



# **Advanced Traveller Information and Traffic Management Systems for Highway 2**

**Stakeholder Workshop  
October 9, 2003**

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# Outline of Workshop

- **Introductory Remarks**
  - Allan Lo, Alberta Transportation
- **Summary of Needs**
  - Alf Guebert, Earth Tech, Canada
- **Overview of ITS Blueprint**
  - Tim Schnarr, Delcan Corporation
  - Mark Pinet, M. Pinet & Associates
- **Benefit / Cost Analysis**
  - Tim Schnarr, Delcan Corporation
- **What's Next ?**
  - Allan Lo, Alberta Transportation



# Introductory Remarks

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**Allan Lo**

**Alberta Transportation**



# Project Objectives

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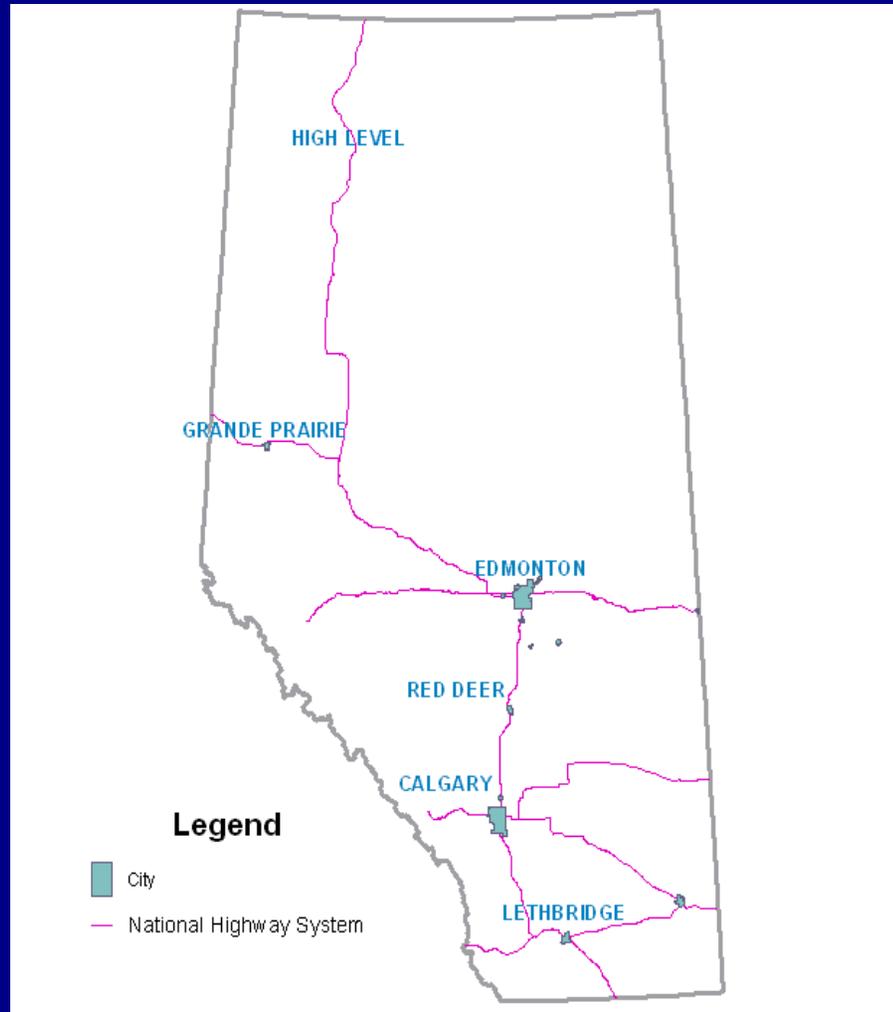
- Enhance safety and operations.
- Integrate solutions with adjacent municipal ITS plans.
- Deploy in a cost-effective and well-planned manner.



# Study Area – Highway 2



# Study Area – National Highway System



# Project Scope

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- Develop a “Blueprint” for future ITS deployment in the Highway 2 corridor
  - Traveller Information
  - Traffic Management
  - Incident Management
- Province-wide Road Weather Information System (RWIS) program
- Deliverables
  - ITS Strategic Plan
  - Functional Plans
  - Technical requirements/specifications

# Purpose of Today's Workshop

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- Overview of Needs
  - Based on Stakeholder Input
- Review ITS Blueprint
  - Recommendations
  - Priorities
  - Benefits & Costs
- Stakeholder Input
  - Suggestions
  - Involvement/Partnerships

# Format for Today

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- Informal
- Discussion and comment from the group
- Time to fill-out workbook at the end of the session



*Please be candid*

# Summary of Needs

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**Alf Guebert**

**Earth Tech Canada**



# Stakeholder Interviews

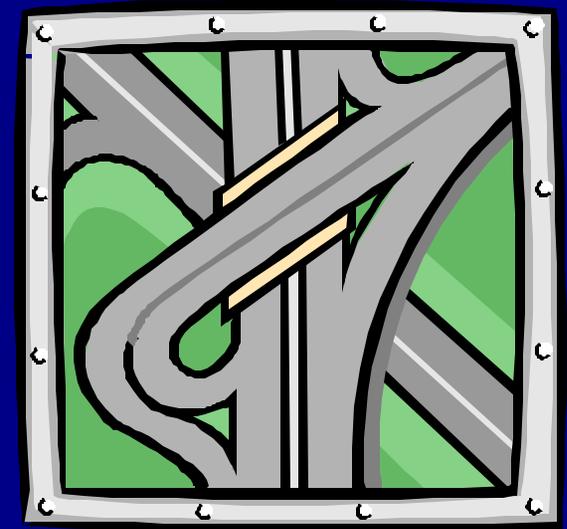
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- One to one interviews at project outset
- Discussion of needs
- Approximately 50 interviews with 45 agencies
- Other informal discussions
- Stakeholders contacted exceeds 90 individuals

# Common Themes

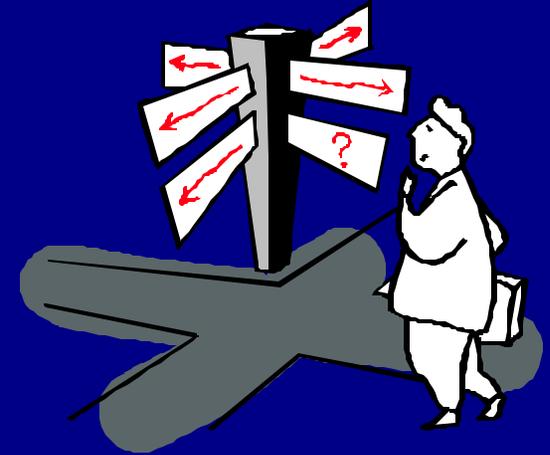
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- Road Condition & Traffic Information
- Incident Management
- Road Weather Information Systems
- Traffic Control & Management
- Work Zone Safety
- Commercial Vehicle Operations
- Inter-Agency Coordination
- Data Collection/Management



# Road Condition & Traffic Information

- More accurate and timely information
- Wider dissemination and easier access to information
- Improve sharing of information and data



# Incident Management

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- Timely detection & verification (location)
- Coordination, control and monitoring of lane closures
- Highway closure capabilities
- Protection of site & personnel
- Hazardous materials

# Road Weather Information Systems

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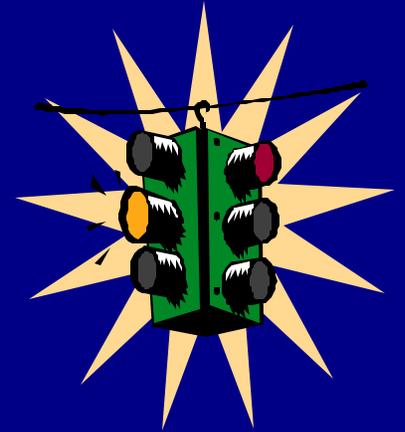
- Existing atmospheric and road conditions
- Ability to forecast atmospheric and pavement conditions



# Traffic Control & Management

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- Improve safety
- Maximize capacity of existing infrastructure
- Minimize impacts of recurrent congestion
- Minimize stops and reduce travel time in major corridors



# Work Zone Safety

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- Protection and safety of site personnel
- Improve traveller information



# Commercial Vehicle Operations

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- Minimize infrastructure damage due to over height and overweight loads
- Minimize delays at vehicle inspection stations
- Compatibility with other provinces and states



# Inter-Agency Coordination

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- Coordination, control and monitoring of lane closures
- Improve sharing of traveller information and data



# Data Collection/Management

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- Maximize use of existing equipment and systems
- Maximize access to information and data (electronic sharing)
- Develop partnerships



# Summary of Stakeholder Needs

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- Accurate and timely road, weather and traffic information
- Scheduled events, incidents, highway closures
- Wider dissemination and easier access to the information
- Minimize impacts of recurrent congestion
- Data management and sharing (agencies)

# Overview of ITS Blueprint

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**Tim Schnarr**

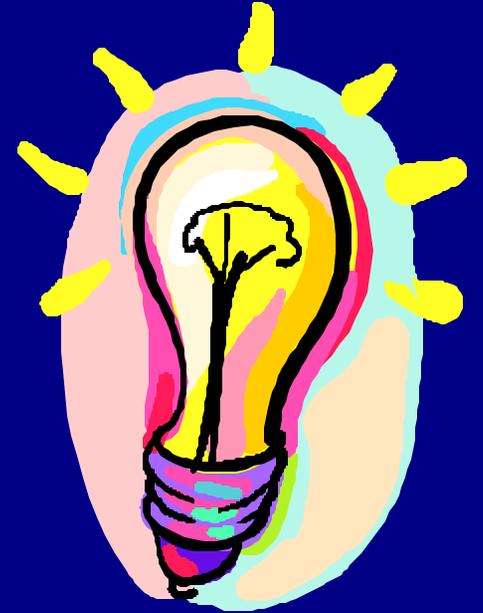
**Delcan Corporation**



# What Is the ITS Blueprint ?

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- Blueprint for Future Action
- Identifies Potential ITS Actions / Deployments
- Identifies Priority Sections



# Overview of ITS Blueprint



What Can We Do to Address the  
Needs ?

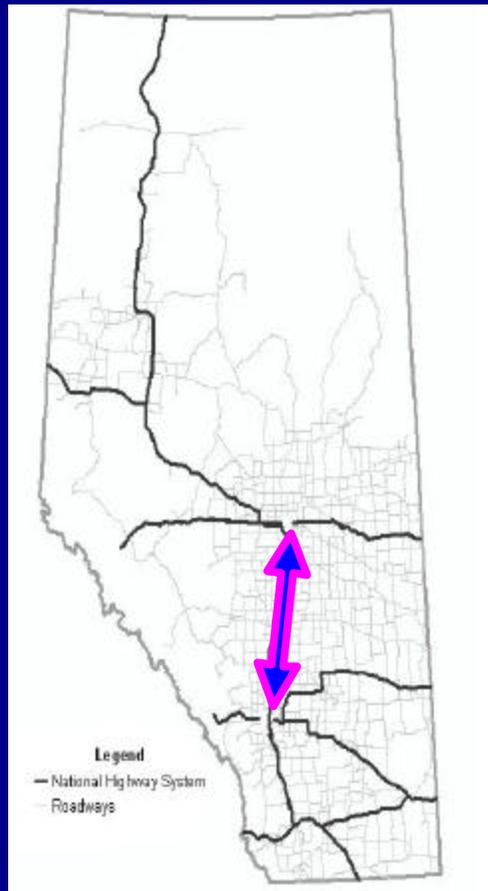


# Highway 2 Blueprint



Anthony Henday Drive

## Rural Section



## Deerfoot Trail

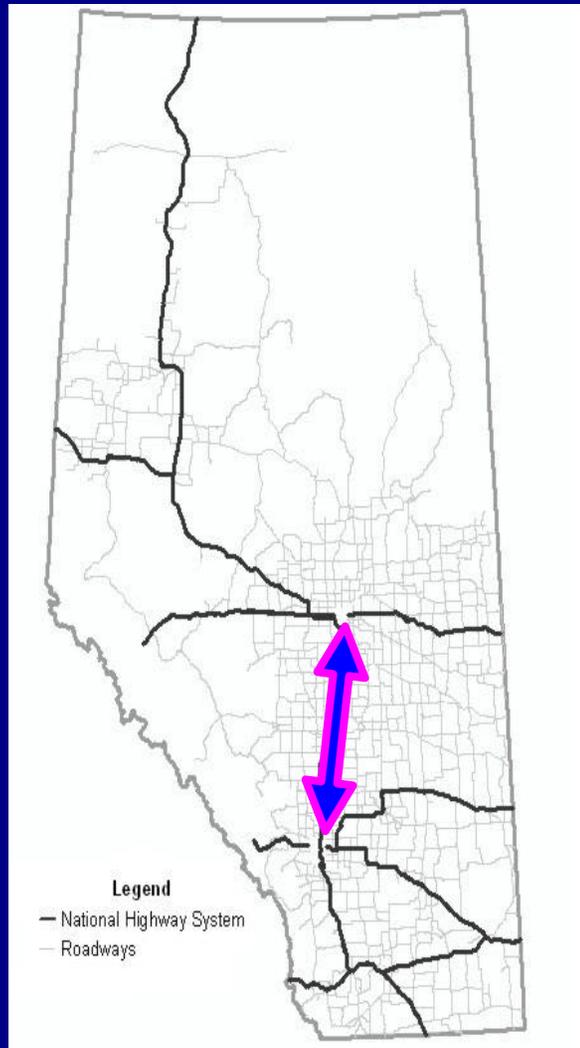


# Preliminary Blueprint Outline

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- Broken down into three identifiable highway sections:
  - Rural
  - Deerfoot Trail (Urban)
  - Anthony Henday Drive (Urban-Rural)
- Broken down by three timeframe periods:
  - Immediate (0-2 years)
  - Short (3-5 years)
  - Long (6-10 years)

# Rural Section



# Rural Section

## CHARACTERISTICS

- Low Volume
  - LOS A/B
  - AADT's 15,000 to 30,000 (50,000 in some sections)
- Safety (800 Collisions Annually)
  - 40% Single Vehicle Collisions
  - 25% Animal Hits
  - 25% Weather Related



# Rural Section

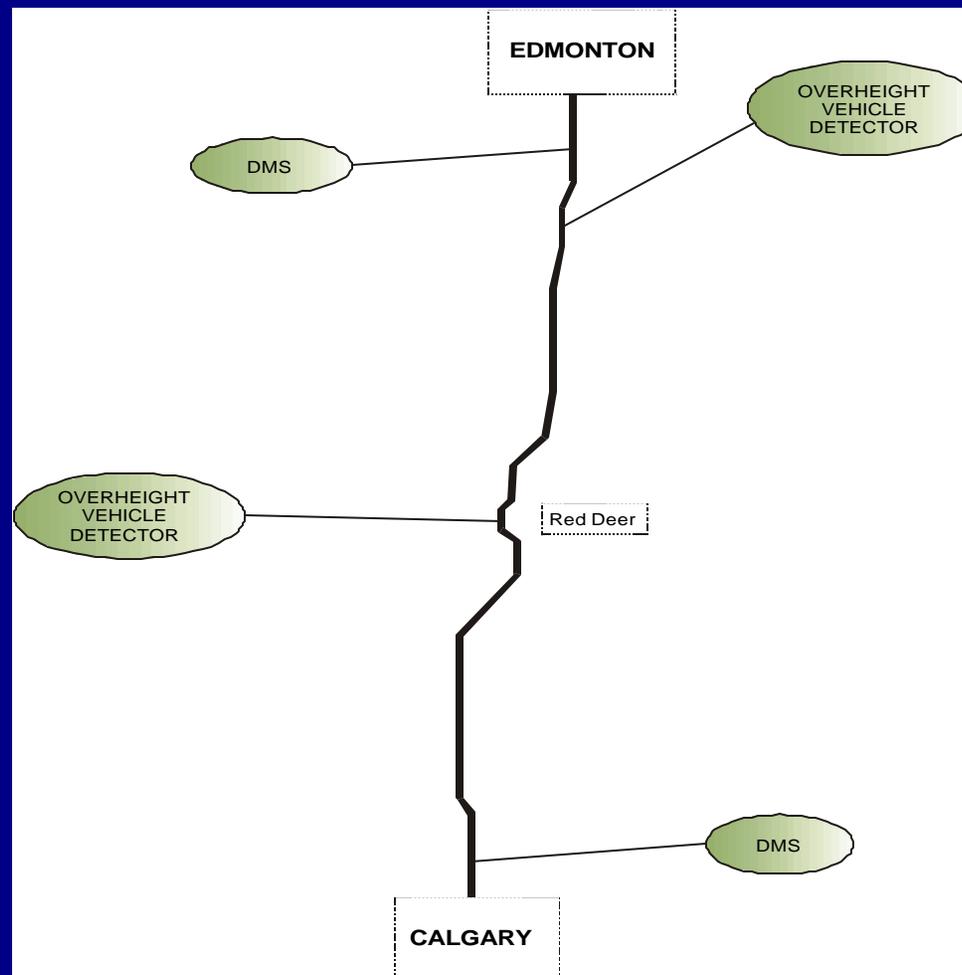
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## NEEDS

- Motorist Advisory / Traveller Information
  - Highway Closure
  - Road and Weather
- Winter Maintenance



# Rural Section – Existing Systems

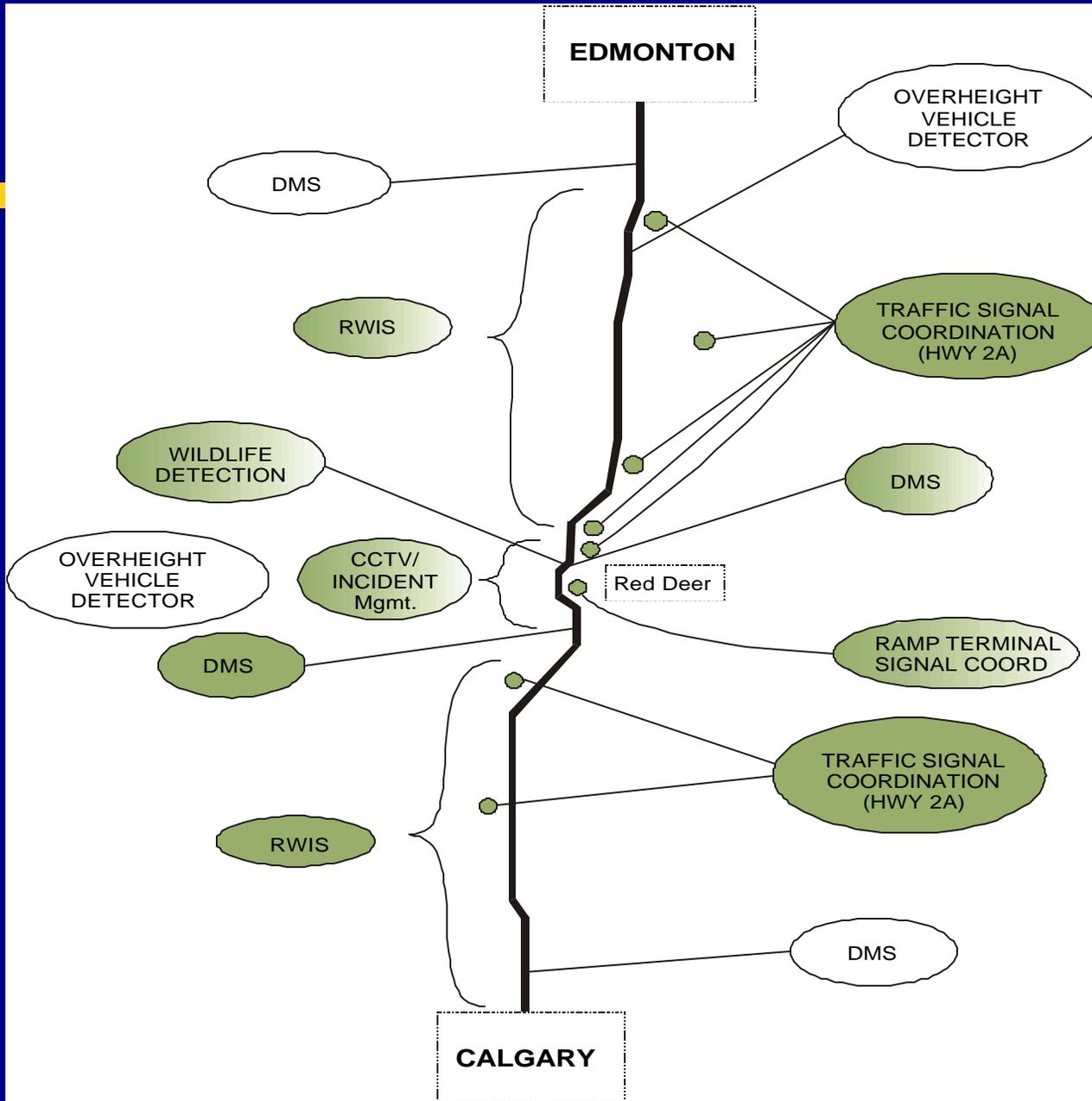


# Rural Section ITS Program

## SHORT TERM (0 to 5 years)

- Traveller Information Database
- ATIS Dissemination
  - Website
  - DMS (Permanent & Portable)
  - Commercial Broadcast Radio
- RWIS (National Highway System)
- Incident Management (Red Deer)
- Animal Detection (Pilot Test)



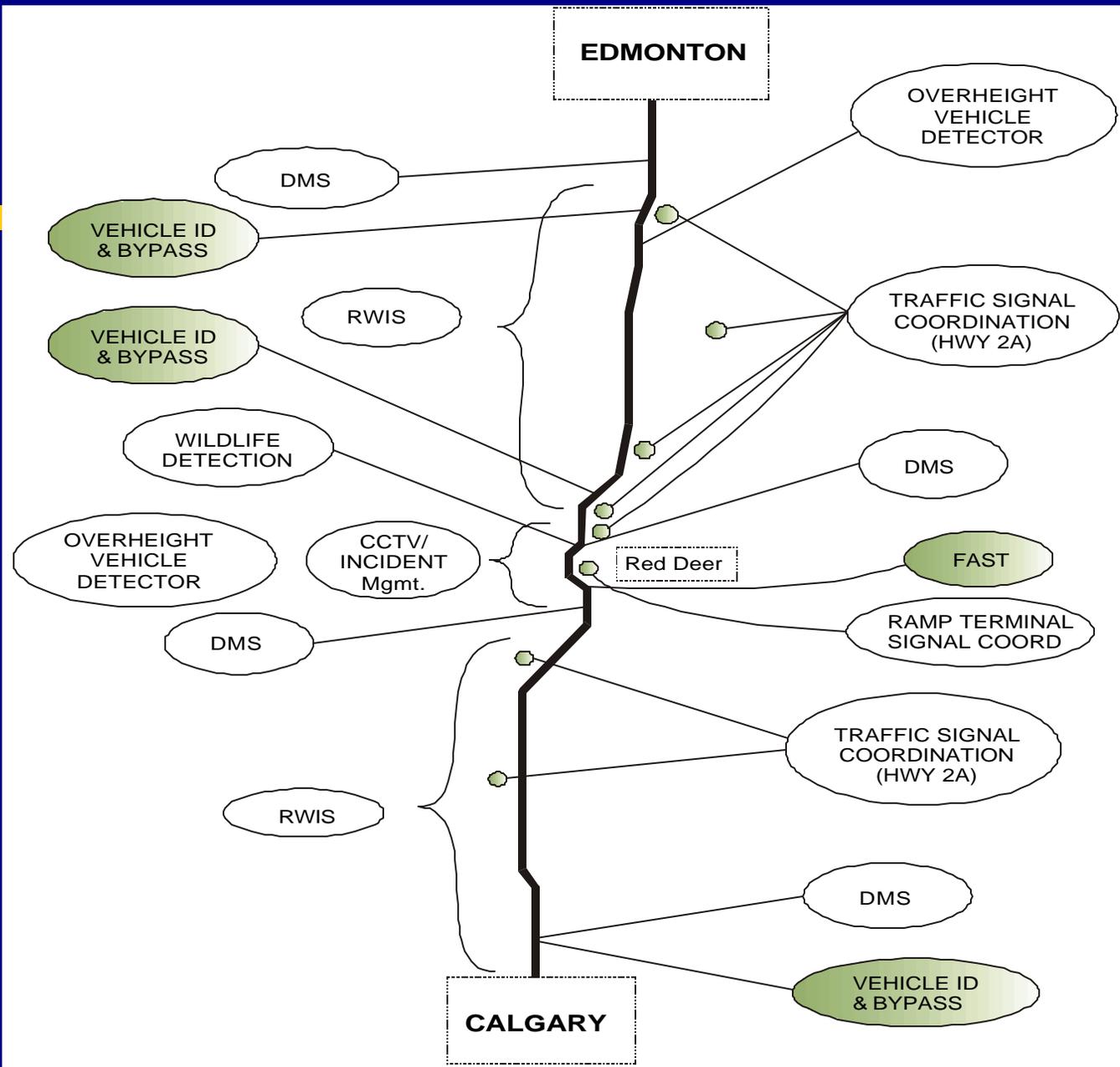


# Rural Section ITS Program

## LONG TERM (6 to 10 years)

- RWIS
  - Automated Surface Condition Reporting
  - Maintenance Decision Support System
  - FAST (Red Deer River Bridge)
- Commercial Vehicle
  - Central Carrier Database
  - Electronic Sorter & Bypass System
  - Weigh-in-Motion





HWY2\_LongTerm.cdr

# Deerfoot Trail



# Deerfoot Trail

## CHARACTERISTICS

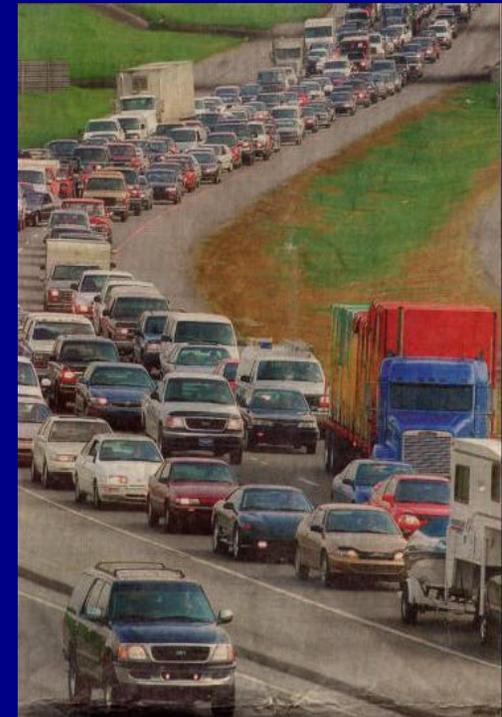
- High Volumes
  - LOS D
  - AADT's of 50,000 to 140,000
- Safety
  - 560 collisions annually
  - 70% congestion related (50% rear ends, 20% side swipe)
  - 30% weather related



# Deerfoot Trail

## NEEDS

- Congestion
  - Ramps
  - Mainline
- Incident Response
- Traveller Information



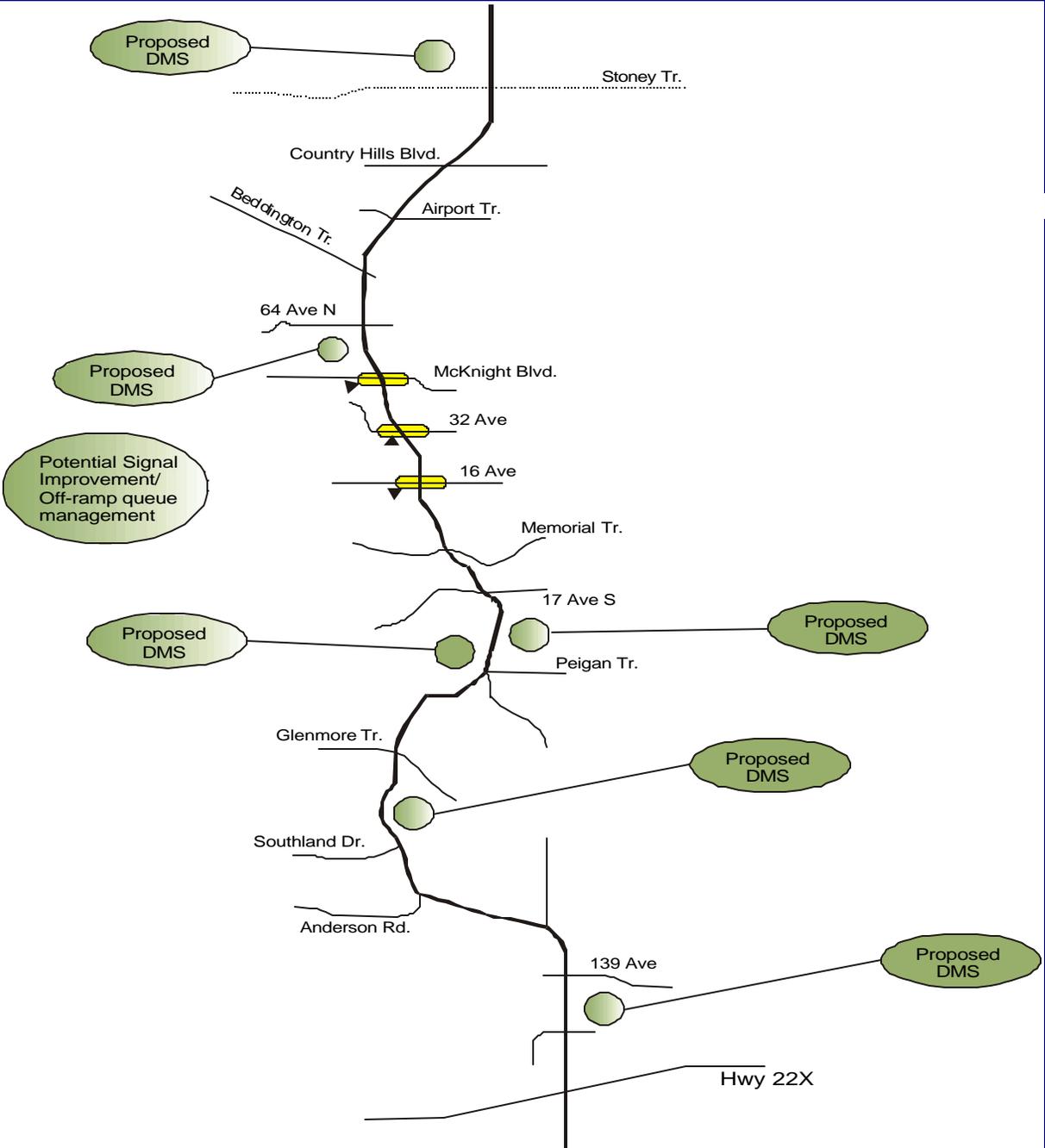
# Deerfoot Trail ITS Program

## SHORT TERM (0 TO 5 YEARS)

- Ramp Terminal Operations
- Incident Management
  - CCTV cameras
  - Collaborative TMC
- Traveller Information
  - Database
  - DMS (Permanent & Portable)
  - Website
  - Commercial Broadcast Radio
- Fixed Automated Spray Technology (FAST)
  - Calf Robe Bridge



Incident Mgmt.  
From Beddington trail  
to Hwy. 22x

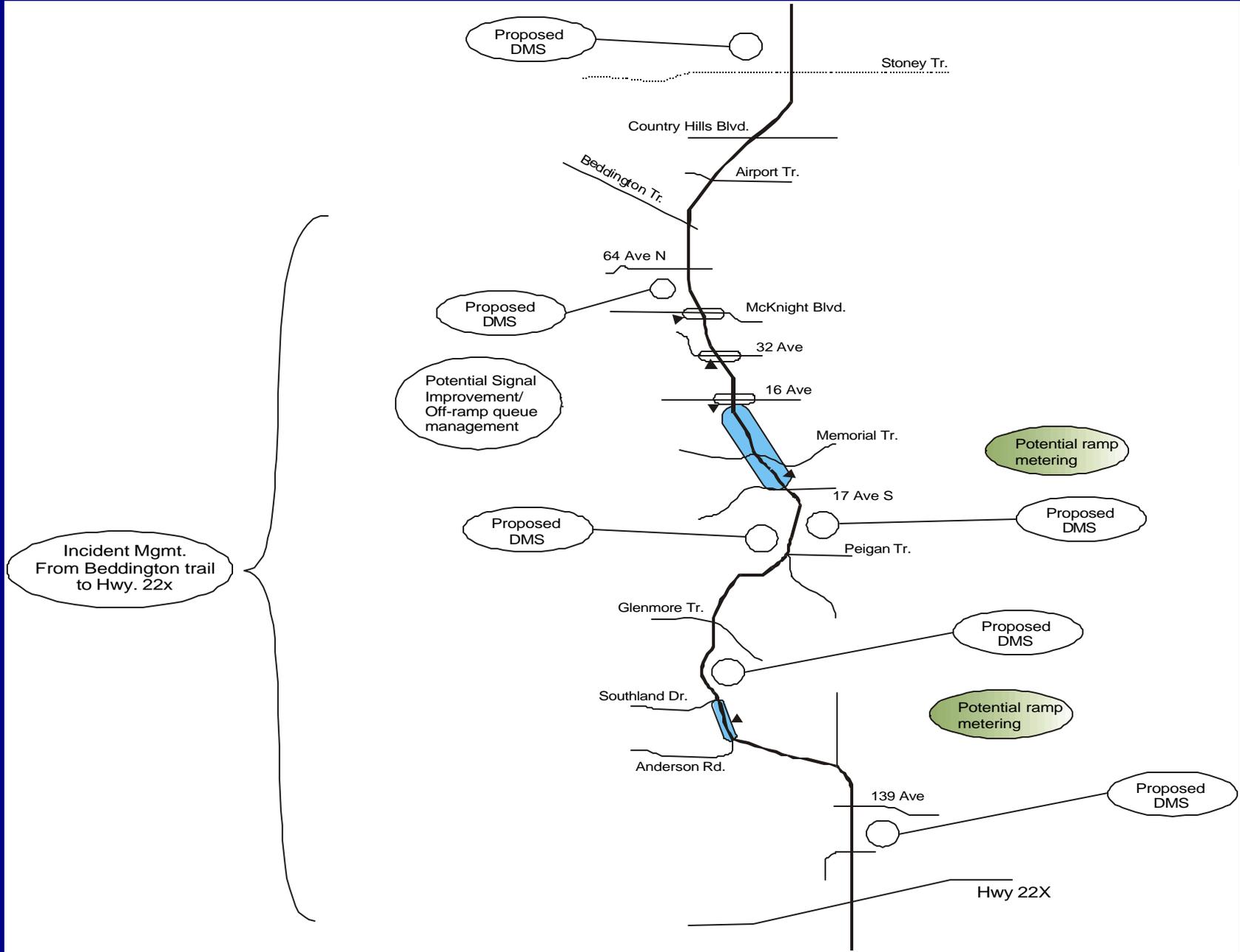


# Deerfoot Trail ITS Program

## LONG TERM (6 to 10 years)

- Incident Management
  - Additional CCTV cameras & DMS
  - Implement Automated Incident Detection
- RWIS
  - Automated Surface Condition Reporting
  - Maintenance Decision Support System
- Ramp Metering





# Anthony Henday Drive (AHD)



# Anthony Henday Drive

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## CHARACTERISTICS

- Moderate Volumes
  - LOS B/C
  - forecast AADT's of 30,000 to 70,000
- Safety
  - 760 collisions forecast annually

# Anthony Henday Drive

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## NEEDS

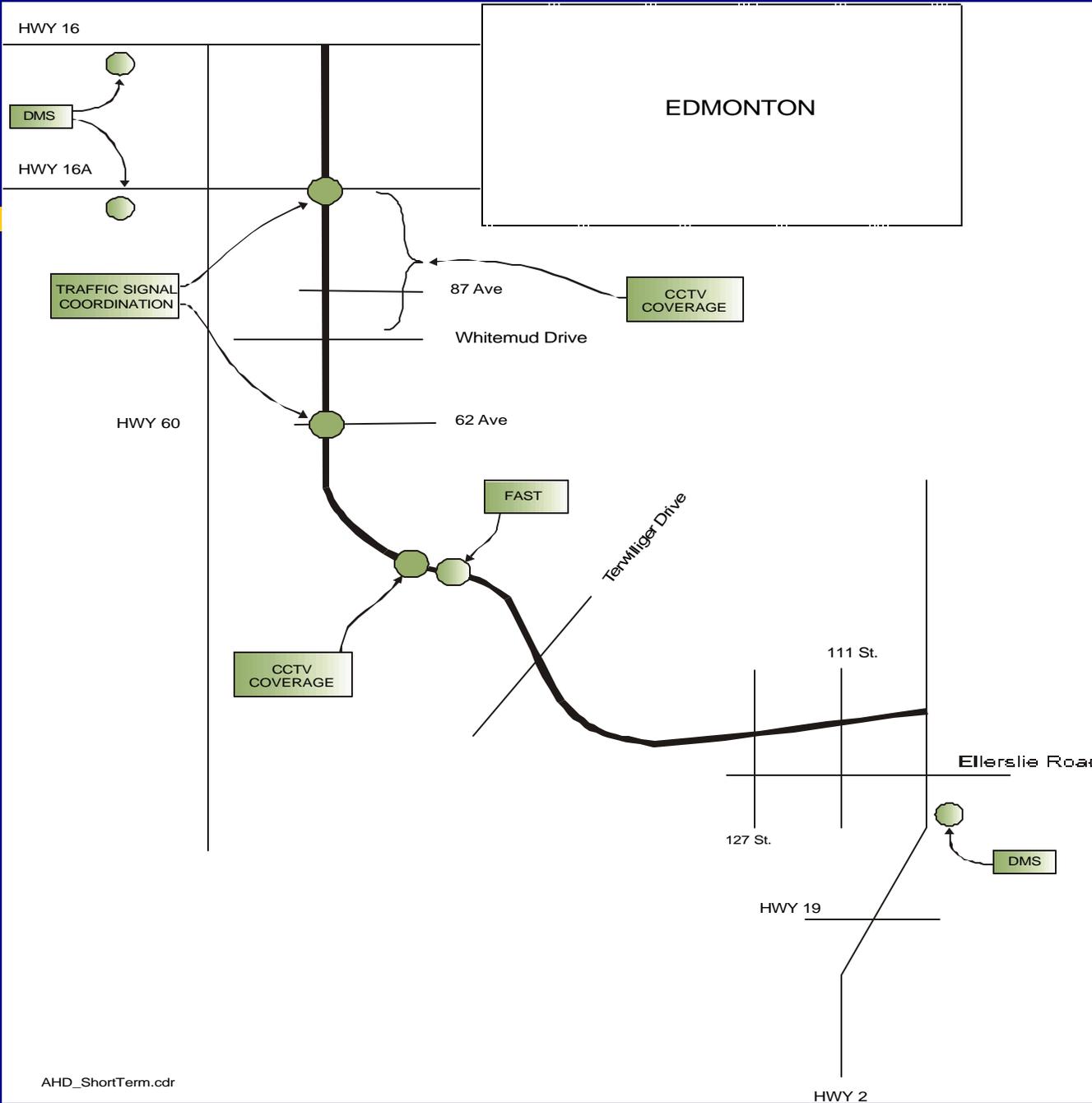
- Traveller Information
- Winter Maintenance
- Safety

# Anthony Henday Drive ITS Program

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## SHORT TERM (0 TO 5 YEARS)

- Integrate Traffic Signals with the City's
- Traveller Information
  - ATIS Database
  - Website
  - DMS
- RWIS & FAST on River Crossing
- Incident Management
  - CCTV at Select Locations
  - Call-In Centre

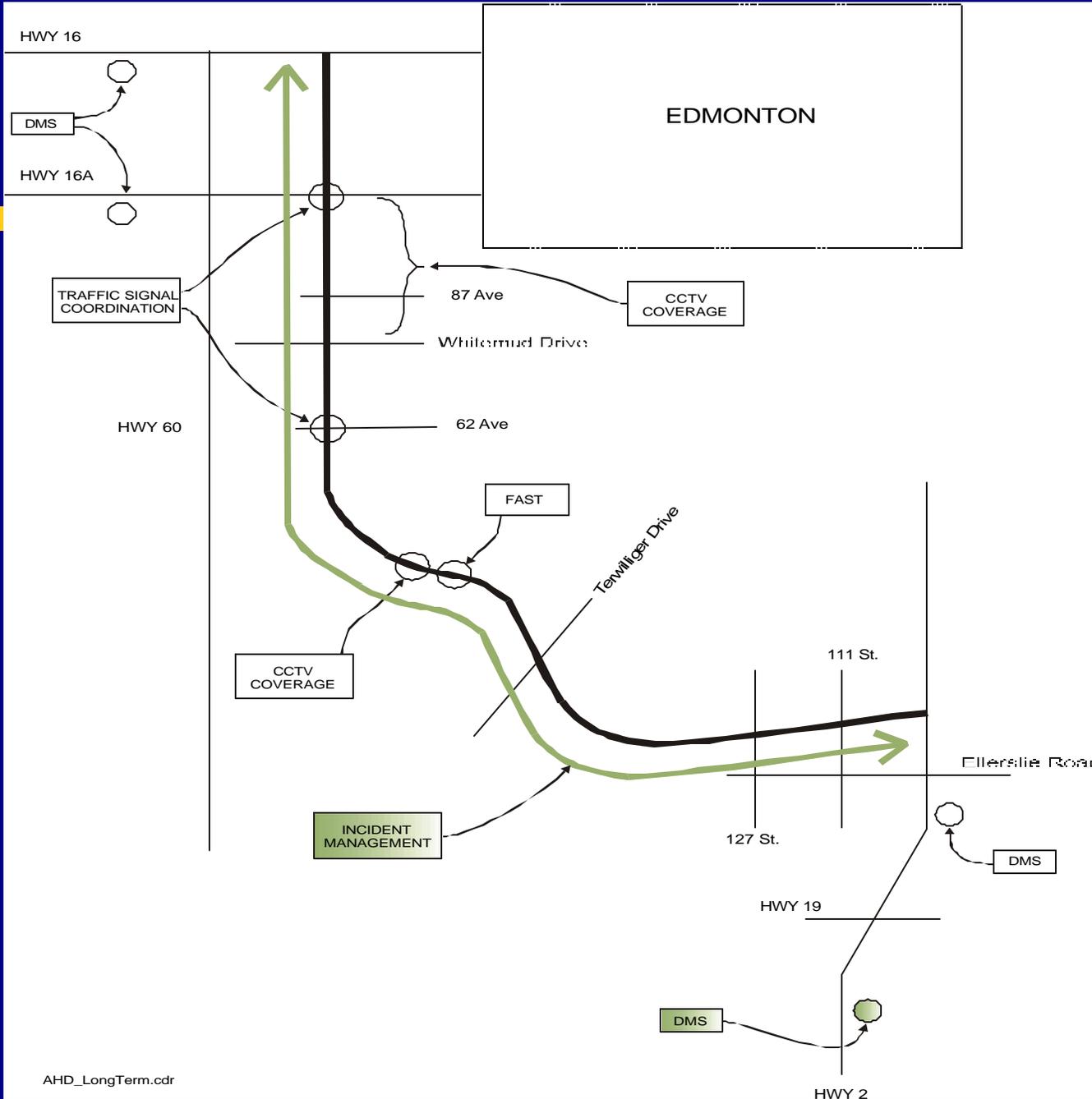


# Anthony Henday Drive ITS Program

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## LONG TERM (6 to 10 years)

- Incident Management
  - 100% CCTV coverage
  - Automated Incident Detection
  - Add DMS
- RWIS
  - Automated Surface Condition Reporting
  - Maintenance Decision Support System



AHD\_LongTerm.cdr

# Early Winners

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- ATIS Database
- DMS
- Incident Management
  - CCTV along Deerfoot Trail
  - Collaborative TMC
- RWIS
  - Stations
  - FAST



# Overview of ITS Blueprint

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**Mark Pinet**

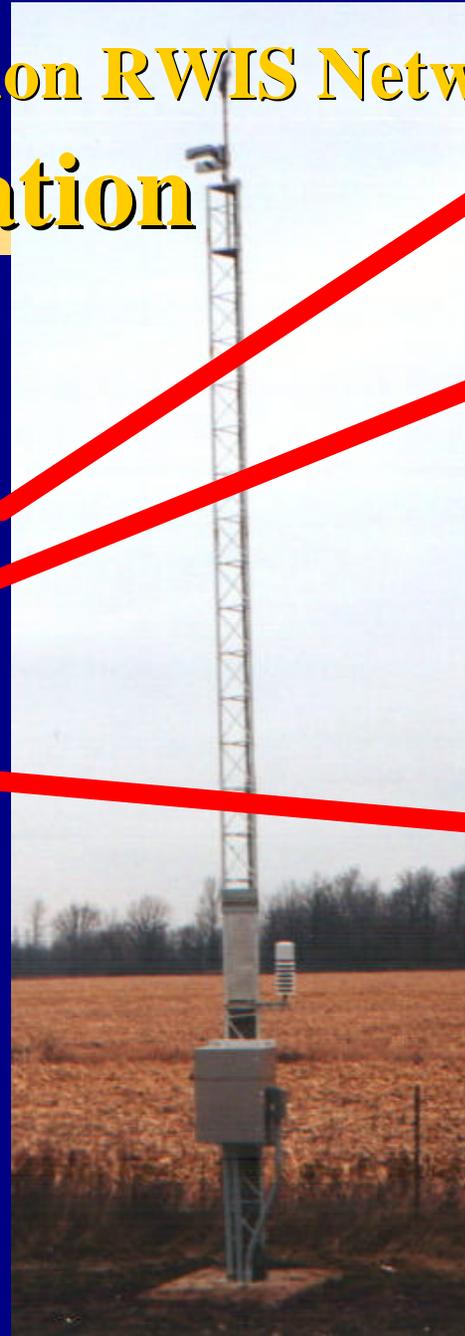
**M. Pinet & Associates Limited**



# Alberta Transportation RWIS Network Design

## RWIS Information

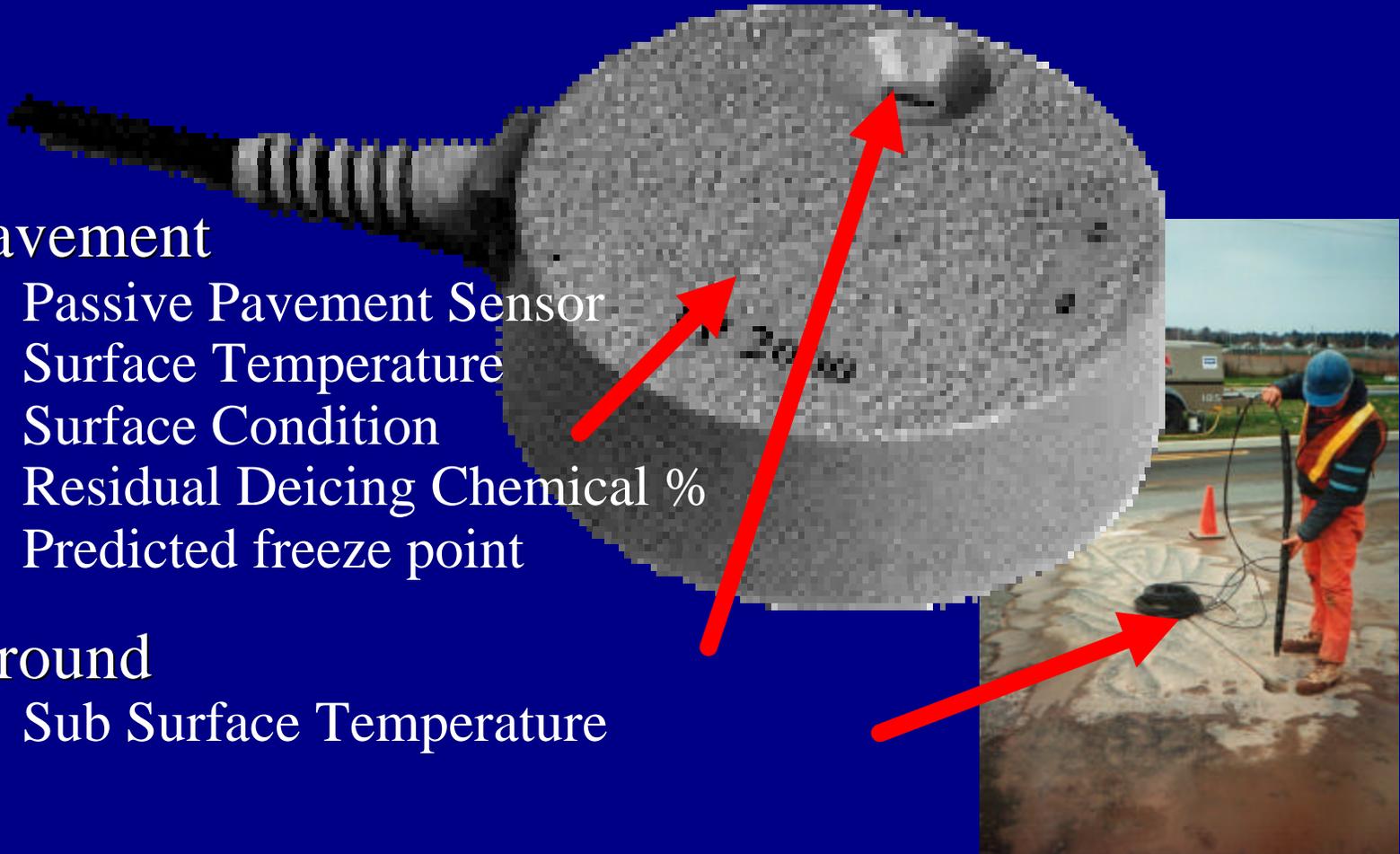
- Atmospheric
  - Wind Speed/Dir.
  - Precipitation
  - RH/Temp
  - RPU
  - Tower



# Alberta Transportation RWIS Network Design

## RWIS Information

- Pavement
  - Passive Pavement Sensor
  - Surface Temperature
  - Surface Condition
  - Residual Deicing Chemical %
  - Predicted freeze point
- Ground
  - Sub Surface Temperature

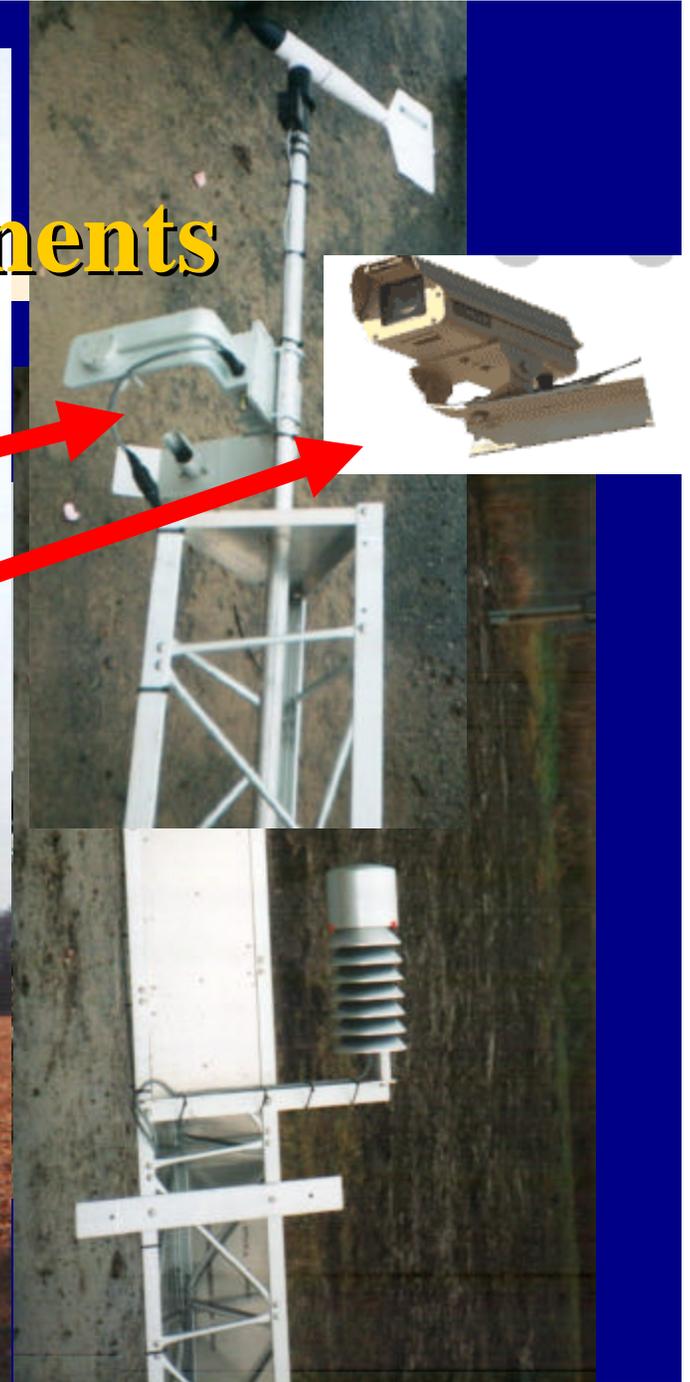
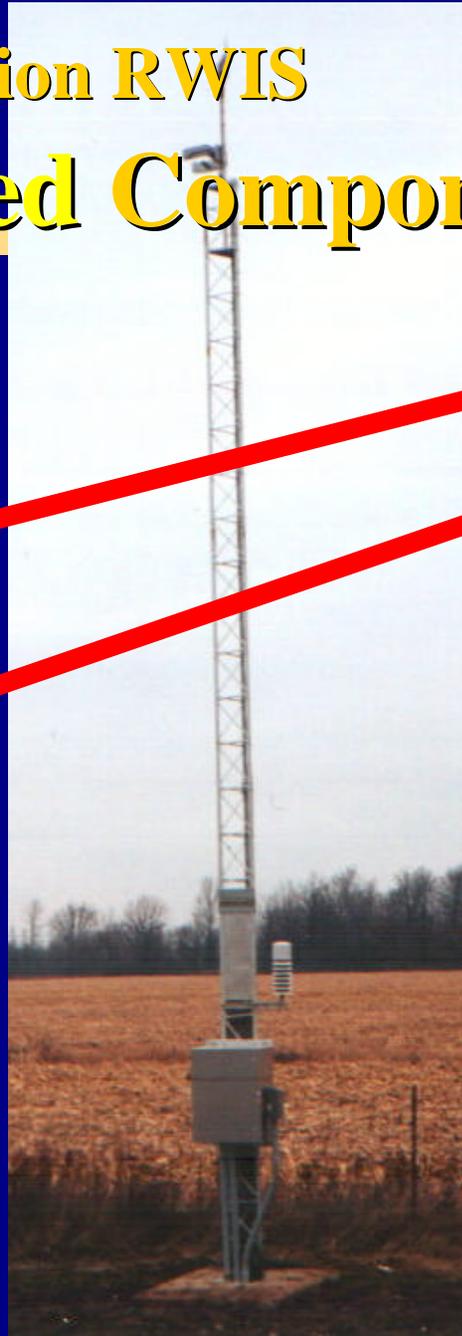


# Alberta Transportation RWIS

## RWIS Advanced Components

- Precipitation identifier
- Cameras for Visibility

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# Alberta Transportation RWIS

## RWIS Advanced Components



### Active Pavement Sensors

#### Passive Pavement Sensor

- Surface Temperature
- Surface Condition
- Residual Deicing Chemical %
- Measured freeze point



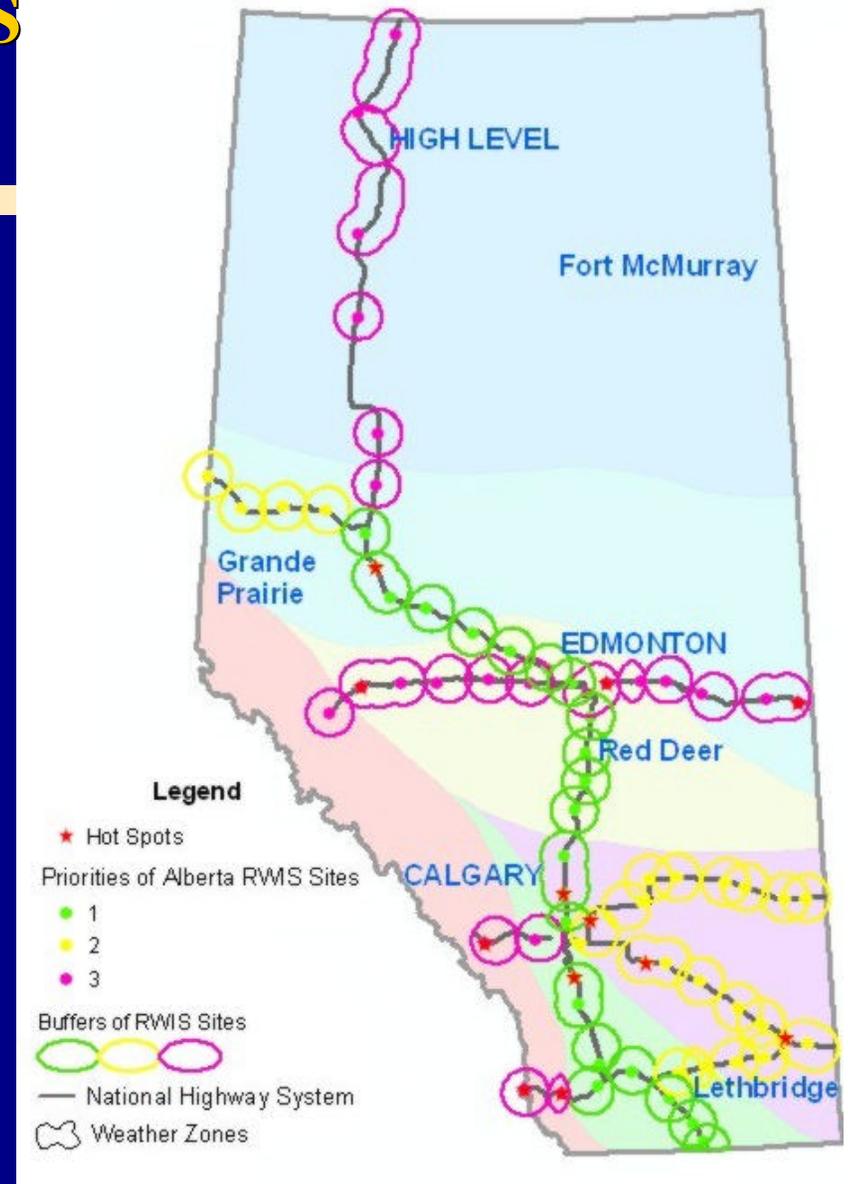
- New Technology



# Alberta Transportation-RWIS

## - Proposed Locations

- Result –
  - GIS Model Results Illustrating Highway Segments Represented By Each RWIS site
  - Representative of:
    - Meteorology
    - Topography
    - Traffic volumes
    - Nominal 50 km spacing



# Rural Section RWIS Program

- Phase One Scope
  - 30 Site
- Timing
  - Compl. Oct /04
- Basic Equipment



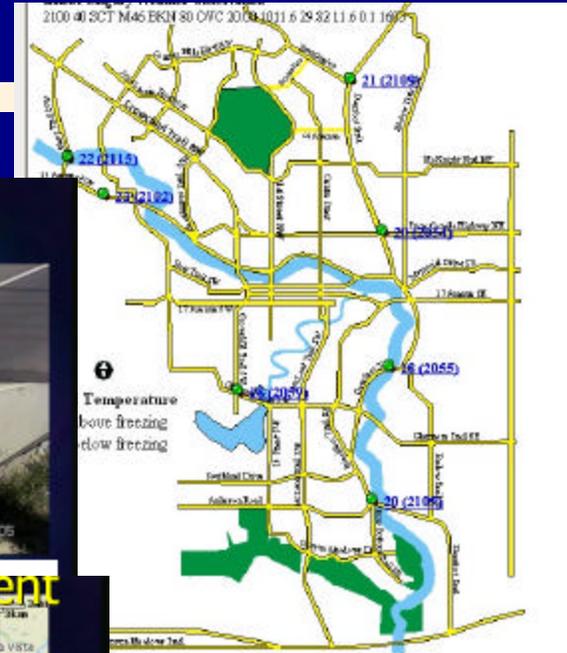
# Rural Section RWIS Program

- Phase Two Scope
- Timing
- Installed Oct/05
- Basic Equipment
- Advanced RWIS sensors  
Ph1,2,Cameras



# Urban RWIS Program

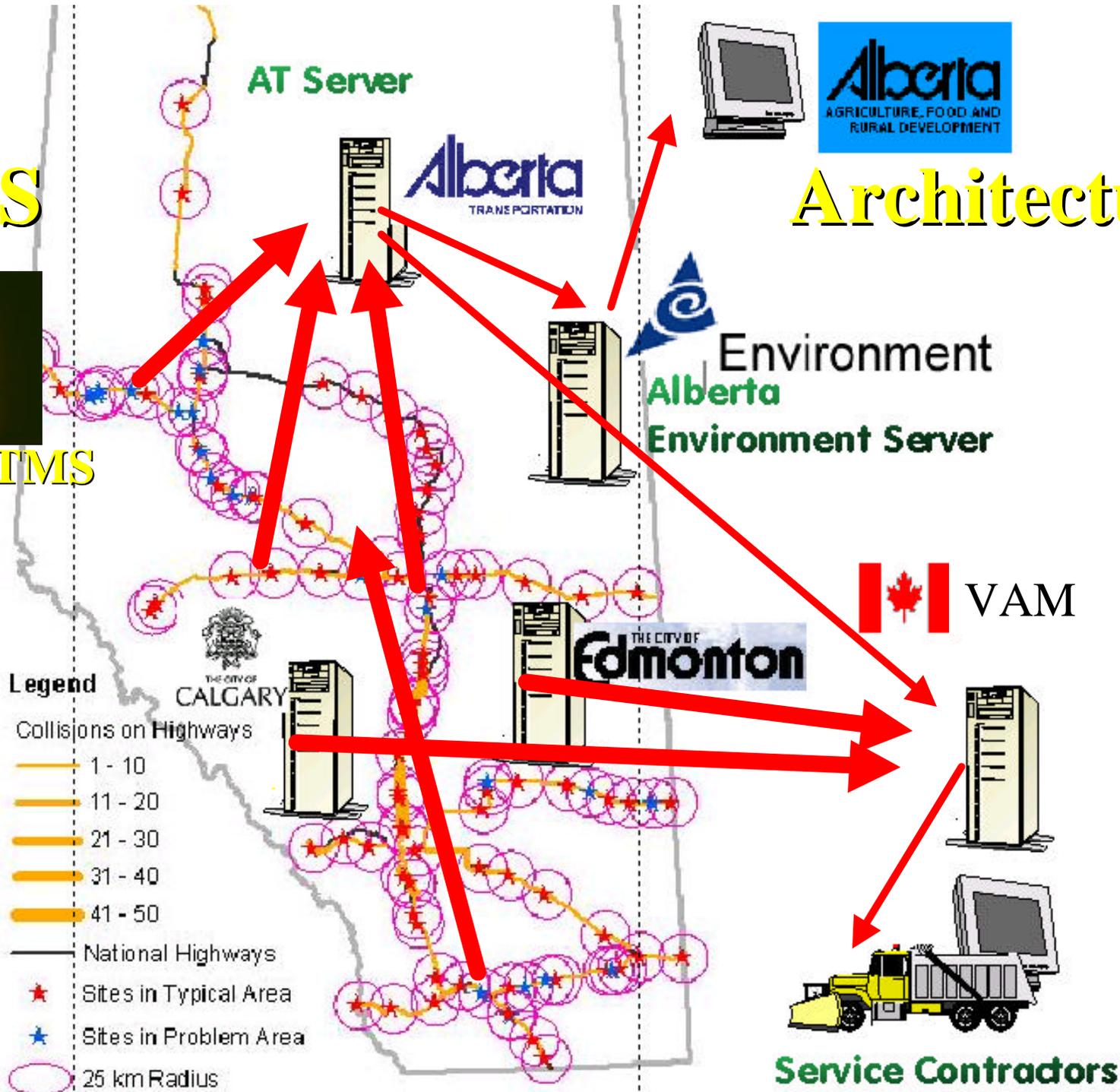
- Calgary
- Deerfoot RWIS upgrades Ph 2 (proposed)
- Edmonton



**RWIS**

**FOG  
SLOW  
DOWN**

**ATIS ATMS**



# FAST

- Future -Advanced RWIS Candidate Sites
- Calf Robe
- AHD
- Red Deer River Bridge



# Benefit / Cost Analysis

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**Tim Schnarr**

**Delcan Corporation**



# Capital Costs

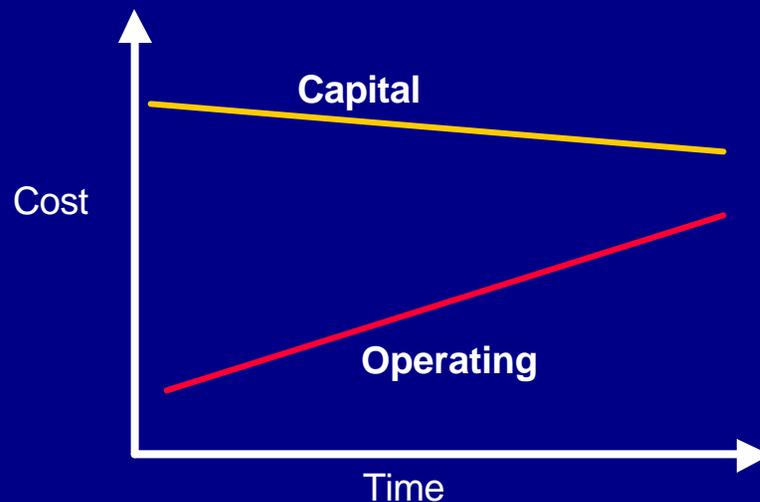
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- Approximately \$ 21 Million over 5 years
- Distribution
  - 40% Deerfoot Trail
  - 30% RWIS
  - 15% Anthony Henday Drive
  - 15% Rural



# Operating & Maintenance Costs

- Estimated \$ 1Million to \$ 2.5 Million Annual
- Combined Capital & Operating of approx. \$ 5 Million Annually



# Potential Benefits

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- Quantified
  - Reduction in Vehicle Delays
  - Reduction in Number of Collisions
  - Reflects Impact of Incident Management, RWIS, etc.
- Qualitative
  - Driver Frustration
  - Customer Satisfaction
  - Environmental
  - Reflects Impact of ATIS, RWIS, etc.



# Projected Benefit/Cost Ratios

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- ATMS/ATIS
  - Deerfoot Trail 7:1
  - Rural Section 3:1
  - Anthony Henday Drive 2:1
- Road Weather Information
  - Rural Section 6:1
- FAST
  - Deerfoot Trail 3:1
  - Anthony Henday Drive 3:1

# Where Do We End Up ?

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- Road & Traffic Condition Information
  - Real-Time
  - DMS & Web-Based (Media)
- Road Weather Information
  - Improved surface conditions
  - Efficiency/management of maintenance operations
- Incident Management
  - Deerfoot Trail
  - Anthony Henday Drive
  - Rural
- Technology Integration & Teamwork



# Challenges

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- Legacy Systems
- Inter-agency Coordination
  - Data Collection
  - Data Sharing
- Traffic Management Centres
  - Regional
  - Partnerships



# What's Next ?

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**Allan Lo**

**Alberta Transportation**



# Current Activities

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- Dynamic Message Signs
  - Two new DMS in Red Deer area
    - Highway Closures
  - Two replacement DMS (Balzac/Leduc)
    - Reliability & Compatibility
  - Completion Spring 2004



# Current Activities

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- RWIS
  - 70 sites on National Highway System
  - Staged over 2 years
  - Completion 2006
    - Transport Canada funding dependent



# What's Next ?

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- ATIS Database
- Incident Detection & Management Deerfoot Trail
- DMS deployment - other highways



# The End?



**Advanced Traveller  
Information and Traffic  
Management Systems for  
Highway 2**

**Completion of  
Workbooks**

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