

OREGON TRANSPORTATION PLAN UPDATE

Background Paper

Long-Term Economic Influences

Introduction

Travel demand and freight movements are closely linked with economic activity in the state, as well as with activity beyond our borders. Oregon's recent, short-term economic experience has been widely chronicled for its sub-par performance. Over the near term, however, the pieces for our economic recovery seem to be falling into place. With these, a resurgence in travel demand and freight shipments will ensue.

The capital intensive and long-lived characteristics of transportation infrastructure necessitate a considerably longer perspective. While the long-run is commonly thought of as a sequence of "short-runs," it is considerably more than that. Fundamental structural changes in the economy and its demographics occur which are frequently set aside in a shorter-term context. Indeed, in the long-term, the direction of causality can get somewhat blurred inasmuch as, particularly in the case here, a lack of a strong, efficient and balanced transportation network can have a deleterious impact on economic conditions on the state and on the quality of life for its citizens. For the long-run perspective of the Oregon Transportation Plan, things need to become much more integrated, more interactive than just a single direction of cause and effect of the economy on transportation demands and needs.

The long-run also requires a special recognition of the impact of uncertainty on a variety of economic variables. In a short-run outlook, where typically the horizon is short enough to assume that there is no physical investment that can expand capacity, there can still be some uncertainty. But the horizon is typically short enough to presume a lack of substantial structural change and its usual, attendant uncertainties. So, short-term forecasts are not likely to materially off the mark, although they are very unlikely to be exactly right either. In the longer term, the composition of both Oregon's physical and human capital can change and with these, there is wider uncertainty in formulating what the state will be like 10 to 20 years out.

As commonly done, and as was done in the state's 1992 OTP, alternative scenarios can and should be developed to reasonably bound these uncertainties.

The current state economic forecast from the Oregon Office of Economic Analysis provides an outlook to 2011 on a quarterly, as well annual, basis: <http://www.oea.das.state.or.us/>. Generally, short-term cyclical aspects dominate the near term outlook, with longer-term trends asserting themselves in the out-years of the forecast. It is these fundamental trends that hold the better picture for the economic backdrop sketched out here. Thus, there is a bit of a leap in going from the state's current economic setting to the long run needed for this Plan.

Long-Term Trends in Oregon's Economy

One of the more readily obvious building blocks of economic growth is a changing population, in the aggregate. Over the long-term, the state has managed to have population growth significantly above average. This is despite having made the slow transition from being a predominately natural resource based economy to a more balanced industry mix, led by high-tech manufacturing and information technology.

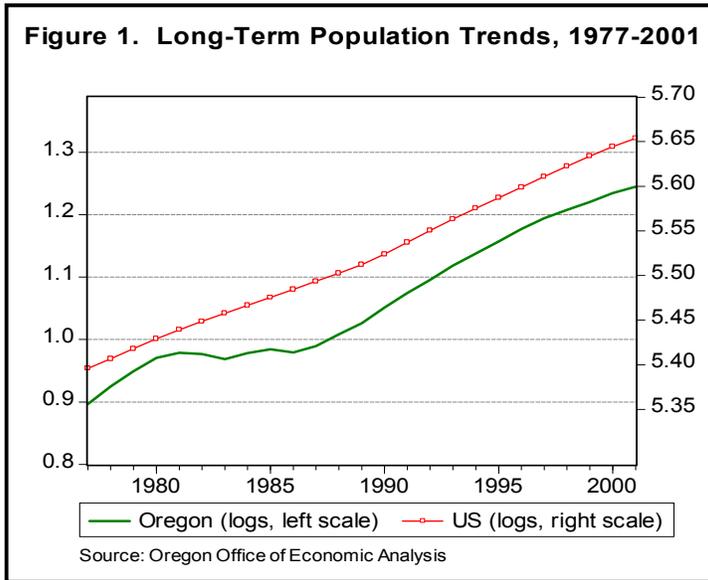


Figure 1 shows a comparison of Oregon's population over time and also that for the U.S. as a whole. Due to very strong growth in the latter half of the 1990s, Oregon's population growth averaged 1.6 percent over the span from 1977 to 2002. In contrast, population growth at the national level averaged only 1.1 percent. The severe recession of 1981-83 is very evident in the chart, when the state witnessed net out-migration of unprecedented proportions.

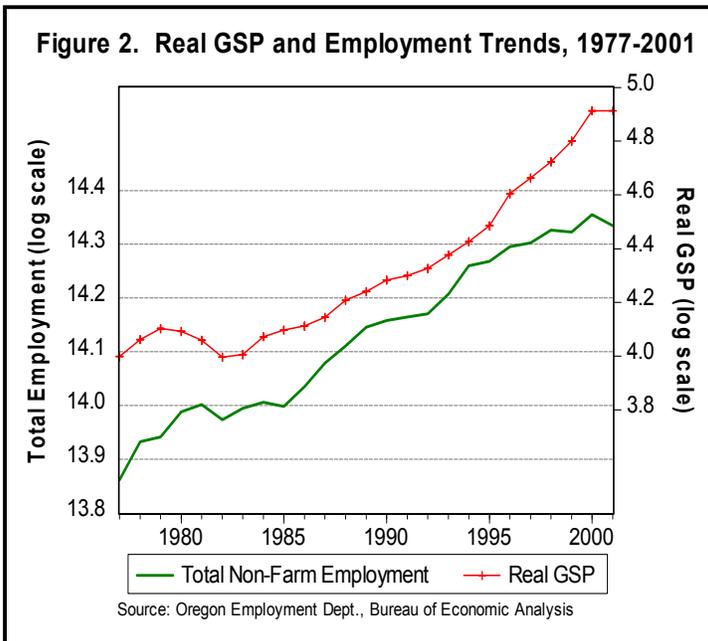


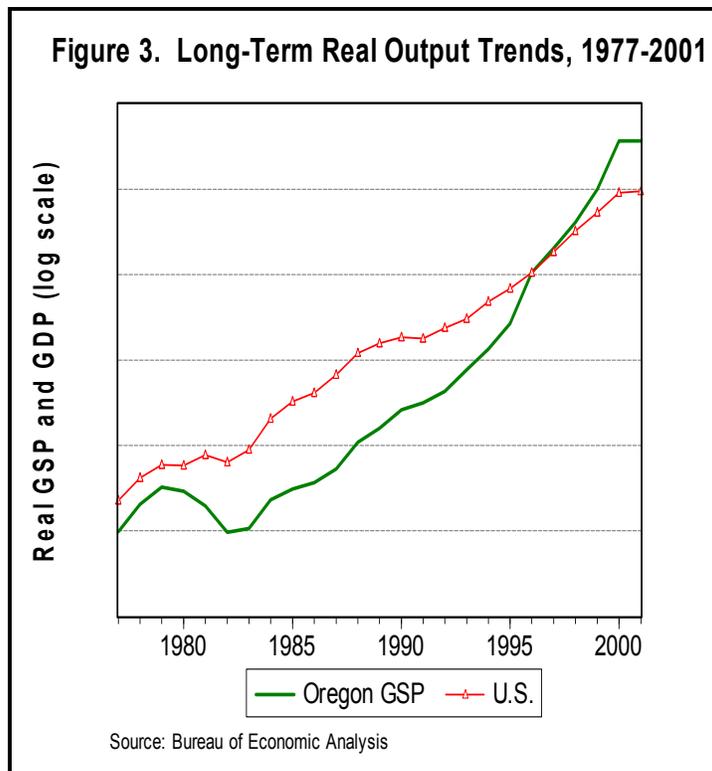
Figure 2 contains the graph of the historical behavior of two of the most significant economic indicators for the state: Total Non-Farm Employment and the inflation adjusted output of goods and services produced in the state (Real Gross State Product ("GSP")). Both variables reveal strong upward trends over the 1977 to 2001 period, the last year for which GSP is currently available from the U.S. Department of Commerce, Bureau of Economic Analysis. During the period from the mid-1980s to mid-1990s, both

employment and real GSP grew in lockstep with one another. However, the linkage is noticeably weaker at both the beginning and at the end of the period shown, both times of volatility and sub-par economic performance. Total non-farm employment levels rose at an average rate of 2.0 percent during this period, slightly faster than the growth in overall

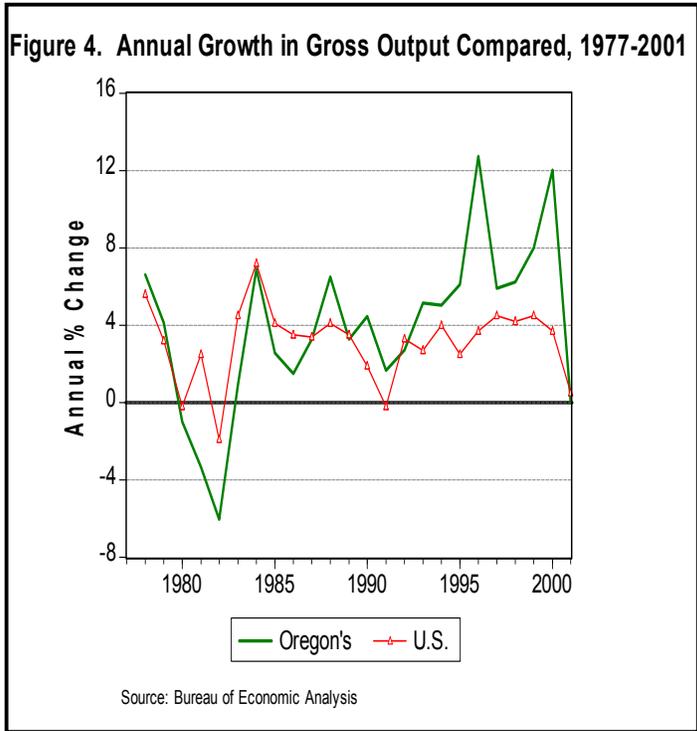
population. Real growth in GSP has been growing nearly twice as fast as job growth, averaging 3.9 percent. Worker productivity accounts for the difference. In the simplest of terms, the rate of employment growth and the rate of productivity underlie the overall rate of real economic growth.

The state's output of goods and services – and as well as the concomitant number of workers necessary to produce and distribute them – is strongly tied to economic activity nationwide. Moreover, globalization and increased opportunities for trade and foreign direct investment will further amplify our reliance on economic activity beyond our borders. Despite employment data being one of the mainstays for being a comprehensive and very timely indicator of the economy, GSP offers a somewhat different, and in some ways better, assessment of overall activity. This is because it embeds other factors of production such as physical plant/equipment, energy, and raw materials into the picture.

Figure 3 shows the temporal relationship between real economic activity in the state and the comparison to the national economy overall. Real, or inflation adjusted, GSP for Oregon and real GDP for the entire country is charted for the span of 1977 – 2001. This covers the production goods and services of all industries, including the government sector. The chart reflects the strong acceleration in Oregon's economy in the 1990's. Otherwise, our GSP seems to trend along with the nation reasonably closely.



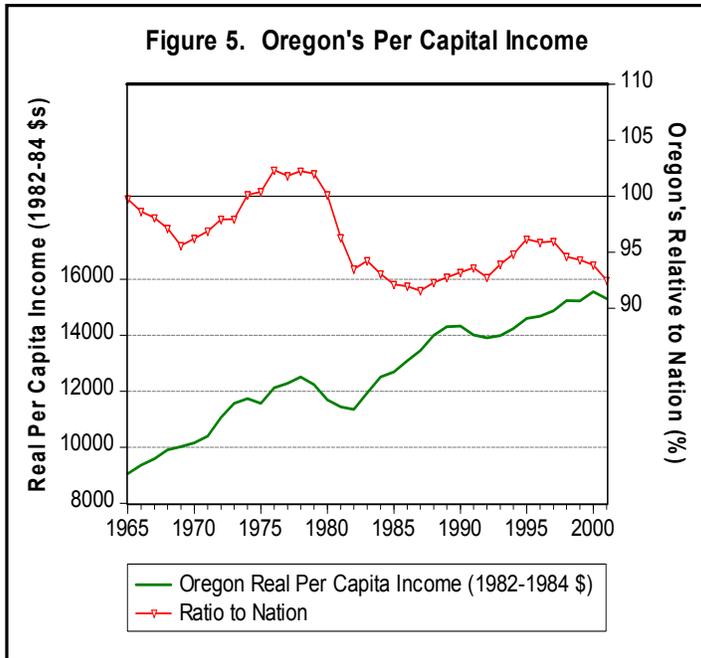
An alternative look at the same variables in terms of their annual percentage changes offers a sharper comparison of Oregon's growth with that of the nation overall. These are represented in Figure 4 below and show the pattern of annual growth rates. Again, our real economic performance dramatically outpaced the nation in the 1990s, ending, however, with the sharp decline in growth in the current contraction. The recession of 1981-1983 is also sharply evident for the state. For the entire period shown, Oregon's real GSP grew at an annual rate of 3.9 percent. Excluding the activities of the government sector, which accounts for about 10 percent of total state GSP, it grew at 4.2 percent. Nationwide, real growth occurred at a somewhat slower average rate of only 3.1 percent.



While the patterns of annual growth in GSP and GDP might seemingly suggest a very close linkage between Oregon's real growth and the nation's, the relationship is not as tight as might be suspected. Statistically, there is a only moderately strong, positive association between the two. The simple, linear correlation coefficient between our annual growth rate and the nation's is only 0.71. Thus, there are obviously other, presumably systematic, factors that account for Oregon's above average growth. These may include its faster population growth, its proximity to abundant trade

opportunities with fast growing counties around the Pacific Rim, and strong export performance, in general.

Personal income is a major factor in supporting economic activity. It directly affects the stock and composition of the fleet of passenger vehicles, and it also influences how intensively that stock is used. So a number of dimensions of both travel demand and transportation infrastructure are influenced by the state's personal income level and trends. In addition, personal income is a large part of the basis for retail activity that requires multi-modal capacity to move and distribute goods efficiently. Figure 5 charts two aspects of the state's personal income historically: real personal income per capita and how it compares with the nation. Aggregate personal income is composed of not only wage and salary incomes (usually about 55 percent of all personal income), but also from non-farm proprietors' net income and passive income (dividends, interest, and



rents), of transfer payments. Personal income on a per capita basis - adjusted for inflation - has generally risen over the past four decades. There have been several rough patches, however, notably in the early 1980s. Despite the downturns, the overall trend rate of growth averages about 1.5 percent over the 1965-2002 period.

Oregon's per capita income is frequently benchmarked to the national average. Oregon's ratio of per capita to the nation's is also contained in the figure with the line using the symbol, using the right-hand

scale as the frame of reference. Several notable similarities and contrasts to the real per capita income trend surface. First, Oregon's has surpassed the national average only in the era dominated by the state's lumber and wood products industry. The late 1970s correspond with the zenith in employment and production in that significant sector. Secondly, along with real per capita income, the ratio collapsed with the devastating recession in 1981-1983. Third, in the post 1981-1983 period, there is seemingly reduced volatility in the ratio, and it shows a very gradual, rising trend toward parity with the nation until the late 1990s. Finally, while per capita income has continued to trend upward in recent years, in relation to the national average we are falling behind. As a result, the state's ratio has been gravitating to the 92 to 93 percent level in recent years.¹

It should be noted that underlying this composite per capita income ratio is the differentiation between urban-based and rural-based employment. Over the past 25 years, inflation-adjusted wages on average have increased at nearly a 3 percent annual rate, whereas in rural Oregon the increase has been at slightly above one-third that rate, or about 1.2 percent annually.

¹ It could be observed that high cost of living states such as California and New York might distort this ratio, particularly given the size of their economies. Netting out these states from the national average does cause the ratio to rise somewhat. This adjustment elevates the Oregon ratio about 3 to 5 percentage points. However, the comparison is qualitatively unchanged, and parity is still not achieved in the 1980s and 1990s.

Table 1 offers a summary of the trends discussed above for reference purposes. In addition, the trend rates of growth that we might reasonably expect for these broad aggregates are also provided, labeled as “Baseline Outlook.” (No attempt is made here to flesh out trends that might support plausible alternative scenarios.)

While Oregon’s population is forecast to have an annual average growth rate of 1.2 percent, the year-to-year rates actually show a gradual decline to about 1.0 percent by 2025. Despite the fact that the growth rate diminishes, a more notable feature of the outlook for our demographics has to do with the changes in

TABLE 1. Historical Trends and Baseline Long-Term Outlook

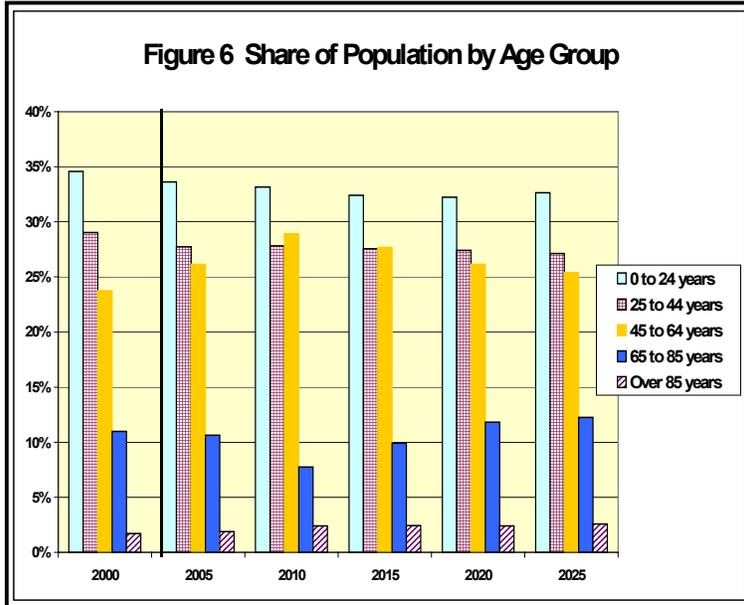
Variable	Historical Annual Growth	Baseline Outlook to 2025
Oregon Population Growth, 1974-2002	1.6 %	1.2 % ^a
U. S. Population Growth, 1974-2002	1.1 %	0.8 % ^a
Oregon’s Real Gross State Product, 1977-2001 (all industries)	3.9 %	3.1 - 4.1 %
Oregon Total Non-Farm Employment, 1974-2002 (all industries)	2.2 %	1.6 % ^a
Oregon Real GSP per Worker, 1977-2001	1.8 %	1 ½ - 2 ½ %
Oregon Consumer Price Index-Urban, 1974-2002	5.0 %	2 ½ - 3 %
Oregon Real Per Capita Income, 1977-2002: 1965-2002:	1.0 % 1.5 %	1.7 % ^a

^a Oregon Office of Economic Analysis, trend rates of change in current forecast (December 2003)

our age composition that are fairly certain to occur. The much chronicled and large-scale retirement of “boomers” starts in the 2010-2011 time frame and begins to exert a profound impact on the state’s, and indeed the nation’s, demographics.

Figure 6 shows how the shares by major age group are expected to evolve out to 2025. Significantly, there is not only a relatively sharp increase in the share of 65 – 84-year olds in the 2010-2020 time frame, there is also a decline in the share of persons in the 45 – 64 age category. Given the payroll taxes/”pay-as-you-go” structure of major portions of retirement support and health care, pressures on financial viability are likely to intensify if not addressed with long-term reform measures.

Despite these pressures, there will be major shifts in the spending habits of retirees, more toward recreational/entertainment activities and toward health care. Travel demand patterns are very likely to be affected by these changes in consumption patterns. Although the share of the elderly rises only slightly, elder care costs will also absorb relatively an increasing amount of resources to meet demand.

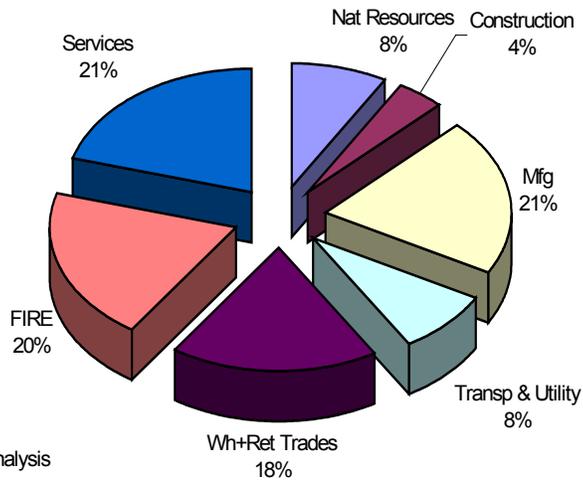


Industry Mix

Notwithstanding Oregon’s transition from a predominately natural resource economy, the state still maintains its manufacturing prowess. While employment levels are frequently used to compare the relative sizes and importance of various sectors, this narrative relies instead on gross state product by major industry component. This has the advantage of implicitly capturing the total valued added of all factors of production, rather than just labor head counts. For very long run horizons such as we are dealing with in the Oregon Transportation Plan, trends in GSP may be a more robust indicator. The basic presumption is that whatever the types of goods and services that consumers demand in a market-based economy, the state is able to retain its competitive advantages, as well as the essential infrastructure, so as to produce its “share” of global production and services.

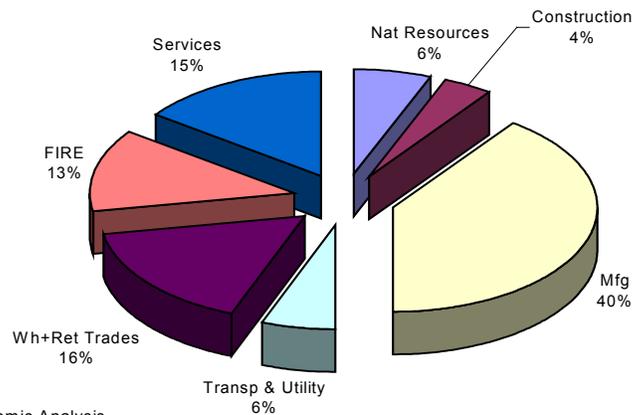
Figures 7 and 8 offer a glimpse of the representative shares of Oregon real GSP for 1986 and 2001, the most comprehensive span available from the Bureau of Economic Analysis. In the figures “Nat Resources” includes agriculture, forestry, fisheries, and extraction activities, but lumber/wood products and food processing are both embedded in manufacturing activities, as is conventionally done.

**Figure 7. Industry Shares by Real GDP, 1986
(Private Industries)**



Source: Bureau of Economic Analysis

**Figure 8. Industry Shares by Real GDP, 2001
(Private Industries)**



Source: Bureau of Economic Analysis

Several things stand out in the inter-temporal comparison provided in the charts. First, manufacturing has surged to be a very dominant share of private sector GDP; to 40 percent from 20 percent of private value added. (Using employment shares, however, the change is considerably less stark. The share of workers engaged in manufacturing was 18 to 19 percent in the mid-1980s. In 2001, it was somewhat lower at about 15 percent.)

Second, wholesale and retail trades have maintained a very stable share of private sector output over the period: about 16 to 18 percent. This is the case, as well, for activity in the transportation-utility, natural resources and construction sectors. Third, in terms of real output shares, services (which range over a wide variety of activities stemming from personal, business, and social services) have actually declined slightly from 21 to 15 percent. While employment levels would controvert this trend, the value-added metric is revealing. A similar result applies to another major non-manufacturing sector: fire, insurance, and real estate (“FIRE”). While this sector has been the source of strong job growth and rising labor share, the share of real value added has declined slowly from 20 percent to 13 percent. Overall, these sectors have all shown net growth, and it is just that they have been overshadowed by manufacturing and its very high value added (and attendant high wages and salaries).

As a follow-up note, there is the treatment of our lumber and wood products, food processing, and paper and allied products industries being a part of Oregon’s manufacturing sector. The picture of the role played by natural resources in their entirety changes if these are removed from manufacturing value added, and combined with natural resources. Then, the combined value added becomes roughly 34 percent of the state’s total in 1986 (all private industries only). However, by 2001 the contribution of natural resource-based economic activity is reduced by about half to only 17 percent of private state GSP.

The sectors of note that reveal the fastest real growth over the broader span of 1977 to 2001 cover:

Natural Resources

1. Agriculture, Forestry, Fisheries and related Services, 5.6 % per year

Manufacturing

1. Electric Machinery, 30.3 % per year
2. Electronic Eq. and Instruments, 20.5 % per year
3. Industrial Machinery and Eq., 9.0 % per year

Non-Manufacturing

1. Security and Brokerage Services, 12.6 % per year
2. Business Services, 7.2 % per year
3. Private Social Services, 6.7 % per year

The slowest growing sectors of note have been:

Manufacturing

1. Lumber & Wood Products, -3.5 % per year

2. Other Transportation Eq., -2.4 % per year
3. Paper & Allied Products, -1.7 % per year
4. Primary Metals, 2.5 % per year

Non-Manufacturing

1. Hotels and Other Lodging, -0.3 % per year
2. Insurance Carriers & Agents, -0.2 % per year
3. Depository Institutions, 1.2 % per year