Economic and Land Use Impacts of the Spokane Central City Line

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Spokane Transit Authority
Spokane Regional Transportation Council

Final Report

ECONorthwest
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ECONorthwest specializes in economics, planning, and finance. Established in 1974, ECONorthwest has 40 years of experience helping clients make sound decisions based on rigorous economic, planning and financial analysis.

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Summary

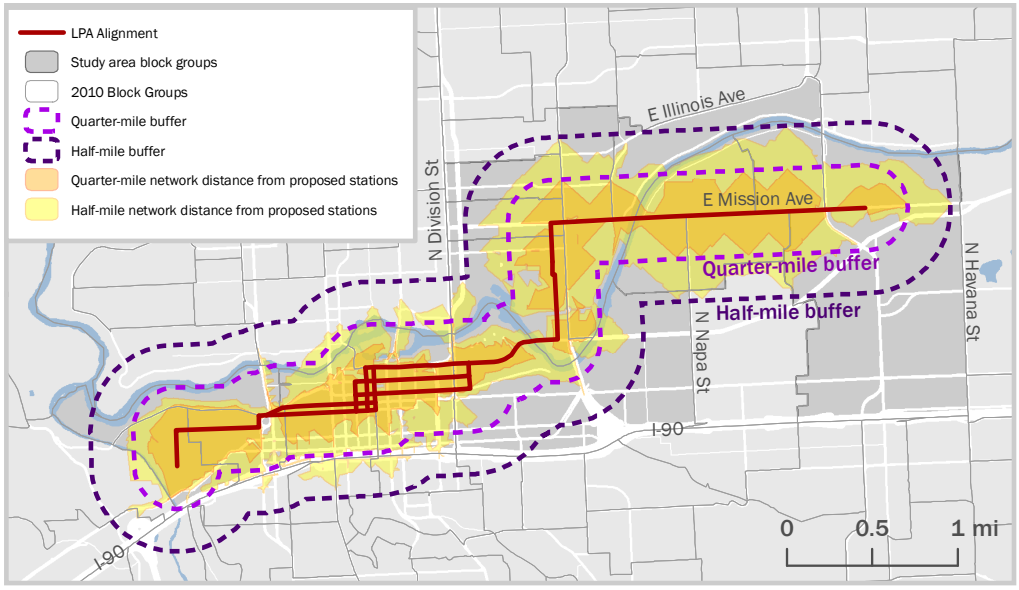
Background

The Spokane Transit Authority (STA) is evaluating the economic and land use impacts the Local Preferred Alignment (LPA) of a new transit line (the Central City Line, or CCL). The CCL would use electric buses on a roughly 6-mile route from Browne's Addition, through the downtown and University District, to Spokane Community College (east) The STA hired ECONorthwest, a consulting firm in economics and planning, to conduct this evaluation. The evaluation occurred between May and September of 2014.

Methods

Exhibit S.1 shows the study area. The project team then (1) compiled local data relevant to the evaluation of the economic impacts of the CCL, (2) reviewed the professional literature and conducted case studies to get information about the range of economic and development effects to expect from transit investments, (3) conducted interviews with stakeholders in Spokane about the CCL project's opportunities and challenges, and (4) created a simple model based on expected transit ridership of user benefits and how they could be capitalized into land value and additional development.

Exhibit S.1. Study area and distances from CCL



Source: ECONorthwest

Findings

The evaluation focused on changes in land values and changes in land development, which in turn are at least partial measures of changes in economic activity. It concluded that:

- The professional literature and case studies agree that efficient transit service can increase land values and the intensity of land development.
- Few studies rigorously control for the unique effects of a transit investment, much less for the parts of that investment that are integral to the operation of the transit system.
- One can estimate a lower bound of the effects of the CCL on property values by looking at expected ridership, estimating ridership benefits, assuming (as the literature of urban and transportation economics suggests) that those benefits eventually get capitalized into property values, converting those benefits to changes in property values, and distributing those changes to properties based on distance from the improved service (also supported by the literature). Using that method, the evaluation in this report concluded that, overall, **land value in the study would be about the $45 million greater (mean estimated present value) because of the ridership benefits of the CCL, and improvement value would be in the range of $175 million or greater.**
- Besides transit improvements, however, other conditions (or public policy and investment, markets, business cycles, and property owner objectives) strongly influence the rate, type, and location of development. Supportive measures (regulations, zoning and direct development subsidies), where justified, are an important catalyst for transit-oriented development. Those supportive elements often also create benefits for non-transit users, which may both (1) increase the speed or likelihood of high-intensity development, and (2) further increase the estimate of benefits that get capitalized into land value, and thus, the total effects on land development and economic activity.
- The direction of the effect of the CCL seems clear: overtime it will (1) improve transportation, (2) make sites along its alignment more valuable, and (3) encourage greater intensity of development, especially if (as is intended) such development is supported by other public policy and investment. The analysis in this report suggests that there is ample vacant and redevelopable land in the study area to allow that type of development to occur. It also suggests the kinds of development that areas along the CCL are likely to support.

These conclusions are conditional: the effects of the CCL depend on conditions. Theory, the literature, and intuition and observation put some

boundaries on the effects of transit. This evaluation estimates the net effects uniquely attributable to the CCL on property values and development to be in the range of 1 to 10 percent, and toward the lower end in the shorter-run. Total property values in the CCL corridor (defined for this calculation as a roughly 2,000 foot buffer on both sides) are about $1.14 billion (land plus improvements). If user benefits from the CCL are in the order of $45 million and these benefits accrue to land, then the change in total property values in the corridor would be approximately 4 percent.

The focus of this report has been on development activity. There is a rough correlation between development activity and economic activity. In the short run, development activity is directly economic activity: the construction industry will be bigger because of the CCL investment. And because the CCL will be built mainly with grant funding from FTA—with money that would otherwise not be available to the Spokane area for other construction projects—the spending is a net gain to the economy, not a transfer.

This evaluation does not speculate on the impacts of the CCL on retail sales along the corridor—too many other variables are at play. In the short run, retail should expect some disruption from construction: how much depends on how STA and retailers along the alignment attempt to mitigate the construction impacts. But the CCL is not a rail system, and its newest configuration still under consideration does not even require overhead wires. Construction impacts will be mainly for stations (spot improvements that will disrupt a few businesses), street rehabilitation and streetscape improvements (which retailers around the country accept as a way of improving the pedestrian / shopper environment).

In the long run, the retail effects depend on design and implementation: will the CCL be designed and built in a way that improves access by transit and the streetscape aesthetics and amenities along the alignment, and does not make driving and parking much more difficult? Presumably it can—it has been done other cities.

Transit systems in medium-sized cities like Spokane are often a long-run play. Spokane is likely to grow. Its elected and appointed officials have the opportunity, authority, and responsibility to shape that growth. Different development patterns will have different costs and benefits. Over the longer run, the CCL will shape the development pattern. It will cause more of the development and economic growth to occur along the alignment. Such a pattern has several advantages, and avoids certain costs. The more one expects the future to be one of increasing fuel prices, the need for decreasing emissions, changes in preferences toward more urban amenities, and other things that make increased central-city density more desirable, the more one is likely to see transit

infrastructure as efficient. If one is building toward a strong downtown in the future, evidence is compelling: strong downtowns have good transit.

One might worry that such a future is too far off, and that investing in transit now is premature: it may be an underutilized investment for many years. That could be true. The counterargument is that such investment will be more than repaid because it will move Spokane toward a future development pattern that is more efficient: one that will increase economic and amenity benefits and reduce service costs. Evidence that definitively points to one conclusion or the other across conditions probably does not exist: the best a region can do is assemble information about impacts (all types, long-run and short-run, public and private, by subarea and group) and have a discussion about their relative magnitudes and values so that tradeoffs can be evaluated and decisions made.

1 Introduction

The Spokane Transit Authority (STA) is evaluating the economic impacts of a potential new transit line (the Central City Line, or CCL) that would use electric buses. This report is that evaluation. This chapter describes how the evaluation is organized.

1.1 Background

Spokane Transit Authority (STA) wants to evaluate the economic impacts of a new transit line (the Central City Line, or CCL) that would use electric buses.[1] Such an evaluation serves at least two purposes. First, it provides information to help decision-makers, stakeholders, and the general public in the Spokane region decide whether the new system, as conceived or modified, is something that will provide net value to them and to the region. Second, if a local decision to pursue some version of the project occurs, the evaluation allows the STA to efficiently assemble a grant application to the Federal Transit Administration (FTA). The second purpose is contingent: it depends on the outcome of the decision that the first purpose addresses.

Any evaluation of a major public investment like the CCL should consider multiple categories of benefits and costs it may generate, and how those benefits and costs are distributed across different groups over time. It should also incorporate into those considerations (a) clear thinking about causal connections (If A, then B) and (b) good data and analysis.

This study focused on addressing a subset evaluation requirements as defined by FTA: the ones about the economic and development impacts of transit projects. That subset of requirements focuses on the economic and development *benefits* of a transit project, not on the costs. Thus, this study is not a full benefit/cost analysis.

The STA hired ECONorthwest, a consulting firm in economics and planning, to conduct this evaluation. The "Acknowledgment" section at the beginning of this report lists the other firms, agencies, and advisory committee members that assisted with that evaluation. The evaluation occurred between May and September of 2014.

[1] The original scope of work specified overhead wires for power. During the course of this evaluation the idea was introduced of charging by induction (from generators in the road at stations at the ends of the line).

1.2 Organization of this report

In addition to this introductory chapter, this report has four chapters:

- **Chapter 2, Framework and Methods.** The *framework* discusses conceptual and technical issues about how an economic evaluation of transit should be conducted. *Methods* describe the specific data and analytical techniques, consistent with the framework, used in this report to evaluate the CCL. This chapter is a summary of Appendix A, which provides more detail.
- **Chapter 3, Context: Past, Current, and Expected Conditions in the study area.** Chapter 2 explains why the economic (and development) impacts of the CCL can only be estimated in reference to economic and development impacts expected to occur *without* the CCL. To make predictions about future economic and development activity, Chapter 3 looks at past and current conditions for several variables expected to drive the future type and amount of that activity. The expected future without the CCL provides a baseline for comparing estimates of activity with the CCL (Chapter 4). This chapter is a summary of Appendix B, which provides more detail.
- **Chapter 4, Economic and Land Use Impacts Attributable to the CCL.** Chapter 4 uses the evidence assembled from a literature review and case studies (see Appendices C and D for details) to make estimates of the economic and land use (development) impacts of the CCL.
- **Chapter 5, Conclusions and Recommendations.** This chapter describes the implications and potential next steps for the CCL process.

The reported is supported by five appendices:

- **Appendix A, Framework and Methods.**
- **Appendix B, Context: Past, Present, and Expected Future Conditions in the Region and the Study Area.**
- **Appendix C, Literature Review: Effects of Transit on Economic Activity and Land Development.**
- **Appendix D, Case Studies: Experience of Cities With Transit Systems Relevant to the CCL Evaluation**
- **Appendix E: Stakeholder Involvement.**

2 Framework and Methods

Framework discusses conceptual and technical issues about how an economic evaluation of transit should be conducted. In summary, the evaluation. *Method*s describe the specific data and analytical techniques, consistent with the framework, used to in this report to evaluate the CCL. This chapter is a summary of Appendix A, which provides more detail.

2.1 Framework

Framework as used here means the concepts and principles that should be part of any evaluation of transportation investment (including transit investments like the CCL). Many of those principles are common to an evaluation of any type of public action.

People base decisions on internal models of cause and effect that are usually simple and incomplete. Most of the facts that go into those mental models are based heavily on assumptions (some testable empirically, some not). Any technical (as opposed to ideological or emotional) discussion of public policy must focus on assumptions. The framework for evaluating the CCL derives from several *assumptions* about how any transportation investment (facility or program) should be evaluated.

At the broadest level, *public policy aims at achieving better quality of life for people in some geographic areas by achieving a more efficient or more fair distribution of economic, environmental, and social benefits, subject to the constraints of cost.* Note the parallels between this definition and the idea from the literature on sustainability of *Triple Bottom Line*: good policy must address and optimize across objectives related to the Economy, the Environment, and Equity.

Transportation is inextricably tied to urban and economic development. Transportation is a factor of production (and, thus, a cost) for goods- and service-producing businesses. It is a cost to households as they pursue income-earning and leisure activities. If transportation can be made to be more efficient, the costs of production and household expenditures decrease and (other things being equal) economic activity increases. Thus, *a key objective of transportation policy should be to make the surface transportation system more efficient* (reduce travel time, increase travel time reliability). The importance of transportation efficiency extends farther: transportation costs are key determinants of land prices, land prices are key determinants of density, density is a key determinant of urban form, and urban form feeds back to influence transportation costs.

Thus, transportation investments should, first of all, improve the transportation system and provide *transportation benefits*. They should improve

some, and perhaps many, aspects of travel, including safety, travel time (mobility and access), and travel-time reliability.

A transportation investment may simultaneously or subsequently provide *non-transportation benefits*. One way a transit project like the CCL may do that simultaneously is by making streetscape or other improvements to the public realm (e.g., adding or improving public open space: parks, trees, seating, lighting). Such benefits are not directly a result of the new and improved transportation, but they might not have occurred without the transportation investment. A second way a transit project like the CCL may provide non-transportation benefits is through the subsequent, downstream effects improved transportation on (1) the *economy* (business and employment growth; incomes; real estate values; municipal fiscal position); (2) the *environment* (various categories of environmental impacts, including reducing auto travel and thus reducing emissions and greenhouse gases); or (3) *equity* (e.g., distribution of impacts).

The economic theory in support of transit-oriented development is that transit service improvements confer benefits to transit users and to non-users that in turn are capitalized into land values near areas served by transit, which then causes beneficial changes in the amount or type of development in those areas. Development opportunities near transit may also stem from economies of scale and scope (what economists think of as positive externalities) that are catalyzed by the transit investments. This can lead to further benefits as new development results in new demand for transit services in the corridor.

The success of development near transit investments depends on more than transit services. Benefits accrue to sites that are in a position to take advantage of the lower costs of moving people. Supporting measures are needed to capitalize transit benefits into real estate development.

The ideal comparison for decisions about transportation investments is of the *net present value* of the investment options (net value meaning benefits less costs; present value meaning that future benefits are expressed in today's dollars so that they can be summarized and compared). It is not the amount of the public spending that should be the focus of evaluation, but rather the *efficiency of that spending* (net benefits). In other words, how well do the new transportation facilities or programs perform?

Not all benefits, however, will be easily quantified or converted to monetary terms, and so evaluation criteria must include measures that lie outside of net present value calculations. The *criteria* for evaluating transportation investments (including investments in transit projects) should address the things that people care about (variously called goals, objectives, impacts, effects, outcomes,

outputs). When criteria get operationalized quantitatively, they become *performance measurements.*

Even if extensive work is done to try to identify and measure all the benefits and costs of some transportation investment, efficient decisionmaking requires that (1) all relevant alternatives be evaluated, and (2) that the *differences* in performance be compared. A related point is that it is not enough to make a careful forecast of what the world will be like *with* a new transportation investment; one must also forecast what the world will be like *without* a new transportation investment, and then compared the two forecasts to see the differences.

For the CCL a related question is about the total economic effects that might accompany its construction and operation compared to the effects that it uniquely contributes. For example, the CCL project could include changes in restrictive zoning and streetscape improvements that have positive effects on property values, but that could have been made independent of the CCL.

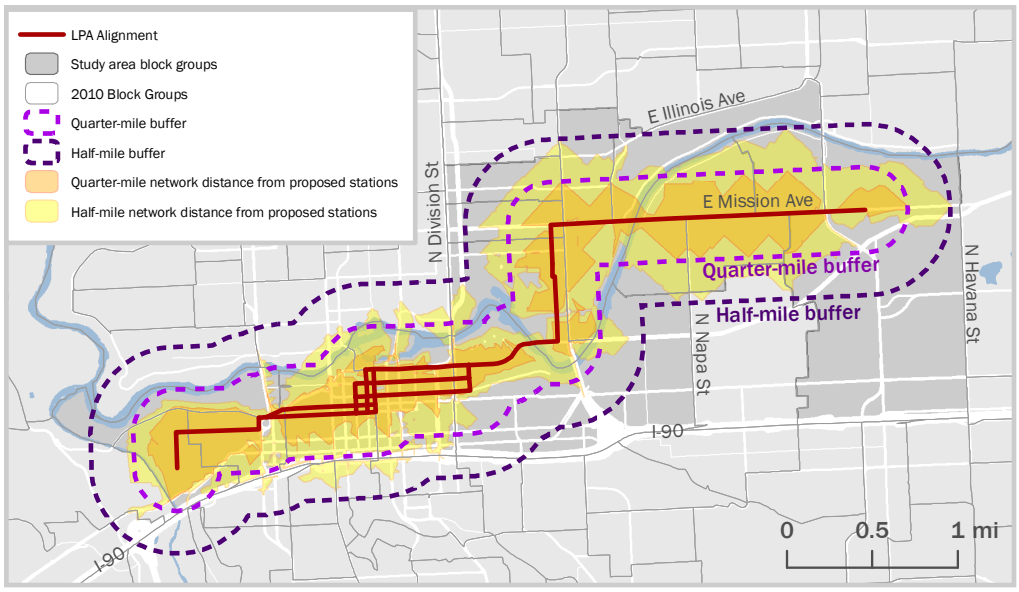
For this study of the CCL, the scope of work focuses on a subset of benefits: *economic* benefits. And within that category it further focuses on the potential benefits of induced changes in *land use and development*.

2.2 Methods

This report was completed in stages. First, the project team defined purposes, products, and evaluation criteria, while identifying data sources and evaluation methods.

Next, the project team (1) defined a study area (Exhibit 2.1 shows the boundaries used relative to the Local Preferred Alignment (LPA)); (2) compiled local data relevant to the evaluation of the economic impacts of the CCL from various sources (Appendix B), (3) reviewed the professional literature (Appendix C) and case studies (Appendix D) to get information about the range of economic and development effects to expect from transit investments, (4) conducted, in person, fourteen interviews with stakeholders in Spokane about the CCL project's opportunities and challenges (Appendix E), and (5) created a simple model based on expected transit ridership of user benefits and how they could be capitalized into land value and additional development (Appendix A and Chapter 4). For details on methods, see Appendix A.

Exhibit 2.1. Study area and distances from CCL



Source: ECONorthwest

All that information was the basis for conclusions drawn in Chapter 5.

3 Context: Past, Current, and Expected Future Conditions in the study area

An evaluation of a potential future action (e.g., construction and operation of the CCL) starts with a description of past, current, and likely future conditions without that action. The chapter describes those conditions in five categories: demographics, economics, land use, transportation, and market conditions. It provides a context and base case for the assessment in Chapter 4 of the effects of the CCL on development.

Spokane County has been growing in population. Continued growth will result in future demand for additional residential and commercial uses in the region, some of which will be captured within the study area. Though there are adequate amounts of developable land within the study area, it has not been the location for much new development recently. Going forward, increased transportation costs and the decreasing supply of less costly and easier-to-build parcels within outlying areas within the County will make location within the study area more competitive for development. The timing, form, and scale of potential development is more difficult to predict.

This chapter summarizes from Appendix B, which provides more detail.

3.1 Demographics

The population within the study area grew at a faster rate than the City and slower than the County between 2000 and 2014. In addition, the demographic composition of those living in the study area is different than the City and County.

- Households in the study area are younger with almost one quarter of the population between 18 and 24.
- The share of lower-income households (those earning less than $25,000 per year) in 2014 is higher in the study area (53% of all households) than in the City (31%) or County (26%).
- The majority of housing in the study area is multi-unit buildings with the majority of households renting.
- Household size is smaller with one-person household composing over half of households in the study area compared to about one-third or less for the City and County.

- Households are also more likely to use transit with 9% of households in the study area taking transit to work compared to 3% and 4% for the City and County, respectively.

3.2 Economics

The region is increasingly a service-based economy, with the region's employment base tied to large health care, government, and education-related employers. The study area, and particularly Central Business District, is the primary commercial center in region and the historic center for many service-based employers.

- The study area has the largest concentration of employment in the region, but the total number of jobs within the study area has not grown since 2002 and declined since 2007.
- In comparison, the total number of jobs in the City and County has increased during the same periods.
- The study area is also a major retail center with more than 12% of the regions taxable retail sales.
- The study area is more sensitive to the ups and downs of consumption spending influenced by business cycles than the City and County overall.

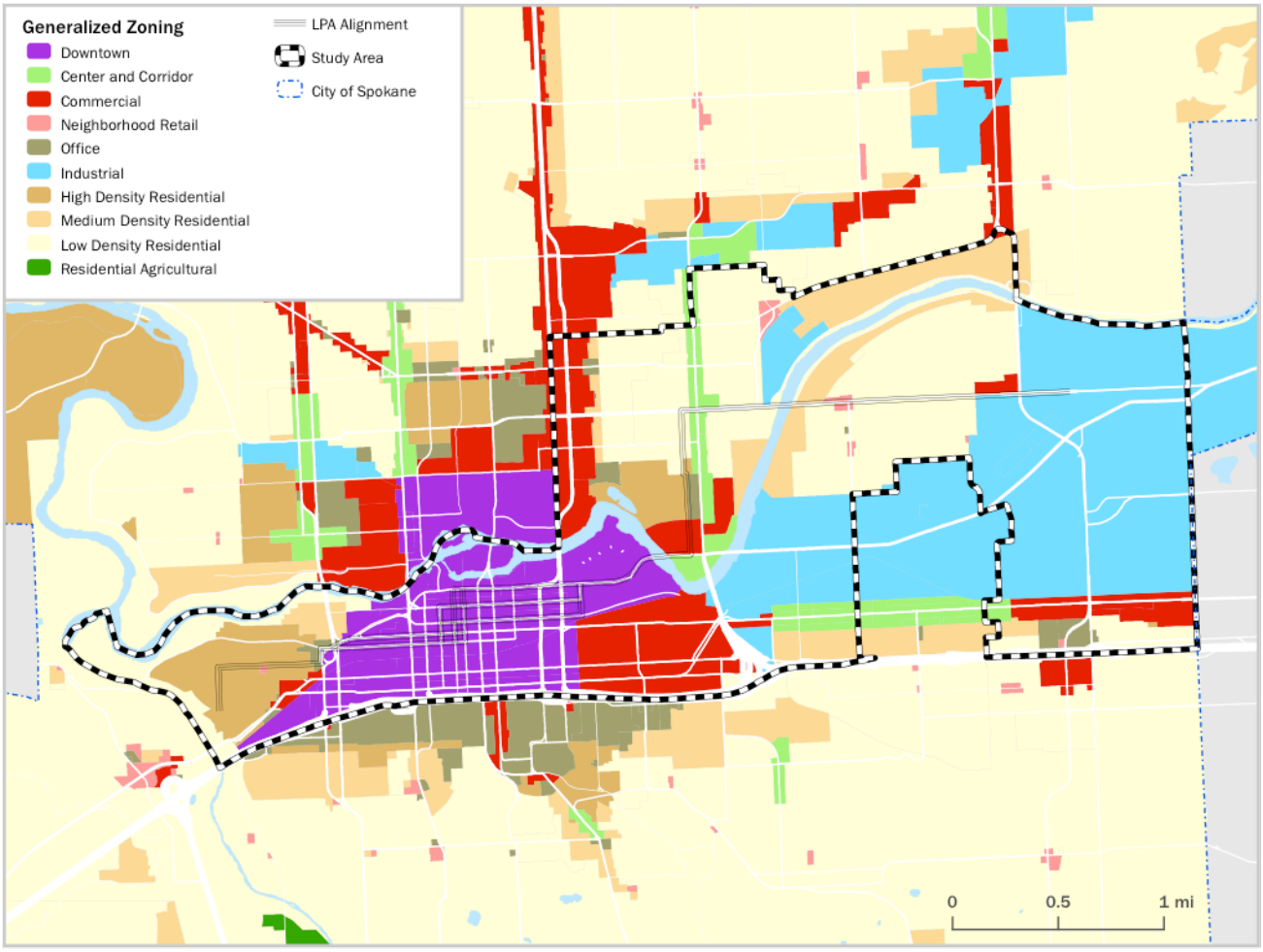
3.3 Land Use

The study area's land use pattern is primarily commercial, university, and multifamily land uses, but the predominant land use differs between each subarea of the study area.

- The CBD is predominantly commercial uses, the University District is mostly commercial uses with sizable amount of university related uses, and Browne's Addition and East Mission subareas are primarily residential with a mix of other uses.
- The LPA for the CCL traverses land designated for high-density activity centers in the City's Comprehensive Plan and enabled in its zoning code.
- Land values in the study area are also higher on average than the City overall, but the Central Business District is considerably higher than the rest of the study area.
- Parcels close to the proposed alignment have higher land values than parcels farther away.
- There is a large amount of vacant and developable land within the study area with nearly 100 net acres of vacant land and nearly 300 net acres of underutilized land on parcels within ¼ mile of the CCL alignment.

- The large share of developable land is within the University District and East Mission subareas. Within the CBD and Browne's Addition areas, the majority of the developable sites are either surface parking lots or under-utilized sites.
- Exhibit 3.1 shows the zoning.

Exhibit 3.1. Zoning in Study Area



Source: ECONorthwest. Data from City of Spokane GIS, Official Current Zoning. Current Land Use Patterns

3.4 Transportation

The study area is predominately auto-oriented, but it is one of Spokane's most transit accessible and walkable area with a dense network of streets throughout most of the central city.

- The Spokane River, Interstate-90, railroad lines, and topography create barriers within the Study Area and between neighboring areas.
- Much of the Study Area has wide arterials of three lanes or more.

- The Study Area has ample parking. The Downtown area has 9,700 spaces at more than 50 parking facilities.[2]
- In the University District, on-street parking is frequently at 80% capacity or more during peak hours, but off-street facilities do not exceed 60% utilization at the highest peak hour.[3]
- Downtown Spokane also acts as the central hub for mass transit with Spokane Transit Authority's Downtown Plaza serving as the City's major transfer hub.
- Many of the bus route corridors emanating from the Downtown Core to close-in centers as well as major arterial corridors feature 15-minute frequency for most hours of the day.
- About 4% of all trips in the CCL study area are taken by transit.

3.5 Market Conditions

Regionally, the market for new development has been relatively limited since the start of the recession in 2008. The study area realized little private development over the last six years. As the economy has recovered, the region and study area have realized small gains in rents, decrease in vacancies, and increases in permits for new construction and/or improvement to existing structures, all indicating growing demand for space. Eventually, demand within existing space will be met, generating the need for new development in the study area. The timing and scale of that development is uncertain.

- In the near-term, multi-family housing is likely the most feasible due to increasing rents and relatively low vacancies region wide.
- In addition, retail uses in the CBD has shown strong growth in rents and occupancy since the recession.
- New office development in the study area are not as likely in the near-term as office rents have not shown any increase since the recession. However, office vacancies have decreased within the study area since 2007 compared to the City and County, which have not realized a decrease in vacancies.
- Additional hotel development is also not likely in the near-term. A new 721-unit hotel is currently under construction in the CBD, which will probably absorb much of the additional demand for accommodations in the near-term.

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[2] Downtown Spokane. "Spokane by the Numbers." http://www.downtownspokane.org/documents/DowntownSpokaneNumbers2010.pdf

[3] University District Parking Study (Spokane, WA). Accessed online: http://www.spokaneplanning.org/docs/Long_Range/Spokane_U-District_Parking_Data_Summary_6-5-07.pdf

4 Economic and Land Use Impacts Attributable to the CCL

Chapters 2 and 3, and Appendices A and B, provide information about theory and methods and local data. This chapter combines that information with information from (1) a literature review and case studies (what types and levels of impacts to expect from transit improvements and the causal chain leading to those impacts) presented in section 4.2 (and summarized from Appendices C and D); and (2) modeling done for this project.

The steps of the modeling and analysis are (1) use estimates of new CCL ridership to estimate user benefits, (2) capitalize those benefits into an aggregate estimate of change in land value for the study area, and allocate the aggregate change to parcels based on proximity to station areas, and (3) consider, in section 4.3.3, all the data described previously to make an assessment of potential and likely changes in land development in subareas of the study area.

4.1 Approach to the evaluation

The benefits from a Central City Line start with those that the service it provides to transit riders. The CCL will allow its patrons to meet their transportation needs with shorter transit trips, on average, relative to a base-case alternative. These shorter transit trips save time, and time has a value. There are also more transit trips with the CCL investment than without it. This increase in transit trips is further evidence of value to the customer.

Those benefits may result in an overall increase in economic welfare for the region if they exceed the costs of providing the services. Transit-user benefits improve the economy through increases in time available for pursuing non-travel activities; increases in regional productivity and the benefits of urbanization and agglomeration; enhanced employment accessibility; and, eventually, impacts on rents and property values. In conjunction with and potentially independent of the transit investment, changes in policy incentives and regulations (e.g., rezoning to allow greater development that the market is willing to build, independent of the transit investment) may cause increased economic activity.

The desire to consider transit's effect on land development derives from the understanding that the benefits to transit patrons eventually get capitalized in land values and the built environment. But the potential effects on land values are usually greater than the capitalized value of transit user benefits because transit investments are often accompanied by, or engender, other improvements in the urban environment that themselves confer benefits on transit patrons and

non-patrons alike. These investments include streetscape improvements, pedestrian connectivity investments, urban open space investments, and other investments in urban infrastructure that have a broad influence on the livability and function of transit station environments. The colocation of these investments leads to a kind of agglomeration economy that results in the opportunity to capture value in property that is beyond the sum of the transit user benefits that accrue to the transit patrons.

Eventually the benefits to transit users get converted to higher rents for land and its uses at the origins and destinations of these transit trips. In other words, property owners and developers see that certain locations provide transit benefits to users, and that they can raise property values, rents, or sales prices to capture some of those benefits. Transportation economists refer to this process as *capitalization* (of transit benefit into property value).

This chain of effects allows the development of estimates of the changes in the valuation of land. Land development opportunities can be roughly estimated from relatively sparse information about transit service performance and demands. The approach for this evaluation:

1. Estimate the net present value of the future stream of transit patron's user benefits. In other words, make an estimate of annual user benefits for 20 – 30 years into the future, and convert that *stream* of annual benefits into its present value using standard economic assumptions about interest rates (rates of return; discount rates).
2. Use the present value estimate to estimate the total land valuation change in the study area, and then distribute the land value change across space in the study area.
3. Examine the effects of land value change to gain insights into development opportunities for districts in the study area.

All the estimates are based broadly on two sources of data: (1) the experiences other places with similar transit systems as reported in the professional literature (Appendix C) or case studies (Appendix D), and (2) information about relevant economic, demographic, land use, and transportation conditions in Spokane (Appendices B and F). More details regarding specific methods and data are in Appendix A: Framework and Methods.

4.2 Effects of transit investments in similar settings

There are only a few ways to do technical analysis of potential future effects of the CCL. All of them, whether quantitative or qualitative, should make some

reference to prior experience that other similar places have had with similar transit systems. Some of that experience is reported in the *professional literature* (e.g., journal articles, agency research reports), so we conducted a review of that literature. Some of it is not reported, so we did our own *case studies* of several systems that that consultant team judged similar or relevant. We then used those results to justify either (1) relationships that we put into our models or (2) our qualitative assessments about development effects.

The literature review covered research completed since 2004 on public transit, land value, and transit-oriented development (TOD).[4] It looked at three categories of impacts:

- Ridership: The extent that new transit service results in increased benefits to users and those benefits materialize in the form of increased ridership.
- Property values: The extent that benefits get capitalized into the value of the land and can be measured in the form of the value of the property.
- Land development: The extent that those property value impacts alter the underlying development economics around the transit service resulting in a change in the type, location, or rate of land development.

No system reviewed in the literature matches the unique technology being considered for the CCL. This evaluation characterized the CCL generally as premium bus service, or bus rapid transit (BRT).

Effects on ridership and on user benefits

Recent practices in transit service design and in the evaluation of transit service options have emphasized the importance of a set of service characteristics that fall under the general term of "premium transit services." These service characteristics lie at the heart of the CCL investment and include unique station amenities and dynamic schedule information, signature transit vehicle branding and design that provide comfort, ease of boarding/alighting, and other amenities that improve identification of the transit vehicle, schedule reliability, schedule span, and the provision of fare machines.

It is well understood that transit patrons will be more likely to use transit service that include some combination of these attributes, but only recently have attempts been made to try to quantify these ridership effects more formally. Quantification in the context of transportation modeling and ridership analysis is helpful because these efforts often yield measures that are proxies for riders' "willingness to pay" for the premium transit features. A higher willingness to

[4] For a complete list of sources and a summary of findings for many of them, see Appendix C.

pay for premium services is correlated to other characteristics of riders that in turn correlate with expenditures on non-transit goods and services.

Patrons who choose transit based on premium characteristics of the service are highly sensitive to the quality of service and typically have choices other than transit for meeting their mobility needs. These patrons also typically have a "willingness to pay" for premium service that can be understood in terms of a tradeoff between premium characteristics and either dollars or travel time. A recent report explores factors beyond travel time and cost that affect travelers' choice of premium transit services and translates those findings into "willingness to pay" equivalents. Exhibit 4.1 is taken directly from this research report.

Exhibit 4.1. Importance of non-traditional transit service attributes (equivalent minutes of in-vehicle travel time).

Attribute	Commute Trips			Non-commute Trips		
	Charlotte	Salt Lake City	Chicago	Charlotte	Salt Lake City	Chicago
Station/stop design features	**3.71**	**4.61**	**4.97**	**9.06**	**1.57**	**4.42**
Real-time information	0.40	*	0.62	1.06	*	0.44
Station/stop security	0.60	0.88	0.85	1.56	0.22	0.84
Station/stop lighting/safety	0.66	0.88	0.86	1.62	0.20	0.82
Station/stop shelter	0.64	1.10	0.86	1.57	0.37	0.69
Proximity to services	0.40	0.84	0.40	0.89	0.47	0.50
Cleanliness of station/stop	0.73	0.42	0.90	1.74	0.15	0.86
Station/stop benches	0.28	0.49	0.48	0.62	0.16	0.27
On-board features	**4.58**	**3.53**	**5.84**	**9.47**	**3.8**	**10.79**
On-board seating availability	1.46	1.23	2.15	3.32	1.41	4.09
On-board seating comfort	0.56	0.51	0.77	1.02	0.41	1.39
On-board temperature	1.20	0.81	1.41	2.42	0.85	2.41
Cleanliness of transit vehicle	0.60	0.44	0.64	1.26	0.39	1.56
Productivity features	0.76	0.54**	0.87	1.45	0.74**	1.34
Other features	**8.94**	**4.92**	**11.17**	**10.60**	**6.14**	**9.77**
Route name/number identification	0.57	0.60	0.63	1.23	0.58	0.61
Reliability	4.59	0.44***	5.64	–	0.29***	4.63
Schedule span	0.52	0.42	0.77	1.47	0.33	0.82
Transit frequency	0.60	0.75	0.82	1.49	0.38	0.71
Transfer distance	0.46	0.72	0.56	1.29	0.12	0.48
Station/stop distance	0.80	0.64	0.92	1.76	0.13	0.84
Parking distance	0.72	0.54	0.84	1.44	0.17	0.71
Ease of boarding	0.08	0.16	0.21	0.52	3.02	0.25
Fare machines	0.60	0.65	0.78	1.40	1.12	0.72
All premium service features	**17.23**	**13.06**	**21.98**	**29.13**	**11.51**	**24.98**

*The attribute was not part of the station/stop design features bundle in the survey for Salt Lake City.

** The attribute was referred to simply as "Wi-Fi" in the survey for Salt Lake City.

***The reliability measure was redefined in the survey for Chicago and Charlotte, so this value is not comparable to the value for Salt Lake City.

Source: TCRP Report 166: Characteristics of Premium Transit Services that Affect Choice of Mode

The research supports the notion that transit patrons value premium services and that the higher value services can have an important influence over the choice to utilize transit services among a set of potential patrons that have a wider set of mobility alternatives.

As a broad generalization, theory and empirical work support the expectation that those that choose to use premium transit service but do not choose conventional bus service will have average incomes education levels that are higher than typical bus riders. An implication for the CCL is that they would be more likely to spend more on retail goods and services than current riders, on average.

Documented, after-the-fact evaluations show that new premium bus services with stations and protected rights-of-ways (i.e., BRT) increases transit ridership. In a study of various completed BRT projects in the US (GAO 2012), 13 out of 15 projects reported increased ridership. Seven of those 15 projects reported increases of 30 percent or more.

Large portions of new BRT ridership is from new transit trips, not from trips diverted from another transit mode or route (TCRP 118). Generally, studies recognize BRT as "premium transit": it has higher service quality and increased station amenities. The GAO attributed increased ridership in part to the design and features of BRT, "affecting the projects' capacity, environmental friendliness, and passengers' comfort and positive overall impression of BRT." Another study (Cervero 2008) cites several reasons for ridership increases: employment densities at trip ends influence ridership, transit quality, fast and frequent transit service, station proximity, limited parking availability at destinations, and time savings.

Effects on land value

The theories of urban economics are clear about the direction of effects of transit service on property values, but some effects can be offsetting.

Fundamental theory suggests that the economic benefits of agglomeration will cause many businesses to desire central locations, and those demands will cause developers of those locations to bid up the prices of that land. Reducing the access costs associated with these places, through transit or other transportation services, makes the agglomeration possibilities larger and land rents higher.

But as central places become more concentrated, congestion becomes an increasing problem. At some point the auto congestion makes vehicle access difficult and trip density makes transit service an effective way to continue to provide access to concentrations of activities in central places. Thus, especially in dense urban settings transit can support the economic forces of concentration, which are the drivers of increased property values. On the other hand, providing new transit where there is little demand may have a modest or even negative effect on property in certain circumstances. Noise and construction costs and impacts are the most significant negative effects of transit investments in short

run. Thus, theory can describe what to look for empirically, but it cannot provide definitive conclusions: empirical work is needed.

There are numerous studies that find empirical support for transit's influence on property value. A summary of literature (Bartholomew and Ewing 2011) that uses economic models[5] to test whether pedestrian- and transit-oriented development is associated with higher real estate prices found that the introduction of transit service is associated with higher land values. A study of the Hiawatha Light Rail line opened in 2004 in Minneapolis (Goetz et al. 2010) used a linear regression model to analyze the line's effects on housing prices while controlling for housing characteristics. The regression showed that prior to the opening of the line, single-family homes within 0.5 miles of the station area sold for 16.4 percent less than homes in the larger comparison area. After the opening of the line, homes sold for 4.2 percent more than homes in the comparison area.

In Phoenix, a study (Atkinson-Palombo 2009) utilizing a hedonic regression model to hold other factors constant showed that property values increase with proximity to light rail. Houses within walking distance (0.5 miles) of transit in mixed-use neighborhoods received a 6 percent premium. Condominiums within walking distance in mixed-use neighborhoods received a 28 percent price premium.

A study of the effects of the 2002 implementation of a BRT line in Boston on condominium prices (Perk, et al. 2012) showed similar results. In 2000-2001, before the implementation of the BRT line, moving 101 to 100 feet away from the station location *decreased* condominium sale prices by $0.12 per square foot. In 2007-2009, 5-7 years after the BRT implementation, moving 101-100 feet away from the station *increased condominium* sale prices by $0.06 per square foot.

The implementation of transit can also affect commercial property values. A study of light rail in Santa Clara County (Weinberger 2001) showed the highest price premiums for commercial properties were found within one-quarter mile of the light rail stations, with a slightly lower price premium within one-quarter to one-half mile of the light rail stations.

Property value increases from the implementation of transit are not universal. A study of 14 metropolitan areas over a 10-year period (Kahn 2007) finds that there is a higher premium for proximity to walk-and-ride stations than

[5] Called hedonic price models, they break-down the total value of a property into a value for each of the many locational, site and building attributes that contribute to that value. The amount and quality of transit are such attributes.

to park and ride stations. The prices of homes in the areas around a park-and-ride station decreased by 1.9 percent whereas those around a walk-and-ride station increased by 5.4 percent. Over a 20 year period, the value of homes around a walk-and-ride station increased by 10.8 percent relative to control areas.

Disamenities associated mainly with heavy rail (noise and vibration) can negatively affect property value within a quarter mile of a station (Bartholomew and Ewing 2011). However, disamenities of light rail rank the smallest. For BRT, and especially for the electrified version proposed for CCL, these types of effects should be smaller yet. ECONorthwest reviewed many additional studies that show property value increases relative to proximity to transit stations.

Note that most of these studies were not designed (or designed well enough) to definitively address two important questions:

1. Multiple effects. Are the observed effects the result of just the transit itself, or were other significant public improvements (e.g., streetscaping, lighting, parks, signalization, way-finding, parking, public contribution to mixed use development) part of the package? As important: did public policy change to allow densities that it had previously prohibited or otherwise made impractical?
2. Causality. Would the observed changes have happened even if the transit service had not been built? E.g., Was the transit placed in a high-density, high-demand corridor well served by roads and parking, and one that was going to develop even without the transit? In other words, transit got sited where growth was going to go and where it was most effective, but it did not cause most of that growth to occur.

   The data and statistical controls necessary for such studies can be expensive, and there is little demand for such studies by local transit agencies. It is more common to report total change and then present more qualitative analysis about how transit contributed to the change.

Effects on land development

As cities complete new BRT projects, development effects will continue to be studied and reported. The available literature suggests that the implementation of BRT, streetcars, and light rail all catalyze denser development in a surrounding area (typically cited as ¼ mile; sometimes up to ½ mile; or, as a 5- or 10-minute walk time—depending on trip purpose and speed, 1/6 to 2/3 mile). Generally, after a transit line is planned and implemented, development tends to cluster around the transit stations.

A study of the Pearl District (City of Portland 2008) considers the density of buildings (measured by floor-area ratio) before the construction of the streetcar

line in 1997 to the density after construction. The study finds that prior to the line's construction, developments were constructed in the Pearl District at less than half the density allowed by the district's zoning code. However, after 1997 developments were constructed at between 60 and 90 percent of the allowed density. The highest density developments are directly adjacent to the streetcar line. Additionally, 55 percent of all new development in neighborhoods through which the streetcar passed occurred within one block of the streetcar line.

Similarly, a study on Denver's public transit (Ratner et al. 2013), which includes four commuter rail corridors, five light rail corridors, and one BRT corridor, concludes that TOD is becoming a larger part of overall development. TOD accounted for 66 percent of all regional residential development, 60 percent of regional office development, and 19 percent of regional retail development. The BRT corridor had 44 percent of total retail TOD. This is partly because of a 2002 land use/transportation plan that changed Denver transit station area zoning to allow higher-density and mixed-use development.

Implementing BRT or other transit does not guarantee development on its own. Many factors influence TOD. Developer interest, development demand, ease of development, public support, private-public cooperation, attractive amenities, "walkable streetscapes," and level of service and convenience of BRT are among the top influences. A 2008 study on BRT and TOD (Vincent and Callaghan 2008) selected six cities to evaluate TOD in BRT corridors. The results of surveys to developers and governmental agencies indicated that they generally felt positively towards development and investment near BRT.

A factor that contributes to transit-oriented development is transit permanence. Developers are less likely to invest and develop along a transit line whose route could easily change. Typically, this puts rail at an advantage over bus transit. A regular bus can change routes with few physical constraints—relocating rail infrastructure is typically more expensive.[6] Developers should perceive BRT to have this desired permanence factor because of the increased station amenities and dedicated right of ways (GAO 2012). The Spokane CCL will also possess this permanence factor (either with the originally proposed overhead lines, or with the investment in inductance technology and specialized stations.

While BRT is less permanent than rail, several advantages stem from BRT's flexibility to choose and relocate routes. Because BRT can easily operate in

[6] The political constraints on changing bus service (headways and routes) can be substantial, however; development can usually safely assume that bus service on a major arterial will continue into the future.

mixed-traffic, routes can imitate more natural trip patterns than rail transit. Additionally, BRT could respond to changes in geographical activity more easily (Currie 2006).

The density of development is typically identified as a key influence of travel demand in a built environment. Benefits of higher-density development may include reduced vehicle miles traveled (VMT) per capita, which can reduce greenhouse gas emissions directly and indirectly (Committee 2009). Increasing density of development also reduces certain capital and operating costs for public services (ECONorthwest 2014).

In addition to the review by ECONorthwest of the professional literature, Nelson\Nygaard analyzed a set of case studies of transit projects. The case studies offer relevant comparisons of socio-economic factors, aspects of real estate and urban development, and general transit profiles of the projects.

Every urban area is unique and the mix of amenities, incentives, and programs needed to impact economic activity and land development in transit corridors can be enigmatic. Case studies chosen provide practical examples of transit investments made in cities throughout the United States. The case studies develop examples of five transit modes: urban circulators, electric trolley buses (ETB) (technological surrogate for the modern electric trolleys or MET), bus rapid transit (BRT), streetcar, and light rail. Appendix D includes detailed information about each case study project.

Exhibit 4.2 shows the projects that were investigated and provides a qualitative assessment of five major economic development factors. The ranking methodology is based on a qualitative assessment of the key components of the five identified factors.

A new transit investment is just one part of the suite of factors that shape socially and economically vibrant places. A mix of existing transit-supportive factors, changes to the built environment, service planning, private and public investments, and government interventions contribute to economic activity and land development. Drawn from the case studies, the following lessons learned are key factors that encourage transit-oriented development. None of the elements stands alone, each supported by a host of other factors.

Above all other factors, the economically successful case studies share strong government, institutional, and stakeholder support through planning, zoning, and financial tools. This support incentivizes developers and supports a community vision for transit-orientation and development intensity at transit nodes.

Exhibit 4.2. Transit systems characteristics in case-study jurisdictions

		ECONOMIC DEVELOPMENT FACTORS					
Transit Service	Transit Mode	Serves Activity Centers	Accessible Station Areas	Distinctive Branding	Permanence/ Placemaking	Institutional Support	Overall Assessment
Seattle Route 49	ETB	High	Med	Low	Low	Med	Low/ Med
Baltimore Charm City Circulator	Circulator	High	Low	Medium	Low	Med	Med
Lane County EmX	BRT	Med	High	High	High	Med	Med/ High
Cleveland HealthLine	BRT	High	High	High	High	High	High
Las Vegas RTC MAX	BRT	Low	Low	High	Med	Med	Low/ Med
Kansas City KCATA MAX	BRT	High	Med	Med	Med/ High	High	Med/ High
Boston Silver Line	BRT	High	Med	Med/ High	Med/ High	Med	Med/ High
Tucson SunLink	Streetcar	High	High	High	High	High	High
UTA S-Line	Streetcar	Low/Med	Med	High	Med/ High	High	Med/ High

Source: Nelson/Nygaard

Planning for successful TOD includes identifying potential transit markets and alignments that support community goals for development. Master planning for development areas and zoning that encourages developers to build requires strong public and government support. TOD zoning often includes parking maximums, higher densities, and strong pedestrian-orientation. Case study cities also used a variety of financial tools and value capture strategies that best fit the development potential of greenfield, brownfield, and infill sites. These tools include tax increment financing (TIF), local improvement districts (LID), public-private partnerships (PPP), and other development incentives.

4.3 Evaluation of the CCL

Previous sections have set up the analysis in this section by covering theory and evidence from similar transit systems. This section applies that information to the conditions in Spokane and to the specifics of the CCL to make estimates or judgments about various aspects of ridership, land value, and development. The evaluation follows this logic:

- New transit creates benefits for transit users (and potentially of non-users)
- Those benefits get capitalized in land values
- The distribution of those changes in land values (where they occur) is influenced by proximity to transit stations and other factors
- Those values, and other factors, influence the amount, type, and location of the additional development that transit might stimulate or otherwise support. That additional development is correlated with, and is thus a proxy measure of, economic change.

Effects on ridership and on user and non-user benefits

Theory and methods

Benefits that accrue to users of transit services are the starting point for the evaluation. They are best estimated using established methods and information on transit system ridership and performance available from the project evaluation process. Other economic effects derive from them (and from other investments made as part of the transit project that are not directly related to transit service; e.g., improved sidewalks, lighting, and public spaces).

Transportation investments provide benefits directly to users in the form of travel-time savings, and reductions in other costs of travel. When the perceived costs of a trip are reduced, these benefits to transit users / consumers (called by economists "consumer surplus") increase. As travel times are reduced between any origin and destination, users already making this trip enjoy lower costs while new users (for whom the willingness to pay was less than the old cost of the trip) now take advantage of a travel opportunity that was not attractive to them before.

These theoretical relationships suggest a simple empirical approach to calculating the benefits of the improvement: subtract the consumer surplus without the improvement from the consumer surplus with the improvement. To do so, one need know only two things:

- The willingness-to-pay (demand) relationship that is involved.
- The effect of the improvement on the users' perception of their costs of travel.

One need not know much about the willingness-to-pay relationship to implement this procedure. All that is needed is an estimate of the effect of a change in travel costs on additional travel.

Often a model of the transit and road system will be used to estimate the ridership and performance information across multiple travel zones and user classes, allowing for a suitably detailed examination of how the benefits from improvements get allocated across the urban landscape and across different types of transit riders. Measuring benefits requires that each project being considered be compared against some alternative scenario. The alternative scenario (sometimes called "the counterfactual") is a state of the world without the improvement or a state of the world with some alternate improvement project.

Ideally, the models will be used to analyze more than one analysis year. This results in user benefits that correspond to specific years of analysis. Single-year benefits are then converted into streams of benefits over time for each year

between project completion and some terminal year. For our purposes, we have a single-year estimate of ridership and performance for the CCL. We have employed various assumptions about growth rates to single year benefits estimates in order to generate streams of benefits over time. The assumptions about growth relevant for our analysis include the following:

- General growth in travel demand within the Spokane region
- Growth in the relative share of transit trips with respect to total travel demand
- The base estimate and real growth in the value of time for transit users.

Streams of benefits and costs are needed to properly treat the time valuation of resources. Future benefits and costs must be converted into *present value* by applying an appropriate *discount rate*. Present value calculations are important since society has the option of using the funds that are being dedicated to the project being evaluated for some other purpose instead. Spending resources on the project in question has an opportunity cost, which represent the benefits foregone by not making some alternative investment. The application of a discount rate to the stream of user benefits yields an estimate of a present value estimate of the total benefits that accrue to transit patrons.

The range of assumptions regarding growth in user benefits over time as well as the discount rate used to convert the stream of benefits to present value are areas of uncertainty with respect to sizing the potential magnitude of effects on land values. To address this uncertainty formally this study used Monte Carlo analysis to simulate the range of possible outcomes. The analysis simulates the growth in benefits and present valuation of those benefits by drawing on a distribution of possible values for variables that represent the key areas of uncertainty. With enough simulated results (in this case 1000 independent simulations) one can estimate a probability distribution of the outcome of interest: the present value of the stream of transit user benefits.

Results

Exhibit 4.3 shows the assumptions used for key variables in the model for estimating user benefits to transit riders of the CCL. Exhibit 4.4 shows the results of the modeling.

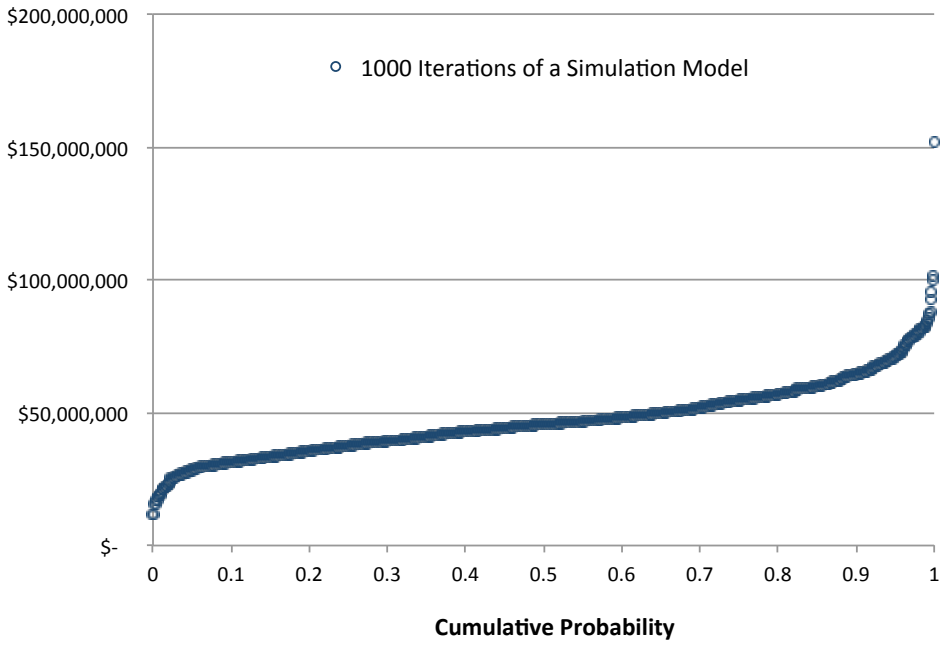
Exhibit 4.3. Assumptions for the user-benefits model and their distributions

Assumption	Distribution	Mean	St. Dev.
Growth Rate in Demand	Lognormal	3.00%	1.00%
Growth Rate in Transit (Share)	Lognormal	2.00%	1.00%
Value of Time	Lognormal	$11.39	$2.50
Growth Rate in Real income	Lognormal	0.75%	0.25%
Discount Rate	Normal	3.00%	0.25%

Source: ECONorthwest, WA Employment Security Department

The result of the Monte Carlo process is a probability distribution of the present value of user benefits. Exhibit 4.4 shows the cumulative probability of the present value of the stream of user benefits over a 30-year time horizon. Given the assumptions (Exhibit 4.3) there about a 90 percent probability that the present value of the transit user benefits will exceed $30 million and about a 10 percent probability they will exceed $65 million. For the purposes of this study we assume a mid-range value of about $45 million.

Exhibit 4.4. Expected present value of user benefits from Monte Carlo analysis



Source: ECONorthwest simulation model; Spokane Transit (transit ridership analysis)

There are good reasons to believe that the CCL will also provide substantial benefits to people who do not use the transit system (non-users). Most importantly, the CCL project will almost certainly include substantial improvements to the streetscape along the alignment that are not integral to the operation of the new transit. Such improvements include roadway surface, new and better sidewalks, bike lanes, signalization, signage, lighting, park and open space, aesthetic improvements at stations.

This study did not model those benefits and it is difficult to extract and distinguish the benefits of these improvements from the benefits to transit riders. Instead, quantitative analysis is limited to establishing an approximate and value of user benefits (Exhibit 4.3), and converting that value to lower-bound estimates of changes in land value and opportunities for redevelopment (sections 4.3.2 and 4.3.3). We then make some judgments in Chapter 5 about the additional effects of non-user benefits.

Effects on land value

Theory and methods

The present value of the user benefits calculated above approximates the opportunity for changes in the value of land. It is a standard statement in economics that "all rents accrue to property," and in well-functioning land markets the benefits from transportation improvements will be captured in higher rents and eventually transferred to the value of land. This process, however, takes time.

Changes in *land value* are not the same as changes in *land development*. A mistake sometimes made in these types of analyses is to assume that increased land value means that more development will happen sooner. The correct inference is more limited: when development does occur, it is likely to be more intense. But *when* it happens is influenced by many other factors. It is even possible that development in the short-run could be slowed down as property owners and developers wait for construction to get done, wait to see the ridership response, and make their own estimates to the optimum time to build.

Stated in other words, the magnitude of changes in land development depend upon a number of factors, including how much land accessibility is improved (user benefits), the relative features of the specific parcels near the station, and the general real estate market in the area. In a robust fast-growing economy, demand for new housing and commercial activities will be high. Under these conditions, the effects of accessibility changes will be stronger than they are in a weak market.

Both the public and private sectors influence the likelihood of development near a transportation investment. Public policy, including zoning and development incentives, may attract or deter development. The size, price and characteristics of specific sites also influence development potential.

Not all land use impacts are double-counting of user benefits. The literature of urban economics and economic development is generally in agreement that there are agglomerative economies of various types (also called economies of

clustering, or concentration, or proximity). Such clustering may allow for of scale economies, reduced labor cost, better communication, and innovation.

Our analysis assumes that gains to users of the transit system represent real gains in economic welfare and that these welfare gains are associated with activities that are located in specific locations in the urban environment. As a starting point we allocate the present value of the stream of transit user benefits to changes in land value within the transit improvement corridor. Alternative possibilities should be recognized up front as well.

- First, it is possible that the benefits to transit users could be "captured" in rents somewhere other than within the immediate transit corridor. This does not reduce the benefits from the transit investment; it merely means the capture area of the development effects could be broader.
- Second, *the capitalization of transit user benefits should be recognized as a low-end estimate*. The initial benefits could engender further economic growth through economies of scale and scope due to the increased density of economic activities. It is also true that transit investments within targeted corridors often are accompanied by third party investments of other sorts that influence the development environment. These added investments may be public expenditures on urban infrastructure, or could be private investments in infrastructure or services.
- Third, there is no conclusive guide from theory as to the specific location and timing of the capitalization of transit user benefits in land values and improvements. The development process is idiosyncratic and highly influenced by local factors; parcel features, developer outlook and many other location specific conditions.

It is theoretically feasible for a transit improvement to produce land value changes and development effects that are highly concentrated in a single location; or they could be broadly distributed across the extent of the transit improvement corridor. What theory expects is that the total size of the change in property value will be about the same in either case. This basic assumption allows us to proceed in allocating the transit user benefits from the CCL to property in the effected corridor by turning to the extensive empirical literature on transit's influence on property values, which is documented in Appendix C.

Most relevant in the literature are results from premium bus services or BRT, including a number of studies led by Victoria Perk, as well as specific studies designed to understand the fine-grain spatial dimension of changes in property values proximate to transit stations such as the study by Thomas Garrett of the Federal Reserve Bank of St. Louis. Based on this body of work ECONorthwest developed a simple model for the allocation of user benefits to parcels of land within the CCL transit corridor.

Results

The modeling exercise at the step is to convert the user benefits to the total study area (estimated above) to changes in parcel value (based on the assumption that over time the user benefits get capitalized into land value). To make that allocation the model uses information from the literature (section 4.2.2) about how the effects of transit access on property values change with distance,. As a broad generalization, the research reviewed generally found positive impacts on property values within 1/2 mile of an access location.

The modeling begins by selecting all parcels that lie within a ½-mile network distance from the planned CCL access locations (transit stops). "Network distance" means that people are assumed to travel, whether by vehicle or by foot, on streets: they cannot fly over ravines or buildings (see figure 2.1 for an illustration of the boundaries). It then groups network distances into 1/8-mile increments. Exhibit 4.5 shows these parcels, grouped by distance from the CCL, and their current valuation. Total valuation in the corridor (as defined by ½-mile network distance) is currently about $1.4 billion.

Exhibit 4.5. Parcels by network distance from CCL stop locations: current (2014) assessed valuation of land and improvements

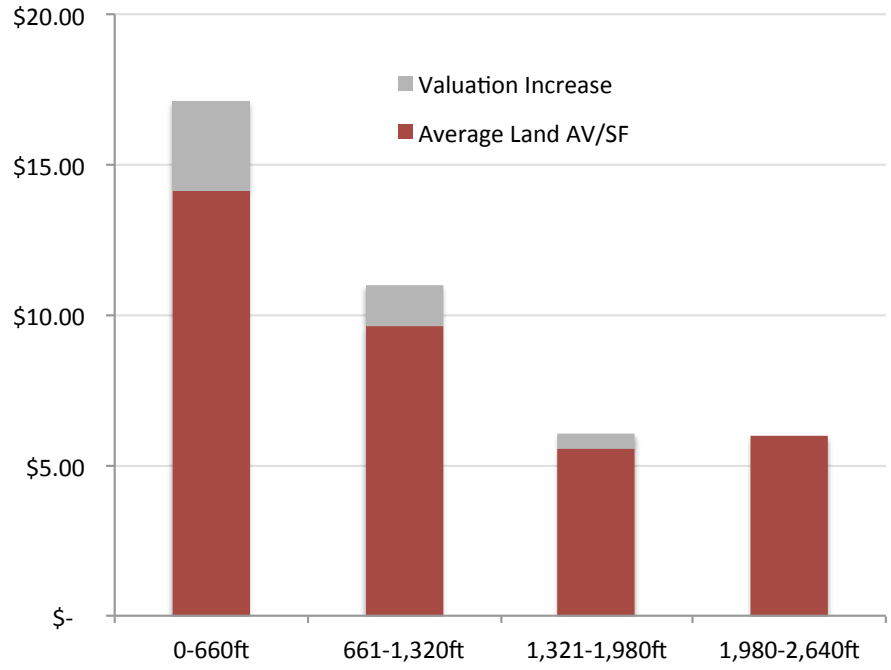
Distance	Total Assessed Value	Land Assessed Value	SqFt	Total AV/SF	Land AV/SF
0-660ft	$452,511,610	$106,297,393	7,517,496	$60.19	$14.14
661-1,320ft	$404,047,020	$119,769,061	12,437,078	$32.49	$9.63
1,321-1,980ft	$282,728,500	$70,284,234	12,663,826	$22.33	$5.55
1,980-2,640ft	$292,367,990	$77,055,823	12,907,173	$22.65	$5.97
Total	$1,431,655,120	$373,406,512	45,525,573	$31.45	$8.20

Source: ECONorthwest, Spokane County Assessor parcel data tax year 2014

Next, the spatial allocation model solves for land valuation changes such that the valuation premiums decay with distance from the transit access locations and the total change in land value equals the 50th percentile value for the present value of transit user benefits derived from the Monte Carlo analysis (i.e., about $45 million, per Exhibit 4.4 above).

Exhibit 4.6 shows the effect on site values for the 1/8-mile distance bands. The average land value "premium" decays with distance to transit access in a manner that is consistent with the literature on transit's effects of property values. In the closest band the premium (in grey) is about 21% of current land value; by the third band out it has dropped to 8%. Overall, the average increase is about 12%.

Exhibit 4.6. Potential change in land values as a result from CCL user benefits



Source: ECONorthwest, Spokane County Assessor, parcel data tax year 2014

A question often asked regarding transportation investments is what will be the total expected change in property values, not just the changes in the value of land. This question is more difficult to answer and requires for its answer a clear understanding of how land value changes affect the development process.

Higher site values, by themselves, do not necessarily cause development to occur faster. Rather, they change the nature of how intensely land is developed once development is supported by market conditions. Higher site values may even cause development to happen later, but with a higher level of improvement on land once development does occur.

For this transit evaluation the implication is that if development opportunities are pursed on parcels with higher land values, then the value of site improvements will probably be higher than it otherwise would have been without the transit improvement. If one assumes that redeveloped land yields a similar improvement to land value ratio to what is evident in the corridor today (approximately 3:1), then the $45 million in higher site values associated with the CCL investment might eventually be associated with an additional $175 million in the value of land improvements.

Three points about how to interpret these results:

- The efficient capitalization of transit user benefits into land values is a process that is subject to a wide range of market specifics, so these results

are suggestive of where development and redevelopment may follow from the CCL investment; they are not a prediction of specific outcomes.

- Land values are affected by other corridor improvements besides just the travel time benefits from the transit service itself. Improvements to streetscapes, pedestrian amenities, signalization and open spaces are often part of transit corridors, and the premium features of the service itself provide value beyond the time-savings to patrons. We do not try to estimate the magnitude of the effect of these other potential improvements on land values: these features are only generally conceived of at this point in the project development. Thus, the results can be seen as a lower bound estimate (see Chapter 5).
- Information from the ridership modeling gives insights into where in the corridor the largest opportunities for land value changes reside. The trip tables from the ridership modeling allow one to calculate and sum user benefits on a trip origin-destination basis. Within the study area user benefits appear to be highest in the central portion of the alignment near the Riverpoint campus, south of Spokane River, north of the rail right-of-way, and east of N. Division St. User benefits are also strong at either end of the transit alignment in Browne's Addition (west of S. Maple St., between W. Clark and W. 2nd Avenues) and in the area of Mission Avenue (north of Mission to the Spokane River and west of N. Smith St.). Other parts of the study area also have positive user benefits, but at a somewhat lower value.

  A limiting factor in this kind of data is that theory does not answer definitively the question of whether the user benefits will be capitalized in land values at a trip's origin or its destination. As a result of this limitation we use this spatial information about user benefits only as a general framework for thinking about how land values and land development might change in response to improved accessibility.

Effects on land development

Theory and methods

Taken together, the estimates of the present value of the transit user benefits from the CCL service, and the model for the spatial allocation of the capitalization of those benefits into site values provides a reasonable basis for considering the development implications of the CCL investment.

The CCL investment produces benefits to transit riders that, in theory, are eventually capitalized into higher site values. Theory and casual observation also support the idea that that land closest to the points of transit access will see the largest changes in site values. The consequence of increasing site values is an increase in the expected development intensity that is needed to justify the

purchase of land for development purposes. When development occurs on these parcels the expectation is that the intensity of that development (subject to development regulations) will be greater than it would otherwise be in the absence of higher site values. Another feasible consequence of higher site values is to influence the timing of development events.

The previous considerations are the foundation for the analysis in this section of potential changes in land development. The analysis has three main parts:

1. Description of characteristics that affect development potential in four subareas: Browne's Addition, Downtown, University District, and East Mission/ SSC. Chapter 3 and Appendix B provide an overview past, present, and expected future conditions and trends for demographic, economic, land use, transportation, and market trends for Spokane County, City of Spokane, and the CCL study area. This section brings forward key data about the buildability of land.
2. Modeling of user benefits and land values. ECONorthwest developed a spatial model based on that theory that yields a general case for the pattern of changes in site valuation. As site values increase in response to the CCL investment the ratio of improvement value to land value for effected parcels will decrease, which means that some parcels with improvements will become attractive enough to allow redevelopment.
3. Descriptive analysis of the potential development changes in the four subareas. This section combines the information in the previous sections with an evaluation of development constraints and opportunities to make judgments about the likely development effects of the CCL.

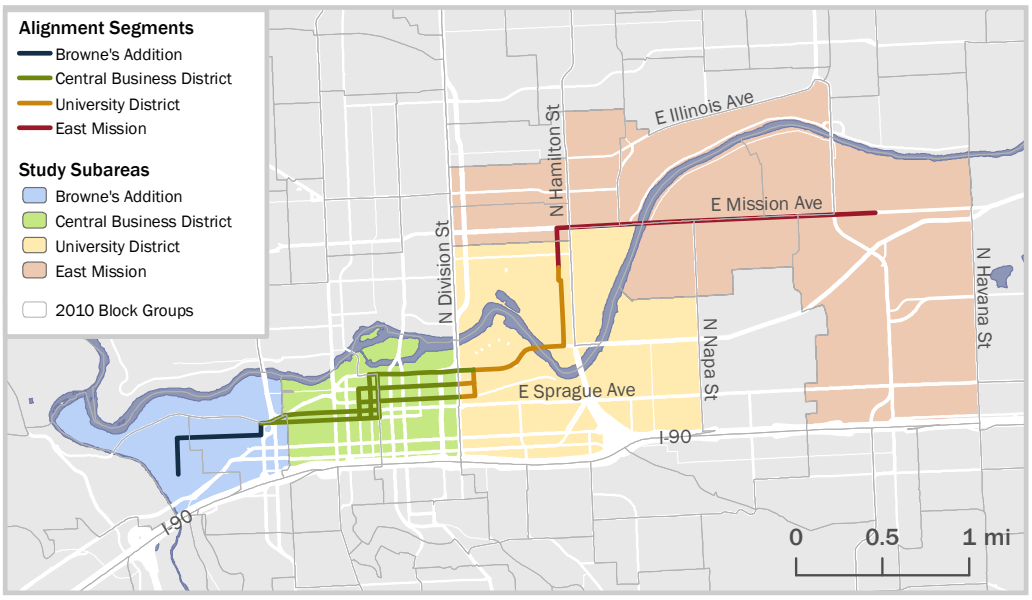
Subareas characteristics affecting potential development

Exhibit 4.7 shows the study area and its four subareas.

Browne's Addition is a residential neighborhood to the west of Downtown. It is one of the oldest neighborhoods in Spokane. Originally it consisted of expansive mansions, but as transit service improved to the neighborhood, residential densities increased. Currently, it has a relatively high density for residential neighborhoods in Spokane and is becoming a desirable location for restaurants and recreation.

The *Central Business District* (also referred to as *Downtown*) subarea is the regional center, and includes the Central Business District, Retail District, Financial District, Davenport Arts District, and government buildings. This area is the hub for mass transit—Spokane Transit's Downtown Plaza is located here. The East Downtown has a mix of retail and housing and is also where the Intermodal Station (AMTRAK and inter-city bus) and Spokane Convention Center area are located. The West Downtown is a mixed-use area.

Exhibit 4.7. Study area and subareas boundaries



Source: ECONorthwest

The *University District* is east of the Downtown and north and south of the river. It is the home to Gonzaga University and the Washington State University/Eastern Washington University Riverpoint Campus. The district also includes residential areas that surround Gonzaga University and a commercial area around Hamilton Street. The South University District has light commercial and industrial land uses. As the University District expands to the south, this area is anticipated to have growth in residential and bio-medical services land uses.

The *East Mission / SCC* subarea includes northern parts of the Logan Neighborhood, the Chief Garry Neighborhood, and East Mission neighborhood. Spokane Community College (SCC) is located at the eastern terminus of the CCL. The headquarters of the Avista Corporation, a large employer, is located at the intersection of E Mission Ave and E Upriver Drive.

Appendix B contains tables related to zoning, level of development, and value of parcels in the four study areas. In summary, the current conditions are:

Zoning

- Browne's Addition is primarily zoned for residential, with a mix of high-density residential (45%) and low-density residential (31%). Eastern and southern portions of the subarea are zoned Downtown. The proposed CCL alignment runs primarily through areas zoned for high-density residential, downtown, and—to a lesser extent—office.

- Downtown / CBD is zoned almost entirely for Downtown. In terms of zoning, the CBD is the most homogenous of the four study subareas.
- The University District includes a mix of zones. Commercial zones comprise about 53% of parcel area, including areas zoned commercial (28%), downtown (14%), center and corridor (9%), and office (2%). About 27% of the subarea is residential (11% high-density, 6% medium-density, 10% low-density). The remainder of the University District (20%) is zoned for industrial uses. However, the portion of the University District with industrial zoning is relatively far from the CCL alignment.
- East Mission is zoned primarily for low- and medium-density residential (46%) and industrial (45%) uses.

Land use

- Browne's Addition is largely multifamily (20%), government (16%), park/recreation (16%), and single-family (13%) land uses. Browne's Addition has the highest share of multifamily land use.
- The CBD is primarily commercial (20%), park/recreation (17%), retail (15%), and transportation/utilities (14%) land uses.
- The University District is primarily commercial (24%), education (22%), and vacant (24%) land uses. Just 3% of the University District is allocated toward multifamily land use. There is a large share of vacant land in the University District.
- East Mission is primarily single family (27%), commercial (21%), and vacant (12%) land uses.

Current land value

Exhibit 4.8 shows the average values for the total study area, the subareas, and buffers around the CCL alignment.

Exhibit 4.8. Average land values in the study area, 2014

	Land Value per SF
Study Area	$6.29
Browne's Addition	$7.41
Central Business District	$23.35
University District	$5.81
East Mission	$2.72
1/4 mile buffer	$8.18
1/4 - 1/2 mile buffer	$4.62
1/4 mile network distance from stations	$8.86
1/4 - 1/2 mile network distance from stations	$5.75

Source: Spokane County Assessor's parcel data, tax year 2014

The development potential of parcels within the study area will vary depending on the size, location, and existing use. Vacant and larger

parcels will be the easiest and least costly to develop. Surface parking lots are also relatively easy to develop, but due to their existing function, they are less likely to develop than vacant land. Parcels with existing uses have the highest threshold for development. The higher the value of the existing use, the less likely the parcel is to be redeveloped.

Vacant, buildable land

Vacant, unconstrained land is the most obvious opportunity for new development. To work with the available assessment data, this analysis defined vacant land as taxlots with no assessed improvement values on the property using 2013 tax values. Vacant land thus defined that was used for schools, parks, and other governmental uses were excluded. The analysis also removed parcels with known development since 2013, such as the convention center hotel. Exhibit 4.9 shows the results of our analysis for the total study area and different sub-areas.

Exhibit 4.9. Vacant or redevelopable net acres for study area, subareas, and selected buffers, 2014

	Vacant	Surface Parking	Underutilized, I:L	Underutilized, lot coverage
Study Area	195	19	186	316
Browne's Addition	8	0	8	8
Central Business District	10	16	23	4
University District	67	2	67	91
Spokane Community College	110	0	88	212
1/4 mile buffer	91	18	83	207
1/4 - 1/2 mile buffer	132	8	83	87
1/4 mile network distance from stations	36	13	52	176
1/4 - 1/2 mile network distance from stations	76	8	65	50

Source: ECONorthwest, data from Spokane County Assessor parcel data tax year 2014, City of Spokane GIS

The four categories of vacant/redevelopable land (the columns in Exhibit 4.9) are exclusive of each other. The ratio of improvement value to land value (I:L) is a standard measure for underutilized or redevelopable land. For new development, the ratio is typical 3::1 or greater. The University District and East Mission have most of the vacant land. More than 500 net acres in the study area are underutilized based on the ratio of improvement value to land value or lot coverage. More than half (300 acres) are located in the East Mission subarea. Browne's Addition has the fewest net acres of underutilized land (20 acres), while the Central Business District has about 30 acres of underutilized land.

Ratios of improvement values to land value

Exhibit 4.10 shows the ratios for the CCL study area, subareas, and selected buffers from the proposed CCL alignment.

Exhibit 4.10. Ratios of improvement value to land value for study area, subareas, and selected buffers from the CCL alignment, 2014

	Total Land Value	Total Improvement Value	I:L Ratio
Study Area	$703,940,810	$1,576,535,031	2.24
Browne's Addition	$76,422,710	$164,633,242	2.15
Central Business District	$294,589,680	$559,743,314	1.90
University District	$170,117,960	$307,129,127	1.81
East Mission	$162,810,460	$545,029,348	3.35
1/4 mile buffer	$544,990,590	$1,065,462,650	1.96
1/4 - 1/2 mile buffer	$237,264,880	$697,474,271	2.94
1/4 mile network distance from stations	$401,468,830	$790,966,793	1.97
1/4 - 1/2 mile network distance from stations	$180,516,360	$463,963,568	2.57

Source: Spokane County Assessor, tax year 2014

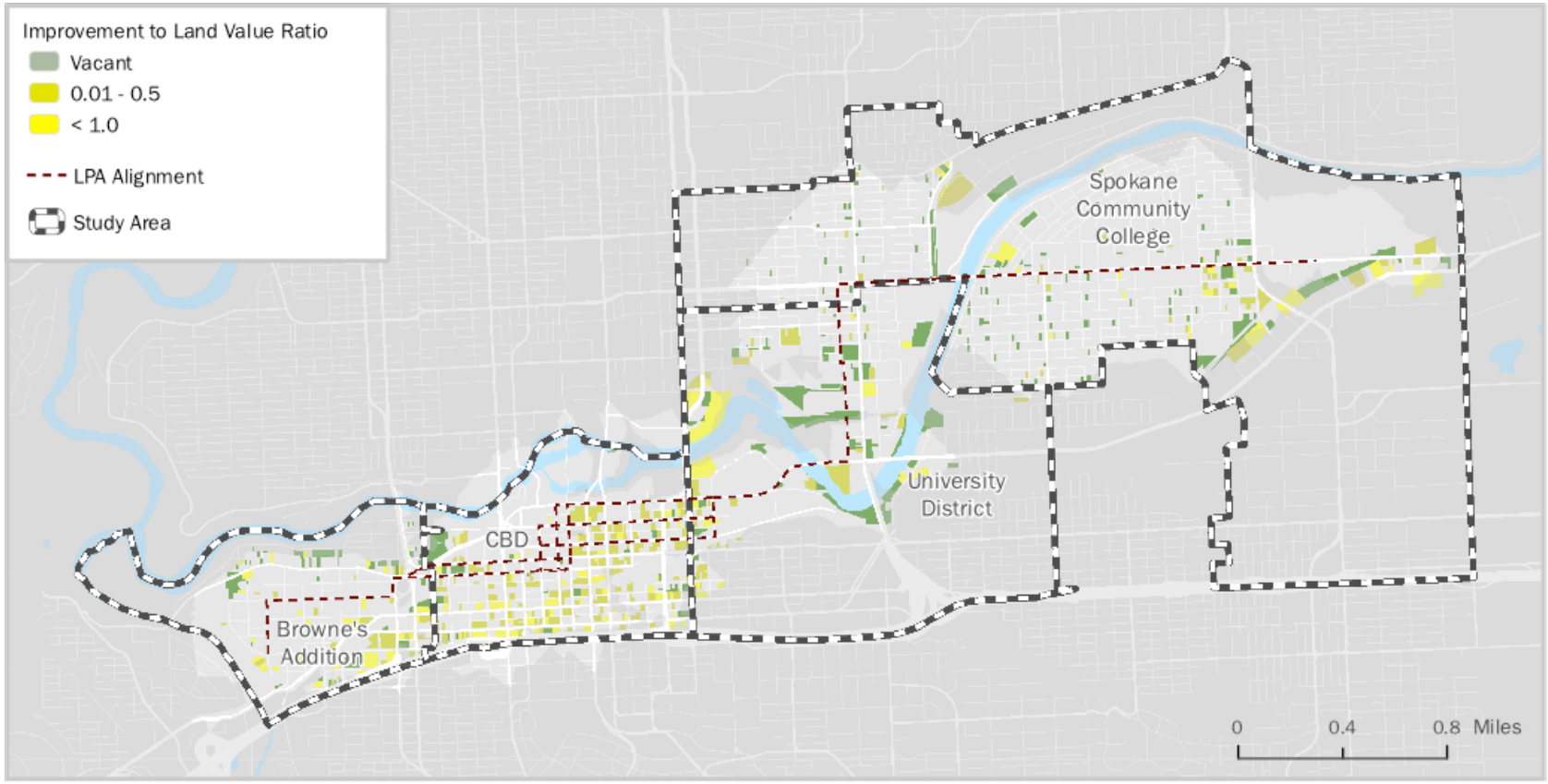
Modeling changes in ratios of improvement value to land value

Exhibit 4.11 shows the results of the analysis to identify vacant and potentially redevelopable sites within ½-network mile of a proposed transit station. The analysis is approximate: it uses 2014 data from the parcel file of the Spokane County Assessor, which includes 2013 assessor values. We had to make several assumptions and conversion to get to estimates of vacant and redevelopable land. Vacant means "no improvement value" but many public uses show no improvement value because they are not assessed taxes (e.g., parks). In addition, 2013 assessed values will be slightly out of date and not capture recent development or development in the pipeline.

A lot of land in urban areas could potentially have its use intensified, but some land is more likely to redevelop than other land. If the ratio of the value of improvements to the value of land is low (a typical cut-off point is that improvement value is equal to or less than land value: the ratio of Improvement Value (IV) to Land Value (LV) is less than one), then it is more likely to redevelop. But a lot of land with IV/LV < 1 will not redevelop during some analysis period (e.g., 10 – 20 years), and some parcels with IV/LV > 1 will redevelop. Thus, Exhibit 4.11 is just providing a rough sense of the density of developable or redevelopable land across the study area.

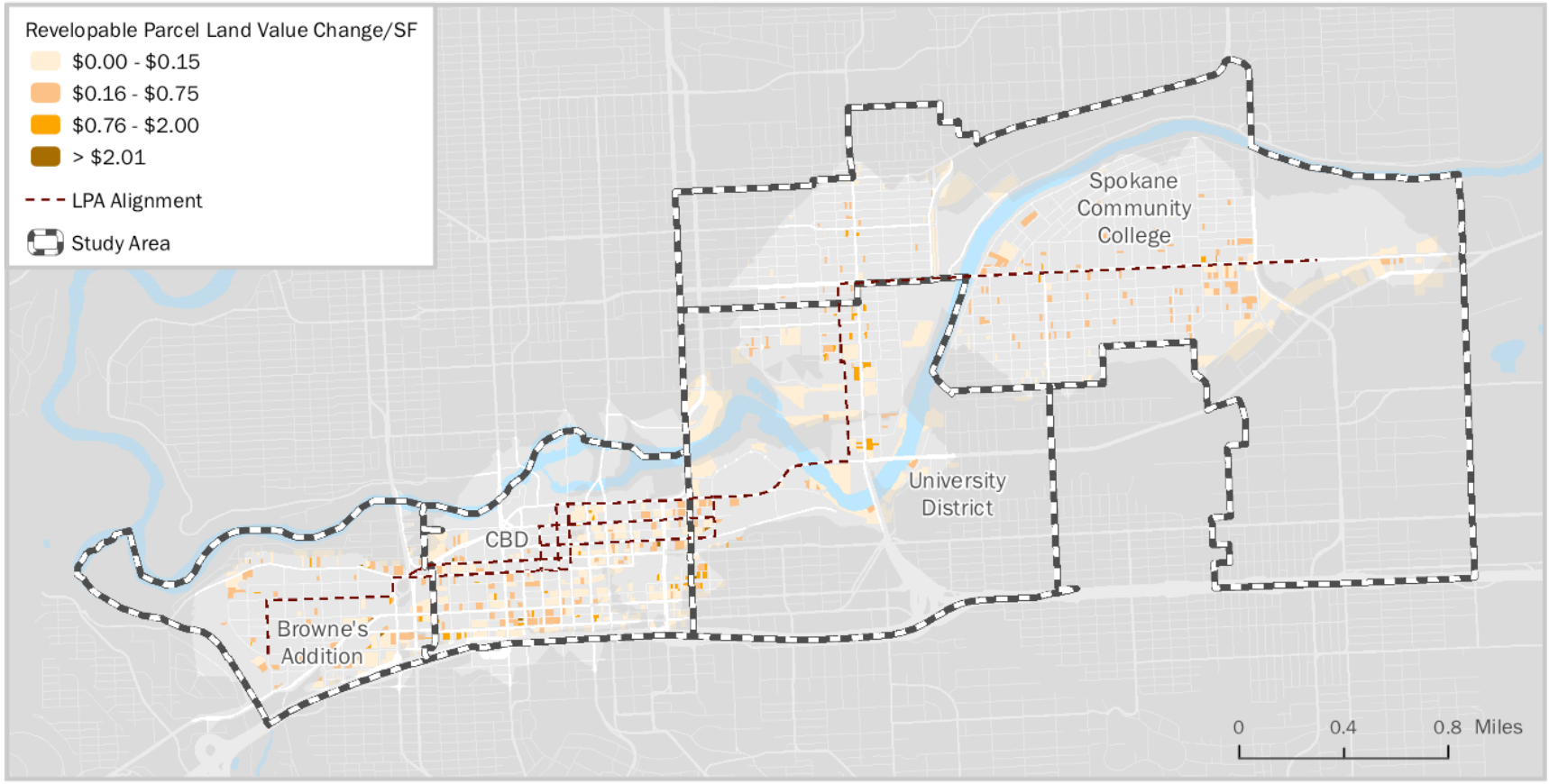
Exhibit 4.12 shows the same parcels shown in Exhibit 4.11, but highlights them differently based on how much the modeling suggests that land values could increase on a per-square-foot basis as a result of the CCL over the long-term. Darker orange parcels indicate parcels where land values would increase the most because of proximity to the CCL; the lightest orange indicate parcels where there is little to no change in land values

Exhibit 4.11. Potentially developable or redevelopable sites within ½-network-mile of a proposed transit station



Source: ECONorthwest spatial model, Spokane County Assessor, parcel data tax year 2014
Notes: For the purposes of this analysis, "Vacant" ="developable." Sites with Improvement-Value-to-Land-Value ratios < 1 are shown as "redevelopable." Not all such properties will redevelop: the map is only meant to provide a sense of where the most likely areas for redevelopment are.

Exhibit 4.12. Estimated changes in land value for redevelopable sites (per Exhibit 4.11) that result from the CCL, within ½-network-mile of a proposed transit station



Source: ECONorthwest spatial model, Spokane County Assessor, parcel data tax year 2014
Notes: This map shows more information about the sites shown as "redevelopable" (Improvement-Value-to-Land-Value ratios < 1) in Exhibit 4.12. It shows how much the model estimates that land values will change in the long run ($/sq ft.) as a result of the ridership benefits provided by the CCL.

Exhibit 4.13 shows in tabular form some the data used to create the maps in Exhibits 4.11 and 4.12. It shows potential changes in site values and the easiest development opportunities (vacant parcels and surface parking lots) within each of the distance bands from points of transit access. Parcels closest the alignment received the largest land value increase. The number and acres of vacant parcels increase the farther from the alignment, however.

Exhibit 4.13. Site value changes and development opportunities by distance to transit access

Distance	Land AV/SF	Increased Land AV/SF	Site Value Change	Vacant Acres	Vacant Count	Surface Parking Acres
0-660ft	$14.14	$17.10	20.9%	12.8	41	8.7
661-1,320ft	$9.63	$10.97	14.0%	17.9	61	5.4
1,321-1,980ft	$5.55	$6.07	9.3%	24.9	65	2.4
1,980-2,640ft	$5.97	$5.97	0.0%	36.5	74	2.2
Total	$8.20	$9.20	12.2%	92.1	241	18.7

Source: ECONorthwest, Spokane County Assessors

Exhibit 4.14 shows the total acres and number of potentially redevelopable parcels (parcels with an improvement to land value ratio less than 1.0 that are not vacant or surface parking lots) under the current (*baseline*) conditions. It also shows the additional parcels that would meet the criteria for *potentially redevelopable* if the land value increases are applied to those parcels within one-half network-mile of proposed station areas.

Exhibit 4.14. Current potentially redevelopable parcels within ½ network mile of proposed transit stations, by subarea, and additional potentially redevelopable parcels that result from the CCL

	Baseline				Change in Redevelopable Parcels			
	I:L <0.5		I:L 0.51 - 1.0		I:L <0.5		I:L 0.51 - 1.0	
Subarea	Acres	Count	Acres	Count	Acres	Count	Acres	Count
Browne's Addition	7.6	20	7.9	13	0.0	0	2.0	7
CBD	22.0	77	14.3	45	1.8	6	1.8	3
University District	17.9	48	15.0	21	1.8	2	0.7	0
SCC	14.1	39	11.5	15	0.5	1	2.7	2
Total	**61.6**	**184**	**48.7**	**94**	**4.2**	**9**	**7.2**	**12**

Source: ECONorthwest, Spokane County Assessors

Based on the assumed improvement to land value (I:L) ratios, only a few parcels shift from having an I:L ratio greater than 1 to less than 1 as a result in the increase in land value from the CCL. Twelve additional parcels totaling 7.2 acres are added to the redevelopable category (I:L < 1) from the current baseline, a 3% increase in total acres of redevelopable parcels. In addition, eight parcels totaling 1.3 acres move shift to having a I:L ratio of less than 0.5.

Descriptive analysis of potential development changes

Browne's Addition

Browne's Addition is an established neighborhood that is the western terminus of the CCL. The area from which it would draw ridership is clearly defined: steep slopes dropping to water bodies on the north and west, railroad tracks and Interstate-90 on the south, and the West Downtown subarea to the east. The area is primarily residential in both use and zoning.

In the context of transit evaluation, Browne's Addition is a "residential origin" not an "employment or commercial destination." It is mainly developed, and mainly at moderate densities: single-family dwellings (many large and on small lots, some converted to "multiplexes") and garden (walk-up) apartments. There is a small commercial node on Cannon Street at Pacific Avenue, and a supermarket (Rosauer's) at the southwest corner at W 2nd Avenue and Elm Street.

There are a few opportunities for some infill development, but not many. Exhibit 4.11 overstates the potential by showing land in the north on W Clarke Avenue that is downhill from the main bench and not very accessible, and two big parcels off W Riverside Avenue, on of which is the parking lot of the Northwest Museum of Art and Culture, and the other of which is forested and steep land that would probably have to be accessed from W Clarke Avenue. Zoning and neighborhood preferences will limit extensive redevelopment.

Since the opportunities for any new development are relatively small, and the CCL would only modestly increase the likelihood of that small amount of development, we assess the impacts of the CCL on Browne's Addition to be relatively small. The CCL could have the effect of making Browne's Addition more desirable as a residential location (e.g., for students and downtown employees), but given the developed character of the area, one might expect that demand to be accommodated first by some conversion of large single-family homes to multifamily units.

The small commercial node on S Cannon Street south of W Pacific Avenue is all developed, a lot of it single story, brick, and in good shape. It *could* be redeveloped someday, but the CCL effects on land value are not large enough to make that likely soon.

Rosauer's supermarket is the only one in the western half of study area (south of the river) has the potential to serve other residential areas in the downtown. To the extent that the CCL increases residential uses in those areas, the area around the supermarket might see demand for redevelopment, but the uses in that area make commercial development challenging (dense residential north and west; major road and rail on the south and east).

Downtown

Downtown is bounded by Browne's addition on the west, the Spokane River on the north (a few places just north of the river and near bridges are in walking distance), the South University District on the east (for this study, N. Division Street is the boundary), and Interstate-90 on the south. Elevated railroad tracks run east-west through the downtown between 1st and 2nd Avenues. The area on the west is mainly single-story commercial and warehousing, with some two- and three-story brick buildings. Building height, density, and value increase as one moves toward the downtown, more on the north side of the tracks.

The CCL alignment will be in the northern quarter of the alignment, through the densest part of downtown. Thus, one should expect any development effects of the CCL south the railroad tracks to be small and later.

In the western half of the central downtown Exhibit 4.11 shows ample potential for development or redevelopment along the alignment (W 1st Ave or Sprague). Most of the vacant land is surface parking lots; most of the buildings are in good condition and not likely to be razed for new development. North of Riverside at the west end of the subarea is vacant land that slopes down to W Main Avenue below: with its central location and views, it has potential of high-density, higher-end residential (one residential tower already exists there).

In the central downtown, any variation of the alignment (riverside, Main, or Spokane Falls Blvd) has almost no vacant land until east of Washington Street. The little that does exist is in a couple surface parking lots. Redevelopment, however, is a continuous process in a health downtown (Spokane's downtown is healthy), and there is ample evidence from other cities to suggest that some redevelopment will occur sooner, differently, and perhaps as part of the CCL development.

More vacant land exists east of Washington in the form of surface parking lots.[7] With the performing arts center, conference center, and new conference center hotel as anchors, this area has good development potential for both commercial and residential uses. The vacant land opens the possibility for joint development as part of the CCL streetscape and station area improvements.

University District

The southern half of this district is bounded by Division on the west, the river on the north and east, and the railroad tracks on the south. The CCL alignment runs east-west on E. Spokane Falls Blvd. and divides the area into north and

[7] Exhibit 4.11 is based on assessment data and incorrectly shows the block at Main and Washington as vacant: the convention center hotel is now being constructed there.

south segments. The northern segment is the larger and is mainly the WSU campus. The northern half of the district is north of the river, bisected by the CCL's north-south alignment through Gonzaga University on Cincinnati Street, and bounded on the north by E Mission Avenue.

Both areas have good opportunities for development: land is available, the ownership is consolidated, the owners (WSU and Gonzaga) have sources of capital and plans for expansions, and many of their employees and most of their students are in socioeconomic and demographic strata with relatively high transit ridership.

WSU has a lot of land in surface parking. Over time one should expect some of that land to convert to buildings, probably related to the University (e.g., faculty and administrative offices, research space, student housing), but not necessarily (WSU could sell land or consider public-private partnerships for other commercial uses). It is easy to imagine master plans that get denser, mixed-use development along E Spokane Falls Blvd, get parking off the river frontage and into the central area (possibly structured), and have high-end employment and housing along the riverfront with plenty of greenspace and access. All that would be within a quarter mile of a CCL station.

On the north (Gonzaga) side, the opportunities are both similar and different. The alignment on Cincinnati brings the CCL into the heart of the campus and makes ridership for students and University employees more attractive, but the vacant land available is in only a few parking lots and playing fields. Those may be mainly essential to the University operation. Getting vacant land may require structured parking. Moreover, development is then contingent on the University's development program.

In contrast, N Hamilton Street, a block to the east, has large amounts of vacant land and development opportunities. Gonzaga University now turns its back on Hamilton, but a redeveloped Hamilton could be a different story, with new University development on the west and new private development on the east. It is only ¼ from Hamilton to the far west end of the campus or to the river on the east. The Iron Bridge trail could contribute to residential development on both sides of the river, all within walking distance of a Hamilton alignment. Given the newest technology being considered for the CCL (rubber tire, electric, no catenary lines, charging by inductance at end points) it could be feasible to run this segment as a loop: Cincinnati one way, Hamilton the other.

That said, the analysis leading to the locally preferred alternative for the CCL considered these potential development benefits in the light of operational issues and concluded that Hamilton Street is too problematic for reliable operations. Even without having the alignment on Hamilton, it is only 100 yards (on block) from Cincinnati and good pedestrian linkages are available or possible.

A few block north of Gonzaga University and its northern most CCL station, the alignment turns east on Mission Avenue. This area is mainly developed with commercial and residential uses: opportunities for new development or redevelopment are not great.

Mission Avenue / SSC

This area is bounded by Hamilton on the west and SSC on the east, with north and south boundaries approximately a quarter mile from E Mission Avenue. The CCL alignment here is entirely on Mission and runs east-west almost two miles.

Little land west of the river is developable. Mission is bounded by relatively dense and valuable commercial and residential uses, and by Mission Park. This area does have an anchor supermarket (Safeway) at Hamilton and Mission. East of the river the development for the first mile along the alignment is mainly lower-density and lower-value housing, and public space (park and school). As one gets within a few blocks of N Greene Street uses shift to low-density commercial, with a lot of vacant land.

A major reason to extend the CCL is service to SCC, a relatively dense activity center with activities that will attract a higher-than-average proportion of people who are transit riders (e.g., students, administrative staff. But while the western half of the CCL (Browne's Addition to Gonzaga) go through areas of dense development and urban activity, the Mission segment adds 50% to the line to go through land that is unlikely to develop densely any time soon, with or without the CCL. It provides travel benefits to SCC and to households along the line, but those benefits do not seem likely to lead to big changes any time soon in the amount, type, or pattern of development, with two qualifications:

- A lot depends on the expansion plans and resources of SCC. The CCL would certainly provide benefits for SCC students and employees, and in doing so would facilitate any expansion SCC has planned.
- Independent of SCC, the CCL would make the land around SCC and the alignment to the west move suitable and valuable for multifamily development. Given the dispersed and industrial nature of employment in the area, the CCL is not likely to have a significant effect on the development of non-SCC employment land in the near future.

5 Conclusions and Recommendations

5.1 About economic and development impacts along the alignment

Estimates of changes in property value

This report addresses potential impacts on economic activity and land development of a proposed new transit alignment in Spokane, the Central City Line. The analysis focuses on changes in land values and changes in land development, which in turn are at least partial measures of changes in economic activity. The analysis concludes that:

- The professional literature and case studies agree that efficient transit service can increase land values and the intensity of land development.
- On the hand, few studies rigorously control for the unique effects of a transit investment, much less for the parts of that investment that are integral to the operation of the transit system. That fact suggests that transit benefits could be overestimated. On the other hand, if one only looks at estimates of benefits using the methods of this report, the effects of total transit project (which may include, for example, other streetscape improvements) may be underestimated.
- This study uses two methods to estimate effects of the CCL on property values. First, it looks at studies done of other transit systems to see what kinds of effects they found. Second, it (1) uses local data about expected ridership and land value, (2) assumes (as the literature of urban and transportation economics suggests) that the benefits of transit eventually get capitalized into property values, (3) converts those benefits to changes in property values, and (4) distributes those changes to properties based on distance from the improved service (also supported by the literature).
- Using the second method, the analysis in this report concludes that, overall, (1) land value in the study would be about the $45 million greater (mean estimated present value) because of the ridership benefits of the CCL, and (2) together improvement plus land value would be in the range of $175 million greater if the transit benefits over a 30-year period were to be fully capitalized into land values. If (1) user benefits from the CCL are in the order of $45 million, and (2) increased land value drives

increases in the value of improvements at typical average rates,[8] then the total value change (land plus improvements) in the corridor derived transit user benefits would be on the order of 12 percent[9] of current land and improvement value for the same area. This estimate is in the range of estimates for other cities (5% to 15%).

- Though the transit improvements of the CCL may be a *necessary* condition for that increase in property values, they are not a *sufficient* condition for those changes, or for new development. Other conditions (or public policy and investment, markets, business cycles, and property owner objectives) strongly influence the rate, type, and location of development. Supportive measures (regulations, zoning and direct development subsidies), where justified, are an important catalyst for transit-oriented development. Those supportive elements often also create benefits for non-transit users, which may both (1) increase the speed or likelihood of high-intensity development, and (2) further increase the estimate of benefits that get capitalized into land value, and thus, the total effects on land development and economic activity.
- Nonetheless, the direction of the effect of the CCL seems clear: overtime it will (1) improve transportation, (2) make sites along its alignment more valuable, and (3) encourage greater intensity of development, especially if (as is intended) such development is supported by other public policy and investment. The analysis in this report suggests that there is sufficient vacant and redevelopable land in the study area to allow that type of development to occur. It also suggests the kinds of development that areas along the CCL are likely to support.

These conclusions are conditional: the effects of the CCL depend on a lot of conditions. Are the ridership estimates about right? What are the socioeconomic characteristics of the riders? How large will the ancillary streetscape investments be, and what will be the net benefits be to people that are not transit riders? To what extent, and how quickly, will the benefits to transit users and non-users get capitalized into land value, and how will development respond to those changes?

Theory, the literature, and intuition and observation put some boundaries on the effects of transit. Transportation is only one many utilities needed for development, and it is only one of several factors in a business's production function. The CCL investment, and transportation investments in all downtowns,

[8] The ratio of improvement to land value in the corridor is about 3 to 1. Thus, $45 million in land value increase would drive roughly another $135 million in capital improvement.

[9] That estimate contains many assumptions and caveats described elsewhere in this report.

occurs in the context of ubiquitous transportation. In downtown Spokane, economic development is not constrained by gridlock. Thus, one would expect that (1) shorter-run impact of the CCL on the economy and development to be small relative to the total, and (2) that other factors—like national economic conditions and local policies about things like zoning and fees—will have larger effects.

All these factors argue that the net effects uniquely attributable to the CCL on property values and development will be in the range of 1 to 10 percent, and toward the lower end in the shorter-run.

Qualitative assessment of other effects

This report has a narrow scope: it is about the economic effects of the CCL, and primarily the likely and potential increases on land values and development. The broader questions that the STA and the Spokane area will be considering as they evaluate STA *Moving Forward* plan, however, is: Does the investment in the CCL make sense, both absolutely and relative to other potential investments in transit. This study was not charged with addressing, much less providing quantitative answers to, that question.

That said, the project team has spent time considering that question and offers some qualitative assessment of some key issues, which it addresses below in four related categories: (1) redistributive vs. net effects, (2) full benefits and costs, and perspective, (3) long run vs. short run, and (4) other types of effects on the economy.

Are the economic effects of the CCL "just" redistributive?

The concern with respect to economic development is whether, at the extreme, the increase in economic activity in the CCL corridor is just a transfer of economic activity that would have occurred in other parts of the region. The answer to this question depends on many things, but key among them are *boundaries* and *time period.*

The bigger the boundary of the study area, the more likely that the effects are redistributive rather than net increases. Within the boundaries of CCL corridor, the analysis in this report is about net effects: the CCL brings more economic activity into the corridor than would occur without the CLL. But where does that growth come from: elsewhere in the City of Spokane, the Spokane region, the state of Washington, or the US? The bigger the larger boundary, the more likely that the effects of a redistribution: economic growth is moving from one place to another.

Transportation modeling in metropolitan regions has usually been based on the implicit assumption that the effects of transportation improvements at the

regional level are redistributive. The reason: a single forecast of population and employment forecasts are used as inputs to a travel-demand model. If the amount of population and employment growth is fixed for the region, then the regional impacts on the economy and development are roughly fixed (though different types and locations of transportation projects may cause sub-regional totals for population and employment for be different.

Those assumptions are understandable for modeling purposes. But it seems hard to argue that in the long run a region is going to have exactly the same amount of growth independent of its investments in the type, amount, and quality of its infrastructure. In other words, infrastructure investment can matter.

Even if economic effects are primarily redistributive, to dismiss them as "just" redistributive misses the point that redistributions can be efficient. There is a lot of literature about "smart growth" and the direct public costs (and other external costs) of serving different patterns of development. Transportation projects are the primary determinants of those patterns.

Beyond the efficiency arguments are equity (fairness) arguments. Sub-areas in a region are not identical. Some are in better shape than others, and part of the reason may be that they have previously benefited from a disproportionate share of public investment. Local decisionmakers have obligations to ensure that they articulate and follow standards for the fair delivery of public facilities and services.

Full benefits and costs? From whose perspective?

It is well known that transit systems cannot pay for their full costs with revenues received directly from users ("farebox" revenues). Other sources of funding (subsidies) must supplement user fees. On the cost side, there are many costs (negative impacts) that are hard to quantify in dollars and may be overlooked.

This study notes in several places that it is not a full benefit-cost analysis. It focuses on a subset of benefits: those related to property value and land development. As for other projects, this project evaluates a broader range of benefits and costs first as pert of the development and evaluation of alternatives, later as part of decisions to include the CCL in *Moving Forward*, and later yet as of project design.

Related to the issue of redistributive effects is the one of national vs. local perspective. In particular, large construction projects with substantial state and federal government look different depending on the perspective of the analysis.

In the case of the CCL, it is possible that up to 80% of the funding for construction could be nonlocal (from outside the region), and that most of that funding could be used *only* for a transit project that meets FTA "small starts" criteria. To the extent that is true, then the CLL could be a very good investment from a local perspective (benefits much greater than costs) even though it performs less well from a national perspective. Why? Because the costs in the denominator of a benefit-cost ratio are much smaller if just the local costs are counted. That is not an economic slight of hand—it is a legitimate calculation that recognizes that costs that a local area does not have to pay may need be part of its decisionmaking criteria.

In short, the fact that the CCL may qualify for and attract grant monies that could not be used for any other purpose ("use it or lose it") is relevant to the decisionmaking.

How long a view?

Business investments commonly get evaluated on short time horizon: two to 10 years. Public investments commonly get evaluated on longer time horizon: ten to 30 (or more) years.

Infrastructure, and transportation in particular, is a long run investment. Households move on average every five years; buildings last 20 to 100 (or more) years); but right of way can last for hundreds of years. Old cities in Europe and Asia are organized around right of way laid down over a thousand years ago.

Those ideas are part of the argument for the importance of taking a long run view of transportation. Even if it were the case that cheaper transit alternatives like expanded bus service could deliver most of the benefits *in the short run* that the CCL is expected to provide, does the capital investment in a strong downtown transit corridor pay off for the region in the future?

Viewed from today's perspective (current conditions for transportation, population, demographics, economics, consumer preferences, prices), transit investments will have relatively big impacts only in relatively big cities with density and traffic problems. Spokane is not such a city.

But change happens. Spokane is likely to grow. Its elected and appointed officials have the opportunity, authority, and responsibility to shape that growth. Different development patterns will have different costs and benefits. Over the longer run, the CCL will shape the development pattern. It will cause more of the development and economic growth to occur along the alignment. Such a pattern has several advantages, and avoids certain costs. The more one expects the future to be one of increasing fuel prices, the need for decreasing emissions, changes in preferences toward more urban amenities, and other things that make increased

central-city density more desirable, the more one is likely to see transit infrastructure as efficient. If one is building toward a strong downtown in the future, evidence is compelling: strong downtowns have good transit.

One might worry that such a future is too far off, and that investing in transit now is premature: it may be an underutilized investment for many years. That could be true. The counterargument is that such investment will be more than repaid because it will move Spokane toward a future development pattern that is more efficient: one that will increase economic and amenity benefits and reduce service costs. Evidence that definitively points to one conclusion or the other across conditions probably does not exist: the best a region can do is assemble information about impacts (all types, long-run and short-run, public and private, by subarea and group) and have a discussion about their relative magnitudes and values so that tradeoffs can be evaluated and decisions made.

Regarding the future, FTA criteria from evaluating grant applications discount future conditions substantially. FTA requires grant applicants to evaluate a new transit system against *current* population, land use, and economic conditions, not future ones. That is understandable because FTA wants to reduce its historical problem of having granting applicants speculate about all manner of rosy futures that make their proposed project look good. But it is paradoxical because FTA certainly understands that cities like Spokane—ones that are expecting to grow to size, and hoping to grow in a pattern, that supports transit—are basing their investments decisions more on future than current performance. STA will have to consider these issues if and when it decides to submit for an FTA Small-Start grant.

What about other types of impacts on the economy?

The focus of this report has been on development activity. There is a rough correlation between development activity and economic activity. In the short run, development activity is directly economic activity: the construction industry will be bigger because of the CCL investment. And because the CCL will be built mainly with grant funding from FTA—with money that would otherwise not be available to the Spokane area for other construction projects—the spending is a net gain to the economy, not a transfer.

In the longer run, economic growth correlates with employment growth, and most of that growth cannot occur without the creation of new space to house employees and equipment. Some economic impacts studies are based mainly on that presumed correlation: for example, a forecast of retail employees converts to new square-footage of retail space, and that square-footage converts to retail sales.

This study does not do those conversions, and does not attempt to speculate on the impacts of the CCL on retail sales along the corridor—too many other variables are at play. In the short run, retail should expect some disruption from construction: how much depends on how STA and retailers along the alignment attempt to mitigate the construction impacts. But the CCL is not a rail system, and its newest configuration still under consideration does not even require overhead wires. Construction impacts will be mainly for stations (spot improvements that will disrupt a few businesses), street rehabilitation, and streetscape improvements (which retailers around the country accept as a way of improving the pedestrian / shopper environment).

In the long run, the retail effects depend on design and implementation: will the CCL be designed and built in a way that improves access by transit and the streetscape aesthetics and amenities along the alignment, and does not make driving and parking much more difficult? Presumably it can—it has been done other cities.

5.2 About increasing the economic development potential of the CCL

There is nothing new in the list that follows, but the items on it are well supported by our experience, our case studies, and the professional literature.

- **Service to Activity Centers.** Placing the alignment as close to major activity centers as possible, preferably with a station in front of the activity nodes, will encourage greater ridership and may intensify nearby development. Collecting ridership, real estate market, and economic activity data along the corridor should begin immediately and continue through implementation of the project to offer statistical analysis of investments and to better understand siting of station areas.

  Spokane has already been through an extensive process to evaluating alignments and select a locally preferred alignment. We have not done anything close to the amount of technical and political work that went into that selection process. Nonetheless, we offer a few comments:

  - The alignment options in west (Browne's Addition) and downtown look reasonable, if not obvious. There are some options noted in the downtown, and there are tradeoffs. Northern alignments have more immediately surrounding density, but southern alignments provide more buildable space within walking distance. Either works; the final decision will probably depend more on traffic details and property owner preferences than on ridership issues.

- There are good reasons for putting the north-south leg of the alignment on Cincinnati, but there are reasons that N Hamilton Street could be a better alignment for long-run, private-sector development: developable lands along Hamilton Street, more traffic / potential customers, and greater proximity to the land near the Iron Bridge trail.
- The alignment along E Mission is the obvious one once the decision to come to Gonzaga University is made. The question is not about the alignment, but about whether that part of the system as an initial phase is the best idea from a development perspective. It adds miles, cost, and travel time, and reduces the focus of the new service without adding a lot to likely new development.

- **Accessible Station Areas.** Streetscape improvements, improved crossings, traffic calming, bicycle infrastructure, and greater pedestrian-orientation through storefront redevelopment and public plazas will help people safely access transit. Through a multimodal streetscape overhaul along the CCL corridor, Spokane and STA can make the corridor more attractive to people walking, encouraging foot traffic to storefronts and attracting new business. The corridor needs a building face to building face overhaul, not simply a curb-to-curb redesign. CCL stakeholders should ensure that the project is integrated and supportive of the citywide bicycle transportation and pedestrian networks.
- **Placemaking.** The CCL can increase non-transit-user benefits by creating a landmark, full-featured transit stations and a seamlessly integrated pedestrian environment. Financial incentives and partnerships may be necessary.
- **Permanence and flexibility.** A tradeoff. On the one hand, new development wants certainty about what public facilities and services will be around and adding value to site development. On the other hand, a flexible transit alignment (possible with the technology proposed in Spokane) reduces risk of serving the wrong growth market. The proper tilt is probably toward permanence. In Spokane's case we had only a couple suggestions about alternative alignments (see first bullet, above).
- **Distinctive Branding.** The development of a distinct brand identity for the CCL that separates the service from other transit modes and attracts new riders is a challenge that STA can address immediately. Using this branding on all communication and messaging about the CCL will support public awareness of the project.
- **Institutional Support.** To encourage land development and economic activity, strong institutional support is necessary. It requires coordination between the City of Spokane, STA, and project stakeholders. Project

partners should ensure that planning, zoning, and financial mechanisms are in place to support the capital investments. For example, the City will need to rezone some of the more suburban areas along the route to encourage denser development. Project partners should revisit transit-supportive zoning along the corridor when the final alignment is set, showing early and sustained support for developers. Political leadership often changes; continued stable institutional leadership from Sounding Board member institutions, City and regional government, STA, and other stakeholders is vital. The Sounding Board should continue to meet quarterly to revisit and develop goals.[10]

We note, however, that some of these "transit-supportive" but ancillary policies and investments can occur even without the new transit services. In particular, if denser development along the alignment is constrained, for example, by zoning and parking requirements, those problems can be remedied without the transit investment. In an environment where general growth in the economy is strong the primary question of development activities may be more of a question of timing than of whether development occurs.

- **Continued service improvements.** Continue to increase the benefits to transit patrons through service improvements designed to reduce transit in-vehicle, transfer, and wait times. As development along the alignment increases and densifies, there improvements will be increasingly cost-effective.

[10] A primary argument for the provision of support measures designed to jump-start transit-oriented development is the presence of economies of agglomeration, or the added production possibilities associated with proximate location of commercial, institutional, and residential activities. The theoretical and empirical literature on agglomerative economies is extensive but mixed in terms of the understanding of the size of its effects. The mixed results are not unexpected due to the difficulty in teasing out the two-way influences of the spatial intensity of economic activity and economic growth (growth following density, or density as a consequence of growth). If agglomerative economies are expected to be strong then there may be justification for the provision of support measures that will increase the likelihood of development occurring sooner. The general idea is what is commonly considered a virtuous circle where transit investments produce benefits to users that are capitalized in increased land values, supportive measures catalyze the market for land development, development accommodates growth in jobs and households, and job and household growth increases transit ridership.

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Technical Appendices

Several technical appendices support this report. They are in separate documents. Here is the list.

- Appendix A, Framework and Methods.
- Appendix B, Context: Past, Present, and Expected Future Conditions in the Region and the Study Area.
- Appendix C, Literature Review: Effects of Transit on Economic Activity and Land Development.
- Appendix D, Case Studies: Experience of Cities With Transit Systems Relevant to the CCL Evaluation
- Appendix E: Stakeholder Involvement