



# SCENARIO AND VISUALIZATION (SAVI) TOOLS FOR COMMUNITY PLANNING

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[www.metrocouncil.org/planning/COO/](http://www.metrocouncil.org/planning/COO/)

# WORKING TOGETHER TO SHAPE FUTURE TRANSITWAY DEVELOPMENT



## Corridor TOD Planning Sites

- Southwest LRT
- Bottineau Blvd Corridor
- Gateway East Corridor
- Cedar Avenue BRT
- Northstar Commuter Rail
- Total: \$1.4 M



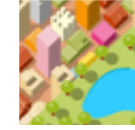
## Central Corridor Demonstration

- Workforce Development
- Alternative Energy Systems
- Stormwater and Green Infrastructure
- Total: \$740 K



## Overarching Strategies and Analyses

- Community Outreach & Engagement
- **Scenario And Visualization Tools**
- Data and Evaluation
- Convene Collaborating Partners
- Local Implementation Capacity
- Regional Sustainable Development
- Total: \$2.1 M

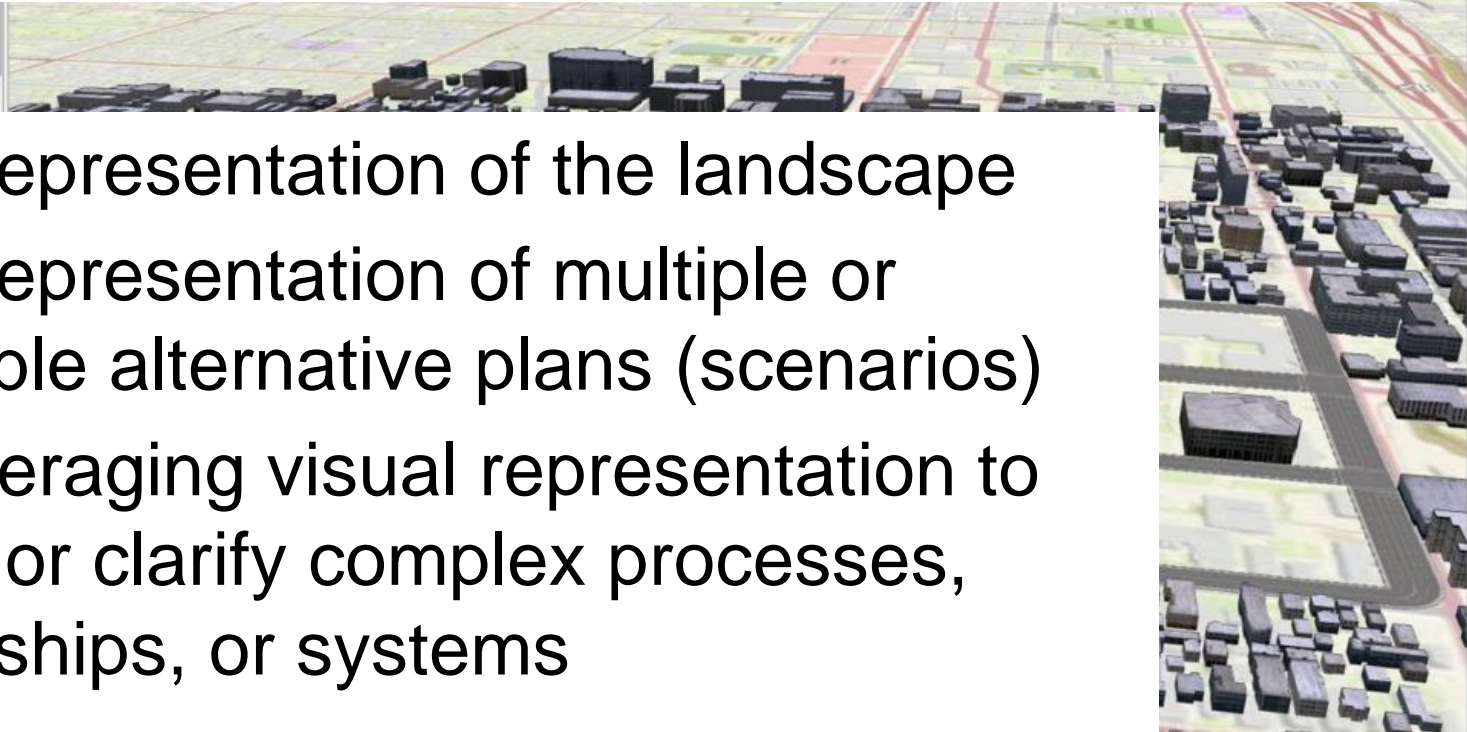


## Technical Studies and Policy Tools

- Research Jobs-Housing Balance
- Program of Projects
- Further Fair Housing
- HousingLink Enhancement
- Location-Efficient Mortgages
- Total: \$360K

# WHAT DO WE MEAN: *VISUALIZATION*?

- Visual representation of the landscape
- Visual representation of multiple or modifiable alternative plans (scenarios)
- And leveraging visual representation to explain or clarify complex processes, relationships, or systems



# 1. VISUAL REPRESENTATION



*Source: Central Corridor Resource Center*



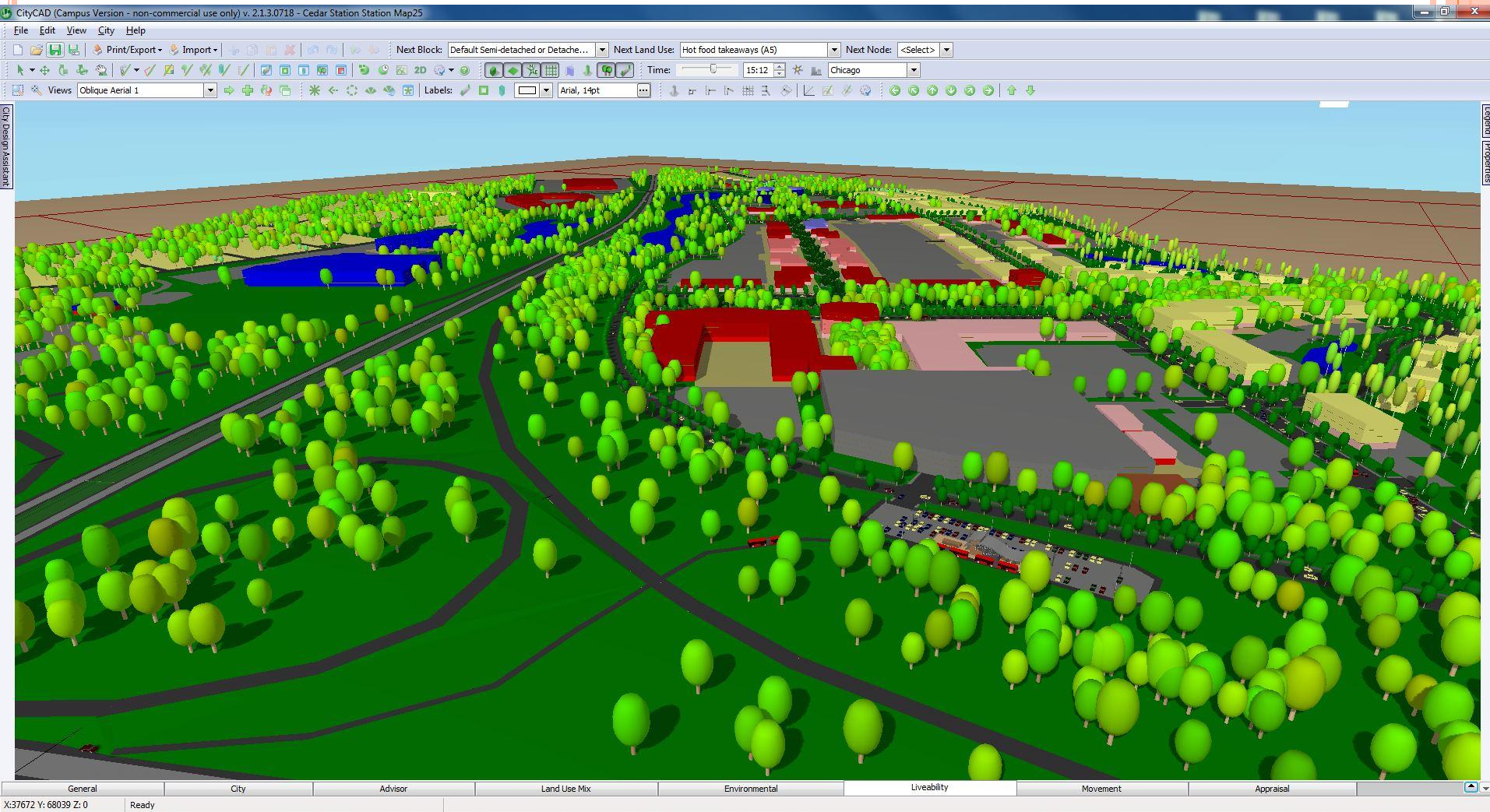
## 2. VIRTUAL, ANIMATED VISUALIZATION



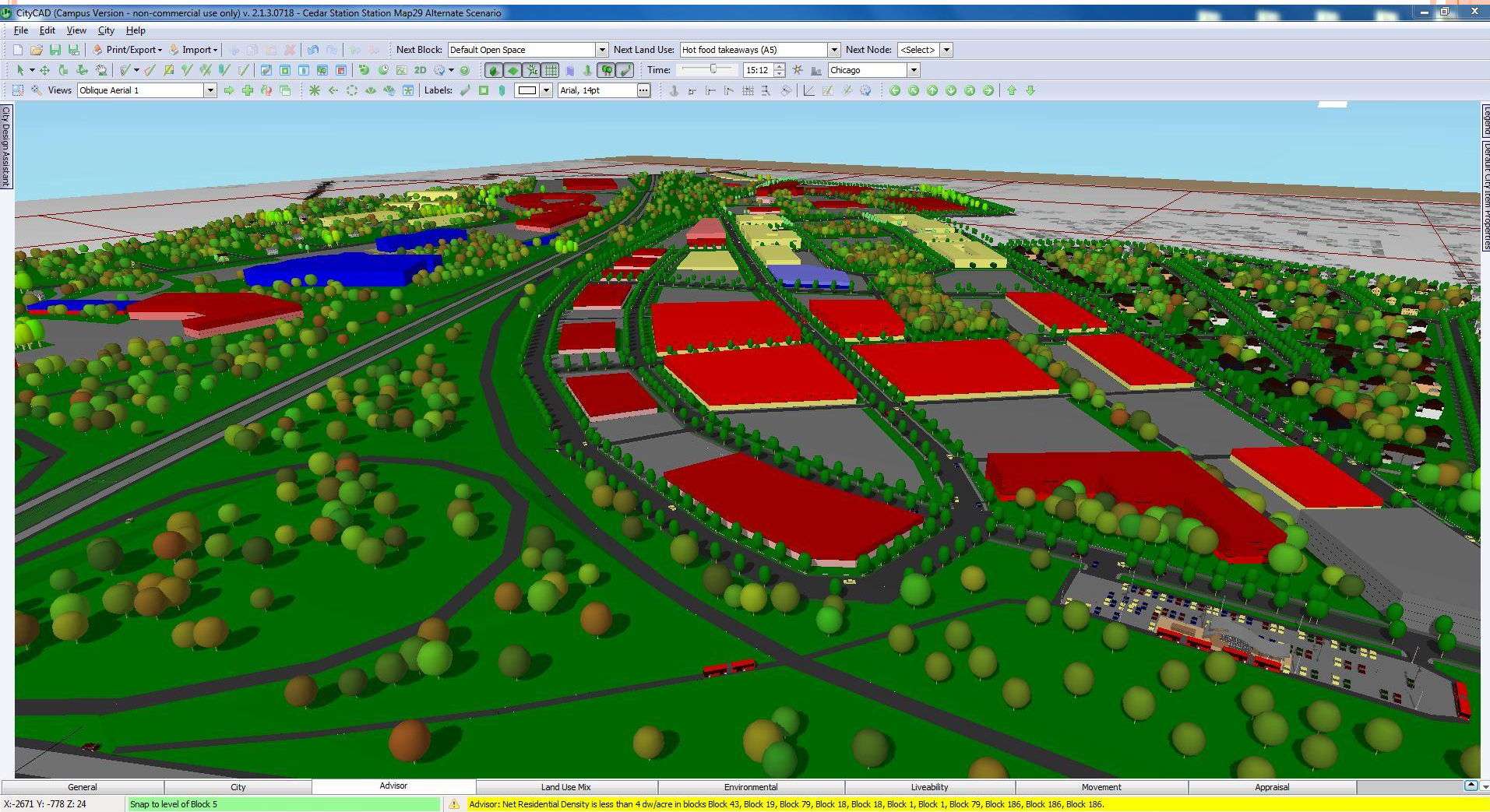
<http://redrockrail.org/station-planning/cottage-grove>



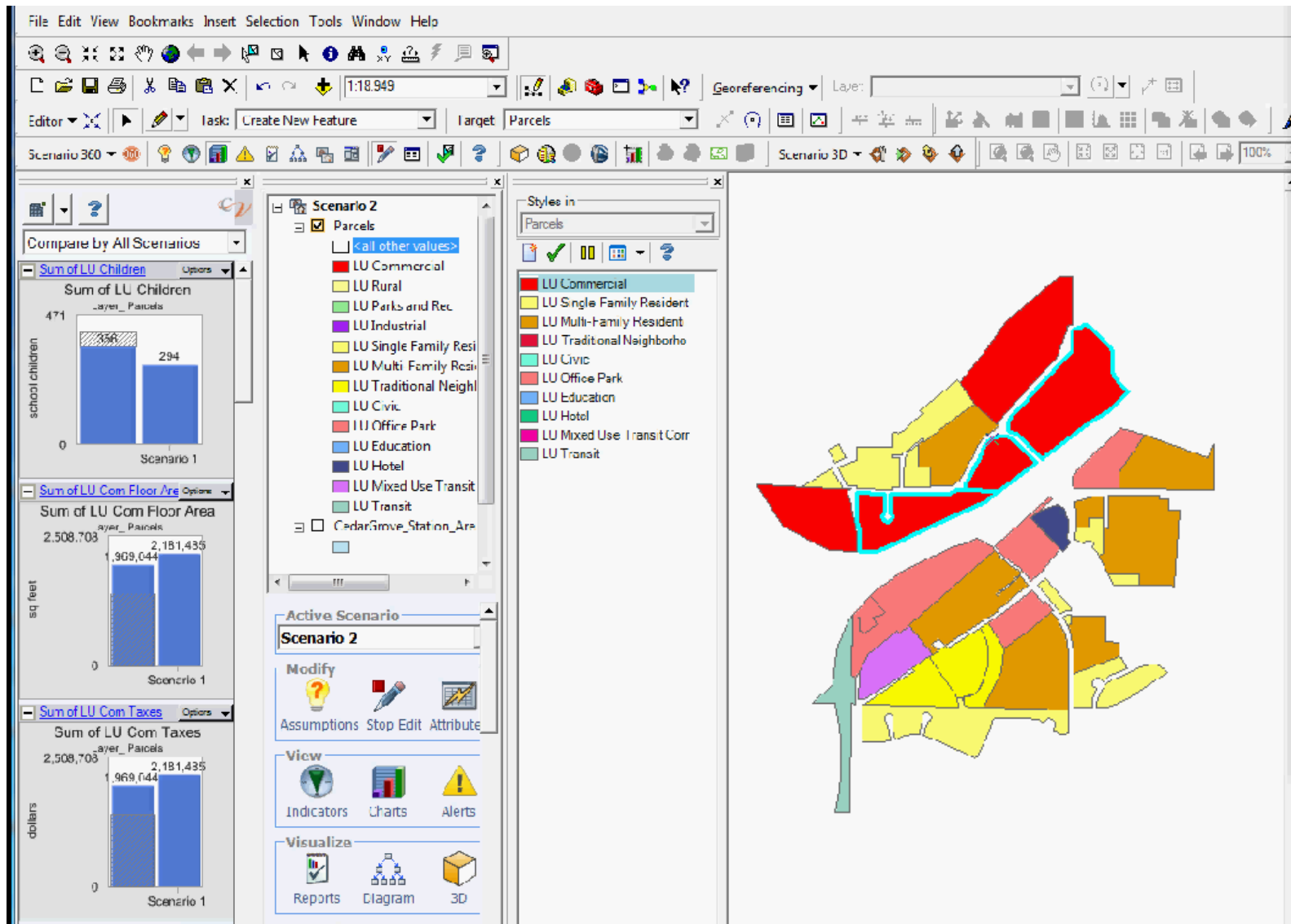
# 3. MULTIPLE AND MODIFIABLE URBAN LANDSCAPE SCENARIOS



# 3. MULTIPLE AND MODIFIABLE URBAN LANDSCAPE SCENARIOS



# 4. OUTCOMES “SCOREBOARDS” FOR EVALUATING SCENARIOS



# WHAT? AND FOR WHOM?

- The Scenario And Visualization (SAVi) Tools project will **equip and prepare transit corridor initiatives to better use planning support systems technology.**
- Tools, training and technical support will be provided to planners, community leaders, and others who will apply scenario articulation and visualization in community settings.
- The tools chosen will be effective for use in community settings, and have potential for broad adoption and use.



# LESSONS FROM STUDIES OF VISUALIZATION USE IN PUBLIC PARTICIPATION

- Best practice:
  - Interactive participatory process
  - Holistic future scenarios
  - with credible, engaging scenario visualizations
  - incorporating local knowledge, data, mapping
- Results from groups convened by Sheppard *et al* (2011):
  - High level of engagement
  - High perceived credibility
  - Future scenarios are well understood

Source: Sheppard et al (2011)

[www.calp.forestry.ubc.ca/publications/](http://www.calp.forestry.ubc.ca/publications/)



# WORKPLAN (SPRING 2011 VERSION)

1. Clarifying the need – the *intended applications* of tools
  - Discussing and listening (Spring-Summer 2011)
  - Met Council & U of M evaluation study (Summer 2011)
2. Building on #1, recommendation of preferred tools
3. Overcoming start-up and steep learning curve **and** offering user support
  - Developing a user community – drawn from fields of planning, urban design, GIS (2012+)
  - A service bureau contract
4. 3D model-building and spatial data needs
5. Improving public participation experiences
  - Working with the 5 corridor planning groups



# CHALLENGES AHEAD

- Are current technologies really viable for live use in public meeting settings?
- Who realistically are users of the technology?
- Are there greater demand and value if the applied use and intent are framed differently?



# WHAT ARE THE RIGHT TOOLS FOR THE JOB?

- First challenges:
  - Clarifying the need, the applied use.
  - Identifying the right technologies.
- What technologies are most usable and applicable to the questions that arise in TOD design and planning?
- **We needed more information – so Met Council and University of Minnesota collaborated in testing and evaluating scenario and viz tools.**



# FINDINGS FROM FOCUS GROUPS

- Participants believe viz can improve understanding of plans and center discussion
- Agreement on technology selection criteria



# CRITERIA FOR EVALUATION

1. Design exploration capabilities
2. Visualization capabilities
3. “Scoreboard” for performance measures and scenario evaluation
4. Usability and viability for the technician
5. Usefulness and benefit for broad audience



# PRELIMINARY COMPARISON OF SYSTEMS

	<b>CityCAD</b>	<b>Community Viz</b>	<b>Envision Tomorrow</b>	<b>SketchUp</b>
<b>Design exploration</b>	<i>Moderate or High</i>	<i>Moderate (focused on land plan)</i>	<i>Moderate (focused on land plan)</i>	<i>High</i>
<b>Visualization</b>	<i>Moderate</i>	<i>Moderate</i>	<b>None</b>	<i>High</i>
<b>“Scoreboard” for performance measures</b>	<i>Moderate</i>	<i>High</i>	<i>High</i>	<b>None</b>
<b>Usability and applicability</b>	<i>Moderate (lacks GIS) or High</i>	<i>High</i>	<i>High</i>	<i>High</i>

# FINDINGS FROM FOCUS GROUPS

- Participants believe viz improves understanding of plans and centers discussion
- Agreement on technology selection criteria
- **Skeptical** that urban design exploration can or should be done in public workshops
- Demonstrated technologies were all considered **insufficient** to produce photorealistic viz
- Landscape and site viz matter, not the tools (the ends, not the means)
- No demand from community representatives for hands-on access to viz technologies



# WHAT PLANNERS THINK...

- “How can this investment by HUD best complement TOD planning processes?”
- Planners more interested in technologies for data management, analysis, and viz of planimetric data and infrastructure plans
- Find tools that better address our business needs and that allow viz to inform public
- Planners can imagine greater use – ***if provided*** with technology support

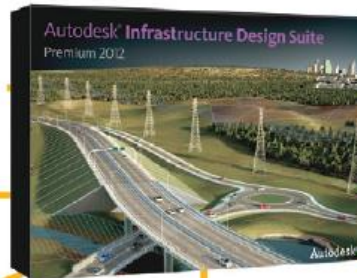


# TECHNOLOGY “SCAN” OF PLANNING SUPPORT, SCENARIO AND VISUALIZATION TOOLS

- Planning and designing in a **CAD** environment
  - **SketchUp.** Building-level design and viz
  - **CityCAD.** Simple design and neighborhood-level planning
- Plan scenarios in **GIS**, combined with outcomes and impacts measures
  - **EnvisionTomorrow.** “Paint palette” planning, urban metrics in an Excel workbook
  - **CommunityViz.** “Paint palette” planning, urban metrics, and 3D visualization



# TECHNOLOGY “SCAN” OF PLANNING SUPPORT, SCENARIO AND VISUALIZATION TOOLS



## PLAN

Access and integrate CAD and GIS data for analysis and more informed decision making.



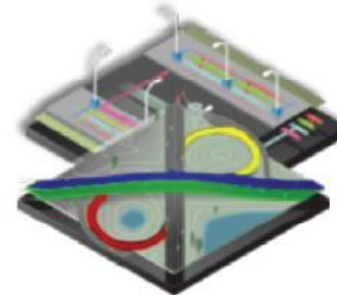
## DESIGN & DOCUMENT

Explore more design options, analyze project performance, and deliver more coordinated documentation.



## VALIDATE & VISUALIZE

Create near-photorealistic renderings to help validate designs, communicate design intent and create compelling presentations.



## COORDINATE

Integrate models from multiple sources for project review as well as navigation and construction sequencing.



## MANAGE

Maintain infrastructure information more dependably with intelligent industry models.

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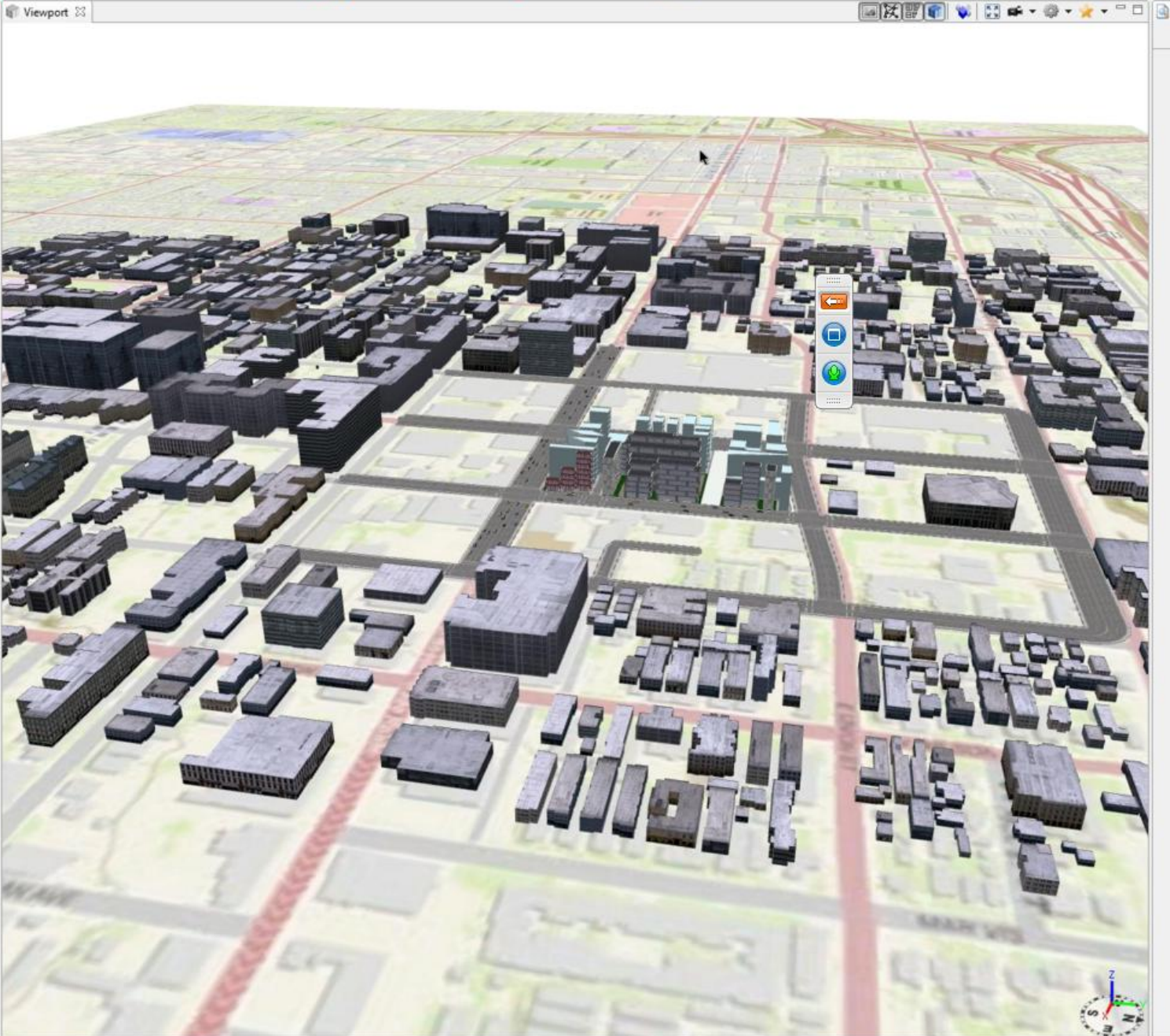
# WORKPLAN (FALL 2011 VERSION)

1. Clarifying the need – the *intended applications* of tools
  - Discussing and listening (Spring-Summer 2011)
  - Met Council & U of M evaluation study (Summer 2011)
2. Building on #1, recommendation of preferred tools
3. Demonstration project in a future transit corridor
  - Identify, fund a project office or GIS shop to apply advanced tools in virtual planning, design, and viz
  - Manage shared spatial data, enable analysis, design and planning during complete project cycle
4. 3D model-building and spatial data needs
5. Improving public participation experiences
  - Working with corridor planning group in targeted corridor



Navigator

- alignStaticShapesToDynamicStreets
- AnalystTraining
- cableCarWiring
- CE\_Documentation
- CE\_Testing\_2011.1
- ce.lib
- Confidentialal\_Rotterdam
- CyberCity3D
- Demo\_CyberCity3D
- Demo\_Middle\_Eastern\_City
- Demo\_Pasadena
  - assets
  - data
    - archive
      - 20110913\_newdata
        - maps\_jpg
          - basemap\_editparcel\_prj.jpg
          - basemap\_editparcel\_prj.jpg
          - basemap\_editparcel\_prj.prj
        - maps\_tiff
        - Pasadena.gdb
          - shapes\_prj2
            - Esri\_shapes
              - parcels.dbf
              - parcels.prj
              - parcels.sbn
              - parcels.sbx
              - parcels.shp
              - parcels.shp.xml
              - parcels.shx
              - streets.dbf
              - streets.prj
              - streets.sbn
              - streets.sbx
              - streets.shp
              - streets.shp.xml
              - streets.shx
            - Esri\_shapes
            - Esri\_shapes2
              - footprints.dbf
              - footprints.shp
              - footprints.shx
              - parcels.dbf



building.cgs \*Scene

search expression

- Scene Light
- Panorama
- Basemap/footprints 1 (1367 Objects)
- Graph Network streets 1 (87 Objects)
- Shapes parcels 2 (24 Objects)
- Terrain basemap\_editparcel\_prj 1



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# 1. DESIGN EXPLORATION CAPABILITIES

- Iterative scenario development: design or plan alternatives can be added, modified
- Compare scenario alternatives to existing landscape, environment
- Applicable to context of neighborhood-level design and planning
- Fast performance creating and exploring design or plan scenarios



## 2. VISUALIZATION CAPABILITIES

- Generate 3-D visualization for land use and development
- Able to show phased development, change over time
- Adequate realism and detail in representing the landscape
- Demonstrates spatial arrangement, proximity to amenities, etc.



### 3. “SCOREBOARD” FOR PERFORMANCE MEASURES AND SCENARIO EVALUATION

- Composite scoring of indicators, determined by users’ goals
- Measures and scoring enable comparison of plan scenarios
- Tool can model land use and produce indicators of outcomes
- Tool can model fiscal and infrastructure impacts and outcomes



## 4. USABILITY AND VIABILITY FOR TECHNICIAN USERS

- Stability of tool performance— minimal errors
- User friendly, intuitive interface
- Flexible and efficient for programming and running custom analyses
- Compatible with ESRI ArcGIS
- Portability of project files – can you share what you create?



## 5. USEFULNESS AND BENEFIT FOR BROAD AUDIENCE

- Interface and information successfully engage stakeholders' interest and input
- Language and concepts in the interface and results are clear and useful
- Likely to promote shared understandings among stakeholders

