll collection system for this 150 km road section. IBI Group will also operate the Electronic Toll Collection (ETC) customer service for 10 years. The toll system includes a central administration and customer service system connected to three mainline toll plazas and three ramp plazas with a total of 46 toll lanes. Forty toll lanes will provide cash, credit card, and ETC payment processing of which 12 will be reversible lanes. The remaining six toll lanes will operate as dedicated ETC lanes. ETC is multi-protocol ISO 6C, ISO 6B, and IAG.

TOLL SERVICES & SYSTEMS

System Provider

Projects for which IBI Group has been a system integrator, generally providing system design, equipment procurement, application software, installation coordination, overall system integration, commissioning, training, and ongoing support.



IBI GROUP

CONFEDERATION BRIDGE TOLL & TRAFFIC MANAGEMENT SYSTEM

PRINCE EDWARD ISLAND/NEW BRUNSWICK, CANADA

The 13 km Confederation Bridge joins the provinces of Prince Edward Island and New Brunswick on Canada's east coast. It is a private design, build, finance, and operate project. A 7-lane toll plaza is located on the island approach to collect tolls from vehicles departing P.E.I. Tolls were initially paid using cash, credit card, or debit card. The toll system includes lane devices, software, and hardware for toll collection, monitoring, auditing, and general management functions. Electronic Toll Collection was retrofitted into two lanes with a full set of complementary customer service functions. ETC is interoperable with other Atlantic toll agencies at the transponder level (based on ATA protocol).

IBI Group was responsible for preliminary, functional, and detailed engineering, toll collection and traffic management system application software development, device integration and on-site implementation (installation, testing, training, documentation, warranty support) of the complete Toll and Traffic Management Systems. We continue to provide system and operations support, as well as system upgrades.

CLIENT STRAIT CROSSING BRIDGE LIMITED

photo courtesy of Strait Crossing Bridge Ltd.© 2005

HIGHWAY 104 COBEQUID PASS TOLL SYSTEM

NOVA SCOTIA, CANADA

CLIENT HIGHWAY 104 WESTERN ALIGNMENT CORPORATION

The Cobequid Pass Toll Highway is a 45 km, 4-lane section of the Trans-Canada Highway. Tolls are collected at a single main-line plaza. IBI Group provided a full replacement of the lane, plaza, and account management solution including: toll booths, vehicle classification, electronic and cash toll collection, image capture, video audit, and driver feedback devices in all six toll lanes; plaza surveillance, equipment monitoring and control; customer service account/tag management and support; and a full range of back office audit and reconciliation functionality.

IBI Group responsibilities included design, development, installation, integration, commissioning, and training. We continue to provide system and operations support, as well as system upgrades.

TOLL & TRAFFIC MANAGEMENT SYSTEMS

GREECE

IBI Group has extensive experience in the application of technology to tolling and charging schemes in Greece, including:

- Design and Implementation of the Integrated Toll and Traffic Management System of the **Attiki Odos Motorway** (65 km, 39 plazas, 195 toll lanes);
- Turnkey provision including design, procurement and commissioning, training and software support and maintenance for the interim and final toll collection systems of the **Olympia Odos Motorway** (365 km, 5 mainline and 18 ramp toll plazas, 190 toll lanes);
- Turnkey provision including design, procurement and commissioning, training and software support and maintenance for the Aegean Motorway Toll Collection System (230 km, 15 plazas, 90 toll lanes);
- Provision of design, software development, integration, testing and commissioning of the **Moreas Motorway** Toll Management System (205 km, 6 mainline and 28 ramp toll plazas, 115 toll lanes); and
- Toll collection system application software, integration, configuration, testing, commissioning, documentation, and training for the **Egnatia Odos Motorway** (670 km, 6 plazas, 53 toll lanes).

CLIENTS ATTIKES DIADROMES SA,
APION KLEOS CJV,
AEGEAN MOTORWAY SA,
MOREAS GROUP

EASYTRIP REVENUE MANAGEMENT SYSTEM (CLEARINGHOUSE)

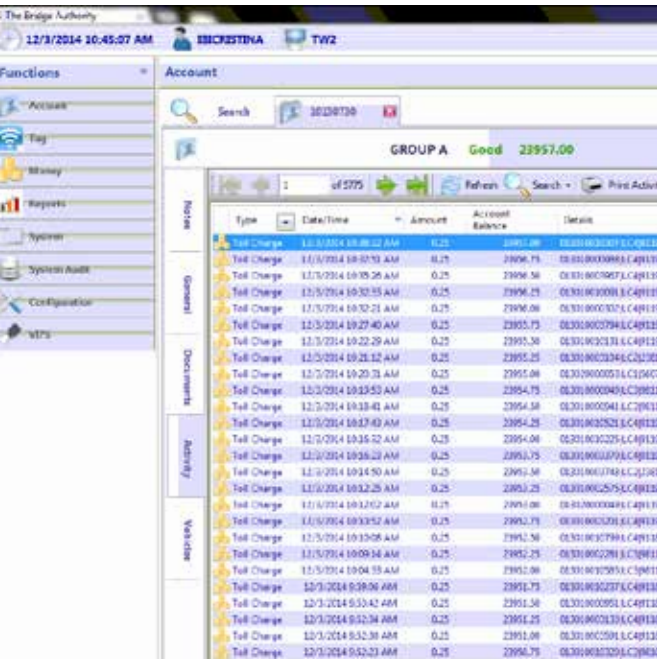
IRELAND

EasyTrip is a state-of-the-art electronic toll collection and revenue management system that contains back-office financial functions to manage road user charges from multiple, independent concessions and jurisdictions. EasyTrip customers can use a single electronic transponder for access to toll roads and other commercial facilities throughout Ireland. Integrated billing, collection, and reconciliation are key facets of the back office.

IBI Group was responsible for the design, development, and implementation of the fully automated EasyTrip back-office revenue management system. This system has point-of-sale functionality and integrates with financial institutions such as banks and credit card issuers to provide a seamless road user charging system that is flexible across facilities. There is an interactive web portal with e Commerce functionality. Real-time information is distributed via Internet, E-mail, and SMS.

- M50 eFlow;
- Dublin Port Tunnel;
- M8 Rathcormac – Fermoy Bypass;
- M4 Kinnegad – Kilcock Motorway;
- M1 Dublin – Belfast Motorway; and
- Q Park.

CLIENT EASYTRIP SERVICES IRELAND LIMITED



PARADISE ISLAND BRIDGE TOLL SYSTEM

NASSAU TO PARADISE ISLAND, BAHAMAS

The bridge provides access from Nassau to Paradise Island through a 4-lane toll plaza. Tolls are presently paid using cash or customer account with identification via smart card or electronic transponder. The original TDMA transponder technology has been upgraded to ISO 18000-6C. In addition to typical customer pre-paid and post-paid accounts, the back office supports a flat rate annual plan for Paradise Island residents. It also provides collection, monitoring, auditing, general management, and transponder account management functions. The design incorporates a violation enforcement system to track toll violators and other incorrect transactions.

IBI Group provided toll collection system design, application software development, hardware/device procurement assistance, overall systems integration, installation, modular and overall testing, and training. We continue to maintain the system, provide operational support, and provide system enhancements.

CLIENT THE BRIDGE AUTHORITY

TOLL & TRAFFIC MANAGEMENT SYSTEMS

INDIA

IBI Group has provided Toll & Traffic Management Systems in India for two major concession companies: GMR Projects Private Ltd. and DS Construction.

GMR Projects Private Ltd. was awarded four concessions (in Punjab, in Andra Pradesh (2) and in Tamil Nadu) for the construction and operation of highway projects including toll and traffic management systems. IBI Group was retained as Software Provider and System Manager to design the overall systems, provide the required application software, and to assist in the procurement and integration of the required equipment for the Toll Management System (TMS), Highway Traffic Management System (HTMS) and the associated communications interconnections. The systems include an automatic vehicle detection system that accurately classifies the various Indian vehicle configurations and video image processing to audit toll collectors and capture violators.

For DS Construction Ltd., IBI Group provided a turnkey Toll System for two newly upgraded highways in Uttar Pradesh and in Chhattisgarh. The IBI Group toll system includes ETC-based on RFID windshield tags (ISO 18000-6C). The ETC solution supports various independent and combined commercial policies required as per the concession agreement.

CLIENTS GMR PROJECTS PRIVATE LIMITED,
DS CONSTRUCTION LIMITED

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SECTORS

INTELLIGENCE
BROADCAST
COMMERCIAL VEHICLES
INFORMATION SYSTEMS
INTELLIGENT BUILDINGS
INTELLIGENT TRANSPORTATION SYSTEMS
POWER SYSTEMS
REVENUE SYSTEMS
SECURITY SYSTEMS
TELECOMMUNICATIONS

BUILDINGS
CIVIC AND MUNICIPAL
HEALTHCARE
HIGH-RISE
HIGHER EDUCATION
HOSPITALITY
JUSTICE AND PROTECTIVE SERVICES
K–12 EDUCATION
MIXED-USE
RETAIL AND COMMERCIAL
SENIORS COMMUNITIES
STADIUMS AND SPECIAL EVENTS

INFRASTRUCTURE
AMBULANCE AND MEDICAL TRANSPORTATION
FREIGHT TRANSPORTATION AND LOGISTICS
GOVERNANCE AND SERVICE DELIVERY
MULTI JURISDICTIONAL PLANNING
NEIGHBORHOOD DEVELOPMENT
PUBLIC TRANSPORTATION
SITE DEVELOPMENT
TRANSPORTATION AND LAND USE
TRANSPORTATION INFORMATION TECHNOLOGY
URBAN AND REGIONAL DEVELOPMENT

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