

Logistics Innovation Zone | Feasibility Report

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1. Executive Summary:

Brampton is on the brink of a monumental transformation, poised to solidify its position as a global hub of logistics and mobility innovation through the establishment of the Logistics Innovation Zone (LIZ). This ambitious project is deeply rooted in the city's longstanding commitment to the manufacturing, transportation, and logistics sectors, which have significantly contributed to both the local and provincial economies. The pivotal role of the CN Intermodal facility which is Canada's largest rail intermodal terminal underscores Brampton's essential contribution to Ontario's supply chain network. The facility is a crucial node in CN's distribution network, with nearly 60% of the railway's system-wide intermodal business passing through it, underscores Brampton's essential contribution to Ontario's supply chain network, further highlighting the city's strategic importance in the logistics landscape and aligning with the *Brampton 2040 Vision* report.

The recent establishment of cutting-edge facilities by industry giants like Lululemon and Pet Valu in Brampton is a testament to the city's burgeoning status as a logistics powerhouse, capable of attracting and supporting major industry players, and creating “jobs within communities”. This, coupled with the vibrant City of Brampton Innovation District, signals a robust culture of “interconnectedness”, innovation and technological advancement that will underpin the LIZ, ensuring its success and sustainability.

Phase 1: Branding and Conceptualization lays the groundwork for the LIZ, focusing on establishing a strong project identity and a Virtual Centre of Excellence to engage businesses and attract leading-edge technology pilots. This phase is crucial in securing buy-in from key stakeholders and setting a solid foundation in cutting-edge logistics technology.

Phase 2: Materializing the Vision transitions the LIZ from conceptual to tangible, with the development of a physical collaboration space designed to foster continuous innovation and collaboration. This phase will see the implementation of pilot projects that embody the zone's commitment to sustainable practices, emphasizing a future of zero emissions powered by renewable energy sources.

Phase 3: Establishing the Keystone marks the culmination of the LIZ's development with the construction of the Centre of Excellence; and referring to Actions #2-4 of the Brampton 2040 Vision: Living the Mosaic, which speaks about the creation of Ancillary Centres, this state-of-the-art facility will not only embody Brampton's dedication to innovation and sustainability but will also serve as an international model for sustainable infrastructure within the logistics sector. The Centre will facilitate collaborative synergy, drawing global thought leaders to Brampton to shape the future of logistics technology. Ultimately, the creation of this Centre will act as a foundational step in the execution of Brampton's 2040 vision, which included, but is not limited to the following goals:

- To be a mosaic of sustainable urban places, sitting within an interconnected green park network, with its people as environmental stewards – targeting ‘one-planet’ living,
- To be a mosaic of safe, integrated transportation choices and new modes, and,
- To be ahead of the wave of new technology applications in order to shape, support and manage but also avoid unwanted distortions of the city.

Throughout its development, the LIZ will stand as a beacon of environmental stewardship and innovation, incorporating advanced technologies such as V2X connectivity, electric and hydrogen fueling infrastructure, autonomous eVTOL systems, and comprehensive cybersecurity measures. In collaboration with the Provincial and Federal Governments, the LIZ will lead the charge in pioneering autonomous heavy-duty vehicle technologies, establishing Brampton as a forerunner in the global logistics industry. Furthermore, the generation and collection of data within the LIZ will be important for the city, and the businesses within, as data is what AI/ML require to be functional; consequently, improving city services, and paving the way for an opportunity for monetization to arise.

As Brampton City Councillors, your support and approval for the Logistics Innovation Zone are sought to realize this visionary project, which promises not only to enhance the economic health of Brampton but also to position the city at the forefront of global logistics innovation.

2. Introduction:

Brampton is on the cusp of an era-defining transformation, poised to redefine its standing as a pivotal hub within Canada's manufacturing, transportation, and logistics sectors. The city's deliberate and strategic investments have laid the groundwork for the imminent Logistics Innovation Zone (LIZ), setting the stage for Brampton to emerge as a leader in sustainable and cutting-edge logistics solutions. Anchored by the CN Intermodal, a cornerstone of both local and provincial economic vigor, Brampton is gearing up for an unprecedented wave of innovation - "one that prioritizes a transit network and new core loop, walking and cycling networks, virtual networks, and new travel technologies".

The recent launches of sophisticated facilities by industry giants like Lululemon and Pet Valu underscore Brampton's ability to support and elevate elite operations, signaling an attractive climate for top-tier business ventures. This momentum is bolstered by the burgeoning City of Brampton Innovation District, a testament to a thriving culture of ingenuity and technological advancement poised to drive the LIZ forward. This initiative is not merely a step but a significant leap toward transforming the global logistics paradigm.

As the heart of North America's transportation network and host to Canada's most extensive inland port, Brampton serves as an essential conduit for commerce, bolstered by a logistics sector that significantly contributes to the national GDP. The city's infrastructure, further highlighted by the Rogers Cybersecure Catalyst, positions Brampton at the forefront of cybersecurity and innovation.

Nestled within the Toronto-Waterloo Innovation Corridor and adjacent to the Toronto International Airport, Brampton boasts unmatched connectivity, recognized as the #1 mid-sized North American city of the future for connectivity. The LIZ is poised to leverage this unparalleled access and Brampton's abundant resources through a strategic, phased development plan. From the inception of a Virtual Centre of Excellence to the establishment of a collaboration space, culminating in the Centre of Excellence, the LIZ is destined to become a beacon of Brampton's commitment to fostering environments that are not only innovative but also sustainably forward-thinking.

In this transformative period, Brampton is ready to carve out the future of logistics, propelled by a legacy of economic foresight and a steadfast commitment to innovation and ecological responsibility. The LIZ transcends being merely a project; it represents a pivotal juncture in Brampton's trajectory, affirming the city's position as a leader in redefining global logistics standards.

2.1. Goals and Strategies: Why Brampton Needs a Logistics Innovation Zone

Brampton is a keystone in Canada's industrial domain, playing a pivotal role in the manufacturing, transportation, and logistics sectors that form the backbone of the national economy. Anchored by the critical CN Intermodal facility, the city's infrastructure is a vital component of the economic tapestry extending beyond its boundaries into the wider Ontario region. The logistics sector in Brampton, with its extensive network of over 11,000 employers and 24,000-strong workforce, contributes significantly to the national GDP, underscoring Brampton's indispensable position in the supply chain network of Canada.

In an era where the demand for innovative and sustainable logistics solutions reaches unprecedented levels, Brampton's geographical and strategic placement within the Toronto-Waterloo Innovation Corridor emerges as a crucial advantage. Its esteemed status as the top-connected mid-sized North American city further solidifies its potential to spearhead advancements in the logistics industry. The Logistics Innovation Zone (LIZ) is not merely an addition to Brampton's assets but a necessary evolution to address the dynamic challenges of global trade, cybersecurity, and the imperative for sustainable development. It aims to harness the city's prime location, skilled labor pool, and vast land resources to cultivate an ecosystem that bolsters trade efficiency and stimulates economic expansion.

2.2. Defining the Logistics Innovation Zone

The envisioned LIZ in Brampton is set to become a paradigm of sustainability and technological excellence on a global scale. Strategically situated in Northeast Brampton, the zone is designed to be a catalyst for innovation, pushing the boundaries within the logistics and transportation sectors.

The development of the LIZ is meticulously planned in phases, each building upon the success of the last. The initial phase introduces a Virtual Centre of Excellence, conceptualized to unite businesses in the pursuit of innovative breakthroughs and to serve as a magnet for pilot testing emergent technologies. This foundational phase paves the way for the establishment of a tangible collaboration space, a crucible for collaborative ingenuity and ongoing pilot initiatives aimed at honing logistics technologies. The culmination of these efforts is the construction of the Centre of Excellence, a facility that will stand as a testament to Brampton's commitment to fostering a breeding ground for sustainable innovation and cutting-edge technology.

The LIZ is poised to be an inclusive platform, welcoming world-leading technologies and global innovators to partake in and drive the logistics revolution right from the heart of Brampton. This comprehensive approach ensures that the LIZ not only fuels economic growth but also establishes itself as a global standard-bearer for environmentally conscious logistics practices.

3. Feasibility Study

3.1. Phase 1: Branding and Conceptualization

Phase 1 emphasizes the importance of branding and conceptualization in laying the groundwork for the Logistics Innovation Zone, setting a strong foundation for its identity, technological direction, and stakeholder involvement.

Project Initiation

- Outline the Logistics Innovation Zone's vision, defining the scope, objectives, and key deliverables, aligning them with Brampton's goals for innovation in logistics and sustainability.
- Establish a comprehensive timeline with milestones that reflect the branding and conceptualization priorities of the project.

Naming/Branding

- Develop a robust branding strategy that embodies the zone's commitment to leading-edge logistics solutions and environmental stewardship.
- Create a compelling brand identity, including a distinctive name, logo, and marketing materials that resonate with the innovative spirit of the initiative.

Technology Assessment

- Conduct a thorough review of emerging and existing logistics technologies to identify those that align with the zone's focus on innovation and sustainability.
- Evaluate the infrastructure needs to support these technologies, such as 5G capabilities, autonomous vehicle integration, and smart warehousing systems.

Pilot Project Framework

- Establish selection criteria for pilot projects that demonstrate the zone's commitment to cutting-edge, sustainable logistics practices.
- Design a process for integrating and monitoring pilot projects within the hub, ensuring they contribute to the zone's objectives and provide valuable insights for future expansion.

Stakeholder Analysis

- Identify and analyze key stakeholders, including local businesses, government bodies, investors, and community organizations, to understand their needs and expectations.
- Develop a strategy for ongoing engagement with these stakeholders, leveraging their insights to refine the branding and conceptualization of the zone.

Virtual Centre of Excellence

- Plan the creation of a Virtual Centre of Excellence as an initial platform for collaboration and innovation, serving as a digital embodiment of the zone's brand and objectives.
- Determine the virtual hub's features and services, such as educational webinars, discussion forums, and a digital resource library, to engage stakeholders and foster a community around the Logistics Innovation Zone.

3.2. Phase 2: Materializing the Vision: From Concept to Reality

In Phase 2 the Logistics Innovation Zone begins to take physical shape, marking a significant milestone in Brampton's journey towards becoming a global leader in innovative and sustainable logistics. This phase is crucial in garnering the support and approval of Brampton's city councillors by demonstrating the tangible benefits and strategic alignment of the project with the city's broader goals.

Transition to Tangible Innovation

- Embark on the transformation from conceptual frameworks to tangible assets by initiating the construction of a dynamic collaboration space. This facility will stand as the cornerstone of practical innovation, blending the theoretical with the real-world application of sustainable logistics practices.

Regulatory Environment

Adherence to Regulations: Ensure the Logistics Innovation Zone meets all logistical and transportation industry regulations, maintaining compliance with environmental, safety, and transportation standards at municipal, provincial, and federal levels.

- **Permits and Policy Engagement:** Efficiently manage the acquisition of construction and operational permits, and actively engage with regulatory bodies to influence policy that supports innovative and sustainable logistics practices.

Pilot Projects Evolution

- Establish a structured agenda for the ongoing execution and evaluation of pilot projects, focusing on the practical implementation of new logistics technologies within the collaboration environment.
- Implement a robust system for feedback and data collection, ensuring each project contributes to iterative enhancements and aligns with the zero-emissions future of the zone.

Strategic Site Selection

- Conduct comprehensive site analyses to identify the optimal location for the collaboration space, prioritizing accessibility, integration with existing logistics infrastructure, and the potential for future expansion.
- Assess the chosen site's impact on Brampton's traffic flow, economic ecosystem, and community well-being, ensuring alignment with broader city development plans.

Ongoing Technological Evolution

- Maintain a vigilant watch over the evolving landscape of logistics and sustainable technologies, ensuring the hub remains at the cutting edge of innovation.
- Forge and nurture partnerships with leading technology providers, securing a pipeline of continuous innovation within the collaboration space.

Economic and Community Impact

- Conduct detailed studies to forecast the hub's influence on job creation, local business empowerment, and its contribution to Brampton's economy.
- Develop models to quantify the hub's economic viability and its capacity to spur economic growth within the city and beyond.

Sustainability and Environmental Blueprint

- Craft a comprehensive sustainability strategy for the hub, establishing clear targets for achieving a zero-emission operation through the adoption of renewable energy sources.
- Pursue sustainability certifications for the collaboration space, ensuring its design and operations set a benchmark for eco-friendly development.

Integration with Brampton's Innovation Ecosystem

- Envision the collaboration space as a pivotal component of Brampton's broader Innovation District, acting as a hub within a hub-and-spoke model of innovation acceleration.
- This integration will not only enhance the collaboration space's impact but also strengthen the collaborative ties within Brampton's innovation community, fostering a city-wide culture of forward-thinking and sustainable development.

3.3. Phase 3: Culmination and Construction: Building the Beacon of Innovation

As Phase 3 unfolds, Brampton is set to witness the culmination of its visionary journey with the construction of the Centre of Excellence within the Logistics Innovation Zone (LIZ). By this stage, the city is already experiencing the economic upliftment from the successful pilot projects and foreign direct investments catalyzed by the activities in Phases 1 and 2. The Centre of Excellence is not just a building; it's a symbol of Brampton's economic resurgence and leadership in sustainable logistics innovation.

Project Plan and Strategic Implementation

- Develop a comprehensive project plan that bridges the initial virtual and collaborative efforts with the physical construction of the Centre of Excellence, ensuring a seamless transition to a tangible infrastructure.
- Implement a dynamic risk management strategy to proactively identify and mitigate potential hurdles, facilitating a smooth progression towards the Centre's completion.

Council Direction and Support

- Outline the guidance and endorsements provided by the City of Brampton's Council, emphasizing their pivotal role in steering the project towards its objectives and aligning it with

the city's broader developmental goals.

Project Budget and Financial Framework

- Present a detailed budget for the Centre's construction, including projected costs, funding sources, and financial management plans, ensuring transparency and fiscal responsibility throughout the project's execution.

Provincial and Federal Government Support

- Highlight the support and collaboration from provincial and federal government bodies, detailing any grants, resources, or policy alignments that bolster the project's vision and execution.

Private Sector Support

- Financial support and project collaboration from the private sector, directly or indirectly linked to the advancement of technologies, logistics, and transportation for cities.

Innovative Infrastructure

- Finalize the architectural designs for the Centre of Excellence, ensuring the infrastructure epitomizes sustainable design and technological innovation.
- Develop an infrastructure strategy that integrates renewable energy solutions, smart building technologies, and spaces dedicated to technological exploration and validation.

Green Construction Paradigm

- Embrace a sustainable construction approach that minimizes environmental impact through the use of eco-friendly materials and practices.
- Establish a phased construction timeline that adheres to green principles, contributing to the city's environmental sustainability goals.

Sustainability and Innovation Leadership

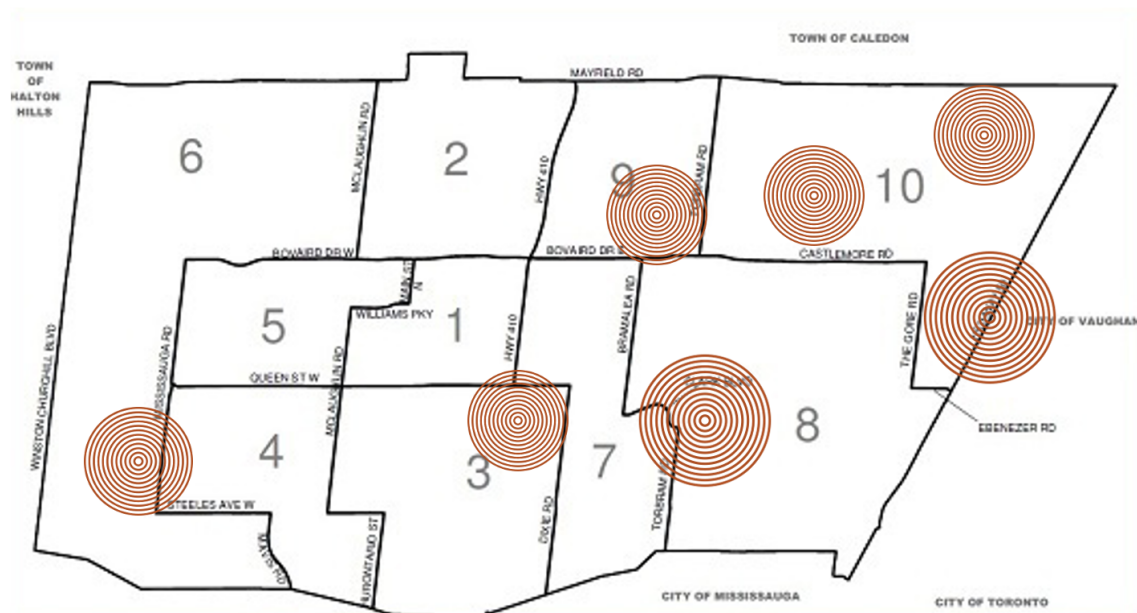
- Affirm the Centre's commitment to setting global benchmarks in sustainable logistics innovation, establishing it as a model of eco-friendly excellence.
- Foster a vibrant ecosystem that attracts leading talents and enterprises in logistics and technology, enhancing Brampton's economic and innovative landscape.

Expanding Global Networks

- Forge strategic partnerships with international logistics hubs, academic institutions, and innovation leaders to integrate the Centre into a worldwide network of knowledge and innovation.

- Create opportunities for global collaboration, knowledge exchange, and joint initiatives in technology development and sustainability, extending the Centre's impact on a global scale.

4. Location: Logistics & Transportation Companies in Brampton



Note: Map and concentric circles indicating logistics and transportation hot spots is an example and for visual representation only.

5. Pilot Projects: Tech Assessments

5.1. Mobility:



Figs. 1 & 2: Drones (Passenger & Goods) delivery



Fig. 3: Micro Mobility Robots



Fig. 4: Heavy Duty Electric Vehicle

5.2. Battery and Energy:



Fig. 5: Charging Infrastructure Solutions



Fig. 6: Hydrogen Fuel Cell Technology



Fig. 7: Dynamic Wireless Charging

5.3. Sustainability:



Fig. 8: Emissions Reduction Technologies



Fig. 9: Renewable Energy Integration

5.4. Communication, Vehicle Tracking, and Safety:



Fig. 10: V2X Communication



Fig. 11: Smart Tire Technology



Fig. 12: 5G Connectivity



Fig. 13: Driver Assistance Systems

5.5. Process Improvement and Management Softwares:

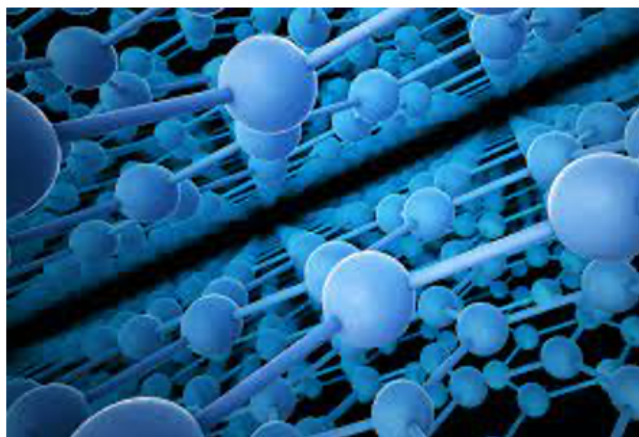


Fig. 14: Advanced Material Science



Fig. 15: Fleet Management



Fig. 16: Autonomous Heavy-Duty Truck



Fig. 17: Regulatory Compliance Software

5.6. Cybersecurity, Blockchain and AI:



Fig. 18: Blockchain Technology



Fig. 19: Smart Contracts



Fig. 20: Data Collection and Analytics



Fig. 21: In-Vehicle Cybersecurity

5.7. Sustainable Facilities



Fig. 22: Centre for Green Logistics

5.8. Real-Time Digital Twin:



6. Pipeline of Pilot Projects & Investment Attraction Files

6.1. Electric Vehicle Charging Infrastructure Pilot (EOI)

The City of Brampton is inviting proposals for the development of innovative charging solutions for personal electric vehicles (EVs). This initiative is part of the city's broader commitment to environmental sustainability and aims to support the transition to more eco-friendly transportation alternatives. By focusing on personal EVs (excluding Brampton Transit EV infrastructure), the pilot project intends to foster increased adoption of electric vehicles among residents, thereby reducing carbon emissions and contributing to cleaner air.

The project is designed to not only address environmental goals but also to stimulate economic development within the city. It reflects Brampton's proactive stance in aligning with Canada's electric vehicle sales mandates, which include a strategic move towards eliminating the sale of gasoline-powered vehicles by 2035. This initiative underscores the city's dedication to sustainable development and its role in the national effort to transition to a more sustainable and environmentally friendly transportation future.



6.2. Drone Food & Goods Delivery

Solution: Order food, groceries and more from your phone and have it delivered by drone within 15 minutes to your backyard.



6.3. Drone Delivery Airline (eVTOL)

One of the latest innovations in transportation technology, eVTOL aircrafts are electric aircrafts that take off and land going straight up and down. Short for electric vertical take-off and landing aircrafts, eVTOLs are sometimes referred to as air taxis or flying taxis. Powered by batteries, eVTOLs hover and fly, much like a helicopter, and are typically designed to carry two to six passengers including a pilot.



7. Benchmarking

7.1. Global Logistic Innovation Centre's

1. **Detroit Smart Parking Lab:** The lab will allow mobility and smart infrastructure pioneers and real-estate innovators and startups to test parking-related mobility, logistics and electric vehicle charging technologies. Led by Enterprise, the collaboration also aims to test more seamless and efficient rental car returns.
2. **Singapore's Tuas Port:** Renowned for its high efficiency and cutting-edge technology, including automated cranes and drones for surveillance and inspection. It's a model for smart port operations and integrated logistics.
3. **Rotterdam Port, Netherlands:** One of the world's most sustainable ports, known for its commitment to green energy and innovation in logistics, including initiatives in autonomous shipping and digital logistics solutions.
4. **Duisburg Harbor, Germany (Duisport):** The world's largest inland port, Duisport is a hub for multimodal transport (rail, road, waterways) and focuses heavily on digital transformation and sustainability.
5. **Dubai Logistics City:** Part of Dubai World Central, this is the world's first truly integrated logistics platform with all transport modes, logistics, and value-added services, including cold chain, in one free economic zone.

6. **Port of Los Angeles, USA:** Known for its Clean Air Action Plan, the port is a leader in environmental initiatives and is investing in zero-emission technologies and data-driven solutions to manage traffic and operations.
7. **Zaragoza Logistics Center, Spain:** A research institute partnered with MIT, focusing on logistics and supply chain management, offering innovative solutions in logistics education and research.
8. **Panama Pacifico Special Economic Zone, Panama:** A logistics and business hub offering multimodal connectivity and a range of tax and operational incentives, known for its role in global trade due to the Panama Canal.
9. **Logistics Park Chicago, USA:** One of the largest inland ports in the US, known for its state-of-the-art facilities, intermodal offerings, and commitment to sustainable logistics solutions.
10. **Zhengzhou Airport Economy Zone, China:** A unique blend of an airport-based economic zone focusing on integrating aviation logistics with e-commerce, high-tech industries, and international trade.
11. **Hamburg Innovation Port, Germany:** A project focusing on creating a future-oriented urban development that combines work, research, and living, emphasizing innovative logistics solutions.

7.2. Detroit Smart Parking Lab

The State of Michigan is teaming up with Ford, Bedrock and Bosch to launch the nation's first-of-its-kind, real-world test site for emerging parking technology – called the **Detroit Smart Parking Lab**. The lab will allow mobility and smart infrastructure pioneers and real-estate innovators and startups to test parking-related mobility, logistics and electric vehicle charging technologies. Led by Enterprise, the collaboration also aims to test more seamless and efficient rental car returns.

