Development of an Intelligent Transportation Systems (ITS) Strategic Plan

IBI GROUP
City of Saskatoon
Saskatoon ITS Strategic Plan
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Background & Approach

- Plan the most effective ITS projects that will help shape the transportation network in Saskatoon as the City continues to grow.
- Build on the preceding work to meet with the larger transportation community and complete a needs assessment for ITS in the City of Saskatoon, including supporting the growth plan.
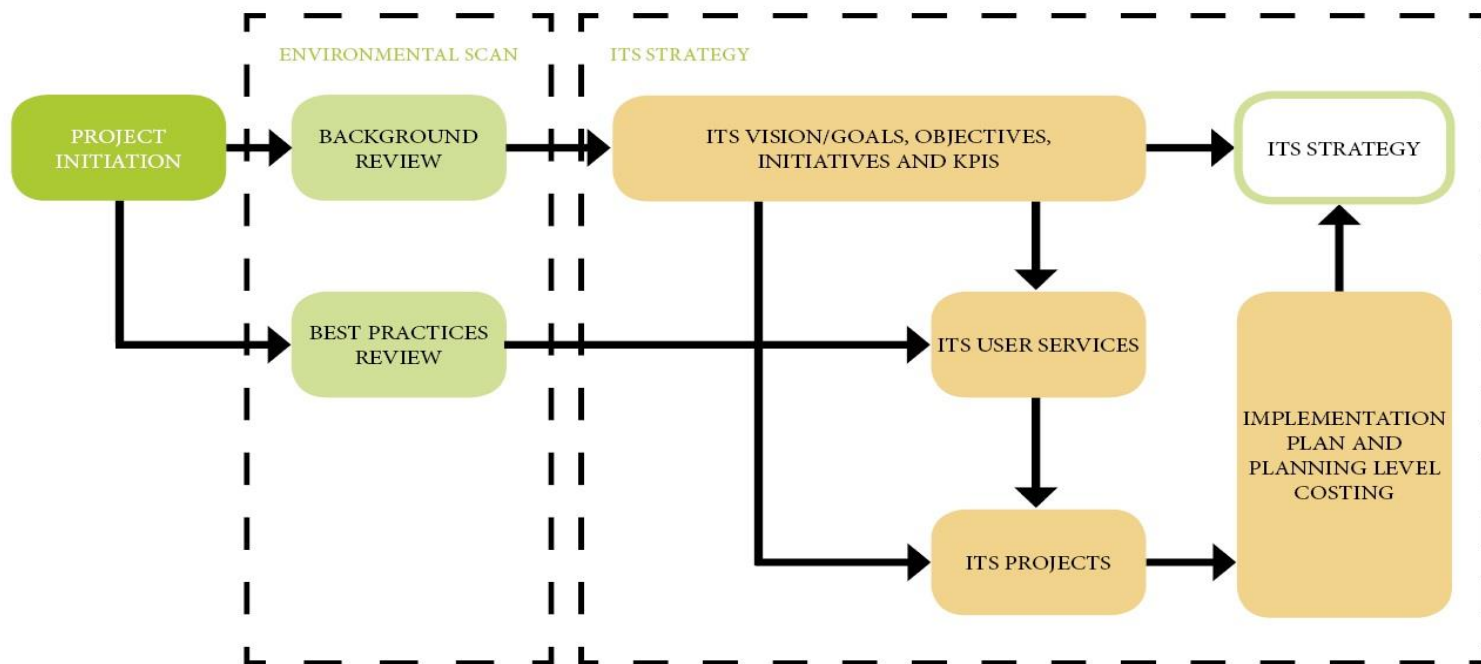
Current State of ITS
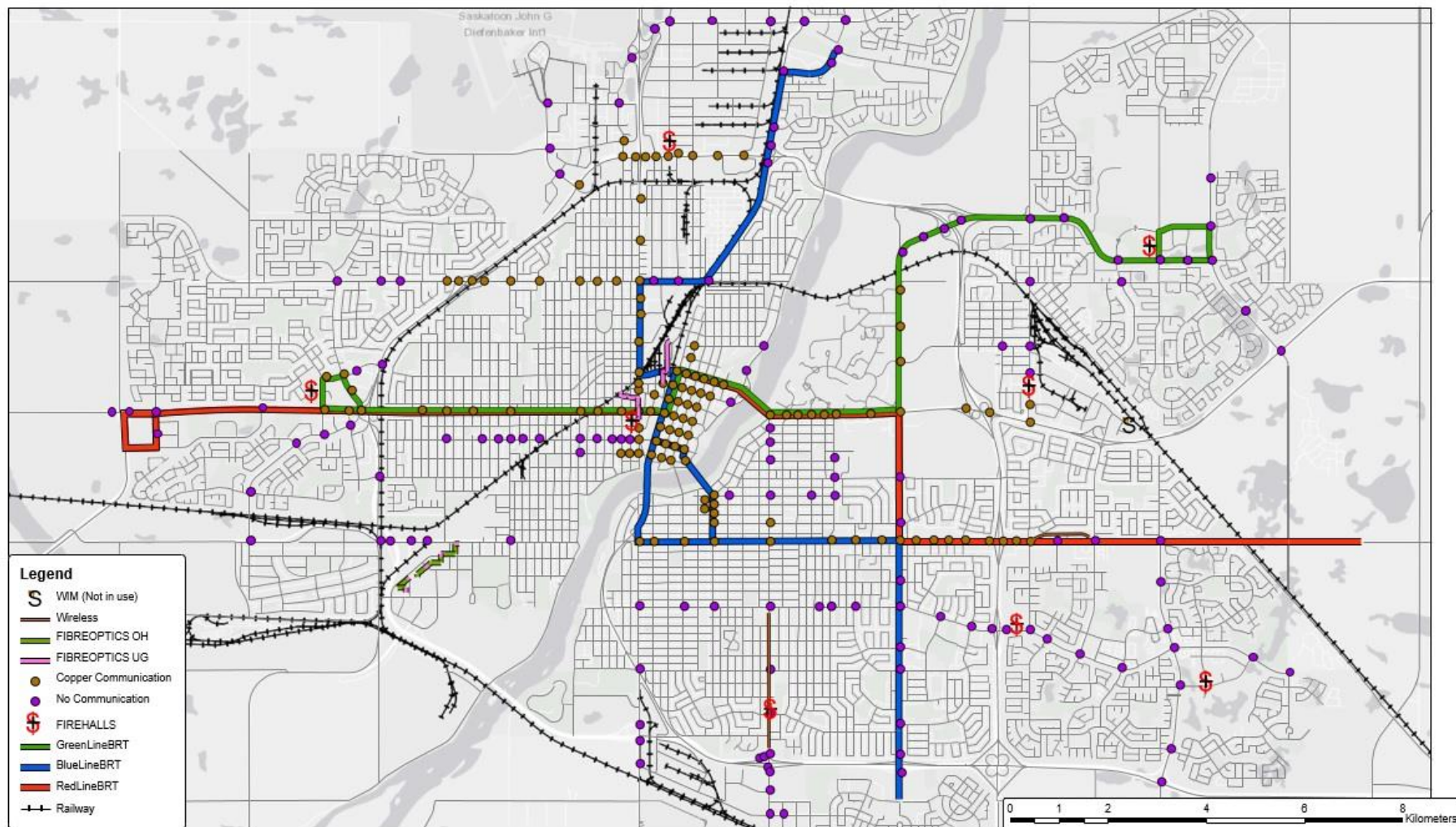
Needs

1. Traffic signal coordination

2. Incident management

3. Wireless and communication networks

4. Congestion issues on corridors and at key locations

5. Commercial goods movement

6. Congestion related to trains blocking railway crossings

7. Public transportation

8. Traveler information systems

9. Data management including telecommunications

10. Institutional issues including organizational structure, coordination between departments, common standards

Needs' Themes
Innovation
Safety
Efficiency
Growth
Information Sharing

Vision and Goals

"Invest strategically in innovations that maximize public safety and efficiency, encourage all modes of transportation, and support our region's growth through improved information access and network adaptability."

The Goals for the City of Saskatoon ITS strategy are:

A.   Improve transportation flexibility (improving the mode split).

B.   Reduce travel times along major corridors.

C.   Improve emergency response efficiency.

D.   Improve transit schedule adherence.

E.   Manage commercial vehicle movements to preserve road infrastructure.

F.   Mitigate impacts of train-road crossing disruptions.

G.   Improve access to traveler information.

H.   Improve multi-agency ITS stakeholder business intelligence for real-time operations and planning purposes

Project Development

PROJECT 3 - TRAFFIC MANAGEMENT

DESCRIPTION	LOCATION
The purpose of this project will be to implement traffic management system technologies that support traffic flow monitoring, incident management, and traffic control. This will include probe-based traffic flow monitoring for network-wide conditions, CCTV monitoring at hot-spots and congestion points, integration with NTCIP compliant traffic signal controllers for the implementation of response plans based on traffic monitoring information and incident/special events. The traffic management system will also include interfaces to the City's traveller information systems for information dissemination and conditions reporting. This project will leverage the existing central systems ATMS upgrade that are underway as part of the traffic signal system improvements. The work will primarily focus on implementation of the field systems referenced above to enable improved traffic flow through the existing systems.	• ATMS hardware/software/APIs at City's TMC • CCTV monitoring at hotspots and congestion points • Probe-based monitoring; network wide

TIMELINE

2019 2020 2021 2022 2023 2024 2025 2026 2027

STAKEHOLDERS	GOALS SUPPORTED
• Transportation • Corporate Performance - IT • Saskatoon Police and Emergency Services • Saskatoon Transit • Saskatchewan Ministry of Highways and Infrastructure	✓ Reduce travel times along major corridors ✓ Improve emergency response efficiency ✓ Improve access to traveller information

KPIs	ENABLING SERVICE PACKAGES
• Change in number and duration incidents per vehicle km • Average travel times for major routes at peak times • Fuel and/or energy used weekly for fleet vehicles • Number of vehicles connected to the infrastructure	• ATMS01 Network Surveillance • ATMS08 Traffic Incident Management System • ATMS02 Traffic Probe Surveillance • ATMS03 Surface Street Control • ATMS06 Traffic Information Dissemination

IMPACT OF FUTURE TRENDS	TECHNOLOGY	
AI: Low Impact | Longer Term C/AV: Medium Impact | Longer Term 5G: High Impact | Medium Term	• Probe Data • CCTV • ATMS • APIs	• Open Data • Lane Control • Radar and Microwaves

OVERALL INDICATORS	COSTS
Cost: Medium **Technological Barriers:** Low **Institutional Barriers:** Low	• Capital: $1,350,000 - $3,050,000 • O&M: $3,000 - $10,000 / month

PRIORITY	DEPENDENT PROJECTS
• Short Term	• Partially Dependent: Data Warehouse, Expanded Data Collection

Short Term Projects

	SHORT TERM				
SHORT TERM PROJECTS	2019	2020	2021	2022	2023
Project 1 – Rail Crossing Information System (RCIS) (Early Win Project)	▇▇				
Project 2 – Data Warehouse	▇▇				
Project 3 – Traffic Management		▇▇▇	▇		
Project 4 – Traveller Information		▇	▇		
Project 5 – Emergency Traffic Management			▇		
Project 6 – Transit Priority		▇			
Project 7 – Expanded Data Collection			▇		

Medium to Long Term Projects

			MEDIUM TERM					LONG TERM				
			2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
LONG TERM PROJECTS												
Project 8 - Support Integrated Multi-Modal Trip Planning	● ● ●											
Project 9 - Mobility as a Service	● ● ●											
Project 10 - Integrated Corridor Management	● ● ●											

Trends that will impact projects

- Connected / Automated Vehicles;
- Open Data;
- Data Warehousing, Business Intelligence, Analytics;
- Telecommunications Infrastructure and Services;
- Private Sector Delivery & Hosted Solutions; and
- Smart City Operations Centres.

Co-ordination with other initiatives

- IoT Centralization Strategy
- Fibre Strategy
- Data Services Roadmap and Strategy
- Network and Communication Strategy
- Bus Rapid Transit
- Provincial Transportation Initiatives

INTERNET OF THINGS
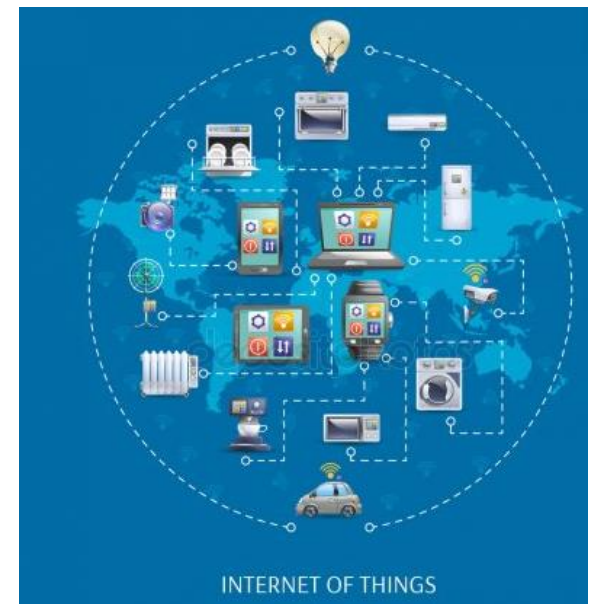
Budget and Staffing

SHORT TERM PROJECTS	BUDGET (X$1,000)				
	2019	2020	2021	2022	2023
Project 1 – Rail Crossing Information System (RCIS) (Early Win Project)	190-260	60-90	18-48	18-48	18-48
Project 2 – Data Warehouse	185-370	125-250	24-60	24-60	24-60
Project 3 – Traffic Management	150-250	450-1,300	500-1,000	250-500	36-120
Project 4 – Traveller Information	---	100-200	1,000-3,000	120-240	120-240
Project 5 – Emergency Traffic Management	---	60-100	100-200	24-48	24-48
Project 6 – Transit Priority	60-100	150-250	24-48	24-48	24-48
Project 7 – Expanded Data Collection	---	---	130-225	120-360	120-360
Capital Budget Range	585-980	945-2,190	1,730-4,425	250-500	---
Operations and Maintenance (O&M) Budget Range	---	---	66-156	330-804	366-924
Estimated Supporting Staffing Augmentation (Full Time Equivalents)	1	1	1-2	1-2	2-3

Thank you! Questions?

Appendix

Goals and Projects

Each project was assessed to confirm the specific goals previously identified that are expected to be at least partially addressed by each project.

GOALS	Project 1 - Rail Crossing Information System (RCIS)	Project 2 - Data Warehouse	Project 3 - Traffic Management	Project 4 - Traveller Information	Project 5 - Emergency Traffic Management	Project 6 - Transit Priority	Project 7 - Expanded Data Collection	Project 8 - Support Integrated Multi-Modal Trip Planning	Project 9 - Mobility as a Service	Project 10 - Integrated Corridor Management
Improve transportation flexibility (improving the mode split).						●	●	●	●	
Reduce travel times along major corridors.	●		●				●		●	●
Improve emergency response efficiency.			●		●		●			
Improve transit schedule adherence.						●	●			●
Manage commercial vehicle movements to preserve road infrastructure.							●			●
Mitigate impacts of train-road crossing disruptions.	●						●			
Improve access to traveller information.	●	●	●	●			●	●		
Improve multi-agency ITS stakeholder business intelligence for real-time operations and planning purposes.		●					●			

The Dependencies

Each project was reviewed to determine the dependencies on other projects for implementation. Some projects have a strong reliance (full dependency) on other projects while other projects have partial dependency. Partial dependency means that the project could proceed and the full benefits may be realized once the dependent project is implemented.

LEGEND

- ☐ No Dependency
- ○ Partial Dependency
- ● Full Dependency

NOTES

* Minimal dependencies, could be an early win. Emergency Management Dispatch would benefit from real-time data from RCIS.

** Could be focused on newer or upgraded intersections, also recommend data warehouse collect data on activations, usage, performance etc.

*** Also dependent on the BRT projects and data from the Transit systems.

	Project 1 - Rail Crossing Information System (RCIS)	Project 2 - Data Warehouse	Project 3 - Traffic Management	Project 4 - Traveller Information	Project 5 - Emergency Traffic Management	Project 6 - Transit Priority	Project 7 - Expanded Data Collection	Project 8 - Support Integrated Multi-Modal Trip Planning	Project 9 - Mobility as a Service	Project 10 - Integrated Corridor Management
SHORT TERM PROJECTS 2019 - 2023										
Project 1 - Rail Crossing Information System (RCIS) *		○								
Project 2 - Data Warehouse			●	○						
Project 3 - Traffic Management		○					○			
Project 4 - Traveller Information	○	○	○				○			
Project 5 - Emergency Traffic Management **	○	○	○			○				
Project 6 - Transit Priority ***		○	○	○	○		○			
Project 7 - Expanded Data Collection		●	○							
MEDIUM AND LONG TERM PROJECTS										
Project 8 - Support Integrated Multi-Modal Trip Planning		●	●	●						
Project 9 - Mobility as a Service		●	○	●						
Project 10 - Integrated Corridor Management		●	●	○						