ECONorthwest
ECONOMICS • FINANCE • PLANNING

Phone • (503) 222-6060
FAX • (503) 222-1504

222 SW Columbia Street
Suite 1600
Portland, Oregon 97201

Other Offices
Eugene • (541) 687-0051

November 18, 2010

TO: **Portland Public Schools, Sarah Schoening**
FROM: **Alec Josephson and John Tapogna**
SUBJECT: **ECONOMIC IMPACTS OF PHASE ONE OF PORTLAND PUBLIC SCHOOL'S PROPOSED SCHOOL MODERNIZATION PLAN**

Portland Public Schools ("PPS") commissioned ECONorthwest[1] to measure the economic impacts associated with the first phase of PPS' proposed School Modernization Plan. Phase one includes the rebuilding of eight campuses; learning environment upgrades at 75 schools; and accessibility, security, safety, and structural upgrades for schools throughout the district. Phase one of the School Modernization Plan will cost $548 million with work to be completed over a six-year, 2011 to 2017 time period. Each phase of the School Modernization Plan is to be funded by voter-approved bond measures using a funding model that attempts to minimize long-term debt and interest costs.

The next section of this memorandum discusses the economic impact methodology used and the results of this analysis.

ECONOMIC IMPACT METHODOLOGY AND RESULTS

One modeling framework for measuring economic impacts is called input-output modeling.[2] Input-output models provide a comprehensive picture of the economic activities in a given study area using data assembled for national income accounting purposes and mathematical relationships that describe the interactions of local industries with each other, with industries outside of the region, with households as suppliers of the factors of production, and with final users of goods and services.

[1] Started in 1974, ECONorthwest is a consulting firm incorporated in the state of Oregon that specializes in economics and financial analysis. ECONorthwest has extensive experience using the IMPLAN modeling system to measure the economic impacts on a wide variety of projects, policies, and business decisions. This report was prepared for PPS by staff at ECONorthwest's Portland, Oregon office. Senior economist, Alec Josephson, conducted the economic impact modeling and received valuable assistance from John Tapogna, Senior Policy Analyst and President of ECONorthwest. Both can be reached by phone at (503) 222-6060, or by email at tapogna@portland.econw.com and josephson@portland.econw.com.

[2] Although initially inspired by Quesnay's "Tableau Economique," and the Marxian and Walrasian analysis of general equilibrium, input-output analysis was first put to practical use by Wassily Leontief in the late 1930s. While at Harvard, Leontief used his input-output system to construct an empirical model of the United States economy. This research gave rise to his 1941 classic, "Structure of American Industry, 1919-1929." For his research, Leontief was awarded the Nobel Prize in Economics in 1973.

The input-output modeling framework has been packaged into a commercially-available software program called IMPLAN (for IMpact Analysis for PLANning).[3] This is the modeling software that ECONorthwest used in this analysis.

IMPLAN is generally regarded as the most reliable input-output modeling platform available, and is used by over 1,500 public and private clients. In 2009, the United States Department of Agriculture (USDA) recognized the IMPLAN modeling framework as "*one of the most credible regional impact models used for regional economic impact analysis"* and, following a review by experts from seven USDA agencies, selected IMPLAN as its analysis framework for monitoring job creation associated with the American Recovery and Reinvestment Act (ARRA) of 2009.[4]

Input-output modeling employs specific terminology to describe the types of impacts. The three types of impacts are:

1. **Direct impacts** are those associated with spending on phase one of the School Modernization Plan. Under a project-centric approach, the direct impacts include the jobs and income for local construction workers and contractors, architects, and project developers. They also include sales, jobs, and income for local manufacturers or providers of new educational technologies for classrooms and furniture, fixtures, and equipment ("FFE") for schools.
2. **Indirect impacts** occur as businesses buy from other businesses. They are oftentimes referred to as "supply-chain impacts." Construction contractors, for example, will purchase a variety of locally provided goods and services, such as wood products, aggregates and cement, roofing materials, welding supplies, etc. Providers of these intermediate goods will, in turn, purchase a host of goods and services necessary to operate. These purchases of goods and services by businesses from other businesses *indirectly* generate sales, jobs, and income for others.
3. **Induced impacts** result from the increased income and purchasing power of households who are either directly or indirectly affected by expenditures associated with phase one of the School Modernization Plan. Construction workers, for instance, will buy groceries or purchase health care services for their children. Employees at the welding supply store will spend their income in much the same way. This spending *induces* sales, jobs, and income for workers and businesses in other sectors of the economy.

The economic impacts associated with expenditures during phase one of the School Modernization Plan can be measured in several ways. This report focuses on three of the most common and useful measures:

- **Output** is the broadest measure of economic activity, and represents the value of goods and services produced. Output includes the value of intermediate goods used in production plus the components of value added (personal income, other income, and indirect business taxes).

[3] IMPLAN was developed by the Forest Service of the US Department of Agriculture in cooperation with the Federal Emergency Management Agency and the Bureau of Land Management of the US Department of the Interior to assist federal agencies in their land and resource management planning. Applications of IMPLAN by the US Government, public agencies and private firms span a wide range of projects, from broad, resource management strategies to individual projects, such as proposals for developing ski areas, coal mines, and transportation facilities, and harvesting timber or other resources.

[4] See excerpts from an April 9, 2009 letter to MIG, Inc., from John Kort, Acting Administrator of the USDA Economic Research Service, on behalf of Secretary Vilsack, at www.implan.com.

- **Personal income** is a subset of output and consists of employee compensation and proprietary income. Employee compensation (or wages) includes workers' wages and other benefits such as health and life insurance, and retirement payments. Proprietary income (or business income) represents the payments received by small-business owners or self-employed workers. Business income would include, for example, income received by private business owners, doctors, accountants, attorneys, etc.
- **Job** impacts reported by the IMPLAN model are full-and part-time jobs.

GROSS VS. NET ECONOMIC IMPACTS

Simply citing the economic impacts that occur as a result of some project would produce an upper bound estimate of economic impacts. This upper bound estimate is often referred to as a measure of the *gross* economic impacts. Gross economic impacts offer a perspective on the magnitude of overall economic impacts that can be traced back to an activity or project; however, they do not necessarily reflect or measure the creation of new jobs or income.

An analysis of the *net* economic impacts requires that only economic stimuli that are new or additive to the economy be counted. To do this, this analysis includes a counterfactual argument that considers the sources of funds used to finance school modernization projects and the possibility that spending and economic activity may be diverted from other areas or sectors of the local economy. Since phase one, and all future phases, of the School Modernization Plan are to be funded by voter-approved bond measures, the gross economic impacts generated by phase one spending will be offset somewhat by the foregone consumption spending of Portland-area households who, as a result of the School Modernization Plan, will pay higher property taxes.

INPUT-OUTPUT IS A STATIC ECONOMIC MODEL

Input-output models are static models in that they measure the flow of inputs and outputs in an economy at a point in time. With this information and the balanced accounting structure of an input-output model, an analyst can: 1) describe an economy at one time period, 2) introduce a change to the economy, and then 3) evaluate the economy after it has fully accommodated that change.[5]

Static input-output models assume that there are no changes in wage rates, input prices, and property values and, in the longer run, that individual projects will not affect the evolution of the regional economy. In fact, however, investments in education, transportation improvements, technological advances, and similar factors do cause the economy to evolve in an expansive fashion. Economists call this an expansion of the "production possibilities" frontier of the economy. This is a difficult effect to quantify, although it has been well established that higher per-capita education and transportation spending tends to be associated with more robust economies over time.[6] For phase one of the School Modernization Plan, this means that the net

[5] This type of analysis is called "partial equilibrium" analysis. The logic of partial equilibrium analysis is straightforward: take a snapshot of an economy, posit a change to the economy, and then take another snapshot to measure what happened. Measurement in this sense is really a before and after comparison.

[6] Carlino, Gerald, A., "Highways and Education: The Road to Productivity?" Federal Reserve Bank of Philadelphia, September-October 1993.

economic impacts estimated within an overly narrow input-output perspective will likely understate the longer-term economic impacts.

ECONOMIC IMPACT RESULTS

ECONorthwest constructed an economic impact model of the three-county Portland area using 2008 IMPLAN data (the most recent data available).[7] The primary inputs and assumptions in this analysis are:

1. Total phase one spending of $548 million over the six-year, 2011-2017 time period, with preliminary annual spending estimates provided by PPS staff.
2. Aggregate project cost estimates were allocated to IMPLAN sectors as follows: project hard costs (nonresidential maintenance and repair construction), project soft costs (architectural and engineering services), learning technologies and FFE costs (a modified investment function for education services[8]), and interest costs (not included as an expenditure but included in the counterfactual spending argument).
3. Future expenditures were adjusted for price changes using IMPLAN industry-specific deflators. All reported impacts are in 2010 dollars.
4. Default Regional Purchase Coefficients (RPCs) were used to determine the proportion of direct spending accommodated by local industries.

The impacts reported in Table 1 represent the *gross* economic impacts generated from project spending during phase one of the School Modernization Plan. It's important to note that these gross impacts are temporary in nature, spread out over the six year time period, and occur as phase one spending unfolds.

Table 1: Gross Economic Impacts

Type of Impact	Direct	Indirect	Induced	Total
Output	$474.0	$184.7	$286.4	$945.0
Personal income	$258.6	$64.4	$89.8	$412.8
Jobs (full- and part-time)	3,727	1,203	2,120	7,051

Sources: ECONorthwest using aggregate phase one cost data provided by PPS and the IMPLAN input-output modeling system.

Table 1 shows how phase one project spending generates additional economic activity (called the "multiplier effect") in other sectors of the Portland economy. That is, via supply-chain and consumption-driven spending effects, the total gross economic impacts are bigger than the direct gross impacts.[9] In total, phase one project spending is associated with $945.0 million in economic activity, including $412.8 million in personal income, and 7,051 jobs in Portland.

The use of local financing means that the gross economic impacts associated with phase one spending will be offset somewhat by reduced private spending. This counterfactual spending component and the resulting net economic impacts are shown in Table 2.

[7] Phase one of the School Modernization Plan primarily affects schools and households in Multnomah County. However, the direct spending on the projects will affect businesses and employees throughout the Portland metropolitan area.

[8] IMPLAN investment function for BEA6100: Educational Services, with adjustments for non-capitalized goods and services.

[9] The gross direct impacts consist of $474 million in economic activity, including $258.6 million in personal income and 3,727 jobs. The gross direct output is less than phase one project spending because some goods and services (particularly learning technologies and FFE) are produced outside of Portland.

Table 2: Gross and Net Economic Impacts

Type of Impact	Output	Personal Income	Jobs (full- and part-time)
Gross Impacts (Modernization Expenditures)	$945.0	$412.8	7,051
Less Counterfactual (Foregone Household Spending)	$601.4	$191.1	4,457
Net Impacts	**$343.6**	**$221.7**	**2,594**

Sources: ECONorthwest using aggregate phase one cost data provided by PPS and the IMPLAN input-output modeling system.

On a net basis, phase one project spending will generate approximately $343.6 million in economic activity, including $221.7 million in personal income and 2,594 jobs, over the expected six-year project time line.