

CIVL 303: COMPUTATIONAL TOOLS IN CIVIL ENGINEERING

Module 4: PROJECT

Issued: September 6, 2021

1. PROJECT TITLE AND CLIENT

Title: Redesign of Chancellor Boulevard / Wesbrook Mall Intersection at UBC

Client: University of British Columbia - UBC SEEDS (Social Ecological Economic Development Studies) Sustainability Program
(You are not allowed to contact the client)

1. PROJECT BACKGROUND

This project will involve a re-design of the intersection at Chancellor Boulevard and Wesbrook Mall Intersection at UBC. An aerial view of the project site is depicted in Figure 1. This intersection was identified for redesign a number of years ago. Unfortunately funding for the near term has been delayed a few years. In the meantime we can still do the work to determine future demands and generate a preliminary intersection design to feed into the future detailed design stage.



Fig. 1. Aerial view of site (Google Earth).

2. OBJECTIVES

To determine an intersection design that accommodates safe and enjoyable travel by all modes of transportation and meets the anticipated traffic, bicycle and pedestrian demands for the intersection. The design must adhere to BC Ministry of Transportation and Infrastructure design guidelines, best accommodate the needs of all stakeholders, and encourage sustainable travel modes, **including cycling and walking** so as to assist in reaching UBC's objectives of reducing single occupancy vehicle trips to and from the campus. As well, the design should prominently feature the intersection as one of several "gateways" to UBC.

Note: All relevant information will be provided, and there is no need to research additional information. Review all information provided on behalf of the client or as posted on Canvas.

3. SCOPE OF WORK

The **preliminary** design is expected to give attention to the following elements:

- **Determine traffic growth rates** apply for the intersection based on growth on campus and other growth in the surrounding / connecting areas. In addition to provided UBC intersection counts, design team may carry out their own intersection count for the experience and to spend some time at the site observing its operation.
- Use future traffic volumes to test intersection control types (signalized or stop controlled), orientation, lane configurations etc. This can be done using the traffic analysis software Synchro. **The client demands that design solutions don't employ a roundabout at the intersection.**
- Based on the results from Synchro start working on a preliminary concept design of the intersection showing bike lanes, travel lanes, sidewalks, curb-lines, storm water management, etc.
- Undertake a safety analysis (including speeds, pedestrian and cyclist safety, sight lines and crossing conditions for pedestrians).
- **On street parking in this area is not permitted or required.**
- Designs must be mindful of the local environment and stakeholder interests in maintaining the local environment and the wilderness aesthetic that currently exists.
- **Prepare a stakeholder engagement, consultation and communication plan.** Audience will include general UBC community, the University Neighborhoods Association (in particular residents of Chancellor Place neighborhood), and the University Endowment Lands to name a few.
- Prepare a Class C cost estimate of the preferred option to enable the design, permitting, project-management and construction of the infrastructure proposed in the Preliminary Design.

Class C estimate ($\pm 25-40\%$): An estimate prepared with limited site information and based on probable conditions affecting the project. It represents the summation of all identifiable project elemental costs

and is used for program planning, to establish a more specific definition of client needs and to obtain preliminary project approval. Check “EGBC- Budget Guidelines for Consulting Engineering Services” document on Canvas.

- Prepare a preliminary schedule of milestones with respect to undertaking the construction and completion of the project, assuming a start-date of May 1, 2022.

It may be that there will be more than one option evaluated, so as part of the final report a recommendation on the preferred option can be provided.

4. DELIVERABLES

The following are the deliverables for CIVL 303 Module 4:

- Team submission of the draft of preliminary design report (due November 19)
- Team submission of the preliminary design report detailing the intersection redesign (due November 30)

Specific requirements relating to each of these deliverables will be announced in the course and posted on Canvas.

5. PROJECT TOOLS AND RESOURCES

5.1 Information Provided by Client

Specific information will be discussed and presented during lecture on October 27th. This is expected to include:

- Traffic count data (pedestrians & vehicles) such as traffic volumes, speeds, and pedestrian counts, including all modes of travel
- Collision data, as may be available (this is for information only, and should not be essential for completion of the project)
- Base CAD files of roads alignments

5.2 Other Information and Resources Relevant to the Project:

- [TAC Geometric Design Guide](#).
- [BC Active Transportation Design Guide](#) (2019 Edition).
- UBC Transportation Plan
https://planning.ubc.ca/sites/planning.ubc.ca/files/documents/transportation/plans/UBC-Transportation-Plan-2014_Oct.pdf
- *Synchro-Studio* software:
<https://www.trafficware.com/synchro-store.html>

The Department will provide copies of Synchro-Studio Educational Version to student teams upon request. Please direct such requests to one of the TA's at CIVL303@civil.ubc.ca . The TA will announce associated arrangements at that time.

5.3 Other Information and Resources

Students should also review the Addendum on Project Tools and Resources. This refers to the following: general software requirements and site visit arrangements.

6. ADDITIONAL NOTES

If you are contacted by the media or if you initiate contact with the media, please inform them that you are not speaking on behalf of UBC SEEDS (Sustainability Program). If you expect that your project will receive media coverage please inform Dr. Nazhat.

ADDENDUM – GENERAL TOOLS AND RESOURCES

In addition to the project-specific tools and resources that have been mentioned, more general tools and resources for the three projects are as follows.

General Computer Applications

[The following has been announced in the pre-term preparation request that has been issued.]

The coursework will be undertaken almost entirely electronically, including written submissions, calculations, drawings and presentations. Students are required to own and use a laptop computer that has the following software applications (or equivalents) installed:

- *Microsoft Office* including:
 - Word - for report writing
 - Excel – for spreadsheet calculation and programming
 - PowerPoint – for presentations
 - Outlook – for e-mail communications
- A web-browser
- 2D CAD software for design & construction documentation (e.g. *AutoCAD*)
- 3D CAD software for design explorations & presentations (e.g. *Sketchup*)
- A pdf reader
- Google Earth – for site images and measurements

SITE VISITS

The site visit forms an important component of information gathering on any project. Since the sites of this project is readily accessible, there will be no formally organized site visit. Instead, all the members of each team are required to visit the location of the project in order to understand the issues involved and take photos for documentation and for use in the reports.