YOUR FUTURE IS CONNECTED.
BIM for Infrastructure in the Era of Connection

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Trends

Accelerating
Increasing
Challenging
Growing
Retention of Demand and Rising
Rising innovation in

Globalization
Urbanization
Access to capital
Project size & complexity
Talent
Energy consumption
Stakeholder expectations
Technology
Better understanding

Fewer errors

Optimized design

Improved schedule

Greater cost predictability

72% 85% 85% 92% 98%

50 BILLION
CONNECTED DEVICES
$3.7 Trillion

Geneva: World Economic Forum
$1.2 TRILLION
The future of making things
ERA OF DOCUMENTATION

1980s

ERA OF OPTIMIZATION
ERA OF CONNECTION
Insert IW360 Design Video (AU#4)

- Site triangles
- Traffic Mobility Drainage analysis
- Drainage Analysis video - spread width & HGL/EGL
- River/Flood analysis
Refine your bridge design, exploring concepts with longer main spans.
Connected Delivery

- Bring digitalization to the construction site
- Integrate the design-build process seamlessly
- Access project data anywhere any time
Connected Teams

- Put the data in the center from the start.
- Keep teams up to date in the office and on the job site
- Collaborate with cloud-connected data and systems across the lifecycle
Connected teams benefit Government Agencies

Easy, timely access to information

- Model
- Schedule
- Cost
- Materials
- Resources
- Outages
- Gates
- Other Data?
MOVE FROM CAD TO BIM
Levels of BIM Model Development

As a model evolves, the data becomes increasingly reliable for more uses.

<table>
<thead>
<tr>
<th>Conceptual/Preliminary</th>
<th>Civil Infrastructure Engineering Design</th>
<th>Build</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOD 100</td>
<td>LOD 200</td>
<td>LOD 500</td>
</tr>
<tr>
<td>Sketches or verbal descriptions of design intent.</td>
<td>Generic system or object with approximate geometry, quantities, materials and locations</td>
<td>As-built or field verified location, size, shape, quantities and materials</td>
</tr>
<tr>
<td>Model elements may be graphically represented with generic symbology.</td>
<td>Accurate for estimating quantities and materials</td>
<td>Accurate for making coordination decisions</td>
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<tr>
<td>LOD 300</td>
<td>LOD 350</td>
<td>LOD 400</td>
</tr>
<tr>
<td>LOD 400</td>
<td>Accurate for construction layout, fabrication and installation</td>
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**Improved Constructability**
- Construction sequencing
- Collaboration
- Safety

**Faster Consensus Forming**
- Public hearing
- Project participant briefing

**Faster Decision Making**
- Owner-Designer-Contractor meeting
- Bi-directional meetings

**Smaller Change Order**
- Automated QTO

**Precise Operation and Maintenance**
- Leverage QC at construction info and censors info

**Reduced Design Mistake or Rework**
- Design visualization
- Well-coordinated design
- Less misestimate

**Easier Comparison and Planning Simulation**
- Routing Simulation
- Cost Simulation
- Leveraged GSI Data
- Easier shift to DD

**Data Integration with MC/MG**
- Data for MC/MG
- Faster construction leveraging CIC
- Enhanced quality

**Eased project safety**
- Check unsafe process in advance

**Infrastructure Asset Management System**

**Construction Management System**
The future of making things