Drive West - A Multi-Agency Approach to Traveller Information

Sharla Griffiths, P. Eng., Alberta Infrastructure and Transportation
Bruno Peters, P. Eng., IBI Group

ABSTRACT

In 2004, a Memorandum of Understanding (MOU) was established between the Provinces of Alberta and British Columbia (BC) and Parks Canada to set the framework for a collaborative and coordinated approach in delivering highway traveller information across all three jurisdictions. The MOU was built upon a vision shared by the tri-party group that the public shall receive timely, accurate, and consistent highway traveller information in order to plan their trips or adjust their travel plans accordingly. It further defines that the objective of sharing and disseminating traveller information is to enhance the safety and efficiency of the movement of people and goods in and around the Banff National Park along the Trans Canada highway and the adjacent provincial highway systems.

Since the MOU was established, The Ministry of Transportation of British Columbia has launched a new province-wide web-based traveller information system called *Drive BC*. In addition, Alberta in partnership with British Columbia, Parks Canada, the Alberta Motor Association (AMA), and IBI Group, are piloting a new web-based traveller information system called *Drive West*. Transport Canada has provided co-funding for this project, under the Intelligent Transportation Systems (ITS) funding initiative of the Strategic Highway Infrastructure Program (SHIP).

The *Drive West* system closely matches that of the BC system and provides information regarding highway closures, delays, incidents, construction zones, and real-time information on road conditions, including access to roadside cameras. Motorists can use this information to plan their trips better and avoid delays caused by construction, weather, collisions, or other incidents.

Some of the unique characteristics of this project are that the web site acts as a map-based portal to traveller information sites in BC, Alberta, mountain parks and neighbouring provinces and states. Information is entered by multiple agencies through a common web interface and includes road event information entered directly by the contractors responsible for maintaining the road network. Roadside camera images from Alberta's deployment of a road weather information system are displayed with an overlay of the current weather information along the road network.

This multi-jurisdictional project is a first step to identifying the most efficient way to provide consistent information seamlessly across the various borders to the travelling public. Some of the issues identified and lessons learned will be explained in the paper, such as success of data entry, consistency of presented road information, and future opportunities.

1. The Beginning of Drive West

As technology advances and as we are expected to realize increased capacity and safety on our highways, motorists expect increased traveller information that is timely and accurate. Many provinces in Canada have their own independent traveller information system. What if jurisdictions could work together to produce a larger, more unified system?

In May 2004, Parks Canada, Alberta Infrastructure and Transportation (INFTRA) and the British Columbia Ministry of Transportation (BC MoT) signed a Memorandum of Understanding (MOU) regarding Highway Traveller Information Sharing. It encompassed the following key geographical areas:

- Banff, Kootenay, Yoho, Jasper, Waterton, Mount Revelstoke, and Glacier Nations Parks of Canada (Mountain Parks),
- Provincial Highways in Alberta, and
- Provincial Highways in British Columbia (BC).

The MOU acknowledged that through Intelligent Transportation Systems (ITS), Parks Canada, INFTRA, and BC MoT could distribute a large quantity of information to the traveling public to assist in the safe, efficient, and seamless movement of traffic in BC and Alberta. The purpose of the MOU was for the three groups to work toward a coordinated and strategic approach to providing highway traveler information to the traveling public. This vision was to make available timely, accurate, and consistent highway information in order to plan trips or adjust travel plans in an effort to increase safety and efficiency in moving people and goods in the Mountain Parks and on Provincial Highways.

There were several short and long term cooperation opportunities identified; one of the long term opportunities encompassed the deployment of various forms of ITS to improve the sharing and dissemination of traveller information between jurisdictions and to provide for consistent traveller information to motorists in each region. Since the signing of the MOU, Drive BC and Drive West were initiated.

The Drive West traveller information Pilot Project was a partnership with Alberta, British Columbia, Parks Canada, IBI Group, and the Alberta Motor Association (AMA). Transport Canada provided co-funding for this project, under the Intelligent Transportation Systems (ITS) funding initiative of the Strategic Highway Infrastructure Program (SHIP).

2. Objectives of the Drive West Pilot Project

Drive West was a web-based multi-agency Advanced Traveller Information System (ATIS) pilot project. It was designed to help motorists plan their trips along certain highways in Alberta and the Mountain Parks; these highways being Highway 1 from the BC border to Calgary and Highway 2 from Calgary to Edmonton. It provided motorists timely information on highway closures, delays, incidents, construction zones, and road conditions, as well as static images of the highway; this information was updated as highway conditions changed. The website (www.drive-west.com) was also developed as a portal to other areas in Alberta and the Mountain Parks that are not a part of the pilot project test area, as well as surrounding jurisdictions (British Columbia, Saskatchewan, Montana, Idaho, Washington, Yukon Territory, and North West Territories).

The objectives of the pilot project were:
- To strengthen Parks Canada's, Alberta's, and BC's policies on sharing traveller information between neighbouring agencies, as outlined in the MOU;
- To provide timely, accurate, and consistent information regarding road conditions due to weather, incidents, and planned events, so travellers can plan their trips and alter their travel plans accordingly to avoid or minimize delays;
- To increase safety and efficiency in the movement of people and goods through timely and accurate traveller information; and
- To improve the method of collecting, managing, and disseminating traveller information.

3. Project Partners and Their Roles

There were many partners involved in the Drive West Pilot Project. It was through the clear definition of roles that this project was able to run smoothly.

Transport Canada provided co-funding for this project under the Intelligent Transportation System (ITS) funding initiative of the Strategic Highway Infrastructure Program (SHIP). The project funding was granted on the basis of further development of ITS initiatives in Canada that are focused on interagency and private sector involvement and continue to utilize the Canadian Architecture for ITS.

BC MoT provided a supportive role related to providing experience and lessons learned on the deployment and operation of the Drive BC system, including technical and operational input.

The Parks Canada area of the Drive West project was centrally located between Alberta and BC. Parks Canada provided resources through the design and

operations phase of the project. The operations of the highway network through the Parks Canada area is somewhat different than both Alberta and BC and provide key information to both regions on a regular basis. This provided a unique perspective to the collaboration and dissemination of traveller information between all stakeholders.

INFTRA was involved in many facets. Technical Standards Branch (TSB) personnel provided coordination for the project. They liaised with IBI Group to establish the website design and communication protocols, provided training, and orchestrated field involvement. The field involvement included utilization of various resources (both internal and external) in order to better evaluate the ability to move the data entry of event information closer to the source.

The Alberta Motor Association (AMA) was a key collector and distributor of province-wide road condition information including the Parks Canada areas within Alberta. AMA provided key insight into current field data collection procedures and also provided critical day to day input into the Drive West system based on field data provided directly to them by fax and telephone. AMA also participated in the development if a direct data exchange between Drive West and the AMA road reports web site.

IBI Group was the project lead and provided a broad range of services to the project team, including project management, design, coordination, and day to day operation and hosting of the Drive West web site as an application service provider. IBI Group provided coordination with Transport Canada (the primary contributor to the project) and developed the final report to Transport Canada and the rest of the project team.

4. Drive West Project Phases

The Drive West project consisted of the following primary phases:

- Review of existing operations;
- Definition and development of the website interface and survey;
- Operations definition and training;
- Launch and Initial Operations;
- Development and Launch of integrated road weather and camera data;
- Development of data exchange with AMA and pilot of Personal Digital Assistant (PDA) access; and
- Statistics review and reporting.

The review of the existing operations included stakeholder meetings with Parks Canada staff, INFTRA Staff and contractors, and AMA staff. The primary focus of the review was to establish lines of responsibility for the entry and maintenance of event information on the Drive West system. A specific focus was placed on establishing event entry at various points in the existing business

flow, including where possible, data entry by one of Alberta's existing highway maintenance contractors (HMCs).

The development of the web interface included the development of a GIS road network for the project area, which included development if a GIS database of appropriate reference points along the road network which provided relevance to the traveller. The web interface also included the development of a portal to allow the user to select from a map, traveller information on any specific area within Alberta, BC, or an adjacent province, territory or US State. Development of a question set as part of a voluntary on-line survey was also prepared.

Operations definition required significant effort due to the multi-agency nature of the project. This is described in further detail below. IBI Group hosted two hands-on training sessions in November 2005 for all involved; one for Banff National Park and one for those involved on Alberta's Provincial Highways. Additional training was provided to AMA in January 2006 for new staff on the project. IBI Group established a test website where the operators could enter, update, and close events. A reference manual was provided that described Drive West and outlined all steps involved in updating the website.

At the conclusion of training, the website was officially launched to the travelling public on December 8, 2005. The launch included the release of a news bulletin by INFTRA, which provided a significant increase in the numbers of individuals accessing the website.

In 2005, INFTRA began to deploy a province-wide Road Weather Information Station (RWIS) System. The RWIS program established 25 operating environmental sensor stations on key locations on the national highway network in Alberta. The deployment, operations, and data collection was provided under contract to third party contractor, Telvent. In January 2006, IBI Group developed and launched an integrated map interface to the RWIS System that allowed travellers to access the current weather and condition information at 25 key points on the road network. This information was updated on 20 minute intervals and included the integration of current photographs from various angles that were also being provided together with the weather data. This data exchange was coordinated through a secure data connection utilizing the Canadian Meteorological Mark-up Language (CMML).

One of the objectives of the pilot project was to evaluate and improve the method of collecting traveller information. The current method of collecting information for the AMA Road reports is through the use of faxed information from HMCs as part of a regular review of road conditions. As a step to eliminating the future need for faxing information to AMA in specific areas, a data exchange protocol was reviewed and developed with AMA. This protocol was based on North American standards and was used to interface with other traffic management and traveller information systems.

Also as a pilot project, the RWIS data and imagery was developed to be accessible by PDAs for the travelling public. The intent was to make the information more readily available to those travellers who are already en-route. Road conditions in Alberta are subject to significant changes in short periods of time due to changes in weather conditions, and providing access to images for those individuals with mobile internet access could have significant value. The PDA access pages were developed and tested by a small user group.

The official end of data entry into the Drive West system was April 15, 2006. This date coincided with the end of the road reporting season for both Parks Canada and for INFTRA/AMA. The data was compiled and the initial results of the usage statistics are provided below.

Figure 1 below demonstrates typical outputs as seen by a public user, including a fog event, RWIS camera image, and weather data.
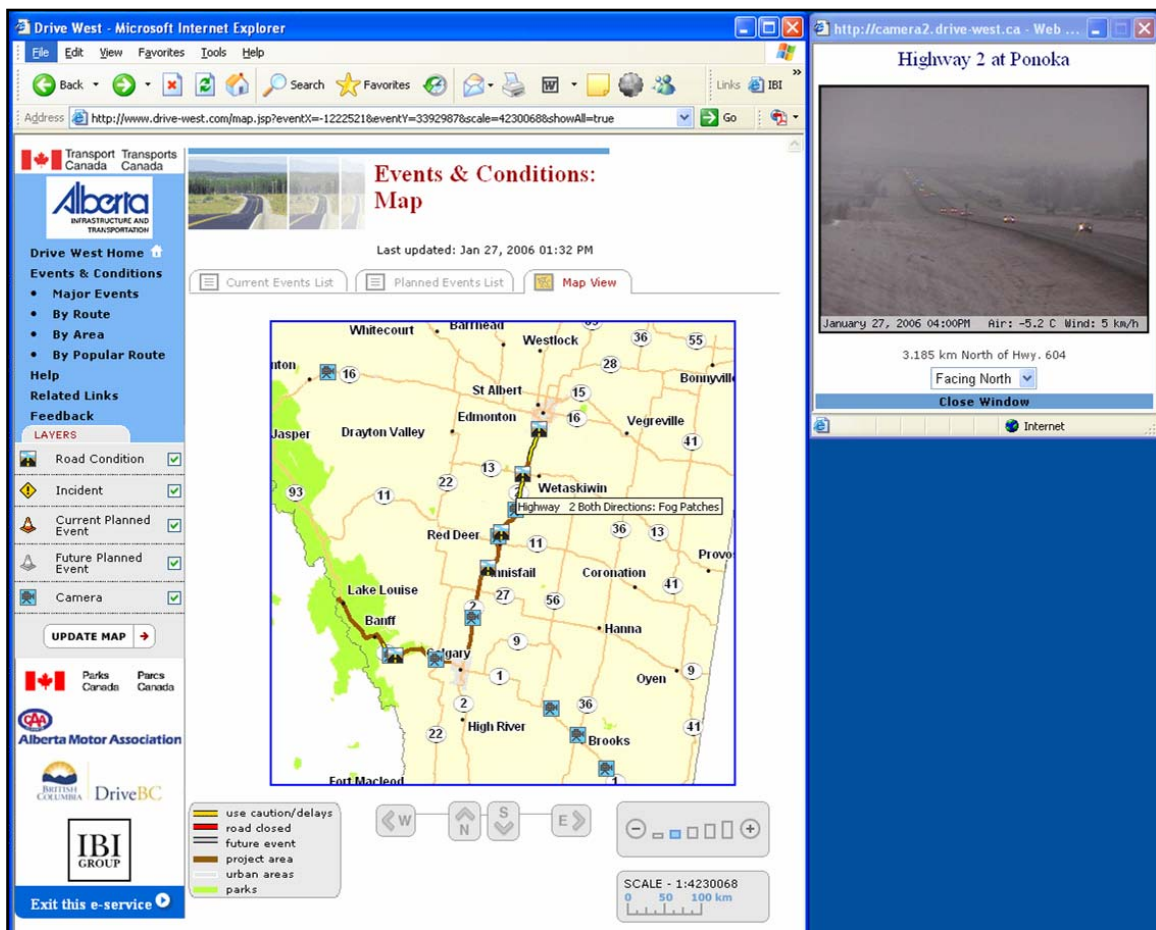

Figure 1: Typical Public Interface Output from Drive West

5. System Operations

Communication Protocol

An introductory meeting was held in October 2005 between INFTRA, AMA, the HMCs, and IBI Group. IBI Group presented the initial concept and discussed communication protocol. From that meeting, protocols for all groups involved were established. An example of one of the protocols is displayed as Figure 2.

TCH Alberta - Drive West Pilot - Event Data Entry				
Event Type	**Region**	**Road Segment**	**8AM to 5PM Weekdays**	**5PM to 8AM Weekdays Weekends and Holidays**
Incidents	Alberta Infrastructure & Transportation	TCH	**HMC (Office Administrator)**	CIC (notified by **HMC** or MCI/FST)
Road Condition	Alberta Infrastructure & Transportation	TCH	**HMC (Office Administrator) Also performs daytime updates.**	AMA - Based on **Faxes from HMC** AMA updates based on phone calls and emails received from field. AMA will operate from 5:30 AM to 10:30 PM Daily CIC updates from 10:00 PM to 5:30 AM based on **faxes/calls from HMC**
Planned Events	Alberta Infrastructure & Transportation	TCH	MCI/FST	MCI/FST or CIC

TCH = Trans Canada Highway
CGY = Calgary
EDM = Edmonton
CIC = Coordination and Information Centre (Alberta Infrastructure and Transportation)
MCI = Maintenance Contract Inspector
FST = Field Support Technologist
HMC = Highway Maintenance Contractor
AMA = Alberta Motor Association - Road Reports Team

IBI GROUP

QE II Ledcor - Drive West Pilot - Event Data Entry				
Event Type	**Region**	**Road Segment**	**8AM to 5PM Weekdays**	**5PM to 8AM Weekdays Weekends and Holidays**
Incidents	Alberta Infrastructure & Transportation	QEII CGY - Millet	MCI/FST OR CIC based on reports from field	CIC (notified by **HMC** or MCI/FST)
Road Condition	Alberta Infrastructure & Transportation	QEII CGY - Millett	AMA - Based on **Faxes from HMC** AMA updates based on phone calls and emails received from field. AMA will operate from 5:30 AM to 10:30 PM Daily	AMA - Based on **Faxes from HMC** AMA updates based on phone calls and emails received from field. AMA will operate from 5:30 AM to 10:30 PM Daily CIC updates from 10:00 PM to 5:30 AM based on **faxes/calls from HMC**
Planned Events	Alberta Infrastructure & Transportation	QEII CGY - Millet	MCI/FST	MCI/FST or CIC

TCH = Trans Canada Highway
CGY = Calgary
EDM = Edmonton
CIC = Coordination and Information Centre (Alberta Infrastructure and Transportation)
MCI = Maintenance Contract Inspector
FST = Field Support Technologist
HMC = Highway Maintenance Contractor
AMA = Alberta Motor Association - Road Reports Team

IBI GROUP

Figure 2: Sample Operations Protocol Matrix

The protocol for Highway 1 through Banff was very straight forward. Information from the Banff National Park maintenance crews on incidents, road conditions, and planned events was entered into Drive West by Banff Dispatch. This protocol was basic because Parks Canada performs its own highway maintenance and has a dispatch centre open 24 hours per day, 7 days per week.

The protocol for Highway 1 from the East Banff Gates to Calgary involved input from the HMC, Volker Stevin Contracting Ltd., INFTRA (field personnel and CIC), and AMA. From 8 am to 5 pm weekdays, the HMC updated incidents and road conditions while INFTRA field personnel updated planned events. From 5 pm to

8 am weekdays and on weekends and holidays, incidents and planned events were updated by INFTRA (field personnel or CIC) and road conditions were updated by AMA or CIC (through faxes and/or phone calls from the HMC).

The protocol for Highway 2 from Calgary to Millet (approximately 230 km) involved input from INFTRA (field personnel and CIC) and AMA. Note that the HMC for this area did not participate in any direct information input into Drive West. From 8 am to 5 pm on weekdays, incidents and planned events were entered by INFTRA (field personnel or CIC) and road conditions were entered by AMA (from faxes from the HMC). From 5 pm to 8 am weekdays and on weekends and holidays, incidents and planned events were entered by INFTRA (field personnel or CIC) and road conditions were updated by AMA or CIC (through faxes and/or phone calls from the HMC).

The communications protocol for Highway 2 from Millet to Edmonton (approximately 50 km) involved INFTRA (field personnel and CIC), AMA, and the HMC Alberta Highway Services Ltd. From 8 am to 5 pm weekdays, incidents were updated by INFTRA (field personnel and CIC) or the HMC, planned events were updated by INFTRA field personnel or the HMC, and road conditions were updated by AMA (based on faxes from the HMC). From 5 pm to 8 am weekdays and on weekends and holidays, incidents were updated by CIC (notification by INFTRA field personnel or the HMC), planned events were updated by INFTRA (field personnel or CIC), and road conditions were updated by AMA or CIC (from faxes and/or phone calls from the HMC).

Multi-Agency Approach

During operations, there were multiple business units and agencies that were trained in utilizing and maintaining current information on the Drive West web site. These groups included:

- INFTRA's Highway Maintenance Contract Inspectors and Field Support Technologists (field personnel);
- Volker Stevin Contracting Ltd. Highway Maintenance Contractor;
- Alberta Highway Services Ltd. Highway Maintenance Contractor;
- INFTRA's Coordination Information Centre (CIC) Operators;
- Alberta Motor Association (AMA) Road Reports Personnel;
- Parks Canada Dispatch Centre Staff; and
- Administrative Staff for managing users on the system.

This approach provided the ability for individuals with the appropriate information to enter the information or updates into the system. During the 4 month trial period, there were a total of 423 unique events entered, maintained, and closed on the Drive West system. The events included 5 planned events, 15 incidents (unplanned), and 403 road condition events.

In summary, the website was populated by information from field personnel, either directly or indirectly, or from the Alberta Motor Association (AMA). Direct input was provided by INFTRA field personnel in the Calgary, Red Deer, and Edmonton areas and the HMC Volker Stevin Contracting Ltd. Indirect field input was facilitated through INFTRA's Coordination Information Centre (CIC); INFTRA field personnel or the HMCs Ledcor Alberta Ltd. or Alberta Highway Services phoned CIC and then CIC inputted the information into the website. Parks Canada dispatch personnel updated all information within the Parks Canada Boundary on Highway 1.

6. Early Operational Results

During the initial meeting with the Alberta Provincial Highway group in November 2005, there were some concerns identified by the HMCs. First and foremost, only two of the 3 HMCs involved in the project area attended the meeting. Secondly, the remaining two HMCs saw the Drive West pilot project as a big increase to their work load; one that they were not willing to take on. And thirdly, they identified that the HMC personnel closest to the events (road conditions and incidents) either did not have remote access to the internet or had limited computer ability and would not be able to input events into Drive West. All of these concerns were addressed in the communications protocols; CIC and AMA took on the responsibility to input much of the information provided by the HMC through faxes or phone calls. Volker Stevin Contracting Ltd., the HMC responsible for maintenance of Highway 1 from Calgary to Banff, took on the responsibility of entering event information during working hours. Similarly, the Parks Canada dispatch personnel who have direct communication to field crews took on the same role on a 24 hour basis.

The Drive West website went live to the public on December 8, 2005. As the various groups started entering events, areas requiring improvement presented themselves.

Most of the additional assistance was required for CIC, because they were not familiar with highway maintenance, the Provincial Highway system's landmarks/reference points, or road and weather condition descriptions. In response to these issues, INFTRA TSB created conversion charts and "look-up sheets", including information on:

- Highway driving conditions;
- Weather conditions;
- "Start and end points" or reference points on the highway (correlation between the AMA descriptions and Drive West descriptions);
- HMC shop phone numbers so CIC could contact them directly if they required clarification;
- Instructions on how to interpret AMA road conditions faxes; and
- "look-up sheets", or a form, with the requirements from the HMC or INFTRA field personnel so CIC could write down the information about

the event while on the phone with them, then transfer that information to Drive West.

These many challenges encountered with CIC identified the need to have the information entered by a source as close to the event as possible (such as the HMCs).

While INFTRA CIC struggled with Drive West at the beginning of the pilot project, INFTRA field personnel found the system very easy to use. They found the Web Input Utility (WIU) intuitive and easy to navigate. This alleviated many of their initial fears regarding additional work load to enter information.

IBI Group and INFTRA TSB stressed to the group in the training and subsequent information e-mails the concept of event ownership. If a person inputted an event into Drive West, it was their responsibility to update it as conditions changed and terminate it when it was complete. CIC and AMA were groups that just inputted the information; it was not their responsibility to make the decision to update or terminate an event, nor was it their responsibility to track down the "owner" for an update. This was a challenge at the beginning of the pilot, but as the users became more familiar with the program and process, most events were updated and closed appropriately. There were many instances throughout the pilot project period where events were entered by one individual or group and were subsequently followed up by one or more other individuals to update and clear events. In fact, 64 events out of 423 were tracked and updated for 2 or more days.

Based on the initial comments received and the events that were entered, the possible event causes were discussed and a modified list of events was developed that included only relevant events for road conditions for the region. It was identified that there were some events that that were relevant in BC but not Alberta and also some events that were somewhat unique to Alberta. The result was a more organized and concise list that was limited to 37 unique road condition events. These 37 events were put into logical groups of ice, visibility, snow, water/rain, hazards, and general driving conditions. The challenge in Alberta was the travelling public was used to viewing road conditions for every segment of highway that included a great deal of detail, including the statement of positive road conditions such as "good winter driving conditions". The intent of this pilot was to report road conditions that were not "normal", therefore reducing the burden on entry of large amounts of information, developing consistency with BC, and providing a mechanism to track and update conditions that were not "normal". As can be seen in the following section, the format of the information was well received by the travelling public.

7. Operations and Public Traveller Usage and Benefits

General Event Data and Public Usage

Table 1 below shows the number of events that were entered into the system between December 8, 2005 and April 15, 2006 for the project areas of Highway 2 from Edmonton to Calgary and Highway 1 from Calgary to the BC border. The weather conditions in Alberta on this particular winter were very mild and dry through December, January, and February, with majority of the adverse weather and road conditions taking place in March.

Month	Planned Events	Incidents	Road Conditions	Total Events
December	2	3	41	46
January	2	2	110	114
February	0	5	111	116
March	1	2	123	126
April	0	3	18	21
Total	**5**	**15**	**403**	**423**

Table 1: Number of Events by Month

Of the 15 incidents entered into the system, 4 were complete road closures due to collisions and material spills.

Table 2 below shows the number of travellers visiting the Drive West web site to view traveller information. The lower numbers in December and April reflect the reduced number of days of operation during those months. It can also be seen that the integrated RWIS weather and camera data integration provided a significant increase in interest as demonstrated by the camera views (77% of total views).

Month	Page Views	Camera Views	Total Views
December	8,962	-	8,962
January	22,300	43,204	65,504
February	22,229	85,384	107,613
March	33,783	155,768	189,551
April	8,304	28,746	37,050
Total	**95,578**	**313,102**	**408,680**

Table 2: Drive West Public "Views" by Month

Another important observation from the above table is that usage of the website increased during periods of higher event activity (primarily weather related) such as the month of March. This indicates that users actively viewed the website during known weather events.

Use of Drive West as Traveller Information Portal

The Drive West opening page was designed to act as a web portal to access traveller information for Western Canadian Provinces, territories, and North Western US States. The Web site provided live map-based links to:

- Other sites within Alberta (outside of the HWY 1/ HWY 2 project area);
- British Columbia (Drive BC);
- Saskatchewan;
- Yukon Territory;
- Northwest Territories; and
- US States including Washington, Idaho and Montana.

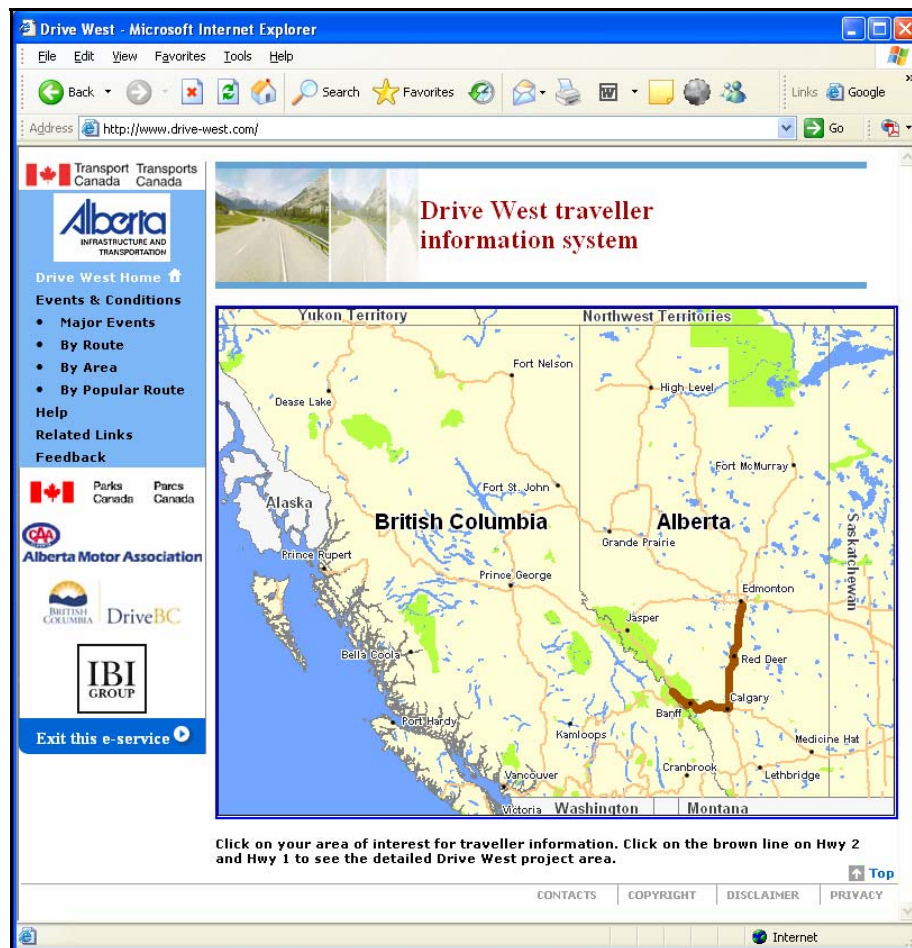Figure 3 below displays the front access map provided by Drive West.

Figure 3: Drive West Opening Map Providing a Portal to other Traveller Information Systems

In addition to the 408,680 page views within Drive West there were an additional 38,626 links made to other jurisdictions traveller information web sites. This demonstrated that travellers are very interested in having access to regional

information as part of their travel planning. Figure 4 below illustrates to what jurisdictions these links were made.
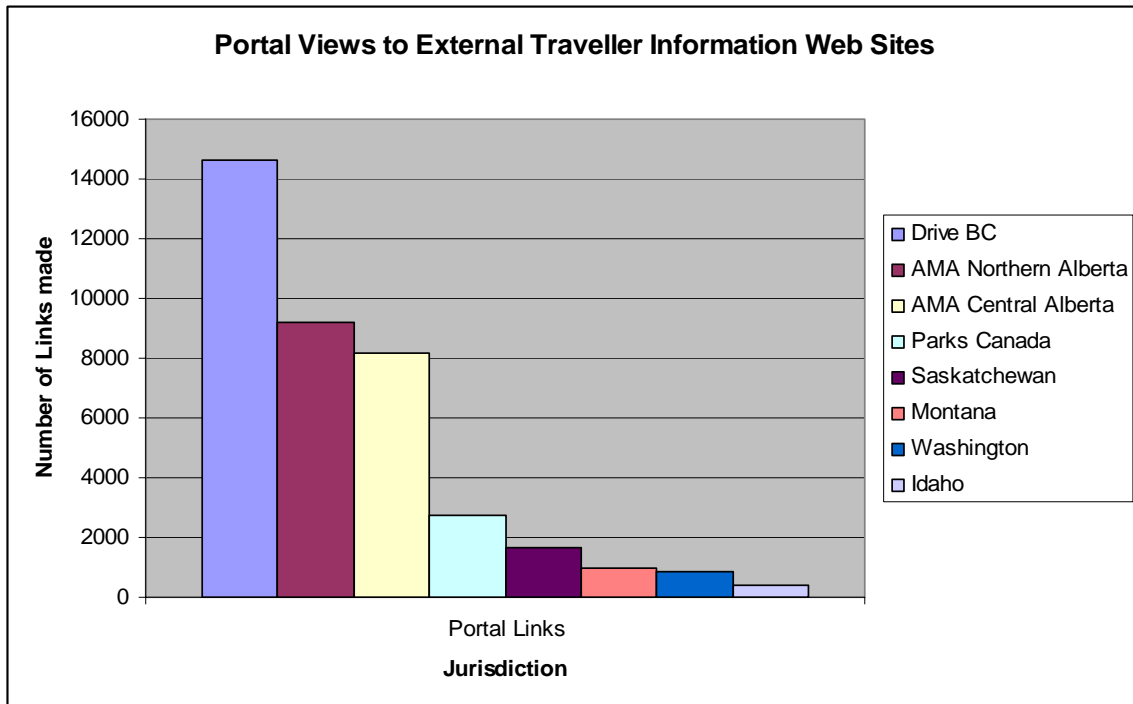
Portal Views to External Traveller Information Web Sites

Figure 4: Portal Links Summary to other Jurisdictions

Feedback Survey

A feedback button was provided on the website that gave travellers an opportunity to complete a survey and provide freeform comments. A total of 137 responses were received from this survey. Some of the key outcomes noted by the survey are described below.

Over 56% of the respondents indicated that they traditionally have used the internet (such as the existing AMA and Parks Canada Road Reports websites) to access information regarding travel conditions. Reliance on the internet to receive this type of information would support further enhancement of this type of information delivery system to the travelling public.

Seventy nine percent of the respondents found the information on the website "very informative" or "somewhat informative". This is further backed up by the fact that 57% indicated that the detail provided by the website was sufficient and 81% would recommend the website to others.

Overall, the respondents were very satisfied with the website; however there was one area of improvement noted through the ratings provided in the survey. Figure 5 below demonstrates the high level of satisfaction with each category;

however the "accuracy and timeliness of the information" received the lowest number of high satisfaction scores.
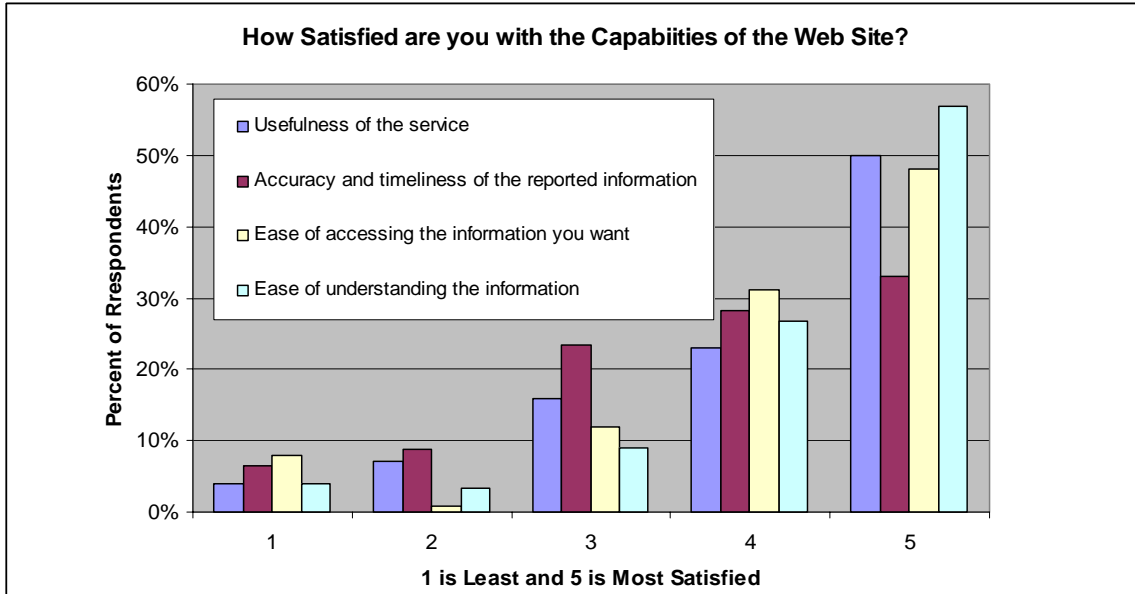

Figure 5: Survey Responses Related to Level of Satisfaction

Users were also asked to rate the importance of various web site features presented. While all features rated high, the "road condition information" and the "RWIS camera images" were clearly the most popular. Figure 6 below illustrates this result.
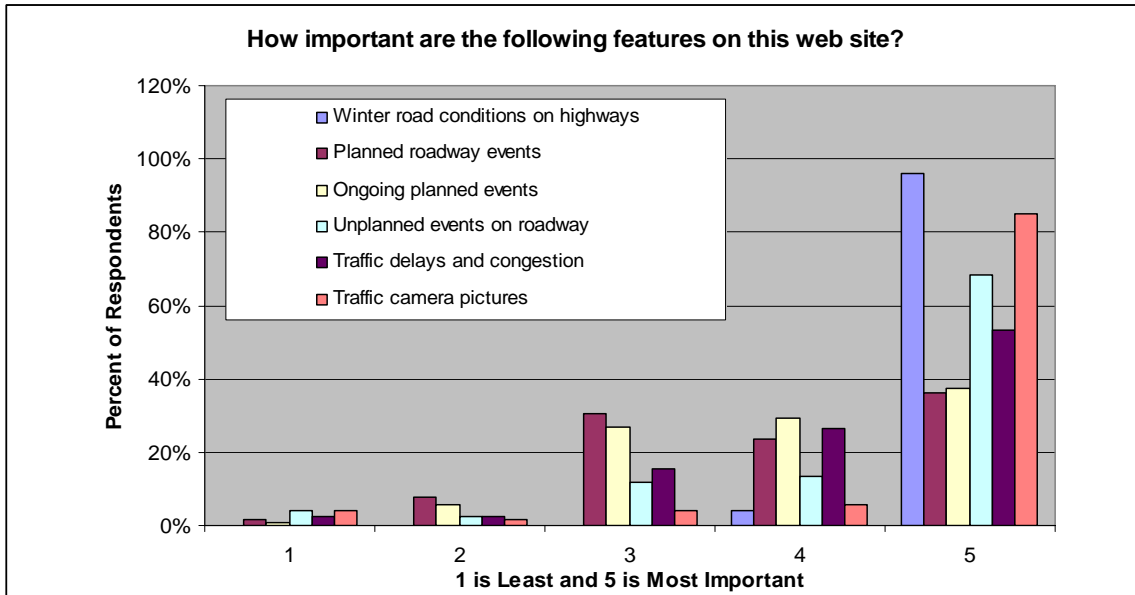

Figure 6: Survey Responses Related to Importance of Web Site Features

Freeform Survey Comments

Survey respondents were also given the ability to provide freeform text comments at the end of the survey. The comments were reviewed during and after the project, and in some cases adjustments were made to the website based on those comments. The comments were grouped into general categories and 153 unique comments were received. There were approximately 18 general categories that these comments fell under, however there were 4 categories that had 10 or more comments that fell into that category. Table 3 below lists these categories and the number of comments received.

Comment	Number of Comments
Valuable tool, like the website and the images	50
Want more RWIS cameras installed	24
Information is not timely enough (events and camera images)	20
Did not include my specific area of interest	14

Table 3: Comments Grouped by 10 or more

As can be seen above, 50 (33%) of the comments liked the websites and in particular the added value of the RWIS data and images. This is further exemplified by the request of 24 (16%) for more RWIS cameras.

Twenty respondents (13%) felt that the events and camera images were not updated in a timely manner. This further exemplifies the need to provide and utilize better tools to allow for data entry from the field at the time the condition changed. The automated collection and dissemination of RWIS data and images provided a valuable tool to provide feedback to the traveller between road condition updates by field personnel.

9. Conclusions

Based on the evaluation of the project to date there are a number of conclusions that can safely be drawn from the Drive West pilot project.

Operations

An integrated approach such as Drive West allowed for multiple jurisdictions to enter event information, including updating and terminating events by different business groups with the appropriate permissions (i.e. AMA enters an event and CIC updates or terminates the event based on new information confirmed from the field after hours). Web based technology allowed for simplified access by the appropriate personnel regardless of their current location (no client software installation was required).

On an operations level, it was still important to get all groups engaged in the use of the system early in the project and to keep clear lines of communication. Simplification of data entry with minimal numbers of forms greatly improved the

likelihood that all operations personnel would maintain the information on the system. This was communicated directly by the operations group during training and they were in turn surprised at how intuitive and simple the data entry was.

Public View of Traveller Information

While the development and maintenance of meaningful event-type descriptions was important to keep understanding and selection of events simple for operators, it was equally important that these descriptions be simple to understand for travellers. Consistency of the information relative to the actual road conditions helped to improve the confidence level of the information with motorists.

Another indicator of the confidence level for the traveller regarding the information on the system was the timeliness of updates. While the camera images provided significant value to travellers as it empowered them to view some of the conditions directly, it also provided a lower level of confidence if the camera image did not coincide with the map based event information. The operations personnel could establish a procedure whereby they utilize the cameras to identify discrepancies in information, triggering them to contact field personnel to verify and update existing conditions.

Regardless of the timeliness of updates, motorists were also appreciative of additional information (such as RWIS images and weather information) to allow for their own informed decisions on their travel plans.

Based on the web tracking results, travellers were very interested in having regional integrated websites that allowed them to go to a single website location to find information regarding their planned trip. Regarding travel and roadway events, the traveller was generally not concerned with boundaries and would prefer to obtain all the information required from a single website location.