High-Quality 3D Representation of Toronto Waterfront

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Purpose and Context

- Theme 3: Visualization Support



Main Goal

- Develop a high-quality 3D representation of Toronto Waterfront using ESRI's CityEngine software that can be used as a visual analytics testbed within the broader iCity project

- >>> Find and import geometry and geodata into CityEngine for procedural modelling
- >>> Identify gaps in data

CityEngine and Procedural Modelling













Development Process

Streets

Geometry + Texturing Gardiner Exp. Queen's Quay

Buildings Extrusion vs. Massing Texturing

Detail Work Street Furniture Trees

Data Visualization Student Move ArcGIS DataVis

Development Process - Streets

- Toronto Open Data .shp
- Attributes (i.e., street names)
- No street widths/heights



Development Process – Street Geometry

ESRI Satellite imagery



Community Maps



Pre-modelled street network



modelled street network



Development Process – Street Textures

Imagery





Google Maps + Streetview

Default Textures

Corrected Textures



Shapes (3)	Termanchy Scog	
∧ Rules		
Rule File 7	Complete Street Rule/rule Assign	
Start Rule ?	Select	
Complete Street	Default Style •	J.
DISPLAY OPTIONS		
Display_Textures	true	
Display_Thematics	Thematics Off	1
Solid_Color	#FFFFFF -	1
Space_Management	Best Fit •	
LOD_Setting	Moderate •	
ROAD LAYOUT		
Basic Components		
Lane_Distribution	0.5 -	
Lane_Width	3.3 -	
Centerline_Color	yellow •]
Traffic_Direction	right-hand 🔻	
Speed_Limit_in_MPH	35 -	
Stop Markings		
Stop_Begin	arrows for right turn]
Stop_End	line only	
Crosswalk Markings		
Crosswalk_Begin	continental •	l
Crosswalk_End	continental •	J
Begin_Crosswalk_To	Stop_E 2.4	
End_Crosswalk_To_S	top_Ba 2.4 •	
Crosswalk_Color	white •	Į
Custom_Crosswalk_1	Texture Irick Red Basket Weave.jpg 👻	
Crosswalk_Width	2.05	
On-Street Parking		
Right_Parking_Type	None	Į
Right_Parking_Width	• •	
Right_Parking_Lengt	h 0 •	
Left_Parking_Type	None	Į
Left_Parking_Width	•	
Left_Parking_Length	•	
Parklet_Percentage	• •	

Complete Streets Rule

Development Process – Queen's Quay

Google Map

ESRI Imagery







On-site photos







Development Process – Gardiner



Development Process – Gardiner



Development Process – Gardiner













Development Process – Buildings

3D massing

Footprint Extrusions





Building Textures - 3D massing



Building Textures - Extrusions







Development Process – Terrain









Development Process – Data Vis

Student MoveTO





Thank You

Iononto