IAC LANDSCAPE REPORT

SMART CITIES

SMART MOBILITY AND INTELLIGENT TRANSPORTATION SYSTEMS

Sensor-based innovation activities in transportation

Innovation
Asset
Collective

Innovation Asset Collective (IAC) is an independent membership based not-for-profit selected by the Canadian Government's Department of Innovation, Science and Economic Development (ISED) to assist Canadian small and medium-sized enterprises (SMEs) in the data-driven clean technology sector with their IP needs.

Led by experts in IP education, strategic counsel, IP generation and patent access, IAC helps Canadian SMEs understand and harness the value and power of their IP so that their innovations can be commercialized and protected for the benefit of the Canadian economy.

With the help of the IAC team, member companies will maximize the value of their intangible assets, while benefiting from the services of the collective and setting the stage for international growth. By realizing the inherent value of IP, IAC will foster Canadian innovation, which will see more Canadian companies succeed globally. To learn more about IAC, visit www.ipcollective.ca

March 2021

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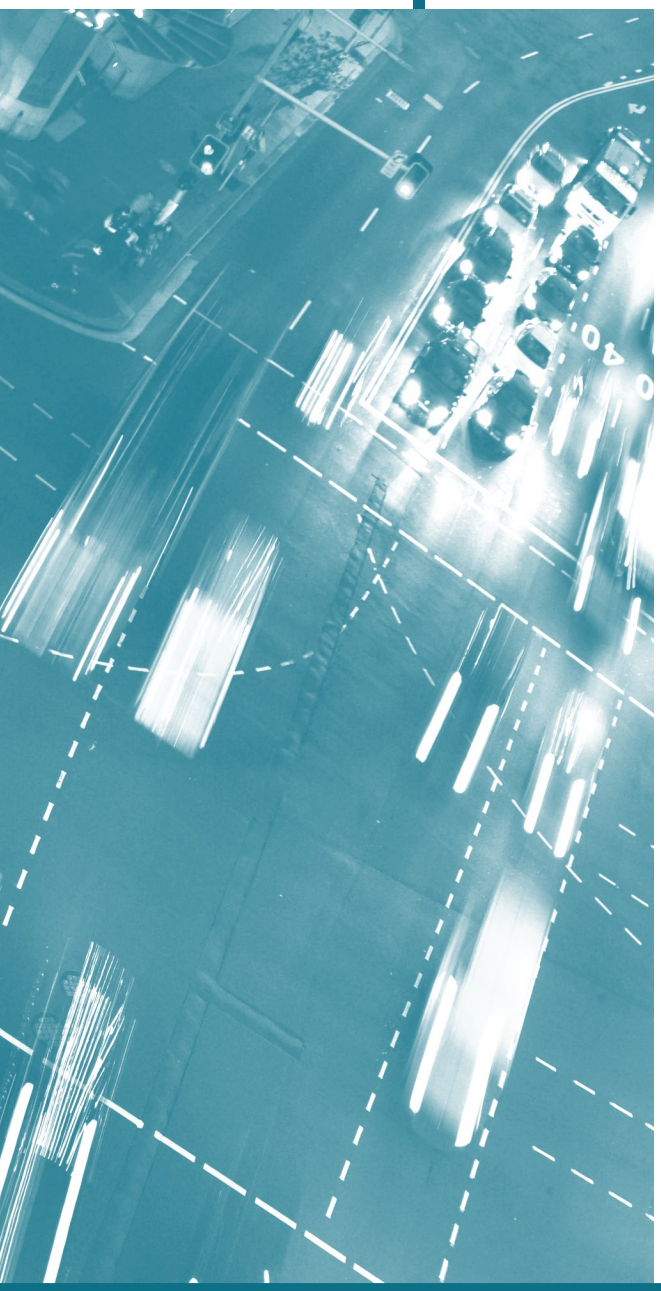


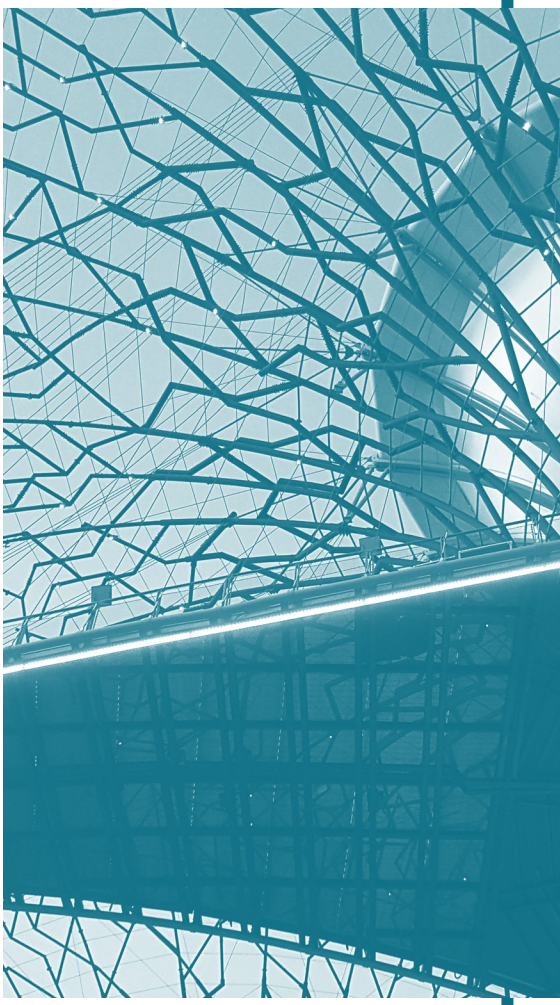
The following is a summary of a Patent Landscape Report that has been researched and developed by the IP experts at Innovation Asset Collective. This patent landscape report explores the patent ownership of intelligent transportation systems across various in-vehicle and on-road sensing technologies, such as Light Detection and Ranging (LIDAR), radar, ultrasonic, magnetic, video processing, piezoelectric, pneumatic tubes and inductive loops. The study examines over 23,500 patents and provides an overview of the key players in each sub-sector, geographic filing trends, litigation summary, new entrants, and technology trends.

Low investment data-driven technologies have opened up the transportation sector for new entrants with the opportunity to work alongside incumbents, offering niche products and services. This can be seen in the partnership secured by start-ups and investment backing received in creating smart data-driven solutions. In Canada, though many new promising players have stepped-up in ITS, a strong foothold in IP is lacking. However, being an emerging area, the patent landscape shows potential areas to build specific IP around.

IP Landscape Reports provide the needed competitive intelligence to navigate and anticipate the competitive space. Driven by strategic intent, landscape reports can inform about recent technological trends, identify new entrants and their underlying strategies. The utility of landscape reports expands when it is used for the purpose of prescriptive analysis to generate firm-specific action plans.

THE SHIFT IN THE ECONOMICS OF INFRASTRUCTURE

Rapid urbanization and industrialization globally have intensified serious environmental concerns. “Smart cities” and associated technologies offer one of the most promising ways to make sustainable growth a viable option, touching several aspects of human’s lives such as consumption, mobility, social connectedness and the cost of living.



Recent investments from the public and private-sectors towards smart city initiatives are turning the vision of connected and sustainable urban centers into reality. Clear indicators from sectors such as energy, transportation, water management and waste and recycling suggest the capability of data-driven technologies to improve the management of resources and infrastructure and introduce efficiencies at various levels. This shift in the economics of infrastructure is generating opportunities for private-sector participation and partnerships with governments[1].

Smart mobility and urban planning aspects of smart cities are “low hanging fruits” for businesses to use data-centric technologies to moderate long-standing problems related to growing population density. Recent trends demonstrate a surge in low-cost, responsive, intelligent transportation and smart mobility applications utilizing real-time data to solve problems related to traffic congestion, parking, and public transit. McKinsey predicts smart mobility solutions to reduce a minimum of 15 to 20 percent on average commuting time by 2025[2].

For Canadian businesses, the time is right to make sense of the new market opportunities and capture a larger global share in the future low-carbon transportation economy. This study summarizes the industrial innovative activities in intelligent transportation systems (ITS). To successfully commercialize and maximize returns on the research and development, this study is a useful block of information for identifying protected IP, key players, technological trends and gaps - all needed to position and secure one’s own IP.

[1] SDTC’s new Seed Fund partnerships support technologies to lower emissions for Canada’s transportation sector, July 2020, https://www.sdtc.ca/en/sdtcs-new-seed-fund-partnerships-support-technologies-to-lower-emissions-for-canadas-transportation-sector/

[2] McKinsey Report: Smart cities: Digital solutions for a more livable future, June 2018 https://www.mckinsey.com/business-functions/operations/our-insights/smart-cities-digital-solutions-for-a-more-livable-future

A UNIFIED ECOSYSTEM
COMPONENTS OF INTELLIGENT TRANSPORTATION SYSTEMS

The longevity and success of smart mobility projects rely on the large-scale planning needed to build a robust, yet adaptable technology base. In the long run, the complexity in a robust technology base lies in the interplay of different systems. These systems are

I. the smart physical infrastructure
II. the applications for interoperability in the data ecosystem, and
III. the user base indicating adoption.

A smart physical infrastructure includes setting up a network of sophisticated sensors and Internet of Things (IoT) protocols to enable devices for data gathering and exchange, supported by the broad range of information and communication technologies (ICTs) and cloud infrastructure. The data-driven models and web applications become portals for delivering instructions and meaningful information to the users. Multiple provisions for interfacing data with users such as mobile devices, connected vehicles, web-based platforms and interactive display screens make the adoption of such technologies easy. Out of the three systems, smart physical infrastructure is the most capital-intensive element.

Information and Communication Technologies (ICTs)

Cloud Solutions

Web Applications

A SUMMARY
OF INNOVATION ACTIVITIES IN INTELLIGENT TRANSPORTATION SYSTEMS

Where public sector initiatives gear up towards upgrading cities' infrastructure to match future technological paradigm[3], private sector engagement is not far behind. Businesses are innovating around sensor-based applications and data-driven models to solve problems of traffic congestion, parking and safe and efficient travelling in the city.

Specifically, sensing technologies have found substantial utility in detecting, diagnosing and reporting the presence and motion of objects and classifying them in groups. Automobile manufacturers are investing heavily in in-vehicle sensor technologies to augment the intelligent features of smart and autonomous vehicles. This strong interest by the private sector is met by the public sector and real-estate owners in augmenting the service offerings by deploying sensor technologies on road surfaces, traffic signals, street lamps, buildings and other physical infrastructures for augmenting vehicle safety and assistance in urban spaces. In a connected environment, a variety of in-vehicle sensors are used for exchanging their positional and driving behaviour with surrounding vehicles and/or objects. Using the patent ownership information, this study examines the protection of sensing technologies applied across the following transportation sub-sectors:

[3] City of Stratford Smart Parking solutions. https://www.stratford.ca/en/inside-city-hall/smartparking.aspx

SMART PARKING

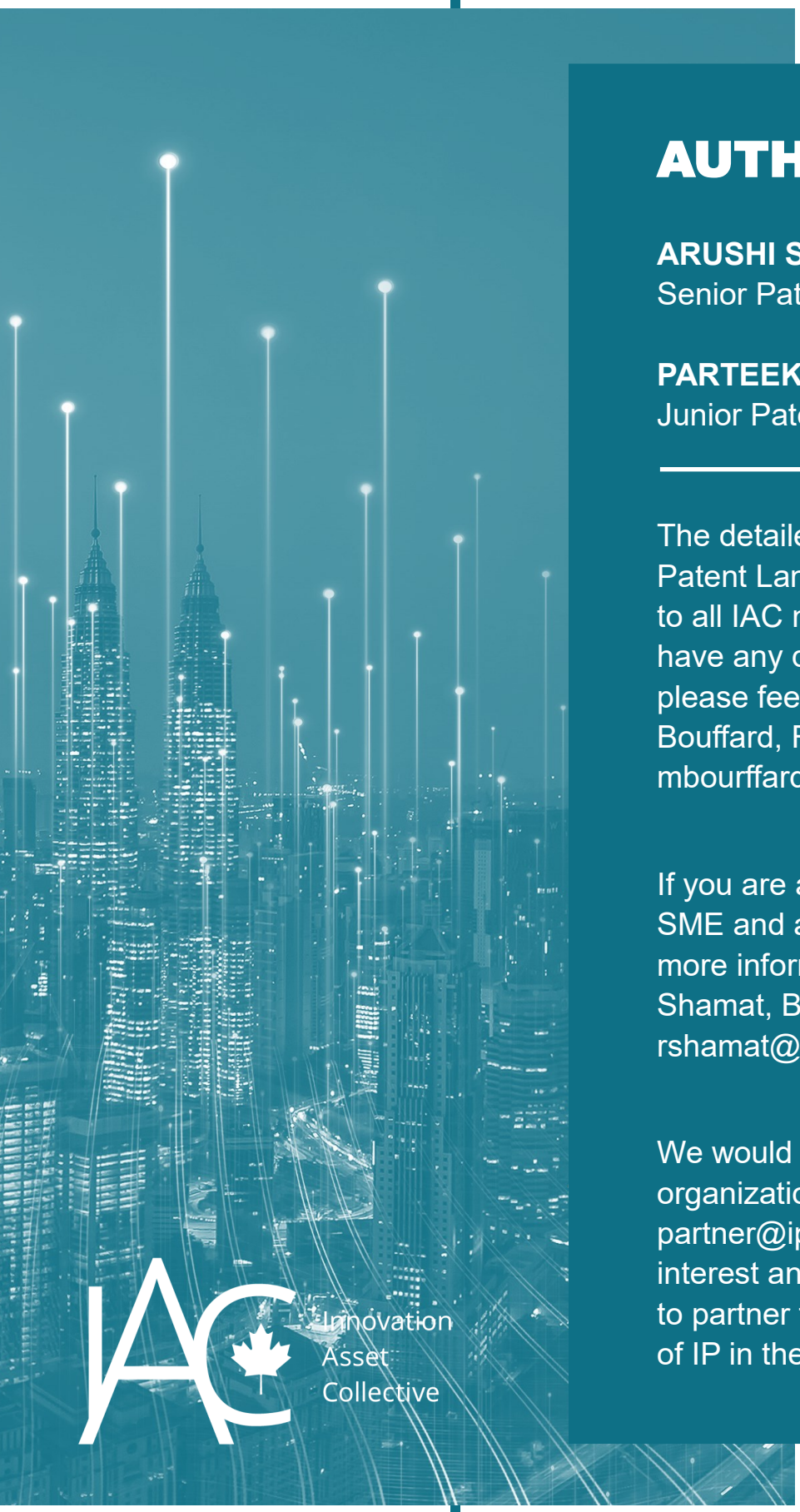
Smart parking solutions apply sensors to embed intelligence in parking infrastructure to exchange and inform infrastructure's utilization patterns with other intelligent devices in the network, including smart automobiles, user mobiles and cloud-based parkade management platforms. These smart solutions have the capability to seamlessly manage urban parking venues in a neighbourhood by relaying real-time parkade occupancy information, making reservations, collecting parking fees, surveilling and monitoring parkades, guiding vehicles to selected parking spots and facilitating electric vehicle (EV) charging, among many other things.

DYNAMIC TRAFFIC MANAGEMENT

Dynamic traffic management solutions are directed towards the application of sensing technologies for solving challenges related to traffic congestion and vehicle pollution by introducing efficiencies in the navigation of vehicles on the road while minimizing vehicle idling. The solutions include dynamic traffic signals, variable traffic messages, advanced driver assistance, vehicle navigation and early warning systems using real-time traffic information.

ADVANCED PUBLIC TRANSPORTATION

Advanced public transits focus on reducing commute times for users while also alleviating environmental pressures put by the transportation system through a coordinated multi-modal transit system. Intelligent public transportation entails solutions such as connected transits and demand-responsive systems to meet the variable demand of urban centers. Additionally, it can also support emergency and incident management systems by reducing emergency vehicles' response time.



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The detailed version of this, as well as future Patent Landscape Reports will be available to all IAC members. If you are a member and have any questions about these reports, please feel free to get in touch with Melissa Bouffard, Relationship Manager at mbourffard@ipcollective.ca

If you are a Canadian data-driven cleantech SME and are interested in joining IAC, for more information, please connect with Rasha Shamat, Business Development Manager at rshamat@ipcollective.ca.

We would also invite private or public organizations to connect with us at partner@ipcollective.ca. If this is a topic of interest and to explore how we might be able to partner together to further the discussion of IP in the cleantech sector.