

Committee of the Whole (Working Session) Report

DATE: Wednesday, April 1, 2026

WARD(S): ALL

TITLE: **DIGITAL TWIN AS ENGINES OF URBAN PLANNING
INNOVATION**

FROM:

Vince Musacchio, Deputy City Manager, Planning and Infrastructure Development

ACTION: FOR INFORMATION

Purpose

This report outlines the transformative role of data and digital twin technology as a catalyst for innovation in urban planning and service delivery. It demonstrates how the adoption of digital twins can bridge the gap between strategic vision and on-the-ground implementation by enabling predictive analytics, integrated workflows, and more informed decision-making. Through this approach, municipalities are better positioned to plan proactively, respond to change, and deliver smarter, more resilient communities.

Report Highlights

- **Enhanced Decision-Making:** These models enable staff to analyze development scenarios, assess impacts, and improve planning decisions.
- **Catalyst for Innovation:** Digital twin technology drives innovation in urban planning by creating dynamic, data-rich virtual models of municipal environments.
- **Transparency and Engagement:** Digital twins foster public engagement while bridging strategic vision and practical implementation through predictive analytics and integrated workflows, enabling smarter, more resilient communities.

Recommendations

1. That the report be received for information.

Background

A digital twin is a virtual representation of a physical object, system, or process that reflects real-world conditions through integrated, data-driven models. In a municipal planning context, digital twins enable the creation of dynamic, information-rich representations of the built and natural environment. These tools support more informed analysis of development scenarios, assessment of potential impacts, and evidence-based decision-making. Digital twins also enhance transparency and public engagement by providing accessible visualizations that help communicate complex planning information.

Over the past decade, the Development and Parks Planning Department has focused on modernizing its workflows and adopting innovative technologies to improve operational efficiency and service delivery. Through continuous process improvements and investments in information systems, the department has established a strong foundation to support advanced planning tools such as digital twins. Building on this progress, the department will continue to strengthen its digital capabilities to enhance transparency, encourage public participation, and support collaborative planning. By leveraging data, technology, and innovation, the department is positioned to help deliver smarter, more resilient, and sustainable communities.

Previous Reports/Authority

N/A

Analysis and Options

Testing and implementing new technologies as well as improving datasets within a municipal planning environment offers significant benefits but also presents challenges. On the positive side, adopting advanced tools and refining data quality can lead to more accurate analysis, better decision-making, and enhanced transparency, ultimately improving service delivery and fostering public trust.

However, the process requires substantial investment in time, resources, and staff training. It may also involve navigating data privacy concerns, system compatibility issues, and the common risk of technology. The Development and Parks Planning department will continue working with municipal stakeholders, including City Council, to strike the right balance and ensure that innovation delivers long-term value to our staff and community without compromising operational stability.

The Development and Parks Planning Department is committed to using data and modern technology to build innovative tools that strengthen transparency and support informed decision making. Several examples of digital twin initiatives maintained within the department include:

PLANit Viewer:

PLANit Viewer was launched in Q4 2025. It enables users to explore and track active development applications across the community, providing detailed insights into proposals along with planning information such as zoning and land use. Designed with modern web-mapping technology, the platform delivers faster and more reliable performance. Users can search applications by address or file number, and enhanced filters allow results to be refined by application type while still displaying all available map data, offering a clearer and more comprehensive picture of Vaughan's evolving planning landscape.

3D Digital Twin:

The 3D digital twin web application provides an interactive 3D view of proposed buildings, allowing users to explore development applications in secondary plan areas by type while also accessing detailed zoning and land use information. With powerful search tools, users can quickly look up applications by file number or address, and staff can perform built-in analysis to better understand the impact of new developments. This integrated platform offers a clear, intuitive way to visualize growth and assess planning considerations in the community.

Approved Residential Units:

In an effort to track development planning residential units approvals, the development and parks planning department created a tool to display development applications along with information on allocation and submitted building permits for these units. The web application categorizes the number of units by application type and approval year. It also maps each application's location and provides links to the associated approval document.

New Zoning by-law Application:

The Zoning Web application provides comprehensive access to the City's zoning by-law, allowing the public to easily search and explore zone categories, linked exception documents, permitted uses, and detailed lot and building requirements. Users

can look up general zoning information or perform specific searches for permitted uses, with results dynamically highlighting areas on the map where those uses are allowed. This intuitive tool helps residents, developers, and staff quickly understand zoning rules and navigate the by-law with confidence.

Artificial intelligence and urban planning policy:

The Development and Parks Planning Department is exploring the use of an artificial intelligence powered technology that connects the City's planning policies, such as the zoning by-law, with interactive mapping, allowing users to instantly see where specific policies apply across the city. By analyzing policy language and linking it spatially, the tool provides clearer, more accessible insights for staff and the public. This emerging technology represents one of the innovative solutions the Development and Parks Planning Department is considering for implementation in the near future to enhance transparency and improve decision-making

Financial Impact

N/A

Operational Impact

The Development and Parks Planning department is actively collaborating with key City departments such as Policy Planning and Special Programs, Building Standards and the Office of the Chief Information Officer. Through joint efforts, we are achieving more accurate analyses, clearer communication, and creating new information products to support the decision-making process. While this work involves navigating challenges, the shared commitment to innovation ensures that improvements are made responsibly and with long-term value in mind.

Broader Regional Impacts/Considerations

N/A

Conclusion

Over the past decade, the Development and Parks Planning Department has focused on improving processes and adopting innovative technologies to enhance staff efficiency and deliver service excellence. This foundation allows City staff to implement advanced tools like digital twins, analytics and dynamic data-rich models that support scenario analysis, impact evaluation, and informed decision-making while promoting transparency and public engagement.

By leveraging data and technology, we aim to build smarter, more resilient communities through data visualization, analytics and integrated workflows. While testing and implementing new technologies and improving datasets offer significant benefits such as better accuracy, transparency, and service delivery, they also present challenges, including resource investment, staff training, data privacy, and system compatibility.

The Development and Parks Planning team will continue working with City Council and other municipal and external stakeholders to lead in adopting new technologies and improving our processes while maintaining operational stability, ensuring long-term value for City of Vaughan staff and the community.

For more information, please contact: Juan Carlos Molina, Manager, Planning GIS and Analytics, extension 8209

Attachments

1. Presentation Material: Digital Twins as engines for urban Planning Innovation

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