

CIVIL INTEGRATED MANAGEMENT (CIM)



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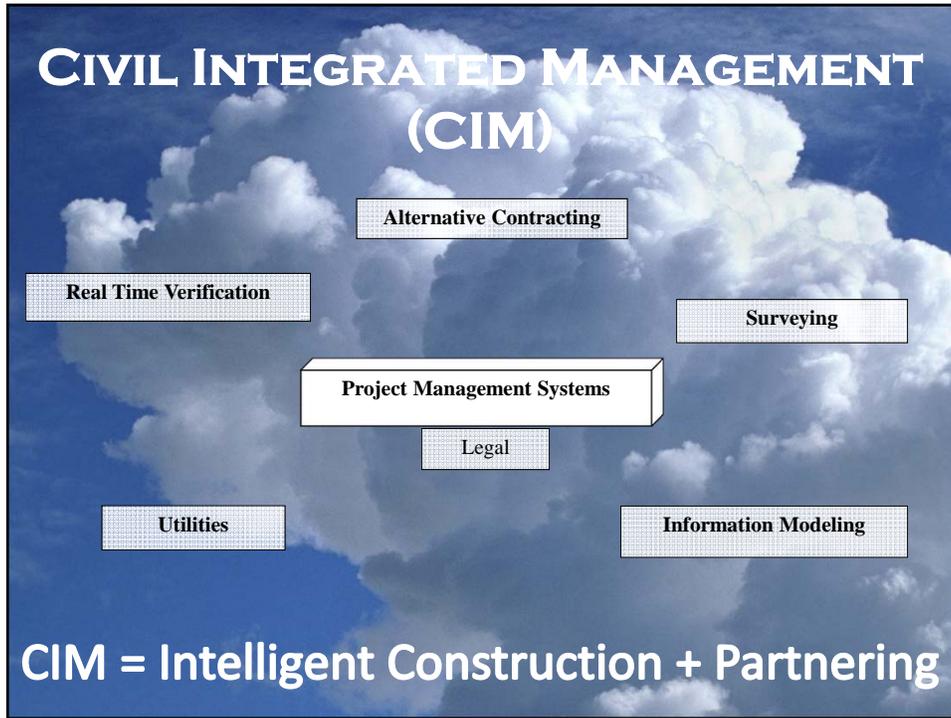
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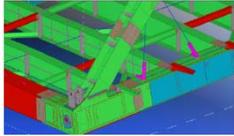
What is CIM?

CIM is the collection, organization, and managed accessibility to accurate data and information related to a highway facility. The concept may be used by all affected parties for a wide range of purposes, including planning, environmental, surveying, construction, maintenance, asset management, and risk assessment.





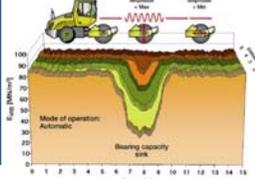
<ul style="list-style-type: none"> ◆ Alternative Contracting <ul style="list-style-type: none"> ✓ Design Build ✓ Alternative Technical Concepts ✓ Construction Management / General Contractor (CMGC) ✓ Franchise Contracting ✓ Alternative Bidding 	<ul style="list-style-type: none"> ◆ Surveying <ul style="list-style-type: none"> ✓ LiDAR – Light Detection and Ranging ✓ Laser Total Stations ◆ Information Modeling <ul style="list-style-type: none"> ✓ Public Outreach ✓ Software Applications ✓ Optimizing Construction Means and Methods ✓ Earthwork balancing ✓ Equipment Automated Guidance Control Systems ✓ Clash Detection ✓ 3/4/5/x D Modeling
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- ◆ **Real Time Verification**
 - ✓ Intelligent compaction
 - ✓ Pavement Thermal Imaging
 - ✓ RFID of materials quantity and certification transmittal
 - ✓ Telematics
 - ✓ In-cab weight scales
 - ✓ Video surveillance for remote construction inspection and recording





- ◆ **Utilities**
 - ✓ 3D Mapping and Data Storage
 - ✓ RFID subsurface marking
- ◆ **Project Management Systems**
 - ✓ Electronic document transmittal, storage, and approval
 - ✓ Online real-time status of materials sampling and testing
 - ✓ Electronic wage rate verification
 - ✓ Public relations



Texas Legislature commissioned Texas A&M Institute Construction Innovations

- ◆ Design-Build/Just-in-Time Design/Design on the Fly
- ◆ 3-D Design
- ◆ Electronic Plans
- ◆ Delayed Closures to Accommodate Special Holidays
- ◆ Holiday/Event Black Out Period
- ◆ Night & Weekend Closures
- ◆ Wireless Paving
- ◆ Intelligent Compaction
- ◆ Smart Concrete Truck
- ◆ Asset Management through Equipment Telematics
- ◆ GPS-equipped Vehicles and Equipment
- ◆ Use of Rock for Retaining Wall Backfill
- ◆ Full Attack Construction/Aggressive Construction
- ◆ Highly Integrated City Coordination
- ◆ Selected Full Closure for Bridge Reconstruction

- ◆ Mobility Coordinator
- ◆ Night Utility Relocation
- ◆ Higher-Level Utility Coordination
- ◆ Consolidate Utility Efforts
- ◆ Pre-Cast Facilities/Pre-Cast In-Situ
- ◆ Recycling In-Place
- ◆ Use of Asphalt Pavement
- ◆ Pre-Cast Composite Steel/Concrete Caps
- ◆ Executive Meetings
- ◆ Scheduling Tools
- ◆ Play of the Day Meetings
- ◆ Weekly Coordination Meetings
- ◆ Co-location of All Offices
- ◆ Monthly 4-square matrix
- ◆ On-site Maintenance Shop
- ◆ Condition Appropriate Span Lengths
- ◆ Use of Recycled Rock Material in Lieu of Lime





<http://mobility.tamu.edu/mip/>

Other Activities Underway for CIM

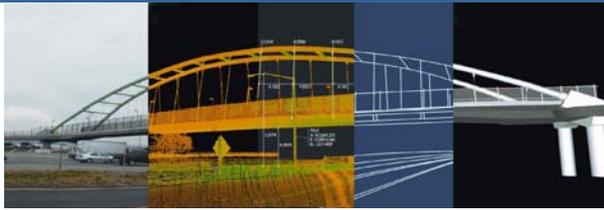
- ◆ Every Day Counts
 - ✓ Geospatial Data Collaboration
 - Efficient Transportation Decision Making Tool
 - <https://etdmpub.flas-etat.org/est/#>
 - ✓ 3D Engineered Models
 - Iowa DOT Developing Implementation Manuals
 - NY DOT Developing Training and Technical briefs on Steel Bridge Construction
 - GPS Paving or Stingless Paving for Concrete Slip Form
 - <http://acpa.scholarlab.com/>
 - ✓ Intelligent Compaction
 - Texas DOT
 - Updating FHWA example specification
 - Developing calibration process for retrofit kits



Other Activities Underway for CIM

- ◆ AASHTO
 - ✓ NCHRP Synthesis
 - ✓ Domestic Scan
 - ✓ Subcommittee on Construction
 - Automated Machine Guidance Systems
 - <http://construction.transportation.org/Documents/Technology%20and%20Computers/QRG%20AMG-Final.pdf>
- ◆ FHWA
 - ✓ <http://www.efl.fhwa.dot.gov/technology/dv.aspx>
 - ✓ <http://www.fhwa.dot.gov/everydaycounts/>





The Future Begins Now!



Design Training
Expo