Infrastructure Industry
Vertical Solutions and Beyond

Chris Bradshaw
Vice President
## Infrastructure Industry

Customers Manage Large, Complex Infrastructure Systems

<table>
<thead>
<tr>
<th>Engineering &amp; Construction</th>
<th>Government</th>
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<tbody>
<tr>
<td><img src="image1.png" alt="Images" /></td>
<td><img src="image2.png" alt="Images" /></td>
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<tr>
<th>Communication &amp; Utilities</th>
<th>Transportation</th>
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Infrastructure Industry
*And the Projects are Globally Dispersed*

**China**
- $100 billion in roads
- $12 billion in rail
- $90 billion in gas and power
- $26 billion on water resources

**India**
- $70 billion on roads
- $12 billion on rail
- $21 billion to increase power
Infrastructure Industry
And the Projects are Globally Dispersed

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India
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US
- American Society of Civil Engineers
- 2005 Annual Report: Overall D

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Drinking Water</td>
<td>D-</td>
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<tr>
<td>Electricity</td>
<td>D</td>
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<tr>
<td>Hazardous Waste</td>
<td>D</td>
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<td>Waterways</td>
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<tr>
<td>Roads</td>
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<td>Transit</td>
<td>D+</td>
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Infrastructure Industry
A Changing Market Demands a New Approach

2D
AutoCAD

Discipline-specific Software (Vertical)
Map 3D
Civil Design
Land Desktop

3D
Civil 3D

Lifecycle Management

DWF
Buzzsaw
MapGuide
GIS Design Server

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The Challenges
Status Quo Not an Option

- Increased design efficiency
- Integrated CAD and GIS
- Lifecycle management solutions
Design Optimization

For Example, Most Civil Design is Still 2D

- Design optimization is difficult
- Drafting productivity is the key metric
- Design data is distributed as paper
Design Optimization

But, **Civil 3D** is Revolutionizing the Way Civil Engineers Work

- **3D dynamic model enables…**
  - Much faster design iteration
  - Automated drafting and digital distribution
  - Direct output to computer-aided grading equipment

- **Multiple civil engineering disciplines**
  - Road, subdivision, rail, land, environmental, etc.

- **Worldwide product with local standards support**
Design Optimization

**Civil 3D** is a Huge Step Forward
### Challenge:
- Speed design
- Employ models for grading in challenging terrain

### Why Autodesk:
- Faster drafting
- Dynamic 3D models

### “Profiling an area with multiple terrains in Civil 3D will revolutionize the way this was done. We truly see automatic profiling being done now.”

Xiao Qiang
Senior Engineer

### Results:
- Fewer errors
- Increased productivity
CAD and GIS Integration

Managing Infrastructure Data Today is Inefficient and Costly

- No spatial analysis
- Data stored in files
- Not precise
- Data stored in databases
CAD and GIS Integration
Requires an Open, Integrated GeoSpatial Data Model

- Eliminate redundancy
- Reduce $$$
- Maintain precision

Integrated GeoSpatial
CAD and GIS Integration

*Autodesk is “The Expert”*

**Autodesk Map 3D – CAD and GIS**
- Creates and manages spatial data
- Performs spatial analyses
- Supports dozens of data formats
- 800 geographic projections and coordinate systems
- Direct connect to Oracle and ArcSDE

**Autodesk MapGuide – CAD and GIS publishing**
- Fast implementation time (hours)
- Interactive web applications
- Supports all the formats of Map 3D and more
CAD and GIS Integration
The Use of Open GeoSpatial Data in Action
City of Garden Grove, CA
Integrated GeoSpatial Data Improves Productivity

Challenge:
- Expensive data
- Expensive staff
- Errors in data

Why Autodesk:
- One database
- Drafters can maintain GIS data at lower cost

“Creating a mailing list of residents in a specific area used to take 20 minutes, but now it takes a minute. And our map counter clerks are instantly accessing the information they need to serve residents. We estimate that Autodesk MapGuide saves about $20,000 a year on just those two processes.”

Jim Deyo, GIS Coordinator

Results:
- Saved time
- Saved money
Las Vegas Valley Water District
And Improves the Bottom Line

<table>
<thead>
<tr>
<th>Challenge:</th>
<th>Why Autodesk:</th>
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<tbody>
<tr>
<td>Increase productivity</td>
<td>Data access</td>
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<tr>
<td></td>
<td>CAD &amp; GIS integration</td>
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“Autodesk Map 3D is the glue that links GIS, CAD, and Survey together. It is our main GIS editing environment.”

Jonathan Pickus
Manager, AM/FM/GIS Division

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<th>Results:</th>
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<td>Eliminated three year backlog for new water projects</td>
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Infrastructure Lifecycle Management
A New Path to a Big Future

- Reduce total cost of ownership
- Single database
- Maintain precision
- Extend spatial data to construction, maintenance, and operations
Lifecycle Management
Delivering on the Opportunity

2D
Discipline-specific Software (Vertical)

3D
Civil 3D

Lifecycle Management

AutoCAD
Map 3D
Civil Design
Land Desktop

DWF
Buzzsaw
MapGuide
GIS Design Server
First Energy
Competitive Advantage at a Lower Cost

Challenge:
- Remain competitive
- Manage mergers
- Reduce operating costs

Why Autodesk:
- Open system
- Stable & scalable
- Lower cost of operation

“Autodesk has an open architecture that makes it easier to interface with other systems. Some other GIS solutions use proprietary data structures that are harder to integrate and more difficult to maintain.”

Kevin Miller
Business Systems Manager

Results:
- $5M per year saved after conversion
- Reduced IT staff
- Fast data for 1,500 employees
The Infrastructure Opportunity

Autodesk is Leading the Way

- Increased design efficiency
- Integrated CAD & GIS
- Lifecycle management solutions