3D Visualization of the 14.4 Mile Multi-lane, Multi-level DFW Connector Corridor in North Texas

Jeff Christiansen

Managing Director of Visual Science & Technology

HALFF

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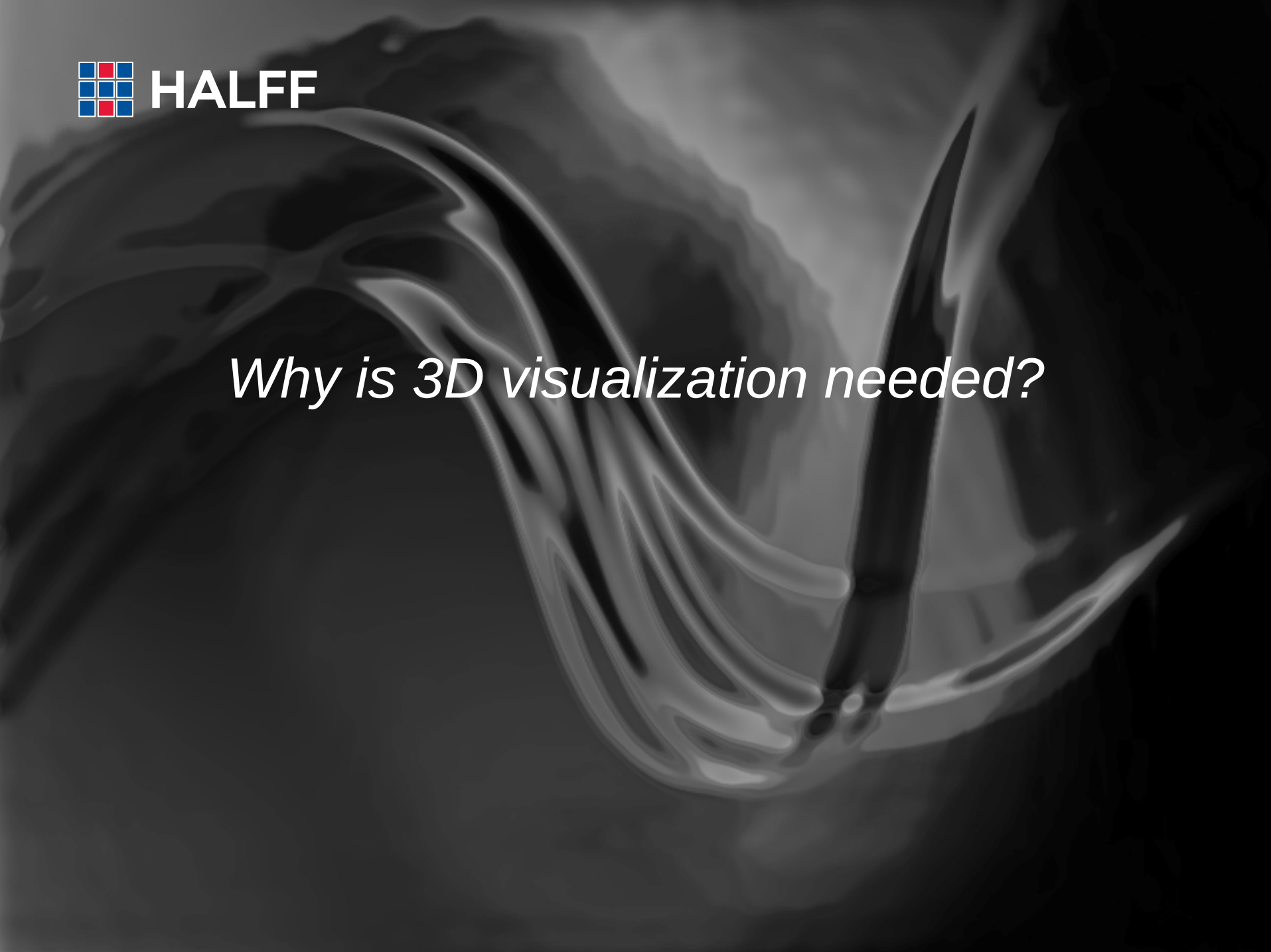
Real or Not?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Why is 3D visualization needed?

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Why is 3D visualization needed?

Stakeholder awareness

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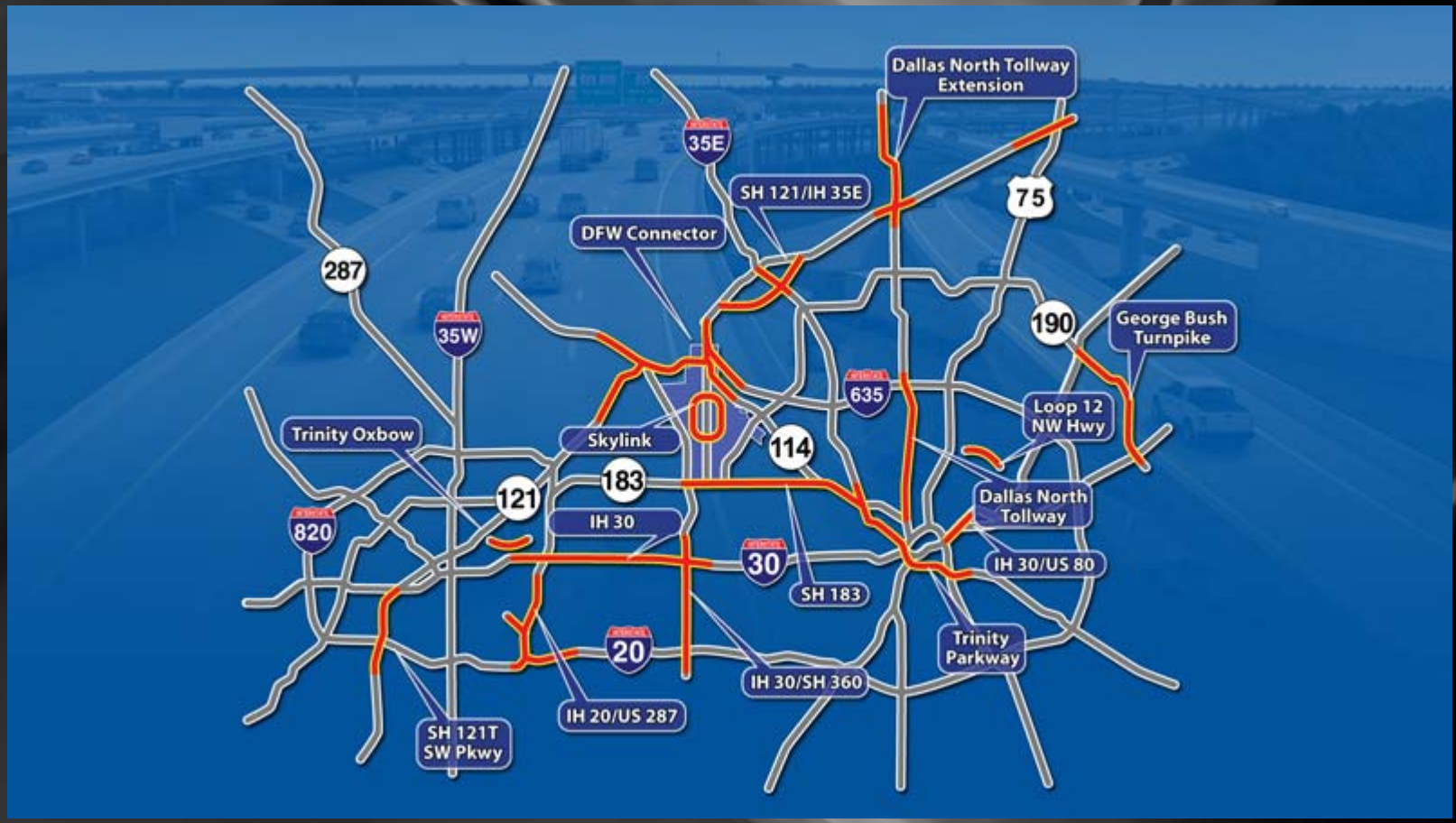
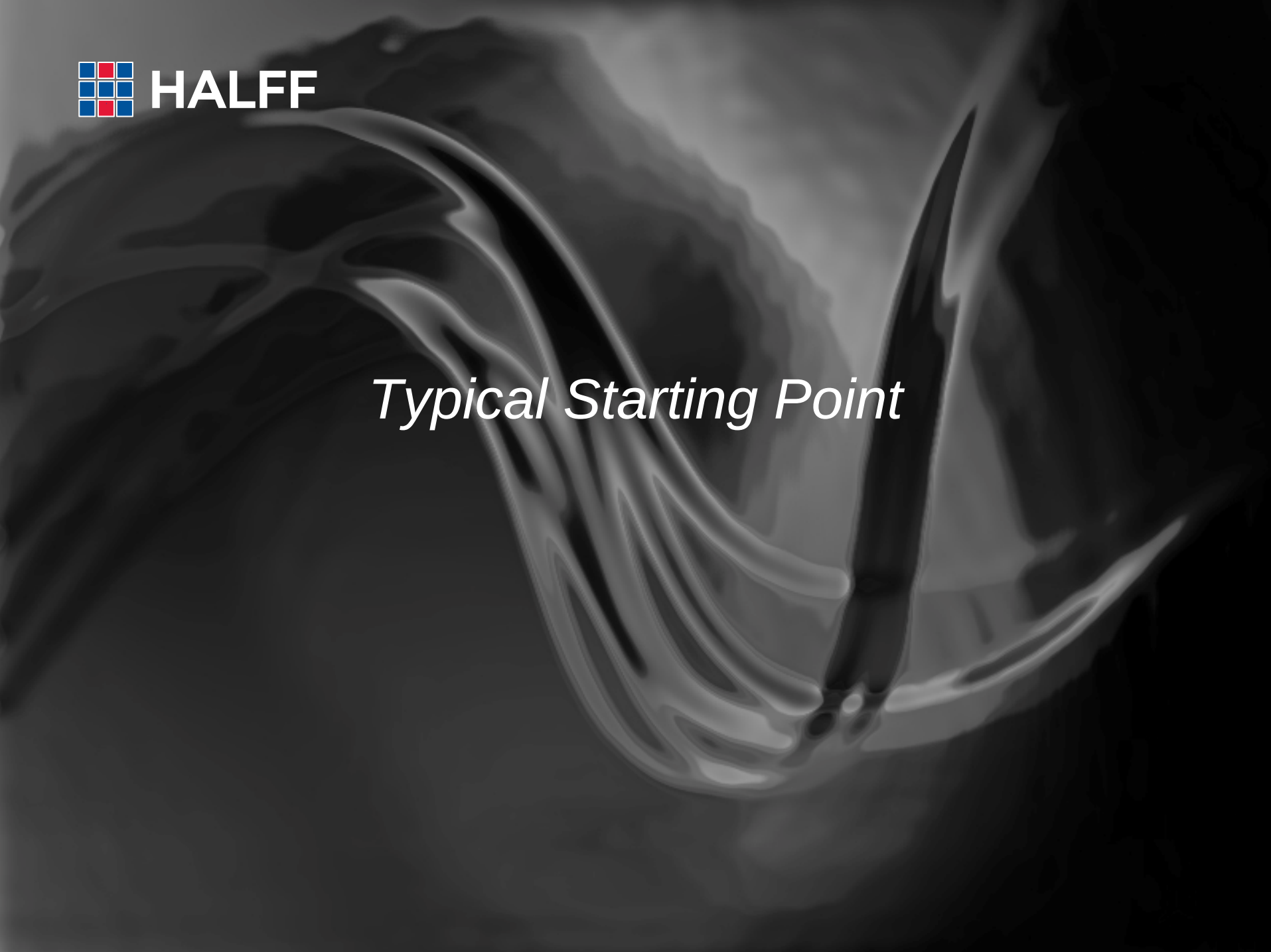


Some of the 200 miles of roadway visualized in North Texas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Typical Starting Point

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Typical Starting Point

Very detailed schematics with every layer imaginable turned on, such that the general public cannot engage in an educated discussion.

The visualization allows a discussion to occur efficiently and in a public forum.

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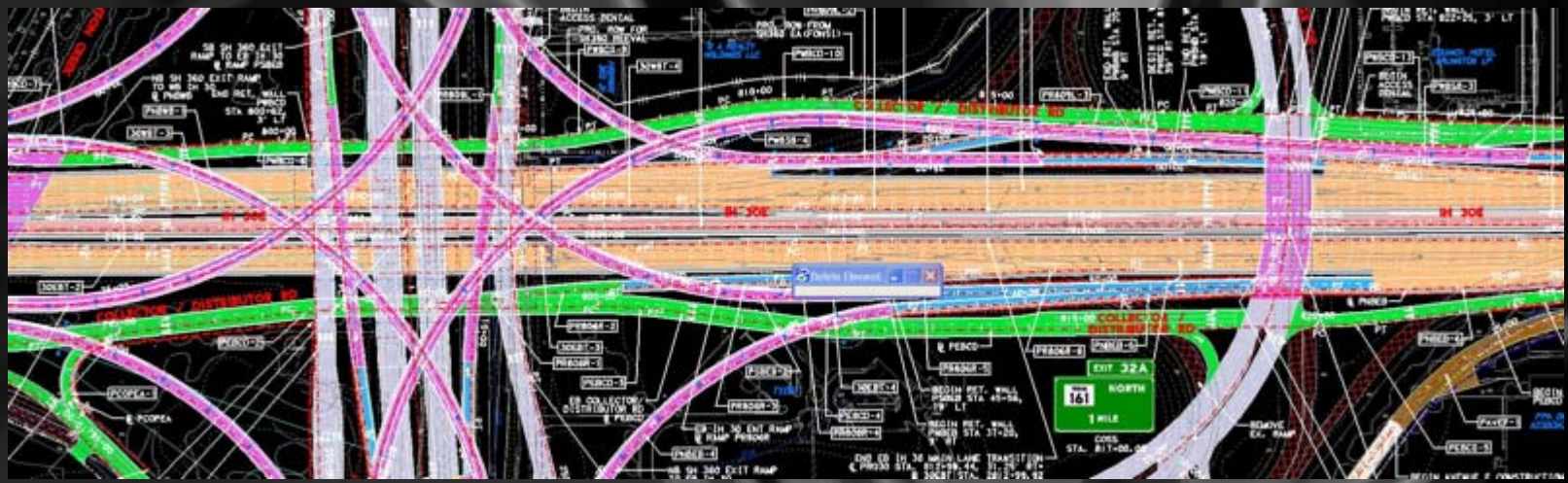
Look familiar?



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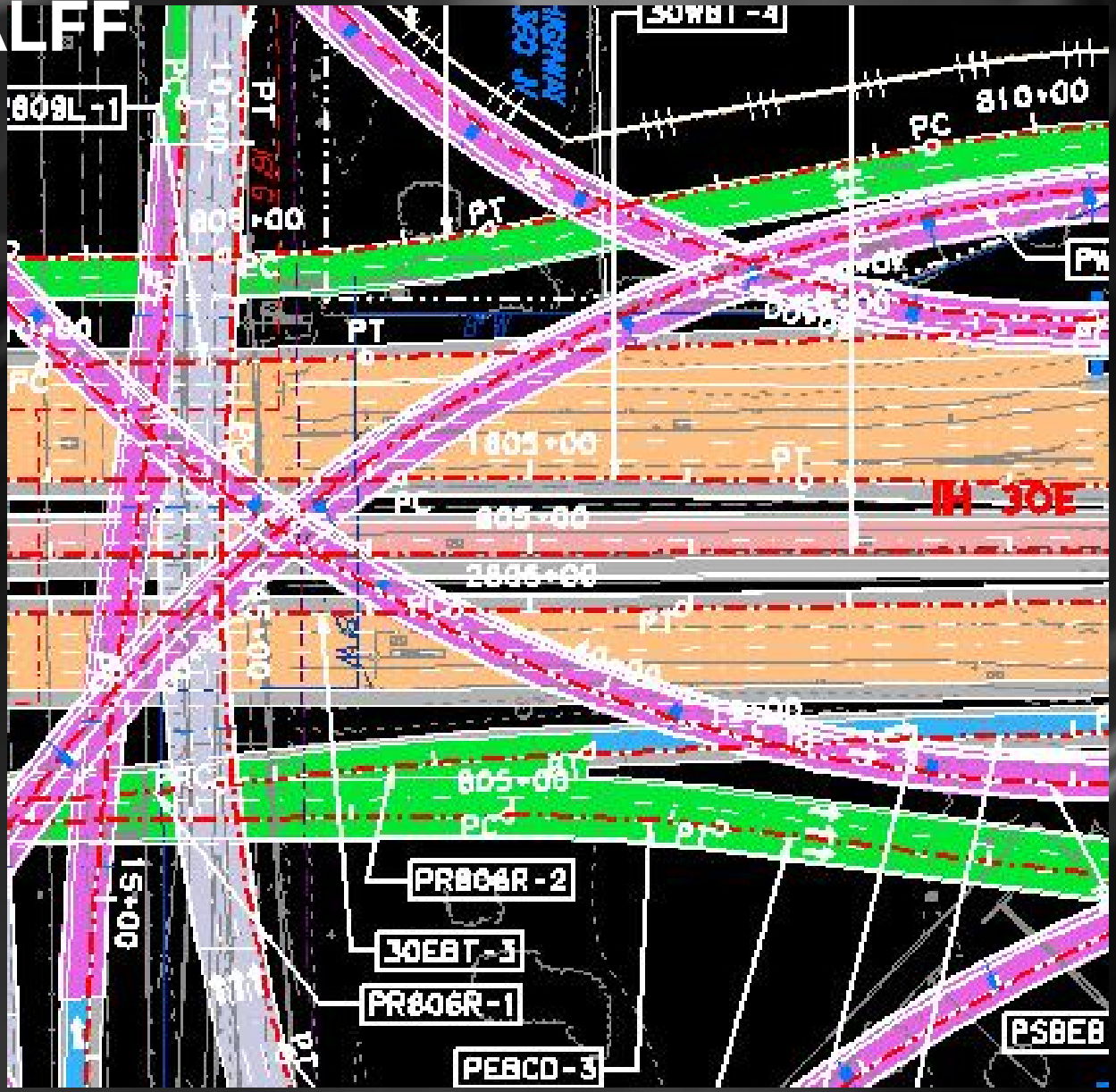

30WBT-4
810+00
PC
PT
IH 30E
PR806R-2
30EBT-3
PR806R-1
PEBCD-3
PSBEB

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Orthorectified 6 inch Aerial Data
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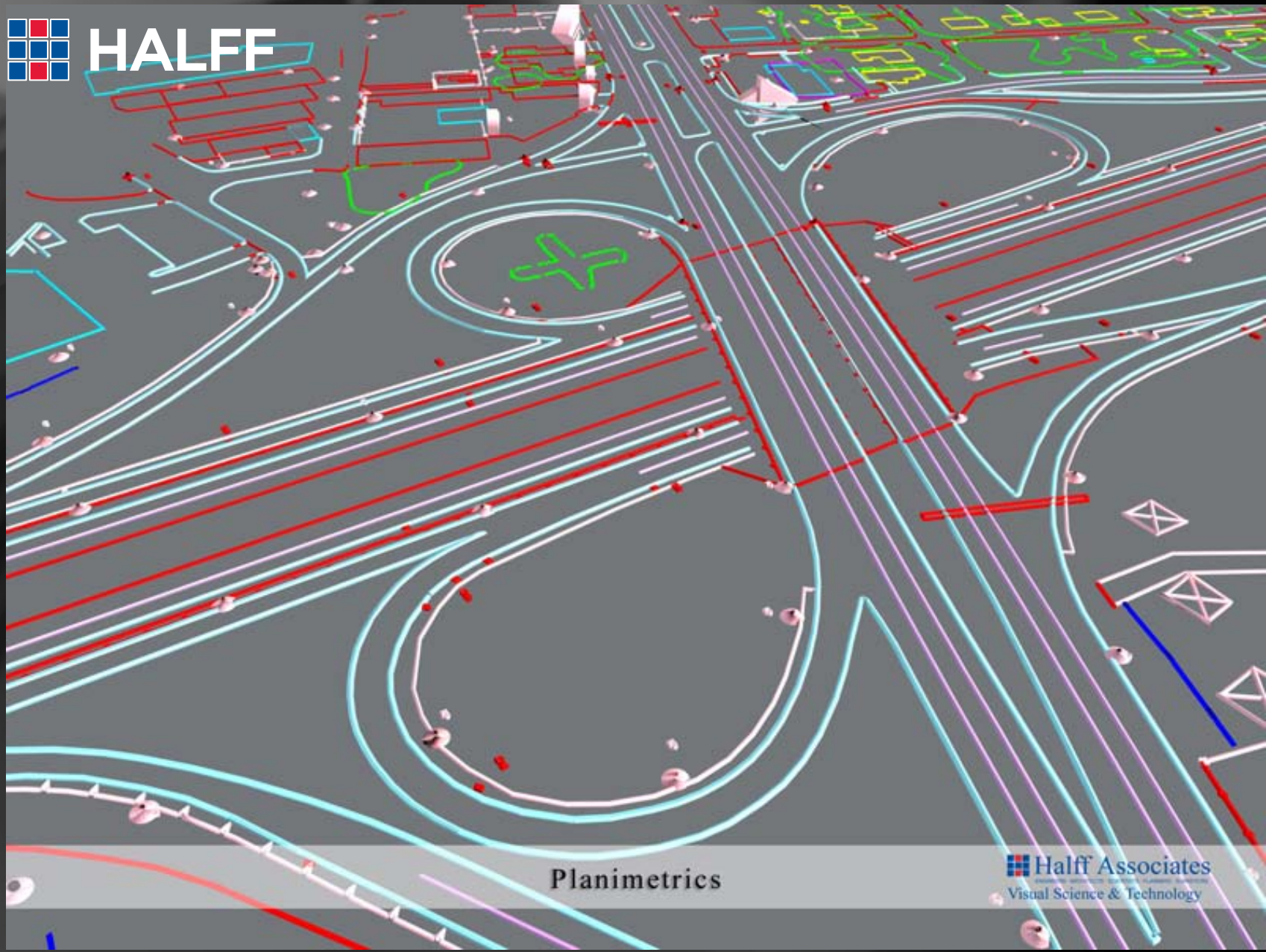
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Planimetrics
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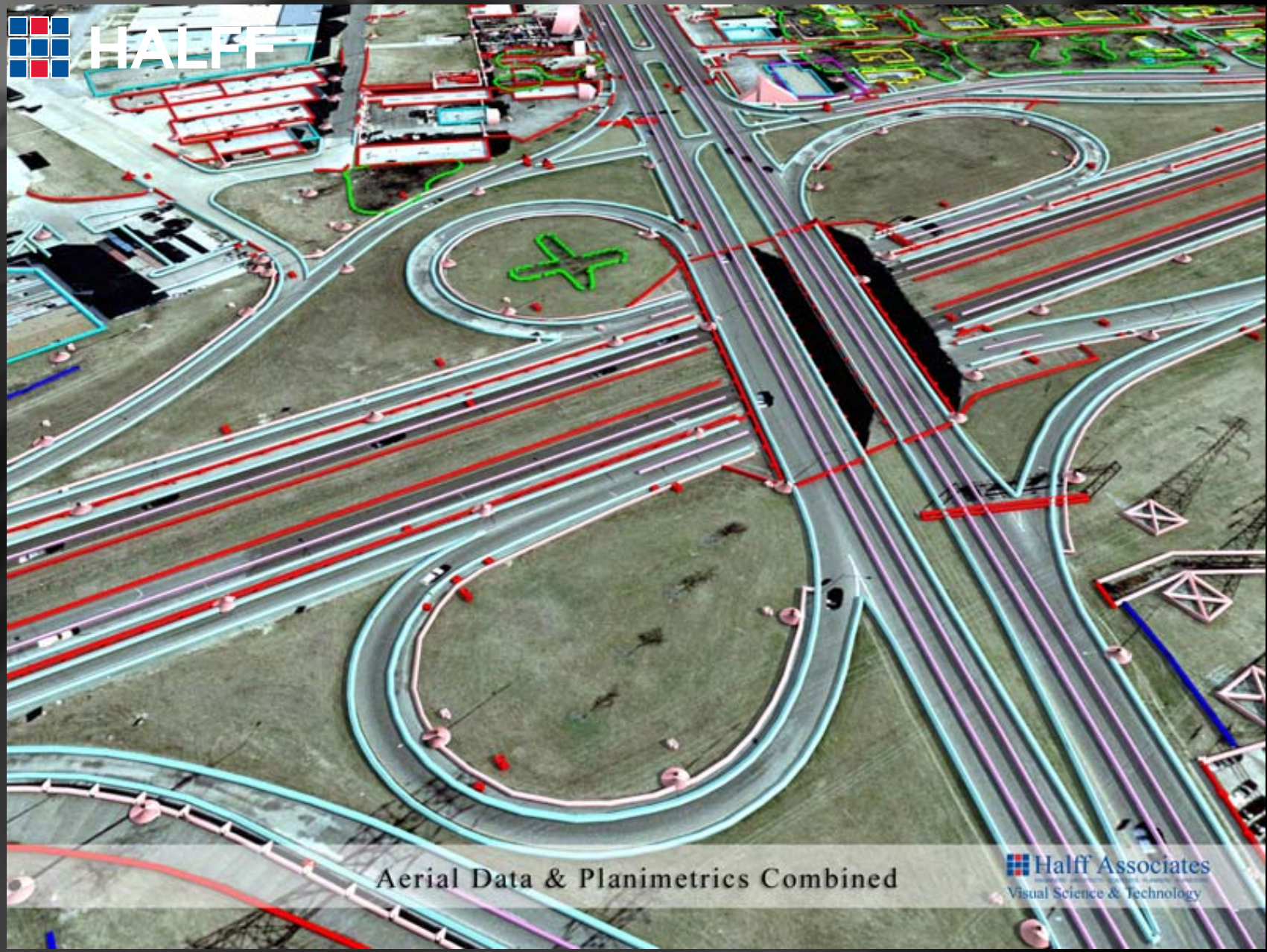
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Aerial Data & Planimetrics Combined
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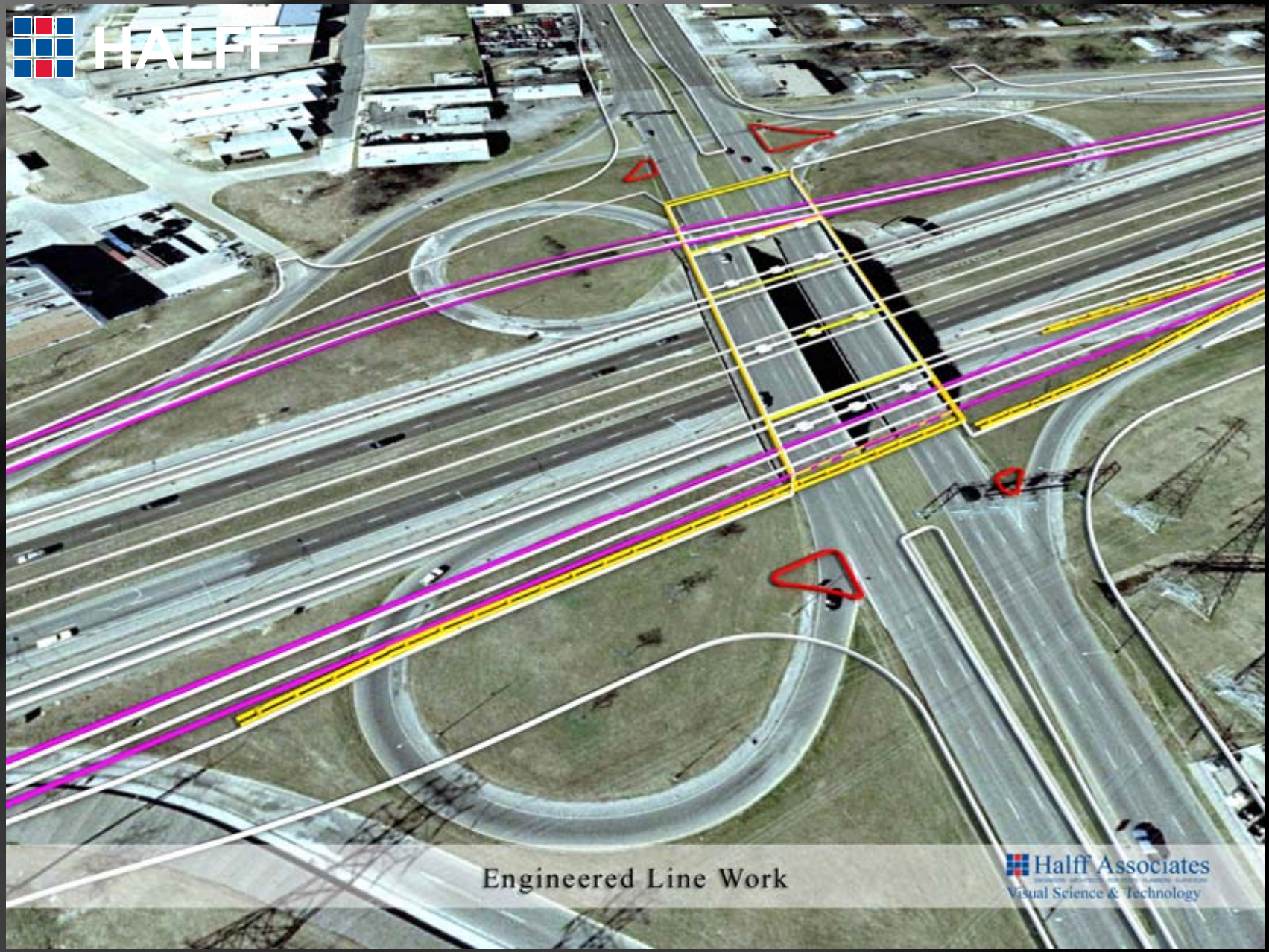
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Engineered Line Work
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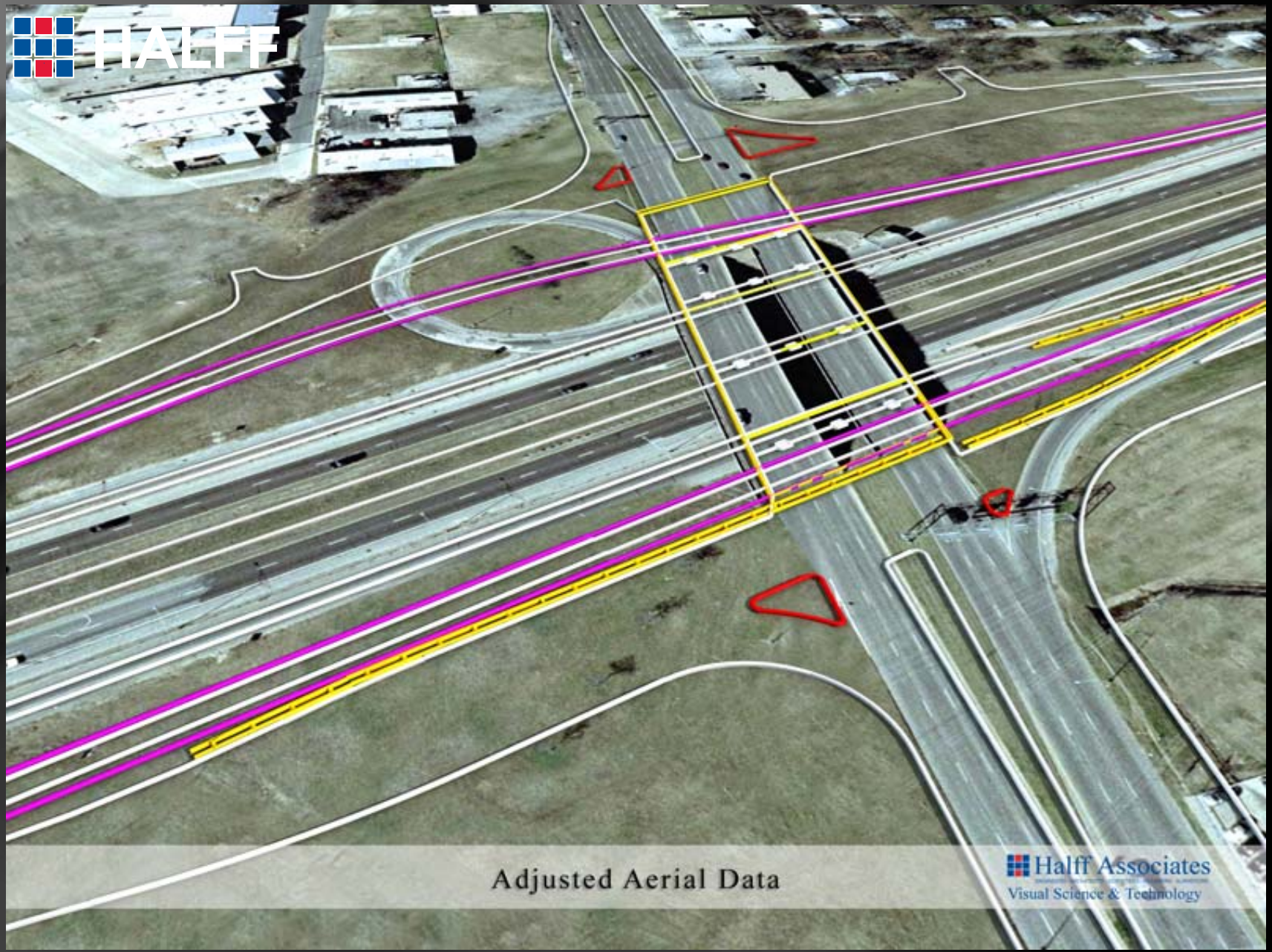
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Adjusted Aerial Data
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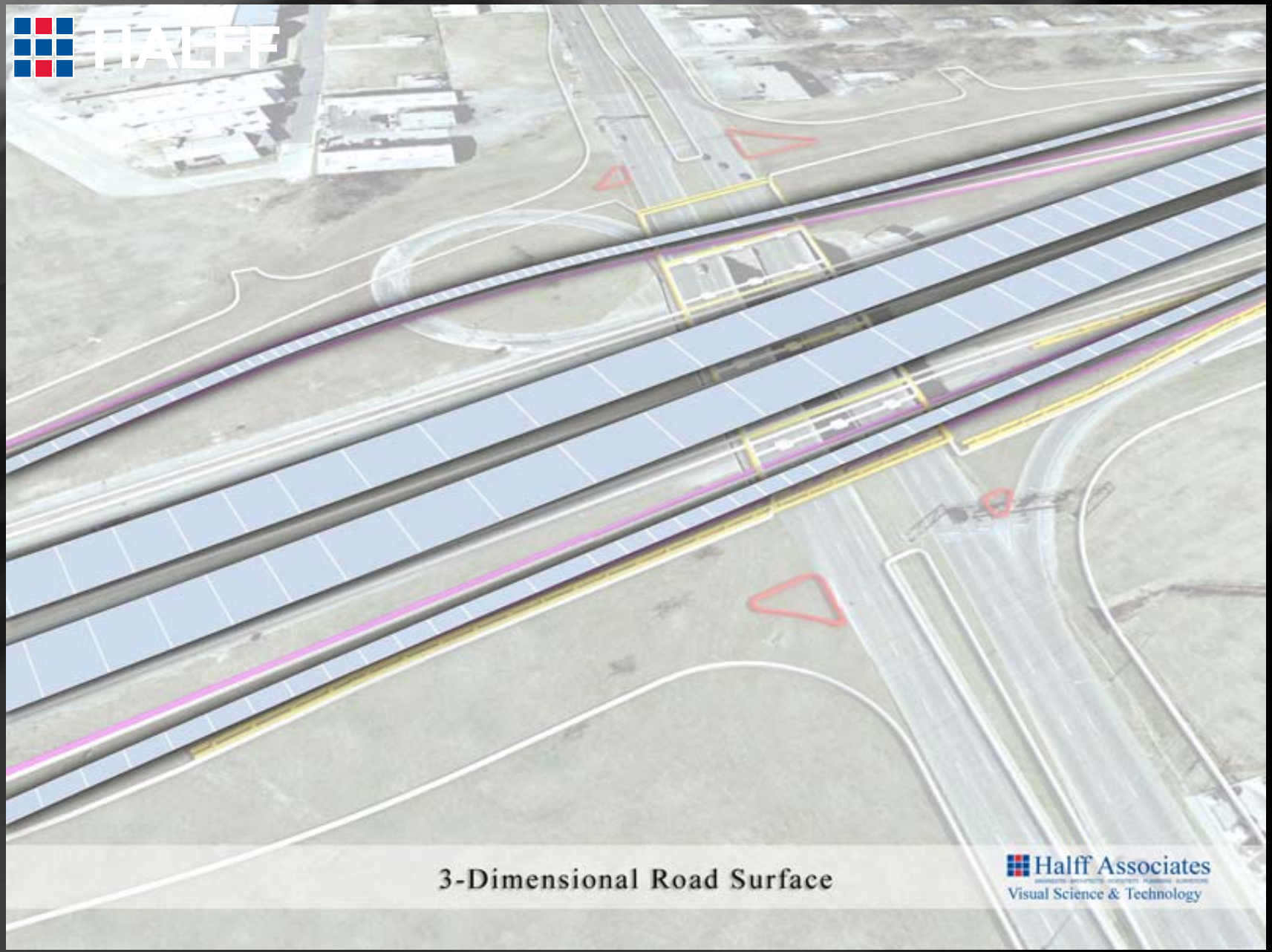
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3-Dimensional Road Surface
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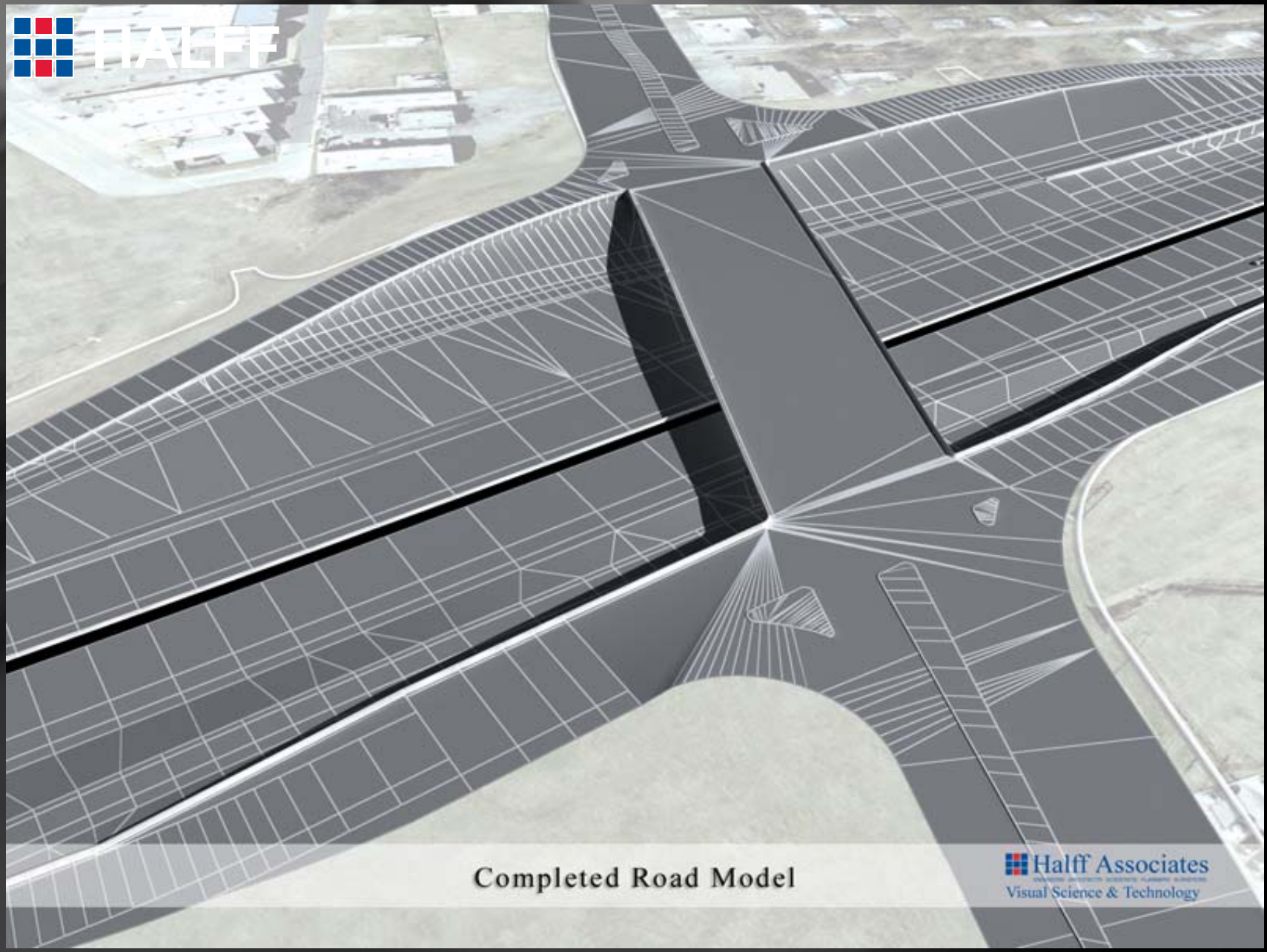
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Completed Road Model
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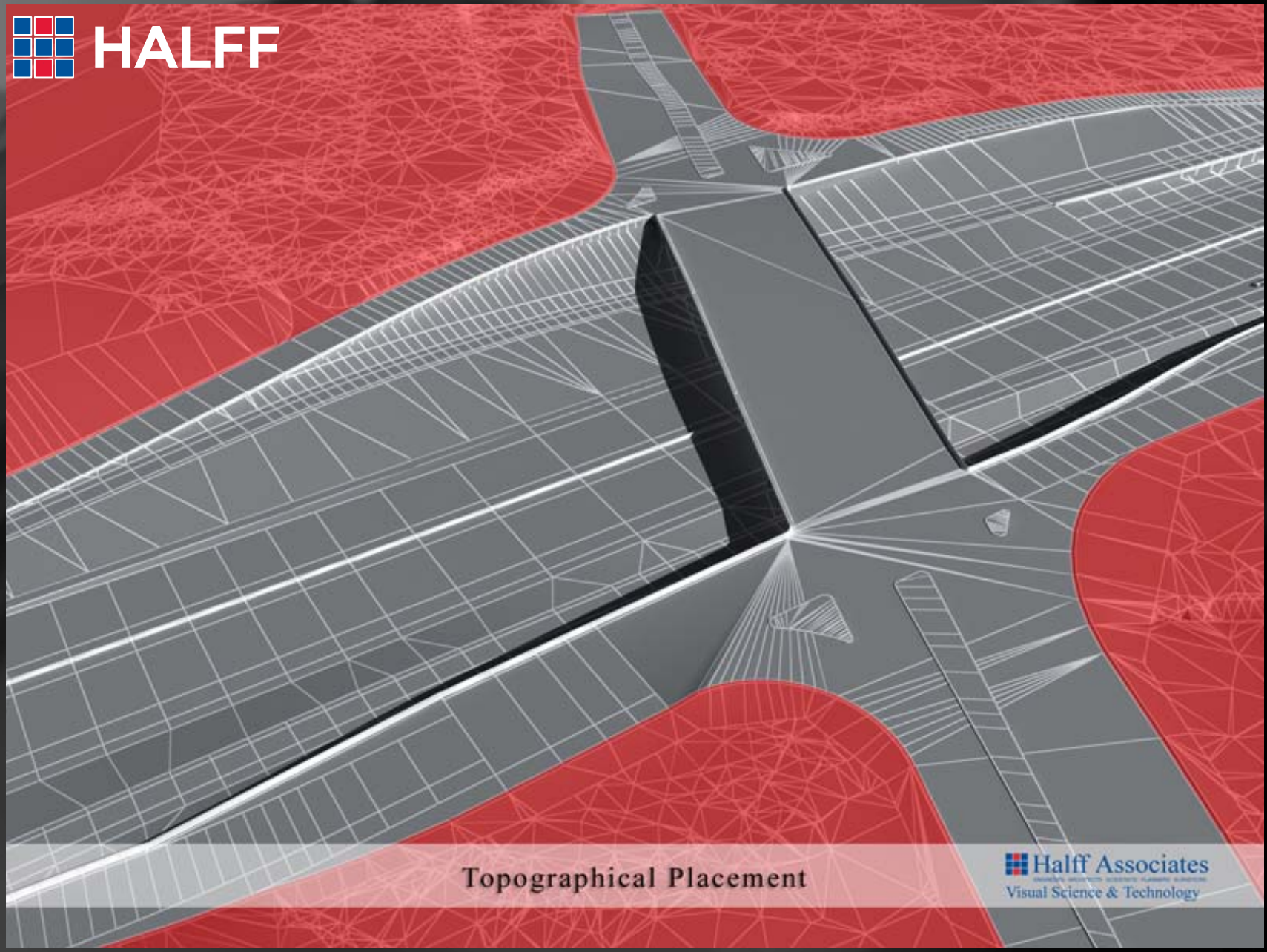
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Topographical Placement
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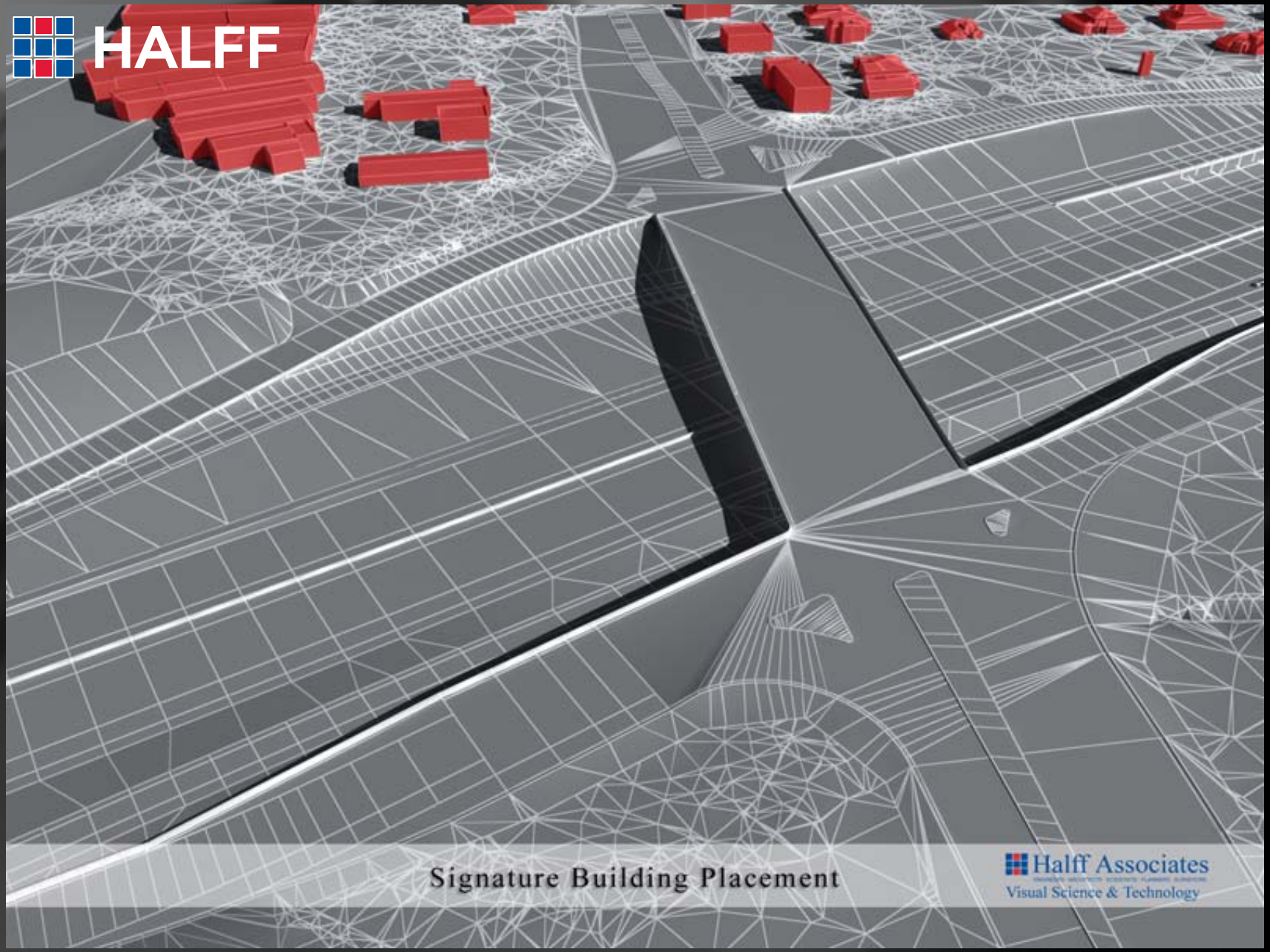
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Signature Building Placement
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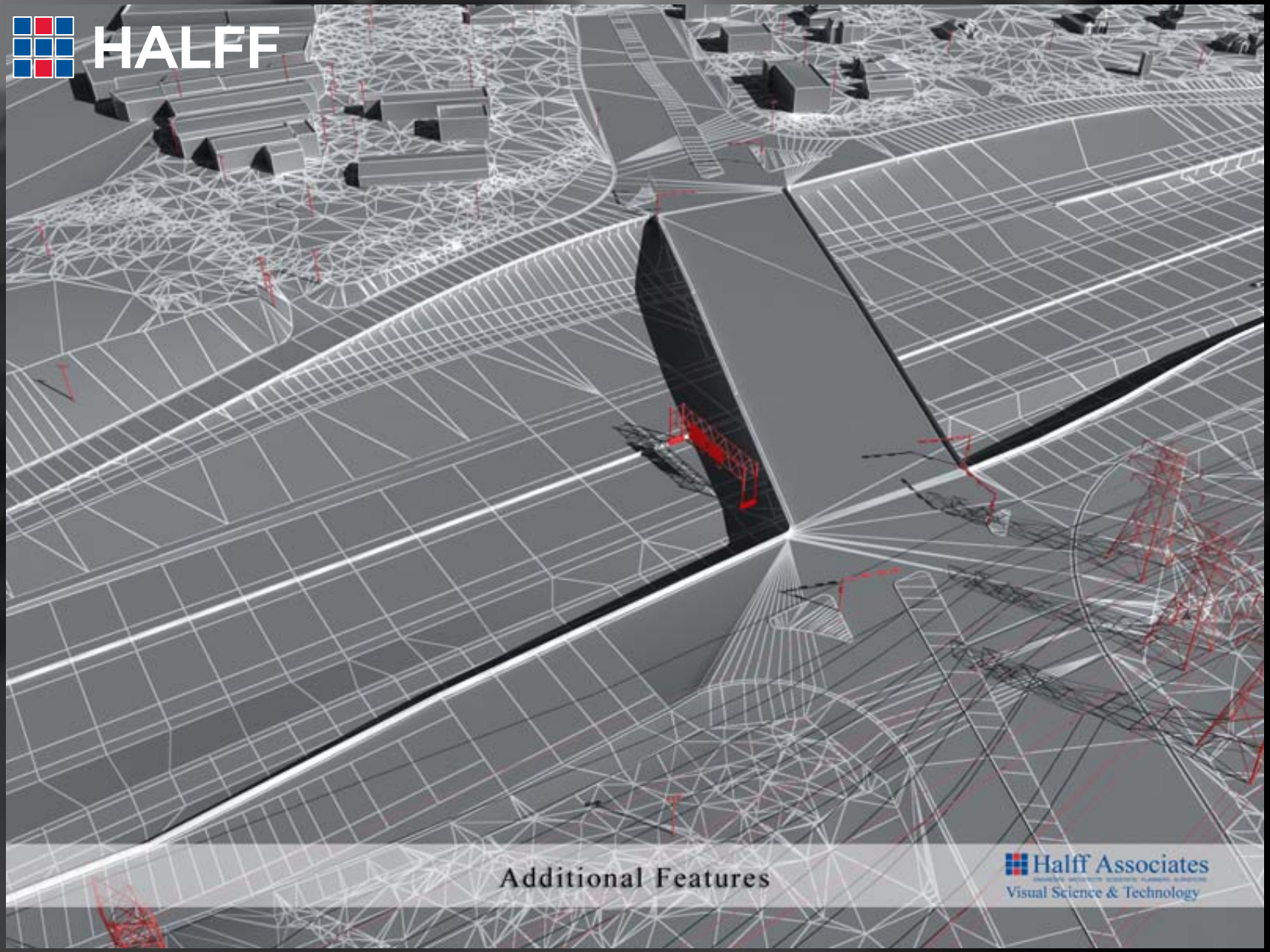
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Additional Features
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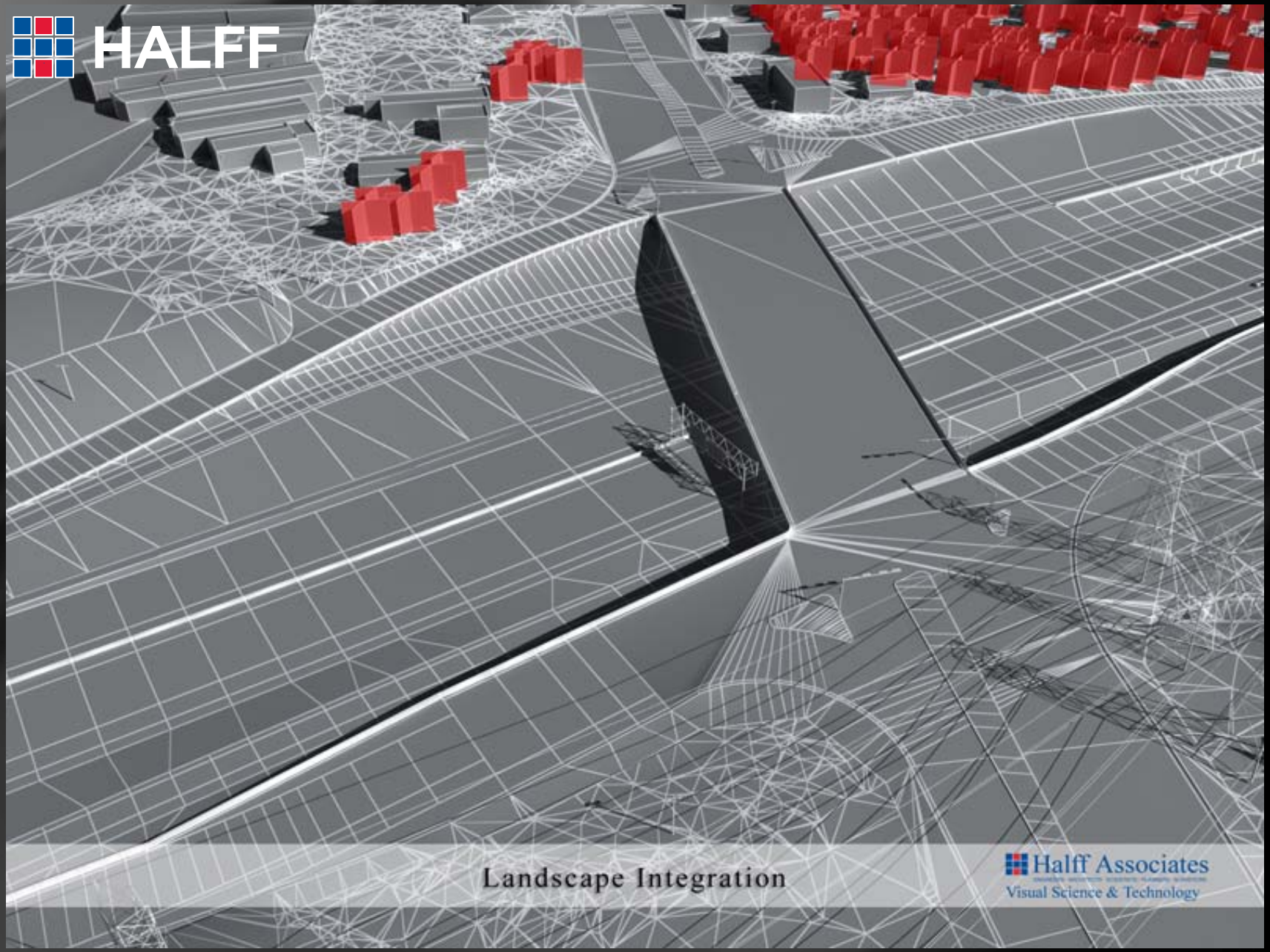
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Landscape Integration
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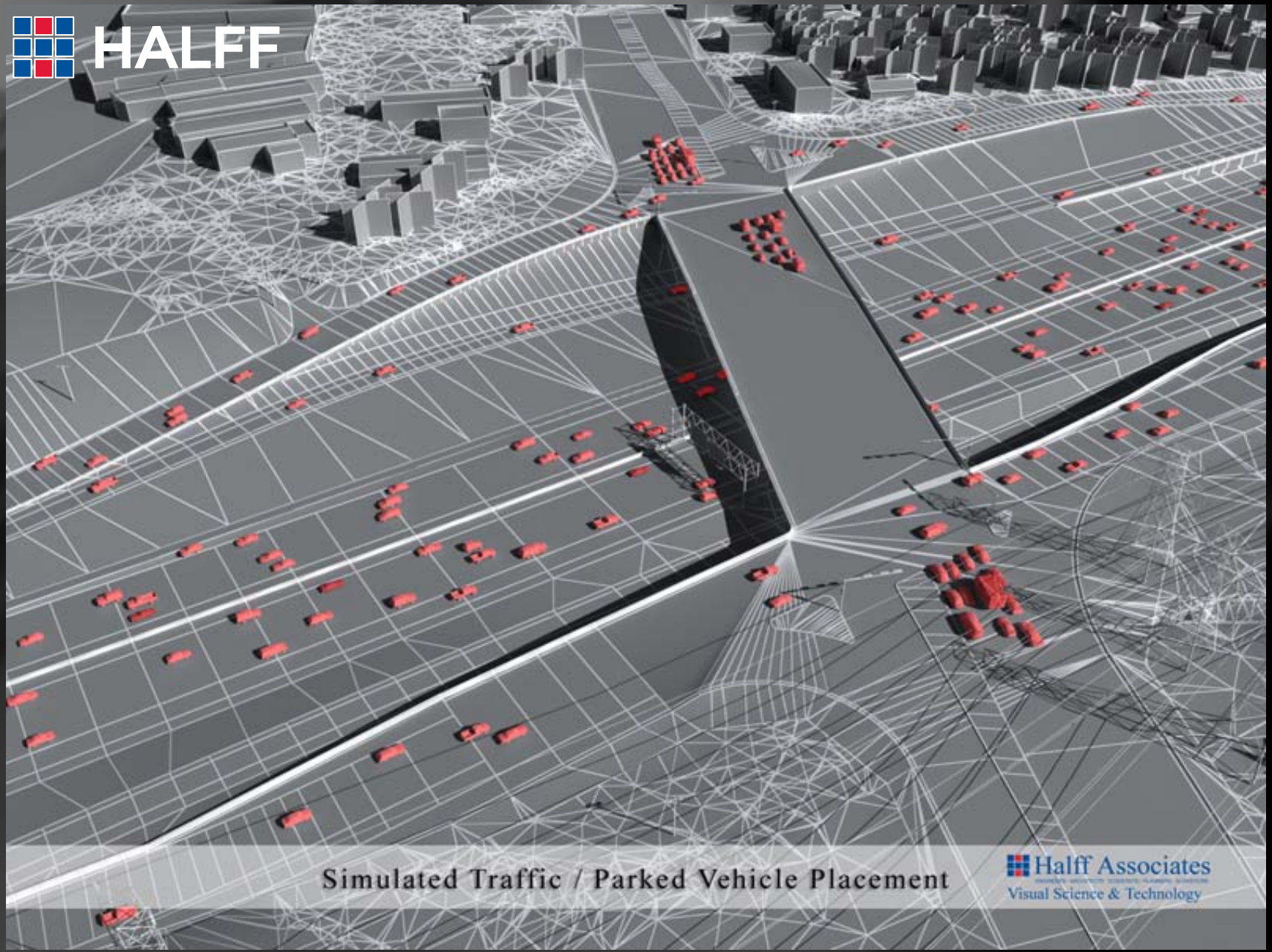
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Simulated Traffic / Parked Vehicle Placement
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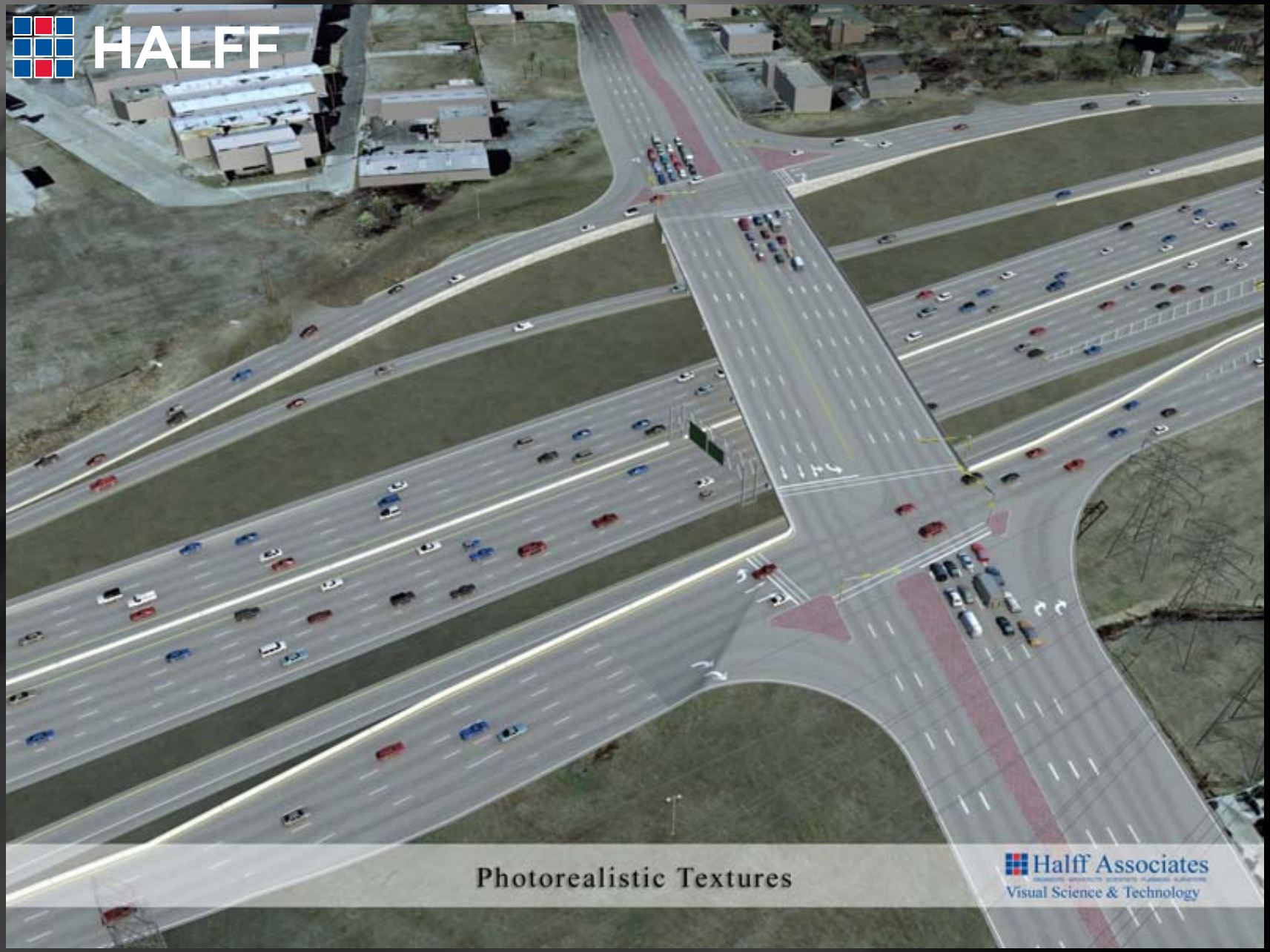
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Photorealistic Textures
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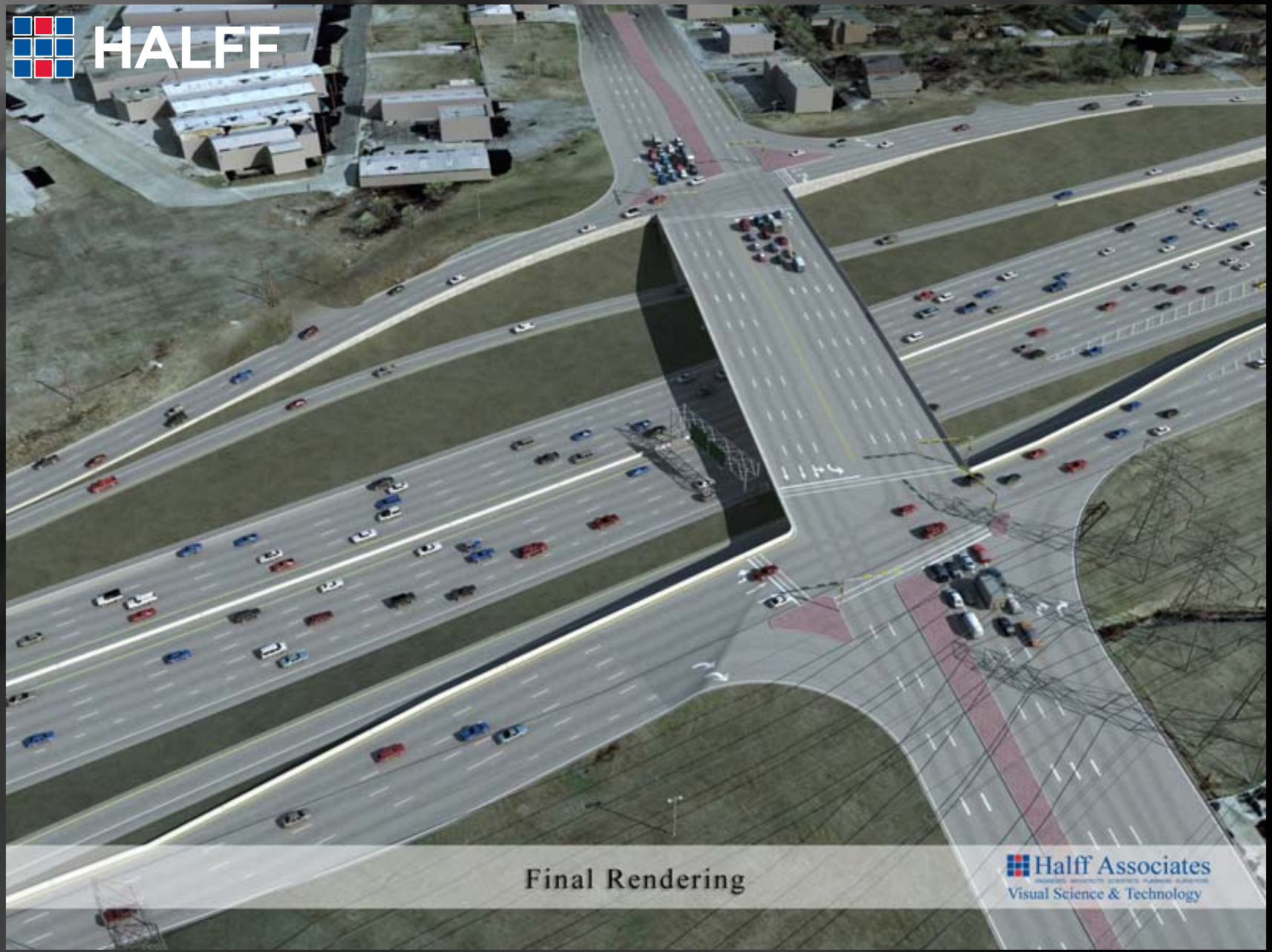
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Final Rendering
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Real or Not?

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60% Project Deliverable

Prior to signature landmark/building/geographical structures being added to the 3D model, a roadway design review is completed of the entire corridor, regardless of size.

We are typically the first to try and tie all the 2D elements together in a 3D manner – an eye opener for everyone involved.

Bridge alignments are usually the problematic areas, with ROW constraints being a very close second.

Aesthetic treatments are becoming more important.

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Real or Not?

HALFF
DVD Presentation

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DFW Connector Specifics

Number of animated lanes of traffic…

HALFF

DFW Connector Specifics

Number of animated lanes of traffic…

174

HALFF

DFW Connector Specifics

Number of animated lanes of traffic…

174

Number of animated vehicles in the scene…

HALFF

DFW Connector Specifics

Number of animated lanes of traffic…

174

Number of animated vehicles in the scene…

7,451

HALFF

DFW Connector Specifics

Number of animated lanes of traffic…

174

Number of animated vehicles in the scene…

7,451

Number of parked vehicles…

HALFF

DFW Connector Specifics

Number of animated lanes of traffic…

174

Number of animated vehicles in the scene…

7,451

Number of parked vehicles…

19,996

HALFF

DFW Connector Specifics

Number of animated lanes of traffic…

174

Number of animated vehicles in the scene…

7,451

Number of parked vehicles…

19,996

Number of placed trees…

HALFF

DFW Connector Specifics

Number of animated lanes of traffic…

174

Number of animated vehicles in the scene…

7,451

Number of parked vehicles…

19,996

Number of placed trees…

143,681 (6 predominant species)

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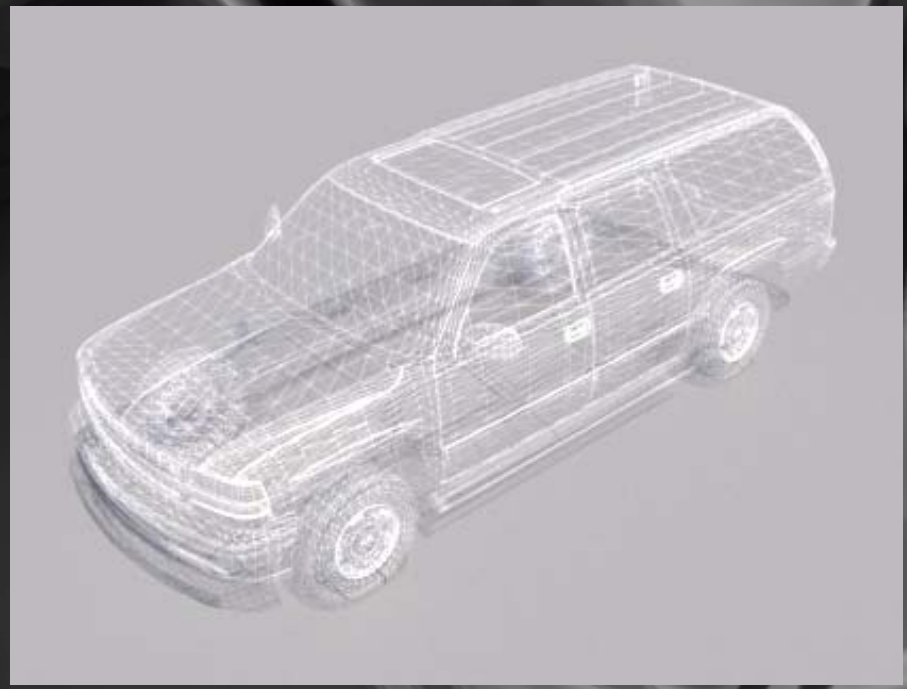
DFW Connector Specifics



51,324 polygons

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DFW Connector Specifics

51,324 polygons

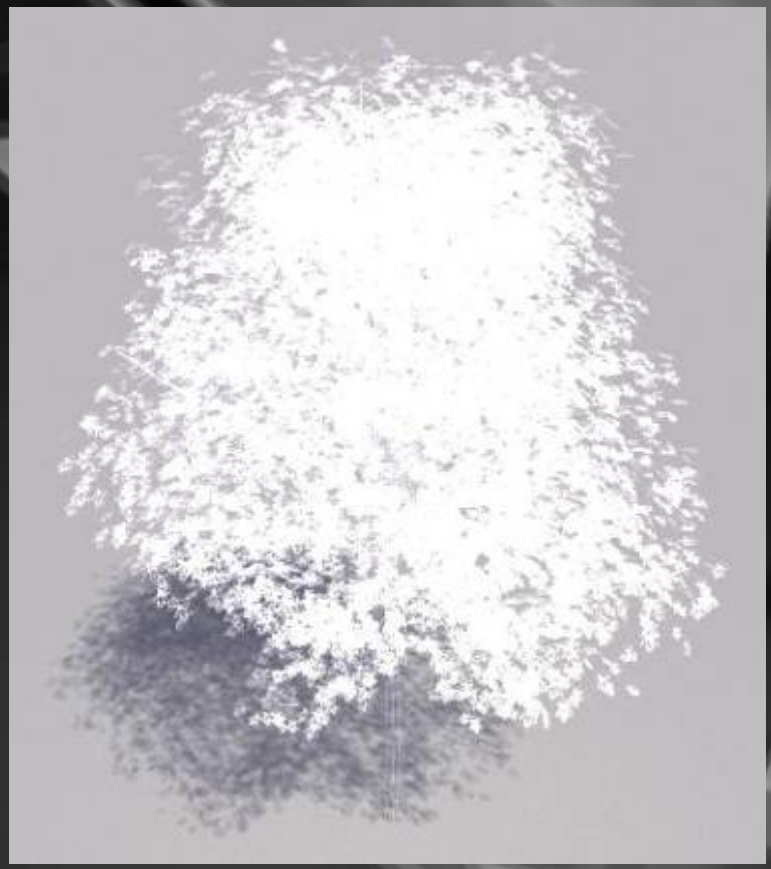
HALFF

DFW Connector Specifics

51,324 polygons

HALFF

DFW Connector Specifics



210,971 Polygons

HALFF

DFW Connector Specifics

210,971 Polygons

HALFF

DFW Connector Specifics

210,971 Polygons

HALFF

DFW Connector Specifics

Total Vehicle Polygons = ?

Total Tree Polygons = ?

HALFF

DFW Connector Specifics

Total Vehicle Polygons = ?

601,135,600

Total Tree Polygons = ?

HALFF

DFW Connector Specifics

Total Vehicle Polygons = ?

601,135,600

Total Tree Polygons = ?

14,451,542,000

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3D Visualization 101

30 frames a second / 1800 frames a minute
think digital flipbook

Each digital frame is rendered separately

*Each *.jpg can take 5 hours to render*

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DFW Connector Specifics

A total of 25,200 frames were rendered for the final deliverable

A standard definition frame is 720 x 405 pixels, while a high definition frame is 1,920 x 1,080 pixels.

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Slowest Computers = 5 hours to render a single frame
126,000 hours of rendering time (14.4 years)

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126,000 hours of rendering time (14.4 years)

and

Fastest Computers = 0.2 hours to render a single frame
5,040 hours of rendering time (0.57 years)

HALFF

DFW Connector Specifics

A total of 25,200 frames were rendered for the final deliverable

A standard definition frame is 720 x 405 pixels, while a high definition frame is 1920 x 1080 pixels.

Slowest Computers = 5 hours to render a single frame
126,000 hours of rendering time (14.4 years)

and

Fastest Computers = 0.2 hours to render a single frame
5,040 hours of rendering time (0.57 years)

A total of 335,000 frames were rendered throughout the project.

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DFW Connector Specifics

Rendering in multiple layers due to complexity

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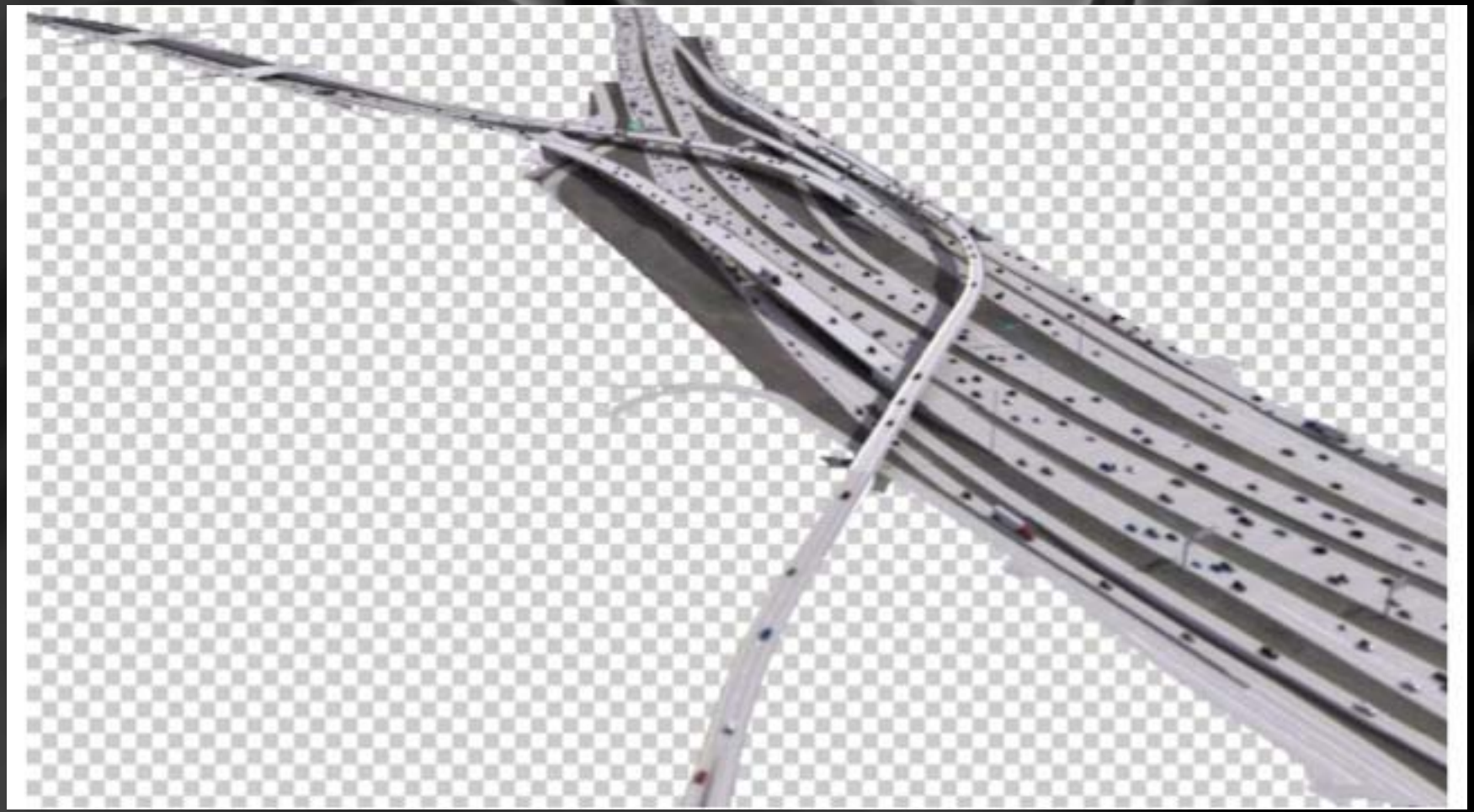
DFW Connector Specifics

HALFF

DFW Connector Specifics



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DFW Connector Specifics

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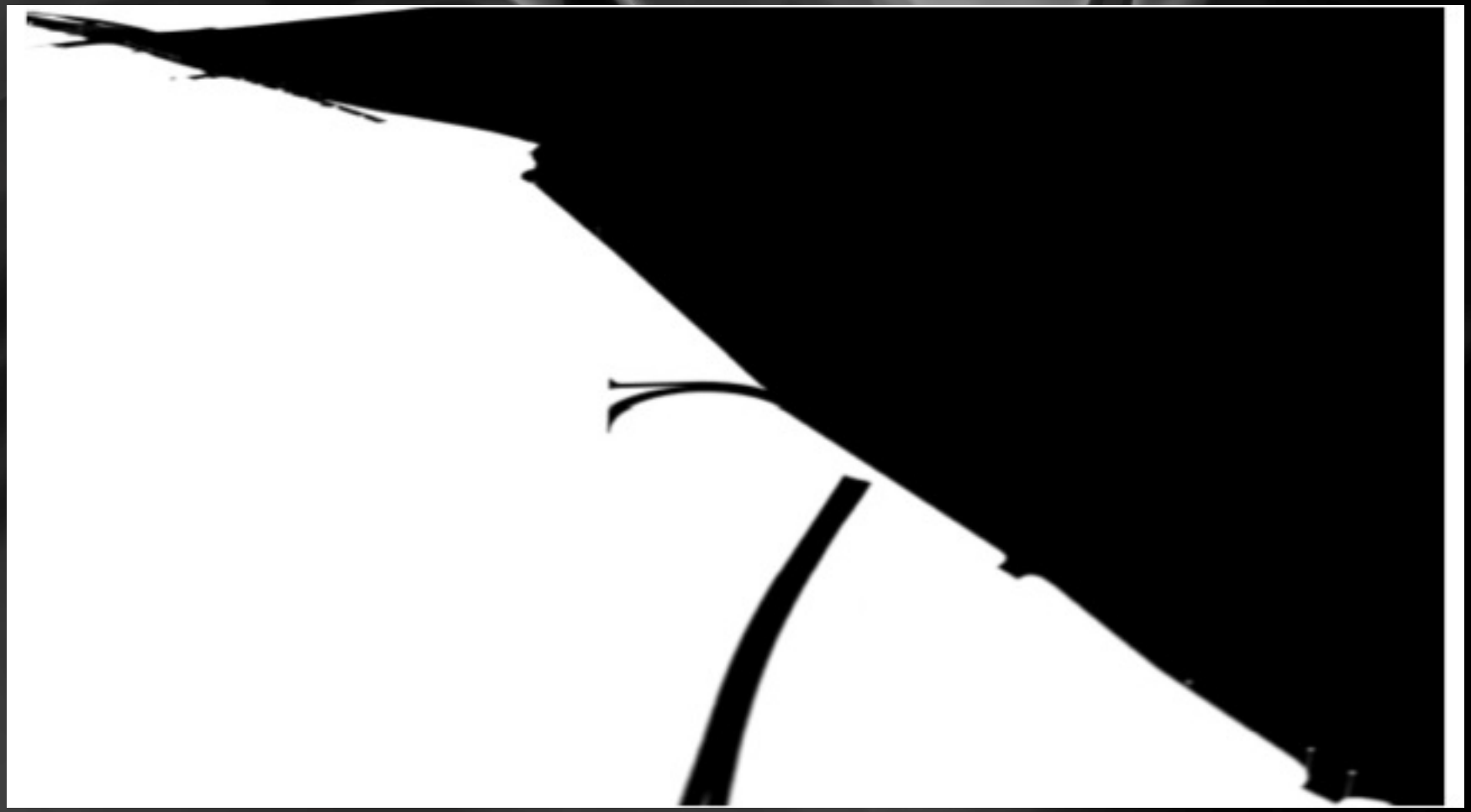
DFW Connector Specifics



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DFW Connector Specifics

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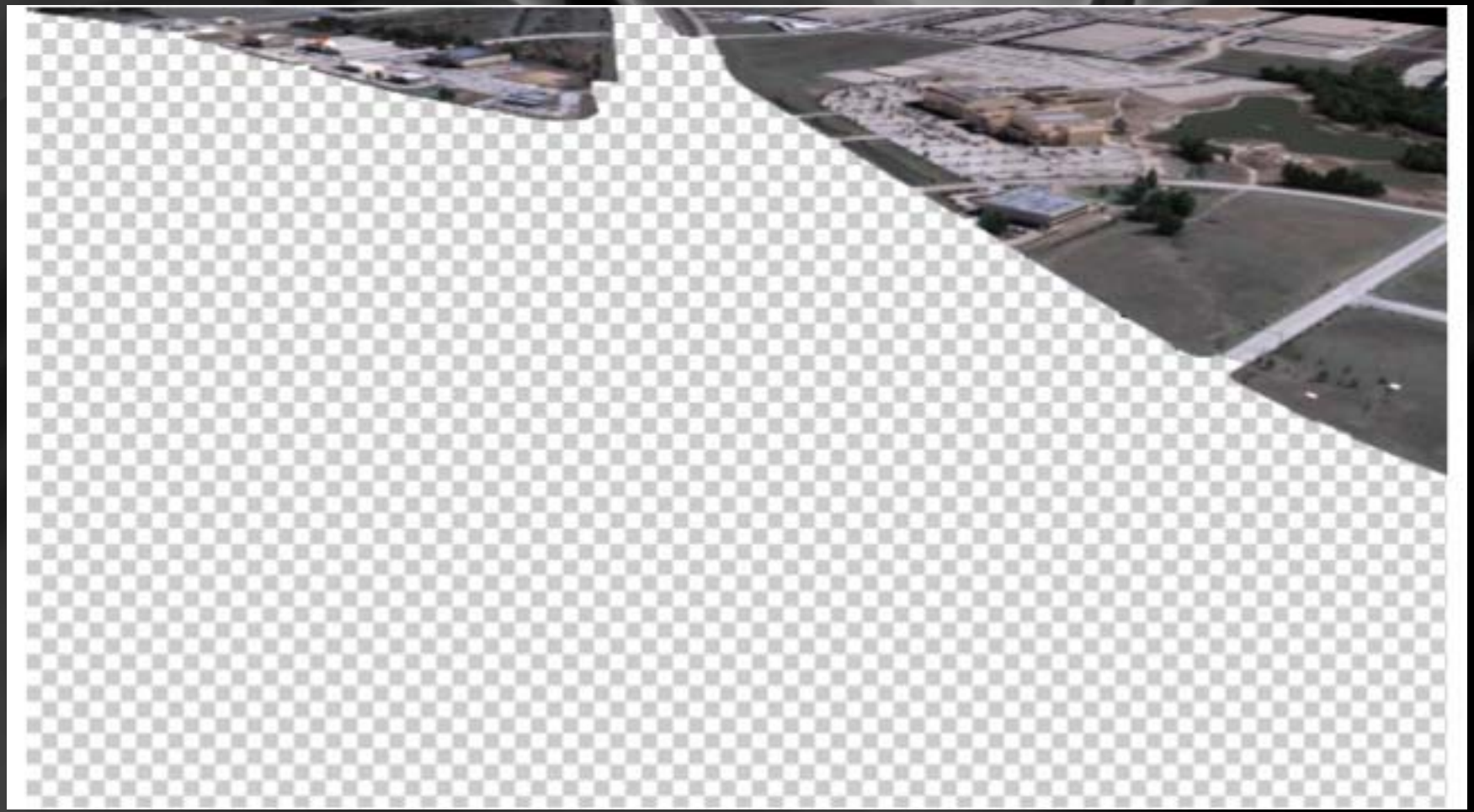
DFW Connector Specifics



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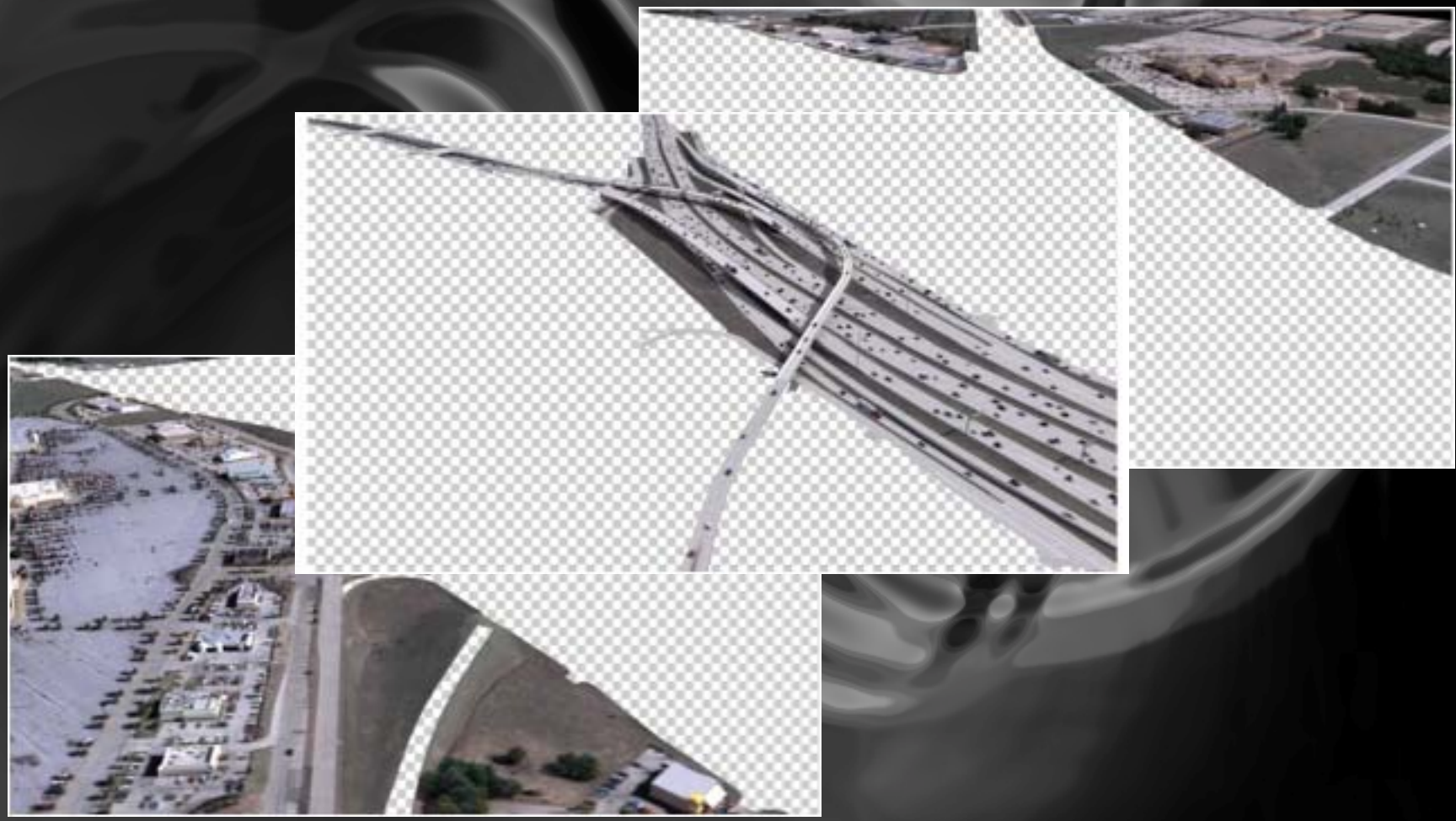
DFW Connector Specifics



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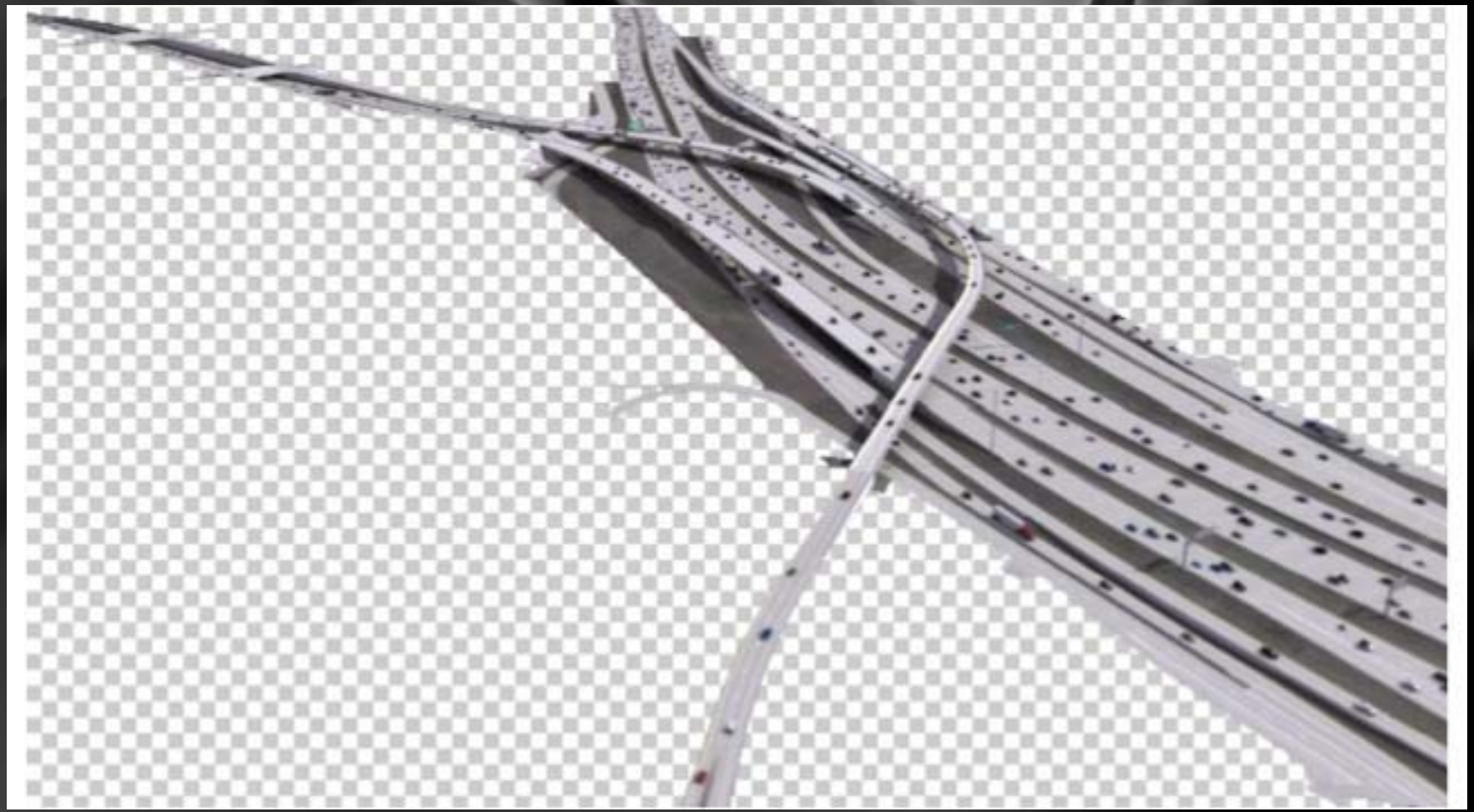
DFW Connector Specifics



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DFW Connector Specifics

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DFW Connector Specifics

Finished at the 11th hour!...?

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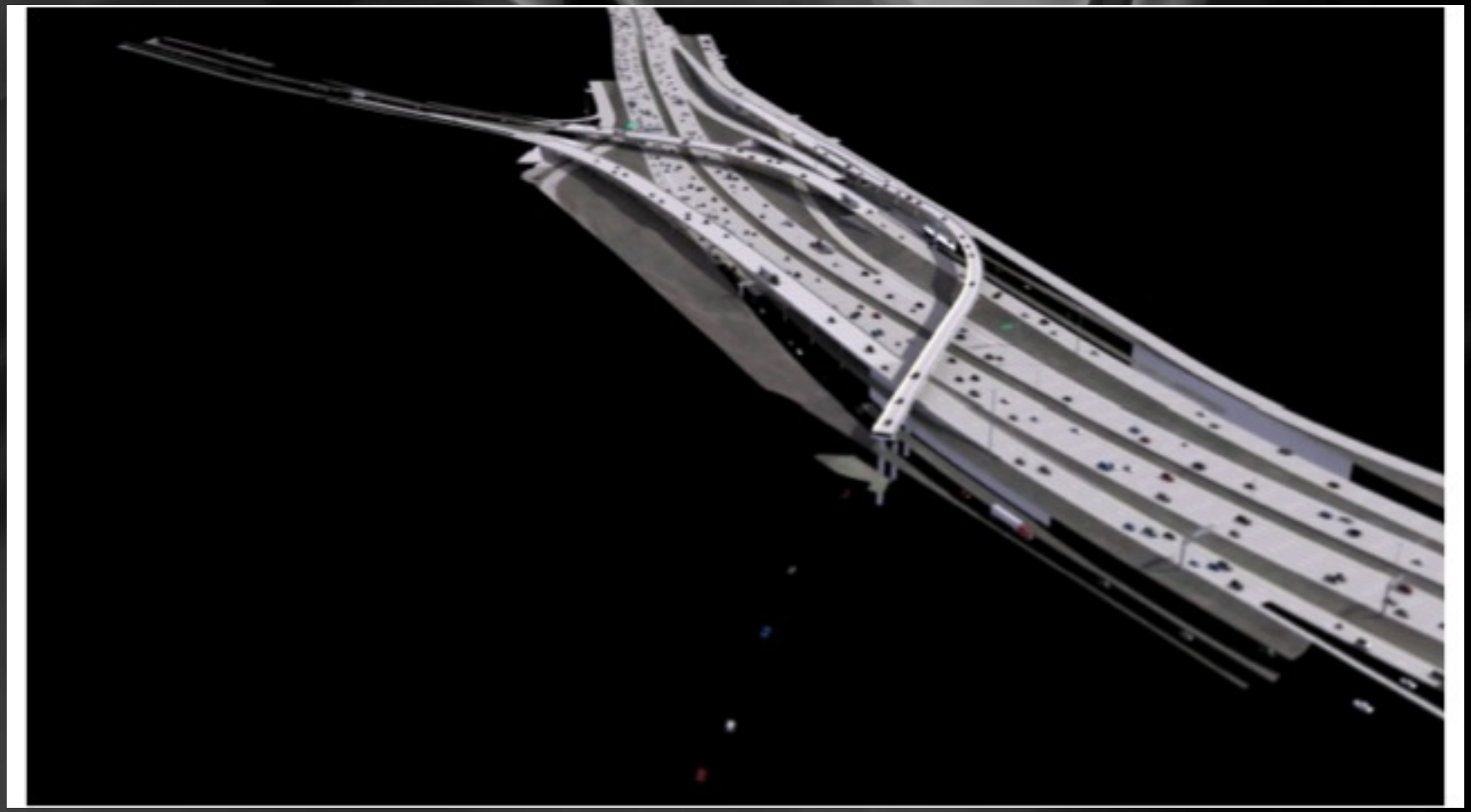
DFW Connector Specifics



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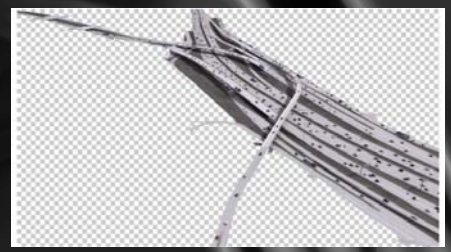

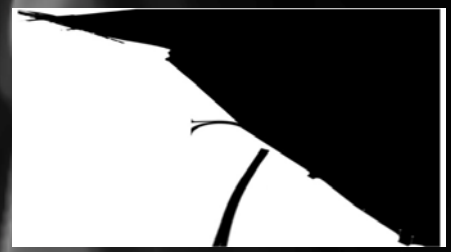

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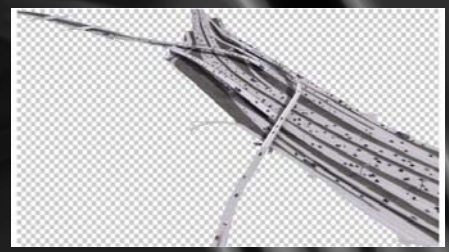

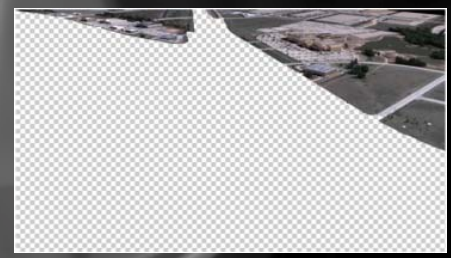

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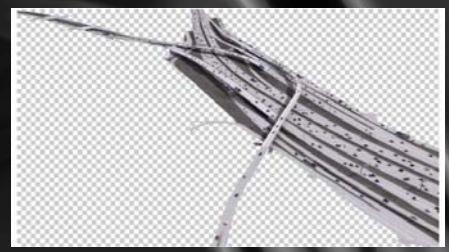

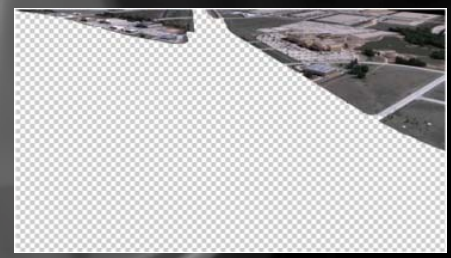

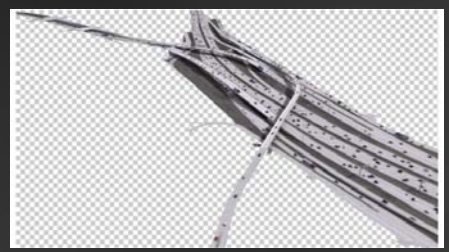

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How do we do it?

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How do we do it?
With a 120 Computer / 280 Core Renderfarm!

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6 TB's of Total Storage Capacity

~ DFW Connector needs 258 GB's of space ~

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Real or Not?

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Real or Not?

Jeff Christiansen

Managing Director of Visual Science & Technology

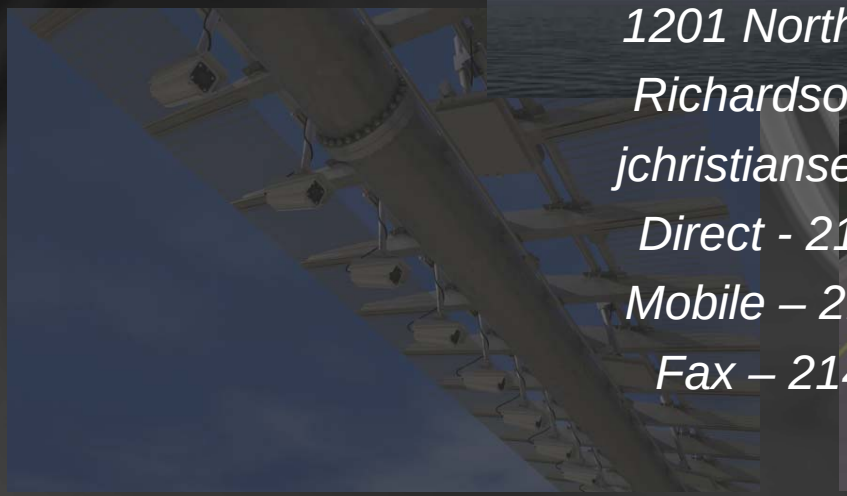
HALFF

1201 North Bowser Rd.

Richardson, TX 75010

jchristiansen@halff.com

Direct - 214-346-6365

Mobile – 214-789-0538

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