

Economic Impacts of Intelligent Infrastructure: Executive Summary

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EXECUTIVE SUMMARY

Can Intelligent Infrastructure Drive an Economy?

Salt Lake City: UTA TRAX and FRONTRUNNER Rail Lines

Upgrading and expanding public transportation systems in Salt Lake City by the Utah Transportation Authority resulted in more than \$225 million in business sales and 1,300 permanent jobs.

Net New Jobs and Impacts:

The UTA Trax and FrontRunner rail lines are attributed with spurring development that has resulted in nearly 1,300 net new jobs generating over \$66 million in income and \$227 million in business sales annually.

Indirect and Induced impacts:

Including impacts associated with supplier purchases and employee spending, the total annual impact on the economy of Salt Lake County is raised to nearly 2,800 jobs, close to \$136 million in income, and over \$410 million in business sales annually.*

**These estimates reflect only some of the economic development impacts associated with the \$7 billion of private investment made near transit stations.*

Louisville: University of Louisville

Investing in smarter building technologies and energy efficiency upgrades on the University of Louisville campus helped directly and indirectly support a total of \$35 million in new business sales and nearly 700 jobs – including new jobs that are supported by the savings achieved through the project's implementation.

Stimulus Effect from Local Spending:

During project implementation, investment in building systems and energy optimization efforts directly and indirectly supported \$26 million in business sales and over 600 jobs in the Louisville metropolitan area.

Economic Impacts of Cost Savings:

Through the end of 2013, technology and energy optimization improvements have generated \$5.2 million in savings beyond the amount owed in annual debt service payments. Reinvesting these savings in university operations and additional energy efficiency projects has supported 71 jobs and \$9.3 million in business sales in the Louisville metropolitan area economy.

Intelligent infrastructure makes efficient use of limited resources by providing more information to end users, allowing residents to make better choices, and making infrastructure work for citizens in a more integrated, holistic manner.

Intelligent infrastructure enables efficiencies in information and energy use that help drive our economies.

In a new study conducted by Economic Development Research Group and commissioned by Siemens, different intelligent infrastructure projects were evaluated for their broader economic impacts. These economic impacts are not only driven by increased spending, but also by savings that derive from their efficient use of resources.

- 1) Building Technologies are known drivers of energy efficiency. Savings they bring about not only bring direct benefits to building operators; they also drive economic activity in their broader communities.
- 2) Public Transportation investments ultimately support smart growth by lowering transportation costs for companies and residents and spurring transit-oriented development for growing sectors of the economy. Focusing solely on highway expansion in urban areas can increase congestion and put a chokehold on growth.

While these projects were selected to create variety in scope, scale, and setting, they share a common goal of increasing energy efficiency and reducing energy and resource consumption.

- In Kentucky, the University of Louisville spent \$46 million to make numerous energy efficiency upgrades in buildings across its campuses that are conserving water, electricity, and natural gas.
- And in Salt Lake City, Utah, a light rail extension reduced residents' dependence on private automobiles and spurred high-density development, thereby decreasing the region's carbon footprint, improving local air quality, and proactively managing traffic congestion.

The study attempted to look beyond well-documented short-term spending effects from local equipment, labor, and service purchases, to lesser-studied, longer-term economic benefits— i.e., from spatial efficiency, greater private sector investment, and cost savings that are reinvested elsewhere:

- In the case of Louisville, where savings beyond the cost of debt service were reinvested back into overall operations and additional energy efficiency projects, energy efficiency

has effectively acted as a long-term stimulus--ensuring an ongoing cycle of economic viability in the face of rising energy costs.

- Because of its investment, vehicle-based trips were reduced and commercial and residential development expanded in Salt Lake City County due to companies and developers desiring access to transit.

For the projects in each of these cities, the effects of direct spending and energy savings on job creation, wage generation, and business sales were examined and demonstrated for the following types of regional economic impact:

3) Local spending on energy-related equipment and services can stimulate regional economic activity.

- In Louisville, local spending impacts derive from the purchase of goods within the Louisville region as well as the payment of wages to workers involved in equipment installation or other related services such as engineering, testing, and environmental remediation. All told, the implementation of the two phases of energy efficiency upgrades has driven local impacts estimated at over 600 jobs and \$26 million in business sales.
- In Utah, the UTA TRAX and FrontRunner rail lines have supported development resulting in nearly 1300 jobs, more than \$66 million in labor income, and over \$225 million in business sales.

4) By allowing households and businesses to use resources more efficiency, investments in smart city technologies can lead to cost savings--which are often redirected to support other economic activity.

- In the case of the University of Louisville, savings above and beyond the cost of the technology investments can be redirected to support additional university activity, thus generating further economic impact. To date, reinvesting these savings in university operations and additional energy efficiency projects has supported 71 jobs and \$9.3 million in business sales in the Louisville metropolitan area economy over a four-year period.

5) Investment in public transportation can stimulate new, contingent business development by improving access to talented workers.

- In Salt Lake City, major companies including Adobe, eBay, Goldman Sachs, Overstock.com, and Workday have made office location decisions based in part on proximity to TRAX (light rail) and FrontRunner (commuter rail) stations. In all, it is

estimated that nearly 1,300 jobs are associated with the existence of new light rail and commuter rail lines. And by paying wages that are spent throughout the region, these jobs have directly supported an estimated \$227 million in new business sales and over \$66 million in wages.

This study was unique in how it looked beyond short-term spending effects and toward longer-term economic impacts that come from cost savings. It also attempted to go beyond modeling economic impacts from expected (or even confirmed) performance savings and sought to rely on local knowledge (based on interviews) to monitor and assess impacts as they are realized after-the-fact. Importantly, we believe these examples will help encourage further discussion around the ultimate viability of making large, up-front capital investments when we are able to identify and show the value of savings and the “multiplier” effect these savings have on the surrounding economy over time.

Economic Modeling Methodology:

The economic impacts presented in this report were estimated using the IMPLAN economic impact modeling system. IMPLAN is the most widely used input-output economic modeling system in the U.S. This system uses industry- and region-specific economic data to translate direct effects into “spinoff” or “multiplier” effects. A more detailed description of the model and its inputs can be found in the body of this report and in the Appendix.