SPACES, PLACES AND POSSIBILITIES

Summary of Proposed Research

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RESEARCHERS

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PROJECT SUMMARY

This research project will explore ways of integrating urban systems modelling with visualization techniques to better capture and convey potential outcomes of social and physical infrastructure decisions to local government and stakeholders. The research will first involve modelling different community development scenarios in order to examine possible outcomes of taking a particular development direction and implementing certain community policies and programs. The research will then use the output from the modelling work to build interactive, realistic visualizations, which will be used to gain a more salient understanding of the potential outcomes and impacts associated with the scenarios. The objective of the research is to investigate challenges and opportunities around using urban systems models as a basis for building visualizations that can effectively engage and clearly communicate to users the benefits and trade-offs of different development paths.

RESEARCH PLAN

The project will involve a series of three focus group sessions, which will convene local government and community stakeholders. Each session will be approximately 1.5 to 2 hours long, and activities and objectives are as follows:

1. Scenario development (*mid-April, 2018*) - The group will meet to discuss the planning challenges that Squamish faces and potential development scenarios that would be relevant to the community (e.g., increased density, adaptation planning, downtown revitalization, etc.). Outcomes of this session will inform the scenarios that will be explored in the modelling and visualization phases of the project.

2. Modelled scenarios (*early-October, 2018*) – After modelling the scenarios, the group will be assembled again to look at the output from the modelling process. This output will be presented in the form of tables and graphs, and the group will provide thoughts and opinions on the scenarios based on the presented information. The group will also provide feedback on comprehensibility and effectiveness of the presentation materials.

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3. Visualizations (*late-February or early-March, 2019*) – An interactive visualization of the scenarios will be built following the second focus group session, and the group will meet once more to interact with the visualization, discuss the scenarios, and comment on the visualization's effectiveness as a communication tool. The visualization will be built in a manner that allows users to "walk" through it and view the scenarios from the first-person perspective.

This is a two-year research project, and it is anticipated that the work described will be completed in the first year. Plans for the second year of the project are tentative, and possibilities include engaging various community groups and/or the broader public with the visualization. How (or whether) to proceed with the second year of the project will depend on the outcomes of the first year.

SCENARIO MODELLING

Approaches to scenario modelling will draw on previous work the researchers have done in this area. Such work includes *Places + Spaces*, a research effort led by Ann Dale and assisted by Robert Newell. The objective of *Places + Spaces* was to develop a tool for Canadian communities to explore and assess different development paths. The "engine" of this tool is an integrated systems simulation model of a community, which incorporates community-specific data and reflects community-specific policies and scenarios. More information on *Places + Spaces* can be found on the project website:

placesandspaces.ssg.coop

Other work relevant to this project includes the *Co-benefits of Climate Action* research currently being conducted by Newell. Climate action co-benefits refer to other benefits experienced from climate mitigation and adaptation strategies, for example, increasing community walkability both decreases greenhouse gas emissions and contributes to community health. Newell is "mapping" co-benefits (as well as trade-offs) to illuminate relationships between climate action and other aspects of community development. Such a map subsequently can be used to inform which variables and relationships should be included within a scenario model. The project is in progress; however, a "simplified" map that illustrates the idea and approach of this research can be found here:

www.changingtheconversation.ca/capp

VISUALIZATION

The visualization will be developed as a realistic, dynamic virtual environment that can be navigated from the first-person perspective. It will be built using a combination of mapping technology and video game development software. Methods for building the visualization were developed by Newell when conducting the *Sidney Spit Visualization* project. More information on and images/videos of the *Sidney Spit Visualization* can be found on the project's website:

www.coraluvic.ca/sidneyspitviz

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