How Do We Build Community Trust in Technology?

Colin Harrison
IBM Corporation
harrisco@us.ibm.com

Agenda

- Smart Cities
- Dependability & Trustability
- What methods do we need?

Instrumented urban systems are widespread … real-time, real-world data contain information about patterns of behavior

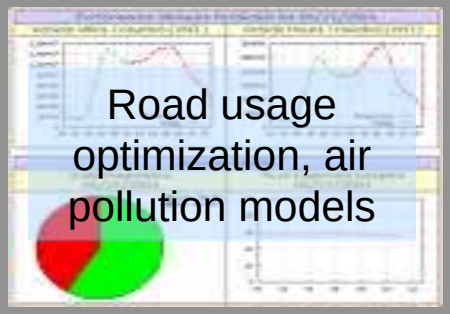
Operational / Transactional

- Toll collection only - disconnected operational data
- Transaction data from the management of payments
- Little automated use is made of real-time traffic data

Insights

- More granular charging, by location
- Analysis of traffic patterns to manage city congestion.
- Modeling traffic to predict and manage entire system

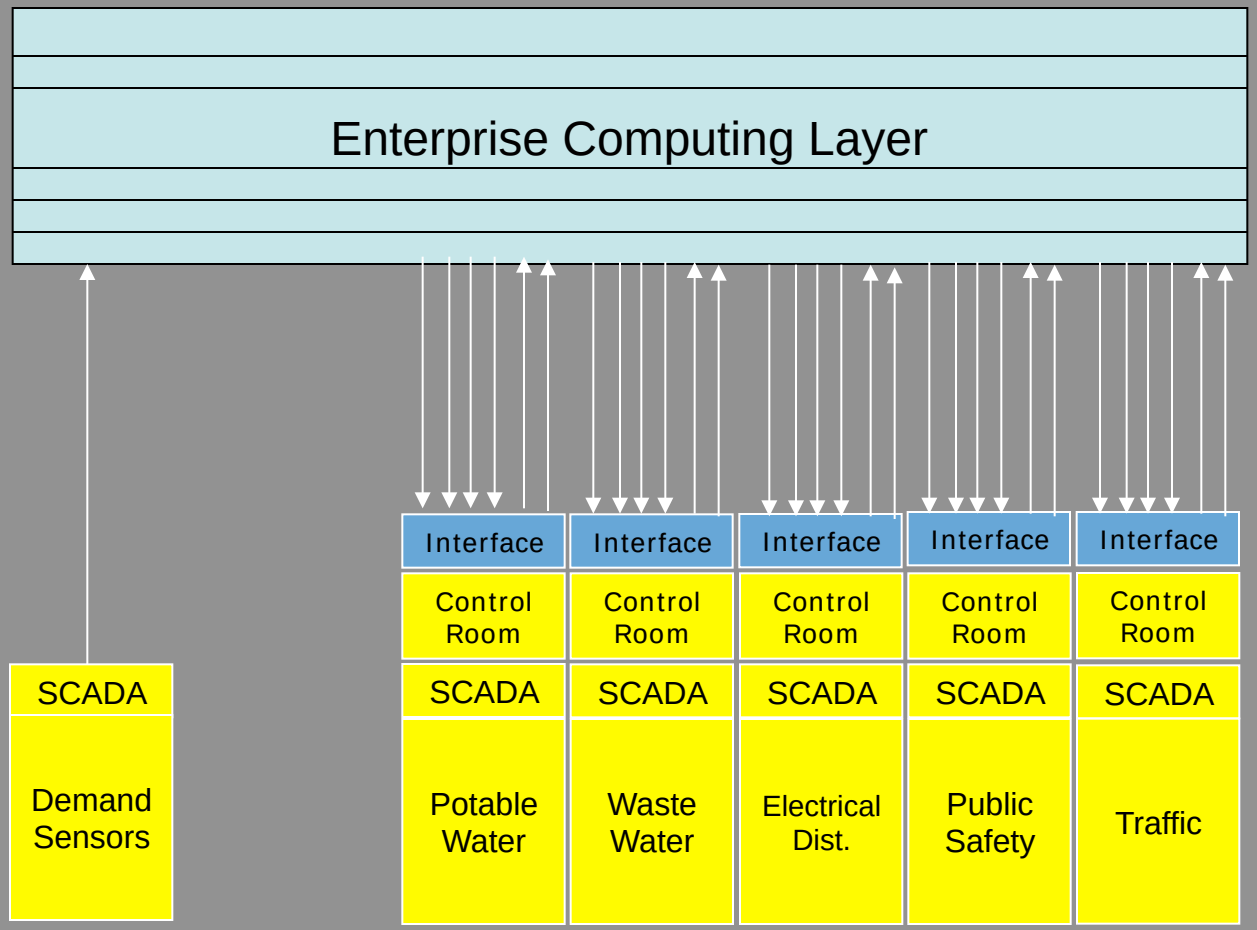
System wide control



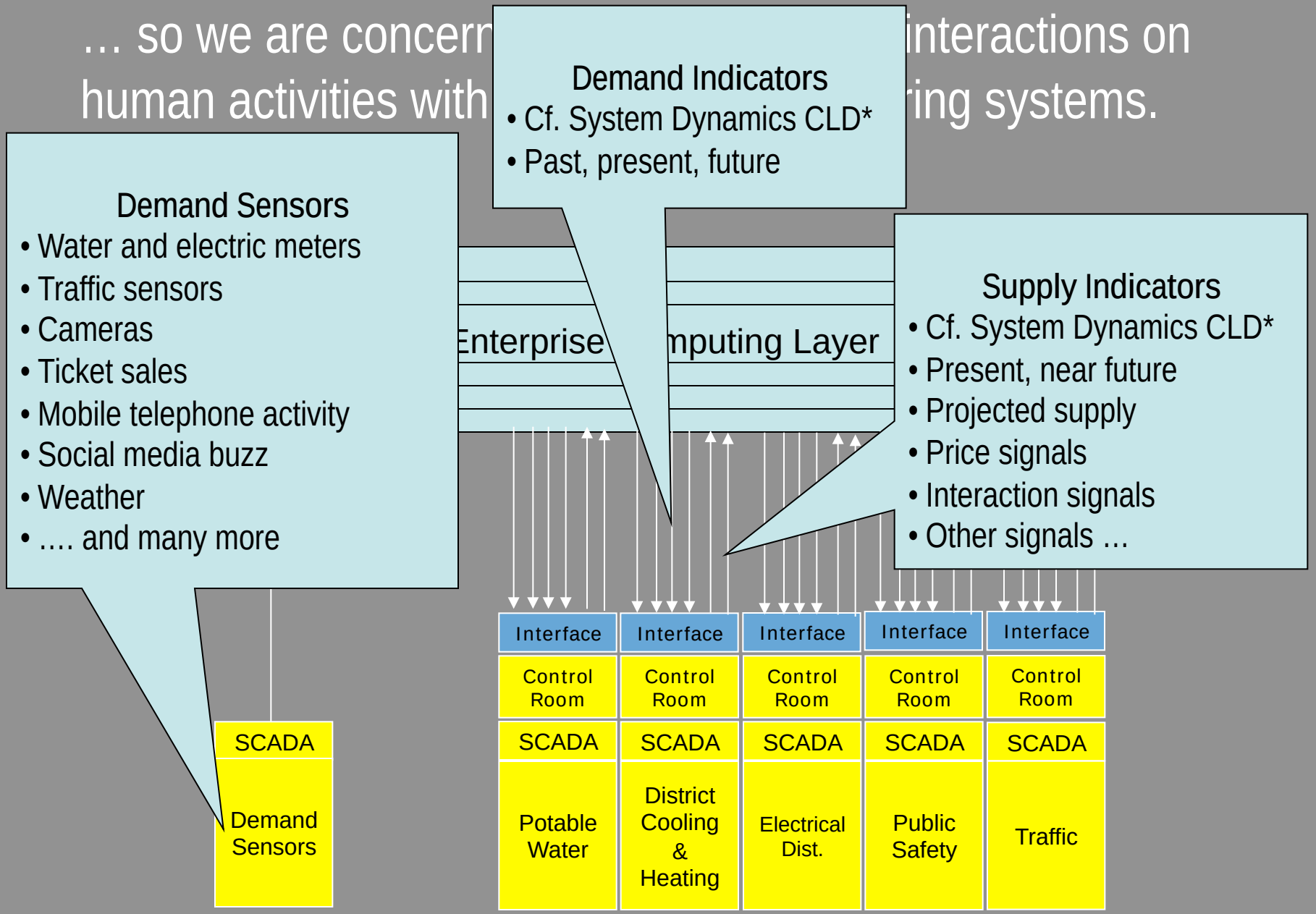
- Dynamic and congestion based pricing
- Route planning and advice, shippers, concrete haulers, limo companies, theatres, taxis etc
- City-wide, dynamic traffic optimization

These instrumented systems enable new approaches to urban infrastructure services ...

…so we are concerned with the *dynamic* interactions of human activities with a system of engineering systems



… so we are concern interactions on human activities with ring systems.

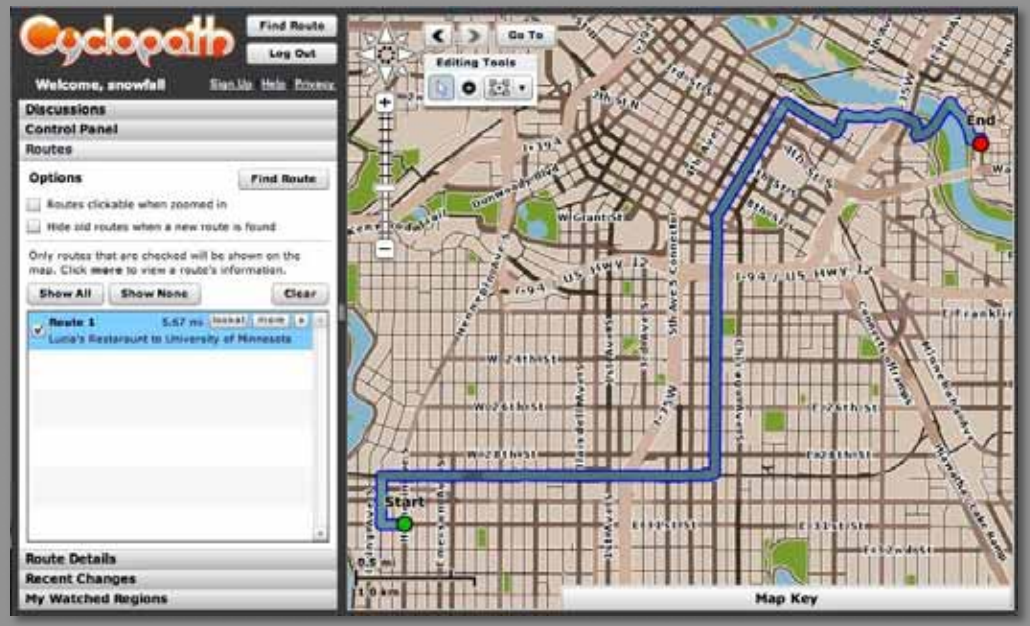


*CLD = Causal Loop Diagram

… and dialogue between city and citizens

In their search for increased attractiveness – especially for Internet natives, progressive cities are exploring new approaches to engaging their citizens

- Informing
- Sharing
- Interacting
- Co-producing



Dependability Goals – not just software or hardware correctness, but dependable urban infrastructure services – technical and social issues

1. Do no harm
2. Produce the intended outcomes
3. Resist physical and cyber attacks
4. Enable accessibility, transparency and citizen engagement
5. Provide a shared benefit
6. Preserve citizen privacy

So what can possibly go wrong……?

- Infrastructure Failures
  - Bus delays
  - Power line down
  - Bridge collapse
  - Water supply contaminated

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- Infrastructure Failures
  - Bus delays
  - Power line down
  - Bridge collapse
  - Water supply contaminated
- Smart Infrastructure Failures
  - Energy consumption increases
  - False alarm on bridge safety
  - Water pipe caused to explode
  - Vehicles induced to collide
  - Personal Information disclosed

Case study: a California utility company and Smart Meter deployment

How Do We Build Community Trust in Technology?

- SW Engineering
- Systems Engineering
- Urban Infrastructure Simulators
- Operational Management

- Role of Professional Engineers