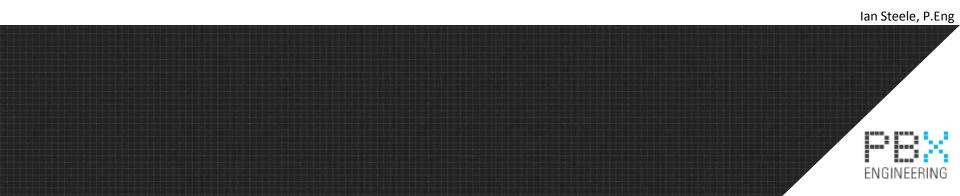




Traveler Information Smartphone Application

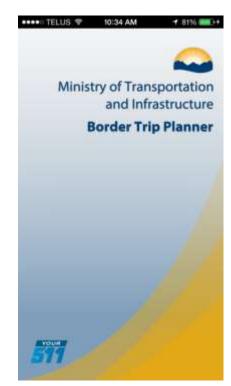
June 02, 2014

Ian Steele P.Eng. PBX Engineering Ltd.



Ministry of Transportation and Infrastructure Border Trip Planner Smartphone Application Background

- Presentation Scope
 - Application overview
 - Data Fusion Engine



*iOS version shown







PBX Engineering Ltd. ITS 2014

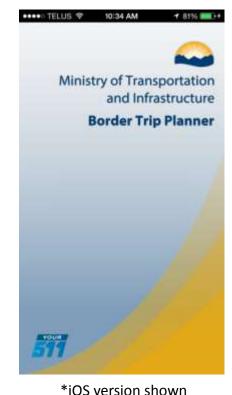


Ministry of Transportation and Infrastructure Border Trip Planner Smartphone Application Background

- Background
 - Funded from the border infrastructure program
 - Part of a group of projects intended to improve flow of people and goods across the border

Objective

- Initial goal is to improve information available for border trip planning
- Architecture is scalable: can ingest any traffic data source
- Can function as full point to point trip planner





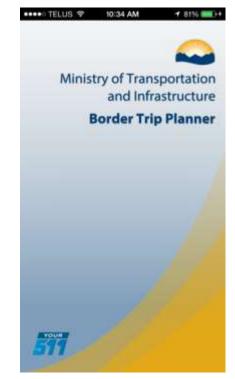


Ministry of Transportation and Infrastructure Border Trip Planner Smartphone Application Application Purpose



Application Purpose

- Provide mobile access point for:
 - Border crossing travel times for 24 distinct travel routes
 - > Notification of travel delays and alerts for each route
 - Delivery of up-to-date traffic camera images for ondemand viewing
- Provide all of the above in a streamlined native application that is purpose-built for Apple iOS 5+ and Android 2.x and later



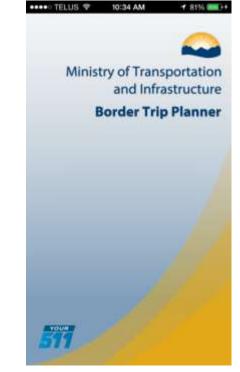
*iOS version shown





Data Sources

- Border ATIS
 - Estimated wait time at Peach Arch, Pacific Truck, Aldergrove, and Sumas
 - Derived from loop-based data
- Hwy 99-91 Travel Time
 - Travel time along Hwy 99 and 91 corridors
- Other Roadway Links
 - ➤ Google Traffic
 - Historical travel times











Ministry of Transportation and Infrastructure Border Trip Planner Smartphone Application Application Functionality – Drive Times



Driving Times

- Travel routes are grouped by trip origin (common, recognizable start points)
- Each trip origin contains several crossing destinations with associated travel times

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- Saved Routes	Q-Borough to Pacific X-ing via Hwy 91	Trips from Q-Borough	Q-Borough to Pacific X-ing via Hwy 99
- Popular Routes	60 min (51 min) 33.0 km	Associated Information	Hwy 99 from north of Hwy 17 overpass
Trips from Tsawwassen	G-Borough to Pacific X-ing via Hwy 99 1 hr 11 mm II hr 2 mm 48.1 km	Cameras 6	Hwy 99 near Hwy91 (Mud Bay) in Delta, looking
Trips from Oak St Br	Q-Borough to Peace Arch via Hwy 91 60 min (52 min) 30.7 km	Events 0	east on Hwy 99 Hwy 99 near Hwy91 (Mud Bay) in Delta, looking
Trips from Knight St Br	Q-Borough to Peace Arch via Hwy 99 1 hr 12 min (1 hr 4 min) 50 km		west on Hwy 99 Hwy 99, north of Hwy 17 overpass
Trips from Q-Borough Br	→	→	Hwy91 at Fraserwood Way, on the East-West Connecter, looking west
Trips from Hwy 1/176 St			Hwy91 at Fraserwood Way, on the East-West Connector, tooking east
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Trips from Hwy 1/Hwy 11			
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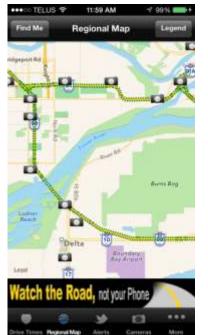
Ministry of Transportation and Infrastructure Border Trip Planner Smartphone Application Application Functionality – Regional Map

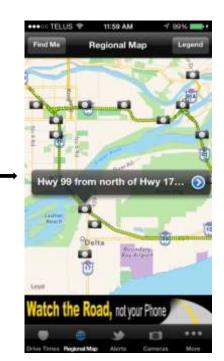


Regional Map

- Color-coded traffic flow displayed on map
- Tapping on specific event/camera triggers display of latest image
- Customizable legend provided for ease-of-use











Hwy 99 from north of Hwy 17 overpass







Ministry of Transportation and Infrastructure Border Trip Planner Smartphone Application Application Functionality – Alerts



Alerts

• Traffic alerts for each crossing link to Twitter accounts regularly-updated by Canada Border Services Agency (CBSA)

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- Alerts can be configured to point to other regularly-updated data sources
- Specific crossings can be set to "Favourite" to allow for Push notifications on smartphone UI





Ministry of Transportation and Infrastructure Border Trip Planner Smartphone Application Application Functionality – Cameras



Cameras

- Cameras are grouped according to highways and roadways
- Tapping on specific highway/roadway expands associated camera list

Tapping on specific camera description triggers display of latest image from that camera

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- Current configuration pulls images from DriveBC
- Image source can be configured on the backend to provide images from any database





Ministry of Transportation and Infrastructure Border Trip Planner Smartphone Application Application Functionality – Preferences



Preferences

- User preferences allow toggles for:
 - Device GPS utilization
 - Display of camera icons on Regional Map
 - Display of congestion data on Regional Map
 - Metric / US Customary units
- Coverage areas can be set via geolocation (using GPS) or manually specified

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Data Fusion Engine

- Developed by ICX Transportation Group
- Used by a number of transportation agencies in North America
- DFE is a sophisticated tool for collection, integration, and dissemination of traffic data sets







- Collection
 - Gathering
 - Validating
 - Converting
- Fusion
 - Rules based system for combining similar data from multiple sources
 - Can be applied to any data type
 - Link(roadway sensor) data
 - Event data
 - Produces a derivative output that is one of
 - A combined view of the inputs
 - A unified view of the best of the inputs







- Link Data
 - Speed/Travel Times
 - Sources: field detectors, probe sources, aggregate providers
- Events
 - Roadway (via operators)
 - Construction/Incidents/Special Events
 - Weather Data (RWIS and Forecast)
 - Automated interfaces to NWS
 - Police CAD Reports
- Camera Metadata







The system includes a number of offline map/GIS tools to support maintenance and operations.

- Link Tools
- Route Tools
- Data Tools





- iOS and Android Supported
- Native UI controls (notably Map)
- Server-side controls provide greater flexibility in content changes/updates







- Resulting data validated to be very accurate
- Interface is very popular with test group; described as "very useful"
- Currently being tested by MoTI
- Design team is working on rollout roadmap for testing among broader audience



