

BIM in Education: Focus on Local University Programs

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GMU Fast Facts

- ✦ **3rd Largest* public** in Virginia (30,714 students)
- ✦ **Distributed University** (Arlington, Fairfax, Loudon, RAK)
- ✦ **Young Engineering program** (23 yrs), heavy IT focus
- ✦ Civil, Environmental and **Infrastructure** Engineering
 - ✦ 275 undergrad, 75 grad, 8 FT Faculty, ~15 adjuncts
 - ✦ **Past Emphasis:** Land Development (Res & Comm.)
 - ✦ **Future:** Sustainability, BIM, and Virtual Construction

BIM & GMU Building Boom

- ✦ \$3 million / week of construction on campus
- ✦ VA PPEA Projects: Dorms, Academic Bldgs, more...
- ✦ 50% of projects developed & designed with BIM



Academic VI Engineering Building / Opening Spring 2009

Personal Profile

- ✦ Assistant Professor in **CM Area** (2006-present)
- ✦ **Background in GIS, Networks, and CAD** modeling for Infrastructure and Project Management
- ✦ Professional interest in Engineering Education - especially how BIM (and related virtual design methods) will **impact the Civil Engineering curriculum**
- ✦ ASCE Student Chapter Faculty advisor - focus on student activities

Teaching BIM

- ✦ Lessons Learned from this week's presentations
 - ✦ Many sessions, many perspectives
 - ✦ BIM Pedagogy still not solidified
- ✦ **My Goal:** Embedding BIM in the Civil Eng. curriculum
 - ✦ Engender BIM skills as early as possible
 - ✦ Reinforce them throughout the curriculum

CEIE472/572 BIM @ GMU

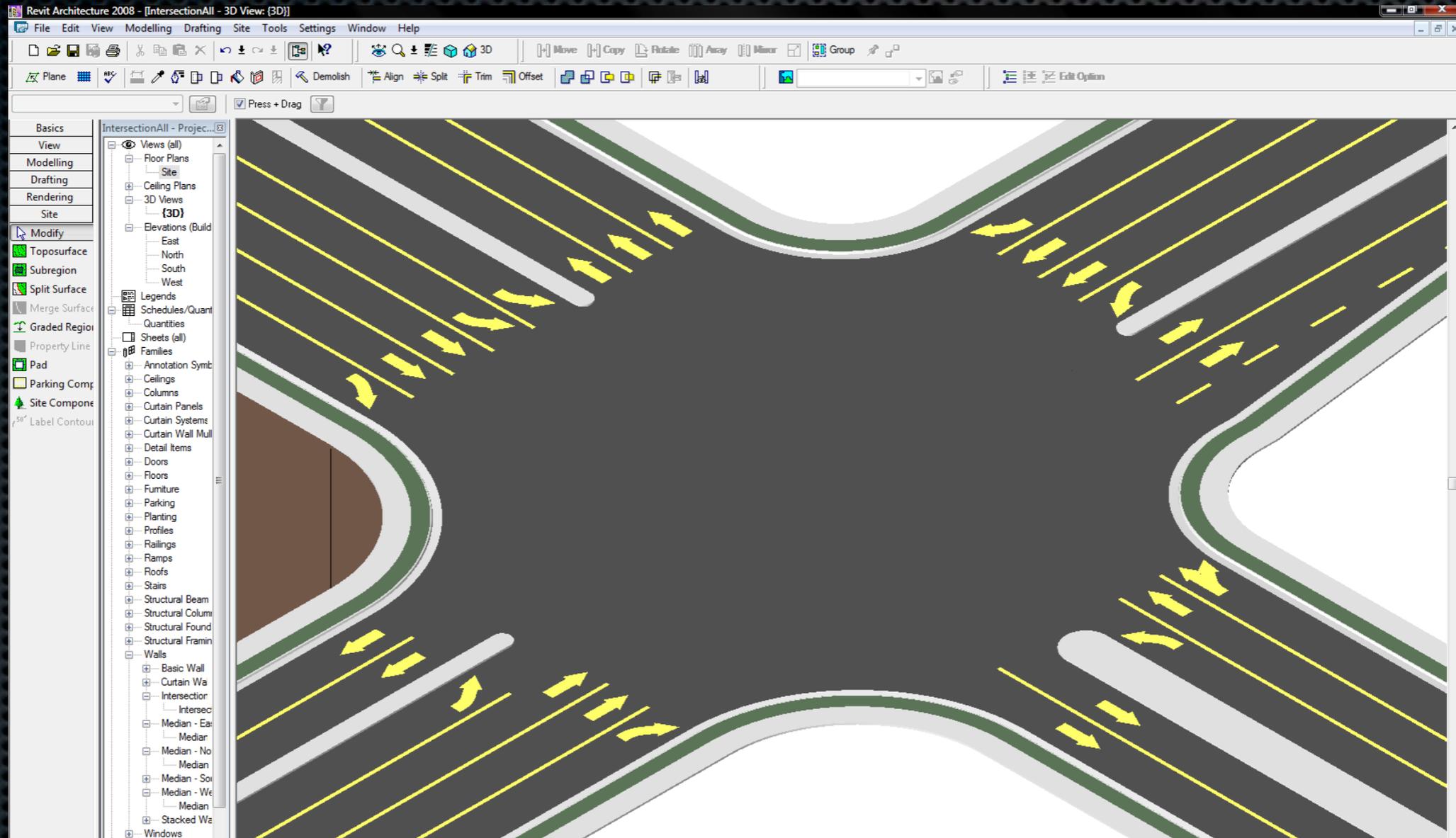
- ✦ First Offering Spring 2009
 - ✦ Theory, practice and software
 - ✦ Construction perspective
 - ✦ Analysis and Simulation for Sustainability
 - ✦ Objectives:
 1. Develop fluency in terms & methods
 2. Provide basic introduction to software packages

ENGR117 IT for Engineers

- ✦ Freshman computing course
- ✦ Revitalized curriculum
 - ✦ 3D modeling using Google Sketchup
 - ✦ Scripting and numerical analysis
- ✦ Objective: Baseline skills and computing knowledge for future course work

Research₁

- Initial effort: fall 2007 transportation design using BIM



Research₂: Field visualization and calibration techniques

- ✦ BIM as preferred AE tool for buildings (2005 - beyond)
- ✦ BIM as preferred tool for construction (2010?)
 - ✦ Constructibility, site logistics, sequencing, etc.
- ✦ BIM as preferred tool for trade- and sub-contractors (?)
 - ✦ Trades and subs still rely on drawings, tapes, levels, etc. for layout and actual building.
 - ✦ Research for direct field visualization of model elements is needed.

Research₃: BIM+GIS Integration

- ✦ Integrated building evacuation modeling using graph-based models
 - ✦ Spatial relationships (adjacency, containment, etc.) not inherent in commercial BIM models. Application of GIS-based network analysis to model **inside-out evacuation planning**.
- ✦ Identifying relationships useful for first responders
 - ✦ **In-building utility tracing**, shared walls/structural members

Professional Activities

- ✦ Design Build Institute of America (DBIA)
- ✦ Local: DBIA-MAR Chapter Owner's Council
- ✦ National: DBIA BIM Steering Committee
 - ✦ Barbara Heller, Design Strategies, Chair
 - ✦ Goals: Provide guidance for owners on what to ask for in DB RFPs.

BIMSig (Student Interest Group)

- ✦ Founded 2007 - monthly meetings to discuss BIM research, software, applications.
- ✦ Spring 2009 - will become a formal student organization with its own governance. Contact Randall Sylvertooth (rsylvert@gmu.edu) for info.

Faculty Recruiting

- ✦ Hiring a **junior Tenure-track faculty position** fall 2009.
 - ✦ Strategic investment, target area for growth
- ✦ Emphasis in asset & life-cycle management, geospatial integration, security engineering
- ✦ Backgrounds in Architecture, Engineering, and Design desired.

Discussion and Questions

- ✦ Thank you and safe travels home!
- ✦ Michael Casey (mcasey4@gmu.edu)