Literature Review Overview

* Introduction
* Semantic City Models (CityGML)
  + Overview
  + Use in city simulation / modeling
    - 3D City DB
  + Application Domain Extensions (use EnergyADE as success story)
* Utility Networks
  + Importance
  + Interconnectedness, interdependencies, hierarchy
  + Difficulties due to no unified modeling system
  + Examples of utility network implementations in previous systems
    - Focus on how they are almost always single-network
* Utility Network Visualization
  + Difficulties due to relative invisibility
  + Difficulties due to differing standards and reluctance of authorities to share & combine data
  + Augmented reality
* Utility Network Modeling
  + Importance of considering semantic properties as well as functional
  + Examples where multi-scale & multi-network modeling is helpful or integral
    - Eco-industrial parks
    - Distributed energy generation in hierarchical electric networks
    - Energy reclamation using another network’s existing infrastructure
      * Combined Heat Networks (CHN) (DHN + energy)
      * Nanaimo Reservoir #1
* UtilityNetwork ADE
  + Overview
    - ADE extension for 3D City DB
  + General appropriateness for adoption
    - Open source
    - Natural extension to INSPIRE EU directive of creating CityGML building models for all of Europe
  + Appropriateness of being a standard format for utility network visualization
    - Uniformity of core concepts with significant capacity for semantic customization
    - Allows for networks to be clearly differentiated by type, semantics and hierarchy
    - Previous successes with building models in AR
  + Appropriateness of being a standard modeling platform
    - Uniformity of core concepts & connectivity with significant capacity for semantic customization
    - Allows for multi-level and multi-network systems to be modeled within the same ecosystem
* Conclusion