Assessment of Vancouver Energy Socioeconomic Impacts:

Statistical Analysis of Potential Property Value Impacts from Vancouver Energy

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This report summarizes an assessment of the impacts to property values in the Vancouver, Washington area as a consequence of the development of the Vancouver Energy distribution terminal (the "Project"). The analysis considers impacts given the potential for increased rail traffic from deliveries of crude oil supplies to the Project.[2] Such impacts could occur due to the expectation of dis-amenity from increased rail traffic, or rail traffic transporting crude oil supplies. There has been significant coverage of the proposed facility in the local press, as well as extensive coverage of other proposed terminals supporting rail transport of crude oil and coal within Washington State. Consequently, while the facility has not been constructed and no increases in rail traffic have yet occurred, there has been much information available to real estate market participants about these facilities and the potential for increased rail traffic.

To evaluate whether the proposed facility has yet had any impact on property values, I perform a statistical analysis of real estate transactions in Clark County, Washington to determine whether the announcement of the Project has had an adverse impact on property values. To test for such an adverse impact, I test whether there is a change in the impact of proximity to rail on property values changes after the announcement of the facility's development. Note that this test differs from the more basic question of whether proximity to the rail affects property values – that is, there is a discount (or premium) to living near to a rail line. If homeowners find it less desirable to live near a rail given the possibility of increased crude rail traffic, I would expect to observe a change in the discount/premium from living near the rail after the Project's announcement. For example, if homes near the rail corridor had, on average, sold for 5 percent less than those more distance, this impact might increase to, say, 10 percent as a consequence of anticipated increases in rail traffic due to the facility. Claims have been made that such potential impacts could be as large as 30 percent.[3]

[1] Dr. Strombom is a Managing Principal and Dr. Schatzki is a Vice President at Analysis Group. The report was conducted on behalf of Tesoro Savage Petroleum Terminal LLC, but the opinions expressed are exclusively those of the authors. To request further information or provide comments, Dr. Schatzki can be reached at: tschatzki@analysisgroup.com.

[2] The report does not consider potential impacts from proximity to the facility itself. The facility is located within the Port of Vancouver, an existing part of Vancouver that is already highly industrial.

[3] Johnson Economics, "Estimated Economic and Fiscal Impacts of the Tesoro Savage Project on the Waterfront Vancouver Development and Downtown Vancouver," December 9, 2013; Johnson Economics, "Predicted Impacts

This appendix is divided in to four sections. Section I provides relevant background on Vancouver Energy project development process. Section II provides an overview of the data and methods used in our statistical analysis. Section III summarizes the results of our analysis. Finally, Section IV provides some concluding remarks. Two appendices provide more information on earlier work I developed to measure potential property value impacts and the details of our statistical analysis.

I. BACKGROUND ON VANCOUVER ENERGY DEVELOPMENT RELEVANT TO THE HEDONIC ANALYSIS

The development of the Vancouver Energy facility has occurred in a series of steps, with various milestones occurring over time. The potential for the facility first became public knowledge on April 22, 2013 when the Port of Vancouver announced that Tesoro and Savage Corporations had developed a joint venture to develop the Project, subject to approval by the Port's Commissioners and the approval of regulatory agencies.[4] On July 23, 2013, Vancouver Energy received approval of the lease with the Port of Vancouver.[5] This approval occurred after a series of five commission workshops held over a ten-week period, providing both general information on issues related to crude oil as well as information specific to the Project. Approvals from regulatory agencies, principally the Energy Facility Siting Evaluation Council (EFSEC) are on-going. Public hearings, with the opportunity for oral or written comment, were held in Fall of 2013.[6] Subsequently, preliminary Draft Environmental Impact Statement (EIS) submitted to EFSEC by Vancouver Energy in July 2014, with additional material provided in September 2014.[7] Various governmental and non-governmental agencies have taken actions with respect to the project, including resolutions by Vancouver's City Council.[8] Over this period of time, there was substantial news coverage of the Project's development in the press, along with significant attention to marine energy terminals generally, in light of proposals for other facilities in Washington State.

The development of the Vancouver Energy facility has not yet been approved. Absent these approvals, the Project would not be developed, and, as a result, there is some possibility that the Project would not be developed and that the potential increases in rail traffic from the Project would not occur. However, to the extent that the Project's development is considered likely, impacts to property values from any increase in rail traffic would be expected to occur as the information becomes known. This outcome reflects two economic principles. First, information about factors that will change the value

of the Tesoro Savage Project on Development and Redevelopment in Downtown Vancouver, Washington," December 18, 2013.

[4] http://www.portvanusa.com/news-releases/tesoro-and-savage-announce-joint-venture-to-construct-and-operate-crude-by-rail-unloading-and-marine-loading-facility-at-port-of-vancouver-usa/

[5] http://www.portvanusa.com/news-releases/port-commission-approves-lease-with-tesoro-savage/

[6] http://www.efsec.wa.gov/Tesoro%20Savage/Public%20Comments%20page_copy(1).shtml

[7] http://www.vancouverenergyusa.com/assets/pdeis_12.17.14.pdf

[8] http://www.opb.org/news/article/vancouver-city-council/

that homeowners place on owning the property in the future – when the facility is actually in operation – will impact the market value of the property today, as soon as the information is known.[9] Second, even if there is uncertainty about whether impacts to value will occur, market prices will adjust to account for the risk that such impacts will occur.[10] Thus, to the extent that the Project would lead to adverse impacts to property values, I would expect to observe such impacts in market prices today, dampened for the probability that such adverse impacts may not occur.

As described above, the diffusion of information about the Project to the local real estate market has evolved over time. This information has potentially important consequences for the impact of the Project on local property values. Because information and attention has varied over time, the market's view of the likelihood that the Project would be developed may be constantly changing, which could lead to variation in the Project's impact on property values. For example, the impact could grow gradually as information about the facility becomes widely known.

Similarly, the availability and type of information about a potential "nuisance" such as the Project can influence the extent of market value impacts. For example, public attentiveness to the Project could increase impacts above the impacts that would have occurred absent the attention. In fact, one study evaluating the potential impact of proximity to a rail corridor found that property value impacts were larger when information about the rail line was receiving public attention (as a result of a rail operator merger), while the impacts were smaller and statistically insignificant, when public attention diminished.[11] Because of these factors, I utilize statistical tests that allow the impact of the Project's development to vary over time.

I am unaware of any analyses of the potential impacts of crude-by-rail shipments specifically on property values. Within the context of the public proceedings related to siting of the Vancouver Energy facility, certain assertions have been made regarding potential impacts. In particular, several analyses performed by Johnson Economics regarding the development of the Vancouver Energy facility assume that these impacts would be large. These analyses were included as Exhibits D and E to EFSEC

[9] This is true of any property or asset in which market value reflects a stream of future benefits, such as publicly trade share prices that reflect the future profits from the underlying firms. In the case of real estate values, these future benefits reflect the value homeowners place on living in a given property. To the extent that information about the property becomes known that would positively or negatively affect this value in the future, it will affect the real estate price that people are willing to pay for the property today. For example, *see* MacKinlay, Craig, "Event Studies in Economics and Finance," *Journal of Economic Literature* 25(1): 13-39, 1997.

[10] In this regard, the potential for the Project to be developed is not different than the potential for an accident to occur or environmental contamination to arise from nearby hazardous facilities. For example, *see* Palmquist, Raymond and V. Kerry Smith, "The Use of Hedonic Property Value Techniques for Policy and Litigation," *International Yearbook of Environmental and Resource Economics*, Volume VI, August 10, 2001.

[11] The research by Simons and El Jaouhari (2004), which evaluates impacts before and after a highly publicized rail merger that was anticipated to increase rail traffic, supports the conclusion that greater information or publicity regarding rail impacts may lead people to place a greater emphasis or value on proximity to the rail corridor. See Appendix A for further discussion.

comments submitted by Columbia Waterfront LLC.[12] One report (in Appendix D) posits that the development of the Project would have an adverse impact on the potential positive economic impacts from a local development project – the Waterfront project.[13] Johnson Economics assumes that the Project would reduce the size of the Waterfront project by 30 percent. They write:

> "To evaluate the construction impacts of each scenario, we modeled the estimated impacts of the current master plan, and reconciled those impacts with a second scenario that *assumed a 30% reduction in development yield on the site*."[14] (Emphasis added.)

No explanation, justification or rationale is provided for the assumption that the Project would reduce the "development yield" of the Waterfront project by 30 percent – the statement above is the extent of the discussion or explanation for this crucial assumption.[15]

In another report (Appendix E to Columbia Waterfront LLC's comments), Johnson Economics assesses the Project's potential impact on development and redevelopment in downtown Vancouver.[16] This report makes assumptions about the impact of the Vancouver Energy facility on future levels of development and redevelopment in downtown Vancouver, and considers changes in this level of development and redevelopment activity from the Project. Based on these assumptions, Johnson Economics concludes that the Vancouver Energy facility would reduce development and redevelopment investment by 28 percent and real market value by 36 percent.[17]

Thus, although the Project has not yet gone into operation, some claims have been made that it would lead to significant impacts to the local real estate market. As discussed in the Secondary Impact Report, these claims are inconsistent with prior economic analysis that has found impacts on the order or 0 to 1.5 percent for similar changes in rail traffic. Our analysis in this report complements these analyses of rail traffic impact in other regions by analyzing the extent to which the Project has to date led to property values impacts in the Vancouver area.

[12] Columbia Waterfront LLC, SEPA Scoping Comments, Tesoro-Savage Energy Distribution Terminal, Docket EF-131590, December 18, 2013.

[13] Johnson Economics, "Estimated Economic and Fiscal Impacts of the Tesoro Savage Project on the Waterfront Vancouver Development and Downtown Vancouver," December 9, 2013.

[14] Johnson Economics, December 9, 2013, p. 2. Johnson Economics also notes that their approach is to "… model an alternative development program reflecting what is viable under an impacted scenario assuming the Tesoro Savage Facility." Johnson Economics, December 9, 2013, p. 8.

[15] Our Secondary Impacts Report provides further assessment of this Johnson Economics' study, including comparison of the magnitude of asserted economic impact to the economic benefits created by Vancouver Energy and assessment of the linkage between Johnson Economics' asserted impact on "development yield" and the way in which impacts are evaluated in their economic analysis.

[16] Johnson Economics, "Predicted Impacts of the Tesoro Savage Project on Development and Redevelopment in Downtown Vancouver, Washington," December 18, 2013.

[17] These conclusions reflect assumptions that achieve rents levels would decline by 15 percent and capitalization rates would fall by 10 percent.

II. OVERVIEW OF DATA, ASSUMPTIONS AND METHODS

To evaluate the potential impacts of Vancouver Energy on property values in the Vancouver, Washington real estate market, we analyze whether there has been a change in real estate property values since the announcement of Vancouver Energy that can be attributed to the Project's development. To perform this analysis, we develop a model to estimate prices as a function of attributes of the property, its location and its surrounding neighborhood, and the time when the sale occurred.

We first construct a data set that includes all residential property transactions within Clark County from 2007 to present through April 2015. This sample period includes 14 months of data in which the market had information about the development of the Vancouver Energy facility. We limit our sample to "arms-length" transactions of single-family residences, and employ certain data restrictions to remove anomalous observations from our data. Details regarding our sample are provided in Appendix B.

We then develop a set of variables that capture each property's characteristics, its location and the time when the sale occurred account for sources of variation in transaction prices. Table 1 provides a list of the variables we use to control for variation in these factors. To control for variation in property characteristics, we include variables such as the lot size, interior house size and the number of bathrooms and bedrooms. To control for a property's location, we include a variable for each unique zip code. To control for the time when the transaction occurred, we develop one model with a year variable and another model with year-month variables. We also perform numerous sensitivity analyses that modify the sample of transactions and the control variables to ensure that the conclusions are robust to these decisions. Further details on these robustness checks are provided in Appendix B.

To measure the potential impacts associated with Vancouver Energy, we construct two types of variables: variables measuring the distance between each property and the BNSF rail corridor, and variables capturing the time period since the Project was announced. A variable measuring the distance between the rail and each property is constructed. In our analysis, we consider different functional forms for how property values vary with distance from the rail. First, we allow property values to vary with four discrete distance "band" from the rail line, with bandwidths including: less than 250 feet; 250 to 1,000 feet; 1,000 feet to one-half mile; and one-half to one mile. Second, we consider models in which impact varies continuously with distance from rail. Specifications are considered in which impacts varies according to a quadratic or logarithmic function. The two functions provide reasonable alternatives for a functional form that declines non-linearly with distance from the rail.

To capture when information about the Vancouver Energy facility was available to the real estate market, we construct time variables that are aligned with the announcement of the Project. One variable is a fixed variable that assumes that the announcement has a constant effect across the 14 month period since the announcement. Another set of variables relax the assumption that these impacts are equal across the 14-month period, and allow this impact to vary by quarter over the 14 month period.[18]

[18] We also consider models in which the impact varies by month.

Table 1: Independent Variables in Housing Price Regression Model

Variable Category	Specific Variables
Housing characteristics	• Year built • Number of bathrooms • Number of bedrooms • Finished square footage * • Lot square footage * • Cooling system (central, wall or none) §
Transaction timing	• Year fixed effects • Month fixed effects § • Year-month fixed effects
Housing location	• Zip code fixed effects • Census tract fixed effects §
Distance From Rail	• Continuous distance measure (log and quadratic) • Distance Bandwidths: < 250 feet; 250 to 1,000 feet; 1,000 feet to one-half mile; and one-half to one mile
Time Period After Announcement	• 14-month variables • Quarterly variables • Monthly variable §

Notes:

* denotes variable specified in logarithmic form in the housing price regression model.

§ denotes variables considered as part of model sensitivities.

Throughout our analysis, we will focus on determining whether the announcement of the Project has had an adverse impact on properties in the Vancouver region. Under the theory that properties closest to the rail corridor would experience the greatest impact, we test whether impact of proximity to the rail has *changed* since the Project's announcement. Thus, instead of focusing on the impact of proximity to the rail, we focus on the *change* in this impact since announcement of the project as a way to try to isolate the impact of the announcement itself from the impacts of proximity to the rail line generally, with or without the Project.

The rail line generally runs along the Columbia River. To the east of downtown Vancouver, the rail corridor is in very close proximity to River, whereas to the north of downtown Vancouver, the corridor runs somewhat inland with farmland and less densely populated land in the area between the corridor and the River.

The models are estimated using ordinary least square (OLS), a standard statistical approach for estimating how multiple independent factors of interest affect the primary (dependent) variable of interest. In this case, property value is estimated as a function of the dependent variables listed in Table 1.

III. RESULTS

Our results are summarized in Tables 2 and 3. Tables 2 and 3 each report two impacts. The first column shows the estimated impact of proximity to the rail line on property values; the second column shows the change in this impact since the announcement of the development of the Vancouver Energy project. (Thus, the net impact of proximity to the rail line after the Project's announcement is the sum of the values in these two columns.)

Tables 2 and 3 test two different models for the relationship between proximity to the rail and property values. Table 2 provides estimates of the percentage difference in property values for each of four discrete distance bandwidths as compared to properties beyond the one mile rail corridor. Table 3 assumes that impact to diminish with distance from the rail, with the impact varying continuously as an arithmetic function of the property's distance to the rail.

The results in Table 2 indicate that properties within 250 feet of the rail sell at a discount (-4.46 percent). However, this impact is not statistically significant – that is, from a statistical standpoint, the estimate cannot be distinguished from zero.[19] Properties that are 250 to 1000 feet from the rail sell at a premium (+2.75 percent), although this estimate also is not statistically significant. Beyond 1000 feet up to one mile, properties sell at a premium of +4.36 or +5.32 percent, which is statistically significant.

The test of whether the Project's announcement has had an impact on property values depends on the estimated coefficients in the second column. If these estimated values were statistically different from zero, this would indicate that the Project's announcement has had an impact of property values. The estimated change in the discount/premium associated with proximity to the rail ranges from -1.54 percent to +4.57 percent. However, none of these estimated changes in the discount/premium are statistically significant. This result is consistent with the conclusion that the Project has had no impact on property values to date irrespective of distance from the rail.

[19] That is, from a statistical standpoint, we cannot assume that the estimated value is any different than zero. In these test, I consider a statistical confidence level of 10 percent. (Technically, this means that zero is within the range of possible values at a 90 percent probability.) A standard benchmark for statistical significance is a 5 percent confidence level. Thus, testing against a 10 percent confidence interval is biased in favor of finding a statistically significant effect. Pindyck, Robert and Daniel Rubinfeld, *Econometric Models & Economic Forecasts*, third edition, McGraw-Hill: New York, 1991.

Table 2

Impact of Proximity to Rail on Property Values, Distance Bandwidths

Change in Impact After the Vancouver Energy Announcement

Proximity to Rail	Percent Impact	Change in Percent Impact After Announcement
1/2 mile to 1 mile from rail	4.31%***	0.65%
1000ft to <1/2 mile from rail	5.36%***	2.41%
250ft to <1000ft from rail	2.69%	-1.47%
< 250ft from rail	-4.56%	4.65%

Notes:

[1] Measure of statistical significance: *** = at 1% level; ** = at 5% level: * = at 10% level

[2] Estimates control for house characteristics, location (zip codes) and time of sale (year-month dummy variables). These variables are further described in Appendix A.

Sources: Realty Trac, ArcGIS

Table 3

Impact of Proximity to Rail on Property Values, Continuous Distance

Change in Impact After the Vancouver Energy Announcement

	Percent Impact	Change in Percent Impact After Announcement
Quadratic		
Kilometers from rail	0.0000311	-0.00157
Kilometers from rail (squared)	-0.0000956	-0.0000291
Logarithmic		
Log(kilometers from rail)	-0.00286	-0.00584

Notes:

[1] Measure of statistical significance: *** = at 1% level; ** = at 5% level: * = at 10% level

[2] Estimates control for house characteristics, location (zip codes) and time of sale (year-month dummy variables). These variables are further described in Appendix A.

Sources: Realty Trac, ArcGIS

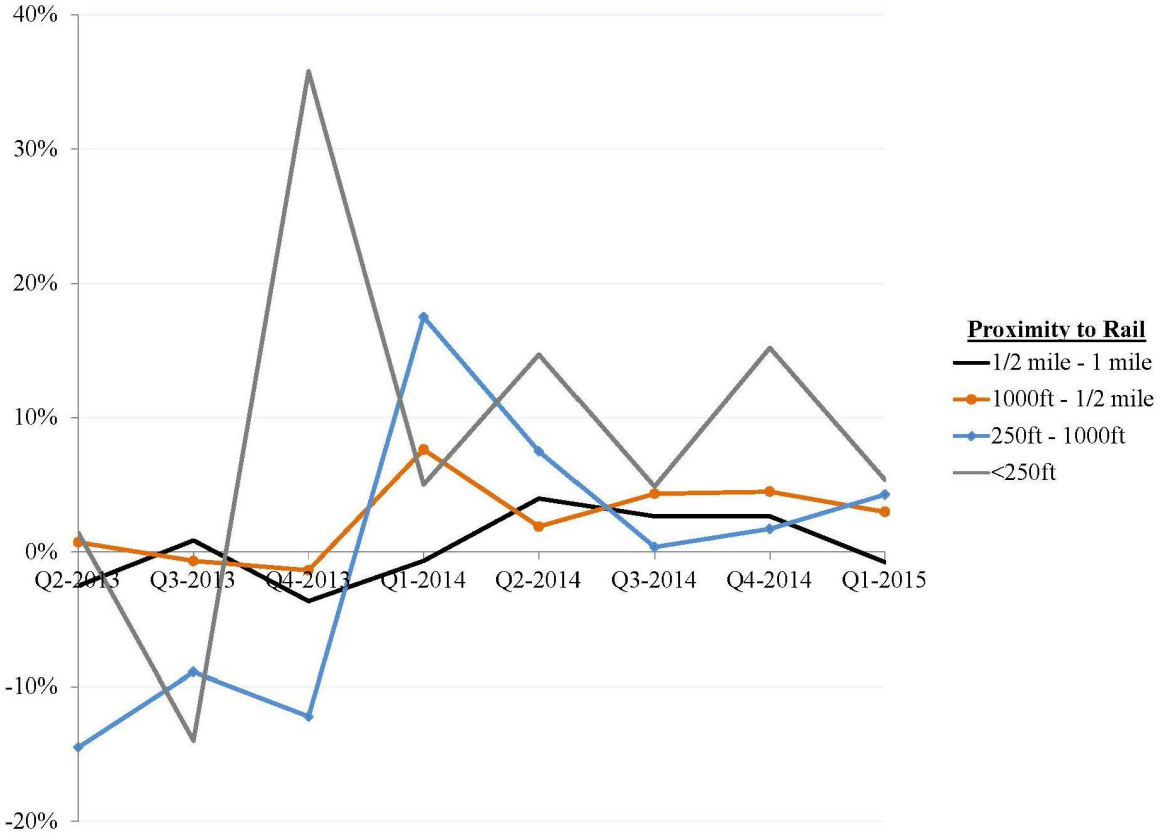
Since the announcement, these premia (positive or negative) to properties nearby the rail line have changed by between -1.54% to +4.6%, and none of the estimated changes are statistically significant. This result is consistent with the conclusion that the Project has had no impact on property values to date.

The results in Table 3 reveal there is no statistically significant association between prices and distance from the rail, specified linearly, quadratically, or logarithmically. On average properties closer to the rail line sell at a premium to those further from the rail, however this trend is not statistically significant. As with the distance band results in Table 2, there is no statistically significant change in the relationship between property value and distance from the rail after the announcement of Project. Thus, the analysis results are again inconsistent with the conclusion that the Project has had a statistically significant negative impact on property values.

As discussed earlier, it is important to consider the possibility that the Project could have an impact on local property values that has changed over time. To consider this possibility, we perform statistical tests in which we measure whether there has been a change in the impact of proximity to the rail in each quarter since the announcement. The results of this analysis are reported in Figure 1. Figure 2 shows that the change in impact has varied by quarter, with an adverse change as large as 14 percent and a positive change as higher as 36 percent. However, most importantly, the vast majority of the estimated impacts in Figure 2 are not statistically significant. Thus, again, the results are inconsistent with the conclusion that the Project has had a statistically significant negative impact on property values.

In addition to the results reported in Tables 2 and 3 and Figure 1, we perform tests under a range of alternative assumptions to test the robustness of our results. Several of these additional tests are of note. First, we consider the possibility that the change in impacts vary by month instead of by quarter. Second, we control for locational or neighborhood effects using census tract variables, rather than zip code variables. Third, we limit our sample to properties nearby to the rail line (within three miles), rather than including all properties within Clark County. Fourth, we consider the possibility that the impact of proximity to the rail varies for the southern segment (along the Columbia River) as opposed to the northern segment (heading to Seattle). These results are reported in Tables A2 to A4. In all cases, our results are consistent with the conclusion that the Project has not adversely affected property values in close proximity to the rail.

Figure 1
Change in Impact to Property Value from Proximity to Rail
By Quarter Since the Announcement



Note: The estimates reflect the change in the impact of proximity to the rail in each quarter after the announcement of the Vancouver Energy project as compared to the pre-announcement impact of proximity to the rail. For example, in Q1 2015, properties within 250 of the rail sold at a premium (on average, all else equal) of 5.4 percent relative to the discount/premium of proximity to the rail prior to the announcement, which was -5.6 percent (as estimated in this specification).

IV. CONCLUSIONS

The development of the Vancouver Energy facility could lead to potential impacts to local real estate markets due to increased rail traffic. Certain claims have been made that the Project could have adverse impacts as large as 30 percent to activity in these markets. In this report, we provide analysis that is inconsistent with this conclusion.

In our Secondary Impacts study, we developed estimates of impact of potential increases in rail traffic delivering crude oil supplies to the Vancouver Energy facility. Based on parameter estimates from two prior studies, we found that the potential adverse impacts were likely to range from 0 to 1.5 percent. This result suggests a small impact from the Project.

In this report, using statistical analysis, we test whether the announcement of the Project has had any adverse impact on the sale price of properties located nearby to the rail line that would deliver crude supplies to the Project. We find no such adverse impacts across the many statistical tests we perform. Because the Project has not yet been constructed and deliveries of crude supplies have not yet begun, it is possible that the full impact of the Project has not yet been felt. However, because property markets will adjust for new information about factors that would impact future property values, we would expect to observe some change in property values if the Project were to result in a large and significant impacts in the future. Consequently, our results are consistent with the conclusion that the Project will not result in a large and significant adverse impact on property values in the Vancouver area.

Appendix A:

Details Information Regarding Data, Sample and Results

The data set was constructed from several sources. Property transaction data was obtained from Renwood RealtyTrac, LLC. These data include information on the type of transaction (sale, transfer, refinancing), the current physical characteristics of the property and property's geographic location (geospatial location). The distance to the BNSF rail line and census tract identification were developed using ArcGIS.

Our sample only includes properties meeting the following criteria:

- Transactions between January 2008 and April 2015;
- Single family homes under 10 bedrooms;
- Arm's length transactions (as identified by RealtyTrac)
- Properties identified as within Clark Country, Washington and within 20 miles of the railway corridor;
- Transaction price above $20,000; and
- Single-parcel transactions (multi-parcel transactions reporting only the sale price across multiple parcels were excluded).

The fixed effect (constant) dummy variable for the timing of the rail announcement identifies all transactions occurring during and after April 2013. The post-announcement quarterly dummy variables identify the months start with the quarter June 2013 to August 2013. By starting the quarterly dummy variables in May 2013, the eight dummy variables cover the entire sample through April 2015. Because transactions typically require multiple weeks to close on the final transaction date, relatively few if any transactions occurring after April 22, 2014 would have a transaction date earlier than June 2013.

Estimates of the transaction price model are performed using OLS, with robust standard errors. Results are reported in Tables A1 to A4. Table A1 reports estimates of the household characteristic control variables. The estimated coefficients measure the change in property value associated with the change in each household characteristic. For example, in the model with no time controls (the first column), the property value increases (on average) 7.58 percent for each additional bathroom. As indicated by the asterisks to the right of the estimated coefficient, this value is statistically significant (at the 1 percent level). In general, most of the estimated coefficient have signs (positive or negative) consistent with reasonable expectations about how household characteristics affect house values (e.g., property values are higher for properties that are larger and have more bathrooms and bedrooms.) In addition, these estimated coefficients are significant at the 1 percent confidence level.

As shown in Tables A2 to A4, the impact of proximity to the rail is relatively consistent across the specifications reported. As discussed in the body of the report, properties closer to the rail tend to have higher value than those more distant, even when accounting for locational fixed effects (zip codes). The one exception is properties within 250 feet of the rail, which have a lower price, although the effect is not statistically significant. This negative premium on properties in very close proximity to the rail differs between the southern segment (along the Columbia River) and the northern segment (heading to Seattle), with the northern segment experiencing a larger negative effect. These results suggest that

proximity to the Columbia River, potentially driven by the scenic view, is a contributing factor to the positive premiums earned by properties in proximity to the rail.

The impact of the Project on property values is measured through interaction terms between the variables measuring a property's distance to the rail and variables indicating the period after the Project's announcement. Across all of the specifications analyzed, these interaction terms are not statistically significant, indicating that there has been no change in the premium (positive or negative) to houses in close proximity to the rail.

Table A1

Property Sales Price Regression Model

Single family residences in Clark County, WA sold after 2007

Dependent variable Ln(Sales price)

Household Control Variables

	Time controls		
Coefficients	**None**	**Yearly fixed effects**	**Quarterly fixed effects**
House year built	0.00%	0.00%	0.00%
	(0.02%)	(0.02%)	(0.02%)
Number of Bathrooms	7.59%***	7.77%***	7.78%***
	(0.47%)	(0.46%)	(0.46%)
Number of Bedrooms	0.42%	0.37%	0.37%
	(0.37%)	(0.36%)	(0.36%)
Ln(square feet total)	46.00%***	45.80%***	45.90%***
	(1.12%)	(1.09%)	(1.09%)
Ln(square feet first floor)	11.00%***	11.50%***	11.50%***
	(0.84%)	(0.81%)	(0.81%)
Ln(Lot size)	9.52%***	9.84%***	9.85%***
	(0.30%)	(0.29%)	(0.29%)
Observations	44,116	44,116	44,116
R-squared	0.344	0.393	0.396

Notes

[1] Robust standard errors in parentheses

[2] *** p<0.01, ** p<0.05, * p<0.1

[3] Estimates are from distance from rail band specification and include zip code fixed effects.

Sources

[1] Realty Trac

[2] ArcGIS

Table A2
Property Sales Price Regression Model
Single family residences in Clark County, WA sold after 2007
Dependent variable Ln(Sales price)
Distance Control: Distance Bandwidths

	Time controls		
Coefficients	None	Yearly fixed effects	Quarterly fixed effects
Distance band indicators			
1/2 mile - 1 mile from rail	4.55%***	4.35%***	4.31%***
	(0.72%)	(0.81%)	(0.80%)
1000ft - <1/2 mile from rail	6.26%***	5.34%***	5.36%***
	(0.91%)	(1.02%)	(1.02%)
250ft - <1000ft from rail	2.69%*	2.68%	2.69%
	(1.53%)	(1.77%)	(1.77%)
<250ft from rail	-3.92%	-4.77%*	-4.56%
	(2.61%)	(2.87%)	(2.87%)
After announcement indicator		8.32%***	-2.60%
		(1.28%)	(1.71%)
After announcement indicator interacted with distance band indicators			
1/2 mile - 1 mile from rail		0.58%	0.65%
		(1.22%)	(1.22%)
1000ft - <1/2 mile from rail		2.19%	2.41%
		(1.50%)	(1.50%)
250ft - <1000ft from rail		-1.52%	-1.47%
		(2.98%)	(2.98%)
<250ft from rail		4.69%	4.65%
		(5.91%)	(5.91%)
Observations	44,116	44,116	44,116
R-squared	0.344	0.393	0.396

Notes
[1] Robust standard errors in parentheses
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] Estimates control for year house built, number of bedrooms, number of bathrooms, finished square footage, lot size, cooling detail description, and include zip code fixed effects

Sources
[1] Realty Trac
[2] ArcGIS

Table A3
Property Sales Price Regression Model
Single family residences in Clark County, WA sold after 2007
Dependent variable Ln(Sales price)
Distance Control: Quadratic Distance Function

	Time controls		
Coefficients	**None**	**Yearly fixed effects**	**Quarterly fixed effects**
Meters from rail	6.64E-4	-3.43E-5	3.11E-5
	(2.07E-3)	(2.12E-3)	(2.12E-3)
Meters from rail (squared)	-1.30E-4	-8.48E-5	-9.56E-5
	(9.48E-5)	(9.71E-5)	(9.68E-5)
After announcement indicator		9.53E-2***	-1.17E-2
		(1.47E-2)	(1.83E-2)
After announcement indicator interacted with meters from rail		-1.16E-3	-1.57E-3
		(2.21E-3)	(2.21E-3)
After announcement indicator interacted with meters from rail (squared)		-4.98E-5	-2.91E-5
		(1.08E-4)	(1.07E-4)
Observations	44,116	44,116	44,116
R-squared	0.342	0.392	0.395

Notes
[1] Robust standard errors in parentheses
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] Estimates control for year house built, number of bedrooms, number of bathrooms, finished square footage, lot size, cooling detail description, and include zip code fixed effects

Sources
[1] RealtyTrac
[2] ArcGIS

Table A4
Property Sales Price Regression Model
Single family residences in Clark County, WA sold after 2007
Dependent variable Ln(Sales price)
Distance Control: Log Distance Function

	Time controls		
Coefficients	**None**	**Yearly fixed effects**	**Quarterly fixed effects**
Log(meters from rail)	-0.42%	-0.27%	-0.29%
	(0.32%)	(0.33%)	(0.33%)
After announcement indicator		9.24%***	-1.56%
		(1.36%)	(1.75%)
After announcement indicator interacted with Log(meters from rail)		-0.56%	-0.58%
		(0.38%)	(0.38%)
Observations	44,116	44,116	44,116
R-squared	0.342	0.392	0.395

Notes
[1] Robust standard errors in parentheses
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] Estimates control for year house built, number of bedrooms, number of bathrooms, finished square footage, lot size, cooling detail description, and include zip code fixed effects

Sources
[1] Realty Trac
[2] ArcGIS