City of Burnaby

Meeting May 13, 2025

COMMITTEE COVER REPORT

TRANSPORTATION COMMITTEE

TO: *MAYOR AND COUNCILLORS*

SUBJECT: BURNABY INTELLIGENT TRANSPORTATION SYSTEMS STRATEGIC PLAN - UPDATE

RECOMMENDATION:

THAT the Intelligent Transportation Systems Strategic Plan as outlined in Section 3.0 of the report titled "Burnaby Intelligent Transportation Systems Strategic Plan - Update" dated April 16, 2025, of the Transportation Committee meeting, be received for feedback; and

THAT staff be directed to proceed in finalizing the Burnaby Intelligent Transportation Systems Strategic Plan.

REPORT

The Transportation Committee, at its meeting held on April 16, 2025, received and adopted the ***attached*** report seeking Council feedback and direction on the Burnaby Intelligent Transportation Systems Strategic Plan.

On behalf of the Transportation Committee,

Councillor R. T. Lee
Chair

Councillor D. Tetrault
Vice Chair

Meeting April 16, 2025
File: 38000-01
COMMITTEE REPORT

TO: TRANSPORTATION COMMITTEE (TC)

FROM: GENERAL MANAGER ENGINEERING

SUBJECT: **BURNABY INTELLIGENT TRANSPORTATION SYSTEMS STRATEGIC PLAN - UPDATE**

PURPOSE: To seek Council feedback and direction on the Burnaby Intelligent Transportation Systems Strategic Plan.

RECOMMENDATION

THAT the Intelligent Transportation Systems Strategic Plan as outlined in Section 3.0 of the report titled “Burnaby Intelligent Transportation Systems Strategic Plan - Update” dated April 16, 2025 be received for feedback; and

THAT staff be directed to proceed in finalizing the Burnaby Intelligent Transportation Systems Strategic Plan.

EXECUTIVE SUMMARY

Guided by the Burnaby Transportation Plan (BTP), the City is developing an Intelligent Transportation Systems (ITS) Strategic Plan that integrates sensor technology, real-time data transmission, and analytics to enhance safety and optimize road network performance. The ITS Strategic Plan leverages advanced and emerging technologies to further the City’s progress towards the three BTP targets by 2050 including: (1) 100% reduction in traffic fatalities and serious injuries; (2) 75% of all trips made by transit and active modes; and (3) 100% transportation emissions reduction.

The development of the ITS Strategic Plan includes a current state assessment, future ambition visioning, and strategy and implementation. As part of the current state assessment, existing infrastructure, technologies, systems, and processes were evaluated. Internal reviews were conducted to identify current operational challenges and future needs, and a vision statement was established to bridge current needs with future ITS strategies. The following eight objectives were identified through the strategy’s visioning:

Objective 1 Upgrade and maintain critical infrastructure to support advanced transportation technologies

Objective 2 Create a centralized data platform for collecting, analyzing and sharing transportation data

Objective 3 Integrate transportation systems with other city services for a cohesive smart city ecosystem

Objective 4 Optimize traffic flow and reduce congestion through real-time data analytics

Objective 5 Ensure continuous operation of the transportation system during disruptions

Objective 6 Reduce traffic collisions and improve cyclist and pedestrian safety

Objective 7 Pilot and implement emerging technologies

Objective 8 Develop emergency response protocols using real-time data to improve incident management

The ITS Strategic Plan presents a five-year roadmap with six initiatives to achieve the vision and objectives. The six initiatives listed below includes projects that utilize advanced technologies and data-driven approaches.

Initiative 1 Reinforce Foundation

Initiative 2 Make ITS Data a Strategic Asset

Initiative 3 Enhance Management and Response Capabilities

Initiative 4 Improve Transportation Safety

Initiative 5 Make Burnaby a Smart City

Initiative 6 Enhance System Reliability

The six initiatives were designed with the ability for most projects to run in parallel; however, Initiatives 1, 2 and 3 have been prioritized as the completion of these projects supports subsequent ITS efforts. Priority projects were assigned based on each project's ability to: (i) Demonstrate value in ITS technology; (ii) Benefit major regional and goods corridors; (iii) Align with capital projects and funding; and (iv) Meet preliminary technology requirements.

ITS projects will need to undergo scoping, analysis, design, implementation, and operation and monitoring. As projects are implemented, performance monitoring will be key to demonstrate the value of ITS investments based on data-driven approaches. As part of the ITS Strategic Plan's timeframe, a detailed analysis of all implemented systems would be undertaken to inform the next iteration and update.

1.0 POLICY SECTION

The ITS Strategic Plan as outlined in this report, is aligned with:

- Corporate Strategic Plan (2022)
- Burnaby Official Community Plan (1998)
- Burnaby Transportation Plan (2021)
- Burnaby Community Safety Plan (2020)
- Climate Action Framework (2020)
- Economic Development Strategy (2020)

2.0 BACKGROUND

The Burnaby Transportation Plan (BTP) is a Council adopted policy that guides the transportation planning and policy decision-making in Burnaby for the next 30 years. The BTP's vision and goals for the City is to foster an accessible, safe, healthy, green and prosperous community by providing and supporting sustainable transportation options and choices for all people. By 2050, the desired outcome of the BTP is supported by three measurable targets including:

- Vision Zero – 100% reduction in traffic fatalities and serious injuries;
- Mode Split – 75% of all trips made by public transit and active transportation; and,
- Zero Emissions – 100% transportation emissions reduction.

To achieve the targets, the BTP outlines a range of policies and actions that prioritize the five modes of transportation, including walking & rolling, cycling, public transit, goods movement, and driving. As part of the Big Moves identified in the BTP for a "Smart City Plan", the ITS Strategic Plan would integrate the use of sensor technology, real-time data transmission, and analytics to enhance safety and optimize road network performance by reducing the impact of congestion, while supporting the goods movement and the reliability of alternative modes of transportation.

Intelligent Transportation Systems (ITS)

ITS leverages advanced and emerging technologies in transportation to enhance safety, save time and cost, conserve energy, and minimize environmental impacts. It is a fully integrated management system that considers all transportation modes, infrastructure, and users to dynamically interact. The potential benefits of ITS include:

- Improving road safety
- Reducing congestion
- Promoting traffic flow efficiency
- Enhancing traffic management and incident response time
- Supporting data-driven actions
- Optimizing mobility mode options in key corridors and activity centers
- Promoting accessible transportation

An introductory report regarding ITS was brought to Council on November 4, 2024. The report identified pilot projects that would highlight potential benefits of ITS and support city initiatives towards improved safety, reduced emissions, and enhanced road system.

3.0 GENERAL INFORMATION

The ITS Strategic Plan (the Strategic Plan) provides a clear vision and direction for integrating ITS into the City's transportation infrastructure and systems by setting long-term goals and objectives in alignment with stakeholder needs. The Strategic Plan allocates resources to improve safety and maximize benefits to the community. Integrating the Strategic Plan's ITS solutions will address current transportation

challenges while meeting the needs anticipated for the future. This approach will create resiliency and adaptability in our transportation network as it aligns with the broader City goals towards a complete transportation system.

The ITS Strategic Plan includes three major phases as illustrated in **Figure 1.**

Figure 1: ITS Strategic Plan Development Process

3.1 Current State Assessment

Burnaby, centrally located in Metro Vancouver, is bordered by Vancouver, Coquitlam, New Westminster, and Port Moody. The City serves as a crucial transportation hub for the region as it supports the movement of people and goods throughout the Lower Mainland. Key regional east-west connections, including Trans-Canada Highway, Kingsway, Lougheed Highway, Marine Way, and the Hastings-Barnet corridor, currently span the City.

In support of the City's transportation needs, a diverse range of infrastructure has been installed comprising of traffic signals, pedestrian-activated crosswalks, streetlights, parking meters, electric vehicle charging stations, and bus shelters. Utilizing both fiber and wireless communication systems, traffic signals are interconnected with a centralized Advanced Traffic Management System (ATMS), which allows the system to be monitored and the traffic signals across the road network to be controlled remotely. The current video wall system allows for remote live streaming of traffic conditions at major intersections using traffic cameras. Traffic data, including volumes for different road users, vehicle speeds, and real-time images, can be collected using permanent and portable data collection equipment.

3.2 Future Ambition Visioning

Vision Statement: *Embracing technology to create resilient, adaptable, integrated, and data-driven systems that enhances the safety, efficiency, and reliability of the transportation network to support the needs of our community.*

The ITS Strategic Plan Vision Statement expresses the aspiration over the City's long-term transportation goals to bridge current needs with future ITS strategies to help achieve the desired outcomes for the future. The following eight objectives were identified in the Strategic Plan in alignment with the BTP:

Objective 1 Upgrade and maintain critical infrastructure to support advanced transportation technologies

Upgrade and maintain critical infrastructure to support sustainable transportation and future innovations. This approach enhances system resilience, ensuring adaptability to new technologies and resistance to disruptions.

Objective 2 Create a centralized data platform for collecting, analyzing and sharing transportation data

Integrate data management for effective transportation planning and decision-making. Create a centralized platform for data collection, analysis, and sharing will enable automated analysis and improved monitoring of progress towards BTP goals.

Objective 3 Integrate transportation systems with other city services for a cohesive smart city ecosystem

Collaborate and communicate among departments, municipalities, and agencies to improve service delivery and address resident concerns. Integrate the transportation systems with other city services allows for data and resource sharing, enhancing operational efficiencies and realizing the vision of a data-driven, integrated system.

Objective 4 Optimize traffic flow and reduce congestion through real-time data analytics

Use of sensor technology, real-time data transmission, and analytics to reduce congestion and optimize the network. Leverage instant data analytics to help the City create an efficient transportation system, enhancing residents' quality of life.

Objective 5 Ensure continuous operation of the transportation system during disruptions

Use ITS for travel demand management to help communicate real-time information about routes, incidents, and construction. This will assist travelers to make informed decisions on route choices, departure time, and mode of travel, which leads to more efficient journeys for residents.

Objective 6 Reduce traffic collisions and improve cyclist and pedestrian safety

Enhance public safety through ITS for road users, cyclists, and pedestrians by better identifying incidents, improving response times, and optimizing traffic management.

Objective 7 Pilot and implement emerging technologies

Commit to continuously reviewing and managing emerging technologies. Pilot new technologies to keep the City at the forefront of innovation while showcasing the benefits of ITS to gain public support for future deployments.

Objective 8 Develop emergency response protocols using real-time data to improve incident management

Support emergency services' mobility and access and identify improved incident response as a key strategic goal. ITS can enhance system reliability by improving response times through better traffic flow awareness and route clearance for emergency vehicles.

3.3 ITS Strategy

The ITS Strategic Plan includes a five-year roadmap designed to help achieve the goals set in the BTP. The roadmap includes six initiatives that leverage regional strengths and emerging opportunities to achieve the ITS vision and objectives.

Within each initiative, a list of projects (detailed in *Attachment 1*) will be recommended, utilizing advanced technologies and data-driven approaches to support immediate and future infrastructure needs.

Initiative 1: Reinforce Foundation

Strengthen foundational technologies and infrastructure to support immediate and future needs by enhancing existing ITS infrastructure, which includes improving road network monitoring, traffic management, and the implementation of new technologies. This initiative will address current deficiencies and prepare for future growth, while ensuring a resilient ITS framework to address traffic management efficiency with quicker incident response time.

Projects include repairing existing video cameras and monitor wall, expanding the video system, improving traffic information dissemination, optimizing the existing Traffic Management System, and developing a telecommunications plan.

Initiative 2: Make ITS Data a Strategic Asset

Use of ITS data as a key resource to enhance transportation systems and infrastructure, provide further understanding of the City's road network performance, inform planning decisions, and optimize traffic management. Effective data sharing and management are crucial for understanding current and future needs, optimizing system performance, and implementing coordinated strategies. Sharing real-time data and predictive analytics with internal and external stakeholders will influence travel decisions and support innovative services and applications.

Projects include piloting new detection technologies, implementing traffic flow monitoring, deploying an ITS data warehouse, developing internal dashboards and reporting tools, enhancing regional data sharing, and installing cyclist and pedestrian counter displays.

Initiative 3: Enhance Management and Response Capabilities

Enhance the City's traffic management and response capabilities by monitoring live traffic conditions, detecting incidents, and responding promptly. Implementing dynamic adjustments to signal timings will accommodate changing traffic patterns based on real-time conditions. These improvements will optimize traffic flow, reduce congestion, and improve road safety for all road users.

Projects include implementing a Traffic Management Centre, Advanced Traveler Information System, and Advanced Traffic Management System with adaptive signal control.

Initiative 4: Improve Transportation Safety

Enhance road safety for vulnerable user groups in and around roadways. Strategies will be evaluated to improve safety, mobility, and network reliability for planned disruptions such as construction and special events. Collaboration and information broadcasting will leverage the latest technology to improve public safety and mobility.

Projects include providing additional pedestrian crossing time for vulnerable user groups, expanding driver feedback signs, and enhancing work zone information reporting system.

Initiative 5: Make Burnaby a Smart City

Incorporate smart technologies into the City's infrastructure to improve transportation management. Through such implementation, the City can improve energy efficiency, lower maintenance costs, and enhance data collection and reporting capabilities. Based on the rapid pace of technological advancement in big data, connectivity, and automation, this initiative underscores the importance of collaborating with external stakeholders, refining procurement strategies, and developing methods for testing new technologies and managing risks.

A central feature of this initiative is the creation of an Innovation Sandbox Environment for transportation technologies in collaboration with the IT department, offering a secure, connected space to test new technologies in real-world conditions and guide future deployment decisions. Projects include smart streetlighting, smart paid parking, dynamic curbside management system, and connected vehicle technologies.

Initiative 6: Enhance System Reliability

Enhance the City's transportation infrastructure using real-time technologies that integrate into traffic signal, emergency, and traveler information systems. This will enhance user experience by allowing travelers to make informed decisions that improves overall transportation efficiency, reducing travel times and increasing safety. Emergency vehicle response times will be reduced while minimizing collision risks, bolstering the City’s overall emergency preparedness and response capabilities.

Projects include expanding the use of transit signal priority in congested areas and emergency vehicle signal pre-emption.

3.4 Implementation Plan

The ITS Strategic Plan is based on a comprehensive assessment of the City's current state and technology level, along with a collaborative visioning effort to identify the role of technology in transportation investments. It includes developing a roadmap that balances recommended projects with strategic investments over the next five years. Each project identified in the ITS Strategic Plan will require planning to support its scoping, technical analysis, design, implementation, and operation and monitoring.

Initiatives 1, 2 and 3 as identified in Section 3.3 will be prioritized in this strategy as the recommended projects will be required to support subsequent ITS efforts although many projects can run in parallel. Project recommendations were considered based on their ability to:

- Demonstrate value in ITS technology

- Benefit regional and goods movement corridors
- Align with capital projects and funding
- Meet preliminary technology requirements

Initial recommended projects include:

- Repairing and expanding existing video cameras system
- Optimizing the existing Traffic Management System
- Implementing smart streetlighting
- Piloting a dynamic curbside management system
- Establishing an Innovation Sandbox Environment to test new technologies

The above recommended projects are key to showcase the benefits of ITS investment prior to the implementation of long-term programs.

As projects are implemented, performance monitoring will be crucial to demonstrate the value, effectiveness, and success of ITS investments based on data-driven decisions. This could include analysis of all implemented systems as part of the Strategic Plan's timeframe and would inform the next iteration and update.

3.5 Next Steps

Based on Council feedback, the ITS Strategic Plan will be finalized with the proposed implementation plan as outlined in this report.

4.0 COMMUNICATION AND COMMUNITY ENGAGEMENT

In Fall 2024, the City connected with representatives from Coquitlam, New Westminster, Port Moody and Vancouver, the Ministry of Transportation and Transit, and TransLink to discuss current and future ITS programs. Most stakeholders communicated their current ITS projects, which primarily included traffic signal video detection, travel time analytics, and smart streetlighting. Through communications with TransLink, the regional transportation authority is in the initial stages of developing a regional ITS strategy.

Opportunities for partnerships with other municipalities and agencies, and a collaborative approach to data sharing to implement ITS technologies will allow the City to explore further to improve safety and more effectively utilize transportation infrastructure within the region.

5.0 FINANCIAL CONSIDERATIONS

The five-year roadmap outlined in the ITS Strategic Plan lays out the expected initiatives and recommended projects to be implemented. Individual project costs can range between $25,000 and $2 million. The order-of-magnitude cost estimate for the complete implementation of the ITS Strategic Plan is approximately $15 to $25 million.

The implementation will be primarily funded through the Engineering Capital Plan with potential collaboration with other City departments including IT. External funding opportunities such as those through senior levels of government will be further explored.

Respectfully submitted,

May Phang, P.Eng., General Manager Engineering

ATTACHMENTS

Attachment 1 – Recommended ITS Projects

Attachment 2 – Burnaby ITS Strategic Plan Update Presentation

REPORT CONTRIBUTORS

This report was prepared by Eric Tam, P.Eng., PTOE, Senior Manager Transportation, and reviewed by Kathy Ho, P.Eng., PTOE, Senior Manager Transportation, and Amy Choh, P.Eng., PMP, Director Engineering Transportation.