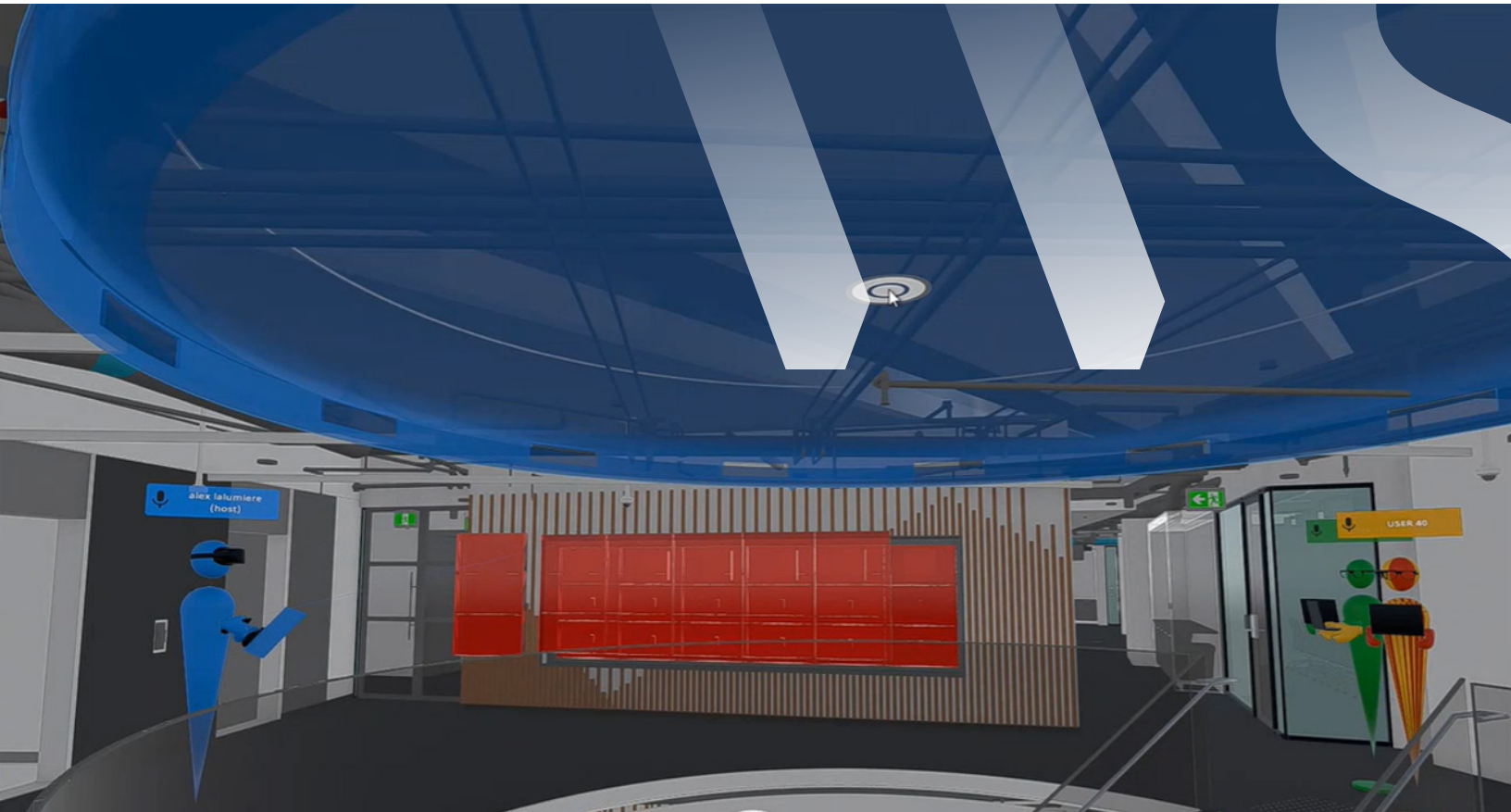


2023 CCE ACEC Showcase Awards

# WSP Digital Acceleration Initiative



Submission Category I

## Community Outreach and In-House Initiatives

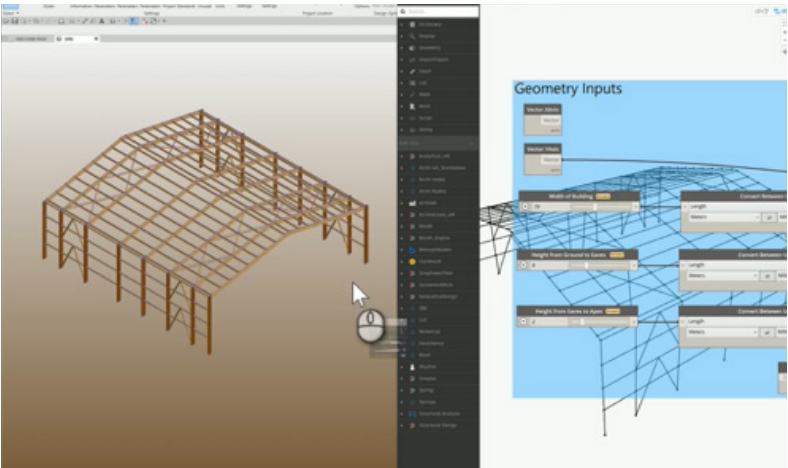
APRIL 12, 2023



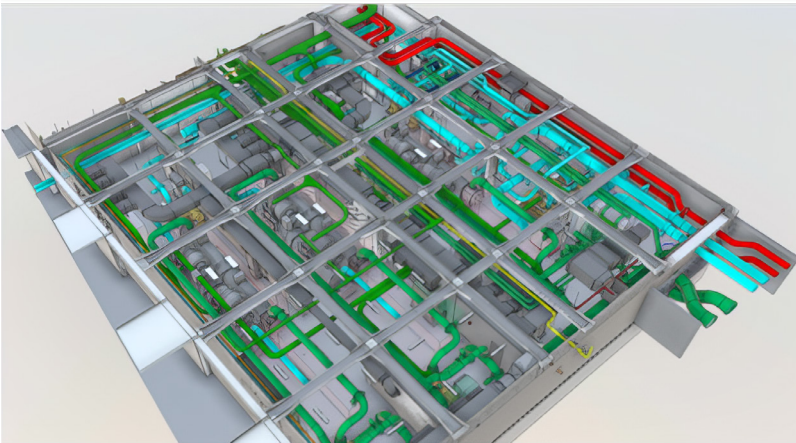
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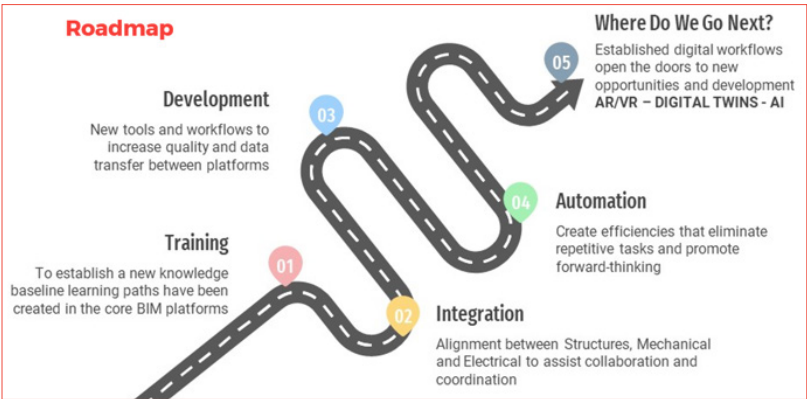
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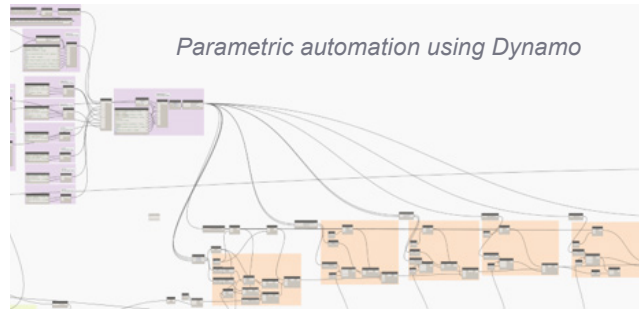
Social, Economic & Other Benefits ..... 03



# NATURE OF THE PROJECT

Describe your project.

What does it involve,  
and what are its  
goals?



Integrated digital project delivery is quickly becoming critical in delivering efficient, high quality and consistent results for clients and means that the consulting industry needs to continuously adapt to an ever-changing marketplace. Some of these needs include reality capture and maturation of digital assets (i.e. digital twins), decarbonization, and modern methods of construction. Realizing this, WSP's Property & Buildings sector leadership in the Structures, Mechanical and Electrical sub-sectors launched a strategic initiative in late 2020 with the goal of becoming the preferred Buildings solution partner and becoming a fully integrated firm with advanced technology as the basis of our service delivery.

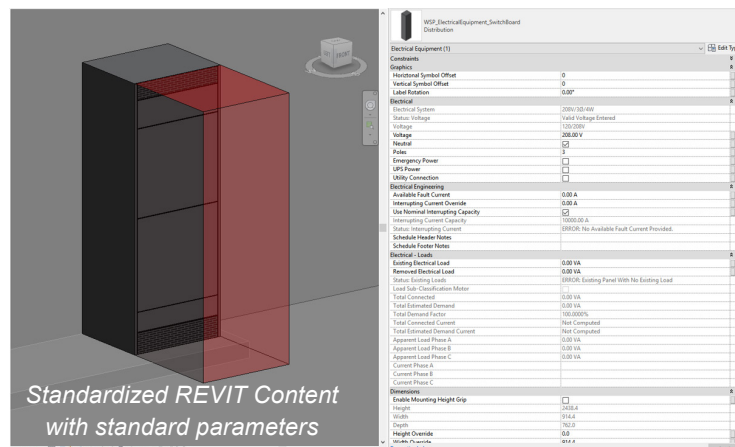
WSP formed a Digital Solutions team, dedicated to executing this digital acceleration. The key steps of the journey have included: baseline training in BIM and automation for all staff, standardization of templates and content to ensure all are working from a common base on all projects, mentoring champions in each business region/sector, and developing innovative custom workflows to enhance efficiency and quality.

BIM and custom tool development requires creation of a standard approach. With 22+ offices across the country, this involved gathering one key BIM leader from each

region and agreeing on the standard for project delivery, including a BIM Execution Plan, a Level of Development Matrix, a BIM Drawing Standard, and a BIM 360 workflow standard, all in 2 languages.

Of the many innovations, the most impactful is a connected approach to project data with a centralized database for all the various software platforms needed to execute a project. This serves as a single source of the truth with "data streams" to receive and feed data back to different sources, in a way that is intuitive to a non-software engineer (a barrier to entry for many of the existing platforms in the industry). This endeavour saves thousands of hours and improves quality. The first steps have been to work towards centralized, consistent data input for project information.

To ensure WSP was advancing with the industry, WSP also created 10 internal focus teams Nationally to work with key clients across the country to act as the voice of industry. The purpose was multifold, share what digital initiatives WSP was working on so clients could validate and give feedback; to get clients input on direction such as future of digital twins, de-carbonization, and automation; and, to promote industry wide tools and set a common language on digital solutions.

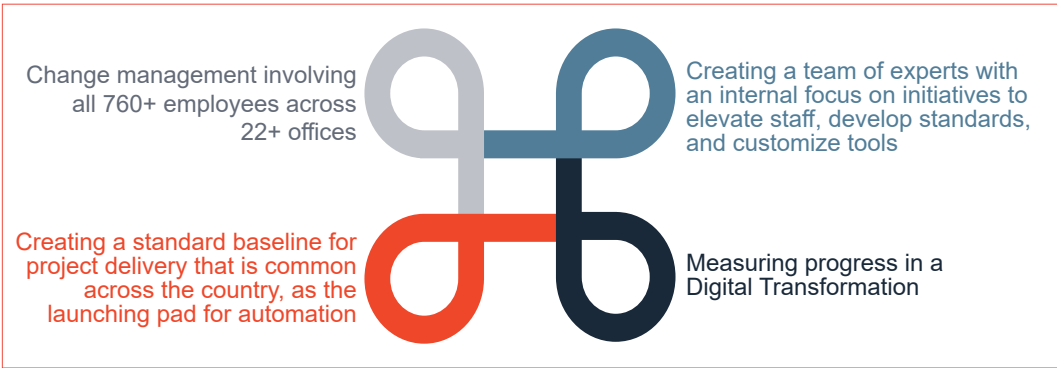


# EFFORT AND COMPLEXITY

Explain what the project involved in terms of staff effort, commitment and challenges.

## Challenges...

Some of the key challenges faced in this program included:



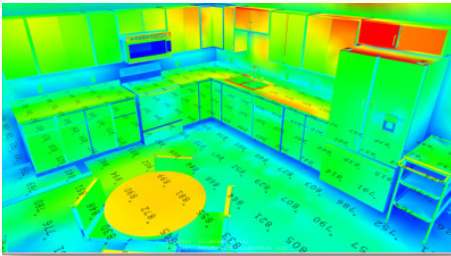
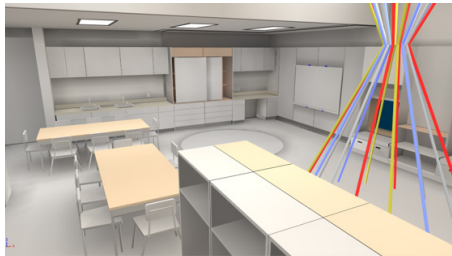
The size of the WSP Property and Building's Structures, Mechanical and Electrical team necessitated a focused approach to change management that mobilized all in the business to participate. This involved using the Four Disciplines of Execution to create small teams of individuals across the business with similar day-to-day activities to pick 1 or 2 "wildly important goals" to achieve in their work by leveraging and adopting technology.

Covering a vast range of sectors, regions, and project typologies with a standard project delivery approach presented a major challenge which was overcome by gathering experts in each sector/region to make key decisions and focus on creation of the content to be used on projects.

The bulk of the effort on the initiative was handled by a centralized Digital Solutions team. Removing key experts from WSPs major projects to focus on a non-billable strategic initiative took the commitment of leaders to acknowledge that, by sharing and devoting these key 10 resources to the

digital initiative, it would ultimately pay back to all involved. Without such a commitment from leadership it is doubtful that software platforms such as those used nationally for reality capture, viewing of point clouds, and scan-to-BIM could be harmonized across the sectors.

Key KPIs such as efficiency improvement or minutes spent by production staff in REVIT vs. AutoCAD were put in place. As of the end of 2021, the efficiency improvement metric (as measured by an increase in overall Direct Labour Multiplier) increased by 4.8%. It was estimated that a passive approach and lack of investment would lead to margin erosion of 10%. This margin erosion was not experienced, further indicating the success of the investment. The adoption metric of time in REVIT vs. AutoCAD flipped (40% REVIT, 60% AutoCAD at end of 2020, reversed to 60% REVIT and 40% AutoCAD by end of 2021). These results led to business leadership agreeing to continue to invest in the program.



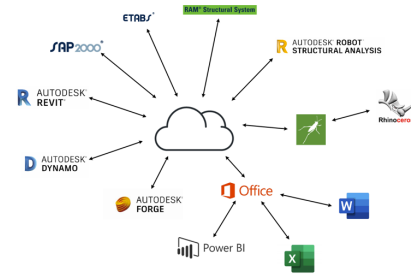
Lighting and energy analysis embedded in the BIM model allows for better insights in design



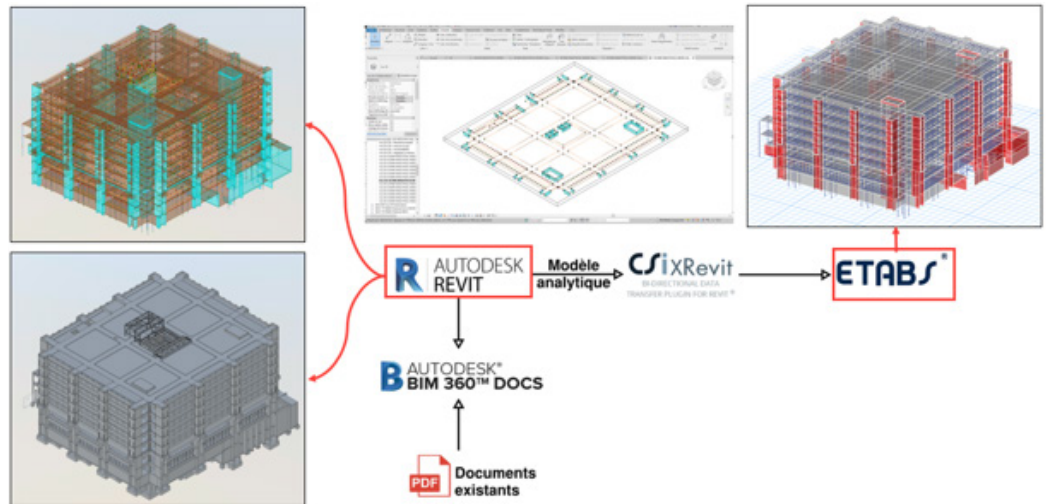
## SOCIAL, ECONOMIC & OTHER BENEFITS

*Explain what social, economic, environmental, etc. benefits the project provided to either (A) the community, and/or (B) your company.*

*How does the project illustrate the consulting engineering sector's contribution to society?*



Connected data through a cloud-based database will lead to efficiency gains and quality benefits, allowing us to replace data translators



Through the encouragement of the staff to be innovative and to leverage the tools and their disposal to work more efficiently WSP has seen a marked increase in the number of BIM modelers using Dynamo to perform parametric design tasks and streamline their work in REVIT, demonstrated by a 334% increase in the number of Dynamo scripts run in October 2022 when compared to January 2022. This has economic and social benefits in freeing up time for project teams to focus on ensuring quality in the final design product, reducing wasteful changes during construction. This is further compounded by the impact of 3D coordination in the design environment prior to issuing for construction.

With the drive towards decarbonization across the AEC industry, the WSP Property & Buildings leadership teams have recently committed to reducing carbon emissions from our designs with the aspirational goal of achieving net zero operational carbon by 2030, and net zero embodied carbon by 2040.

With this commitment and the digital acceleration initiatives in mind, the project team for a major historical building retrofit successfully created a custom application to match a database of steel beams slated

for removal from the building with the new steel beams required in the retrofitted areas of the building in an automated fashion, to divert the historical beams from the waste stream. This design approach will save over 500 tonnes of CO<sub>2</sub>e. Without the baseline BIM standards, creation of a culture of innovation, and focus on modified design approaches to suit decarbonization, this would either have been tackled in a manual fashion which may have become cost prohibitive, or this opportunity would have been missed altogether.

By leveraging the data from our models, WSP have been able to benchmark our past designs on hundreds of projects from a carbon intensity perspective and construct dashboards which report on the level of embodied and operational carbon. From this benchmarking, WSP, and the consulting industry, will be able to find trends and use this information to influence design decisions on new projects.

Using this database at schematic project stages will allow consultant to act as advisors to clients, offering better insights on how to impact the carbon intensity of a building when it can be most heavily influenced, at the beginning.



As one of the world's leading professional services firms, WSP exists to future-proof our cities and environment. We provide strategic advisory, engineering, and design services to clients in the transportation, infrastructure, environment, building, power, energy, water, mining, and resources sectors. Our 12,000 Canadian employees, and 65,000 trusted professionals worldwide, are united by the common purpose of creating positive, long-lasting impacts on the communities we serve through a culture of innovation, integrity, and inclusion. Sustainability and science permeate our work.

