

Walden 3-D, Inc.



Continuing to make a positive difference
through geotechnical consulting,
designing responsive environments, and
formalizing synergistic philosophies.

Integrating Cedar City & SUU Strategic Plans

H. Roice Nelson, Jr.

2155 West 700 South #31

Cedar City, Utah 84720

Cell: 713.542.2207 Home/FAX: 435.256.2668

<http://www.walden3d.com/cedarcity/CedarValleyWater/>



Who is Roice Nelson?

- Son of Howard Roice Nelson, Nelson Meat Packing Plant , 29 Mar 1916 - 16 May 1996, & Pauline H. Nelson, 29 Mar 1929 – 08 Apr 2003.
- Grandson of Roice Bengt Nelson, Farmer and Entrepreneur, 23 Jun 1891 – 21 Apr 1947.
- Great Grandson of Bengt Nelson, Jr., Farmer / Rock Church, 11 Mar 1860 – 11 Nov 1926.
- 2nd Great Grandson of Bengt Nelson, Sr., Bricklayer, 28 Sep 1834 – 22 Apr 1919.

- Grew up on the back end of a shovel on the Star Ship Enterprise in Cedar Valley:

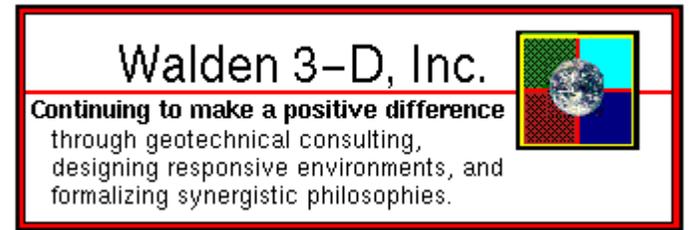
- Spent 40 years in the Texas wilderness changing oil and gas exploration processes.
- Developed new geophysical data type: data mining lightning databases.
- Bought a condo in The Seasons on the Cedar Valley Drumlin known as Leigh Hill the week after the Cedar City Temple was announced.
- Moved to Cedar City 01 July 2014 to help take care of Maxine Shirts, Mother-in-Law.

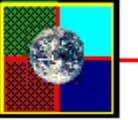
Dad's Farm Today:



What do Strategic Plans address?

1. Water
2. Energy
3. Communications
4. Geologic Framework
5. Transportation
6. Measuring & Monitoring
7. Feedback





1.a. Water

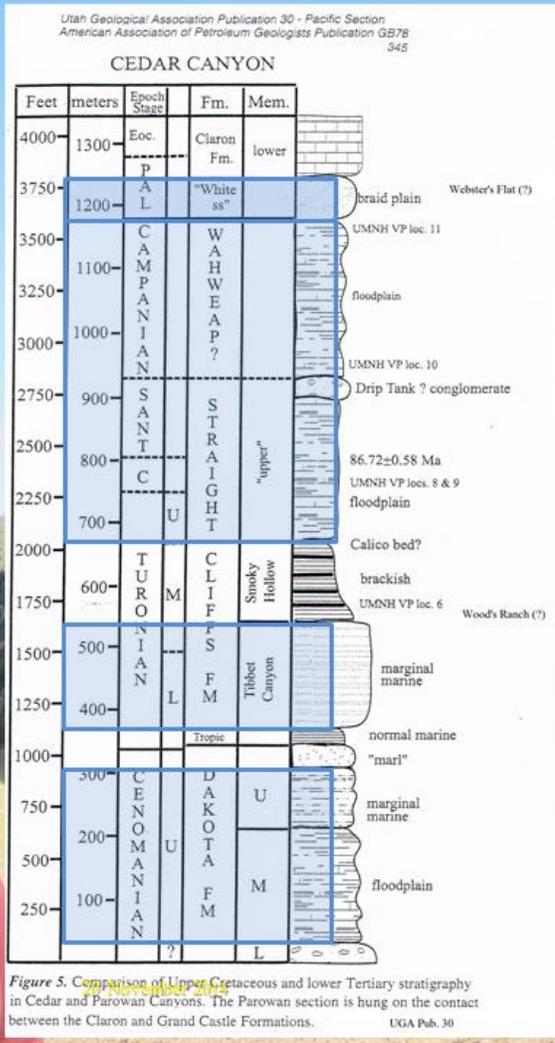
- Gary Player has defined 3 key aquifers in Iron County.
- The Blue Aquifer is the existing valley sands and shales, which were fed by Lake Bonneville some 16,000 years ago. Production currently exceeds recharge, which is a problem for Cedar City and SUU.
- The Orange Aquifer is 50 miles long fractured quartz monzonite, which can be tested by re-entering the Arco well at Iron Springs.
- The Yellow Aquifer is the Cretaceous from Cedar Canyon to Parowan.



1.b. Quartz Monzonite Aquifer

- The well was plugged and abandoned by ARCo on March 15, 1985. Several cement plugs were placed in the 9 and 5/8" casing below 11,590 feet BGL, from 7,050 feet to 6,920 feet BGL, and from 2,350 feet to 2,225 feet BGL. One last plug was set from the surface to 25 feet BGL.
- Most important, the 9 and 5/8" casing is open for potential future aquifer testing below 2,350 feet BGL.
- In order to test the quartz monzonite (Qm) aquifer, a workover rig similar to one available from Grimshaw Drilling in Enoch, would set up over the hole and drill out the surface plug and the next shallow plug present from approximately 2,225 feet to 2,350 feet BGL.
- Once the plugs have been drilled out, the well should be pressure tested by filling it with water and applying about 200 psi pressure at the surface. Once the casing is proven to be intact, the next step will be to enter the casing with a perforating gun and fire 24 to 48 shots through the casing in the interval from 2,480 feet to 2,610 feet BGL.
- Wells drilled into the same Qm zone at Quichapa Creek and at the base of the Pine Valley Mountains southwest of New Harmony are very productive of high quality water. The closest well (Quichapa) penetrated only the first two hundred feet of the Qm, but was producing at a rate of about 150 gallons per minute by air lift while the well was being drilled. Wells at New Harmony have been pump tested at rates on the order of 2,500 gallons per minute with little drawdown.

1.c. Cretaceous Aquifer



Type Section

• 32% Porosity in the White Sandstone at Webster's Flat

• 1,700 feet thick

• 20% Porosity in the Lower Cretaceous Sandstones beneath Woods Ranch

• 400 feet thick \$15,000 well

• 800 feet thick \$50,000 well

2014/09/19 08:37

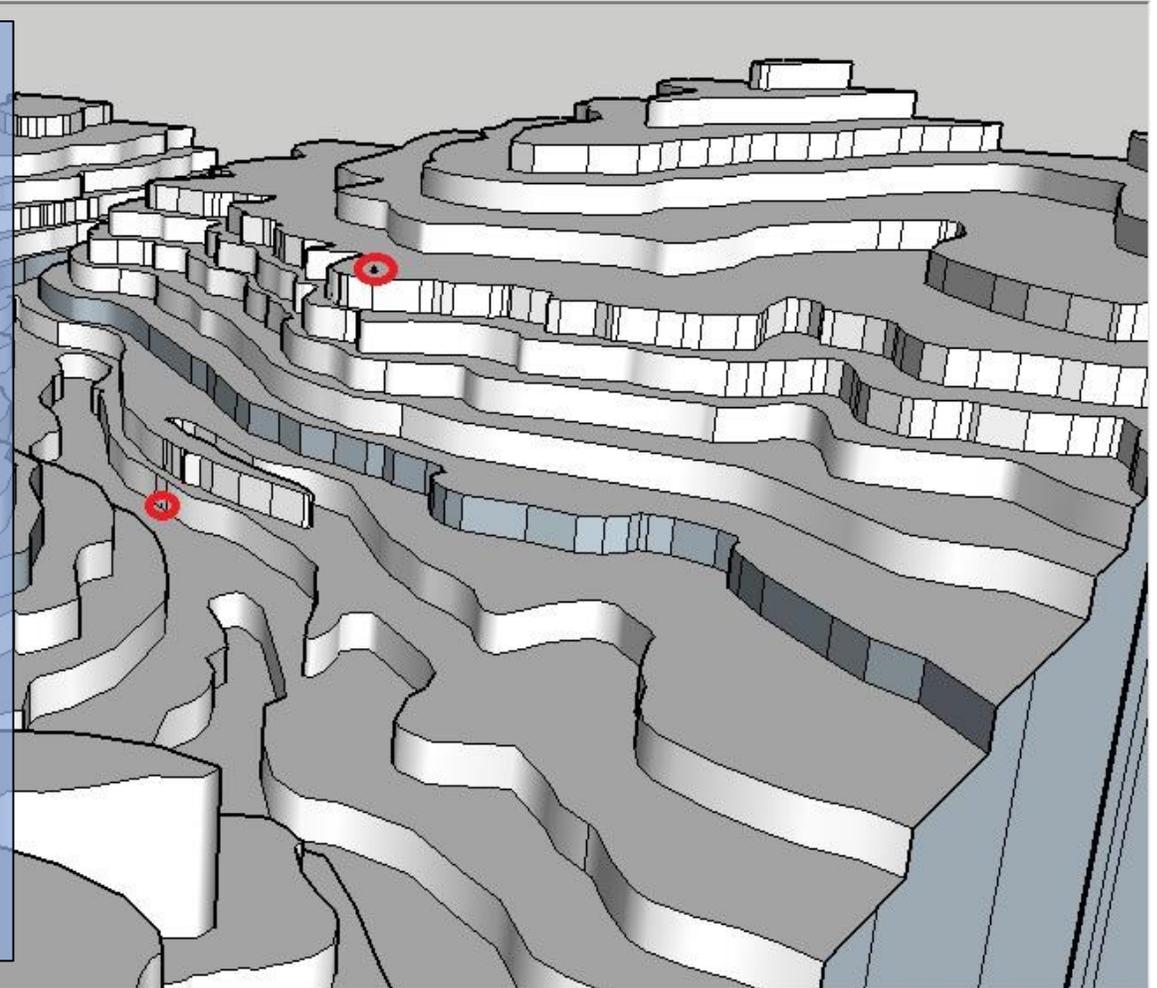
Copyright © 2014
 Dynamic Measurement LLC
 Iron County, Utah 67

- The Cretaceous Rocks, where the slides occur, are an excellent aquifer.
- This will be tested at Woods Ranch, hopefully soon, by the CICWCD.
- Anticipate 80,000 acre-feet of water within 1,000 feet of the ground level within each 640 acre section covering these rocks.
- Cedar City can encourage development of new water resources, especially since they have good recharge.



2. Energy

- Imagine putting a well by the old road up Cedar Mountain (top red circle),
- Deviating the well so it comes out at Coal Creek, beneath where the rock slide keeps happening (bottom red circle), and
- Putting turbines in the well pipe to:
 - Remove the cost of pumping water, and
 - Generating electricity for Cedar City.
- Furthermore, by removing water from the Cretaceous rocks above the current road it will cut down on future rock slides.





3. Communications

- The entire world is the marketplace for Cedar City entrepreneurs and SUU students.
- It is critical to have the highest possible Internet speed available for everyone in Cedar City & at SUU.
- Connecting every house will have advantages for first responders.
- Security can allow users to track who enters their web portals.

By 2020, Ericsson forecasted that smartphones will account for 6.1 billion subscriptions, up from 2.7 billion currently. To put that number into perspective, the current world population is estimated to be about 7.1 billion people.

Smartphones, mobile PCs, tablets and mobile routers with a cellular connection

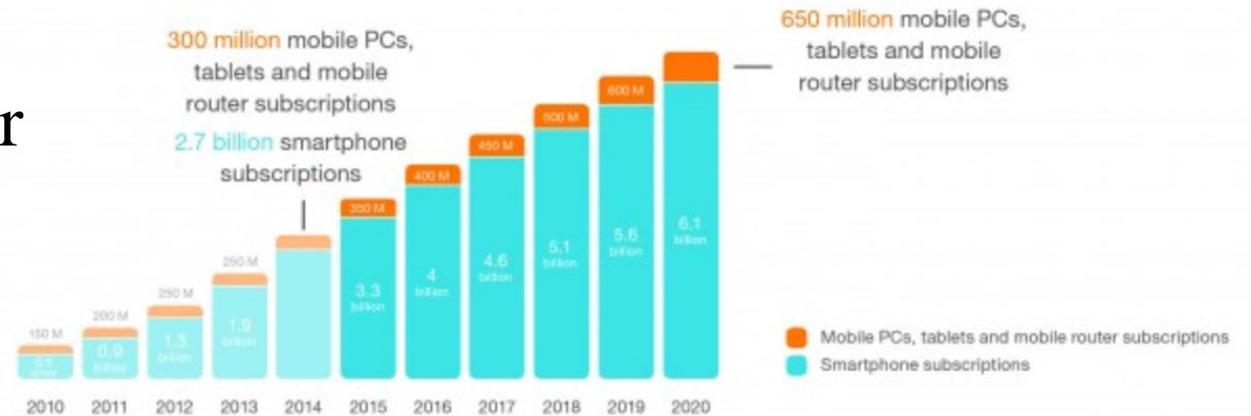
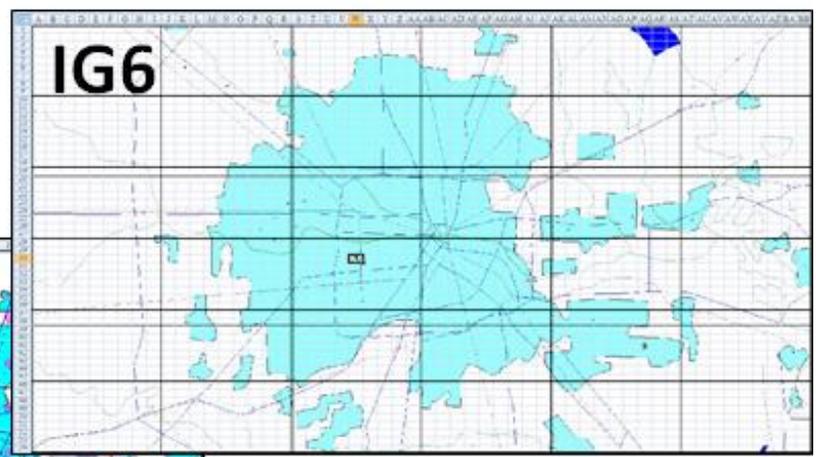
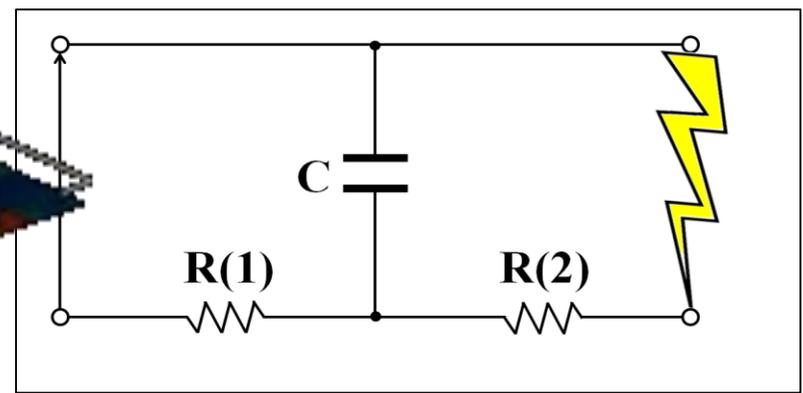
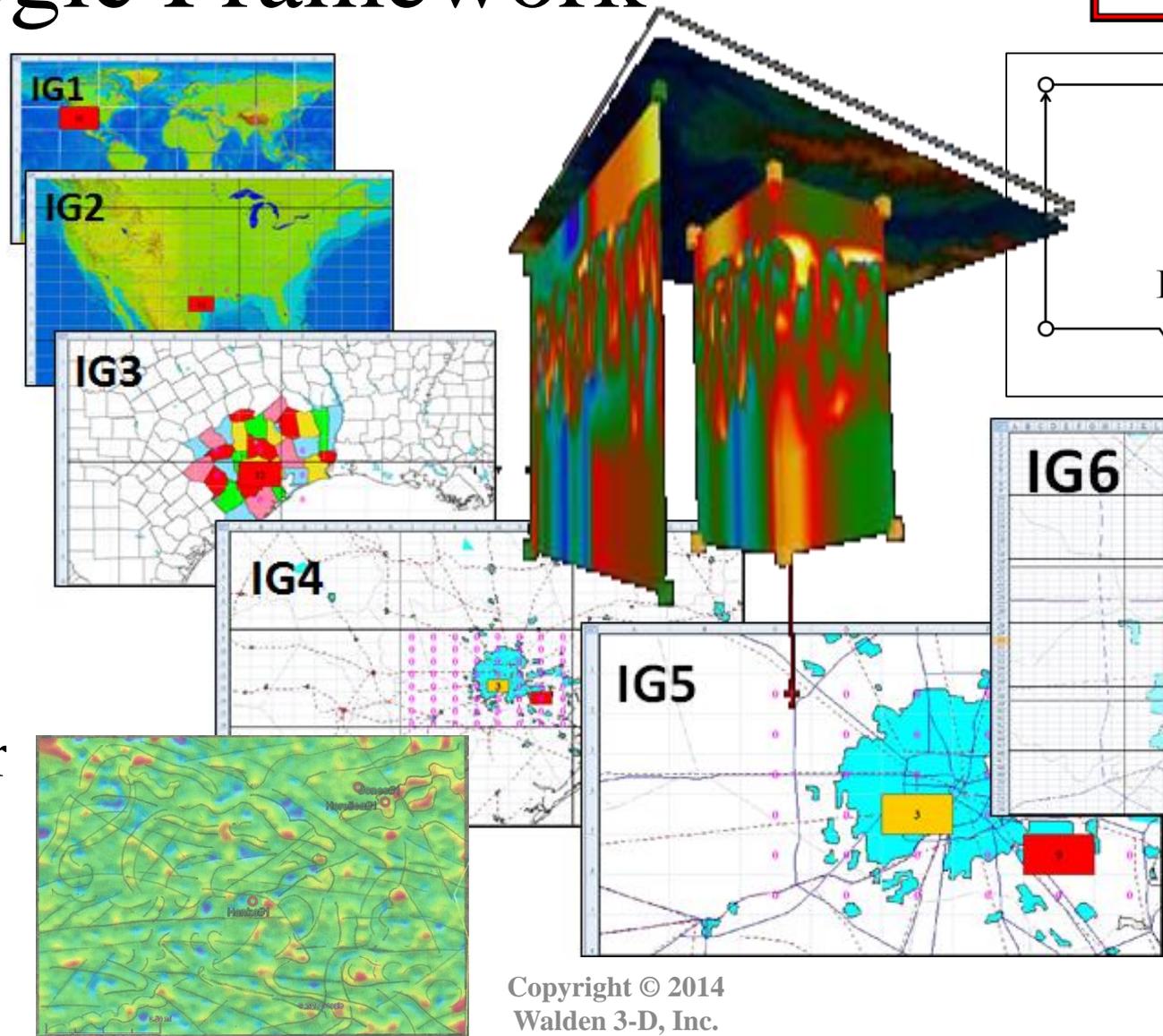


Image source: Ericsson

Ericsson projected video traffic will account for 55 percent of all data use by 2020, with social networking comprising 15 percent, Web browsing 5 percent and audio, like music streaming, 2 percent.

4. Geologic Framework

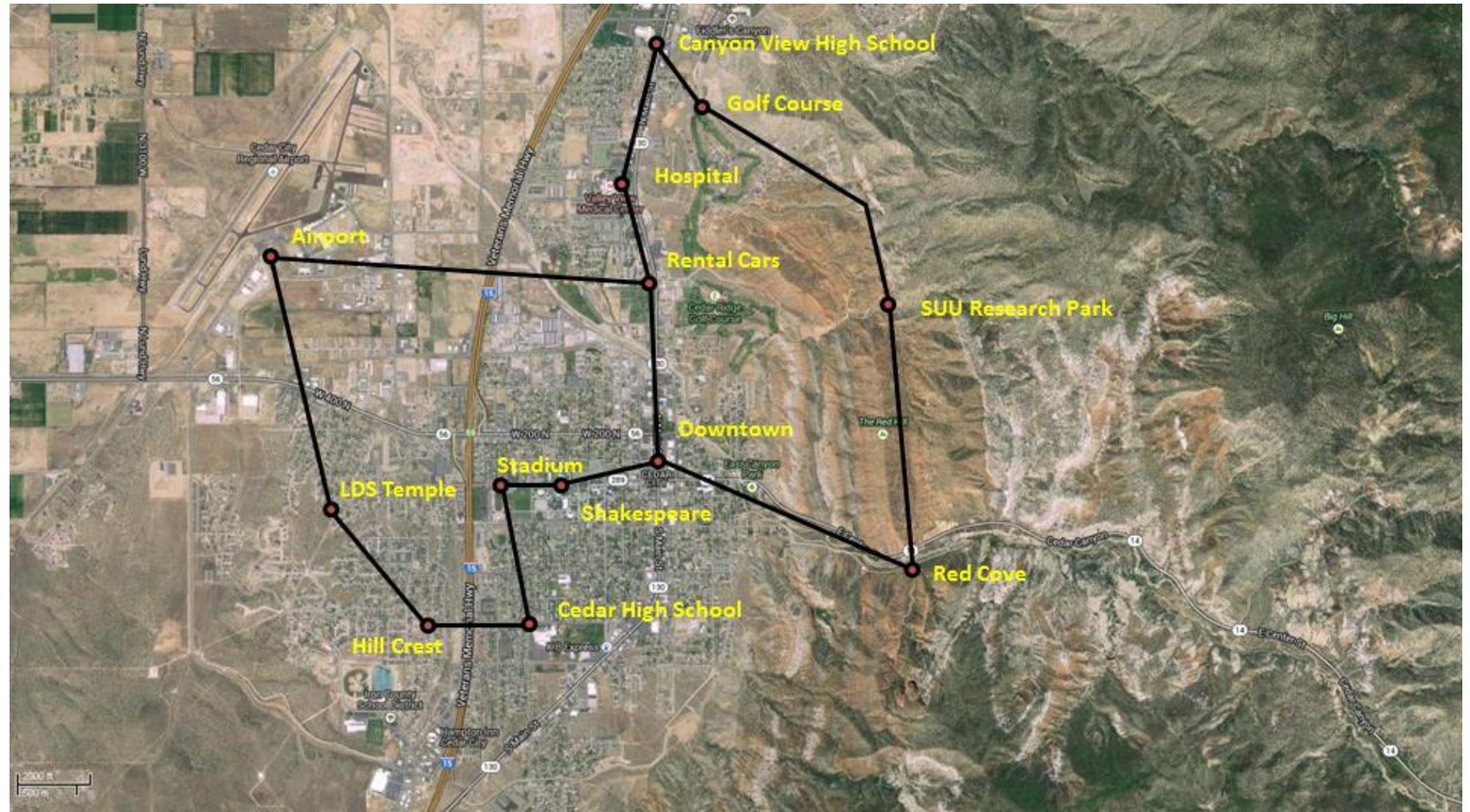
- Lightning occurs everywhere and databases are updated.
- Data can be used to map geology, providing an evergreen framework for planning.





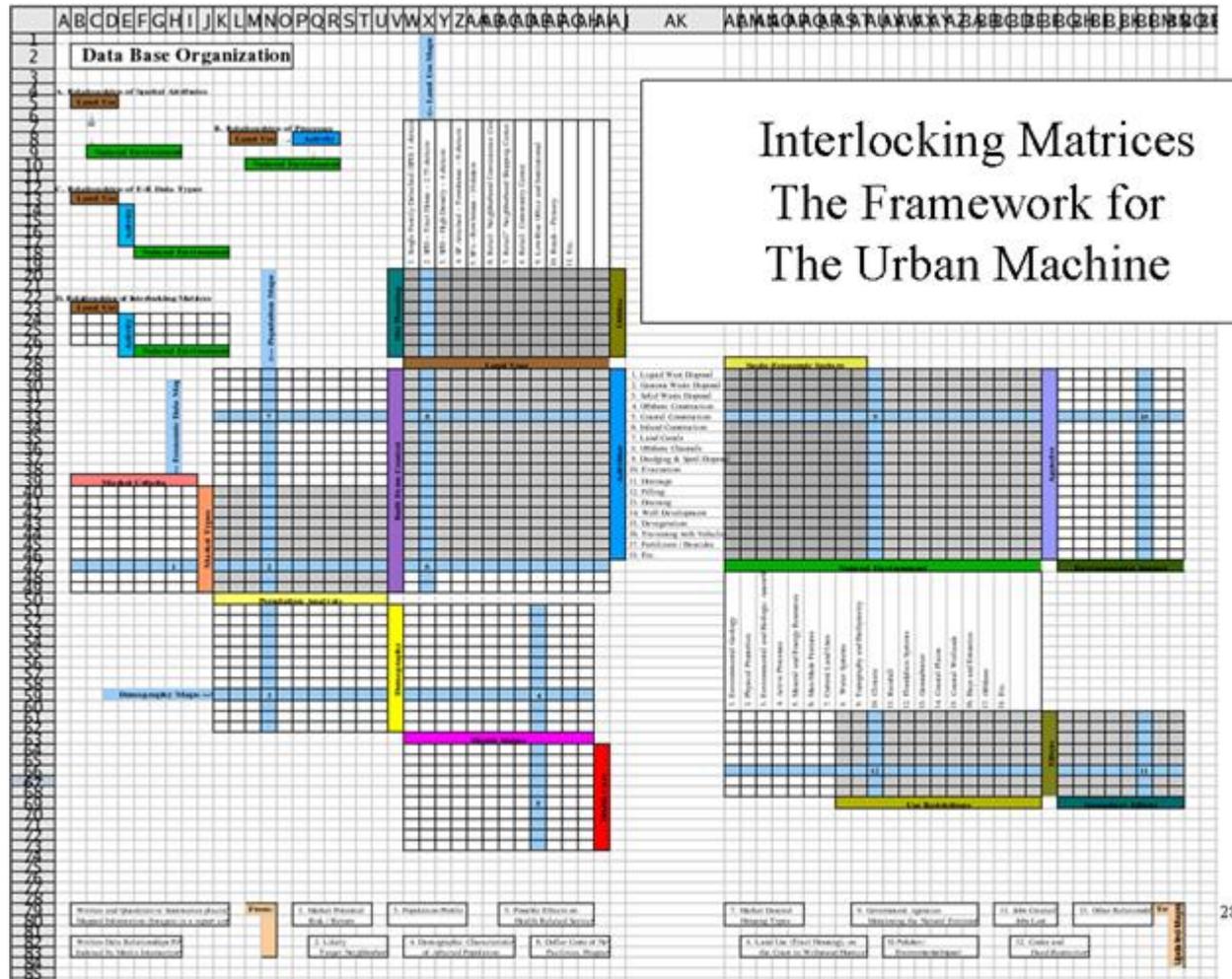
5. Transportation

Is mass transit feasible for Cedar City?



6. Measuring & Monitoring

- Communication infrastructure allows measurement of water and energy usage & distribution.
- Monitoring usage allows optimization of distribution and decreases costs significantly.
- Digital tracking enables quantitative forward use modeling and optimization.



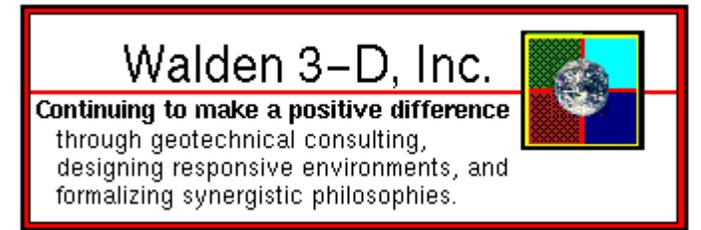


7. Feedback

Cost Savings for future city & university building projects from:

- Identifying Need: e.g. preparation for an earthquake;.
 - Collecting data: maps, indexed data, and interlocking matrices;
 - Analyze Patterns: seek to derive invariant polynomials of data sets;
 - Determine Parameters: define components for computer models;
 - Build Entity-Relationship Model: basis for enterprise planning;
 - Visualize Models: virtual reality allows model optimization;
 - Generate Construction Drawings: automatic creation;
 - Automated Assembly: ideally robotic assembly of subcomponents; and
 - Built Form: computer driven operation & maintenance schedules;
- are anticipated to be significant.

- **Thank You!**



Use Me! I volunteer for this kind of planning work.

H. Roice Nelson, Jr.

2155 West 700 South #31

Cedar City, Utah 84720

Cell: 713.542.2207 Home/Fax 435.256.2668

<http://www.walden3d.com/cedarcity/CedarValleyWater/>