

BIMFORUM

More Than Meets the Eye: BIM, Data & the Transformation of Deliverables

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Spring BIMForum
San Diego, CA
Hilton San Diego Bayfront
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Denver International Airport: by the numbers...

- 54 million passengers in 2013
- 5th busiest airport in the US
- 24/7/365 Operations
- 53 square miles of campus
- 20 million square feet of facilities
- 30,000 (approx.) people employed
- Economic impact to Colorado: \$26.3 billion annually



DEN BIM Program History

- Launched in 2010
- Goal is to better integrate design and construction with the asset management and maintenance programs
- First project: \$700m Hotel & Transit Center

BIM & Asset Management

- VDC v. BIM
 - Asset Management?
 - Yes: BIM
 - No: VDC
- BIM is a disruptive process
- What's your disaster?

What's Your Disaster?



What's Your Disaster?



Traditional Deliverables at DEN

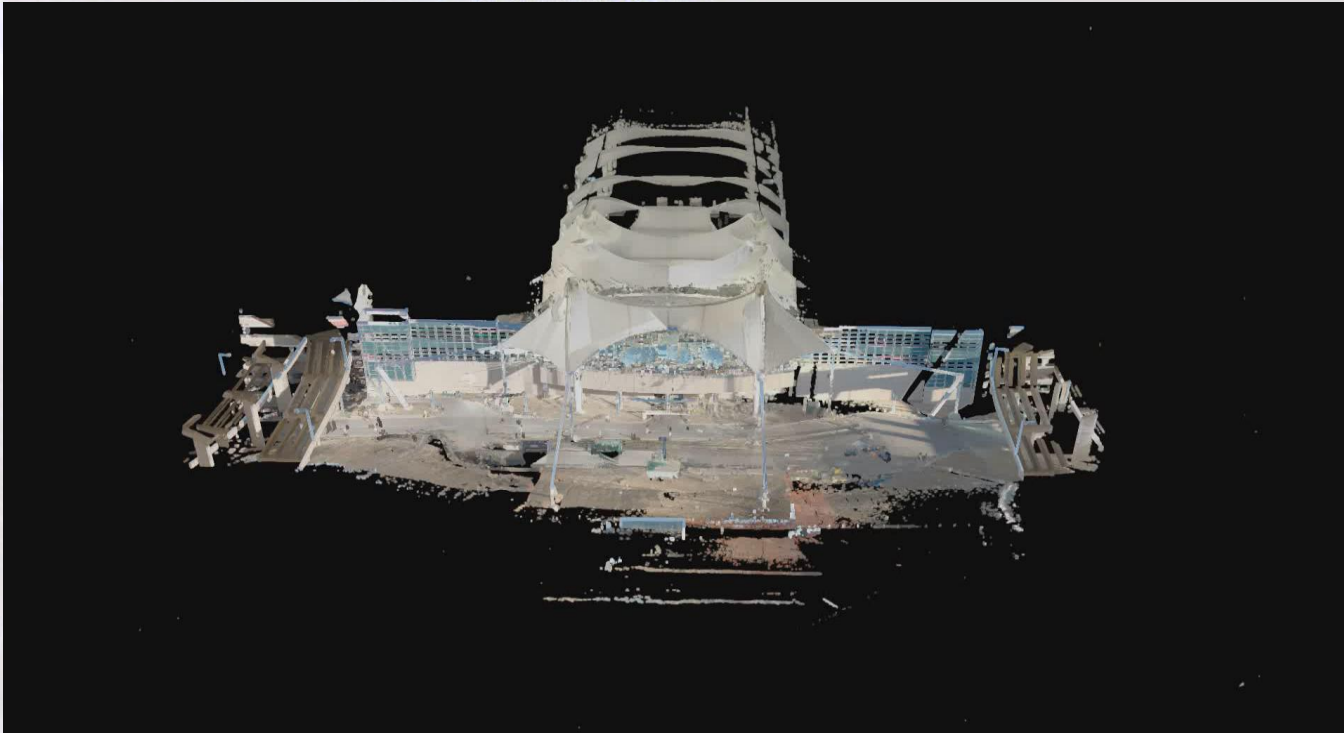
- Stamped & Signed design documents (drawings & specs) – CAD & Paper
- The built facility/systems
- Record / As-Built Drawings
- Facility Maintenance Manual

What hasn't changed... Much.

- Stamped drawings & specifications
 - Right of Reliance
 - If Model and Drawings conflict, the Drawing wins...
 - Although the owner might not be too thrilled about that discrepancy!
- The built facility/systems

Owner Deliverables to Project Teams

- More information available with the RFP
 - Laser scans available to bidders
 - BIM Models
 - Preliminary design models with more information



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What has changed...

- Contracts
 - Project Execution Plans
 - Electronic Info Requirements (EIR)
 - Level of Development (LoD) Matrix
- Design
 - BIM Models
 - Spatial Coordination Models
 - Electronic Drawing Formats
 - Facility & Asset Information
- Construction Deliverables
 - Clash Detection Models
 - 3D Verification Scans
 - R300 Coordinated Model
 - Integrated Asset Commissioning Data
- Final Deliverables
 - Facility Model
 - Record Design Model
 - Integrated Asset Data

Digital Construction Documents

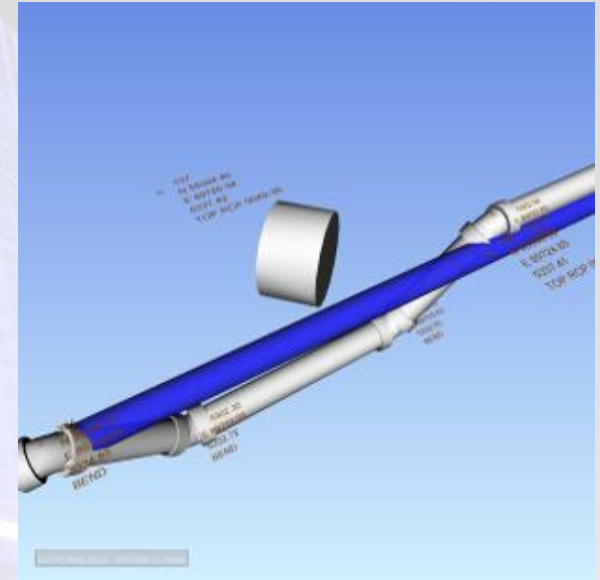


- 6,800 Sheets
- \$6k+
- 1000lbs+
- City didn't want it!
- 1 Tablet -
- <\$1k -
- 1lb -
- Portable -
- Multiple projects -
- Photos, models, etc. -



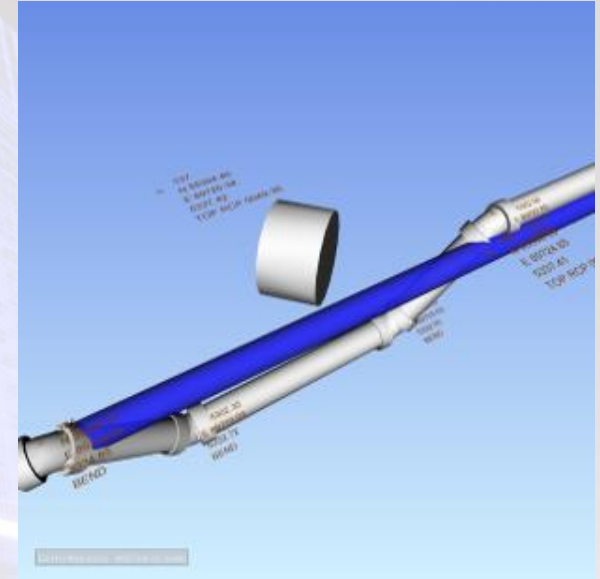
New Deliverables

- Reconciled Level 300 Model (R300)
 - Design Model coordinated with Construction model
 - Emphasis on:
 - Designated Asset types
 - Design Impacts



R300 Challenges

- Unknown process for many consultants
- Can alienate some consultants



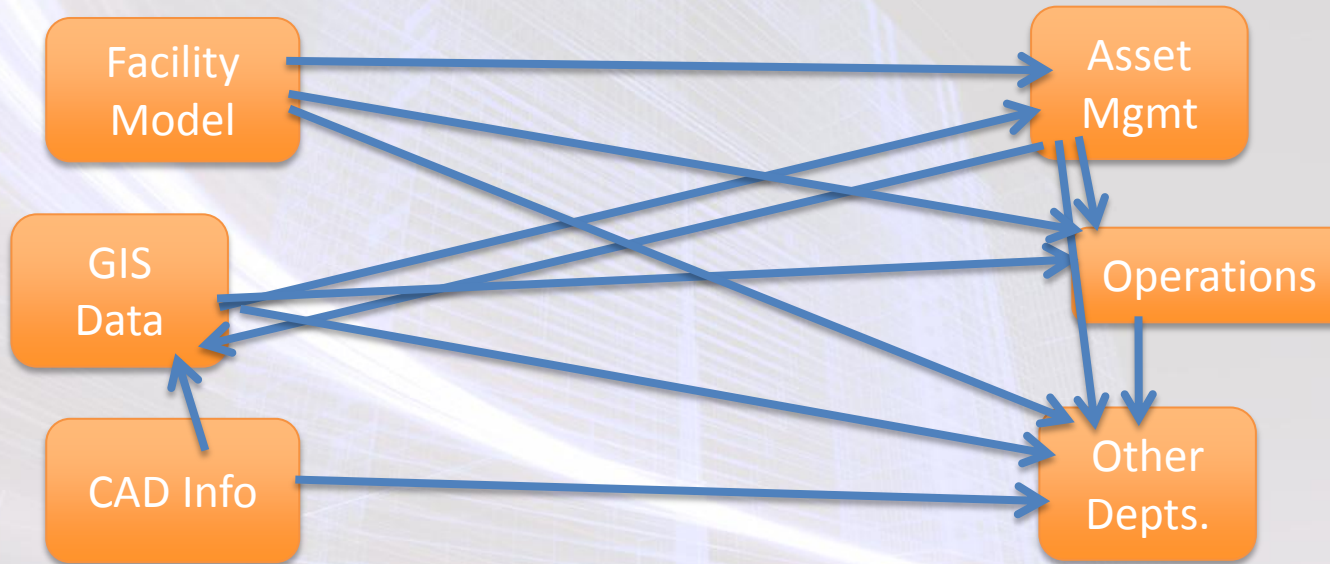
New Deliverables

- Facility Model
 - Design Model > R300 + Commissioning Data
 - Model is duplicated/split
 - One model becomes the Record model
 - One model becomes Facility model
 - Design documentation removed (Sheets, details, text, linework, etc.)
 - Remaining: geometry and asset data

Facility Model Challenges

- Commissioning tly covers LEED only
- Owners don't always know what information they need
- Owners don't always know HOW to use the information they get
- Using a design model for Facility Management freaks out designers

All to inform Asset Management



Centralized Data Hub... Single Source of Truth



More Changes?

- Greater integration of 3D scanning tools
- Integration with more facility departments:
 - Properties/Concessions
 - Parking
 - Finance
 - Etc.
- Broader scope of data collection

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