



# CityEngine está Transformando

El Diseño y la Planificación Urbana

Carlos Cardona | Esri



Nov. 22 2013

I  3D





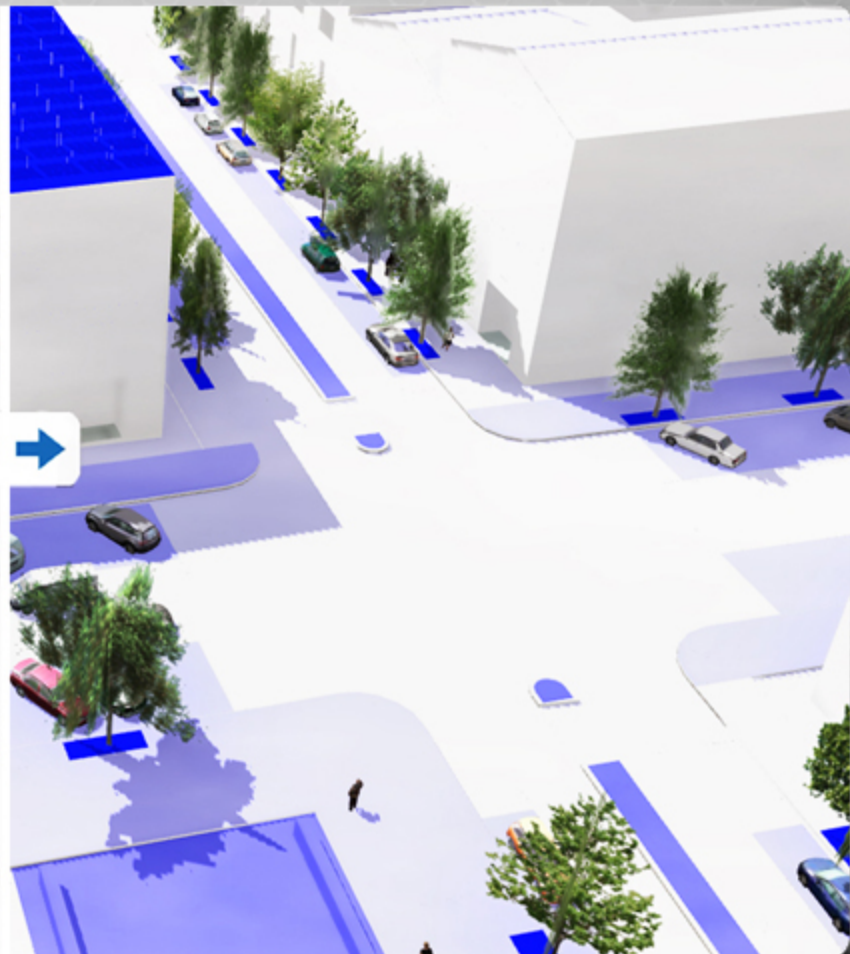
beautiful

# Comprehensible





effective



# Realista





# Futurista







Fantasia

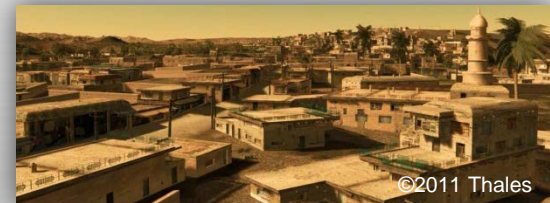




# Industrias

CityEngine

- Medios y Entretenimiento, Cine, TV, Juegos
- Arquitectura, Diseño Urbano, Visualización
- SIG, Municipios, Simulación, Entrenamiento





# Entretenimiento

CityEngine





# Casos de Estudio



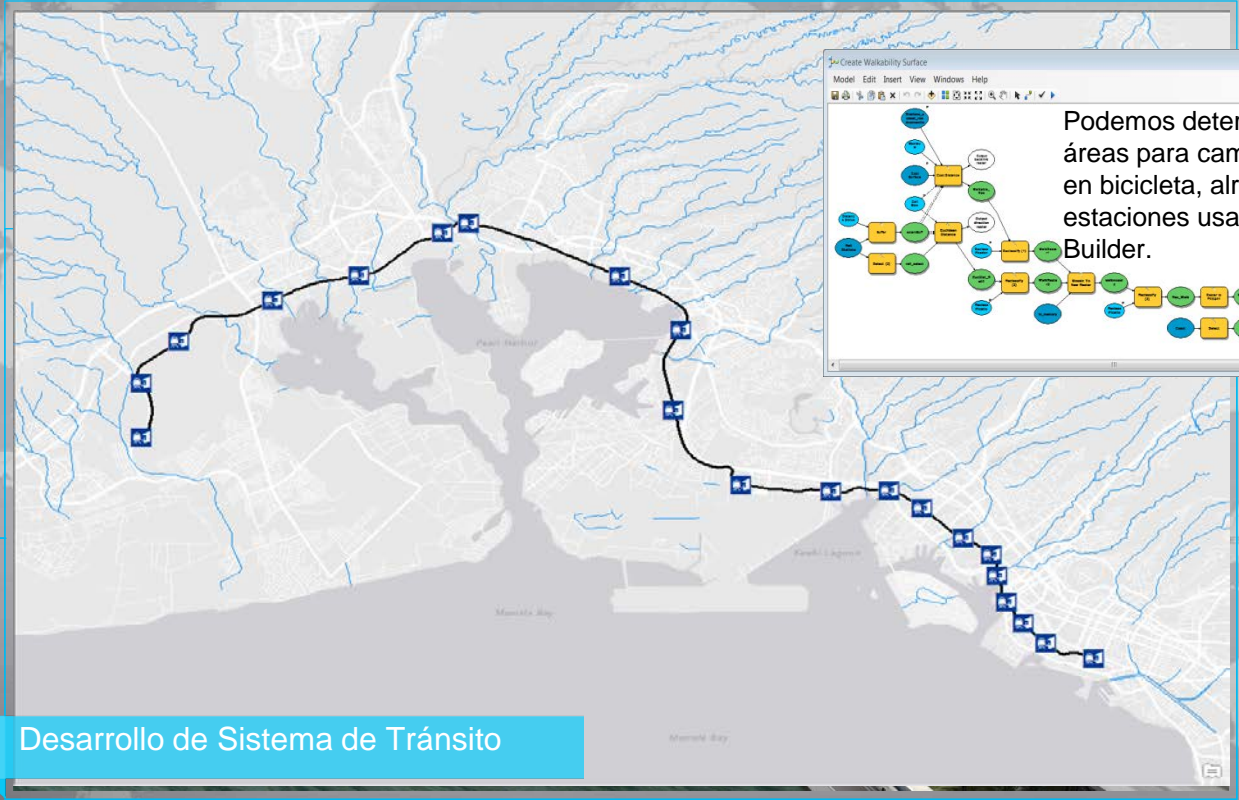
# Honolulu



Desarrollo de Sistema de Tránsito



# Honolulu



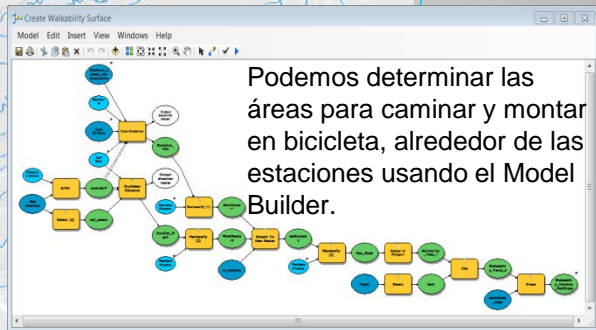
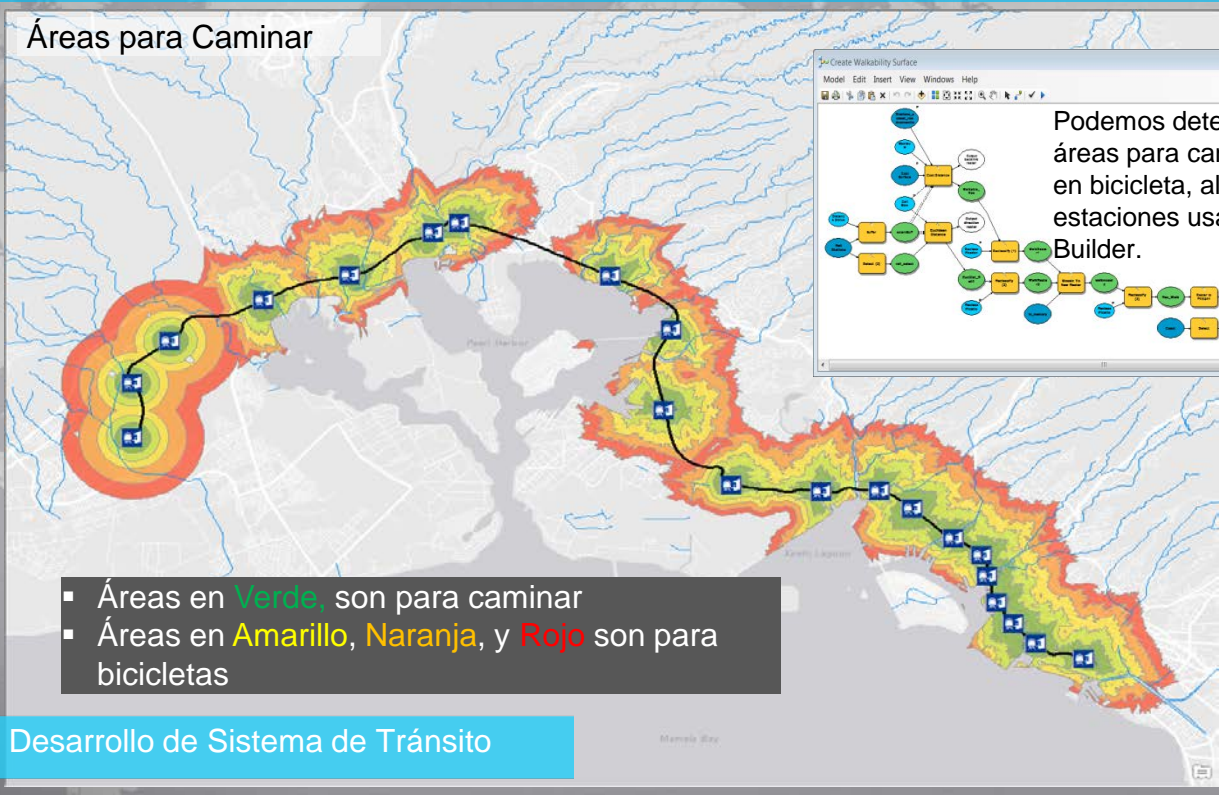
Create Walkability Surface

Model Edit Insert View Windows Help

Podemos determinar las áreas para caminar y montar en bicicleta, alrededor de las estaciones usando el Model Builder.

Desarrollo de Sistema de Tránsito

## Áreas para Caminar



- Áreas en Verde, son para caminar
- Áreas en Amarillo, Naranja, y Rojo son para bicicletas

Desarrollo de Sistema de Tránsito

Honolulu





Charlotte



Potencial de Techos Solares



Zurich



Regulación de Zonas

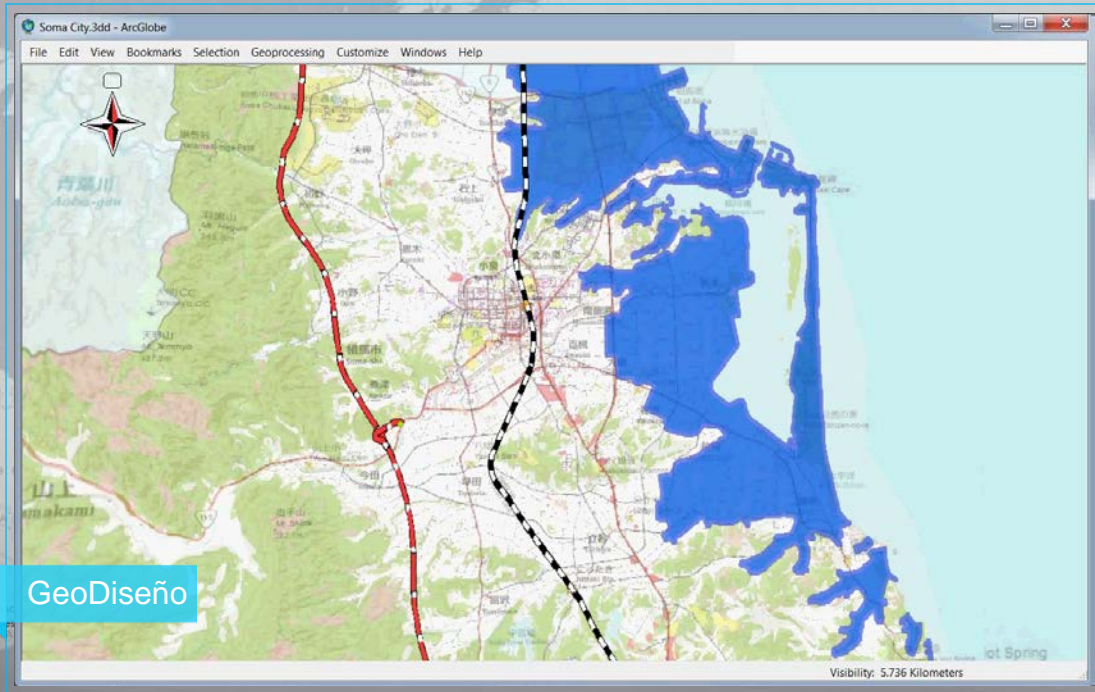




Planeación Urbana

## Medio Oriente





**Soma**



Seoul

Shanghai

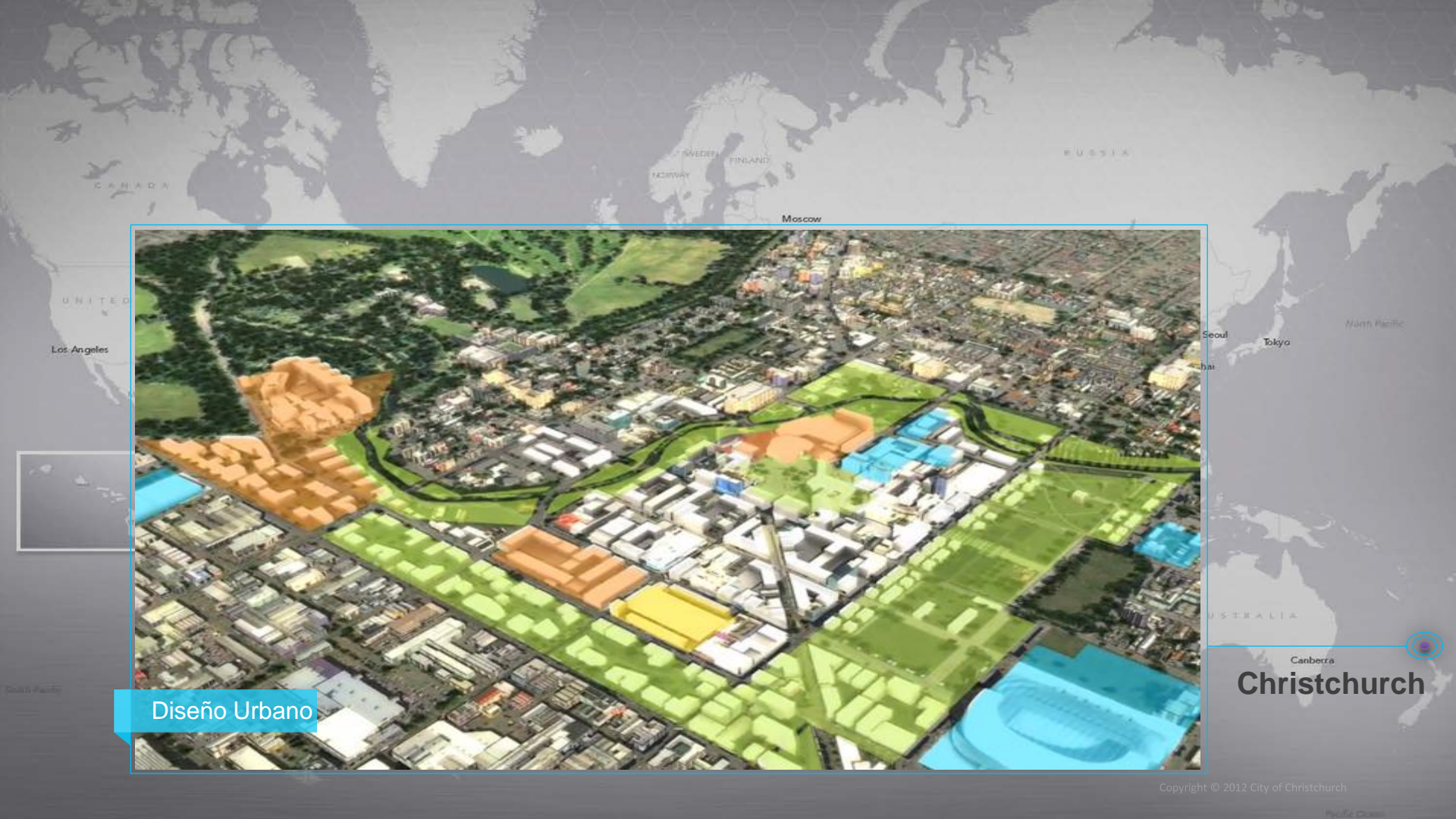
Manila

AUSTRALIA

Canberra

Pacific Ocean





Diseño Urbano

Christchurch

# Rochester



Washington

Los Angeles

MEXICO

México City



Caracas

Bogotá

Lima

São Paulo

Paulo, Janeiro

Santiago

Buenos Aires

ARGENTINA

SWEDEN FINLAND  
NORWAY

Moscow

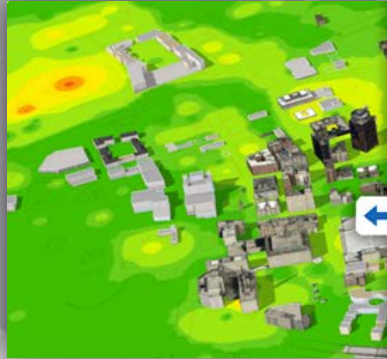
RUSSIA

North Pacific

Tokyo

Legend

Manhattan



Diseño Urbano

Kinshasa

Luanda

ANGOLA

ANGOLA

ANGOLA

ANGOLA

ANGOLA

ANGOLA

ANGOLA

ANGOLA

ANGOLA

ANGOLA

ANGOLA

Nairobi

Kinshasa

Luanda

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ANGOLA

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Canberra



# Redlands

Los Angeles

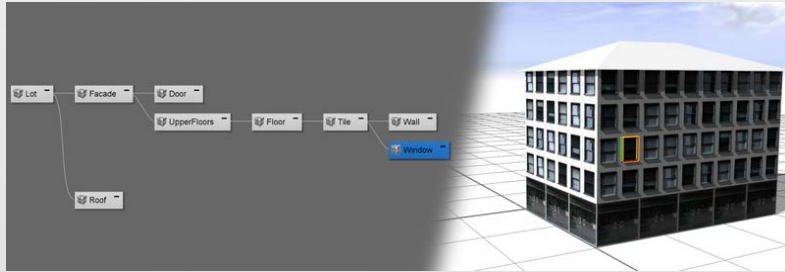


Nuevo Desarrollo

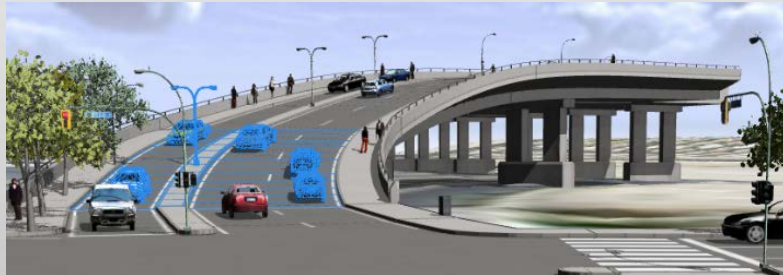
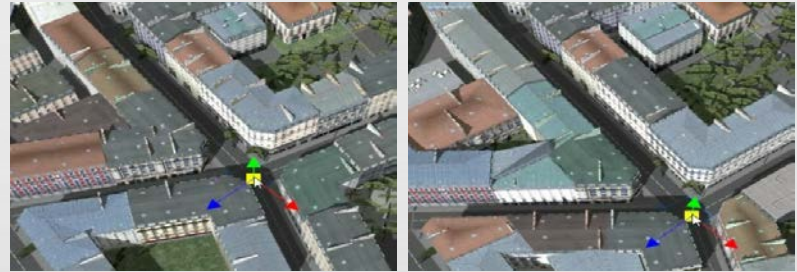


# Suite Completa para Modelar Ciudades

## Reglas de Diseño Abiertas



## Plantillas Dinámicas de Ciudades



Herramientas para construcción de Calles



Geolocalización





### Step 1

Geodatabase/2D  
Information



### Step 2

3D Streets, Blocks,  
and Parcels (import  
or creation)



### Step 3

3D Extrusion, Roof  
Generation, and  
Street Furniture



### Step 4

Texturing and  
Façade Creation  
(details)



### Step 5

Finished 3D City  
Shared on the Web  
and Updated in the  
Geodatabase

# Porqué Modelado Basado en Reglas?

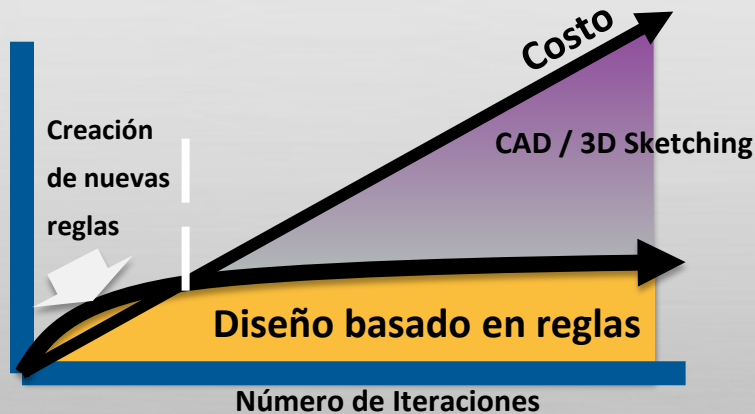




# El Modelado Basado en Reglas Provee un Diseño en 3D Flexible Soportando Procesos Repetitivos

## Pasos

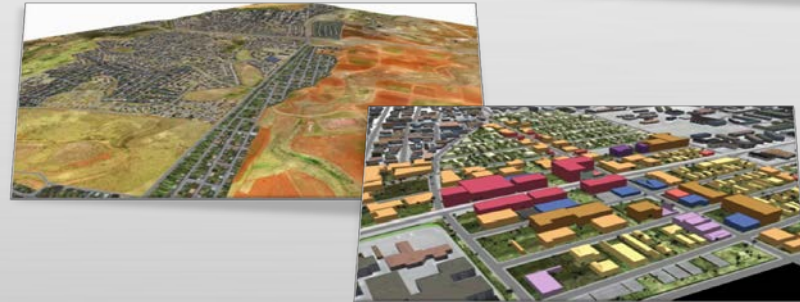
- Diseño de las reglas (o usar las existentes)
- Generar múltiples diseños y escenarios
- Evaluar alternativas



A



B



Particularmente cuando los proyectos requieren múltiples iteraciones

# El Diseño Basado en Reglas es Inteligente

## Base de Datos Basada en Reglas

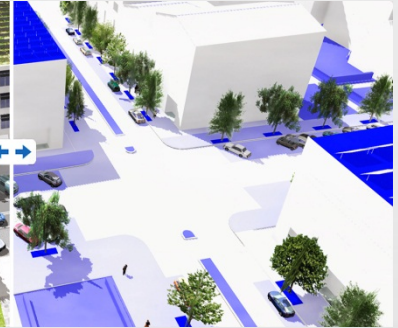
- Interactivo
- Múltiples Vistas
  - Despliegue realista
  - Renderización temática en 3D
- Reportes y Desempeño
  - Basado en atributos
  - Visualización Dinámica



Diseño



% de Filtración de Agua



Diseño



Zonificación en 3D

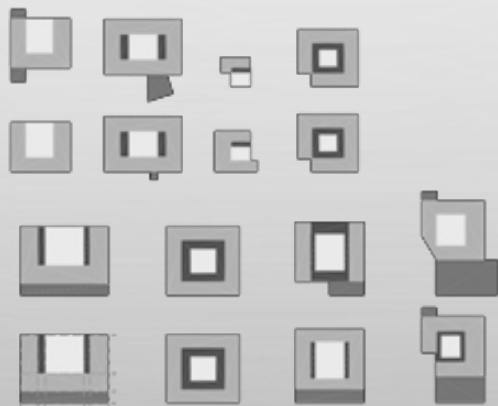




# Parcelas

## Patrones generales y Reglas de Zonificación

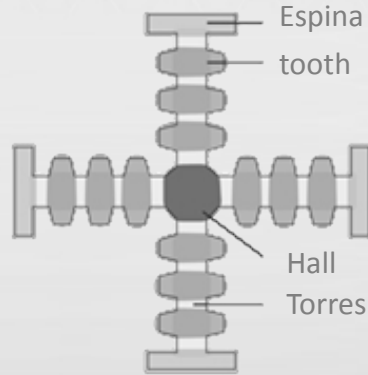
- Distancias máximas (edificio-calle, entre edificios, ...)
- Plano, orientación, área mínima, accesos, ...



# Modelos de Masas

*“Cruciform Skyscraper”*

by Le Corbusier



Control de Atributos:

Ancho Edificio = 220

Torres = 4

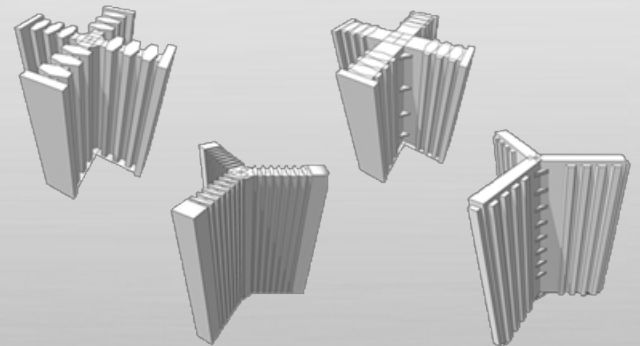
Longitud = 100

Ancho de cada torre = 16

Ancho del hall = 50

Proyección y Angulo = 10

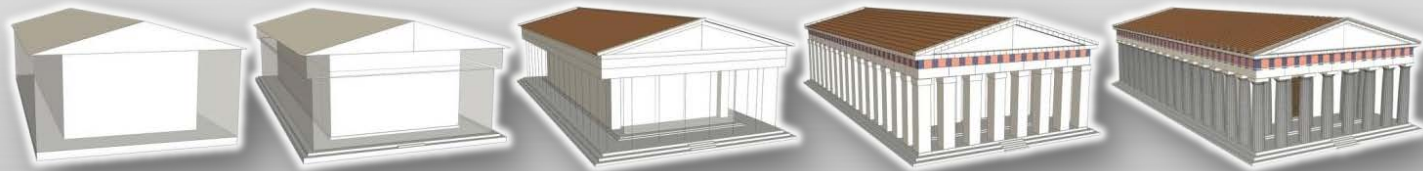
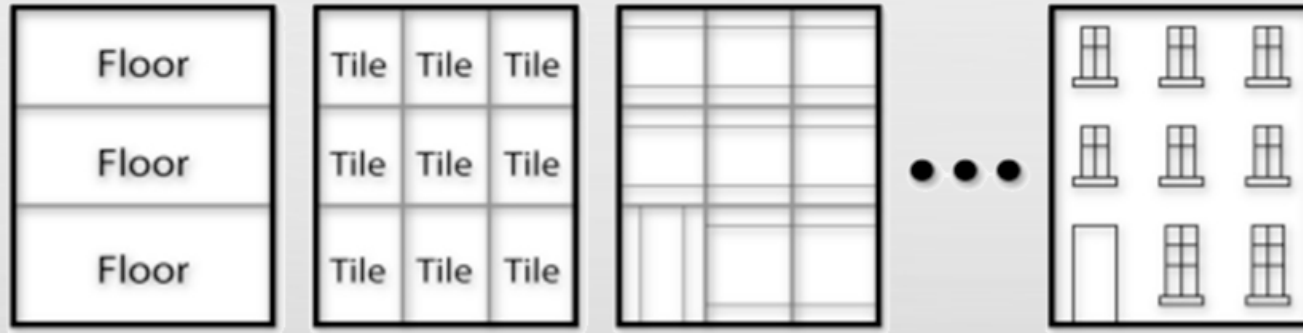
Distancia = 12 ...





# Subdivisión de Fachadas

Refinamiento de Fachadas



# Creación de Techos

- Techos de vertientes



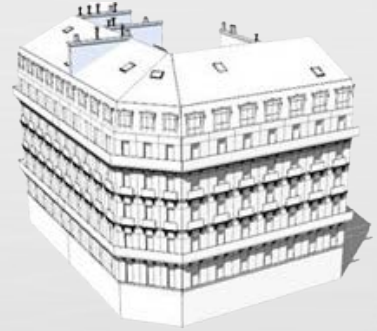
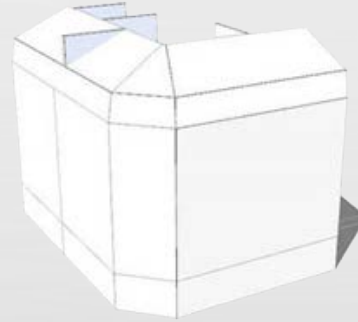
- Techos planos con elementos complejos






# Niveles de Detalle

- Textura vs geometría
- Elementos multi resolución



# demo

ArcGIS Resources ArcGIS Online Sign In English 


[Home](#) [Communities](#) [Help](#) [Blog](#) [Forums](#) [Videos](#)

## CityEngine

Communities

### What is CityEngine?

CityEngine allows you to efficiently create 3D urban landscapes using your existing GIS data, as well as the revolutionary production of 3D scenarios that let you track into various future scenarios as requested by urban and transportation engineers or stakeholders.



### Getting Started with CityEngine

- Install and Update
- System Requirements

### Help

- CityEngine Help

### Other Links


- What's new in CityEngine 2013.11
- CityEngine Gallery
- Knowledge Base
- News
- Support

### Related Communities


- 3D GIS Resources

### Gallery


[More Gallery posts](#)




Example Redlands Redevelopment




3D zoning visualization



3D City Masterplan (part 1)



3D City Data Preparation (part 1)



3D City Creation (part 2)

### Recent Blog Posts

[More Blog posts](#)

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by Steve Hogg, Geoprocessing and Spatial Analysis Team: Esri Jump-start your conference a day early by joining us for the 20th annual pre-conference Water Resources Workshop on ...

### Featured Videos

[More Videos](#)



Thumbnail: 3D city model

Thumbnail: 3D city model

CityEngine 2013.11 early supports the Esri for



## Example Redlands 2013 Redevelopment Training

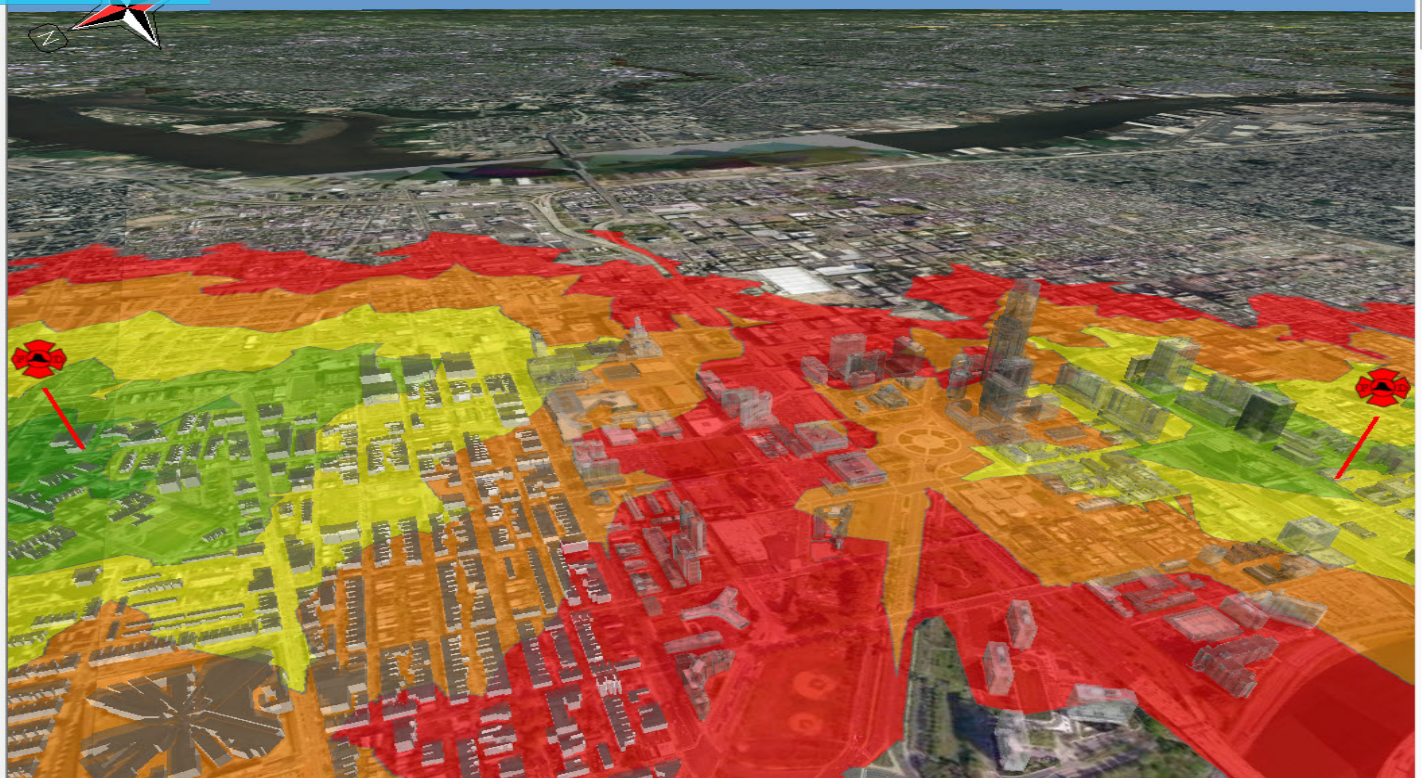


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# Análisis y Valoración 3D

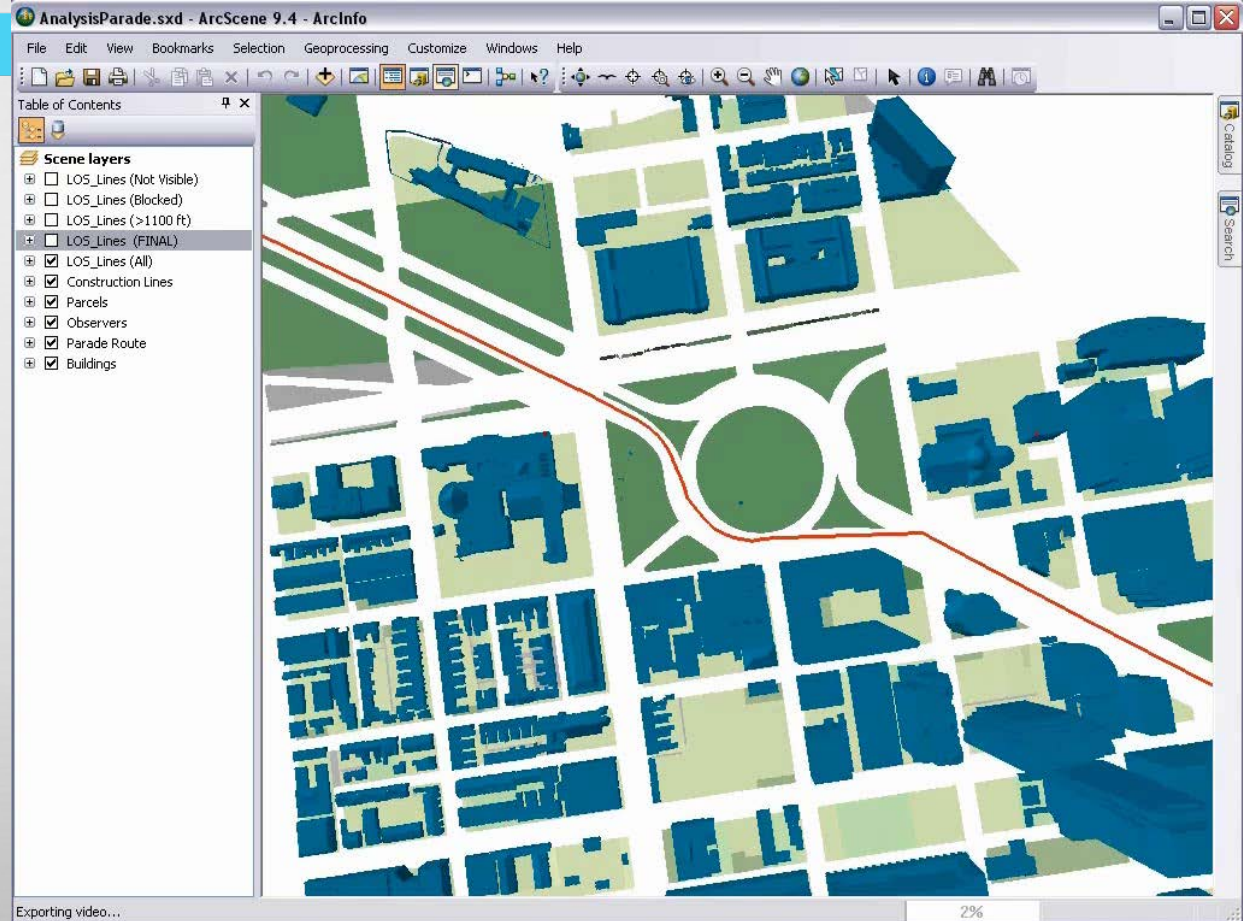
- Fire Stations
- Franklin Group
- Street Furniture, by illui
- Street Furniture, by cor
- Street Furniture
- Vegetation
- Miscellaneous
- Building Subset, Landu
- Zoning
- Building labels
- Building Subset
- Extruded Buildings
- Buildings\_LessSubset
- ProposedDevelopment
- BIM via IFC
- SketchUp Building
- Proposed Building
- Models
- LAS Footprints with He
- LAS Points
- LAS Footprints
- Overpasses
- ServicesForAmazon-Ph
- IS\_Imagery\_Prime\_Wor
- Philly-DEM1Meter
- Elevation (30m)
- Elevation (90m/1km)
- DriveTime
  - <all other values>
  - Name
    - 1
    - 2
    - 3
    - 4
    - 5
- ExtrudedDriveTime
  - <all other values>
  - Name
    - 1 - 2
    - 2 - 3
    - 3 - 4
    - 4 - 5
- Redevelopment Suita
  - 1
  - 2
  - 3
  - 4



## Línea de Vista

Cuanto del camino se puede ver desde una cámara / ubicación de un observador?

Rápida valoración de visibilidad entre los elementos usando herramientas de geoprocresamiento.

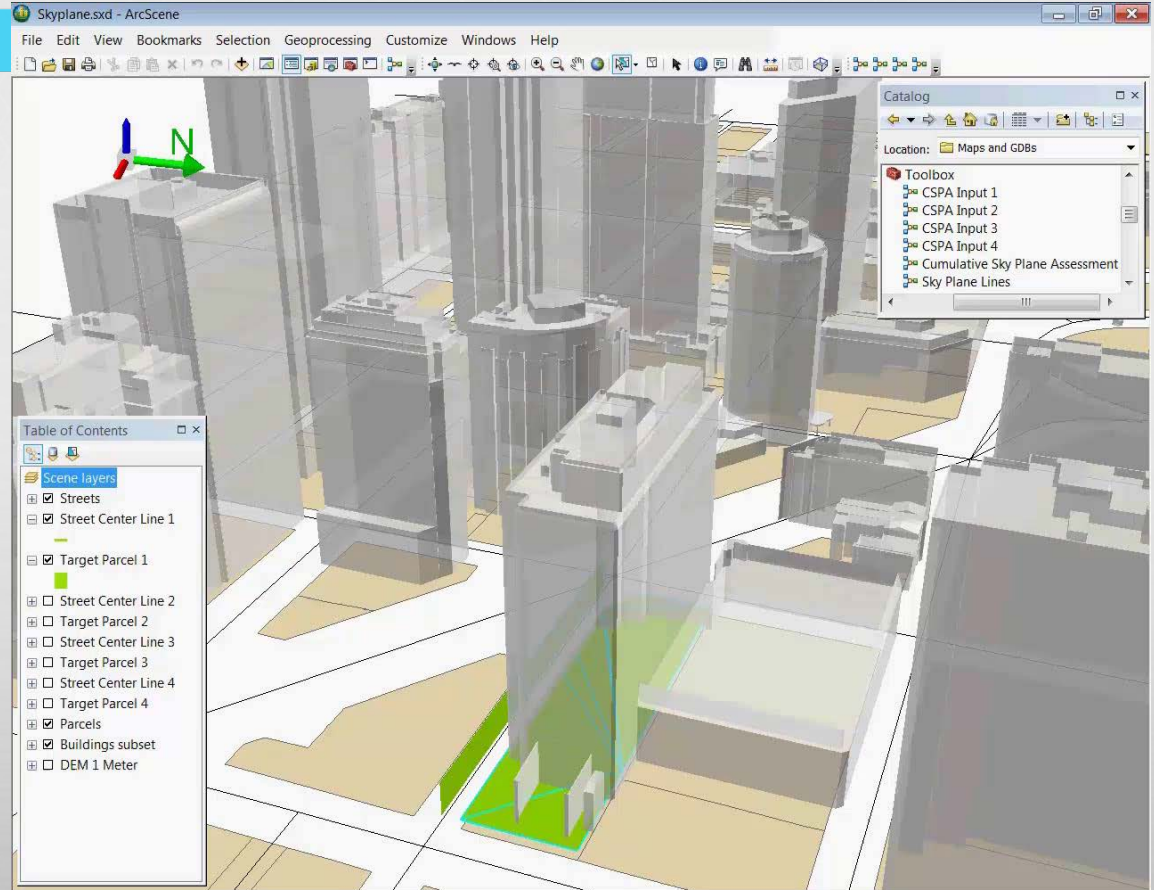




## Línea de Vista

Cuanto del cielo es obstruido por el edificio propuesto? Acaso está violando las reglas de planeación de la ciudad?

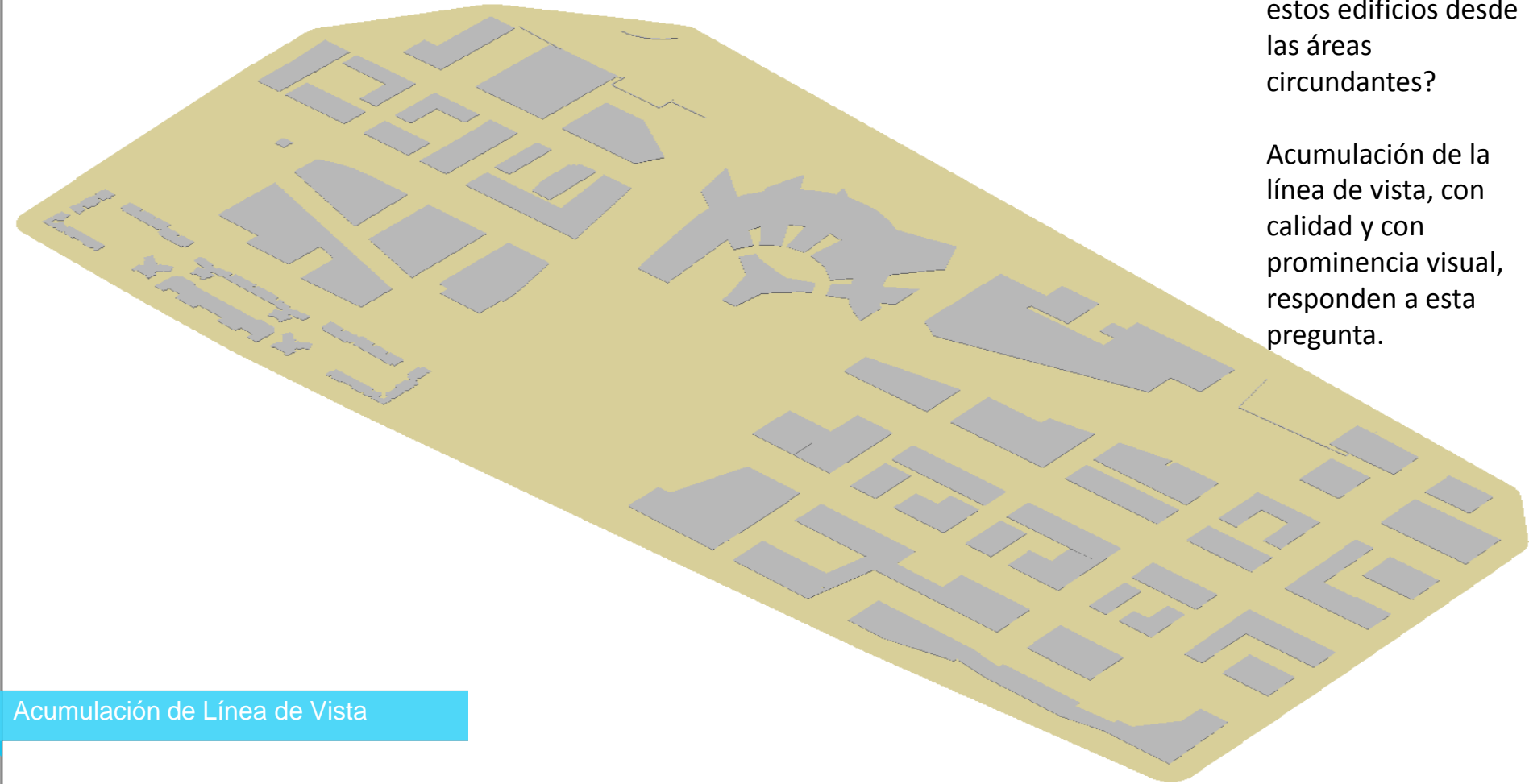
Reporte del % de cielo visible, basado en las herramientas de línea de vista.



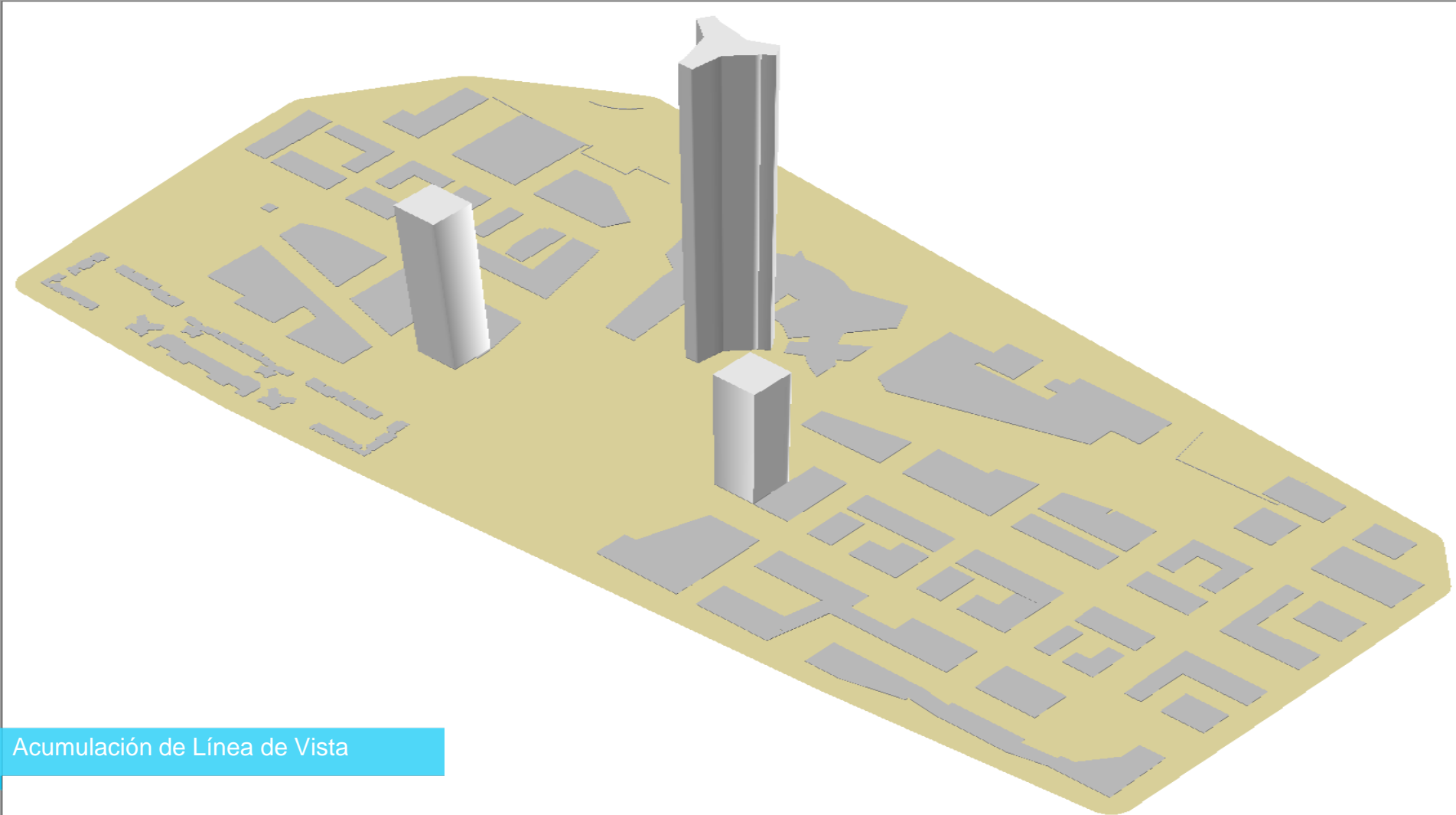
Que tan visibles son estos edificios desde las áreas circundantes?

Acumulación de la línea de vista, con calidad y con prominencia visual, responden a esta pregunta.

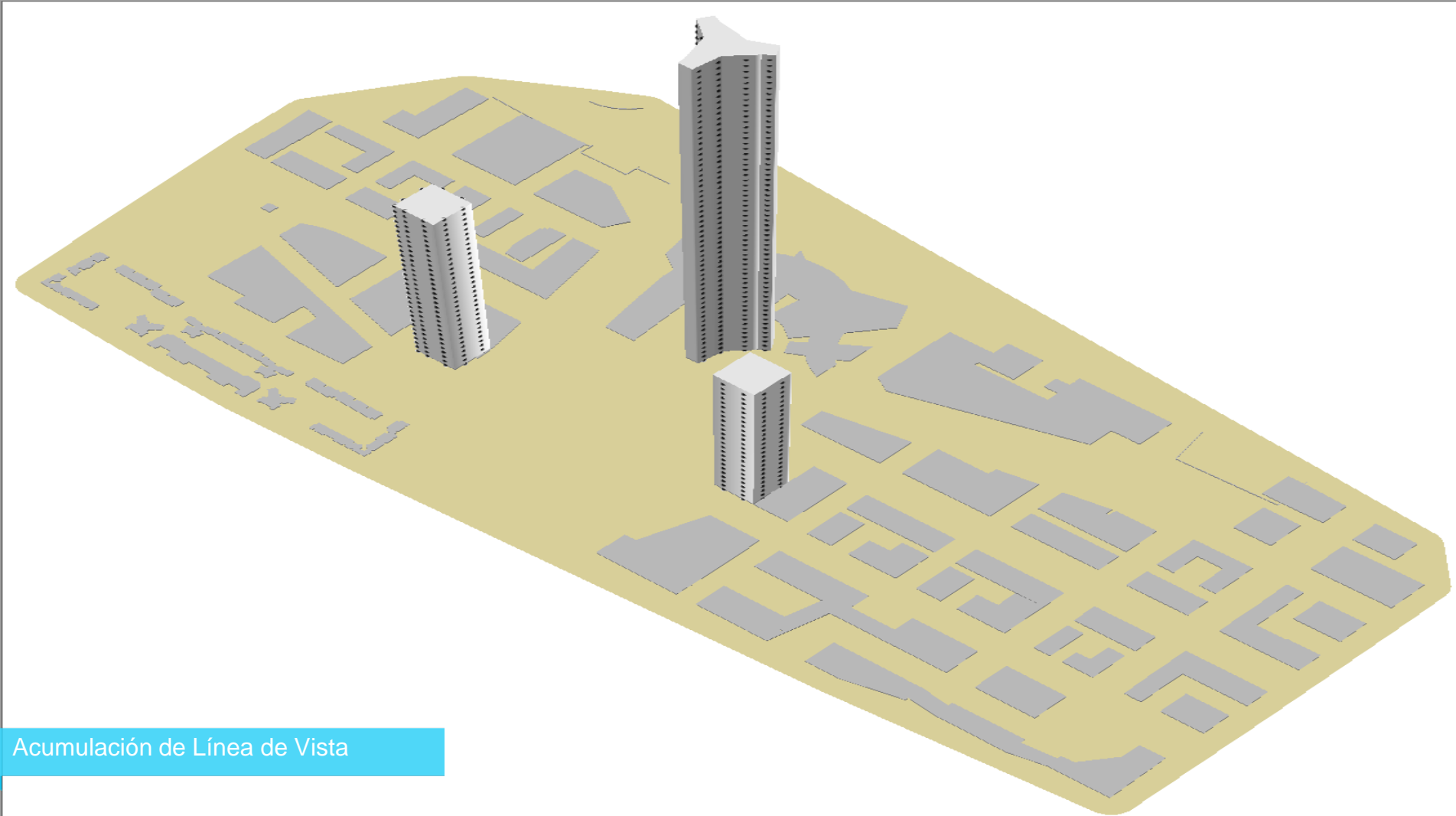
Acumulación de Línea de Vista



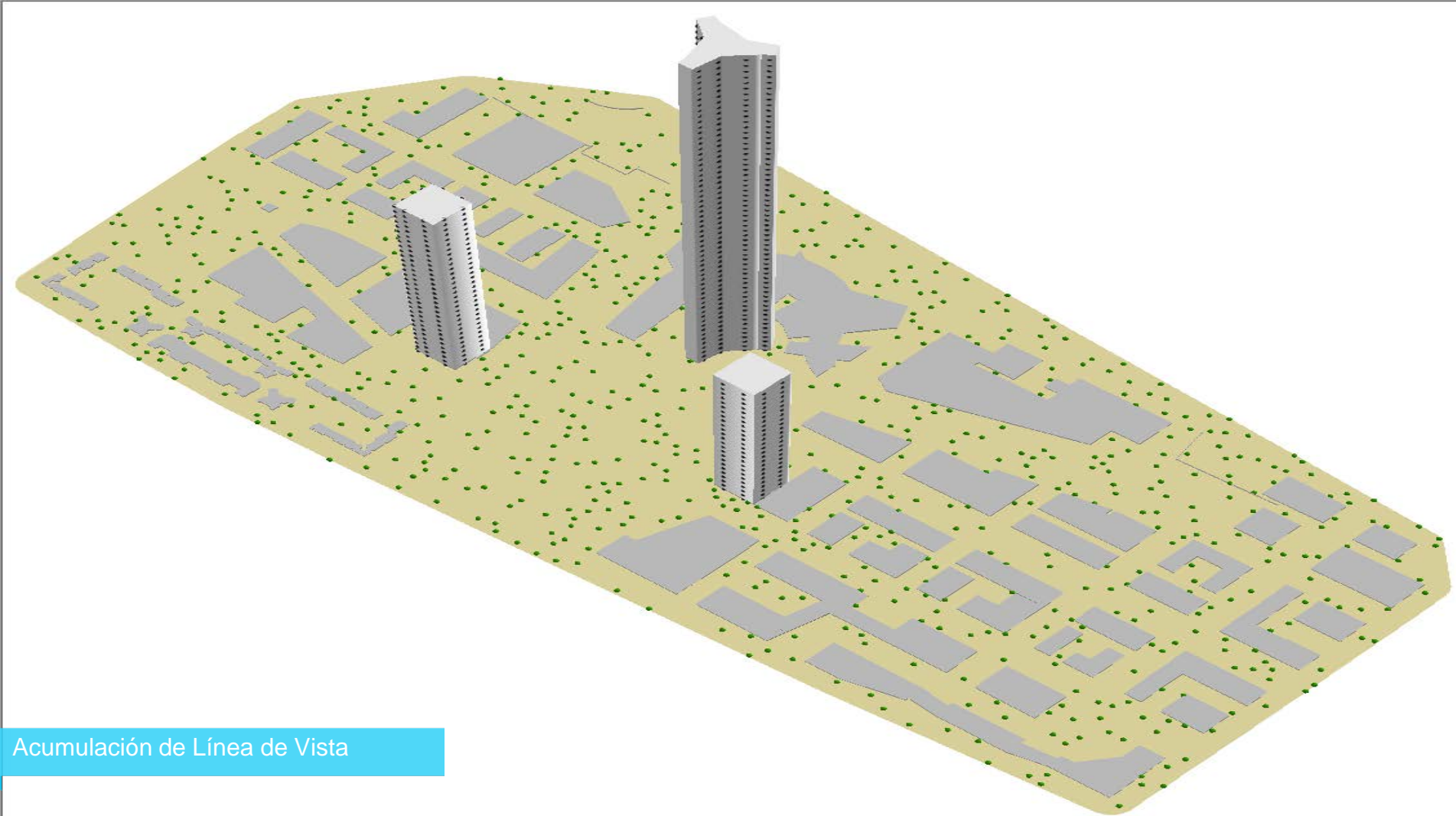




Acumulación de Línea de Vista

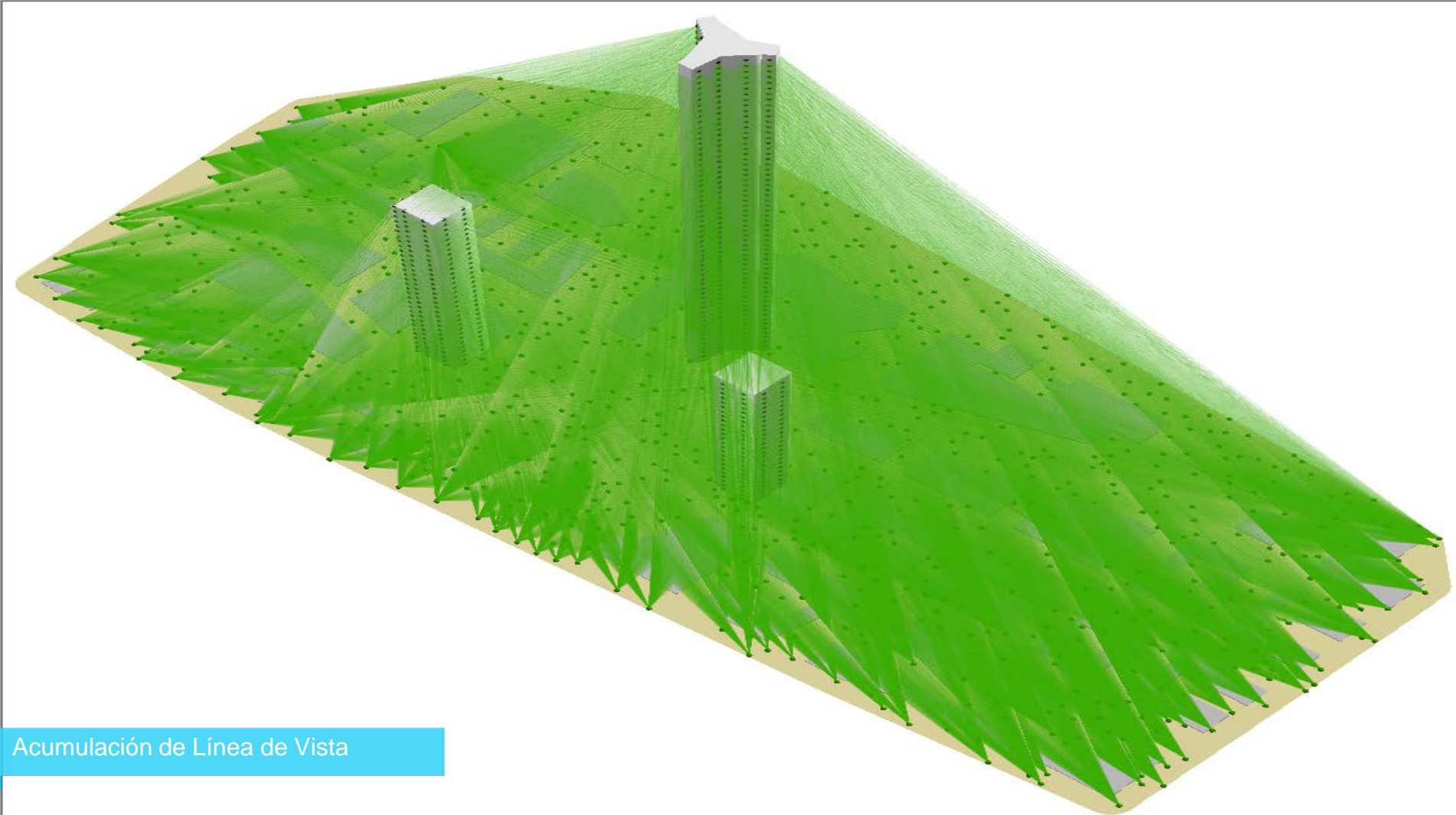


Acumulación de Línea de Vista

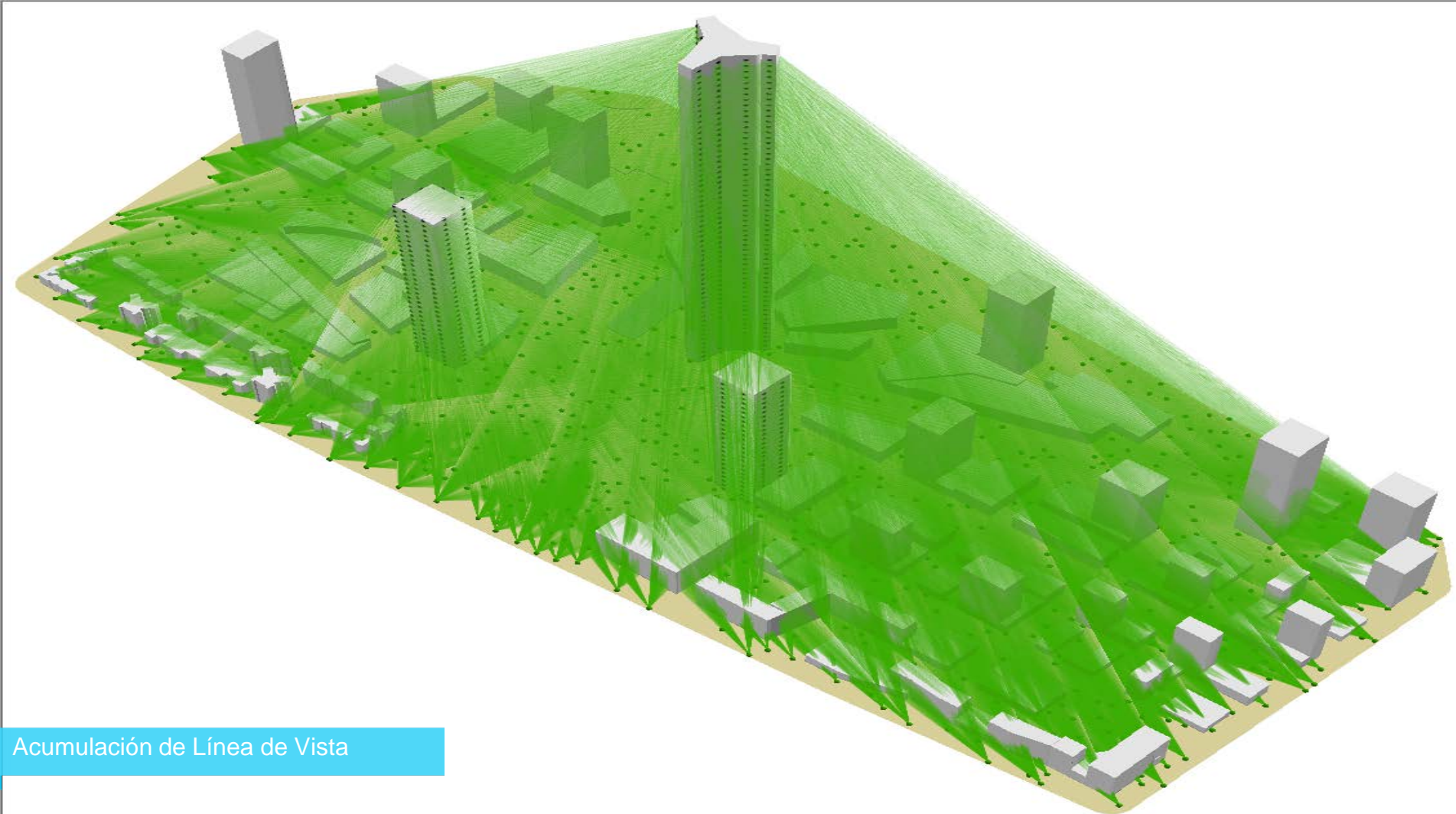


Acumulación de Línea de Vista

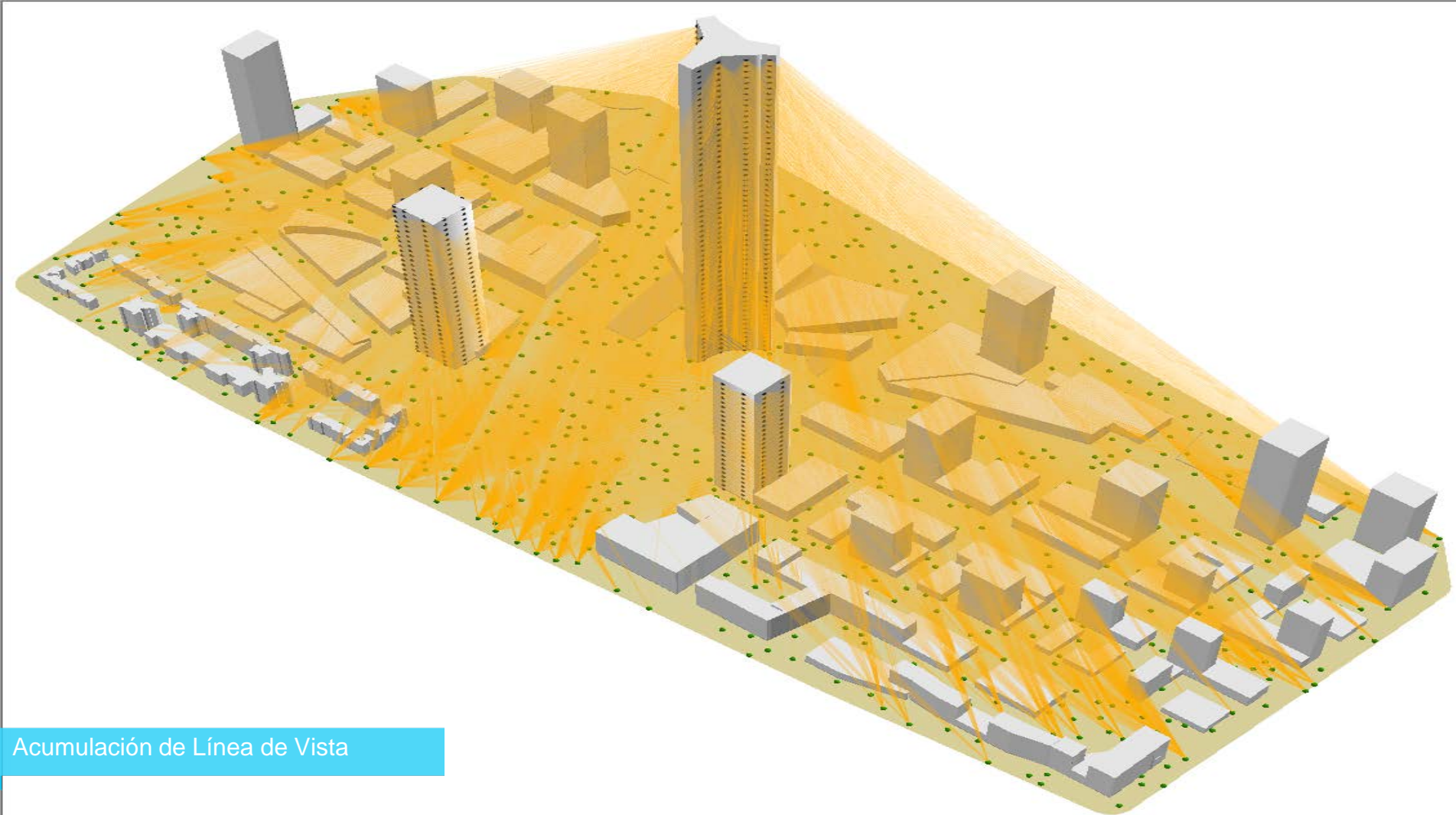




Acumulación de Línea de Vista

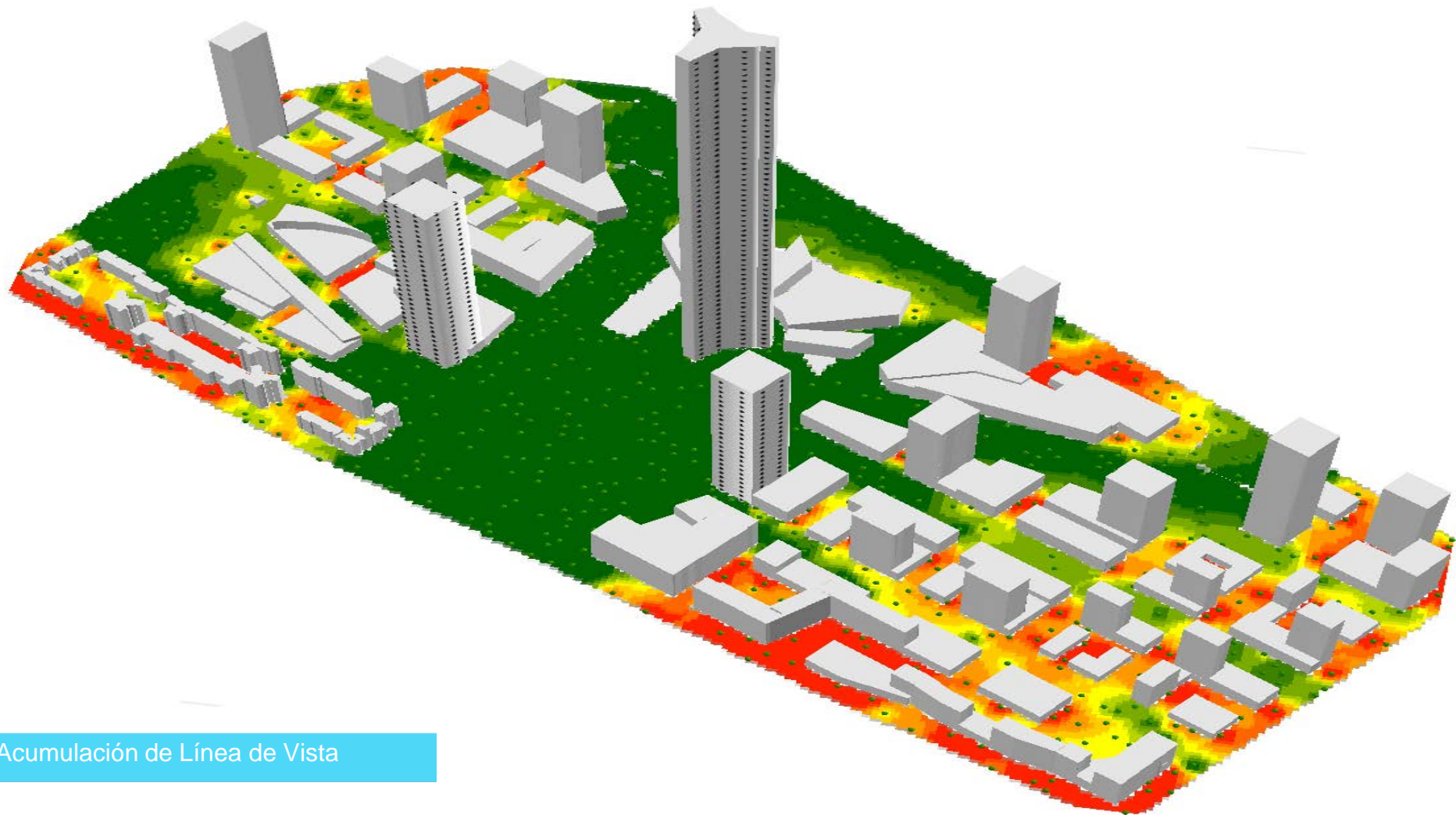


Acumulación de Línea de Vista



Acumulación de Línea de Vista



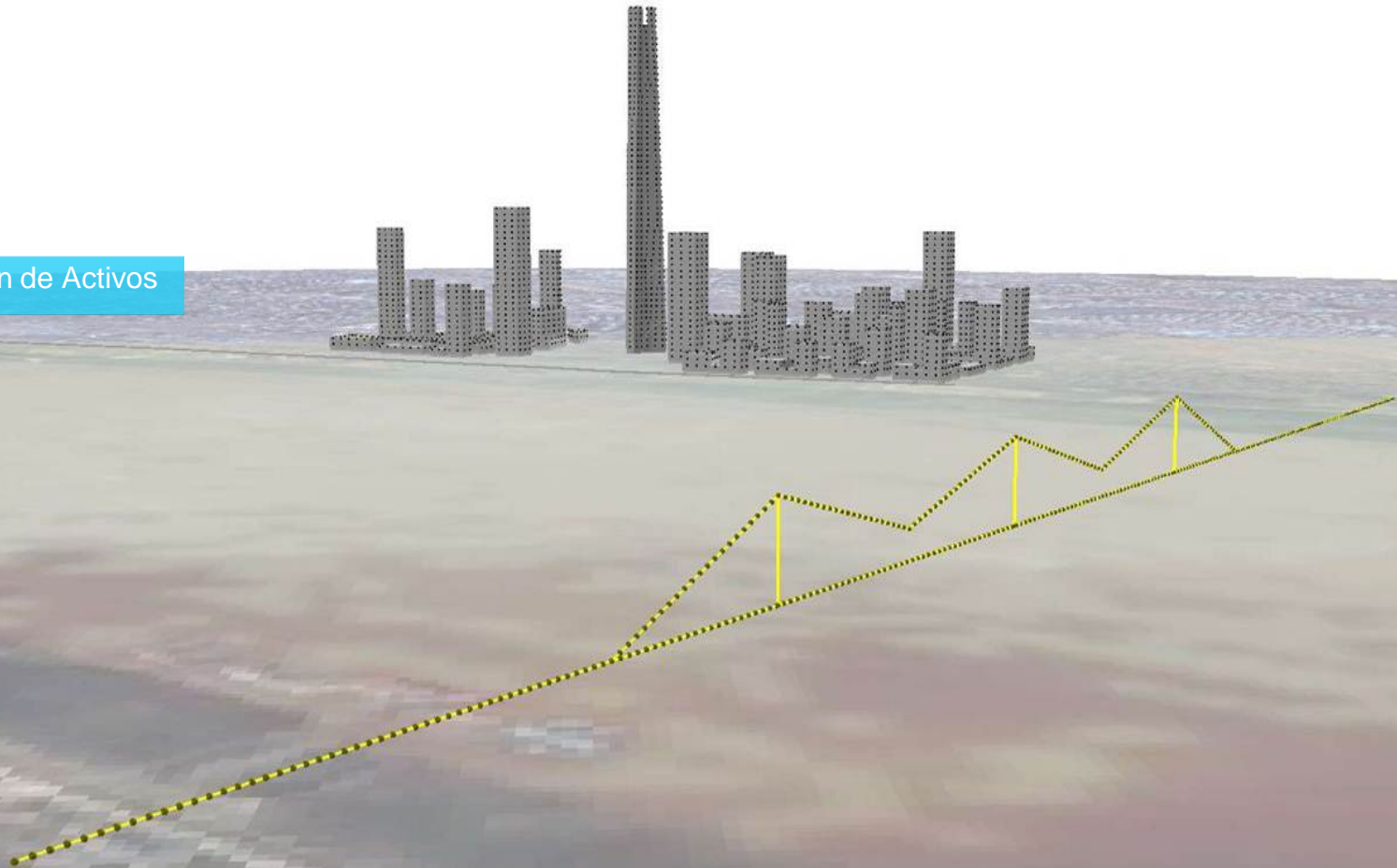


Acumulación de Línea de Vista

Valoración de Activos



## Valoración de Activos

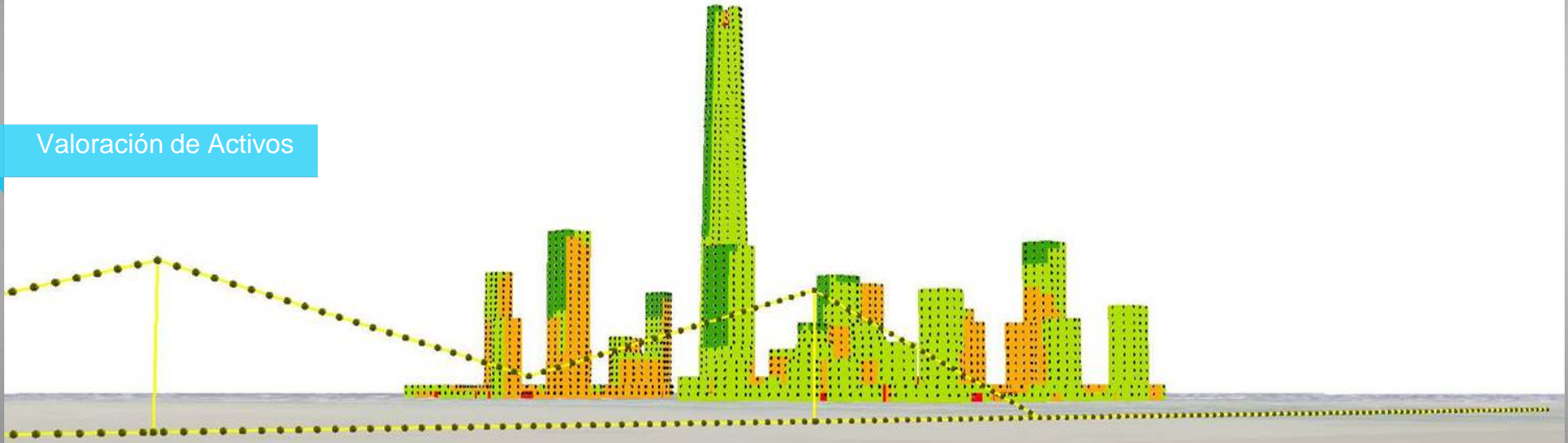




Valoración de Activos



## Valoración de Activos

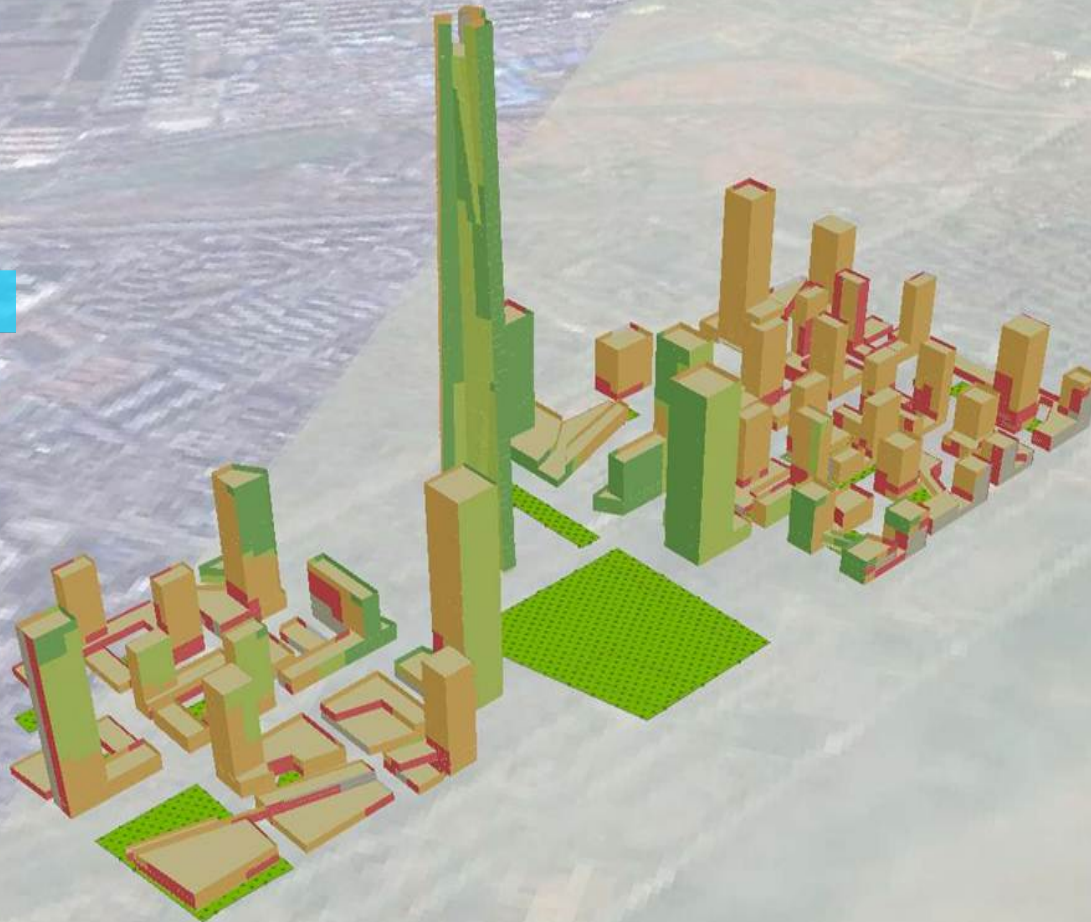


An aerial 3D visualization of a city grid. A semi-transparent grey plane is positioned above the city. A yellow dotted line with vertical markers runs across the plane from the left to the right. On the right side of the plane, a 3D bar chart is overlaid, showing several vertical bars of varying heights in shades of orange, green, and red. The background shows a detailed city street layout.

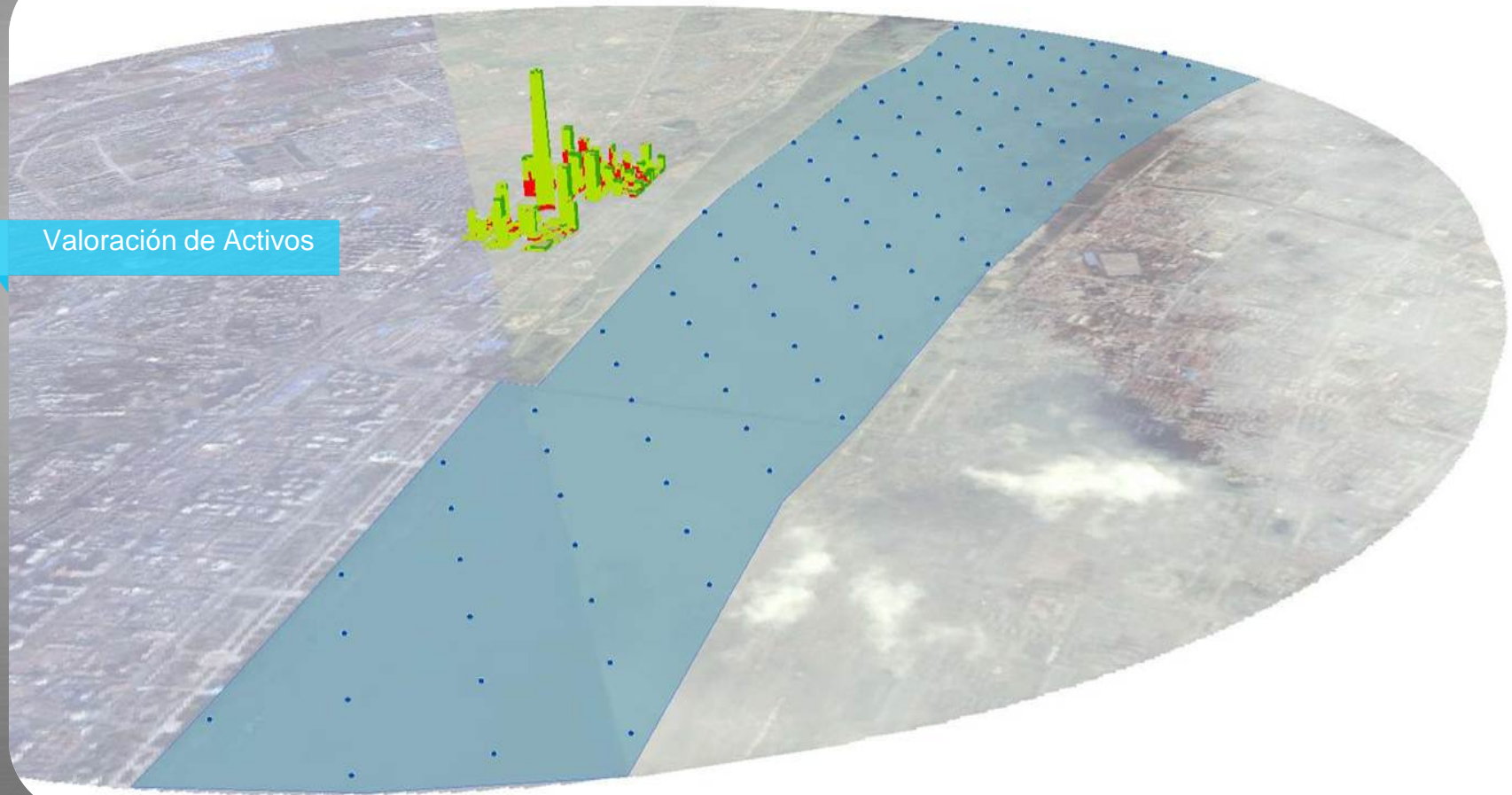
Valoración de Activos



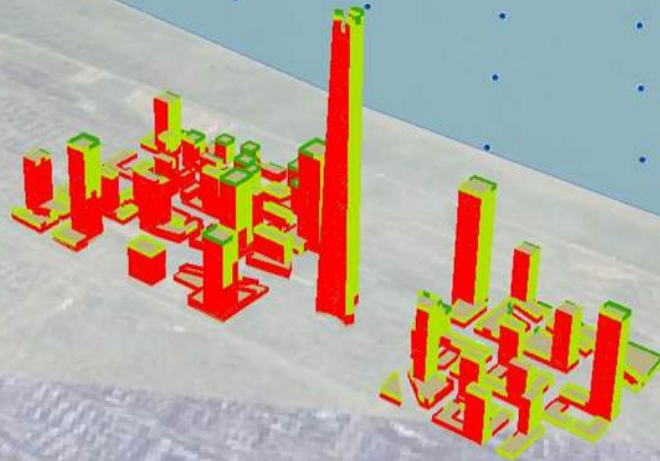
Valoración de Activos



Valoración de Activos

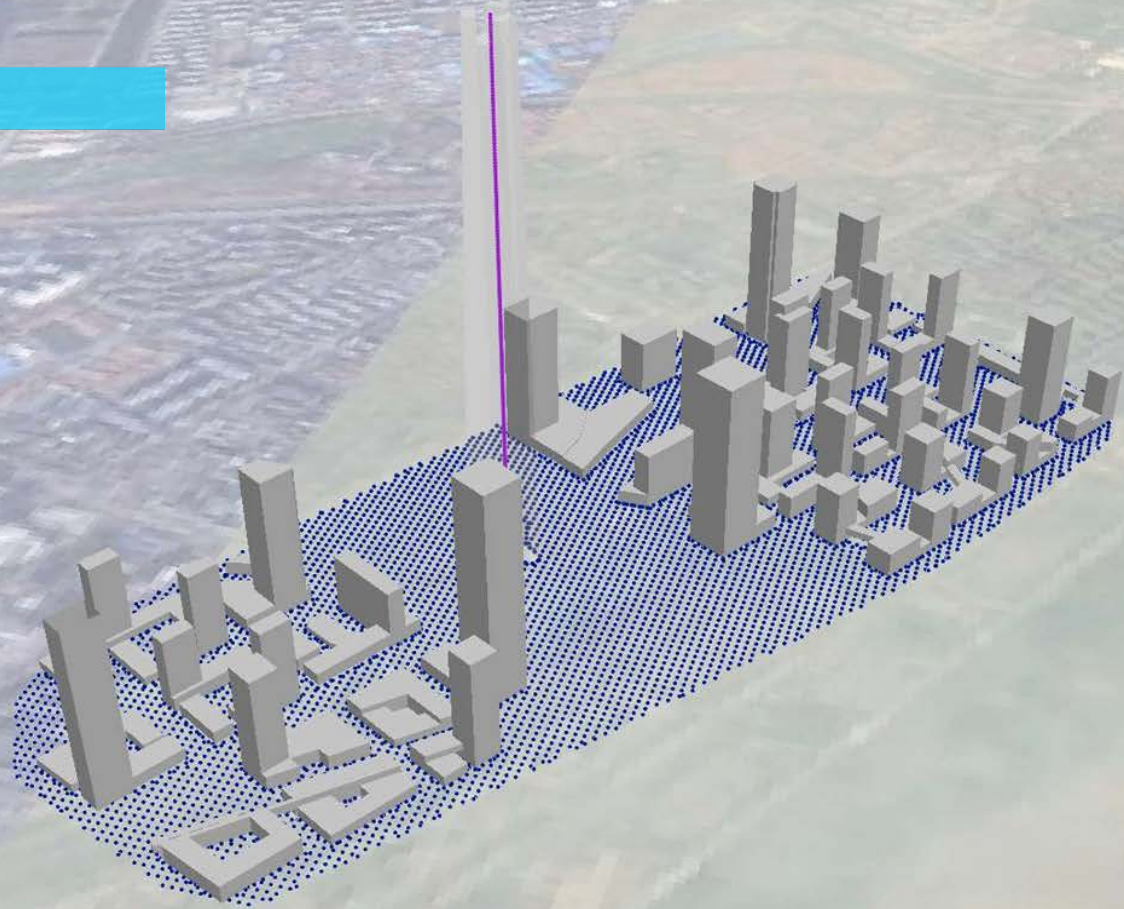


Valoración de Activos





Prominencia Visual

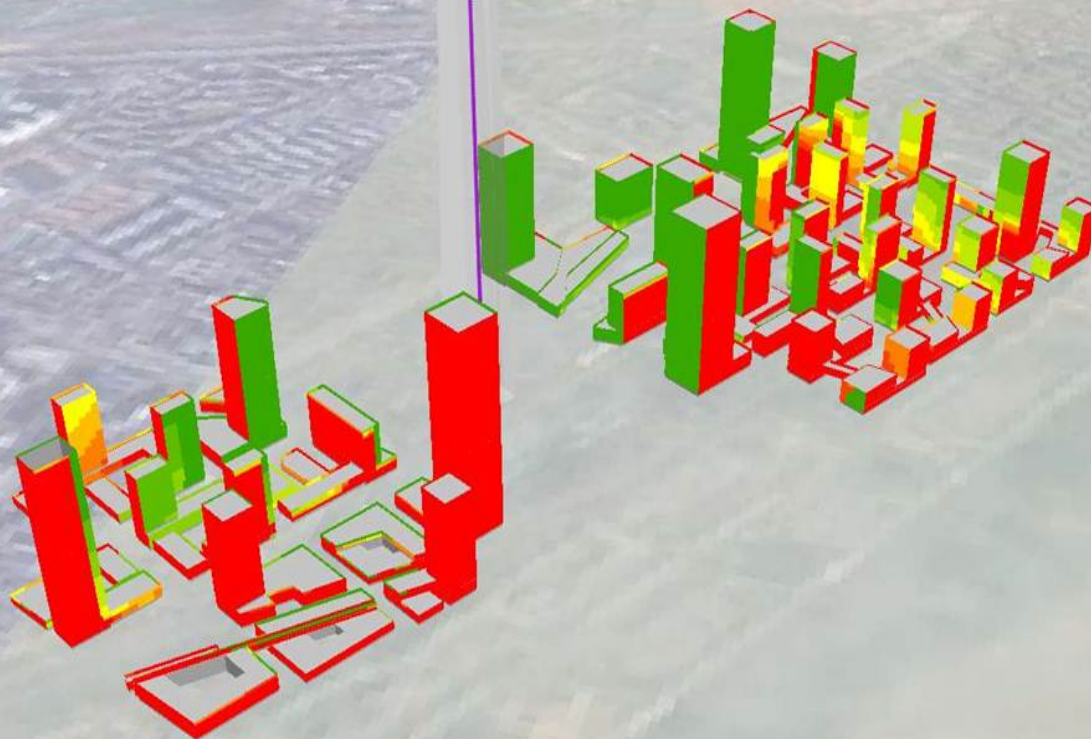


Prominencia Visual



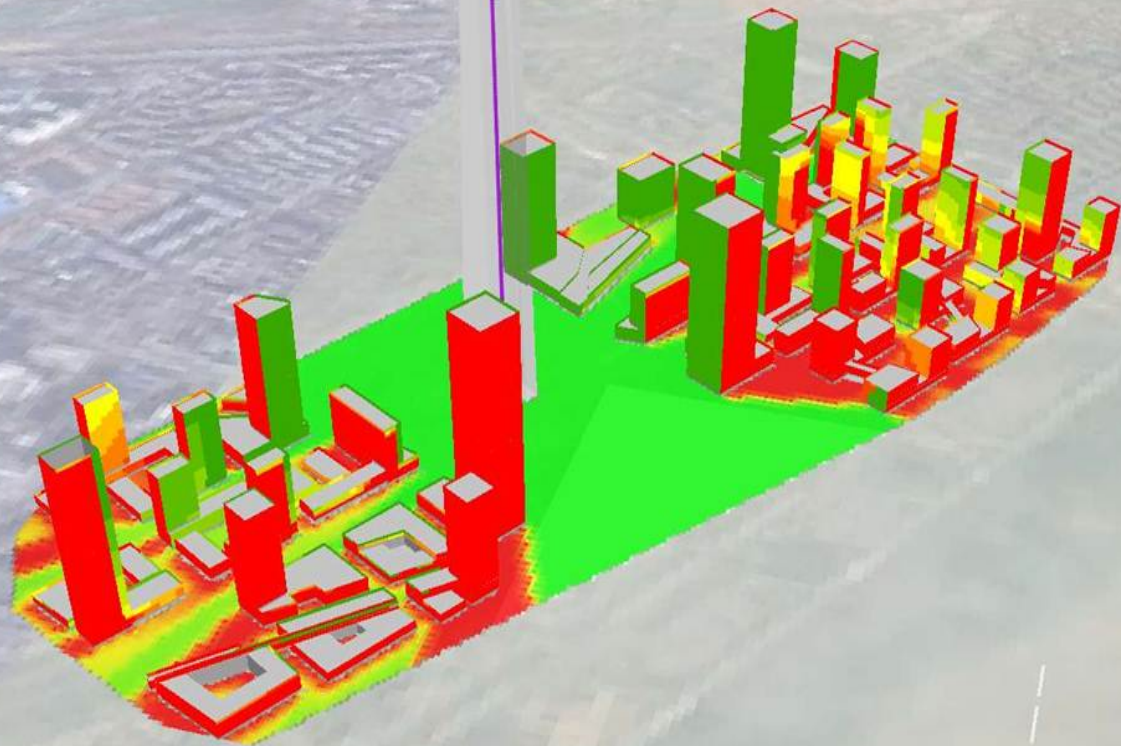


Prominencia Visual

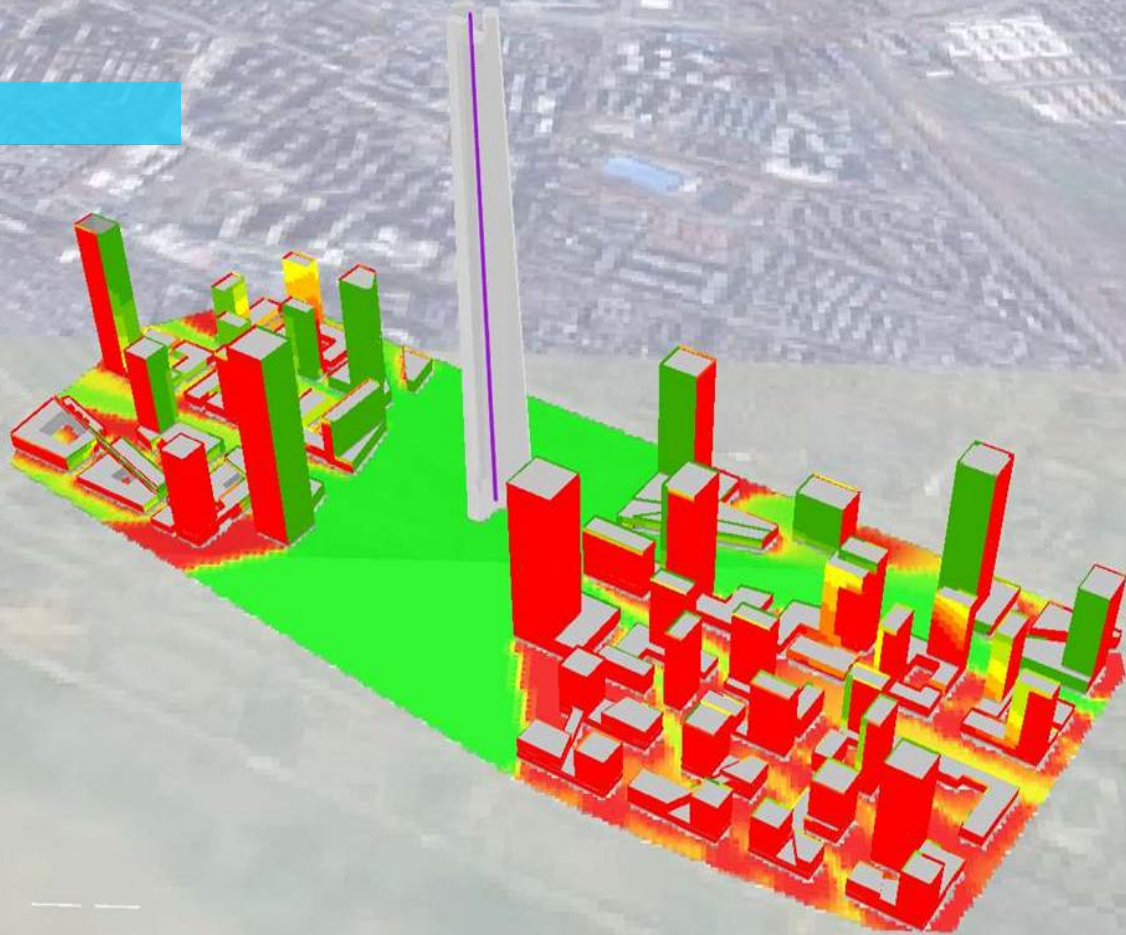




Prominencia Visual

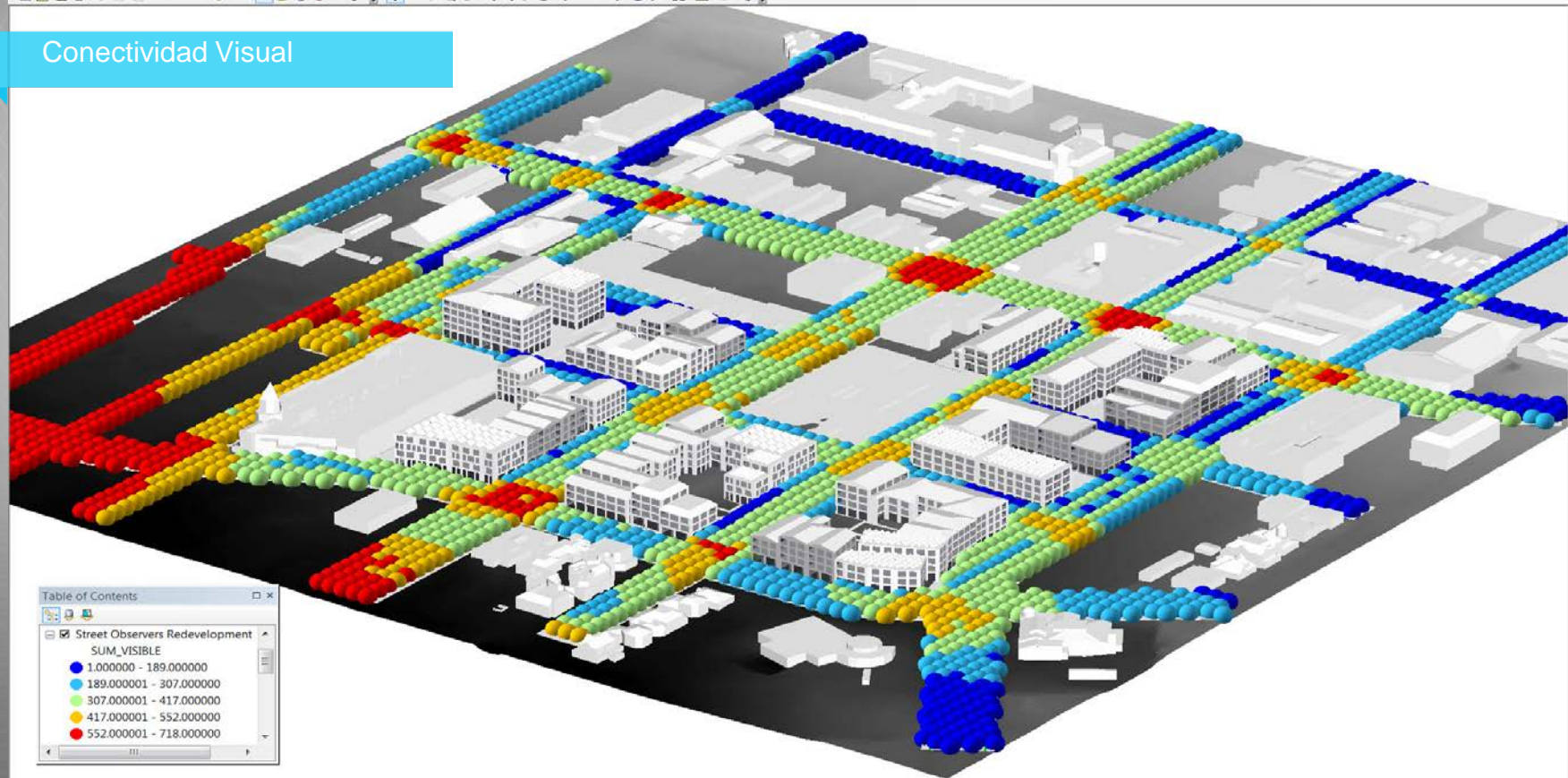


Prominencia Visual





## Conectividad Visual

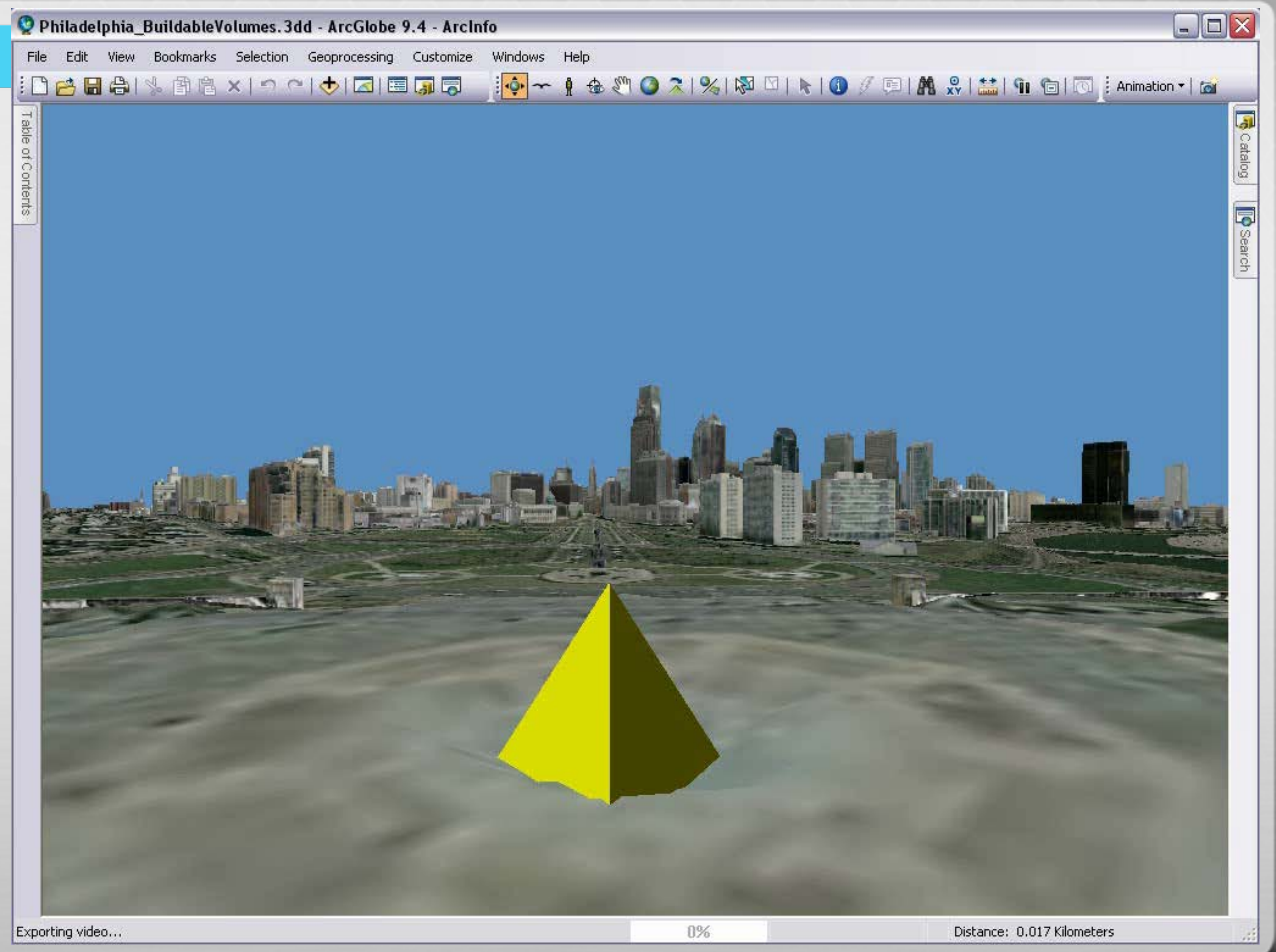




## Skyline and Skyline Barrier

Which buildings define our skyline? How high can we build without changing our skyline?

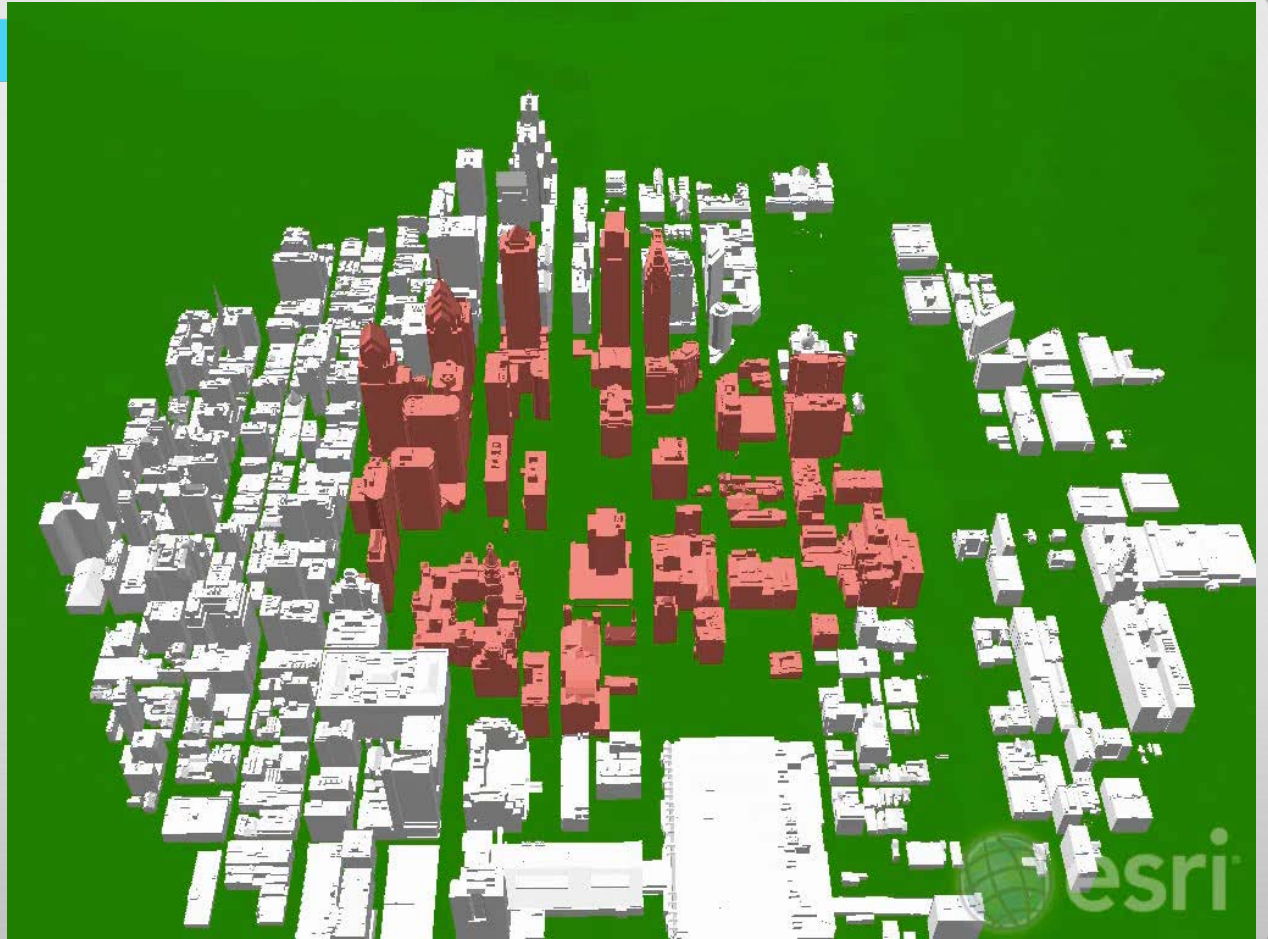
Intersect sample points with a surface created using skyline barrier, then using it to generate a buildable volume.



## Shadows and shadow maps

Where do shadows fall?  
How can we quantify their  
impact over time?

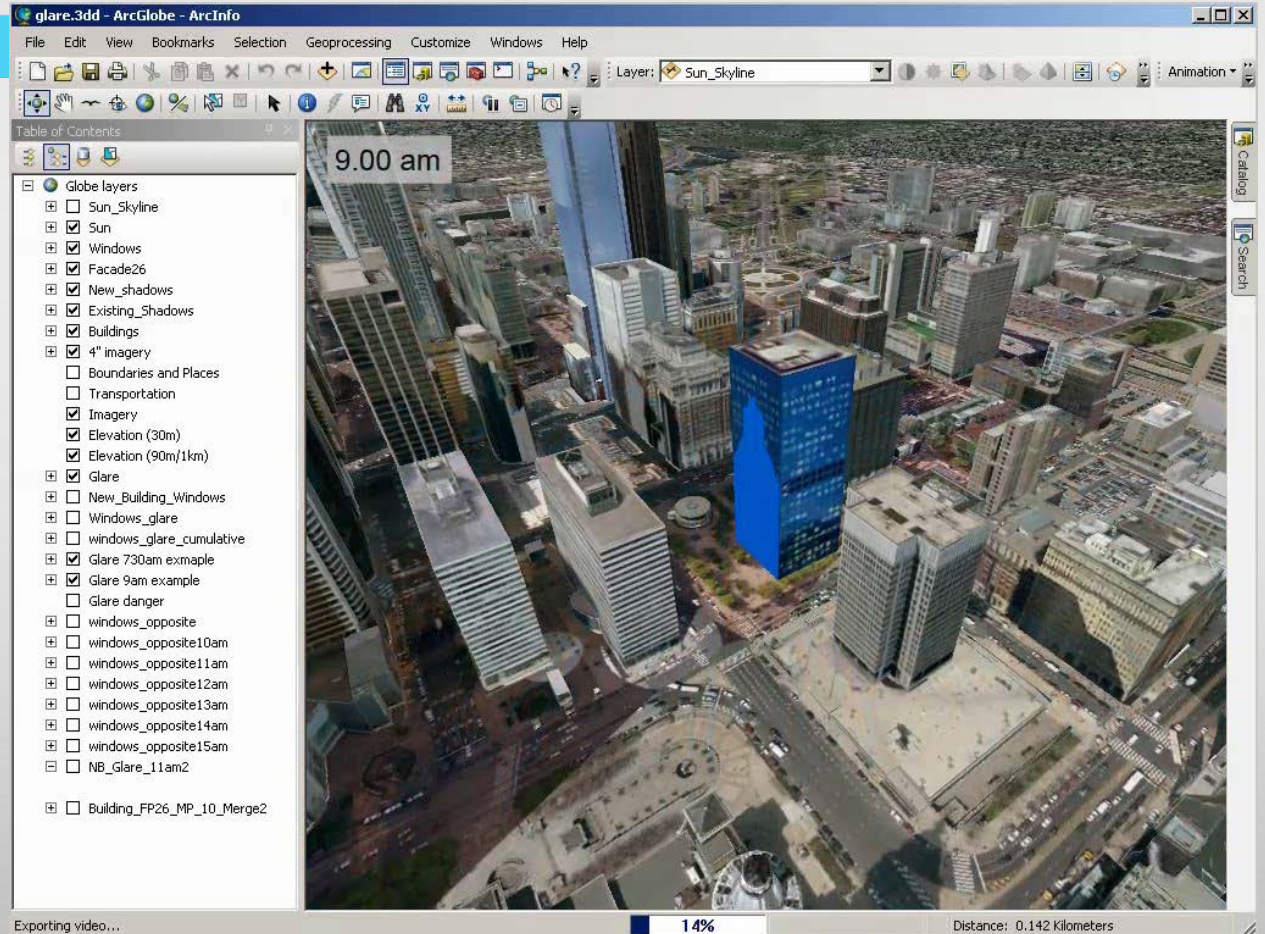
Intersection of shadows,  
at specified time intervals,  
for specified days in the  
year, on a park polygon.



## Estimación del Reflejo

Donde, aproximadamente, el sol va a reflejar el edificio propuesto sobre los edificios actuales.

3D intersection to extract faces in shade, then skyline volumes are used to simulate light volumes.



The screenshot displays the 'glare.3dd - ArcGlobe - ArcInfo' application window. The interface includes a menu bar (File, Edit, View, Bookmarks, Selection, Geoprocessing, Customize, Windows, Help), a toolbar, and a 'Table of Contents' panel on the left. The 'Table of Contents' lists various layers and simulation options, with 'Sun\_Skyline' selected. The main view shows a 3D cityscape with a blue building highlighted. A glare volume is visible, and a timestamp '9.00 am' is displayed in the top left of the view. The bottom status bar shows 'Exporting video...', '14%', and 'Distance: 0.142 Kilometers'.

glare.3dd - ArcGlobe - ArcInfo

File Edit View Bookmarks Selection Geoprocessing Customize Windows Help

Layer: Sun\_Skyline Animation

Table of Contents


- Globe layers
  - Sun\_Skyline
  - Sun
  - Windows
  - Facade26
  - New\_shadows
  - Existing\_Shadows
  - Buildings
  - 4" imagery
  - Boundaries and Places
  - Transportation
  - Imagery
  - Elevation (30m)
  - Elevation (90m/11km)
  - Glare
    - New\_Building\_Windows
    - Windows\_glare
    - windows\_glare\_cumulative
    - Glare 730am exmple
    - Glare 9am example
    - Glare danger
  - windows\_opposite
    - windows\_opposite10am
    - windows\_opposite11am
    - windows\_opposite12am
    - windows\_opposite13am
    - windows\_opposite14am
    - windows\_opposite15am
  - NB\_Glare\_11am2
- Building\_FP26\_MP\_10\_Merge2

9.00 am

Exporting video... 14% Distance: 0.142 Kilometers



# Recurros

ArcGIS Resources ArcGIS Online Sign In English 


[Home](#) [Communities](#) [Help](#) [Blog](#) [Forums](#) [Videos](#)

## CityEngine

Communities

### What is CityEngine?

CityEngine allows you to efficiently create 3D urban landscapes using your existing GIS data, as well as do conceptual exploration in 3D. Scenarios can be brought back into ArcGIS for further analysis or exported to high-end simulation engines or web clients. [Read more](#)



### Quick Links

**Getting Started with CityEngine**

- Install and Update
- System Requirements

**Help**

- CityEngine Help!

**Other Links**


- What's new in CityEngine 2012.1?
- CityEngine Gallery
- Knowledge Base
- Ideas
- Support

**Related Communities**


- 3D GIS Resources

### Gallery


[More Gallery posts](#)




Example Redlands Redevelopment




3D Zoning Validation



3DCity Maintenance (part 3)



3DCity Data Preparation (part 1)



3DCity Creation (part 2)

### Recent Blog Posts

[More Blog posts](#)

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### Featured Videos

[More Videos](#)



Publish 3D city scenes directly to the web for sharing 3D models, analysis results or design proposals with decision makers or the public. Based on WebGL technology, no plugin is required for most browsers. 12



CityEngine 2012.1 fully supports the Esri file



## Example Redlands 2013 Redevelopment Training



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full integration



user experience



# 3D GIS for everyone





[www.esri.com/cityengine](http://www.esri.com/cityengine)

