Using 3D GIS to Facilitate Intersection Design

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Why Use 3D

• See data in its true perspective
• Make better decisions
• Communicate ideas more effectively and efficiently
Workflow

• Build Intersection with Vehicles in CityEngine
• Import Intersection with Vehicles from CityEngine to ArcGIS Pro
• Do sight analysis in ArcGIS Pro
Intersection Selection

- Signalized Intersection with permissive left turn
- Crashes related to northbound left-turn vehicles
- Sight of northbound left-turn vehicle was blocked by southbound left-turn vehicles
Intersection in CityEngine
Rules in CityEngine
Intersection Imported in ArcGIS Pro
(Facing North)
Sight Analysis

• Observer Vehicles (Northbound Left-turn)
  – Position 1
  – Position 2
  – Position 3

• Obstacle Vehicles (Southbound Left-turn)

• Analyzed Vehicles (Southbound Through)

• Use the following 3D Analysis tools
  – Skyline
  – Skyline Barrier
Observer Vehicle
(Northbound Through)
Observer Vehicle at 3 Positions
Analyzed Vehicles (Looking North)
(Southbound Through)
Analyzed Vehicles (Looking South)
(Southbound Through)
Obstacle Vehicles
Enclosed Obstacle Vehicles
Vehicle at Position 1
(Facing North)
Vehicle at Position 2
(Facing North)
Vehicle at Position 3
(Facing North)
Vehicle at Position 1
(Facing South)
Vehicle at Position 2
(Facing South)
Vehicle at Position 3
(Facing South)
Analysis Results

• Some southbound though vehicles are blocked by southbound left-turn vehicles for all 3 observer vehicle positions.

• Those vehicles are near the intersection. If their speed are higher than speed limit, crash may occur.

• Results can be used as a guidance to mitigate the crashes occur in the intersection.
Questions