

TINY TO

REIMAGINING TORONTO

PROJECT MANAGER

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Kendra Savard

Ariel Quinteros Salgado

LAND ACKNOWLEDGEMENT

We acknowledge the land we are meeting on is the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples and is now home to many diverse First Nations, Inuit, and Métis peoples. We also acknowledge that Toronto is covered by Treaty 13 with the Mississaugas of the Credit and is within the territory of the Dish With One Spoon Treaty.

AFRICAN ANCESTRAL ACKNOWLEDGEMENT

The City of Toronto acknowledges all Treaty peoples – including those who came here as settlers – as migrants either in this generation or in generations past – and those of us who came here involuntarily, particularly those brought to these lands as a result of the Trans-Atlantic Slave Trade and Slavery. We pay tribute to those ancestors of African origin and descent.



MEET THE TEAM



KYLA ROSS
Project Manager



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HANNAH DUMANCAS
Industrial Design Student



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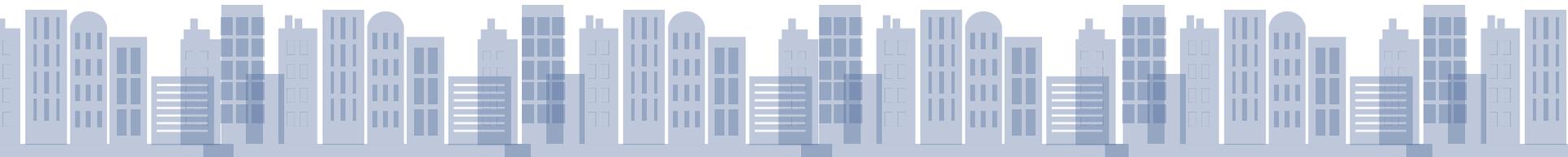
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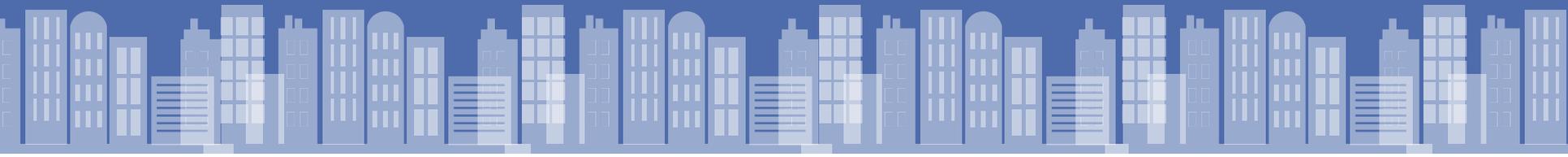
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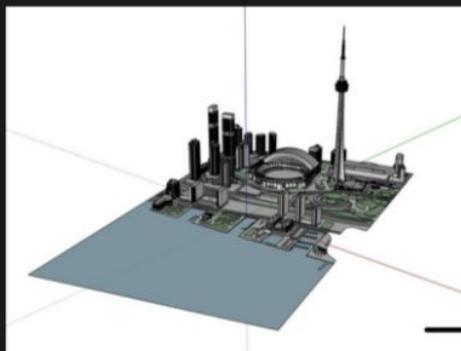
Questions?



RECAP FROM LAST YEAR



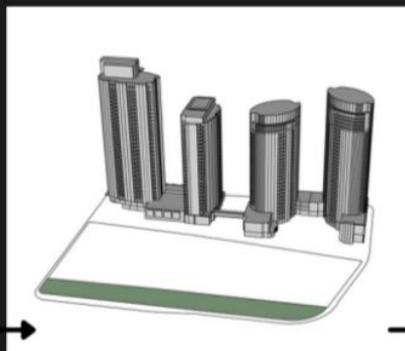
3D Massing to 3D Printing



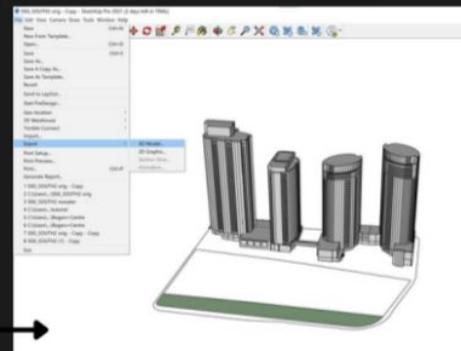
The Block from the 3D massing



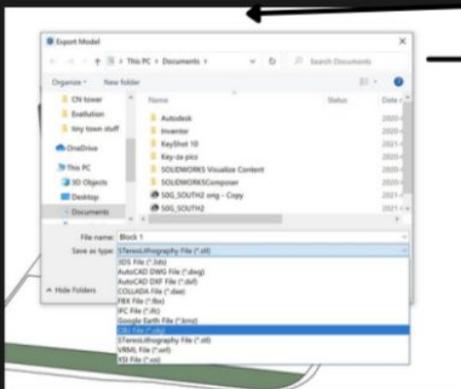
Edit the landscape



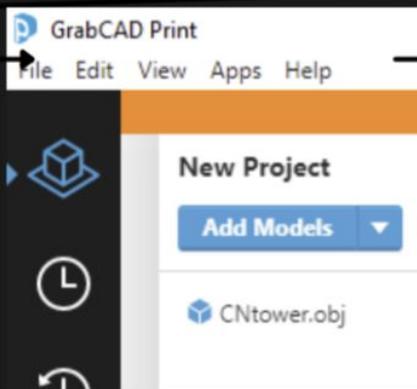
Prepare the file



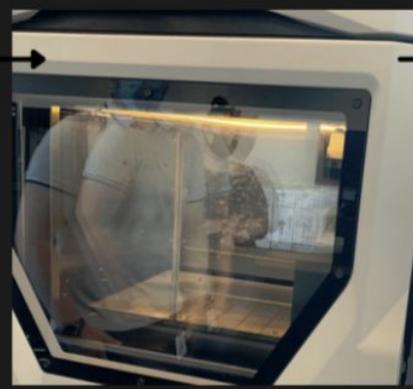
Export as a 3D model



Export as an OBJ



Importing to GrabCAD Print



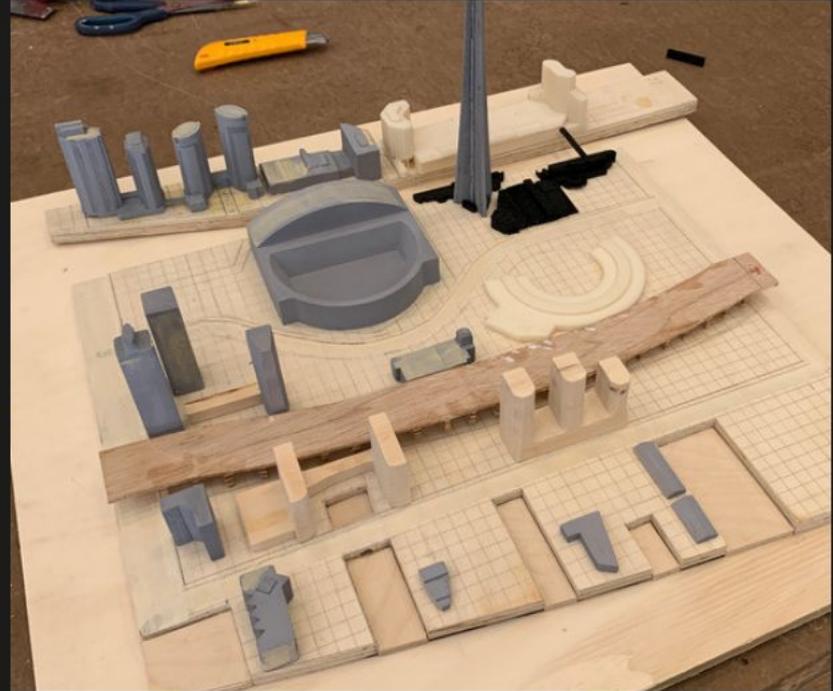
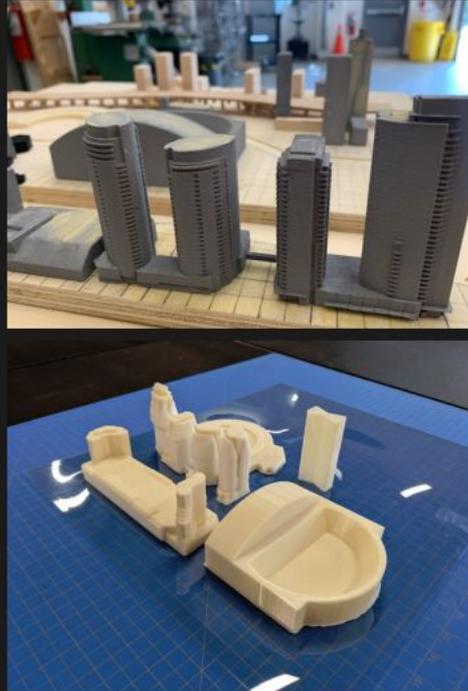
Setup 3D Printer



Extract prototype for paint and installation

The Build Process

3D Printing



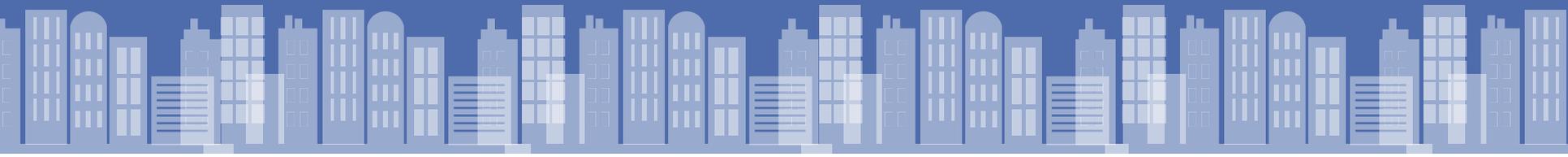
Prototype



Tactile 3D Model



WHAT TO EXPECT



PROJECT PARAMETERS

TOP PRIORITY - PHYSICAL MODEL

Model Details

- Focus on waterfront tiles **A1-A3**
- Model scale **1:1500**
- **Level of detail (LOD)** on buildings: roof detail, fenestration, roof type, setbacks
- **Neutral colour scheme** for base model
- Accommodate **AODA guidelines**
- Model base must be light and durable for **efficient transportation and easy removal for cleaning**

Recommended Materials

Acrylic
Timber
Pvc
Solid polystyrene

MEDIUM PRIORITY

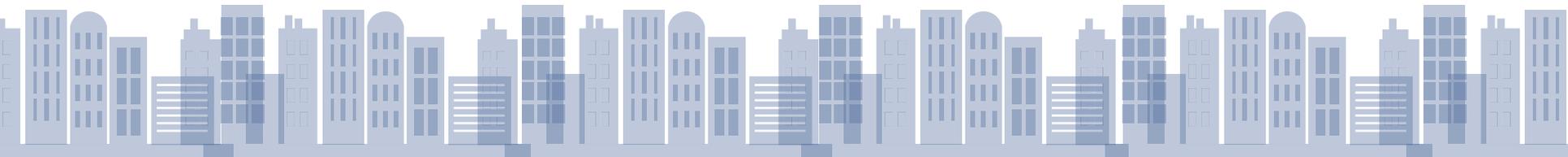
Marketing

- **Profiling partnership** between Humber and Toronto City Hall
- **Documenting progress**
- Building **social media presence**

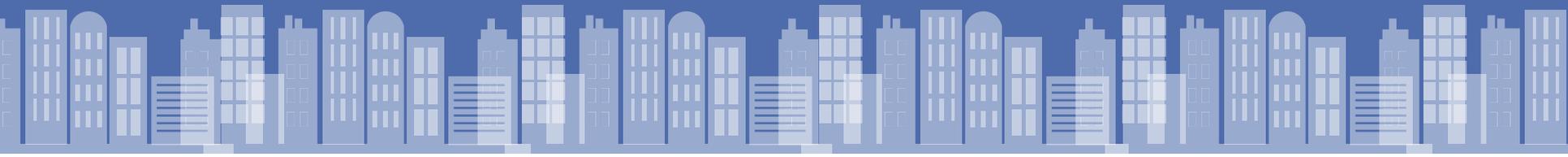
LOW PRIORITY - INTERACTIVE ADDITIONS

Augmented Reality Additions

- AR elements to **identify sites or places of interest**
- **Display and highlight models using AR** contributed from members of the public



PLANNING



TINY TO 2022

Welcome to the Tiny Town 2022 Memo Board!
Feel free to upload any images/info/memoboards
you want to share with the group!

DATE	EVENTS	NOTE
April 10	Brainstorming	
April 11	Brainstorming	
April 12	Brainstorming	
April 13	Brainstorming	
April 14	Brainstorming	
April 15	Brainstorming	
April 16	Brainstorming	
April 17	Brainstorming	
April 18	Brainstorming	
April 19	Brainstorming	
April 20	Brainstorming	
April 21	Brainstorming	
April 22	Brainstorming	
April 23	Brainstorming	
April 24	Brainstorming	
April 25	Brainstorming	
April 26	Brainstorming	
April 27	Brainstorming	
April 28	Brainstorming	
April 29	Brainstorming	
April 30	Brainstorming	

Moodboard for Design La... Meeting with City - June 13 2022

Map division 1

Week 8

Specific Buildings

Branding - initial iterati...

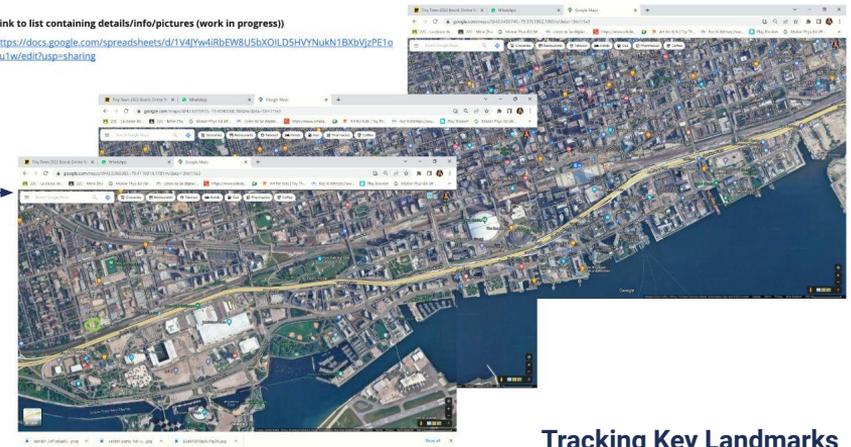
JUN 14 2022 - updat...

Approved by City Hall

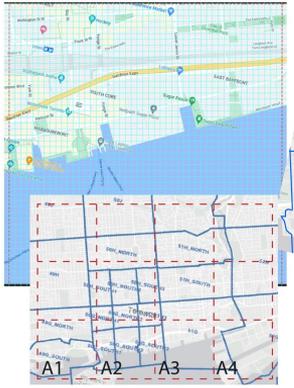
Branding - Preliminary Re...

JUN 13 2022 - Updated...

Link to list containing details/info/pictures (work in progress)
<https://docs.google.com/spreadsheets/d/1V4fw4irbEh8U5bXOILD5HYNukN1BXWjgPE1gau1wfdR2upg-sharing>



Tracking Key Landmarks

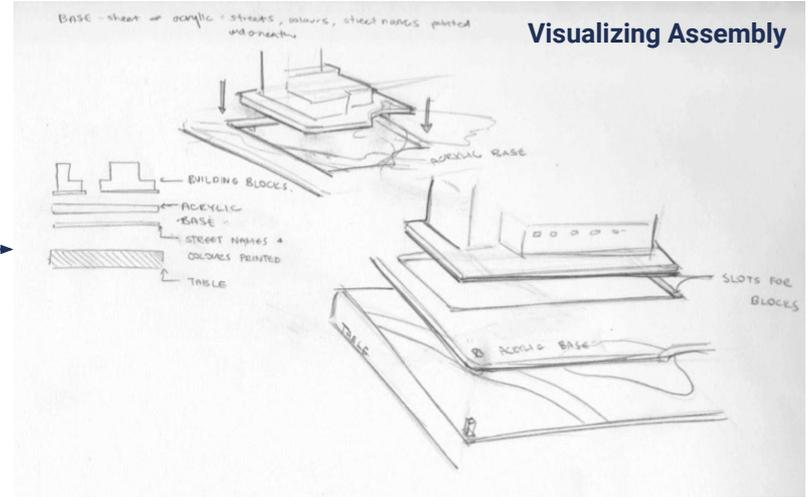


Please check what is finished and requires work.



Priority

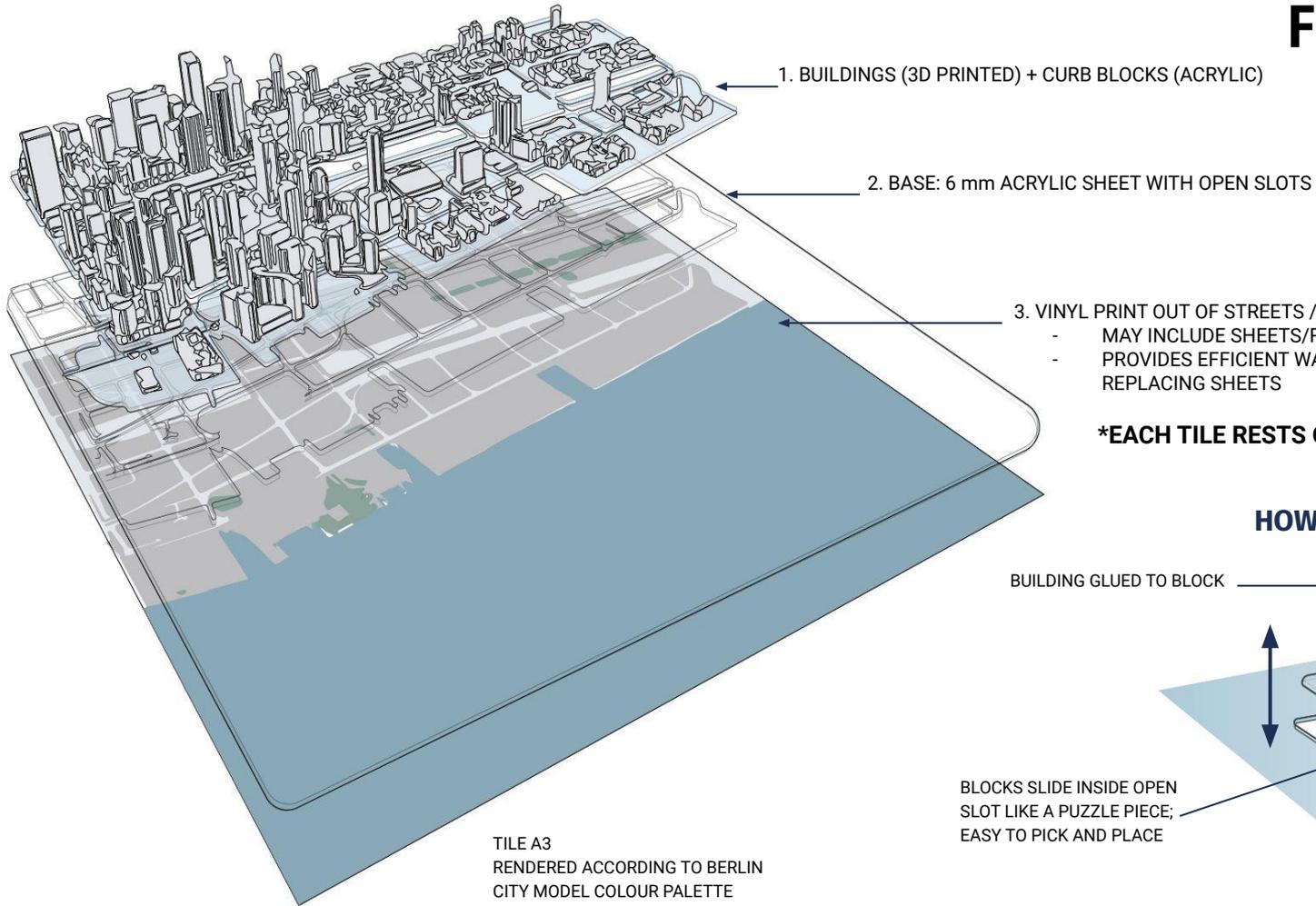
Tile A1 Dan 98%	Tile A2 Kendra 50%
Hannah 60%	
Tile A3 Mai 80%	Laser cutting map



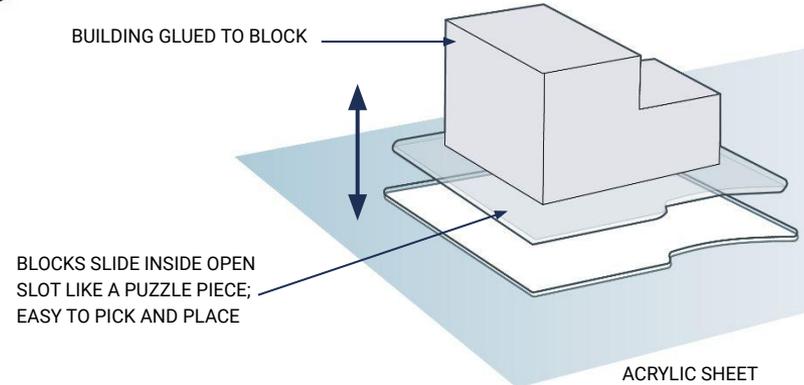
Visualizing Assembly

FINAL RENDER

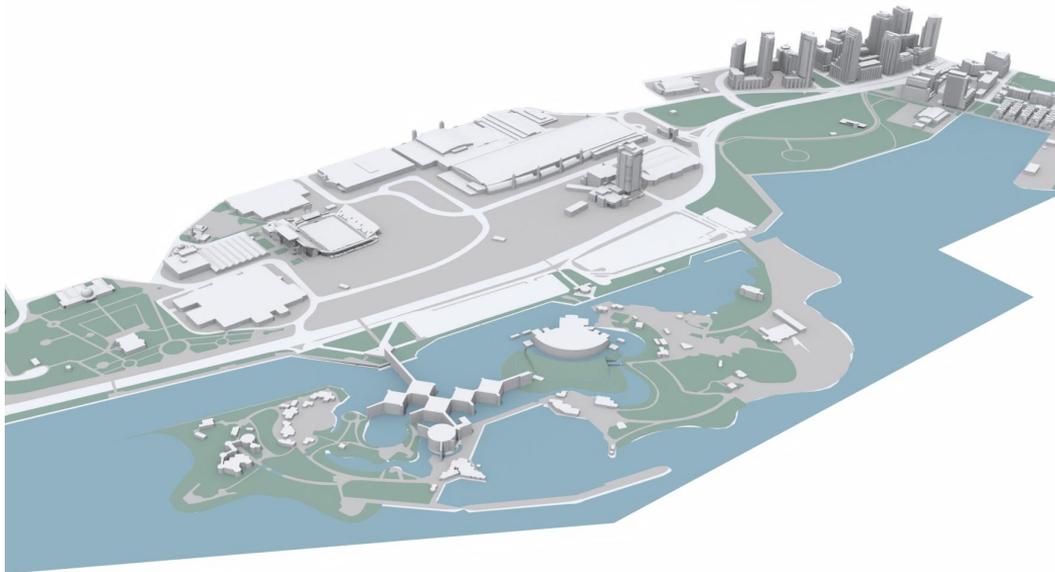
**TOP PRIORITY:
PHYSICAL MODEL**



HOW BLOCKS FITS INTO BASE



DESIGN LANGUAGE



COLOUR PALETTE

Berlin City Model

 **Park** R 138 G 163 B 154

 **Water** R 137 G 169 B 184

 **Massing** R 225 G 227 B 232

 **Road** R 227 G 230 B 235

 **Curb** R 190 G 189 B 191



TREES

Berlin City Model - Contains simple trees made from a green wooden ball attached to dowel

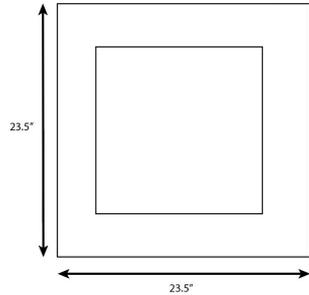
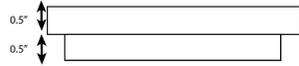
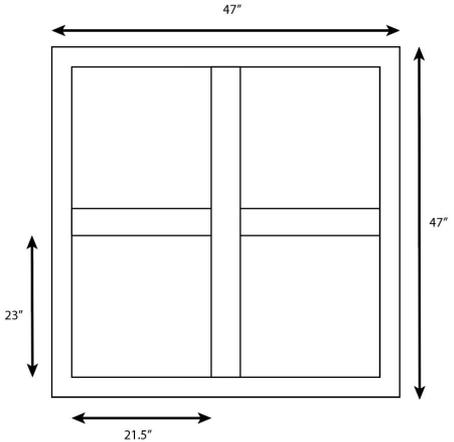
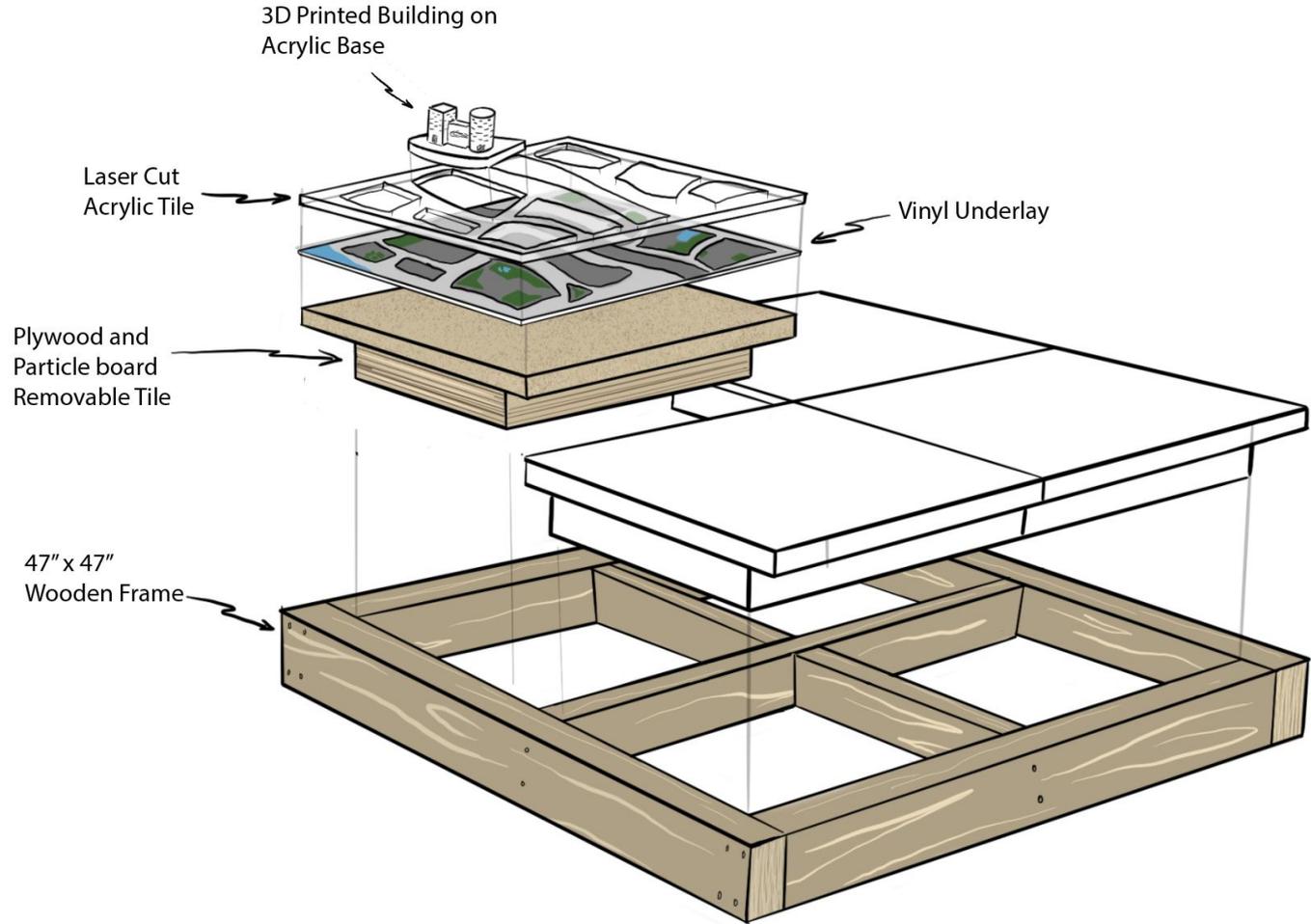
ABCDEFGHIJKLM nopqrstuvwxyz
NOPQRSTUVWXYZ 1234567890
abcdefghijklm \$?!@!#*()=

FONT

Highway Gothic

Typeface was developed to maximize legibility at a distance and at high speed

BASE DESIGN



MEDIUM PRIORITY - BRANDING AND SOCIAL MARKETING

Templates for All Platforms



Other Templates for Future Use



Landscape post: 2500 x 1396 pixels



Portrait post: 2250 x 2813 pixels



Font

Open Sans Condensed Bold

Open Sans Regular

Both accessible through Adobe Creative Cloud and free for commercial use*

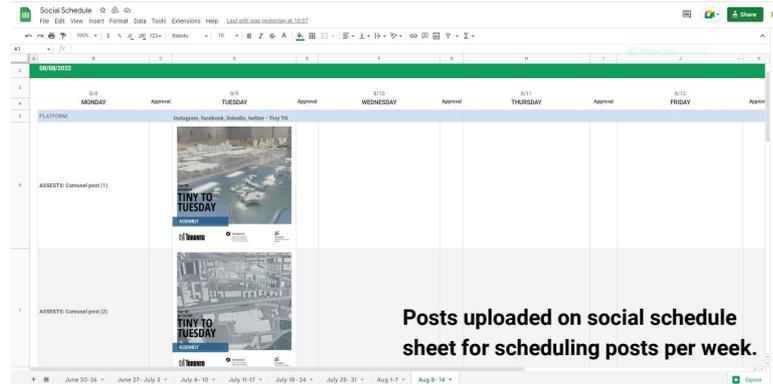
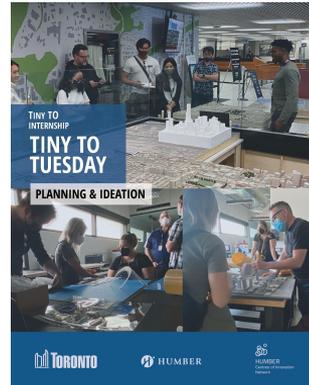
Colour Palette



Wordmark and Text - Black/White

Banner - Corporate Blue

Pantone 647 R22 G87 B136



Posts uploaded on social schedule sheet for scheduling posts per week.

LOW PRIORITY - AUGMENTED REALITY

Even though Augmented Reality (AR) was listed as low priority we thought it would be worth exploring for the following reasons:

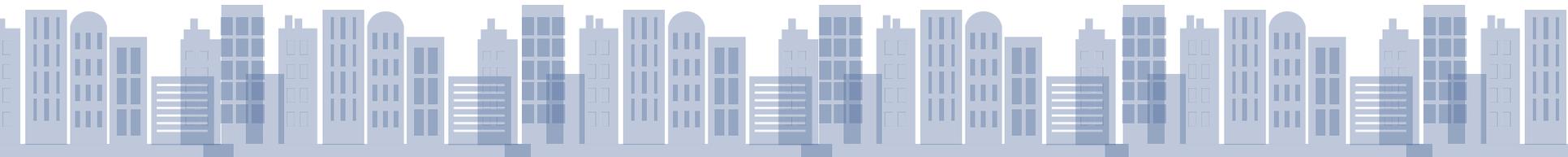
- It would provide extra information about key landmarks
- It could help visitors identify important landmarks
- It can assist with accessibility for people with disabilities (especially visual)
- Could feature proposed buildings as virtual elements
- Add an extra level of viewer engagement

The goal with this years project was to create a Minimum Viable Product to serve as proof of concept. This would demonstrate the value of the app and provide a starting point for future development.

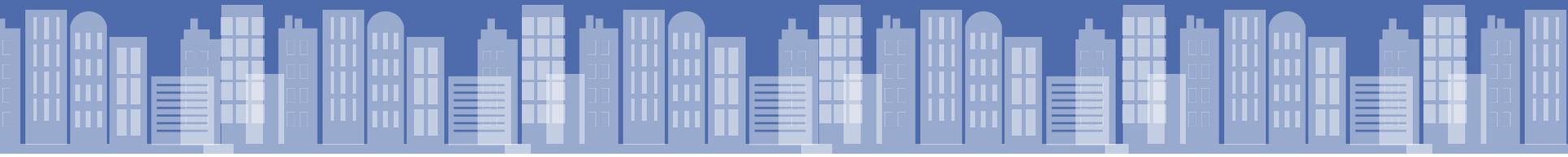
MVP features

- App must be easy to use
- App must be able to identify selected point of interest and display name of that point of interest
- App must be able to show more information about the point of interest and feature photographs
- If possible add animations to make the city come alive

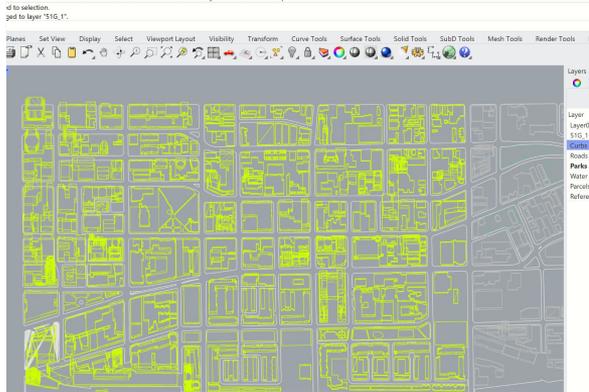
Note: App will be a prototype and will not be complete enough to be submitted to app stores



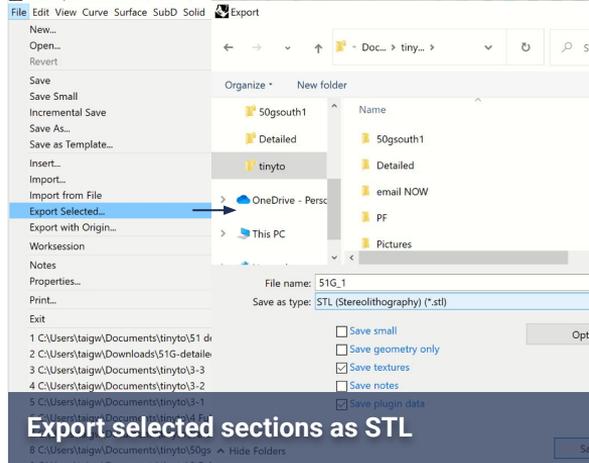
PRODUCTION



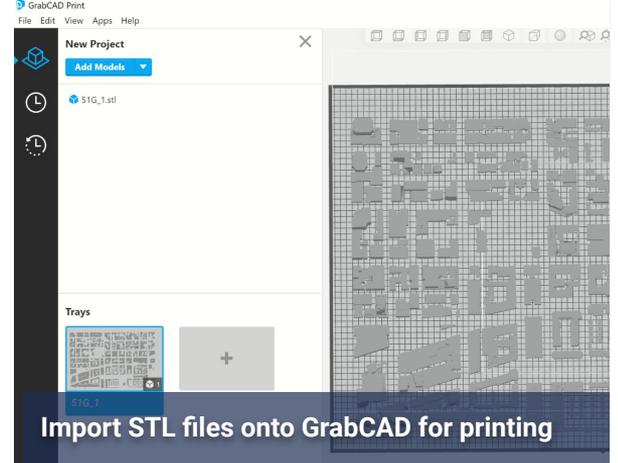
3D MASSING TO 3D PRINTING



Open city file on Rhino and Isolate sections

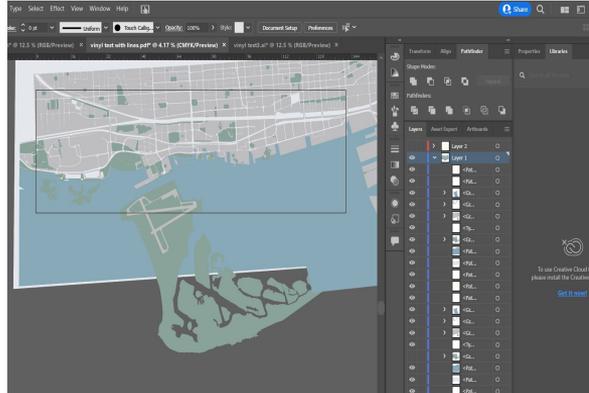


Export selected sections as STL

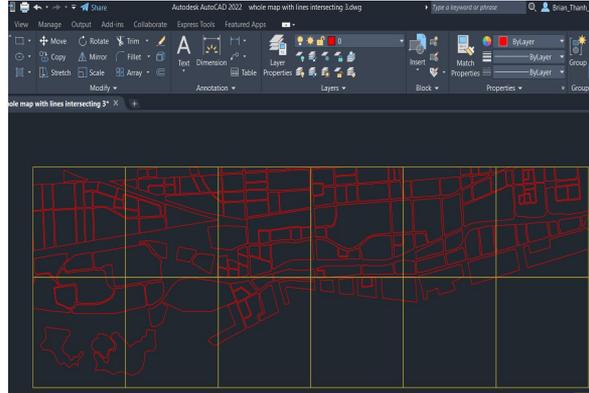


Import STL files onto GrabCAD for printing

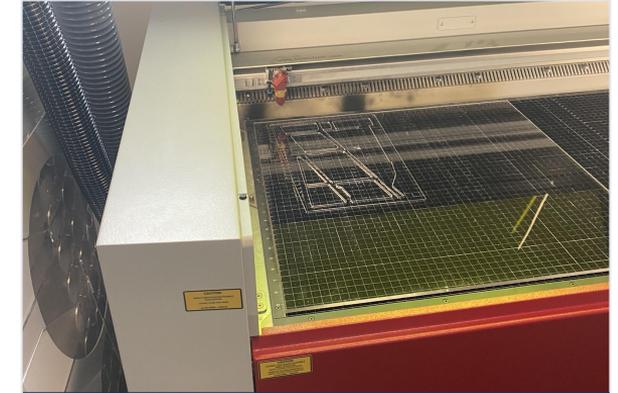
PREPARING FILES FOR LASER CUTTING



Open city files on illustrator and remove layers

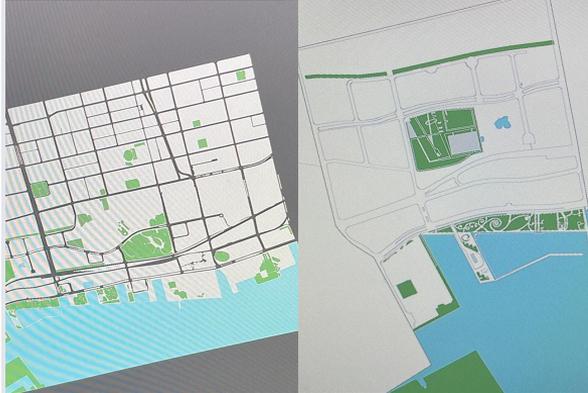


Sectional off maps to fit the laser cutter

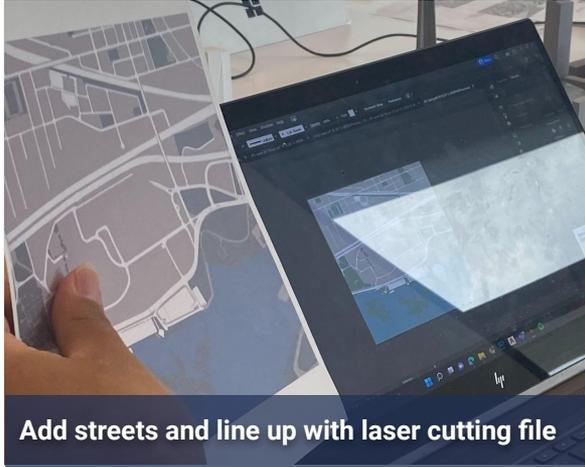


Place 6mm acrylic sheet for cutting

VINYL PRINT UNDERLAY



Open city files on Illustrator and remove layers

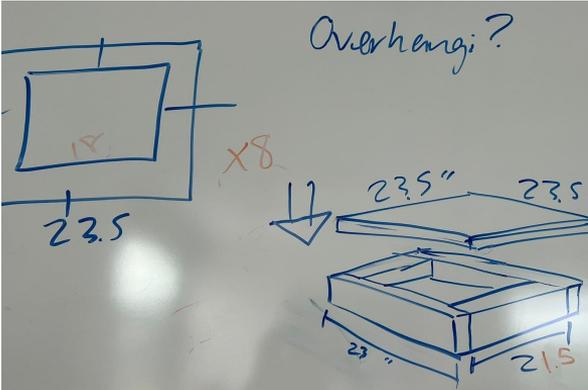


Add streets and line up with laser cutting file



Print on Vinyl with adhesive back

BASE



Ensure dimensions are correct to fit enclosure



Glue and staple 4 frames to square the tiles



Apply vinyl to plywood sections of each tile

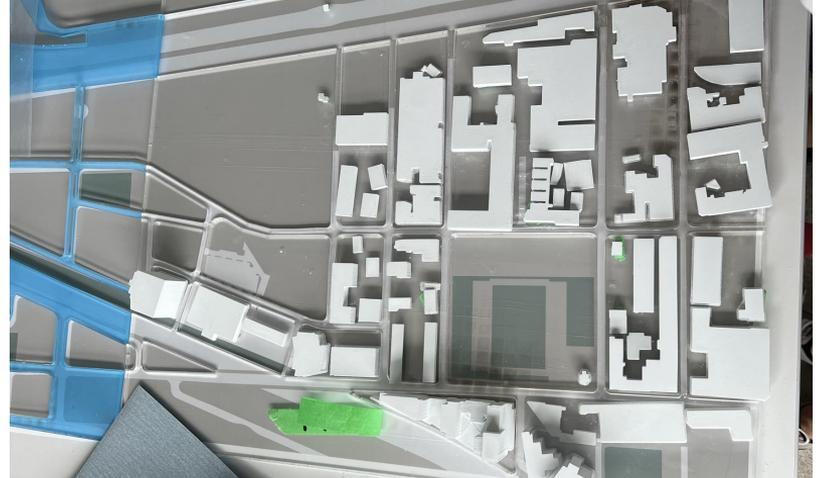
REFINEMENT & ASSEMBLY



Gluing the buildings

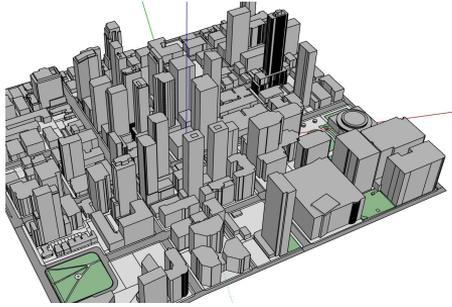


Dry fit tiles before installation



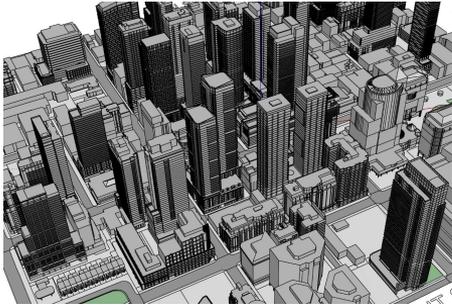
CHALLENGES & TROUBLESHOOTING

USING FILES FROM CITY DATA FOR 3D PRINTING

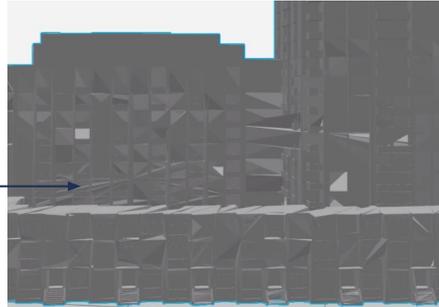


*Sketchup files were used from City Data

Files with **simplified buildings** work best for 3D printing. Requires minimal touch-ups due to lack of detail.

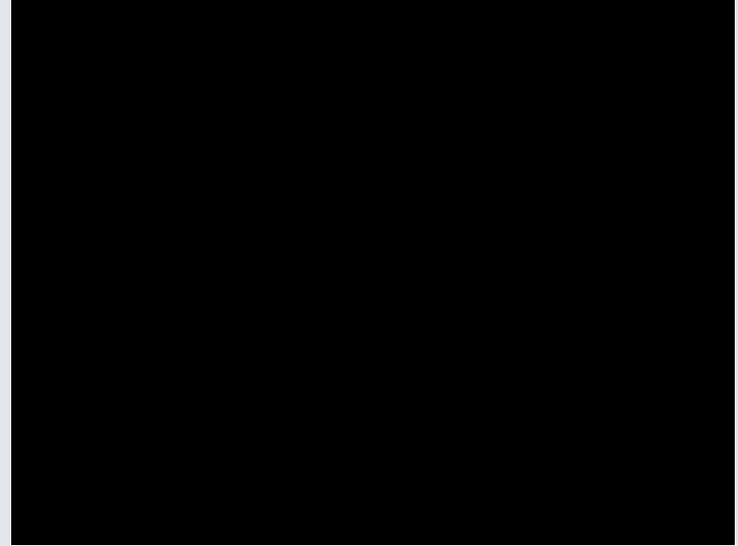


Files of **detailed buildings** require most repairing and takes the most time to fix.



Irregularities occur when trying to repair these files into GrabCAD, making them **difficult to slice and print**

CURRENT SOLUTION

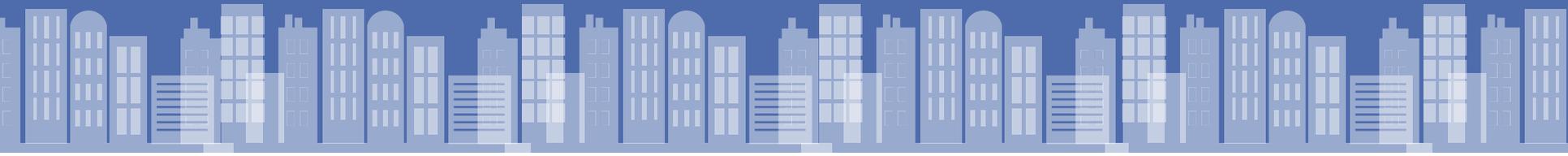


https://drive.google.com/file/d/1JU9T05xbZr859le-84p8uzZEB_p7DWHj/view?usp=sharing

Filling Model Gaps

1. Isolate building that needs fixing
2. Import onto **PrusaSlicer** to repair
3. Export as STL
4. Fill in extra gaps manually using **Solidworks** if needed

FINAL MODEL





CLEANING THE OLD MODEL

The model was first vacuumed to remove dust then each building was wiped down with a cloth containing an alcohol/water mixture.

Meanwhile the new tile for A1 was assembled and placed next to the old model for display.



Before Cleaning

Cleaning Process

After Cleaning with New Tile



Preparation



Assembly



Placed in Exhibition





3D PRINTING

Bill of Materials

- 795 cubic inches of ASA White Filament
- 10 acrylic sheets

Time Spent

Editing Files: 4 weeks

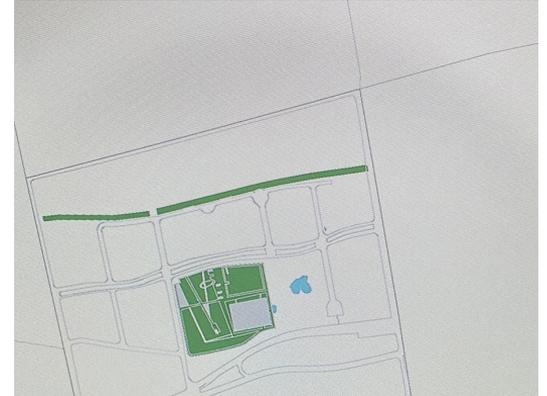
Printing: 4 weeks

Sanding: 2 weeks

Gluing: 1 week

Assembly: 1 week

Total Time: 12 weeks





LASER CUTTING

Bill of Materials

- 12 - 23.50" x 35.50" of 6mm Acrylic Sheets

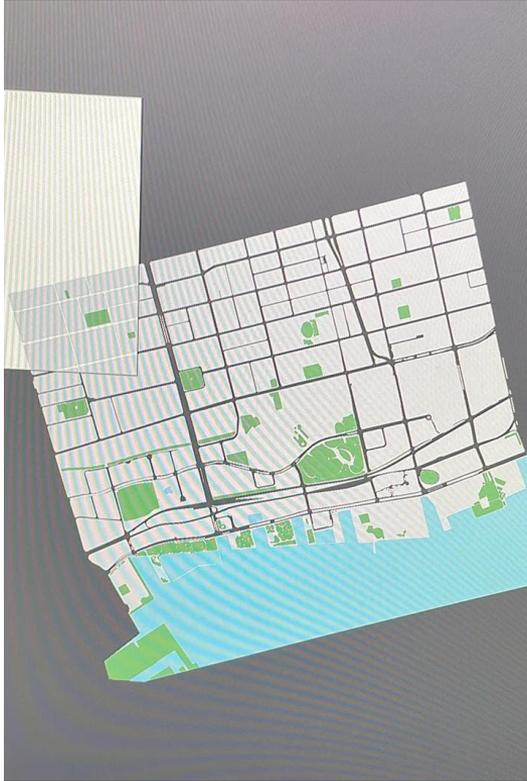
Time Spent

Editing Files: 27 hours

Cut Time: 8 hours

Total Time: 35 hours





MAP PATTERNS

Bill of Materials

- 3 - 47" x 47" adhesive vinyl sheets
- Large sheets cut into 12 smaller tiles

Time Spent

Editing Files: 10 hours

Print Time: 4 hours

Cut Time: 1 hour

Total Time: 15 hours



AUGMENTED REALITY

The original concept provided last year featured AR that used object recognition. The app would identify points of interest by recognizing the actual 3d printed building. We prototyped object recognition but quickly discovered that if the building was obscured in anyway the tracking would fail. We moved to plan B using tracking markers. Tracking markers are reliable and robust but require there to be a marker on the tile. We decided to use a city of Toronto logo with a QR code as the marker. This would serve a dual purpose of acting as a tracker and providing a link to download the app.

The app is built using the following technologies:

- Unity - A game development platform that is widely used
- Vuforia Engine - A framework that easily allows AR integration

Unity makes it easy to publish native apps to both platforms from one codebase. It is the perfect tool for rapid development.



Example tracking marker



AUGMENTED REALITY APPROVED UI

Splash screen



Onboarding 1



Onboarding 2



Onboarding 3



Active screen



Building detail screen



AUGMENTED REALITY DEMO

Our goal was to get a polished MVP prototype for the end of this engagement. Unfortunately There was some basic functionality that we were unable to complete. One of the biggest holdups was the delays in completion of the A2 tile

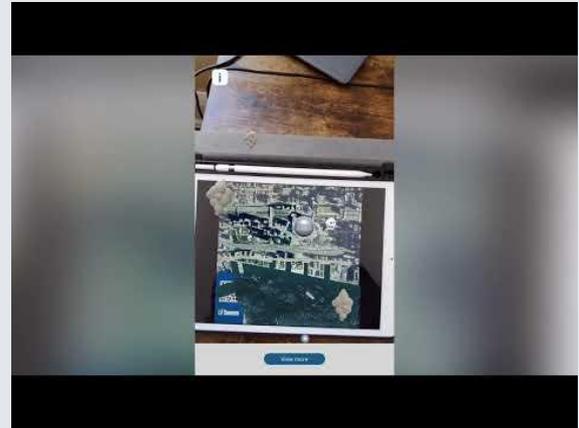
Missing in this demo:

- The app does not work on the finished model yet
- Full UI has not been implemented

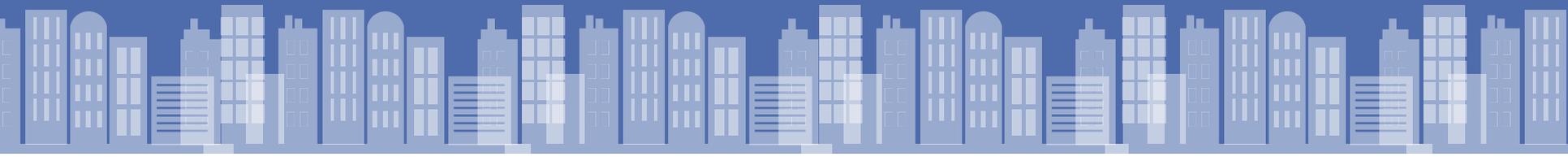
With this being said all the under the hood work has been completed and it should be a simple matter to add the missing functionality before the end of the year.

What is included in this demo

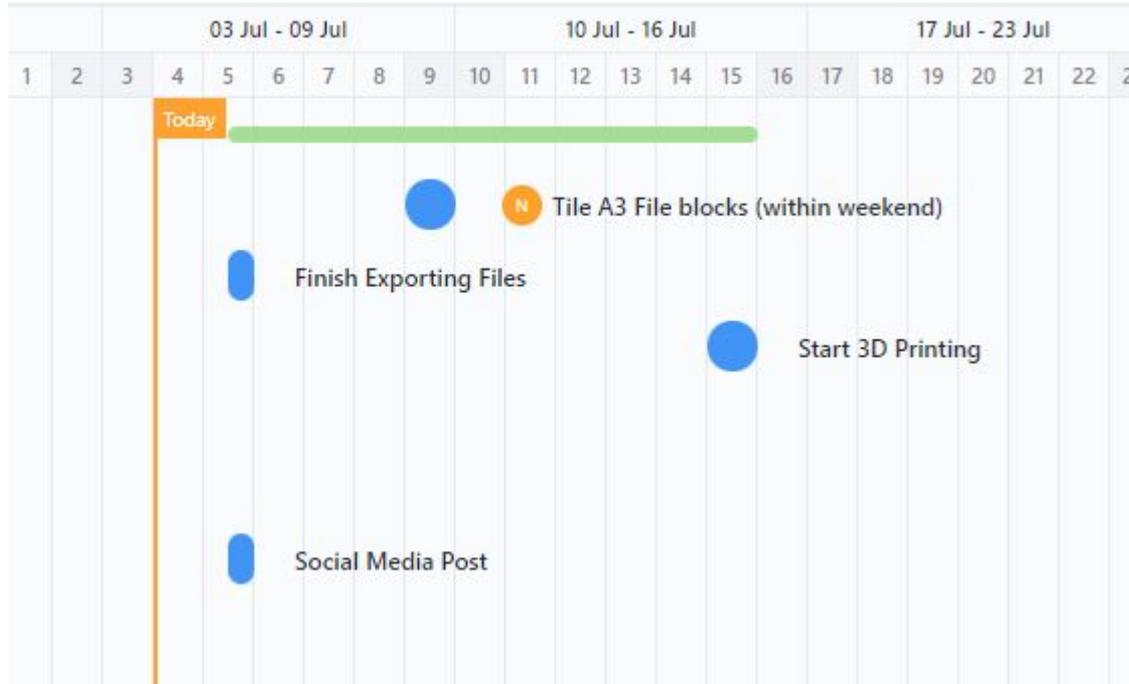
- App can identify building locations
- App can display supplemental information about those locations
- Features animated water and clouds



MOVING FORWARD



MOVING FORWARD - Short term



Tile A1 is now complete and installed.

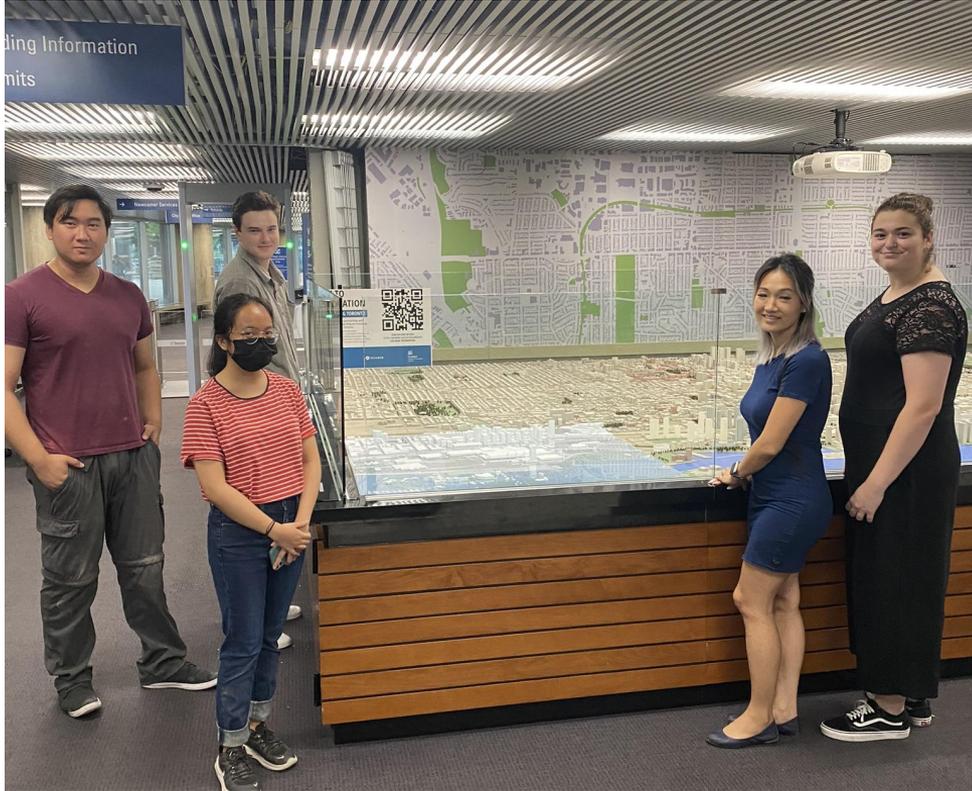
Installing tiles **A2 & A3** will be our **main priority** in the coming weeks.

Details such as trees and raised highways to be added.

A short documentary film will be produced using footage and interviews filmed over the course of this summer.

3D printing files on open source website (with credit to Humber TinyTO interns)

MOVING FORWARD - Long term



- Framework for completing remaining 9 tiles is now in place
- Work plan and process established.
- Production of remaining tiles will be done incrementally via a combination of curriculum embed work and focused work study.
- New challenges to explore in coming phases such as changes in elevation in future tiles

MOVING FORWARD

AUGMENTED REALITY

The base app that has been created is ready for continued development. By using Unity and Vuforia we have selected development tools that are easy for beginning and intermediate developers to use. The source is on GitHub.

Next steps in developing the app:

- Add approved UX
- Set up tracking on physical model
- Add more points of interest
- Add haptics for accessibility
- Add voiceover for accessibility
- Select images owned by city
- Submit to App Store, Google Play



FUTURE CREATIVE OPPORTUNITIES

- Wall space around model - Graphic Design
- Table frame - Interior design / industrial design
- Projection mapping
- Video projection on wall
- Expanding AR interaction to include information such as heritage buildings and approved new developments.



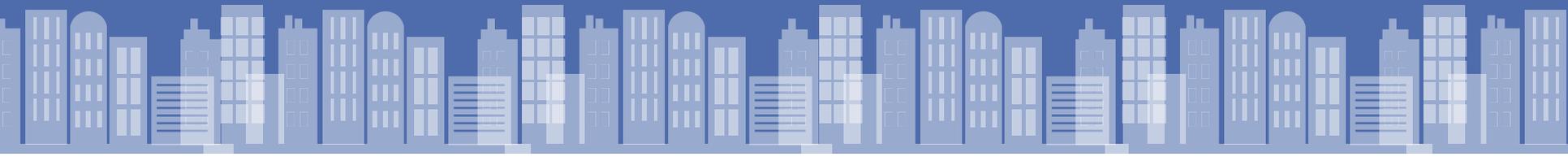
CONCLUSION

Special Thanks to:

The City of Toronto, City Planning Office

The Humber Barrett Centre for Technology Innovation

Anxhelo Mecollari & Anthony Nyman (BCTI Technologists)





THANK YOU FOR LISTENING
We appreciate any questions or feedback.