Automated Permitting, Routing, and Restriction Management
A Comprehensive Solution for Oversize/Overweight Vehicles
Automated Permitting, Routing, and Restriction Management for OS/OW Vehicles

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1. Introduction

Transportation agencies across the United States permit and route hundreds of thousands of oversize and overweight (OS/OW) vehicles daily. With loads continuing to increase in size and weight, these agencies are not able to achieve proper staffing and production levels necessary to fulfill the mounting requests for these permits. The shortfall typically results in very expensive delays to the carrier, reduced revenue for infrastructure damaged by vehicles traveling without a permit, disruption to traffic flow when an accident occurs, and increased safety risks to the motoring public.

With public safety and protection of the highway infrastructure as top priorities, many states are searching for innovative solutions to issue permits faster and enable safer routing for OS/OW vehicles. The candidate solution must be easily available to the public and capable of evaluating and selecting the most appropriate route path for the vehicle – accounting for the many regulations and roadway/bridge hazards.

Intergraph® offers a solution that automates the daily activities of an OS/OW permitting department, streamlining the permit process, routing, financial management, restriction management, and reporting workflows. With a web-based solution, a permitting staff or the carrier community can use the automated solution to quickly apply for a permit, analyze the roadway network for an appropriate path, and pay for and receive the travel permit with limited to no government staff involved. Intergraph’s solution utilizes configurable business rules and parameters to ultimately decide if a vehicle/load qualifies for auto-issuance. Typically, a carrier can obtain an auto-issued permit in less than 15 minutes if all requirements and rules are met. If a manual review is required, the permit is placed in the agent’s queue for review where additional workflows are in place to process the permit.

Common business goals satisfied by Intergraph’s solution include:

1. Auto-issuance of a permit
2. Financial management
3. Accounting for regulations and business rules
4. Automated route selection to increase production and reduce errors
5. Timely accounting for roadway constraints to increase safety
6. Seamless data interfaces for efficient operations and robust reporting
7. Long-term tracking of approved routes to identify which roads are used more
8. Real-time accounting of restrictions on the roadway that impact an OS/OW vehicle

For an efficient automated routing system, you need a navigable road network optimized for routing. Our solution is built on an open architecture and can process many data formats, including ESRI, Oracle, SQL Server, and commercial data providers such as NAVTEQ. Intergraph’s solution also incorporates roadway and bridge information, like vertical or horizontal clearance, roadway width, turning limitation, and more. You can deploy our out-of-the-box routing solution, which includes NAVTEQ Street map data integrated with our Restriction Manager application, without any enterprise data incorporation.

If you require the use of existing roadway and bridge data, Intergraph offers both software and services to assist you with this integration. Through configurable system parameters and industry best practices, Intergraph’s solution helps minimize implementation risks. Intergraph’s Transportation Services team can customize the GUI and data interfaces to meet your specific requirements, whether as an on-site installation or as a hosted service by Intergraph. Furthermore, the solution can be implemented with an existing permitting application, or delivered as a turnkey solution provided by Intergraph.
2. Solution Overview

Intergraph’s OS/OW Solution streamlines the permitting process, providing a more intuitive workflow while significantly reducing the amount of time from permit request to permit approval. We provide our solution through a web-browser interface where you can request a permit, generate a safe route, make a payment, and receive the permit – all within minutes. If for some reason the carrier does not qualify for auto-issuance, the carrier can track a permit through the manual review process.

Along with automated permit and route generation, awareness of valid and current road restrictions is a crucial component to the overall OS/OW process. The management and maintenance of roadway and bridge restrictions can be a tedious and cumbersome task, and permitting offices often issue permits with out-of-date restriction data – causing unnecessary delays in the routing of OS/OW vehicles. Intergraph’s solution includes a highly intuitive Restriction Manager application which easily manages and maintains restrictions while providing robust reporting capabilities, such as business intelligence, dashboards, and other user-defined reporting functionality. This application enables government personnel to restrict travel on a certain portion of the network (as a single point, along a line, or an entire area) in near real-time fashion. Various restriction types include, but are not limited to: vertical or horizontal clearance, weight, or turning movements.

A key strength of Intergraph’s system is its ability to seamlessly integrate with commercial map and data providers, such as Google, Microsoft® Bing, and NAVTEQ Streets data. The wide popularity of these applications at the consumer level alleviates the need for additional training with our solution and helps you feel more at ease using our software.

Many transportation agencies lack the foundation of a “routable network” required to automate routing of OS/OW vehicles. In such cases, our system implementation will include third-party integration with commercial road data such as NAVTEQ Streets – all while leveraging as much of our customer’s existing data as possible.

Additional solution highlights include robust permit functionality for office staff. Most government permitting offices allow walk-in or call-in customers. With our system, we streamline this permitting process to get the carrier’s permit in-hand in approximately 12 minutes. We also have a number of additional functions available to permitting staff for typical day-to-day job activities, including:

- Financial management
- Business intelligence/reporting
- Business rules configuration
- Workflow management based on business rules
- Bridge analysis
- Extensive information search
- Account and user management

You can also integrate our solution with several commercially available business intelligence and reporting applications, such as SAP’s Business Object/Crystal Reports, Microsoft, and Oracle Business Intelligence. When implemented with the solution, management and authorized users can access the business intelligence portal for program and production statistics, summation reports of financials, and breakdowns of various types of loads permitted over a period, including which routes are most common.
Intergraph offers maximum flexibility and delivers a turnkey solution that can include any of the following components:

- **Third-Party Permit Manager Application**
  - Document upload for required attachments
  - Financial management
  - Information search

- **Route Planner Application**
  - Auto-generate route
  - Bridge analysis
  - GPS integration

- **Restriction Manager Application**
  - Insert, update, or delete temporary restrictions
  - Review of active versus expired restrictions
  - View of future restrictions
  - Associate documentation (e.g., plan sheets or details with a restriction)

- **Business Intelligence and Reporting Application**
  - Business intelligence and statistical web portal
  - Structured formatted reports for accountability

- **Enterprise Data Integration**
  - GIS road network
  - Bridge management
  - Roadway characteristics
  - 511 incident information

If desired, we can modularize our OS/OW Solution to fit your needs (e.g., if you only need automated routing and restriction management). Furthermore, if you already own an electronic permitting system, you can easily access the route planner through a modern, web-based interface.
3. Solution Components

Intergraph’s OS/OW Solution delivers highly configurable software modules designed to simplify workflows and account for business rules through centralized database components, including:

- Third-Party Permit Manager
- Route Planner
- Restriction Manager
- System Manager
- Solution Architecture

Each component of the solution is discussed in further detail below.

3.1 Permit Manager

Intergraph’s Permit Manager Application, provided by a third party through an Intergraph partnership, manages the customer account and a permit’s submission, review, payment, and issuance process.

Typically, when you enter this system, you’re presented with a dashboard that displays pertinent information pertaining to your account. This information may include an escrow balance, a list of recently processed permit applications, and information about the status of those permits and messages. New customers must create or apply for an account in the system before they can order permits.

With the Permit Manager, government employees are presented with information that helps them manage daily operations. This information may include the number of permits in the work queue, types of permits needing review, and various statuses. Intergraph often tailors the dashboards or “Home Pages” to each functional group that interacts with the system based on the functions they most frequently perform and the information they need or are authorized to view.

The Permit Manager can make optional or require certain fields based on state business rules. One field in particular that is usually captured is the U.S. DOT (department of transportation) for linkage into the state’s CVIEW. Permit Manager also captures DOT information on the permit, including, but not limited to:

- Customer name
- Customer address
- Contact information (phone, e-mail)
- U.S. DOT (if available)
- Customer account number

This application also lets you apply for permits (single trip, multi-trip, or annual), manage companies and customers, review permits that need manual approval, pay for permits, issue permits, search for permits, and perform various management tasks such as reporting. Workflow rules allow the state to manage how certain types of permits are processed by setting data limits or thresholds.

High-level features supported with our solution include, but are not limited to:

- Intuitive, easy-to-use system for both the carrier and the permitting staff
- Ability to effortlessly duplicate a permit request and change only the information pertinent for that permit application
Automated Permitting, Routing & Restriction Management for OS/OW Vehicles

- Support for a variety of workflows, including automated approval for various classifications of permits/loads and manual review
- Online permit status checks to alleviate customers from calling the permit office for this information
- In-depth search utility to provide a variety of search options
- Detailed summary page to give customers their permit costs and restrictions to follow
- Ability to attach supplemental documents for state review
- Support for restriction assignment based on the permit type or permitted dimensions
- Support for engineering review and approval process for structures
- Support for various payment options, such as credit cards, billings, escrow or bond accounts, checks, and/or money orders
- Integration with accounting functions
- Ability to fax or e-mail a permit document, as well as download the document directly from the system
- Enhanced enforcement access

3.2 Route Planner Application

The Route Planner application provides the graphical user interface (GUI) and the core business application logic (application and data security, business rules, data stores, and external system interfaces) through a secured web browser. The GUI is a customizable web application developed in Microsoft .NET, and provides several key functional workflow components to enhance your experience and simplify the routing process.

To generate a route, you simply define a point of origin, destination, and any optional intermittent points. The system will utilize the points selected to analyze the route segments to ensure the vehicle being routed can safely pass.

In some cases, the permits office allows various options to be toggled on or off which affects how the system evaluates for a route. Configurable business rules typically drive these options, which enable you to choose how you want the route selected. For example, you can choose to “use” or “avoid” a certain route type. When the “Generate Route” function is invoked (see Figure 1 below), the user is prompted to toggle certain options on or off. Once you’ve dismissed the form, the system performs the route path analysis accordingly.

![Route Planner Application](image)

*Figure 1: The “Generate Route” function routes directions on the map and provides detailed driving directions.*
During implementation, Intergraph can configure the Route Planner as a standalone application or can integrate with a permitting application. In standalone mode, you can use the Route Planner for route bidding or testing alternate route paths without affecting financials. As a fully integrated system with an electronic permitting application, the Route Planner is positioned to streamline the workflow of issuing automated permits by providing the routing component of the system. See Figure 2 below for a diagram of these components.

![Diagram of Intergraph’s OS/OW Solution components](image)

**Figure 2:** This diagram displays the components of Intergraph’s OS/OW Solution.

### 3.2.1 Route Planner Business Logic Layer

As mentioned above, the Business Logic Layer accounts for business rules, data interfaces, system and data security, application web services, and other back office processes. This system component is not exposed to the end user, but contains the heart of the route planner application.

Included in the business logic is the routing web service – one of the core functions of the system. This web service is the foundational component of the Route Planner for performing restrictive route path analysis. At the root, the routing web service enables the software to analyze the vehicle parameters against the constraints on the intelligent network to determine a safe route.

Also within the business logic is the permitting application web service. This web service enables the Route Planner to seamlessly integrate with most modern permitting applications. There are a number of other web services and data interface programs delivered during implementation to support the system.

The vehicle pre-screening process is a function within the business logic layer that performs the initial screening processes of the vehicle/load against the pre-defined business rules to determine the proper routing operations. Based on the outcome of the screening process, the routing operation will produce certain workflows and results for the route.

The solution’s business logic component and centralized database provides route logging. The solution captures the spatial alignment of the approved or accepted route, which is useful in creating infrastructure usage and system accountability reports. Along with spatial data, other roadway identification information generated through the routing process will be stored in the database and made available to the agency’s business systems through an integrated data design.
3.2.2 Generate Route Function

The Generate Route function is the core functional workflow of the routing system from the end-user perspective. This function lets you identify or locate the route’s origin, destination, and intermittent stop points using various input methods (shown in Figure 3) including, but not limited to:

- **Map Click** – Click a point on the roadway map
- **Street Address** – Enter in a street address and/or city
- **Intersections** – List what the location intersects with (crossing street or jurisdictional boundary such as city, county, or state)
- **LRS** – Enter a linear reference system key and mile post
- **Coordinates** – Key in latitude/longitude or (X,Y) coordinates
- **Section/Township/Range** – Input the public land survey system reference information
- **Route Memory** – Load route from a saved route list

![Figure 3](image)

*Figure 3: The “Generate Route” functions include several options to help locate your destination point.*

The system automatically searches for a safe route path based on the business rules defined in the business logic, roadway restrictions applicable to the routed vehicle, and any options set by the user. The Generate Route Function then displays mapped route and directions on the screen for the carrier.

During implementation, Intergraph can configure the system to prompt you with various routing options when the Generate Route Function is executed. You can toggle these options on or off based on how you want the route path generated. For instance, you may opt to consider a certain route type such as the interstate or choose to avoid certain route types such as toll roads. These options, along with pre-
configured business rules in the business logic, roadway and bridge restrictions, and a “travel cost” or impedance value for each roadway segment are analyzed to determine the appropriate path for the vehicle.

If a safe route for the vehicle is not possible, the system can prompt the user to generate and display the “prohibited route,” outlined in Figure 4. A prohibited route is a route generated by the system based on the business rules defined in the database and business logic, but may have certain restriction violations. This route is not considered safe and must be manually reviewed by an appropriate agent or engineer before it is approved and assigned to a permit.

![Image of Route Planner](image)

*Figure 4: You can display a prohibited route to view the hazards associated with this path. This will help you better understand why the Restriction Manager provided you a safer route.*

### 3.2.3 GPS Integration

Once a route is approved, it can be transmitted to various GPS devices. The generated route and directions from Intergraph’s system can integrate with any GPS provided by trucking companies for their vehicles. This can help drivers graphically visualize and better understand the approved route.

### 3.2.4 Bridge Analysis Function

Our OS/OW Solution offers several options for evaluating bridge ratings for overweight vehicles. Depending on the customer’s preferred methods, the system can configure to perform bridge analyses using the following methods:

- Weight classification (comparison of various “known” vehicle configurations against bridges that are pre-assigned a weight classification)
- Posted bridges versus vehicle type and gross weight
- Federal bridge gross weight formula
- AASHTOWare VIRTIS integration for live load analysis
- Bending moment and shear analysis

When Intergraph first delivers the solution, it is automatically capable of performing weight classification (shown in Figure 5), posted bridges, and federal bridge gross weight analysis with the given required data. Addition configuration services are required for VIRTIS integration or bending moment and shear analysis.
3.2.5 Vehicle Information Function

The Route Planner application can visualize and/or capture vehicle configuration information directly in the vehicle tab of the GUI. When implemented with the Permit Manager, this information is captured in the permit application and displayed as read-only. The Route Planner then uses this vehicle data for route path analysis.

If you access the Route Planner application in standalone mode, you can edit vehicle information with various vehicle parameters for route path analysis.

3.2.6 GIS Map Viewer Function

For reduced training overhead and increased ease of use, our OS/OW Solution provides a GIS Map Viewer Function that is shared with the Route Planner and Restriction Manager applications. Within the Route Planner, you can use the GIS Map Viewer to graphically see the route path and other geographic information to ensure the carrier fully understands the route path. Standard map navigation functions...
include ‘zoom in,’ ‘zoom out,’ ‘pan,’ and ‘zoom to area.’ The map also includes a legend for turning available map features on or off.

Using an easily distinguished graphic setting, such as a bold line thickness and bright color, you can symbolize and overlay the selected route on a map to present the carrier with an image of the route path. The map will display points of origin, destination, and intermittent points using a pushpin type symbology and identified in alphabetical order beginning with “A.” See an example of this below in Figure 6.

![Figure 6: The Route Planner displays the GIS map window with routing points in alphabetical order, as well as other application functions such as driving directions.](image)

Optionally, you can implement our solution using commercial map data such as Google Maps or Microsoft Bing Maps. We can easily integrate our solution with the publically available APIs of these products and incorporate functions such as the base map for a backdrop or the geo-locate services for geo-coding address if adequate address data is not available.

3.3 Restriction Manager

The Restriction Manager application provides the web-based GUI and core business logic for managing existing enterprise data restrictions such as bridges. This application also helps you manage real-time temporary restrictions, such as construction zones or crashes. The Restriction Manager is considered to be one of the most critical components of our solution because it extends the functionality for managing the roadway restriction information, ultimately impacting the routing decision. These restrictions were traditionally handled through e-mails to the permitting agents from disparate resources across the agency, website postings to the carrier industry, or some other form of manual process.
Most state DOTs geospatially locate and manage their enterprise roadway data, such as bridge and roadway inventory, using a GIS roadway layer or LRS. By taking the state’s roadway network layer and enterprise asset data and combining it with real-time restriction data, such as crash events or construction zones, Intergraph can provide DOTs with an intelligent network for restrictive routing. Figure 7 below displays different types of restrictions associated with a particular route in the “Restrictions Details” area.

Below are the key functions of the Restriction Manager application:

- Dashboard for viewing various statistics and quick filtering or of restriction data
- Management of temporary restrictions and roadway alerts
- Override of enterprise data sources
- Maintenance of routing systemwide parameters
- Management of impedance models

Figure 7: The Restriction Manager application displays a map window with restrictions and associated data in the Restriction Details tab.
3.3.1 Dashboard

We provide advanced dashboard capabilities to quickly filter restriction data and enhance your ability to search for restrictions (see Figure 8 below). For example, you may need to filter for all restrictions expiring within seven days. To quickly visualize this data, you can simply click a time slice in the appropriate pie chart and the data grid will automatically update accordingly.

Figure 8: With the pie chart dashboard built into the Restriction Manager application, you can quickly obtain restriction data by multiple categories.
3.3.2 Management of Temporary Restrictions and Roadway Alerts

Restriction Manager lets you capture and manage roadway events in real time, including relevant data for the restriction and its location. These “temporary restrictions” (highlighted in Figure 9) and “roadway alerts” typically occur in real time and affect travel in the network, but do not exist in an enterprise data source. A restriction varies from an alert because a restriction prevents travel on a route section for certain vehicles while an alert does not. An alert in its simplistic form is information for the driver concerning something that may be experienced while driving in a particular section of roadway.

![Figure 9: The Restriction Manager displays temporary restrictions in the restrictions tab and on the map.](image)

3.3.3 Override of Enterprise Data Sources (Permanent Restrictions)

Much like the management of temporary restrictions, the Restriction Manager also provides a tab for viewing and editing “permanent restrictions.” These restrictions are typically created from a known enterprise data source and are used to set minimums or maximums on the roadway network for aspects such as width, height, and weight. Unfortunately, enterprise data is not always updated as quickly as you need it, so you need a way to edit the restriction values. This can be done quickly with Restriction Manager using the same tools you use for editing a temporary restriction. The edits are contained within the context of the solution until the Restriction Manager is used to lift the override.
3.4 Business Intelligence & Reporting

Intergraph’s OS/OW Solution effortlessly integrates with Oracle or SAP’s business intelligence software. For daily statistics, Intergraph offers a web-based portal that helps you quickly access the detailed data produced by the system. For example, you can configure the portal to show pie charts or graphs for various types of permitted or routed vehicles on any given day. You can also configure the portal to show daily revenue intake, volume of permits submitted versus approved and active, or any other measure produced on a daily, weekly, monthly, or annual basis. Without needing to know all of the specific details, management personnel and authorized users can get answers instantly with a simple mouse click.

The portal can also provide access to standard formatted reports that can be pre-configured and easily accessed. You can negate reports similar to the statistical measures mentioned above on-the-fly and print them for sharing with management, legislators, or other concerned parties. Figure 10 shows a report for temporary restrictions.

![Temporary Restrictions Report](image)

**Figure 10:** With Intergraph’s OS/OW Solution, you can take advantage of robust reporting capabilities, such as generating a temporary restrictions report.

Because the approved route is also stored in the database, you can generate statistical reports to help the DOT identify which roads are most heavily traveled. This is vital information for a DOT when making a decision on future-needs planning or in the maintenance office when deciding where potential road issues might occur over time due to heavy use.

The business intelligence portal utilizes the common map viewer to show routes and other pertinent information on the map. The ability to visualize this information on a map can help communicate to management where projected issues might occur.
3.5 System Manager

3.5.1 Maintenance of User and Group Permissions

The System Manager provides a graphical user interface for managing user and group permissions for the solution. Typical user roles in the system include, but are not limited to:

- **Internal Users**
  - System Administrator
  - Permit Agent Supervisor
  - Permit Agent
  - Bridge Engineering
  - Restriction Administrator
  - Restriction Editor

- **External Users**
  - Carrier Executive
  - Carrier User
  - Permitting Agency Executive
  - Permitting Agency User

3.5.2 Maintenance of Routing System-Wide Parameters

Our System Manager also provides graphical tools for editing and maintaining parameters, which ultimately affect how the route planner selects and produces a safe route. These parameters could be tolerance factors assigned to the vertical or horizontal clearance to create a safety buffer. Other parameters might include whether a certain type of restriction is utilized for a particular type of vehicle. Regardless of the parameter, Intergraph designed our solution to easily modify these limits and immediately apply the business logic to the automated routing process. A list of parameter examples are highlighted in Figure 11.

![Restriction Manager](image)

*Figure 11: The outlined boxes above display parameters and impedance model management in Restriction Manager.*
3.5.3 Management of the Impedance Model(s)

With the System Manager, you can create and edit the routing impedance models. These models are used to assign a numeric value to each section of roadway based on factors such as travel distance, speed, route type, and more. Once the value is set, the routing system uses the number for each route segment to compute a “travel cost” for the route. The system will then determine the “least cost path” for the route based on the value generated.

This system will support multiple impedance models. You can configure business rules to selectively choose an impedance model based on the routed vehicle or load type. You can also apply business rules to certain user groups to use particular impedance models. This approach allows you to use the system for OS/OW routing and will potentially support other routing needs, such as hazardous materials routing.
3.6 Solution Architecture

Figure 12: This diagram displays Intergraph’s OS/OW Solution architecture.

An overview of the solution architecture as illustrated in Figure 12 above includes:

- **User Interface** – End-users will interact with the applications via a web browser.

- **Business Logic** – The solution is comprised of various applications that rely heavily on web services to manage the needs of the application. The proposed applications are based on a common framework, and the web services can be shared among the applications or isolated to each server.

- **Data** – The solution uses a centralized database to store all routing related data and perform data-centric processing. The data integration approach with enterprise data sources is to utilize heterogeneous database services to connect to databases where possible, or rely on open standards for data communications.
The application architecture is illustrated in the Figure 13 diagram below.

Intergraph’s OS/OW solution captures key data items about the vehicle and load within the permitting application, communicates it to the Route Planner, and utilizes it during the route analysis process. The resultant route is then communicated back to the Permit Manager. This round-trip approach ensures a streamlined approach and a pleasant user experience – all while accounting for business rules and data requirements.

Our solution can make extensive use of the existing enterprise data sources whenever possible. For this reason, the database design and conversion strategy may rely heavily on a centralized Oracle database that integrates the required datasets. The web application utilizes the centralized database to access and update required data. If the solution is exposed to the Internet, an existing firewall will be necessary to allow access to the Oracle instance.

3.6.1 Commercial Data Providers

Intergraph’s solution provides the ability to combine commercial data provided by NAVTEQ with roadway data, such as bridge and roadway inventory, to build a routable network that is restricted based on the customer data. Our solution is also designed to make use of commercially available mapping APIs such as Google, Microsoft Bing, or Yahoo maps.

3.7 Implementation Approach

In addition to meeting your permitting and routing needs, Intergraph also provides implementation services for these solutions. A typical project includes installation, configuration of business rules and parameters in the business logic layer, and integration with disparate data sources or business systems. Whenever possible, our solution makes use of existing customer data for routing and restrictions. Data such as the GIS road feature, PONTIS (bridge management), and roadway inventory are all used to compile the intelligent routable network.

If data is not available, Intergraph can provide NAVTEQ Streets data as a navigable street network for routing. You can then use the Restriction Manager application as the primary interface for managing all
roadway and bridge restrictions. (This option is the most simplistic approach for solution implementation of and can be deployed very quickly).

For a more comprehensive implementation, PONTIS or bridge data and other enterprise roadway data are interfaced into the solution. A mix of customer data with commercially available data from sources such as NAVTEQ is also possible to implement when the customer data is not entirely complete. This implementation approach allows for maximum flexibility while creating an intelligent network using customer maintained data.

Various levels of implementation and data interfaces are also possible. Intergraph is happy to discuss your needs in further detail to determine the best approach.

3.7.1 Hosted Versus Customer-owned

Intergraph offers both hosted and customer-owned options. We can deploy our solution locally on your own hardware platforms, or remotely by Intergraph.

For regional routing, Intergraph can provide a hosted solution using NAVTEQ data as the base routing system. We can configure the Restriction Manager and customer data interfaces to build an intelligent routing system. Many possibilities exist on this topic, and Intergraph welcomes further discussions on these possibilities with any regional group.
4. Summary

Intergraph’s solution for automating the workflows of an OS/OW permitting office is very flexible, and we can customize it to meet your specific requirements. Our solution helps you quickly request a permit, generate a safe route path using automated techniques, and receive a permit document within minutes. With Restriction Manager, government agencies can quickly account for issues on the roadway and bridges before they result in an accident. Intergraph offers a system that can be implemented in a modular fashion or delivered as a turnkey solution. Web services are used throughout the solution to ensure easy maximum flexibility and integration with other enterprise systems.

For more information about Intergraph’s Automated Routing Solution for OS/OW vehicles, please visit our website at http://www.intergraph.com/osow.