600 NE Grand Ave.
Portland, OR 97232-2736

Metro | *Agenda*

Meeting: Metro Technical Advisory Committee
Date: Wednesday, August 6, 2014
Time: 10 a.m. to noon
Place: Council Chamber

Time	Agenda Item	Action Requested	Presenter(s)	Materials
10:00 a.m.	**CALL TO ORDER** **Updates from the Chair**	Information	John Williams, Chair	
10:10	**Citizen Comments to MTAC Agenda Items**	Information	All	
10:15	**Streetcar Evaluation Model:** Information & Discussion *Objective: To inform and update MTAC about the Streetcar Evaluation Model*	Information & Discussion	Eric Engstrom, City of Portland Elissa Gertler, Metro Jamie Snook, Metro	Packet
10:45	**Growth Management Decision:** Release Draft Urban Growth Report *Objective: To inform and update MTAC about the draft Urban Growth Report*	Information & Discussion	Ted Reid, Metro	Packet
Noon	**Adjourn**			

(Continued)

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2014 MTAC Tentative Agendas
Updated 7/30/14

Left blank on purpose	**August 20 MTAC meeting**
September 3 MTAC meeting • 2015 Growth Management Decision: Residential Preference Survey • Climate Smart Communities: discuss evaluation results and public review of draft preferred approach	**September 17 MTAC meeting**
October 1 MTAC meeting	**October 15 MTAC meeting** • 2015 Growth Management Decision: 2014 Urban Growth Report (recommendations to MPAC) • Climate Smart Communities: Begin discussion of recommendations to MPAC
November 5 MTAC meeting • 2015 Growth Management Decision: 2014 Urban Growth Report (recommendations to MPAC)	**November 19 MTAC meeting** • Climate Smart Communities: MTAC makes recommendation to MPAC on adoption of the preferred approach
December 3 MTAC meeting	**December 17 MTAC meeting**

Parking Lot

- August 18 TPAC/MTAC workshop on draft Climate Smart Communities preferred approach evaluation (2 – 5 p.m., Council Chamber)

STREETCAR CORRIDOR EVALUATION METHODS: ECONOMIC IMPACT ANALYSIS PREDICTIVE MODEL

FINAL PROJECT REPORT

PREPARED FOR:
METRO
DECEMBER, 2013

JOHNSON REID
LAND USE ECONOMICS

Angelo planning group

TABLE OF CONTENTS

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I. EXECUTIVE SUMMARY

A. About this Project

This report is prepared as the main written component of the *Streetcar Evaluation Methods* project, funded by grant from the Federal Transit Administration (FTA) to Metro, the regional government of the Portland Metropolitan Area. Many local and regional partners have partnered with Metro in guiding and advising this effort. The main objective of this project is the development of a predictive computer-based model (Model) which projects the potential new economic development within a proposed streetcar transit corridor.[1]

This report describes the process undertaken to inform and build the Model, provides an overview of the Model's methodology, and discusses the results of test runs of the Model on four corridor types.

This report is accompanied by a *Technical Appendix* which describes the model in further detail and provides instructions for operating it.

B. Economic Development is Just One Consideration in Assessing Streetcar Service

The Model described here is designed to project economic development impacts, defined here as *real estate development activity* and the resulting number of new housing units, commercial space, and real market value in the proposed streetcar corridor.

Economic development, as measured by an increase in real estate development activity and property values, is just one policy consideration among many in deciding whether or not a streetcar line should be built. The recently updated guidance from the FTA for the New Starts and Small Starts

[1] For the purposes of this project a corridor is defined as ¼ mile from the centerline of the street being considered for the improvement.

transit grant programs[2] emphasizes that the FTA evaluates transit grant proposals on six distinct but inter-related measures:

1. Mobility Improvements
2. Economic Development Effects
3. Environmental Benefits
4. Cost Effectiveness
5. Land Use Benefits
6. Congestion Relief

As these categories attest, economic development is just one among many considerations in evaluating the benefits of a proposed streetcar line. Furthermore, while real estate development activity is a critical means of measuring economic development, there are multiple factors influencing that activity, including some that may not be quantifiable by this Model.

This Model is meant to address only the economic development criterion in evaluating streetcar service. If being used to inform an FTA grant application process, the quantitative results of this Model are meant to complement the required qualitative discussion as outlined in the "Economic Development Effects" section of the FTA New Starts and Small Starts policy guidance document. These outputs are also important to local developers, investors and decision makers.

C. Overview of the Economic Development Model

The Model designed during this process is an Excel-based model which uses inputs on existing conditions in a corridor to predict the magnitude of new development that could be expected over time as a result of a streetcar investment in that corridor.

Recognizing that streetcar projects encompass more than merely tracks and streetcars, the Model is designed to consider a bundle of actions of the type that often accompany streetcar investments, including new stations and streetscape improvements, improvements

[2] "New and Small Starts Evaluation and Rating Process, Final Policy Guidance, August 2013", Federal Transit Administration, 2013

to walkability, and the addition – or attraction – of local amenities. Together this bundle is referred to here as "streetcar improvements" (see Section II of this report).

The Model uses development pro forma analysis[3] to project the highest incremental increase in property values based on uses that are feasible and permissible by zone. It allows the user to assess whether that increase would justify the redevelopment of individual parcels based on their current value. The projected increase in property values and development activity resulting from a streetcar investment can then be considered as part of a broader cost/benefit analysis for the investment.

To project the increase in value catalyzed by a streetcar investment, the Model is run twice to provide two separate projections:

1. First, a "baseline" projection of development assuming no new streetcar line; and
2. A second projection assuming that new streetcar improvements are built.

The results of the two scenarios are then compared to create an estimate of how much the streetcar might increase economic development activity over normal baseline predictions.

It is impossible to precisely quantify future activity in a broad real estate marketplace with thousands of different property owners, businesses, and other interests with differing levels of public involvement. Therefore, while this Model does provide specific quantified estimates, *it is more appropriate to see the results as a broader estimate of the relative magnitude of economic development* under the two scenarios.

More detail on the methodology used in the Model is included in Section III of this report.

D. General Findings

The following trends and relationships were identified through the process of developing this Model, including preliminary research, expert feedback, building the Model and performing test runs. These findings address where and how streetcar improvement may have the greatest impact on property values in a proposed corridor.

[3] In real estate, a pro forma is a document designed to estimate the performance of a property investment or new development by modeling the expected income and expenses of the property once operating. The pro forma provides an estimate of the expected performance and economic return on a prospective investment. The Model developed for this project uses a series of these prototypical pro forma worksheets for multiple land use and building types. This approach most closely simulates the decision-making process of real world developers, investors and lenders in judging when redevelopment is feasible and profitable in the proposed streetcar corridor.

- The Model tends to confirm available research and expert opinion indicating that streetcar improvements generally have a positive impact on the development potential in a corridor. The magnitude of that impact will vary based on the nature of the proposed corridor and the type of improvements proposed.

- Streetcar improvements can encourage greater development by increasing transit access, improving the pedestrian environment and supporting local amenities. These changes in turn can improve the marketing and pricing potential for new and existing real estate in the area. These favorable market fundamentals make the area more attractive for new development activity on the margin.

- Streetcar improvements will have the greatest marginal impact where they represent a larger improvement over existing conditions, such as significantly reducing transit headways, or significantly improving access, safety or attractiveness. Streetcar improvements will likely have a smaller relative impact on corridors that already feature strong transit service and walkability.

- The Model finds significant overlap between the parcels found to be "developable" under the baseline and streetcar scenarios. Streetcar improvements boost projected development results by increasing the likelihood of development on these parcels: for instance, turning a "somewhat likely to develop" parcel into a "most likely" parcel. In this way, streetcar improvements can help accelerate development in an area, hastening real estate activity that may otherwise happen at some indeterminate date in the future.

- One important role of streetcar investment is to focus the attention of developers, lenders, businesses and other interests on the corridor, helping to create "buzz." Streetcar improvements may enhance the marketability of nearby properties and improve perceptions of an area. Developers, lenders, residents, businesses and other users, tend to recognize and respond to this new investment and the sense that policy makers are committed to the area. For developers, this can reduce the perceived risk of investing in the area, improve borrowing potential, lower vacancy, and strengthen rent and pricing

levels. In a metro area with many potential development opportunities, major investments such as streetcar improvements can help direct development.

- The project team performed four test runs of the Model on four different corridor types in the Portland Metro area. In the test runs of the Model, there were few instances where proposed streetcar improvements actually changed the likely development forms in the corridor (triggering, for instance, a change from low-density development under the baseline scenario to mid-rise development in the streetcar scenario.) Instead, the increase in development comes mostly from higher likelihood that parcels will develop – albeit with the same predicted building form.

- The smaller the share of existing low-density zones in the area, the greater the redevelopment potential for transit-supportive density. Corridors where medium and higher-density zones extend into the surrounding neighborhoods have the greatest potential for meaningful redevelopment into a transit-oriented atmosphere. This is due in part to the fact that low density zones support less development in general. Additionally, built-out low-density neighborhoods a redeveloped housing unit is more likely to be replaced by another single unit - or at most a duplex – which has a lower marginal impact on increasing housing numbers.

- It is useful to divide the streetcar corridors into smaller segments for analysis, as market conditions are likely to change over corridors that exceed a mile in length. Corridors can be broken into distinct segments, with the Model run on each. Results can be compared, and then combined to judge the performance of the entire corridor.

- The Model produces quantified outputs of development activity measures: construction investment, new housing units, new commercial space, and new real market value. While the Model is designed to produce precise numerical outputs for each of these measures, it is impossible to accurately predict development activity with such precision over time.

  Therefore, **the results of this Model are best seen as an indicator of the estimated magnitude of impact from streetcar improvements.** For example, a conclusion that "Streetcar Scenario A may boost housing production by around 15%" is more accurate and defensible than one stating "the Streetcar Scenario will lead to an additional 437 units." The first provides useful reference for discussion, while the second is overly precise and thus highly likely to be proven incorrect.

- The results from this Model may best be presented in the form of a range. Because the Model allows calibration, it can be used to adjust assumptions and test results under different scenarios: "If the streetcar improvements achieve a rent increase of 5%, then the corridor may achieve X level of development. If the corridor sees a rent increase of 10%, it may achieve X+1 level of development." The Model allows for changes to the input assumptions of future zoning and level of streetcar improvements to test how such changes might impact development.

- The Model uses specific parcel-level data to generate quantified measures of predicted development activity, but it is important to remember that this Model is actually generating a broad study-area-wide estimate of development activity. **In no event should this Model be used to reach definitive conclusions about what will happen on any given parcel.** Any data provided that identifies parcels, be it in map or data base form, must specify that **it is making no firm predictions or guarantees on the eventual development or lack of development on specific properties.**

- Because the Model is an indicator of broader trends in the study area, it may actually provide a better approximation of development changes over a longer period of time. A five- or even ten-year period will be highly dependent on the current and near-term trends in the real estate development environment. A shift in the market soon after the Model is run could impact the development environment for years, changing the dynamics for a large share of the study period. A longer period of fifteen to twenty years will include more fluctuations in the market cycle. Market ups and downs are more likely to be averaged out, reducing the distorting impact of any one turn in the cycle.

E. Next Steps and Further Research

The process of developing and testing this Model revealed ample evidence that streetcar improvements are seen as positive amenities and can have a positive impact on the development environment. However, the exact size of this impact remains a topic for further investigation.

The Model will benefit from new research and data allowing finer calibration over time. In particular, the lack of published research specifically describing the impacts of a streetcar line on property values and/or rents represented a significant knowledge gap at the time of Model development.

It is hoped – and expected – that additional data (some of which will be collected by the application and calibration of this Model) will ultimately serve as the basis of a hedonic

regression analysis to attempt to quantify the impact of streetcar improvements on value and pricing, relative to other factors that impact real estate pricing. Further modeling of additional corridor types will increase understanding of streetcar impacts in different types of urban or suburban environments.

An additional research avenue would be application of the Model retroactively to an existing streetcar corridor to see how well it simulates the development that occurred there. This step would be helpful in further calibrating the model to real world conditions.

II. WHAT ARE STREETCAR IMPROVEMENTS?

The successful implementation of new streetcar service involves more than simply installing tracks on an existing street. In practice, the development of streetcar lines includes a number of linked physical improvements and actions, which are difficult to unbundle. These include streetscape improvements, changes in entitlements and other public actions to capitalize on the investment.

Since evaluating the marginal impact of specific components within this bundle is difficult, the Model is designed to address the bundled nature of streetcar improvements and related actions. These bundled investments are referred to collectively in this report as "streetcar improvements."

Depending on the goals and resources of the implementing jurisdiction, streetcar improvements may include:

Physical Improvements

- **Tracks & Vehicles:** The most basic component is simply the installation of tracks and the one or more streetcar vehicles which will operate on them.
- **Stops or Stations:** Improvements to provide functional stops for the streetcar may include elevated platforms, curb extensions, or more elaborate transit stations for the intersection of multiple lines or transit modes. Stops and stations may also include amenities such as lighting, shelters, signage, and plantings.
- **Streetscape Improvements:** In addition to improvements at the stops, a new streetcar line may include broader streetscape improvements and/or sidewalk reconstruction. Other improvements may include, but are not limited to: repair of aging sidewalks, wider sidewalks, curb cuts, new and/or broader planter strips, space for outdoor dining or other activities, bike racks, and new street trees.
- **Other Street Improvements:** Disruption of a street for streetcar installation creates an opportunity for broader redesign and/or re-marking of streets and intersections. Such improvements may include, but are not limited to: resurfacing and re-marking, redesign

of auto lanes, addition of bike lanes, new or better signalization, improved crosswalks, and medians.

Environmental Improvements

- **Mobility & Reduced Auto Dependence:** It is assumed that streetcar improvements will enhance transit service to some degree by adding a new travel option, increasing service times (reducing headways), and reducing auto dependence for residents, employees, customers and other users of the corridor. In some cases, the new streetcar line may include a better connection to a major destination district by crossing a barrier such as a freeway or waterway that previously blocked auto traffic.
- **Increased Amenities:** Beyond the benefits of the streetcar itself and the investment in physical public improvements, a successful streetcar will attract other amenities, including new businesses and activities, to take advantage of increased foot and transit traffic and an atmosphere of reinvestment and revitalization.
- **Marketability & Perceptions:** Streetcar improvements may enhance the marketability of nearby properties and improve perceptions of an area. Developers, lenders, residents and business owners tend to recognize and respond to this new investment and a sense that policy makers are committed to the area. For developers, this can reduce the perceived risk of investing in the area, improve borrowing potential, lower vacancy, and strengthen rent and pricing levels.
- **Complementary Public Policy:** To make the most of the public investment, streetcar improvements are generally accompanied by policy initiatives to help spur transit-oriented development and rehabilitation. These include goals for creating and investing in streetcar corridors, followed by zoning that permits and encourages those goals. Additional public steps can include master planning of the corridor and the creation of public financing tools such as fee waivers, entitlement bonus programs for TOD, or more direct subsidies. The greatest impact comes from well-funded programs such as urban renewal (or equivalent economic development funds) that allow direct public participation in land assembly, purchase of key sites, and public/private partnerships.

A city or local agency planning for a new streetcar may have an estimate of the scope and scale of planned improvements including some or all of the above components. Agencies preparing a New and Small Starts grant application may have this information prepared for inclusion in their application packet. In the absence of this information, agencies seeking to use the Model can estimate what physical public improvements would be built in conjunction with a new streetcar line, how it will improve mobility, whether new supportive public policies will be put in place and how generous those policies will be. Improvement in livability and marketability are integrated into the Model's calculations.

III. OVERVIEW OF MODEL METHODOLOGY

This section of the report discusses how an assumed package of streetcar improvements is applied to generate Model outputs.

A. General Approach

The Model is an Excel-based model which translates user inputs on existing and expected conditions in a corridor into an estimate of the magnitude of new development projected over the planning period. The following steps describe an application of the Model:

1. The user **inputs a range of indicators** on existing conditions in the area, as well as anticipated future conditions after streetcar improvements have been implemented.
2. The model **generates a "baseline scenario"** based on existing conditions.
3. The model **is re-run to generate a "streetcar scenario"** based on the anticipated conditions resulting from streetcar improvements.
4. The Model **produces projections of the anticipated amount of development** in the corridor under each scenario.
5. The Model provides a **comparison of the baseline vs. streetcar scenarios**. The difference represents how much additional development, if any, streetcar improvements may encourage.

A key component of this approach is the utilization of a "production" model, which is intended to mimic a developer's decision tree. As such, the Model solves for the "highest and best use" development form on the basis of predicted financial return.

To do this, the Model uses a pro forma based predictive model to generate predominant development profiles for the study area. This model evaluates highest and best use development forms under a range of assumptions, based on the implied residual property value[4] under each use. This allows a calculation of the likely predominant development form within the study area and subareas, based on market dynamics and zoning entitlements. It also establishes a residual property value for the area, which enables an evaluation of the extent to which existing properties can be expected to redevelop.

[4] "Residual Property Value" reflects the maximum supportable acquisition value of the property under an assumed development program (i.e. what the developer is willing to pay given the planned and permitted uses of the site). The permitted use that yields the highest Residual Property Value is considered the most attractive use in terms of financial return to the developer.

B. User Inputs

The major categories of user input in the Model are as follows:

- **Transit Service, Connectivity & Accessibility** – These inputs are intended to help answer the following questions:
  - What is the quality of the current transit service connectivity and accessibility within the corridor?
  - Will the streetcar project improve transit service and connectivity?
  - How will it change transit service and connectivity in the corridor?
- **Pedestrian Environment** – The assessment of the pedestrian environment takes into account attributes such as sidewalks, street trees, availability of services, and other elements that impact the pedestrian experience. These inputs are intended to help answer the following questions:
  - What is the current pedestrian environment like within the corridor?
  - Does the streetcar project include any pedestrian improvements?
  - How will those improvements change the pedestrian environment?
- **Public Policy** – These inputs are intended to help answer the following questions:
  - Are there public policies and/or funding tools available within the corridor to support streetcar? This would include urban renewal or other improvement districts.
  - Will changes to public policy be made as part of the streetcar project?
  - How will those changes affect availability of public tools in the corridor?
- **Zoning** – An assessment of existing zoning is included because of its relevancy to future development in the corridors, as follows:
  - Is zoning in the corridor supportive of streetcar in terms of permitted uses and development/design standards?
  - Will any changes to current zoning be needed as part of streetcar development?
- **Market Indicators** – Inputs on market pricing levels, financing terms, cost and vacancy assumptions:
  - What is the current strength and attractiveness of the market for new development?
  - Will the streetcar make development more likely by improving market fundamentals?
- **Study Area Parcels** – Information on all study area parcels by identifier (address or parcel i.d.), size, zoning, and estimated market value.

As described in Section II of this report, the development of streetcar lines and corridors typically includes a number of linked physical improvements and actions, which are difficult to unbundle. The result is that evaluating the marginal impact of specific components within the bundle is difficult.

In response to this challenge, the **Initial Input Screen** was developed to help capture this bundle of quantitative and qualitative factors that can accompany streetcar service and contribute to the impact on the development environment. For instance, a streetcar investment may include new streetscape improvements, new station areas, better pedestrian mobility, or increased business and service amenities in the neighborhood, all of which can have a synergistic effect in strengthening a real estate market.

Taken together, streetcar improvements affect specific levers that impact the feasibility of development in a corridor.

C. Streetcar Improvement Levers of Impact on Development

Key inputs to the Model are those that impact the revenues, costs, return parameters and site entitlements of a prospective (re)development project.

The Model is predicated on an assumption that streetcar improvements will substantively impact a number of variables that influence the perceived development environment, triggering a predictable response in the market. Figure 3.1 lists impacts commonly associated with streetcar improvements. Each of these is categorized by category, as well as color coded to denote general impact on the Model's predictive development component. Marginal shifts in assumptions about the variables are converted into changes in residual land values, and in some instances changes in development form.

The development variables used in the model can be broken into three primary categories that help determine final development form: **achievable pricing**, **cost to develop**, and **threshold returns**. Shifts in these inputs can alter associated patterns of

FIGURE 3.1: LEVERS OF IMPACT ON DEVELOPMENT

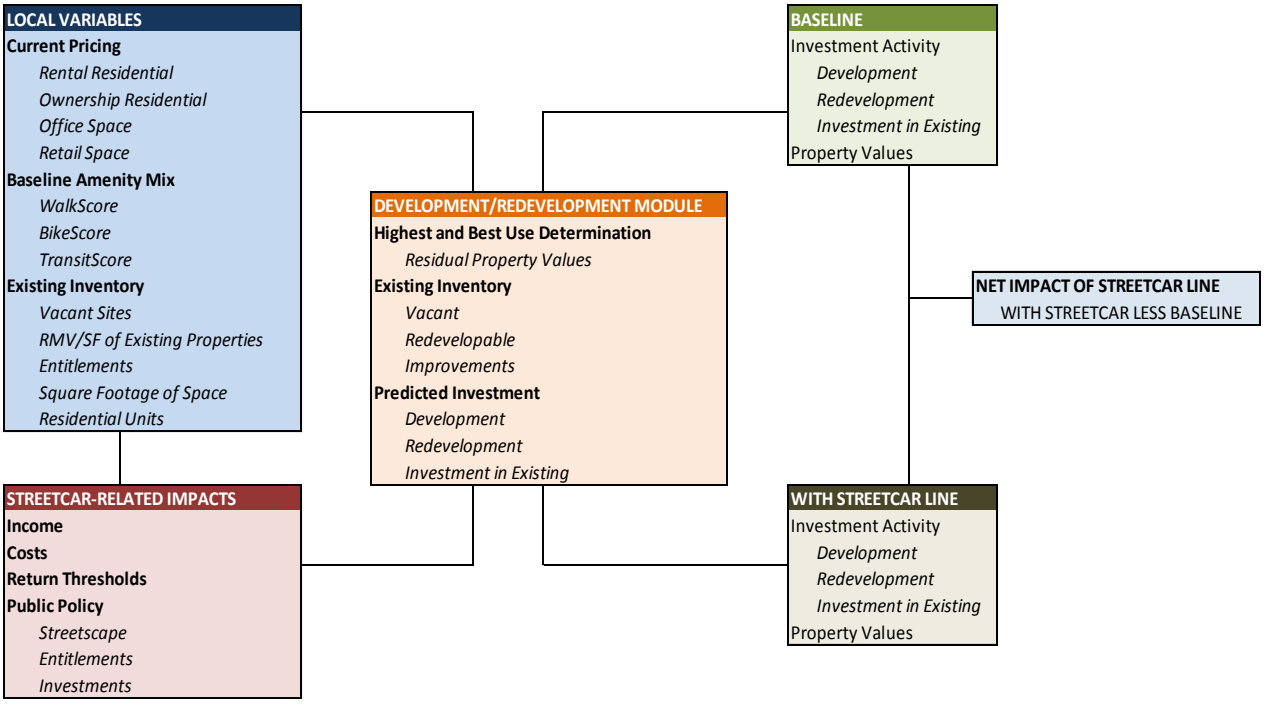
INCREASED ATTRACTIVENESS/MARKETABILITY TO TENANTS
Higher Achievable Pricing
Higher Absorption Rates
Lower Vacancy/Collection Losses
Less Tenant Turnover
INCREASED ATTRACTIVENESS TO INVESTORS
Lower Capitalization Rates/Return Thresholds
Greater Availability of Financing
IMPACT ON CONSTRUCTION COSTS
Reduced required parking ratios
Reduced Off-Site Improvements
RELATED PUBLIC SECTOR ACTIONS
Entitlement Changes
Related Streetscape Improvements
Active Efforts to Encourage Related Development
Grants/Loans/Financing Mechanisms
Property Disposition

REVENUE
COST
RETURN
ENTITLEMENTS

investment. In this model, streetcar improvements are assumed to impact some of these inputs, and therefore potentially alter investment and development patterns.

The following is a schematic of the model, followed by a discussion of the key components.

FIGURE 3.2: SCHEMATIC OF MODEL



D. Local Variables

Information on local variables is entered into the model to describe the existing characteristics of specific study areas. The variables to be collected include information on pricing, amenities and physical property characteristics at the parcel level. It is anticipated that model users will rely on local GIS or other mapping data and tax assessor data to collect data on physical conditions in the study area. Local economic development staff or real estate market professionals may be needed to provide data on market variables such as rents and construction costs.

FIGURE 3.3: CATEGORIES OF LOCAL VARIABLES

- **Pricing**

  Assumptions with respect to current pricing in the area, reflecting the estimated anticipated pricing for new product by category, need to be generated as an input. This includes per-square-foot rental rates for rental apartments, sales prices per square foot for ownership residential units, and net lease rates per square foot for office and retail space. In addition, assumptions need to be developed with respect to achievable pricing for parking spaces. **These variables should be set to reflect the achievable pricing that a developer would assume for a new construction project in the area being studied.**

  The current achievable pricing structure in an area is an important variable to consider in predicting the marginal impact of any changes in the development environment. It is a significant factor in determining the form of development as well as predicting residual property values in the district. While the pricing experience of new comparable projects can be a strong predictor of achievable pricing, in some markets there may be limited or no new product to establish a reliable price. Nonetheless, **an assumption of current achievable pricing in a study area will be necessary to run the model.**

Determination of this variable will be somewhat subjective, based on a few universally available data sources. Model users will likely need to consult the expert opinion of local brokers, realtors and other real estate professionals. This can be supplemented with readily available secondary data sources such as *CoStar* for commercial space, *Zillow* for residential pricing, local multiple listing service data and other third party data sources.

- **Physical Characteristics of Corridor Properties**
  As with pricing, the physical characteristics of prospective corridors will be a major factor in the predicted magnitude and character of redevelopment. The model incorporates an assessment of existing properties at the parcel level, for both improved and vacant sites. Parcel assessment inputs include the following:
    - The estimated Real Market Value (RMV) of Improved sites at the parcel level (This variable is used as a proxy for the market value of the site in and found in assessor records);
    - Parcel size/square feet; and
    - Current entitlements (zoning) by parcel.

  Within the model, the attributes of individual parcels are used to predict the likelihood of redevelopment, with properties that have a high current value of improvements being more challenging to redevelop. Zoning entitlements by parcel are used as a screen, which limits potential redevelopment scenarios to those allowed under the zoning.

- **Existing Amenity Mix**
  The existing amenity mix reflects the current level of amenity in the district, and is important to help predict the marginal impact of new streetcar investments on the local amenity base. The Model assumes that a streetcar investment will expand the local amenity base and increase marketability, but this impact will likely be less pronounced in areas that have a relatively high existing amenity base. Our hypothesis is that the marginal impact on marketability of a new amenity such as streetcar service would be reduced in areas that are already highly amenitized. The ability to input information on the current level of amenity in the area is included on the Initial Input Screen. This variable is included in recognition that it may have some explanatory power with respect to the results.

E. Streetcar Related Impacts

This component of the model summarizes the anticipated marginal impact associated with the streetcar investment, including impacts on income, costs and return parameters. The impact of the streetcar improvements assumed in the model are expressed in terms of a percentage shift

in income, costs and return thresholds. Incremental improvements to transit service, walkability, streetscape and other factors related to streetcar investment have a marginal impact on these variables. Assumptions with respect to marginal shifts attributable to the streetcar improvements are based on available studies and the input of real estate professionals with experience in streetcar corridors and transit oriented development. Evaluation of these types of impacts is ongoing, and more accurate information will help adjust these assumptions over time.

A hedonic study focusing specifically on the impact of streetcar on real estate pricing, costs and other market levers has not been identified in the literature and is beyond the scope of this project. In the future, a jurisdiction applying this model might seek to inform their variable assumptions with such a study, should it become available

FIGURE 3.4: CATEGORIES OF PROSPECTIVE IMPACTS FROM STREETCAR IMPROVEMENTS

STREETCAR-RELATED IMPACTS
Income
Costs
Return Thresholds
Public Policy

As part of its projection of streetcar-related impacts, the Model is capable of evaluating some policy-sensitive actions that may have a significant impact on future investment patterns. The primary policy input incorporated into the model is entitlements (zoning. range of allowable uses, allowable densities, etc.). To the extent that public policy mechanisms such as urban renewal, land assembly, fee waivers, property tax abatements, subordinated debt and/or other economic development tools are included as part of the streetcar bundle of actions, the impact of these interventions is addressed through associated shifts in income, costs and return thresholds on the Initial Input Screen.

F. Development/Redevelopment Module

The development/redevelopment module is intended to simulate the development decision tree, factoring in the impact of the key inputs on decisions to undertake development activity. The model is based on a series of simplified pro formas for 27 theoretical development programs that characterize the relationship between key variables, predicted development form and associated residual property values. The module generates a generalized determination of the "highest and best economic use" based on the theoretical development programs, as well as an associated residual property value associated

FIGURE 3.5: COMPONENTS OF THE DEVELOPMENT/ REDEVELOPMENT MODULE

DEVELOPMENT/REDEVELOPMENT MODULE
Highest and Best Use Determination
Residual Property Values
Existing Inventory
Vacant
Redevelopable
Improvements
Predicted Investment
Development
Redevelopment
Investment in Existing

with each program under both the baseline and streetcar scenarios. This information is reconciled with information on the existing inventory information and zoning, resulting in a predicted pattern of investment.

"Highest and Best Use"

The development/redevelopment module initially solves for a development solution that represents the highest and best use of the property under the assumptions used, as well as outputting an associated residual property value. **The highest and best *economic* use of the site is defined as the allowable land use program that yields the greatest return to the existing property, and the residual property value reflects the maximum acquisition value supported by that program under the assumptions used.** There may be additional considerations in determining the *overall* highest and best use of land from a community and planning perspective, but this Model focuses on the economic component which tends to be most relevant to private developers.

The highest and best use determination is based on the allowable use that has the highest indicated residual property value. The model currently incorporates a total of 27 theoretical development programs, but the number and nature of program options can be varied. An entitlement screen is necessary, since use types identified as having the greatest residual values may not be allowed under existing zoning. In the model, this is done using a matrix that evaluates whether or not the theoretical programs are allowable under the range of zoning codes in the study area. If the use is not allowed, the highest and best *allowed* use is determined.

The model allows for the testing of different zoning scenarios to see if changes to zoning entitlements may change the ultimate built environment by allowing uses which are currently prohibited.

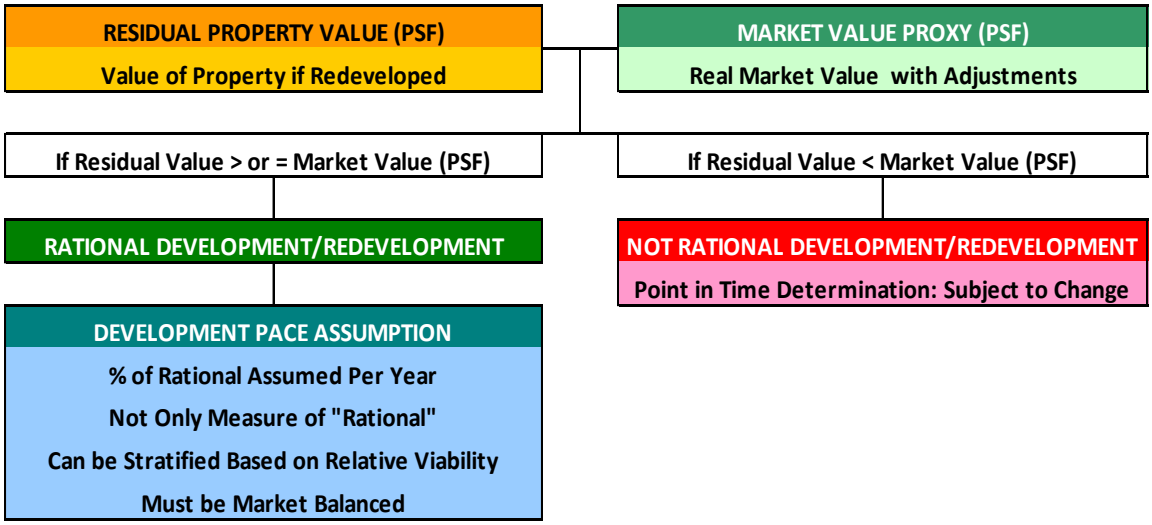
Threshold for Development

Development and redevelopment activity is predicted by the model **when the residual property value exceeds the property value under the existing use**. If the residual value is greater than or equal to the market value of the property, it is assumed to represent a "rational" development or redevelopment opportunity – i.e. a developer can purchase the property at current market value for anew intended purpose that places a greater value on the site (Figure 3.6).

While development and/or redevelopment is considered viable in these instances, it does not necessarily mean that it will occur within the study time frame. There are a number of additional factors that impact redevelopment, and the Model assumes that only a portion of opportunities identified as viable will be realized within the study horizon. The assumed rate of redevelopment should be based on historic trends in the study area, and is an input on the

Initial Input Screen. (This means looking at the amount of land area in the study area which has developed over the prior 10 to 20 year period, to come up with a realistic estimate of development rate. Permitting data or GIS data can provide indicators of historical development activity.)

FIGURE 3.6: COMPARISON OF RESIDUAL PROPERTY VALUE TO REAL MARKET VALUE (PER SQUARE FOOT)

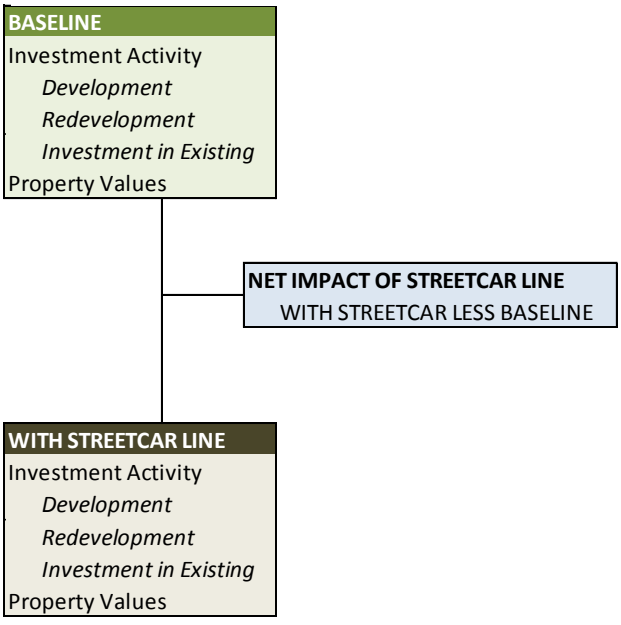


G. Measures of Development Impacts (Outputs)

The development/redevelopment module is run twice: first under baseline assumptions and subsequently with assumptions reflecting streetcar investments. Comparison of the two scenarios provides the basis for estimating the net impact of the proposed streetcar investments.

The net impacts associated with streetcar investments are broken down into multiple categories: 1) predicted levels of new development, 2) predicted levels of redevelopment, and 3) investment in existing structures. To determine the net impacts, the model solves for the differential between the

FIGURE 3.7: COMPARISON OF OUTPUTS BASELINE AND STREETCAR SCENARIOS



baseline scenario and the streetcar scenario. The units of measure include:

- The dollar value of construction and investment activity in physical improvements.
- Projected net change in real market value in the study area associated with new construction
- Net change in square footage of commercial space, as well as residential units in the study area.

The model does not address the direct, indirect or induced impact of the construction activity funded, nor the costs of ongoing operations of any streetcar lines.

H. Limitations and Assumptions

As with any model, this Model has limitations resulting from gaps in knowledge and data.

- First and foremost, it is impossible to precisely predict future development activity in a large study area given the multitude of property owners, individual investment decisions, real estate market cycles, general economic conditions and unforeseeable events. For this reason, **it is recommended that this Model be used to consider the *potential magnitude* of impacts in a proposed streetcar corridor, rather than the precise numerical results generated.** Individual results should be seen as an indicator of magnitude.

- The project team encountered various gaps in research which necessitated the use of assumptions where the literature or expert review was unable to provide more exact factors for use in the Model. In particular, hedonic regression analysis seeking to isolate and quantify the impact of streetcar specifically on real estate pricing, costs and other market levers was not identified in the existing literature at the time of Model development. Such a study was beyond the scope of this project to conduct. To help compensate for this deficiency, a collection of studies identifying such impacts in various environments around light rail lines and stations was used to form an assumption of the potential range of rent impacts from streetcar improvements. Data collection and more precise studies in the future will allow for calibration of the Model over time.

- The Model is designed to address the fact that streetcar improvements include a series of bundled actions, and evaluating the marginal impact of specific components within this bundle is difficult. Components include not only the streetcar line itself, but also streetscape improvements, changes in entitlements and other public actions and interventions to capitalize on the investment. The user must have at least a preliminary understanding of which components will accompany a proposed streetcar investment in a corridor.

- The Model uses specific parcel-level data to generate quantified measures of predicted development activity, but it is important to remember that this Model is actually generating a broad study-area-wide estimate of development activity. In no cases should this Model be used to reach definitive conclusions about what will happen on any given parcel. Any Model outputs that identify parcels, whether in map or database form, should specify that *it is making no firm predictions or guarantees on the eventual development or lack of development on specific properties.*

- This methodology assumes a base level of data availability on existing conditions, market factors, Walk Score and other third-party metrics, and parcel-level data. The methodology is designed to strike a balance between requiring information that should be available for most mid-sized cities, while not simplifying to the extent that the methodology is compromised.

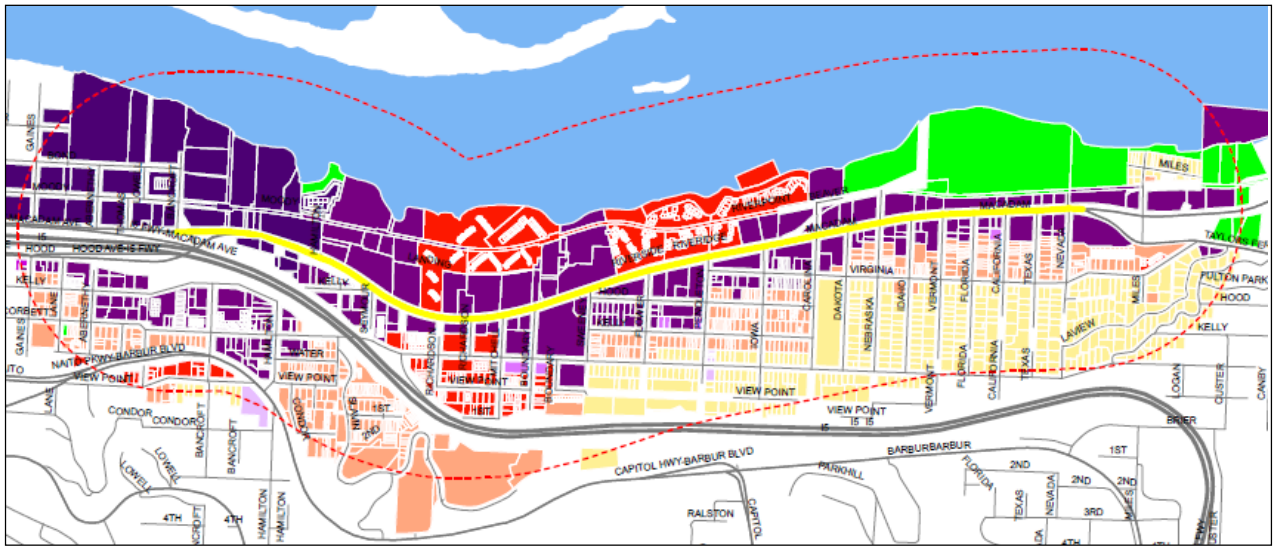
IV. TEST RUN OF MODEL

As part of this project, the project team performed test runs of the Model on four corridor types in the Portland metropolitan area. While specific corridors were used, the point of the exercise was not to make corridor-specific determinations at this time, but to apply the Model to representative corridor typologies, in order to test the Model and provide more universal insights. The four corridor types considered included:

- An auto-oriented commuter corridor as it enters the Central Business District
- A historical streetcar route in an inner neighborhood
- A classic auto-oriented retail strip on an urban highway route
- A new-urbanist planned community in a suburban community

The test runs of the Model were instrumental in learning how it works in practice, identifying trends among corridors and how they differ, and finding unforeseen bugs. A more detailed discussion of the test run results is presented in Appendix C.

FIGURE 4.1: EXAMPLE TEST CORRIDOR



Source: Angelo Planning Group, Metro RLIS

The general conclusions from these test runs of the Model are included in the General Findings section of this report. However, some of the findings which were more specific to these test runs are presented below.

General Conclusions from the Test Application

- The Model projected that streetcar improvements would increase the development potential in the test corridors, averaging 15% more investment and 20% more growth in property value than the baseline scenario.

- Streetcar improvements showed the greatest relative impact in the test corridor where these improvements had the most potential to improve transit service, sidewalks and crossings. In the test corridor that was already strongest in these areas, the additional marginal impact of streetcar improvements was projected to be less. Similarly, the planned new-urbanist community is already projected to have excellent walkability and amenities when developed; therefore the Model prediced that streetcar would provide a smaller relative improvement on these measures.

- In the test runs of the Model, there were few instances where proposed streetcar improvements actually changed the likely development forms in the corridor, triggering a change, for instance, from low-density development under the baseline scenario to mid-rise development in the streetcar scenario. Instead, the increase in development mostly comes from increasing the likelihood of development of parcels with the same building form.

- The smaller the share of existing low-density residential zones in the area, the greater the redevelopment potential for transit-supportive density. Corridors where medium and higher-density zones extend into the surrounding neighborhoods have the greatest potential for meaningful redevelopment into a transit-oriented atmosphere.

- As the Model outputs multiple measures of development, there are different ways to compare the projected "success" of streetcar improvements in different corridors. For example, based on public policy in a particular area, housing production may be the most important metric in one corridor, while in another, new taxable assessed value is considered most important.

There are many measures of streetcar success, including mobility, equity and land use considerations. As stated in the Executive Summary, this Model focuses on the economic development impacts only, but does not claim that these impacts are more or less important than other considerations. Moving forward, all of these general conclusions will be further examined by Model application and calibration.

V. LITERATURE & RESEARCH REVIEW

An essential early step in this project was the review of existing reports and studies from government, academic and other sources. The purpose of this review was to identify what data and conclusions were already available regarding the central relationships to be modeled in this project regarding the following questions:

- Is there any existing data demonstrating and/or quantifying the impact of streetcar improvements on real estate development in the streetcar corridor or station areas, including impact on rent and pricing levels, construction costs or lending terms?
- Is there existing research on the impacts of other types of rail and transit on real estate development?

A. Overview

TO JOHNSON REID's knowledge, only two studies have so far endeavored to document the impact of new streetcar lines on property development and values with quantitative research. Both studies are limited in scope, and do not attempt to isolate the effects of streetcar from other factors that may have affected property development and pricing along the corridors at the time. The literature on light-rail systems is considerably more extensive, and arguably provides a better basis for estimating likely benefits of new streetcar projects. Significant attention is therefore given to research on light-rail in this summary.

However, for the purpose of modeling impacts of new streetcar lines, studies focused on value premiums may be more useful than studies of changes in development. This is due to the different ways in which property values and development activity respond to market signals. Changes in value tend to affect both undeveloped and developed properties, and occur in small increments that can be observed in sales transactions. Compared to the development impact, the value impact can thus be measured more reliably, with greater precision, and more independently of local, non-transit factors. Secondarily, the value premium is a more crucial input when modeling the impacts of a new streetcar line, as increases in achievable pricing usually precede development decisions. The following review therefore focuses mainly on value premiums.

A total of 35 research publications were reviewed for this project. Emphasis was placed on recent studies that employ hedonic modeling, a technique that uses multiple regression to estimate the marginal value of individual benefits known to impact property values. Only the most relevant studies and findings are included in this summary. A comprehensive bibliography of reviewed literature is included at the end of this report.

B. Relevant Studies and Findings

STREETCAR STUDIES

- E.D. Hovee & Co. (2005) studied the impact of the original west side Portland Streetcar alignment on property development by comparing densities along the line before and after the alignment was committed. After the construction of the street car was announced in 1997, properties within one block of the line were shown to capture a large share of new development and significantly higher densities than areas further out. Impacts on pricing levels were not quantified.

  The study did not attempt to quantify the contributions of streetcar in isolation from urban renewal efforts or to make a judgment on the amount of development that would have taken place without streetcar. However, developer interviews referenced in the report indicate that the alignment decision was interpreted by developers as a guarantee of public-private commitment to the affected neighborhoods, and thus came to represent investments and amenities not directly related to streetcar.

- As part of a funding assessment for D.C. Surface Transit, Re-Connecting America conducted a case study of streetcar impacts in three cities (Brookings, 2009). The value impact, estimated by comparing changes in tax assessments for streetcar-adjacent properties to average city-wide changes, was found to be strong and positive in Seattle and Portland but negative in Tampa. No consistent pattern was observed regarding the relative effect on different property types. Tampa saw the greatest benefit for hotels and multifamily properties, whereas vacant land saw the greatest boost in Portland and Seattle. During the planning stage and early operation of the line, Portland also saw significant appreciation for commercial properties and sub-dividable single-family parcels, while multifamily properties saw greater relative appreciation after completion. As with the E.D. Hovee report, the authors did not attempt to distinguish the marginal impact of streetcar from the effects of other efforts.

- A recent study by the Institute for Transportation and Development Policy (ITPD, 2012) examined development in 21 different transit corridors including streetcar, light rail, bus rapid transit, and bus service. Out of the 21 corridors, two were streetcar corridors in Portland and Seattle. The study attempted to quantify the development return in the corridors, compared to the cost of constructing the transit improvements. The study identified other factors in the corridors that might have impacted development, such as the existing development potential, government support for TOD. The analysis determined qualitative rankings for these factors such as “weak, moderate, or strong”.

This study found no correlation between the type of transit and level of TOD investment. Instead, the most important factor in encouraging development was found to be the level of government investment in TOD. The second most important factor was the existing "development potential" of the corridor prior to transit improvements. The best performing categories were rated as having "emerging" or "strong" potential irrespective of the transit improvements. Those rated as having "limited" potential fared the worst in terms of development in the corridor after transit improvements.

LIGHT-RAIL STUDIES

Considerable resources have been committed to measure the impact of new light-rail lines on property values over the last three decades. Most researchers have followed a cross-sectional approach, measuring variations in property values at different distances to transit stations. Some have also employed a longitudinal approach, comparing changes in values over time inside and outside defined station areas.

Though estimated property value or rent premiums vary widely from city to city (and sometimes even within a city), the majority of studies find statistically significant value premiums for properties located around light-rail stations. A quantitative summary of hedonic studies conducted prior to the early 2000s has been provided in the form of a meta-analysis by Debrezion et al. (2007). Light-rail represented 16 out of the 57 sets of study results included in the analysis. The average value premium across the light-rail studies was 7.1% for properties located within a quarter mile of a station, and 2.7% per 250 meter closer a property was to a station. The authors observed wide differences in the results of the underlying studies, with estimates of the quarter-mile premium ranging from -7% to 30%.

The authors estimated the premium differential between commercial and residential properties through a meta-regression of the underlying study results (all transit forms). Within the quarter-mile radius, the commercial premium was found to be higher by 12.2 percentage points. However, per 250-meter increment, the residential premium was 2.3 percentage points higher than the commercial premium. As explained by the authors, the apparent inconsistency reflects that commercial properties have rent curves that are steep immediately around transit stations and flat further out, with the flat part dominating the calculation. The authors did not distinguish between retail and office properties, but research not included in the meta-study has shown that the rent curve for office properties need not be that steep.[5]

[5] Weinberger (2000) found rent premiums of 11% for office properties within ¼ mile and 6% for properties between ¼ and ½ mile of light-rail stations in Santa Clara County.

Debrezion et al.'s findings lead to premium estimates for light-rail presented in the table below. The estimates are based on the premium differentials calculated for all transit forms. Research by Cervero (2003) indicates that the differential might be considerably lower for light-rail than for commuter rail. Consequently, the estimates for residential and commercial premiums below should perhaps be pulled closer to the overall average. In addition, the estimates might need a downward adjustment. Debrezion et al. find that the lack of variables to account for access to highways and other transportation in some of the underlying studies inflates the overall estimates.[6]

FIGURE 5.1: META-REGRESSION RESULTS, LIGHT-RAIL PREMIUM ESTIMATES

	Premium within 1/4 mile of station	Premium per 250m closer to station
Overall	7.1%	2.7%
Residential	4.2%	3.2%
Commercial	16.4%	0.9%

SOURCE: Debrezion, et al., 2007, Johnson Reid

Recent research largely confirms the work by Debrezion et al. Many newer studies focus on residential properties alone, and present premium estimates in dollars per foot or meter. When converted to a quarter-mile radius, these premiums typically range between 2-6% (Cervero 2003; Garret 2004; McMillen and McDonald 2004; Hess/Almeida 2007; Goetz et al. 2010; Yan et al. 2012).

One recent study from Dublin, Ireland should be given special attention because of its potential relevance for streetcar. Not unlike Portland's MAX system, the Luas light-rail system in Dublin resembles streetcar in downtown stretches by making frequent stops and using at-grade tracks integrated with other street traffic. Mayor et al. (2008) distinguished central residential stretches of the line (Zone 2) from the more suburban (Zone 3), and found that homes within 500 meters (0.3 miles) of Zone 2 stations command a 6% premium, while the premium in the suburbs was 13.2%. The authors point out that affected districts had high level of congestion and inadequate transit service prior to the new line, something that likely widened the premiums. The study also revealed a greater willingness to walk than is usually seen in North America, which might also have bolstered the premiums.

[6] The authors do not provide average premiums for the studies that include such variables, but calculate the regression coefficient for including such variables, based on all transit forms. Applying this coefficient to light-rail, which may be misleading, indicates that the overall ¼-mile premium should be reduced from 7.1% to 3%.

OTHER FINDINGS

Existing research reveals no clear pattern for how proximity premiums are capitalized over time. But in general, single-family residential properties appear to have the most gradual appreciation, with a significant portion of the premiums developing after the line is completed. In one case, statistically significant premiums appeared four years after announcement of the line, and were still widening two years after completion (McMillen and McDonald 2004). Commercial properties often see capitalization concentrated around the construction phase. Multifamily properties generally occupy a middle ground between commercial and single-family properties.

The size of the impact radius around rail transit stations appears to be strongly correlated with service coverage. For light-rail, researchers generally find that the proximity premium disappears between a quarter of a mile and half mile of a station (Chen et al. 1998; Garrett 2004; Goetz et al. 2010).

Though demographic factors in many studies are shown to impact premiums, the direction of the impact is not consistent (e.g., Gatzlaff/Smith 1993, Kahn 2007, Hess/Almeida 2007). In their meta-study, Debrezion et al. found that the overall effect of including demographic variables was insignificant.

To our knowledge, no one has yet documented the impact of transit station proximity on investor return requirements. However, Pivo and Fisher (2008) found that "responsible properties" – properties that are either energy efficient, within half a mile of a rail transit station, or within an urban regeneration zone – had capitalization rates 0.45% below other properties.

C. Limitations and Gaps in Knowledge

The wide range of premium estimates in the research literature reveals that it is difficult, even with hedonic modeling, to estimate the market premium on transit proximity completely free from local and non-transit influences. One challenge with hedonic modeling is that it is dependent on the researcher's ability to correctly identify and reliably measure relevant variables. A number of factors, like congestion and attitudes to public transit, are difficult or costly to measure in practice. Moreover, hedonic modeling can only estimate the impact of variables that have significant variation within the collected data. Thus, a study area with a uniform, transit-reliant population would likely yield higher proximity premiums than other study areas. Significant resources are required to produce accurate estimates that can serve as reliable baseline predictions for new study areas.

Due to the lack of research on streetcar systems, baseline premium estimates for new lines must be deduced from research on light-rail. This process must take into account the differences between the two transit systems. But no formula or procedure for this translation process presents itself in the literature. Several studies, including Debrezion et al., indicate a correlation between service coverage and premiums, which would point to lower premiums for streetcar assuming it covers less area than a light rail system. However, streetcar may represent less dis-amenity in the form of noise, visual nuisance and perception of station-area crime, and may also have a positive impact by virtue of representing urban vitality and enhancing walkability. Estimating baseline streetcar premiums requires a subjective weighting of these factors.

D. Conclusions for Model Development and Application

Based on premium estimates from the most recent light-rail research and the meta-study by Debrezion et al. (with the above suggested adjustments), residential properties within a quarter mile of light-rail stations might be expected to capture value premiums of around 3-6%, and commercial properties might see premiums of twice the magnitude.

To translate these estimates into a streetcar context, for Model development purposes we assumed that for residential properties the reduced nuisance and added walkability/vitality benefits of the streetcar largely offset its narrower coverage and slower speeds. This assumption may not hold for commercial properties, for which passerby traffic (ridership) and accessibility (speed, coverage) are crucial determinants of pricing (cf. Cervero 2003). This leads us to a baseline premium estimate of 4% for residential properties and 6% for commercial properties within a quarter mile of streetcar stations.

In future applications, the Model should be adjusted to local conditions before applying the baseline estimate to a particular study area. Because part of the premium represents accessibility to the city center and other important nodes, and because the benefit of increased accessibility is greatest where the existing accessibility is the poorest, the estimated premiums should be adjusted to reflect a neighborhood's existing accessibility. Premiums should be reduced in neighborhoods with short walking distance to important nodes or with nearby access to alternative transportation modes that provide faster or more far-reaching service. And premiums should be increased in dense and congested areas where the opposite is the case. In the same way, premiums should be adjusted to reflect a proposed alignment's length and connectivity with other transit lines.

New research on the economic impacts of modern streetcar systems will continue to inform and improve upon our knowledge and modeling capabilities. Such research is highly welcome and could be invaluable to planners, decision-makers, and anyone involved in evaluating the feasibility of proposed investments. Especially helpful would be detailed hedonic analysis of the

impact of streetcar service specifically on property values and/or pricing levels, as well as spatial variables that can determine the impact radius and temporal components that can reveal causality.[7]

[7] When determining whether identified premiums are caused by a new transit line or whether the transit line was placed along a corridor that already enjoyed value premiums, streetcar systems are more prone to false cause fallacy than light-rail systems. Light-rail corridors will normally show a pattern of accessibility premiums around stations and nuisance discounts around tracks, which safely can be assumed to stem from the light-rail line. But streetcars have more frequent stops and cause less nuisance along its tracks, and also offer retailers along the line more even exposure. As a result, pricing will be more homogenous along the corridor, and studies without a temporal component may falsely attribute pre-existing premiums to the new line.

VI. PROFESSIONAL FOCUS GROUP AND TECHNICAL REVIEW

During the process of developing and testing the model, the project team sought feedback from local real estate experts and regional technical advisors who may be using the model. This section provides an overview of these efforts and summary of the takeaways from each.

A. Developer and Real Estate Professional Focus Group

A focus group of local developers and real estate professionals with experience around existing Portland Streetcar lines (and in other parts of the region) was convened to discuss how streetcar improvements impact the private market dynamics and decision-making process, which may result in new development in these corridors.

The discussion included five professionals of long experience in the area, representing development and lending perspectives. The following is a summary of the major takeaways from this conversation.

Summary of Discussion and Major Themes

- Participants tended to agree that streetcar is a positive amenity for real estate end users, but that measuring its effect is difficult. There was general acknowledgement that being located near rail transit could increase achievable rents for different types of space. This effect is caused by a group of inter-related factors which include the streetcar itself, but also includes the general location, livability, and amenities that accompany a streetcar line.
- One participant stated that there are three common elements of revived urban neighborhoods, regardless of the city: access to transit, services and walkable neighborhoods. The three are inter connected and rely on each other.
- Some think of the streetcar as an "extender" for pedestrians to travel a bit farther than they otherwise would. It is a local service, vs. the regional service of a light rail line. Its difference from bus transit is perception and socioeconomics. Another expressed that it is "an attraction," that doesn't serve a robust transit function, but is valuable for community marketing and tourism. Streetcar doesn't run all the time, and so people can't rely on it as primary transport 24-hours a day.
- There was agreement that location near rail service reduces parking needs, at least for residential buildings, which saves costs for developers.

- The group felt that the presence of a streetcar will generally not impact the thinking of lenders or the terms they offer, but it is a nice extra, and makes lenders more likely to consider somewhat reduced parking ratios.
- One developer stated that streetcar may be like green features in a building, in that it may not increase rents much, but will increase absorption and retention of tenants.
- There was discussion of the strength of location for streetcar, with emphasis on proximity to the Central City. Some expressed that even Portland's Eastside Loop was "ahead of the market". One participant emphasized keeping the streetcar tightly focused in the Central City. Many agreed that Macadam Avenue (a commuting corridor just outside and feeding into the Central City) would be a good candidate for streetcar service if coupled with zoning changes to allow increased density.
- Streetcar may be most successful where the real estate market is already strong or growing, or perhaps it can help bridge adjacent neighborhoods to those which are already strong. One question for policy makers is: how much are you asking developers to lead the market? Their willingness will vary according to the perceived risk.
- Another important factor is existing public support in a proposed corridor. Because many impacts of streetcar are intangible, community support vs. resistance will make a big difference in the predicted success of a new line.

Lessons for the Economic Development Model

The focus group discussion provided many good insights into how developers may perceive the addition of streetcar improvements. The group gave support to the basic perception that streetcar improvements are seen as a positive addition which should benefit rent levels and perhaps reduce parking requirements. There was little support for the idea that the presence of streetcar by itself would improve lending terms in the area, but agreement that general improvements to livability, walkability and pricing levels that can accompany streetcar may improve lending terms.

This group remained somewhat conservative in its assessment of the development prospects of different neighborhoods, signaling that neighborhoods with emerging or strong market fundamentals will still have the most support, while streetcar may not be enough to attract significant new investment to riskier areas. This is in keeping with some other research reviewed (see previous section of this report.)

The professional focus group informed various aspects of Model development. It supported the guiding assumption that streetcar is a positive amenity that can marginally improve the development environment. Streetcar can be expected to boost rent levels and perhaps reduce costs, particularly be decreasing parking needs on-site. In addition, the discussion supported

the idea that streetcar service is part of a larger bundle of improvements to transit, streetscape and livability which have synergistic effects on neighborhoods. This assumption underlies the design of the Model's Initial Input Screen which addresses some of these other factors.

B. Technical Advisory Committee

As the preliminary Model took shape, the project team gave a presentation to a Technical Advisory Committee (TAC) regarding the planned operation and methodology. The TAC was attended by representatives of local and regional governments and transit agency who bring technical expertise and may use the Model in practice.

After the presentation of the preliminary Model, the TAC engaged in discussion and asked questions regarding the methodology and functionality. The following is a summary of the major takeaways from this conversation.

Summary of Discussion and Major Themes

- Participants discussed the need to properly reflect differences in zoning entitlements and test different zoning scenarios. One particular focus was the need to accurately reflect the difference in parking requirements in transit-oriented zones, to get the full benefit of reduced parking requirements which save developer's costs and allow more leasable space to build on a site. The project team described the pro forma and zoning input sections of the Model to explain how zoning is addressed and how different development assumptions can be modeled.
- Participants asked if there was value added for master planning or other TOD-specific planning actions in conjunction with streetcar. This concern was ultimately addressed in the Model's Initial Input Screen by reflecting the positive impact of additional public policy steps on enhancing streetcar outcomes.
- Existing amenities will impact the marginal impact of streetcar improvements. If a corridor is loaded with amenities, and pricing is already relatively strong, the streetcar is likely to have a lower marginal impact then where it will help incent these amenities itself.
- There was some discussion of how to treat small parcels (such as 5,000 s.f. lots typical of single family development). Simply aggregating this square footage with larger parcels may overstate the development potential of small and fragmented parcels. This is handled two ways in the Model. For built-out low-density single-family zoned land, the development potential is judged to be negligible because few lots remain, and because redeveloped lots are generally replacing one home with one home, for no net gain of housing. For small lots on high-density zoned land, a function was added to the Model which assumes that a more restrained amount of development will happen on these parcels.
- Similarly, the TAC discussed the case of multiple developable sites adjacent to each other and whether the Model would reflect the enhanced development potential of such sites or treat them as distinct development opportunities. The project team explained that because the Model seeks to identify conditions over a large area, it assesses parcels in "bulk", and

such adjacent opportunities will be treated like other sites. Part of applying this model to a given real-world corridor is that the results must be "truth tested" afterwards by knowledgeable local users to identify if the developability of key sites has been correctly modeled. It is inherent in the model that special cases will be missed and must be reviewed.

- The group discussed the lack of hedonic analysis specifically on the impact of streetcar. It was agreed that such analysis would be valuable, and ways to best approximate it were discussed. No clear approach was identified short of doing a future hedonic analysis.
- One participant remarked that the Model could be run iteratively, with results given as a range. For instance, the results might say "if the streetcar improvements lead to a 3% increase in rents, you may get X development; if the improvements lead to a 10% increase in rents, you may get X development." This suggestion was not integrated directly into the model, but is one way of presenting results. The Initial Input Screen of the Model allows for directly entering different percentage impacts to pricing/rent and costs, to allow for testing this range of outcomes.
- There was discussion about modeling the demand side of development, and whether the Model assumes that streetcar improvements can generate new demand and development, or is it really helping to steer the location of existing demand within a city. The Model does not include a screen for market demand, and does assume that the streetcar is about steering the location of TOD within a city, which may be a legitimate public policy goal.

Lessons for the Economic Development Model

In contrast to the professional focus group, which identified larger themes, the TAC discussion was more narrowly focused on the preliminary methodology presented to the group. The discussion led to some adjustments to the Model, which are outlined in the points above.

VII. EXPERT PEER REVIEW

As the preliminary Model took shape, an in-depth description of the approach and methodology was submitted to three national experts who have done studies in this field to provide peer review. The reviewers were:

- **Keith Bartholomew, JD**
  Associate Dean, College of Architecture + Planning
  University of Utah

  Keith Bartholomew is an expert in a range of transportation and land use planning subjects relevant to this project. He has published many papers on transit and transit-oriented development, with particular focus on planning and modeling future transportation and build-out scenarios.

- **Robert Cervero, PhD**
  Friesen Chair of Urban Studies
  University of California Berkeley

  Dr. Cervero has decades of experience in teaching, consulting and publishing on transit and development. He authored or contributed multiple studies reviewed for this project. His books include *Transforming Cities with Transit* (World Bank, 2013), and *Developing Around Transit: Strategies and Solutions that Work* (ULI, 2004).

- **William Lee**
  Bill Lee Land Econ Consultants

  Bill Lee has provided real estate market analysis and economic development services for over 30 years to a full range of public and private clients. Prior to creating his own firm, he was the Managing Principal of Economics Research Associates (ERA) San Francisco and Executive Vice President of AECOM Economics. Bill Lee recently consulted on the economic impact analysis of the Downtown Los Angeles streetcar project.

Peer Reviewer's Charge

The selected peer reviewers were charged with assessing the proposed methodology of the Streetcar Evaluation model. Reviewers received detailed written documentation of the model, and not the model itself. Reviewers had access as needed to the consultant team to ask follow up questions during the evaluation period.

The reviewers provided written feedback, either positive or negative, regarding the appropriateness and efficacy of the methodology. The reviewers were instructed that written

feedback could be as brief or long as warranted, but should cover each of the reviewer's concerns in sufficient detail for the issue to be understood by the project team.

Peer Reviewer Response

The reviewers submitted written comments regarding the model. In general, the reviewers supported the theoretical underpinnings of the proposed pro-forma-based approach to modeling future development activity. They agreed that the lack of solid hedonic analysis to provide more precise measures of the impact of streetcar service was problematic.

The peer reviews raised many key points and questions regarding the methodology, which are outlined in the following tables, along with the project team's response. (The full written comments of the peer reviewers are included in the Appendices.)

FIGURE 7.1: KEITH BARTHOLOMEW, COMMENTS AND RESPONSES

Keith Bartholomew		Addressed in Model	Model Modified	Special Instructions	Out of Scope
Issue Raised	***Response***				
▪ ***Are market indicators averaged across the corridor? The model may need greater geographic differentiation.***	*This issue is one that can be highly relevant to the outcome. When utilizing the model, we would recommend that the geographic coverage is limited to market segments with somewhat homogeneous conditions. In some cases, this may require a corridor to be evaluated in several segments. Users will need to recognize when they have a corridor that includes submarkets with substantially different market parameters.*	X		X	
▪ ***There are possible problems with pricing and other variables if they are determinant of pricing. Need to be careful to not double count variables.***	*We recognize that a number of the variables are bundled into achievable pricing, as well as into other key factors such as capitalization rates. This is primarily an issue on projections of marginal shifts, and we have reduced the number of input variables to address the issue of double counting.*		X		
▪ ***Recommends a high/medium/ low scale for other measures such as amenities (Likert scale)***	*The model has been adjusted to allow for this type of input. It should be noted that while a Likert-type scale is commonly used, it does add an additional level of qualitative input, and a user should understand this and use the model to test sensitivities to these inputs.*		X		
▪ ***Deciding the adjustment factors relies solely on professional judgment. Recommends a mixed-method approach combining some quantitative and qualitative and professional judgment.***	*The model does rely substantially on professional judgment for the variables, reflecting the relative lack of reliable quantitative evidence of the hypothesized impacts. We have adjusted the model to limit the range of assumptions regarding issues such as pricing, capitalization rates and construction costs. As written, the model is capable of simple refinement as the quantification of key input variables improves through ongoing research.*		X		
▪ ***Their research has found that quantitative tends to overestimate impacts while qualitative tends to underestimate impacts***	*Similar to our response on the previous issue, the model recognizes that the research on these types of improvements is evolving and improving, and the model has been designed to allow for refinement as these variables are better understood. We have added an input sheet using Likert-type scale adjustments, which allows it to incorporate additional qualitative assessments.*		X		
▪ ***Existing zoning may be a limitation on possible development impacts. Need to allow for zoning to change with streetcar***	*The model does allow for the consideration of changes in zoning, which is part of the core model structure. This is done using a highly specific matrix of assumed zoning by parcel, which requires a substantial level of input by users.*	X		X	

FIGURE 7.2: BILL LEE, COMMENTS AND RESPONSES

Bill Lee		Addressed in Model	Model Modified	Special Instructions	Out of Scope
Issue Raised	***Response***				
▪ ***Confusion over whether the model is meant to cover multiple corridor scenarios.***	*Scenario testing with the model does require multiple runs. The primary measure of net impact is the delta between predicted marginal development activity from alternative runs of the model. This is relatively simple to do for most changes in variables, but can be time intensive for some types of zoning/entitlement shifts.*	X		X	
▪ ***Different corridor candidates will have different market response depending on current connectivity to CBD or existing streetcar line.***	*The model has been modified to include consideration of the existing transit profile, as well as connectivity to a broader system. The model now uses the "Transit Score" metric as a baseline, and adjusts impacts based on the marginal anticipated shift in this metric. The assumed marginal impacts on variables are now assumed to be greater if the improvement is linked to a system.*		X		
▪ ***Demographics and perceptions of crime can make rail service a negative in some areas. Portland is a relatively homogenous area, and this impact is likely less locally.***	*This is a difficult issue to measure, although we agree that it may have a substantial impact. The model does not have a direct input variable that can address a negative impact on pricing or other variables associated with this potential effect, but it can incorporate assumptions of negative impacts on the key variables. While not directly included in the input sheet for the model, potential impacts can be incorporated through relatively simple model manipulation.*			X	
▪ ***The model needs to account for market momentum and path of growth inputs.***	*We have refined the model to incorporate assumptions with respect to the baseline market trajectory, expressed through real anticipated increase in achievable pricing. This is now included in the input sheet.*		X		
▪ ***Model should account for rehab and renovation.***	*The model has been refined and expanded to incorporate projections of rehab/renovation activity. This is based on an assumed average annual rate of investment activity as a percentage of market value, and extrapolated to reflect the shift in market value between alternative scenarios.*		X		
▪ ***Rehabilitation may make redevelopment less feasible.***	*We recognize this likely outcome, and would recommend users run scenarios in discrete time increments, which will allow for interim investment and development that may potentially preclude later development.*			X	
▪ ***Need to account for adjacent parcels where the overall synergy is greater than the sum of its parts.***	*This is an excellent point, and will require inspection and adjustment of interim results by the user. Additional manipulation in the parcel data may also be done by users to recognize multiple parcels acting as a single economic unit, such as condominium units or multiple parcels in a single use or ownership.*			X	
▪ ***Don't go too far with zero or low parking solutions.***	*We recognize that these development forms typically consume on-street capacity, and need to be limited in their utilization. While we can recognize that this is a potential concern, the model cannot necessarily address this if entitlements allow, and it may require some level of manual override of results if the output appears unreasonable.*			X	

FIGURE 7.3: ROBERT CERVERO, COMMENTS AND RESPONSES

Robert Cervero		Addressed in Model	Model Modified	Special Instructions	Out of Scope
Issue Raised	*Response*				
▪ *The methodology seems strong on market factors, but weak on accounting for other benefits of streetcar expansion.*	*As designed, the model is intended to measure marginal projected changes in real property development activity a highly specific corridor that can be attributed to streetcar related investments. The model is designed to be additive to the overall evaluation of this type of investment, and not inclusive of all relevant variables that should be considered.*				X
▪ *Relies on fairly subjective input assumptions and expert knowledge, which could be vulnerable to political exigencies.*	*This is true. Our intent with the model is to make these assumptions as transparent as possible, with the expectation that more reliable quantitative measure will be incorporated as research in the area matures.*			X	X
▪ *Overlooks cross-property, multiple parcel opportunities.*	*As noted in the response to similar concerns from Bill Lee, the issue of assembly is not directly addressed. Manual manipulation of the parcel data to account for multiple parcel development can be done if desired, and may be a useful exercise for a user to undertake.*			X	
▪ *Have you addressed infill and added density, alongside existing uses?*	*The model does not currently account for infill and added density, such as accessory dwelling units. It does incorporate renovation/rehab investments, which can include some of this impact.*	X	X		
▪ *Have you addressed build-to-suit office space?*	*The underlying economics of the decision criteria for build-to-suit office space is effectively similar to that of speculative office space. While these decisions can vary based on highly specific firm decisions, decisions factors not included in model are not considered to be reliably predictable.*	X			
▪ *Other measures of amenities need to be considered as part of a bundle*	*Our methodology has been careful to define streetcar improvements as a bundled investment, which includes associated amenities such as streetscape. This was done largely as a result of available research, which has largely not addressed the discrete impact of specific associated investments.*	X			
▪ *The methodology needs a longitudinal element. How will development occur? Will it begin before the line is completed?*	*The model is designed to predict development activity over a defined time period. As developers build towards market conditions anticipated at product introduction, we would expect that developers will consider anticipated market conditions when initiating a project, and as a result would be expected to factor in their expectations of streetcar related improvements for projects initiated prior to completion of the improvements.*				X
▪ *What is the territorial reach of station areas?*	*The model is defining the territorial impact as ¼ mile.*	X			
▪ *Absent hedonic modeling, still need to include estimated impact of accessibility improvements*	*The model is designed to allow incorporation of better measures of impact as additional research is available. The model has been refined to incorporate marginal shifts in metrics such as Transit Score.*		X		
▪ *It is important to bundle impacts and consider synergies of streetcar with other public and private improvements*	*We acknowledge the bundled nature of impacts, and the model incorporates some inputs that are designed to reflect this.*	X	X		

APPENDIX A: TECHNICAL APPENDIX (MODEL WALKTHROUGH)

This section provides a walk-through of the Model to demonstrate its appearance, function, and major areas of input.

The major categories of user input in the Model are as follows:

- **Transit Service, Connectivity & Accessibility** - These inputs are intended to help answer the following questions:
  - What is the quality of the current transit service connectivity and accessibility within the corridor?
  - Will the streetcar project improve transit service and connectivity?
  - How will it change transit service and connectivity in the corridor?
- **Pedestrian Environment** – The assessment of the pedestrian environment takes into account attributes such as sidewalks, street trees, availability of services, and other elements that impact the pedestrian experience. These inputs are intended to help answer the following questions:
  - What is the current pedestrian environment like within the corridor?
  - Does the streetcar project include any pedestrian improvements?
  - How will those improvements change the pedestrian environment?
- **Public Policy** - These inputs are intended to help answer the following questions:
  - Are there public policies and/or funding tools available within the corridor to support streetcar? This would include urban renewal or other improvement districts.
  - Will changes to public policy be made as part of the streetcar project?
  - How will those changes affect availability of public tools in the corridor?
- **Zoning** - An assessment of existing zoning is included because of its relevancy to future development in the corridors, as follows:
  - Is zoning in the corridor supportive of streetcar in terms of permitted uses and development/design standards?
  - Will any changes to current zoning be needed as part of streetcar development?

- **Market Indicators** – Inputs on market pricing levels, financing terms, cost and vacancy assumptions:
  - What is the current strength and attractiveness of the market for new development?
  - Will the streetcar make development more likely by improving market fundamentals?
- **Study Area Parcels** – Information on all study area parcels by identifier (address or parcel i.d.), size, zoning, and estimated market value.

A. Initial Input Screen

The Model begins with an Initial Input Screen (see Figure A.1) where multiple categories of relevant information are entered. The Model uses these inputs to create a profile of current conditions in the given corridor and project future conditions with the assumed package of streetcar improvements. This information is used to inform subsequent steps in the Model.

As specific inputs are entered into the red-shaded cells on the Initial Input Screen, the magnitude of change between the existing and anticipated conditions is registered. The current conditions, and the expected future conditions after the implementation of streetcar, affect pricing, cost and other factors which directly impact development feasibility.

The following are the specific inputs as requested on the Initial Input Screen (not including market indicator inputs), followed by an explanation of how these inputs are scored.

Transit Service, Connectivity and Accessibility

1. **Quality of transit service**:
   - All transit service types currently available along corridor (bus, light rail, water taxi, etc).
   - Frequency of transit service using headways (in minutes) and weekend versus weekday service differences (if any).
   - Number of bus lines serving the corridor.
   - Any nearby regional service such as light rail or bus rapid transit.
2. **Average distance between stops:** measured in miles

3. **Accessibility to city center/employment center:** a yes/no measurement to assesses whether or not the future streetcar will create a new physical connection to a city center or employment center where one does not currently exist (for example: a new bridge, underpass or street connection).

FIGURE A.1: INITIAL INPUT SCREEN, TOP PORTION (EXAMPLE)
PREDICTIVE ECONOMIC DEVELOPMENT MODEL

PUBLIC INFRASTRUCTURE

TRANSIT AND ACCESSIBILITY

How is the current transit service in the corridor? Will the streetcar improve transit service and connectivity?
Will the streetcar improve accessibility to the city core or other major town center or employment center?

		Existing Conditions	Projected Conditions w/Streetcar	Impact on Development	NEGATIVE High	NEGATIVE Med	NEGATIVE Low	Neutral	POSITIVE Low	POSITIVE Med	POSITIVE High
1	Quality of Transit Service (scale 1-5)	2	4	*Med +*						■	
2	Average Distance Between Stops (scale 1-5)	5	5	*Neutral*				■			
3	Will the new streetcar line provide new or vastly improved access to a "Major Destination" district (Central Business District/Town Center/Major Employment Center) that does not exist currently through the traditional street and transit network? (For instance, will the new streetcar line travel above or beneath a previous physical barrier such as a freeway or waterway, to provide a faster/more direct route to the Destination district, whereas the current street system is encumbered by that barrier?) (scale 1-5)		No	*Neutral*				■			
4	Transit Score (if not available, leave blank)	65	77	*Med +*						■	
5	Connection to Existing Streetcar Network (Yes/No)		Yes	*Med +*						■	

PEDESTRIAN ENVIRONMENT

What is the current pedestrian environment in the corridor? Does the streetcar project include improvements to sidewalks and streetscape?
Are there services, shopping and other destinations to walk to?

		Existing Conditions	Projected Conditions w/Streetcar	Impact on Development	NEGATIVE High	NEGATIVE Med	NEGATIVE Low	Neutral	POSITIVE Low	POSITIVE Med	POSITIVE High
6	Quality of Sidewalk Network (scale 1-5)	3	4	*Low +*					■		
7	Quality of Pedestrian Experience (scale 1-5)	3	4	*Low +*					■		
8	Availability of Services (Walkscore)	66		*Low +*					■		

PUBLIC POLICY

Will the streetcar corridor have zoning, financial tools, and other public policy advantages over other similarly zoned corridor in the city?
Are specific changes to zoning and public policy planned as part of streetcar implementation?

		Existing Conditions	Projected Conditions w/Streetcar	Impact on Development	NEGATIVE High	NEGATIVE Med	NEGATIVE Low	Neutral	POSITIVE Low	POSITIVE Med	POSITIVE High
9	Public Tools Available (scale 1-5)	3	4	*Low +*					■		

Source: Johnson Reid LLC, Angelo Planning Group

4. **Transit Score:** measured from the center of the corridor segment, a proprietary algorithm based on the number of transit options in a given area. Where available,

Transit Score can be found on walkscore.com. If not available, leave the input blank; the model is designed to function without it.

5. **Connection to existing streetcar:** a yes/no measurement indicating whether or not the corridor being studied will connect to an existing streetcar line.

Pedestrian Environment

6. **Quality of sidewalk network:**
   - Sidewalk widths, measured in feet and averaged throughout corridor.
   - Completeness of sidewalk network (for example, are there areas where no sidewalk exists?). Can be assessed via site visit, local sidewalk inventories (if available), or via satellite imagery.
   - Condition, smoothness of sidewalk.
   - Presence of curb cuts at intersections to reduce crossing distance, expressed as a general observation from site visits.
   - Frequency of marked and/or signalized pedestrian crossings, both at intersections and mid-block, along corridor. Can typically be assessed using satellite imagery.
7. **Quality of pedestrian experience**
   - Presence of street trees, measured as average number of trees per block.
   - Posted speed limit.
   - Number of vehicle travel lanes along corridor.
   - Building orientation and placement, measured qualitatively during site visits to assess whether or not buildings are built to and oriented toward the sidewalk with obvious pedestrian entrances.
   - Presence of a landscaped buffer between the street and sidewalk.
8. **Availability of services (Walk Score™)**: measured at the center of the corridor segment being studied, Walk Score is a proprietary algorithm that measures the "walkability" of a location or neighborhood using the proximity to businesses, green space, civic locations, and other attractions. Information and data can be found at http://www.walkscore.com.

Public Policy

9. **Public Tools Available**: assessment of public funding and other tools available that will support streetcar development in the corridor. Examples include urban renewal, local improvement districts and waivers to system development charges. Review of existing zoning designation to determine if transit-oriented development types would be allowed under current regulations (densities, building heights, allowed uses, parking requirements, etc.)

Scoring

The following table (Figure A.2) provides guidance on how to score these initial inputs. Inputs scored on a scale of 1 to 5 represent a spectrum of conditions. The table provides definitions for scores of 1, 3 and 5. Scores of 2 and 4 represent gradations between these descriptions, based on the user's knowledge and expertise of the local corridor being studied.

FIGURE A.2: INITIAL INPUT SCREEN, SCORING

Input		Scale	Score			Data Sources
			1	3	5	
1	Quality of Transit Service	1 - 5	• No local transit service on planned streetcar corridor; or • Service with frequency of less than one transit visit per hour. • No access to a regional system such as light rail or bus rapid transit within 0.5 miles of main corridor street.	• Bus or equivalent transit mode on planned streetcar corridor. • One to two separate bus lines. • Service frequency of 15 to 30 minutes. • Bonus: Access to a regional system such as light rail or bus rapid transit within 0.5 miles of main corridor street.	• Bus or equivalent transit mode on planned streetcar corridor. • At least two separate bus lines. • Service frequency of no more than 15 minutes during rush hours. • Access to a regional system such as light rail or bus rapid transit within 0.5 miles of main corridor street.	Information from local transit agencies or city regarding transit service, frequency, and stop location.
2	Average Distance Between Stops/Stations	1 - 5	• No transit stops, or stops located more than 0.5 miles apart from each other along at least 75% of the main corridor street.	• Transit stops within 0.5 miles of each other along at least 75% of the main corridor street.	• Transit stops within .25 miles of each other along at least 75% of the main corridor street.	Local mapping sources, transit agency information, site visits, Google Maps

FIGURE A.2 (CONTINUED): INITIAL INPUT SCREEN, SCORING

Input		Scale	Score			Data Sources
			1	3	5	
3	Will the new streetcar line provide a new or vastly improved access to a "Major Destination" district (Central Business District/Town Center/Major Employment Center) that does not exist currently through the traditional street and transit network? (For instance, will the new streetcar line travel above or beneath a previous physical barrier such as a freeway or waterway, to provide a faster/more direct route to the Destination district, whereas the current street system is encumbered by that barrier?)	Yes/No	NA	NA	NA	Staff knowledge
4	Transit Score (if not available, leave blank)	Transit Score	Note: Measured at centroid of corridor segment being studied.			walkscore.com
5	Connection to Existing Streetcar Network. Will the proposed streetcar line connect to a current functioning streetcar system as an extension?	Yes/No	NA	NA	NA	Staff knowledge

FIGURE A.2 (CONTINUED): INITIAL INPUT SCREEN, SCORING

Input		Scale	Score			Data Sources
			1	3	5	
6	Quality of Sidewalk Network	1 - 5	• The main corridor street, and adjoining blocks, feature major discontinuity of the sidewalk system, with multiple segments of sidewalk missing and forcing users to detour or walk on unpaved area or the street (does not include sidewalks closed for repair). • Sidewalks are narrow and do not allow walkers and/or cyclists to comfortably or easily pass each other. • At least half of the sidewalks are in poor condition, with some combination of serious cracks, gaps, uneven surfaces, root damage. • Sidewalks lack curb cuts at intersections. • There are no marked or designated crossings of the main corridor street; or, crossings are located at least 0.5 miles apart. • Crossings are generally un-signalized.	• The main corridor street, and adjoining blocks, feature no more than two or three instances of discontinuity of the sidewalk system, such as missing sidewalks. • Sidewalks are generally wide enough for users to comfortably pass each other; at least six feet wide on the main corridor street. • No more than 25% of main corridor street features sidewalks that are in poor condition, with some combination of serious cracks, gaps, uneven surfaces, root damage. • Sidewalks feature curb cuts on at least 75% of intersections on main corridor street. • There are marked and designated crossings of the main corridor street generally located no more than 0.25 miles apart. • Signalized crossings are generally located no more than 0.25 miles apart.	• The main corridor street, and adjoining block, feature a continuous, finished sidewalk grid. • Sidewalks are generally wide enough for users to comfortably pass each other; at least eight feet wide on the main corridor street. • No more than 10% of main corridor street features sidewalks that are in poor condition, with some combination of serious cracks, gaps, uneven surfaces, root damage. • Sidewalks feature curb cuts on at least 90% of intersections on main corridor street. • There are marked and designated crossings of the main corridor street located no more than 0.25 miles apart. • Signalized crossings are located no more than 0.25 miles apart. • Crossings are generally within 500 feet of transit stops.	Local agencies may have a sidewalk inventory or other information to inform this input. Sidewalk width and quality can be assessed with site visits as well as aerial and "street view" imagery of Google Maps. Pedestrian crossings can be located and measured using site visits and Google Maps

FIGURE A.2 (CONTINUED): INITIAL INPUT SCREEN, SCORING

Input		Scale	Score			Data Sources
			1	3	5	
7	Quality of Pedestrian Experience	1 - 5	• The main corridor street features a posted speed limit of 40 mph or more. • The main corridor street features six or more lanes (including central or turning lane) • Buildings on the street have an auto-based orientation, with parking lots located between the sidewalk and the building. • Few or no buildings have a sidewalk-adjacent "storefront" character. • There are no street trees on most blocks of the main corridor street, or an average of no more than one per block. • The street trees that are present are young and/or provide poor coverage. • There is little other landscaping in a sidewalk planting strip or on adjacent private properties which improves the walking experience.	• The main corridor street features a posted speed limit between 31 and 40 mph. • The main corridor street features five lanes (including central or turning lane) • Buildings on the street are a fairly even mix of those which have an auto-based orientation, with parking lots located between the sidewalk and the building, and those with a sidewalk-adjacent "storefront" character. • There is an average of 1.5 to 2 street trees per block, most of which are mature and provide good canopy coverage when foliated. • There is other landscaping in the sidewalk planting strip or on adjacent private properties which improves the walking experience.	• The main corridor street features a posted speed limit of no more than 30 mph. • The main corridor street features four or fewer lanes (including central or turning lane) • It is more common for buildings to be sidewalk-adjacent or nearly so, than to be located behind parking lots. Direct access from the main corridor sidewalk to a residential or commercial building is common, and new buildings tend to be built this way. • There is an average of 2 street trees per block, most of which are mature and provide good canopy coverage when foliated. • There is other landscaping in the sidewalk planting strip or on adjacent private properties which improves the walking experience.	Travel lanes and speed limits can be counted using aerial imagery, local agency data, and site visits. Street tree locations and landscape buffers can be identified using aerial imagery on Google Maps and site visits. Building orientation can be assessed using aerial imagery and site visits.

FIGURE A.2 (CONTINUED): INITIAL INPUT SCREEN, SCORING

Input		Scale	Score			Data Sources
			1	3	5	
8	Availability of Services (Walk Score)	Walk Score	Note: Measured at centroid of corridor segment being studied.			walkscore.com
9	Public Tools Available	1 - 5	• There are no special zoning, incentive or financing programs for development in the proposed streetcar corridor which are not available in other similarly-zoned corridors in the city.	• The corridor has been zoned to facilitate transit-oriented development (TOD), such as with unique TOD zones, or overlay. • Such zoning might allow or require increased density, vertical mixed uses, reduced parking, and TOD design features such as street-orientation, and bike parking. • Small financial incentives are in place for qualified projects such as fee and SDC waivers, expedited permitting or other processing. • City may participate in one or two modest-scale public/private projects or land assembly actions.	• The corridor has been zoned to facilitate transit-oriented development (TOD), such as with unique TOD zones, or overlay. • Such zoning might allow or require increased density, vertical mixed uses, reduced parking, and TOD design features such as street-orientation, and bike parking. • Some master planning or other planning process has taken place which addresses in the detail the goal of improving the transit-orientation of the main corridor street. • Significant financial programs are in place such as Urban Renewal, Local Improvement District, or other economic development funding to participate in redevelopment in the corridor. (Above and beyond the cost of the streetcar improvements themselves.) • City may participate in multiple larger public/private projects. City may control key development sites in the corridor to guide development	• Local zoning code • Local economic development program information • Urban Renewal information

B. Initial Input Screen (Continued)

The lower section of the Initial Input Screen (Figure A.3 and A.4) allows the user to enter data on market dynamics in the corridor study area. The user may need to rely on local real estate expertise, or recent market studies, to find the requested market data.

FIGURE A.3: INITIAL INPUT SCREEN, BOTTOM PORTION (EXAMPLE)
PREDICTIVE ECONOMIC DEVELOPMENT MODEL

MARKET DYNAMICS

CURRENT MARKET PRICING (MARGINAL, ASSUMING NEW PRODUCT)			
10	Rental Residential	$2.10	Per Square Foot Per Month
11	Ownership Residential	$210	Per Square Foot
12	Office Space	$18.00	NNN (Triple Net Lease)
13	Retail Space	$18.00	NNN (Triple Net Lease)
14	Parking - Rental Residential	$75.00	Per Covered Secured Space per Month
15	Parking Price - Ownership	$15,000	Per Covered Secured Space
16	Parking - Office Space	$65.00	Per Covered Secured Space per Month
17	Average Annual Pricing Growth Trend (Residential-Rental)	2.0%	AAGR/Inflation Adjusted
18	Average Annual Pricing Growth Trend (Residential-Owner)	2.0%	AAGR/Inflation Adjusted
19	Average Annual Pricing Growth Trend (Office)	0.0%	AAGR/Inflation Adjusted
20	Average Annual Pricing Growth Trend (Retail)	0.0%	AAGR/Inflation Adjusted
OPERATING CHARACTERISTICS			
Structural Vacancy			
21	Rental Residential	5.0%	
22	Office	10.0%	
23	Retail	10.0%	
Operating Expenses			
24	Rental Residential	35.0%	
25	Office	5.0%	
26	Retail	5.0%	
FINANCIAL CHARACTERISTICS			
27	Rental Residential Cap Rate	6.50%	
28	Office Cap Rate	7.50%	
29	Retail Cap Rate	7.50%	
30	Ownership Residential, Return on Cost	20.00%	

Source: Johnson Reid LLC, Angelo Planning Group

The categories of input information are discussed below.

Achievable Pricing

Questions 10 – 16: These questions ask the user to input estimated achievable pricing levels for different land use types in the corridor, or segment of corridor, being studied. If it is possible for property managers to charge additional fees for parking in the area, that is reflected here as well.

These pricing estimates should represent the achievable pricing for *new real estate* in the study area, not the average of all real estate pricing. This is because new development or substantial renovation will charge pricing near the top of the achievable market, while many older and obsolete properties will pull down the average in the area. However, the assumptions of achievable pricing should reflect a realistic view of the quality of likely new development.

Recent Pricing Trends

Questions 17 – 20: These questions ask the user to indicate if pricing for any of these real estate uses has been exceeding or trailing inflation in recent years, and is expected to over the next 5 to 10 years. If rents have been exceeding inflation, this will be reflected in subsequent steps of the Model. Recent market analysis, rent data, or professional opinion might inform these answers. If this information is not available, these inputs may be left at "0%".

Operating Characteristics

Questions 21 – 26: These questions ask the user for inputs on standard operations for the different real estate types. These represent the levels of vacancy and expenses which might be considered normal across the market. They should represent the realistic anticipated operations of healthy new real estate, rather than the conditions in existing space, particularly if it is distressed.

Financial Characteristics

Questions 27 – 30: Financial characteristics have to do with the expected return that a developer/investor would expect from a new development project. This means "Cap Rate" for rental properties, and expected return for for-sale properties. These numbers vary due to market conditions and location and therefore professional expertise will likely be needed to determine the current "going rate" for these indicators.

Cap Rate (Capitalization Rate) = A measure of rate of return on investment real estate and is usually defined as Net Annual Income divided by Total Property Value. The higher the cap rate the greater the rate of return. In general, investors and lenders are willing to accept a lower cap rate in markets perceived to be less risky, and demand a higher return to invest in markets perceived as risky.

FIGURE A.4: INITIAL INPUT SCREEN, BOTTOM PORTION (CONTINUED)
PREDICTIVE ECONOMIC DEVELOPMENT MODEL

TIME PERIOD (YEARS)	10

Development Probability	RMV/Residual Category				
Time Period (Years)	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0
5	5%	4%	2%	0%	0%
10	10%	7%	3%	0%	0%
15	23%	13%	7%	3%	0%
20	35%	19%	12%	5%	0%
50	60%	30%	20%	10%	0%

Annual Rehab/Renovation Factor:	1.5%

SITE EFFICIENCY ADJUSTMENT	
Reduction Factor (% Realized Density):	75.0%
Minimum Efficient Site Size (sf):	8,000

Source: Johnson Reid LLC, Angelo Planning Group

The final section of the Initial Input Screen allows the user to set some assumptions for the study period and development levels in the study area.

Time Period: Set the time period of the study over which the user would like to test the impacts of streetcar. The Model assumes for the "Streetcar Scenario" that the streetcar improvements

are in place at the starting point, so the time period represents the development period after the introduction of streetcar.

Development Probability: In subsequent steps (described below), the Model determines the likelihood of development parcel by parcel. While some significant subset of the study area may be found to be "likely to (re)develop", in reality, not all of these parcels will develop in the study time period. Development in an area does not take place all at once, but in a procession of parcels.

To adjust for this reality, the Development Probability table allows for the adjustment of probabilities. The user can set the probabilities in the 10-year time frame, and the other time period adjust automatically based on the 10-year assumption.

As described below, the "RMV/Residual Category" is a measurement of the "redevelopability" of a site. Those with the lowest RMV/Residual Ratio are most likely to redevelop (the "<.75" category), while those with a higher ratio are less likely, or unlikely to redevelop. In general, an RMV/Residual Ratio of greater than 1.0 means that the property under its current use is as valuable or more valuable than under the proposed new use, and therefore unlikely to develop. (RMV/Residual Ratio is discussed in more detail below.)

The inputs to this table should be based on historic development patterns if possible. This means looking at the amount of land area in the study area which has developed over the prior 10 to 20 year period, to come up with a realistic estimate of development rate. Permitting data or GIS data can provide indicators of historical development activity. In the example above (Figure 7.3), if the study area has shown redevelopment of 7% of its land area in 10 years, the development probability in this table should reflect roughly an average of 7% across the three lowest RMV/Residual Ratio categories. Those in the lowest category have a development probability somewhat higher than the area-wide average.

The user must endeavor to set these levels at realistic real-world levels. In some cases, historical development in the study area may be very modest, with streetcar development expected to increase development activity. In that case, the user may set a somewhat higher rate of development probability over the study period, however this increased rate should be set conservatively.

Annual Rehab/Renovation Factor: This represents the amount of rehab of existing properties that takes place in the study area. This is important because not all investment in the streetcar corridor will take the place of new development. In a successful corridor, there will be reinvestment and reuse of existing properties.

This factor represents = value of annual rehab/renovation permits as a percentage of total Real Market Value. Permitting data can help determine the assumption used here. This factor may be based on activity in the study area itself, but a city-wide or representative sample area can be substituted as well.

Site Efficiency Adjustment: This adjustment helps to model the reality that smaller sites are more difficult to develop to the density level of larger sites. This is largely due to the needs for circulation/parking, setbacks, and common areas which consume proportionately more of a small site, than a larger site which has greater efficiency of scale. These inputs will rely on user judgment of the nature and zoning of smaller sites in the study area and what barriers they face to efficient use.

C. Development Adjustment Factors

The inputs into the Initial Input Screen shown above feed into subsequent steps in the model. The first set of inputs (Questions 1 -9) help to determine the marginal impact to rents, costs and return factors from streetcar improvements. These represent the changes to these factors in the subsequent pro-forma analysis between the Baseline and Streetcar Scenarios. For example in Figure A.5, Streetcar Improvements are expected to increase rent potential by 6%.

FIGURE A.5: LEVERS OF IMPACT FROM STREETCAR AND RELATED IMPROVEMENTS

	Office	*Retail*	*Residential*	*Mixed use*
Achievable Pricing/ Rents:	6%	6%	6%	
Construction Costs:	-3%	-3%	-3%	-3%
Operating Costs:	-2%	-2%	-2%	-2%
Cap Rates:	-6%	-6%	-6%	-6%

Source: Johnson Reid LLC

D. Prototype Development Pro Formas

Following the Initial Input Screen, is a set of pro forma screens, reflecting a range of development types. Each development type is a combination of land use (i.e. office) and building type (i.e. mid-rise). There are a total of 27 of these combinations.

The full list of development types in the standard Model is shown below. Individual users can add or modify different development programs as needed.

FIGURE A.6: PROTOTYPICAL DEVELOPMENT PRO FORMAS

Land Use Category/ Building Form	Parking Form
OFFICE	
office high rise	several floors of structured parking
office mid/struc	one basement parking level
office mid/podium	parking under podium
office mid surf + struc 2	integrated pkg struc
office mid surf + struc 1	struc pkg outside bldg footprint
office mid/surf	all surface parking
office low rise	all surface parking
RETAIL	
mid rise dept. store	struc pkg outside bldg footprint
retail low rise	all surface parking
MIXED USE RESID./COMM.	
MU res/ret high rise	integrated pkg struc
MU res/ret mid/struc 2	integrated pkg struc
MU res/ret mid/struc 1	separate pkg struc
MU res/ret mid/surf	surface parking
MU res/ret type v/podium	some under-podium parking
MU res/ret 3-story wood w/surf SM	surface parking
MU res/ret 3-story wood w/surf LG	surface parking
RENTAL RESIDENTIAL	
residential high rise	integrated pkg struc
residential mid/struc 2	integrated pkg struc
type v/podium	some under-podium parking
2-story wood w/surf	Surface Parking
3-story wood townhome	surface parking
3-story wood Zero Park	No Parking
OWNERSHIP RESIDENTIAL	
residential high rise	integrated pkg struc
residential mid/struc 2	integrated pkg struc
type v/podium	some under-podium parking
2-story wood w/surf	Surface Parking
3-story wood townhome	surface parking

Source: Johnson Reid LLC

Figure A.7 shows the Pro Forma worksheet for the Office types, as an example. Most of the information on this worksheet is designed to translate between corridors and locations. Needed inputs are highlighted in Red, and include average construction costs for different land use types in the market, and structured parking costs.

FIGURE A.7: OFFICE PRO FORMA SHEET (EXAMPLE)

PREDICTIVE ECONOMIC DEVELOPMENT MODEL

		office high rise	office mid/struc	office mid/podium	office mid surf + struc 2	office mid surf + struc 1	office mid/surf	office low rise
PROGRAM	**Property Assumptions**							
	Site Size (SF)	20,000	13,000	10,000	25,000	20,000	20,000	10,000
	Bldg Footprint	19,000	12,000	9,500	8,500	7,500	3,500	4,000
	Stories	8	5	2	4	3	3	1
	FAR	10.45	6.46	2.85	2.04	1.50	0.53	0.40
	Building Square Feet	152,000	60,000	19,000	34,000	22,500	10,500	4,000
	Efficiency	85%	85%	85%	85%	85%	85%	90%
	Leasable Area	129,200	51,000	16,150	28,900	19,125	8,925	3,600
	Parking Ratio/000 SF	1.0	1.0	2.0	2.0	3.0	3.0	3.0
	Parking Spaces	129	51	32	57	57	26	10
	Parking SF/Space - Surface	350	350	350	350	350	350	350
	Parking SF/Space - Structure	425	425	375	425	375	425	425
	Parking Spaces - Surface	-	-	-	14	29	26	10
	Parking Spaces - Structure	129	51	32	43	29	-	-
	Structured Parking %	100%	100%	100%	75%	50%	0%	0%
	Structured Parking Stories	3	2	1	2	1	0	0
	% of Struc Pkg in Bldg FP	100%	100%	100%	0%	0%	0%	0%
	Base Construction Cost/SF	$185	$175	$140	$140	$140	$140	$130
	Adjustment Factor	0%	0%	0%	0%	0%	0%	0%
	Construction Cost/SF	$185	$175	$140	$140	$140	$140	$130
	Base Parking Costs/Space	$35,000	$30,000	$18,000	$35,000	$30,000	$0	$0
	Adjustment Factor	0%	0%	0%	0%	0%	0%	0%
	Structured Parking Cost/Space	$35,000	$30,000	$18,000	$35,000	$30,000	$0	$0
OPERATING ASSUMPTIONS	**Income Assumptions**							
	Base Income/Sf/Yr.	$18.00	$18.00	$18.00	$18.00	$18.00	$18.00	$18.00
	Adjustment Factor	0%	0%	0%	0%	0%	0%	0%
	Achievable Pricing	$18.00	$18.00	$18.00	$18.00	$18.00	$18.00	$18.00
	Parking Charges/Space/Mo	$65	$65	$65	$65	$65	$65	$65
	Expense Assumptions							
	Vacancy/Collection Loss	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
	Base Operating Expenses	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
	Adjustment Factor	0%	0%	0%	0%	0%	0%	0%
	Operating Expenses	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
	Reserve & Replacement	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
	Valuation Assumptions							
	Base Capitalization Rate	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
	Adjustment Factor	0%	0%	0%	0%	0%	0%	0%
	Capitalization Rate	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%

Source: Johnson Reid LLC

FIGURE A.8: OFFICE PRO FORMA SHEET (EXAMPLE) (CONTINUED)

SUPPORTABLE PROPERTY VALUE								
Cost								
Cost/Construct w/o prkg.	$28,120,000	$10,500,000	$2,660,000	$4,760,000	$3,150,000	$1,470,000	$520,000
Total Parking Costs	$4,515,000	$1,530,000	$576,000	$1,496,250	$855,000	$0	$0
Estimated Project Cost	$32,635,000	$12,030,000	$3,236,000	$6,256,250	$4,005,000	$1,470,000	$520,000
Income							
Annual Base Income	$2,325,600	$918,000	$290,700	$520,200	$344,250	$160,650	$64,800
Annual Parking	$100,620	$39,780	$24,960	$33,345	$22,230	$0	$0
Gross Annual Income	$2,426,220	$957,780	$315,660	$553,545	$366,480	$160,650	$64,800
Less: Vacancy & CL	$242,622	$95,778	$31,566	$55,355	$36,648	$16,065	$6,480
Effective Gross Income	$2,183,598	$862,002	$284,094	$498,191	$329,832	$144,585	$58,320
Less Expenses:							
Operating Expenses	$109,180	$43,100	$14,205	$24,910	$16,492	$7,229	$2,916
Reserve & Replacement	$65,508	$25,860	$8,523	$14,946	$9,895	$4,338	$1,750
Annual NOI	$2,008,910	$793,042	$261,366	$458,335	$303,445	$133,018	$53,654
Property Valuation							
Return on Cost	6.16%	6.59%	8.08%	7.33%	7.58%	9.05%	10.32%
Threshold Return on Cost	8.63%	8.63%	8.63%	8.63%	8.63%	8.63%	8.63%
Residual Property Value	($9,343,288)	($2,835,312)	($205,664)	($942,218)	($486,792)	$72,240	$102,080
RPV/SF	**($467.16)**	**($218.10)**	**($20.57)**	**($37.69)**	**($24.34)**	**$3.61**	**$10.21**

Source: Johnson Reid LLC

Figure A.8 shows the bottom of the example Pro Forma worksheet. The worksheet ends in a calculation of "Residual Property Value" (RPV), and RPV/Square Foot. Under the approach used in this Model, the RPV is a key determinate of the developability of a given parcel, and therefore this is a calculation is central to the functioning of the model.

Residual Property Value (RPV) reflects the maximum supportable acquisition value of the property, under the assumed development program (i.e. what the developer is willing to pay given the economic performance of the proposed use). The permitted use that yields the highest Residual Property Value is considered the most attractive use in terms of financial return to the developer.

- In the example above the "low rise office" development program has the highest estimated RPV/SF, at $10.21. Among office uses, it is the most valuable use.
- The lowest RPV/SF is estimated for "high rise office" at -$467.16. This means that to make this use feasible to the developer, he/she would require a subsidy of at least $467 per square foot. In other words, in this location at this time, high rise construction is

widely expensive relative to the actual rent levels that the developer could hope to achieve.

- The current rent levels justify low-rise construction, or perhaps mid-rise construction with surface parking. Denser types of office uses currently represent a money-losing (infeasible) proposition.

Remaining Prototypical Development Programs

The Pro Forma worksheet for office programs is provided above as an example. An equivalent worksheet is provided for each of the remaining categories: Retail, Mixed Use, Rental Residential, and Ownership Residential.

E. Zoning Screen

Following the Pro Forma worksheets, is the Zoning Screen, in which the user describes the individual zones found in the corridor study area, and details which uses are permitted in each zone. Not every use is allowed in every zone. If the use with the highest RPV/SF ratio is not permitted, the "highest and best use" in that zone will be the use with the highest ratio that *is* permitted.

Figure A.9 on the following page shows a truncated example of the Zoning Screen worksheet. Zoning types are inputted by row in the left hand section. (The section in the middle updates automatically).

The section on the right shows the Office uses used in the previous example (Figures A.7 and A.8). The calculated RPV/SF is shown along the type, under each of the Office development types. The table below, bounded by a red line, is where the user indicates if a given development form is permitted or not permitted. This is indicated with a simple "1" for permitted, and "0" for not permitted.

Conditional Uses: The Model uses a simple permitted/not permitted standard for the zoning screen. Many of these building types may be allowed as a "conditional use", "limited use", or

other gradation of allowance. For the sake of this table, the knowledgeable local user should determine the impact of the Conditional Use provisions for a given development type. Does the Conditional Use represent a small impediment, or does it make the development type unlikely to actually occur in the real world. In general, Johnson Reid recommends erring on the site of listing uses which may occur as permitted, even if there are some conditions.

Figure A.9 is a truncated view of the Zoning Screen worksheet. In the Model, this worksheet extends to the right, where the other prototypical development types are found, and the zoning permissions are inputted for them in the same manner.

Based on what is permitted or not permitted in a given zone, the permitted use with the highest RPV/SF is identified and listed automatically in the central box. This is the identified highest and best use from an economic return perspective for parcels in that zone.

FIGURE A.9: ZONING SCREEN (TRUNCATED)
PREDICTIVE ECONOMIC DEVELOPMENT MODEL

				Office						
				($467.16)	($218.10)	($20.57)	($37.69)	($24.34)	$3.61	$10.21
CODE	Code Description	Residual	Use Description	office high rise	office mid/struc	office mid/podium	office mid surf + struc 2	office mid surf + struc 1	office mid/surf	office low rise
RH	High Density Residential	$136.26	residential mid/struc 2	0	0	0	0	0	0	0
R1	Residential 1,000	$71.49	3-story wood townhome	0	0	0	0	0	0	0
R2	Residential 2,000	$71.49	3-story wood townhome	0	0	0	0	0	0	0
R5	Residential 5,000	$0.00	N/A	0	0	0	0	0	0	0
CS	Storefront Commercial	$193.98	3-story wood Zero Park	0	0	0	0	1	1	1
CN1	Neighborhood Commercial 1	$71.49	3-story wood townhome	0	0	0	0	0	0	1
CX	Central Commercial	$103.55	MU res/ret mid/surf	1	1	1	1	1	1	1
CG	General Commercial	$103.55	MU res/ret mid/surf	0	0	0	1	1	1	1
OS	Open Space	$0.00	N/A	0	0	0	0	0	0	0
CO2	Office Commercial 2	$71.49	3-story wood townhome	0	0	0	0	0	1	1
CM	Mixed Commercial/Residential	$193.98	3-story wood Zero Park	0	0	0	1	1	1	1

Source: Johnson Reid LLC

F. Redevelopment Screen

Following the Zoning Screen, is the Redevelopment Screen (Figure A.11). This worksheet allows the user to enter data on individual parcels within the study area. The Real Market Value (RMV) per square foot of each parcel is compared to the Residual Property Value (RPV) per square foot of the highest and best economic use for the appropriate zoning code (from the Zoning Screen worksheet). The comparison of RMV to RPV is completed automatically, generating a RMV/Residual ratio.

The parcel data is inputted as a list of parcels in the four left-hand columns. (The parcel list in Figure A.11 is shortened for presentation; an actual study area will likely have parcels numbering in the thousands). The necessary fields of data for each parcel are:

- Tax lot or Parcel I.D.
- Zoning Code (must match the Codes included in the Zoning Screen sheet)
- Estimate of Real Market Value (RMV)
- Square Footage (SF)

It is the hope and intention that most cities of sufficient size to be considering undertaking a streetcar project will have access to this type of data through some combination of local and tax assessor database or GIS data.

After the parcel data is inputted in the left-hand columns, the remainder of the worksheet should calculate automatically. The box in the center of the worksheet (right side in the truncated example in Figure A.11) breaks the parcels into categories of RMV/Residual ratio, and tallies the number of parcels in each category. The categories are as follows:

FIGURE A.10: RMV/RESIDUAL CATEGORIES

RMV/Residual Category	Likelihood of Redevelopment
<.75	Most likely to redevelop
.75-1.25	Somewhat likely
1.25-2.0	May redevelop
2.0-4.0	Unlikely
>4.0	Highly Unlikely

The Residual Property Value represents the estimated value that a developer would pay for a parcel under the proposed use. Therefore, if the Real Market Value of the parcel is at or below the Residual level, it is a more likely target for redevelopment. If the RMV is higher than the Residual value, then the site is assumed to be more expensive than its value as a development site (i.e. the Residual), and therefore a less likely development opportunity.

FIGURE A.11: REDEVELOPMENT SCREEN (TRUNCATED)

PREDICTIVE ECONOMIC DEVELOPMENT MODEL

Parcel	Code	RMV	SF	RMV/SF	Residual	RMV/Residual	RMV/Residual Category				
							<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0
R140915820	R2	$255,990	1,810	$141	$71.49	1.98	0	0	1	0	0
R649782930	R2	$281,480	4,839	$58	$71.49	0.81	0	1	0	0	0
R669102900	R2	$763,290	15,201	$50	$71.49	0.70	1	0	0	0	0
R669102850	R2	$30,000	5,250	$6	$71.49	0.08	1	0	0	0	0
R669102800	R2	$538,570	5,250	$103	$71.49	1.43	0	0	1	0	0
R669102820	R2	$218,510	4,491	$49	$71.49	0.68	1	0	0	0	0
R669102830	R2	$287,830	4,691	$61	$71.49	0.86	0	1	0	0	0
R669102840	R2	$309,390	8,796	$35	$71.49	0.49	1	0	0	0	0
R825802300	R2	$249,100	3,527	$71	$71.49	0.99	0	1	0	0	0
R825802680	R2	$227,270	4,018	$57	$71.49	0.79	0	1	0	0	0
R825802700	R2	$302,650	3,524	$86	$71.49	1.20	0	1	0	0	0
R825802780	R2	$8,000	3,767	$2	$71.49	0.03	1	0	0	0	0
R825803080	R2	$8,000	4,510	$2	$71.49	0.02	1	0	0	0	0
R825804590	R2	$107,730	17,567	$6	$71.49	0.09	1	0	0	0	0
R991150330	R2	$13,000	4,536	$3	$71.49	0.04	1	0	0	0	0
R175800200	R2	$275,040	8,767	$31	$71.49	0.44	1	0	0	0	0
R175800150	R2	$254,710	2,972	$86	$71.49	1.20	0	1	0	0	0
R175800100	R2	$262,250	2,972	$88	$71.49	1.23	0	1	0	0	0
R175800050	R2	$277,340	3,990	$70	$71.49	0.97	0	1	0	0	0
R669103100	R2	$311,070	8,490	$37	$71.49	0.51	1	0	0	0	0
R669103070	R2	$446,420	12,736	$35	$71.49	0.49	1	0	0	0	0
R991150270	R5	$3,369,660	168,569	$20	$0.00	10.00	0	0	0	0	1
R991150600	R2	$15,860	7,035	$2	$71.49	0.03	1	0	0	0	0
R825804520	R2	$201,190	7,736	$26	$71.49	0.36	1	0	0	0	0
R825804510	R2	$3,000	1,559	$2	$71.49	0.03	1	0	0	0	0
R649865010	R2	$320,960	2,209	$145	$71.49	2.03	0	0	0	1	0
R649865020	R2	$320,960	2,312	$139	$71.49	1.94	0	0	1	0	0
R991150580	R2	$250,330	4,096	$61	$71.49	0.86	0	1	0	0	0
R991151210	R2	$529,000	8,075	$66	$71.49	0.92	0	1	0	0	0
TOTALS		$10,438,600	333,292				14	10	3	1	1

Source: Johnson Reid LLC

Below the box of RMV/Residual categories (Figure A.11), there are also tallies of the land in each category by number of sites, square footage, acreage, and real market value (see Figure A.12). Finally, a tally is produced of the RMV of sites which the model assumes will develop/redevelop in the study time frame. (This is based on the Development Probability entered on the Initial Input Screen.) These tallies are used on the following screen to produce the Model's outputted estimates of development activity.

FIGURE A.12: REDEVELOPMENT SCREEN (CONTINUED)
PREDICTIVE ECONOMIC DEVELOPMENT MODEL

	SITES					
	RMV/Residual Category					
ZONING	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0	Total
RH	28	3	25	15	31	102
R1	19	27	30	36	235	347
R2	38	56	74	49	37	254
R5	0	0	0	0	15	15
CS	53	22	17	27	18	137
CN1	0	0	0	0	0	0
CX	36	5	2	1	17	61
CG	1	1	0	0	0	2
OS	0	0	0	0	0	0
CO2	0	0	1	0	0	1
CM	2	0	0	0	1	3
TOTAL	177	114	149	128	354	922

	SQUARE FEET OF LAND					
	RMV/Residual Category					
ZONING	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0	Total
TOTAL	3,535,482	800,390	706,762	193,951	1,401,680	6,638,265

	ACREAGE					
	RMV/Residual Category					
ZONING	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0	Total
TOTAL	81	18	16	4	32	152

	CURRENT RMV/$000s					
	RMV/Residual Category					
ZONING	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0	Total
TOTAL	$147,498.3	$74,588.7	$90,140.3	$43,045.1	$296,743.6	$652,015.9

	CURRENT RMV ($000s)/Assumed Dev/Redev					
	RMV/Residual Category					
ZONING	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0	Total
TOTAL	$14,749.8	$5,221.2	$2,704.2	$0.0	$0.0	$22,675.2

Source: Johnson Reid LLC

G. Development Activity Output

The following screen (Figure A.13) shows the estimate of development activity resulting from the example presented above. This is the Model's output, resulting from the information entered in the screens shown thus far. This screen updates automatically from previous screens and doesn't require further user input.

Figure A.13 shows the predicted development output for the "Baseline Scenario" of the hypothetical corridor which has been shown in the previous examples in this section.

- The table in the upper left shows the square footage of land area in each RMV/Residual ratio category (from the Redevelopment Screen).
- This total area is multiplied by the Development Probability (from the Initial Input Screen).
- This produces the table just below, which is the bulk estimate of developable lands in the corridor study area. In this example, the "< 0.75" category is multiplied by 10%. The categories where RMV/Residual is greater than 2.0 are determined to have low likelihood of redevelopment, so 0% of the land area in those categories pass through this screen.
- The determination of predicted development land area by zone is then compared to the highest and best economic use in those zones (from the Zoning Screen) to estimate the amount of **construction investment**, **housing units** and **commercial space** resulting from that development.
- Finally, the change in **Real Market Value** is calculated both from new development, and renovation/reinvestment in existing properties.

Figure A.13 shows the predicted development output for the "Baseline Scenario" of the hypothetical corridor which has been shown in the previous examples in this section. This example resulted in a Baseline Scenario forecast of:

- $72.2 million in new construction investment

- 621 new housing units
- 21,500 square feet of commercial space
- $217.3 million in new Real Market Value

(As discussed in the conclusions of this report, the outputs are inherently more precise then can realistically be forecasted. They are best viewed as an indicator of the potential overall magnitude of development activity, rather than a prediction that the corridor will achieve exactly 620 units, or $72 million in construction investment.)

This is an example of the Baseline Scenario outputs. The next steps in the model are to produce similar outputs for the Streetcar Scenario, then compare the two sets of results to judge what additional impact the streetcar improvements are predicted to have.

FIGURE A.13: PREDICTED DEVELOPMENT ACTIVITY (OUTPUT SCREEN)

PREDICTIVE ECONOMIC DEVELOPMENT MODEL

	SQUARE FEET OF LAND (Scale Adjusted)					
	RMV/Residual Category					
ZONING	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0	Total
RH	221,627	14,218	22,048	7,000	82,844	347,738
R1	292,148	146,785	233,037	32,024	614,341	1,318,336
R2	639,309	220,637	175,027	61,129	111,340	1,207,443
R5	0	0	0	0	282,236	282,236
CS	736,484	76,757	9,211	10,364	33,985	866,801
CN1	0	0	0	0	0	0
CX	1,519,850	215,062	194,034	46,595	206,871	2,182,413
CG	12,514	39,842	0	0	0	52,357
OS	0	0	0	0	0	0
CO2	0	0	2,925	0	0	2,925
CM	21,679	0	0	0	5,262	26,941
TOTAL	3,443,612	713,303	636,282	157,112	1,336,879	6,287,189
Dev Probabili	10%	7%	3%	0%	0%	6%

	LAND DEVELOPED/REDEVELOPED (SF)							Predicted Development Yield			RMV/		Net
	RMV/Residual Category						Predicted Predominant	Construction	Residential	Commercial	Dev. or	Current	Change in
ZONING	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0	Total	Development Form	Investment	Units	Space	Redev.	RMV	RMV
RH	22,163	995	661	0	0	23,819	residential mid/struc 2	$14,625,157	80	0	$20,551,520	$1,828,776	$18,722,744
R1	29,215	10,275	6,991	0	0	46,481	3-story wood townhome	$3,625,511	27	0	$7,990,451	$2,825,265	$5,165,186
R2	63,931	15,445	5,251	0	0	84,626	3-story wood townhome	$6,600,856	50	0	$14,547,967	$4,055,286	$10,492,681
R5	0	0	0	0	0	0	N/A	$0	0	0	$0	$0	$0
CS	73,648	5,373	276	0	0	79,298	3-story wood Zero Park	$21,102,527	229	0	$41,957,599	$5,862,776	$36,094,823
CN1	0	0	0	0	0	0	3-story wood townhome	$0	0	0	$0	$0	$0
CX	151,985	15,054	5,821	0	0	172,860	MU res/ret mid/surf	$25,068,217	224	21,054	$51,561,072	$7,604,201	$43,956,871
CG	1,251	2,789	0	0	0	4,040	MU res/ret mid/surf	$585,938	5	492	$1,205,175	$341,383	$863,792
OS	0	0	0	0	0	0	N/A	$0	0	0	$0	$0	$0
CO2	0	0	88	0	0	88	3-story wood townhome	$6,845	0	0	$15,086	$10,853	$4,233
CM	2,168	0	0	0	0	2,168	3-story wood Zero Park	$576,909	6	0	$1,147,054	$146,702	$1,000,352
TOTAL	344,361	49,931	19,088	0	0	413,381	**TOTAL**	**$72,191,961**	**621**	**21,547**	**$138,975,923**	**$22,675,241**	**$116,300,683**
							TOTAL/REHAB/RENOVATION						**$101,034,870**
							OVERALL TOTAL						**$217,335,553**

Source: Johnson Reid LLC

H. Streetcar Scenario

The Model is designed so that the inputs described in the previous steps automatically generates the Streetcar Scenario subsequently to the Baseline Scenario. The Streetcar Scenario essentially follows the same steps, however the inputs used in the pro forma analysis for such factors as rent levels and costs factors are changed, based on the estimated Development Adjustment Factors which were derived on the Initial Input Screen.

In other words, the Streetcar Scenario models the impact of increased rent potential and lower costs from things such as reduced parking requirements on the same building types included in the Baseline Model.

The adjusted development factors can generally have two impacts:

1) Increase the Residual levels (i.e. the amount developers can pay for land) and therefore increase the amount of land in the lower RMV/Residual ratio categories. More land in these lower ratio categories means more is deemed likely to develop.
2) In some cases, where the real estate market in the corridor is already on the margin between lower density development and supporting a more dense form of development, the adjusted development factors may be sufficient to "push" the feasible development type to a denser, taller development type. (For instance, the higher rent level may now support mid-rise development where only low-rise was possible before.) This will only happen where the market is already near this threshold.

In the average tested corridor, the first type of impact is likely to be responsible for the majority of the difference between the Baseline and Streetcar scenarios. (This is discussed further in the conclusions of this report.)

Potential Adjustments to Streetcar Scenario

While the Model is designed to hold most factors constant between the Baseline and Streetcar scenarios, in order to allow the most direct comparison, the user does have the potential to

make changes to the Prototype Development Pro Forma worksheets, or the Zoning Screen worksheet if the user desires.

The user may wish to change the Zoning Screen if it is anticipated that the proposed streetcar program will be accompanied by zoning amendments which will change was is permitted or not permitted in the area. In other words, the zoning entitlements will change between the Baseline and Streetcar scenarios.

It is less clear why a user would want to change the Prototype Development Pro Forma worksheets between the scenarios, but the flexibility is there to do so. Such changes should be well considered and limited to realistically anticipated changes that would occur between the two scenarios.

Streetcar Scenario Outputs

The Model produces a Development Activity Output screen for the Streetcar Scenario that matches that of the Baseline Scenario (see Figure A.13). The two scenarios are then compared to determine the net gain from streetcar improvements (see below).

I. Reconciliation Baseline and Streetcar Scenarios

The final step in the Model is to compare the outputs of the Baseline and Streetcar Scenarios. This is done automatically. Figure A.14 presents the comparison of results from the hypothetical corridor Modeled in the examples above. In this example, the streetcar improvements are judged to have a positive impact on all indicators, increasing investment, production of housing and commercial space, and resulting change in Real Market Value.

FIGURE A.14: RECONCILIATION OF BASELINE AND STREETCAR SCENARIOS
PREDICTIVE ECONOMIC DEVELOPMENT MODEL

BASELINE					
		Predicted Development Yield			Net
ZONING	Predicted Predominant Development Form	Construction Investment	Residential Units	Commercial Space	Change in RMV
RH	residential mid/struc 2	$14,625,157	80	0	$18,722,744
R1	3-story wood townhome	$3,625,511	27	0	$5,165,186
R2	3-story wood townhome	$6,600,856	50	0	$10,492,681
R5	N/A	$0	0	0	$0
CS	3-story wood Zero Park	$21,102,527	229	0	$36,094,823
CN1	3-story wood townhome	$0	0	0	$0
CX	MU res/ret high rise	$25,068,217	224	21,054	$43,956,871
CG	MU res/ret mid/surf	$585,938	5	492	$863,792
OS	N/A	$0	0	0	$0
CO2	3-story wood townhome	$6,845	0	0	$4,233
CM	3-story wood Zero Park	$576,909	6	0	$1,000,352
	TOTAL/NEW CONSTRUCTION	**$72,191,961**	**621**	**21,547**	**$116,300,683**
	TOTAL/REHAB/RENOVATION	**$101,034,870**			**$101,034,870**
	OVERALL TOTAL	**$173,226,831**			**$217,335,553**

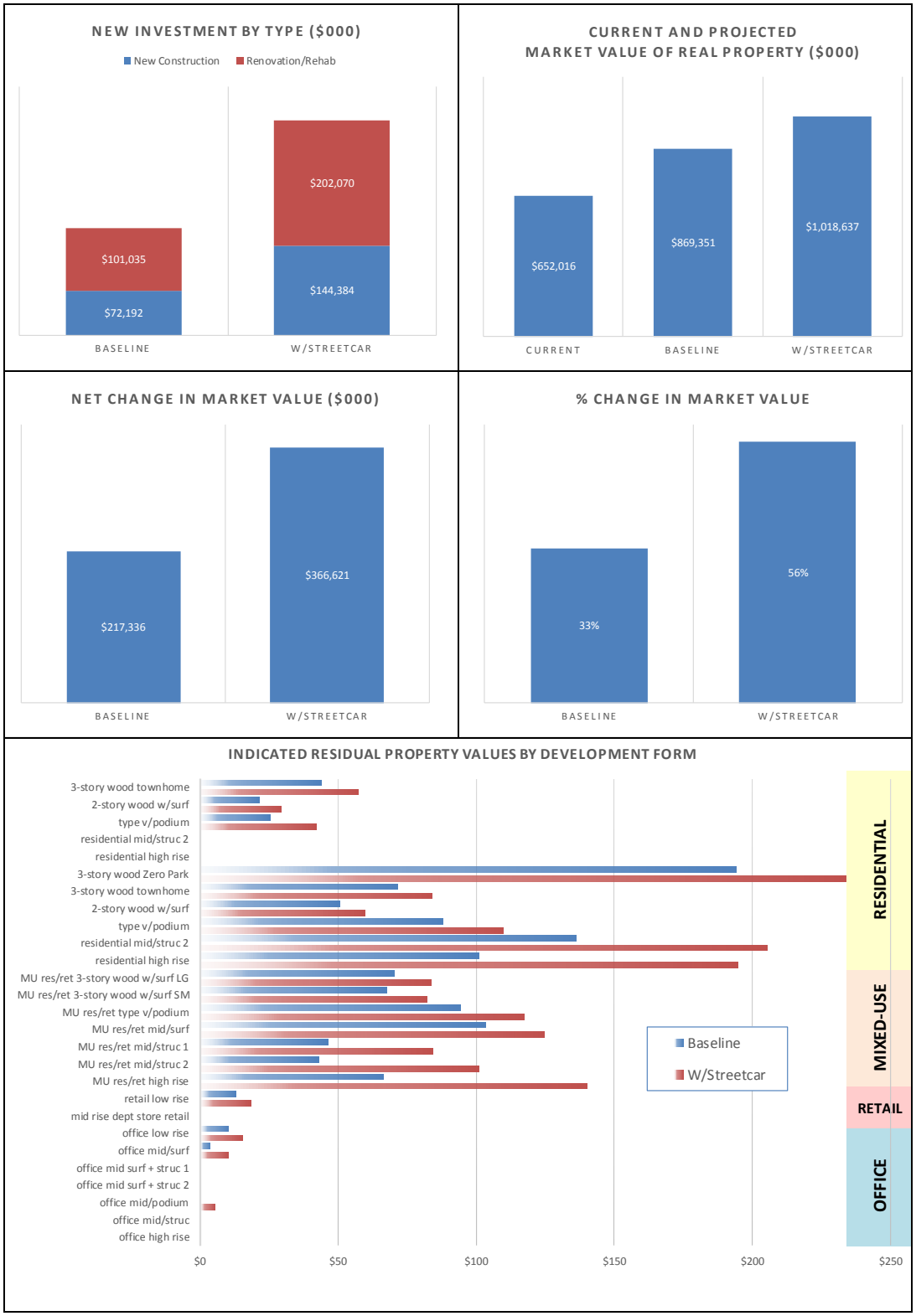
WITH STREETCAR IMPROVEMENTS					
		Predicted Development Yield			Net
ZONING	Predicted Predominant Development Form	Construction Investment	Residential Units	Commercial Space	Change in RMV
RH	residential mid/struc 2	$15,070,361	85	0	$22,537,186
R1	3-story wood townhome	$3,657,731	28	0	$6,378,431
R2	3-story wood townhome	$6,790,648	53	0	$12,784,372
R5	N/A	$0	0	0	$0
CS	3-story wood Zero Park	$20,756,753	232	0	$42,150,323
CN1	3-story wood townhome	$0	0	0	$0
CX	MU res/ret high rise	$126,847,814	725	34,027	$173,552,903
CG	MU res/ret mid/surf	$737,130	6	638	$1,218,106
OS	N/A	$0	0	0	$0
CO2	3-story wood townhome	$15,506	0	0	$14,622
CM	3-story wood Zero Park	$560,083	6	0	$1,157,020
	TOTAL/NEW CONSTRUCTION	**$174,436,027**	**1,135**	**34,665**	**$259,792,963**
	TOTAL/REHAB/RENOVATION	**$106,827,704**			**$106,827,704**
	OVERALL TOTAL	**$281,263,731**			**$366,620,667**

NET DIFFERENTIAL	$108,036,900	514	13,118	$149,285,114

Source: Johnson Reid LLC

The final worksheet in the Model presents the comparison of the scenarios in graphic form (Figure A.15).

FIGURE A.15: RECONCILIATION OF SCENARIOS (GRAPHICS)
PREDICTIVE ECONOMIC DEVELOPMENT MODEL



J. Truth Testing of Results

The Model produces various assumptions about the developability of various parcels. The results for both the Baseline and Streetcar Scenarios should be mapped (if possible), and "truth tested" by users knowledgeable about the test corridor. There is no substitute for local knowledge in assessing the accuracy of results.

The Model does not generate mapped results. To generate map, a user with technical expertise in GIS software will be required to copy the list of parcel records from the Redevelopment Screen, along with the "RMV/Residual ratio category" to which the parcels have been assigned, and import into the GIS software.

Because this Model assesses parcels in bulk, it is likely to produce erroneous or otherwise unexpected results for some parcels. Depending on the time/effort the user wants to expend, it will be less important to consider every small parcel in the study area, however larger parcels will have a greater impact on the results and should be reviewed. Local planning professionals should have an idea of the condition of important sites, and of any development plans already in process which should be reflected.

Some situations which might arise:

- A public park, school or other large site is identified as a development site.
- A large site with known development interest is not registering as a likely site.
- Local expertise otherwise concludes a site is likely to redevelop, despite relatively high real market value.
- Individual parcel records have flawed data (such as when the real market value of two adjacent sites under common ownership is applied to only one site, and other is shown to have a RMV of zero.)

For sites that are important or large enough to skew the overall magnitude of the development findings, the user can correct these flaws by finding the individual parcel in the Redevelopment Screen worksheet and making manual changes to ensure that it is indicating the proper level of developability.

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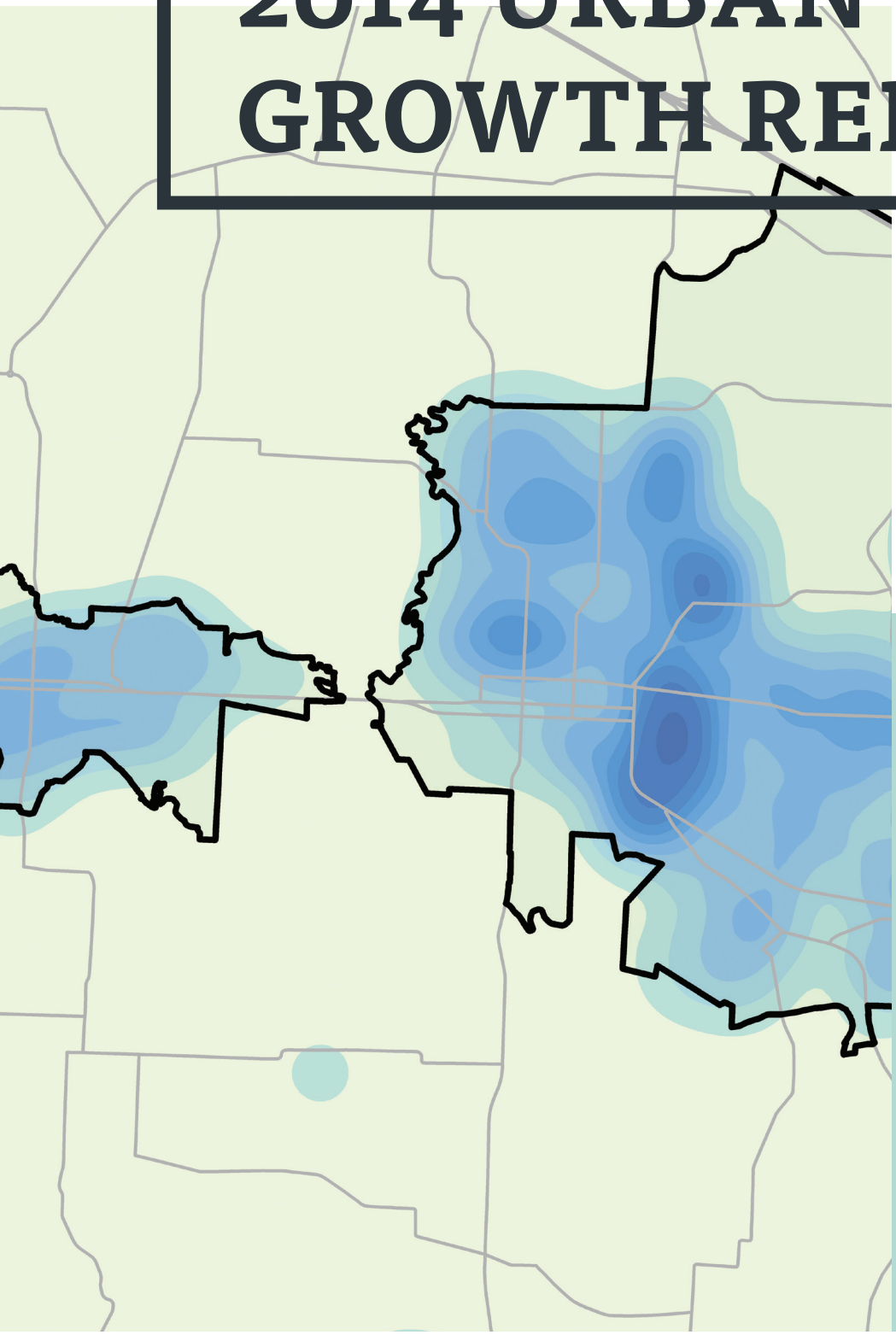

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TABLE OF CONTENTS

APPENDICES

Introduction

As the Portland metropolitan region grows, our shared values guide policy and investment choices to accommodate growth and change, while ensuring our unique quality of life is maintained for generations to come.

Metro, local jurisdictions and many other partners work together to guide development in the region. This means striking a balance between preservation of the farms and forests that surround the Portland region, supporting the revitalization of existing downtowns, main streets and employment areas, and ensuring there's land available for new development on the edge of the region when needed.

Oregon law requires that every five years, the Metro Council evaluate the capacity of the region's urban growth boundary to accommodate a 20-year forecast of housing needs and employment growth. The results of that evaluation are provided in the urban growth report.

While complying with the requirements of state law, the urban growth report serves as more than just an accounting of available acres inside the urban growth boundary. It plays a vital role in the implementation of the region's 50-year plan that calls for the efficient use of land, redevelopment before expansion, and the preservation of the region's resources for future generations.

ACHIEVING DESIRED OUTCOMES

To guide its decision-making, the Metro Council, on the advice of the Metro Policy Advisory Committee (MPAC), adopted six desired outcomes, characteristics of a successful region:

- People live, work and play in vibrant communities where their everyday needs are easily accessible.
- Current and future residents benefit from the region's sustained economic competitiveness and prosperity.
- People have safe and reliable transportation choices that enhance their quality of life.
- The region is a leader in minimizing contributions to global warming.
- Current and future generations enjoy clean air, clean water and healthy ecosystems.
- The benefits and burdens of growth and change are distributed equitably.

WORKING TOGETHER

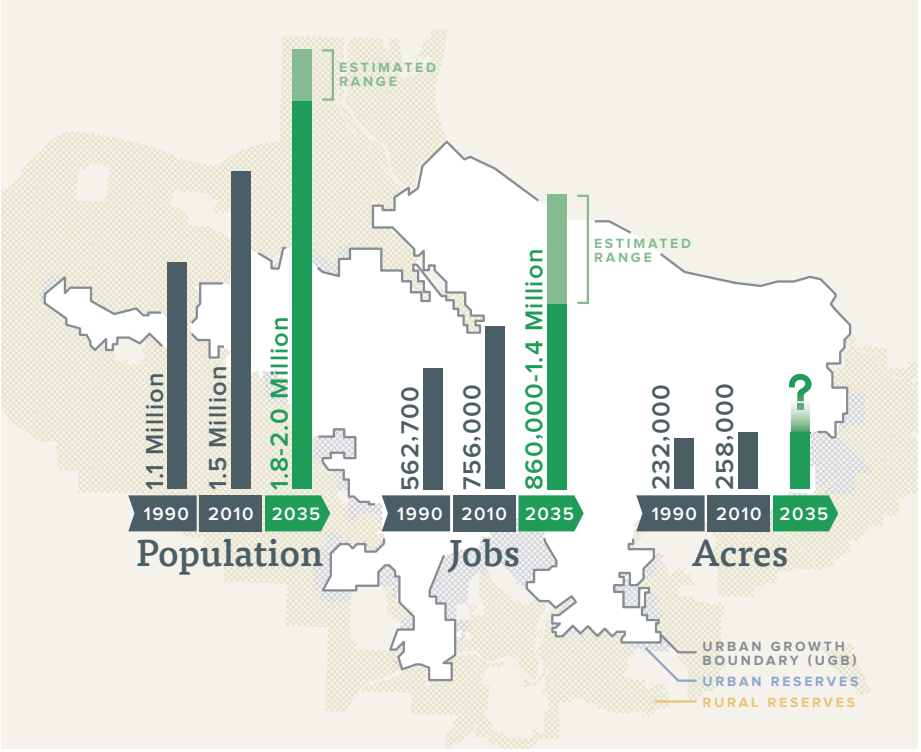
The population and employment range forecasts in the urban growth report help inform Metro, local jurisdictions, and other public and private sector partners as they consider new policies, investments, and actions to maintain the region's quality of life and promote prosperity.

The urban growth report, once accepted in its final form by the Metro Council in December 2014, will serve as the basis for the council's urban growth management decision, which will be made by the end of 2015.

But the work does not end with the council's decision. Implementation will require coordination of local, regional and state policy and investment actions. In its role as convener for regional decision-making, Metro is committed to building and maintaining partnerships and alignments among the different levels of government and between the public and private sectors.

Past growth-future forecast

Population and job growth within the Metro urban growth boundary
1990-2035



SUCCESSES AND CHALLENGES

The region's longstanding commitment to protecting farms and forests, investing in existing communities, and supporting businesses that export goods and services is paying off in economic growth. From 2001 to 2012, the Portland region ranked third among all U.S. metropolitan areas for productivity growth, outpacing the Research Triangle in North Carolina, the Silicon Valley in California, and several energy producing regions in Texas.[i] Likewise, the region's walkable downtowns, natural landscapes, and renowned restaurants, breweries, and vineyards are well known around the world. In 2013, visitors to Clackamas, Multnomah and Washington counties spent $4.3 billion dollars, supporting 30,100 jobs in the region.[ii] These successes are no accident – they demonstrate that prosperity, livability and intentional urban growth management are compatible.

However, Metro and its partners also have challenges to face when it comes to planning for additional population and employment growth. These include making sure that workforce housing is available in locations with access to opportunities, providing more family-friendly housing choices close to downtowns and main streets, delivering high quality transportation options that help people get where they need to go, ensuring freight mobility, and protecting and enhancing the environment.

Outcomes-based approach to growth management

A core purpose of the urban growth report is to determine whether the current urban growth boundary (UGB) has enough space for future housing and employment growth. Considerable care and technical engagement have gone into the assessment of recent development trends, growth capacity, and the population and employment forecasts provided in this report. However, this kind of analysis is necessarily part art and part science. State laws direct the region to determine what share of growth can "reasonably" be accommodated inside the existing UGB before expanding it but ultimately, how the region defines "reasonable" will be a reflection of regional and community values.

HOW WE ACCOMMODATE GROWTH

URBAN AND RURAL RESERVES Areas outside the current UGB designated by Metro and the three counties through a collaborative process. Urban reserves are the best places for future growth if urban growth expansions are needed over the next 50 years. Rural reserves are lands that won't be urbanized for the next 50 years.

INFILL Development on a tax lot where the original structure has been left intact and the lot is considered developed.

REDEVELOPMENT Development on a tax lot where the original structure has been demolished and there is a net increase in housing units.

VACANT LAND Land inside the UGB that's not developed.

RESIDENTIAL BUILDABLE LAND INVENTORY

If the region's historic annual housing production records (high and low from 1960 to 2012) are any indication, how long might the residential buildable land inventory last?

SINGLE FAMILY 10 to 52 years

MULTIFAMILY 28 to 354 years

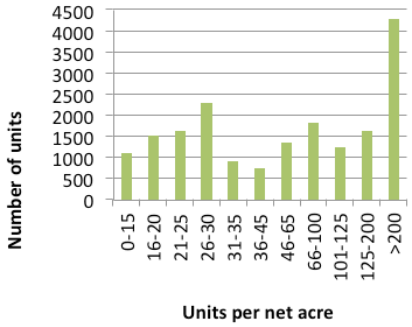


FIGURE 1 Net new multifamily units by density inside UGB *(built 2007-2012)*

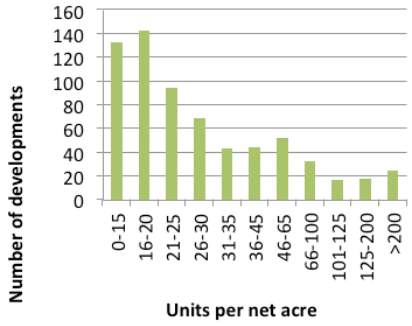
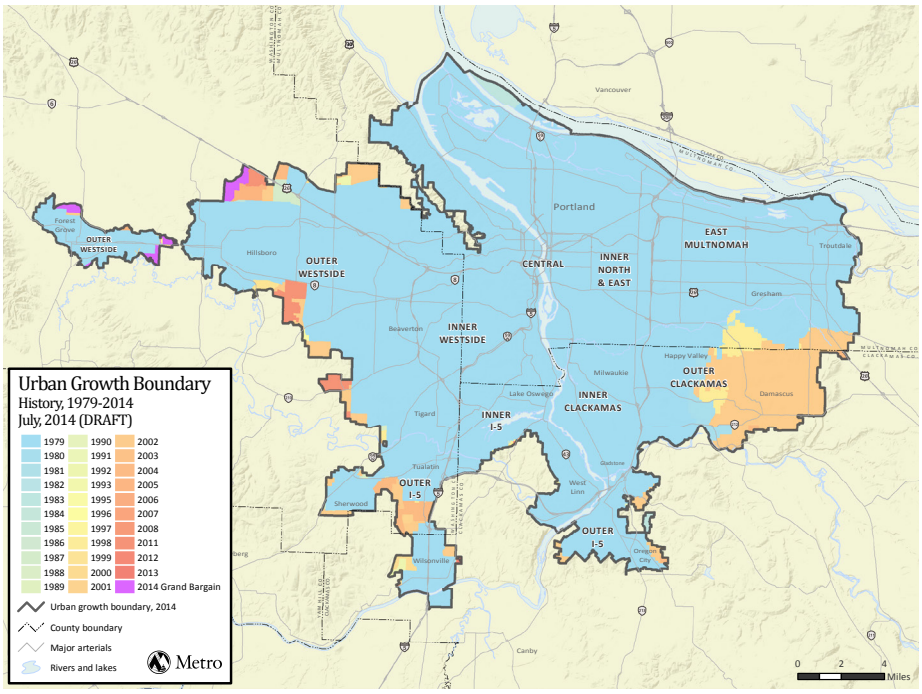


FIGURE 2 Net new multifamily developments by density inside UGB *(built 2007-2012)*



MAP 1 Metro UGB expansions over time *(1979 - 2014)*

How has the region been growing?

The Portland region's original urban growth boundary was adopted in 1979. As depicted in Map 1, the UGB has been expanded by about 31,400 acres. During the same time period, the population inside the UGB has increased by over half a million people. This represents a 61 percent increase in population inside an urban growth boundary that has expanded by 14 percent.

RESIDENTIAL DEVELOPMENT TRENDS

From 1998 to 2012, 94 percent of the new residential units were built inside the original 1979 boundary. During these 14 years, post-1979 UGB expansion areas produced about 6,500 housing units compared to the approximately 105,000 units produced in the original 1979 UGB. With a couple of notable exceptions, UGB expansion areas have been slow to develop because of challenges with governance, planning, voter-approved annexation, infrastructure financing, service provision, and land assembly. Development of Wilsonville's Villebois and Hillsboro's Witch Hazel communities demonstrates that new urban areas can be successful with the right combination of factors such as governance, infrastructure finance, willing property owners, and market demand. There are also challenges in our existing urban areas. Infill and redevelopment have been focused in a few communities while many downtowns and main streets have been slow to develop.

The 2040 Growth Concept, the Portland region's 50-year plan for growth, calls for focusing growth in existing urban centers and transportation corridors, and making targeted additions to the urban growth boundary when needed. To achieve this regional vision, redevelopment and infill are necessary. During the six years from 2007 through 2012, which included the Great Recession, the region saw levels of redevelopment and infill that exceeded past rates. During

this time period, 58 percent of the net new residential units built inside the UGB were through redevelopment (46 percent) or infill (12 percent) and 42 percent were on vacant land. There are a variety of views on whether the recession explains this uptick in redevelopment and infill or whether this is an indication of people wanting to live in existing urban areas with easy access to services and amenities. What is clear is that development challenges exist in both urban areas and past expansion areas. In some cases, however, market demand in existing urban areas appears to have overcome those challenges.

During this same six years, new residential development was evenly split between multifamily and single-family units with a total of 12,398 single-family and 12,133 multifamily residences built. The average density of new single-family development was 7.6 units per acre (5,766 square foot average lot size) and multifamily development was 41.8 units per acre. The highest density multifamily developments also tended to be the largest, so while there were many smaller developments, the statistics are dominated by the large high-density developments. This pattern is clear in Figures 1 and 2 (p. 8), which depict the number of units and developments built per net acre, indicating levels of density.

EMPLOYMENT TRENDS

As in most regions, many people in the Portland region lost their jobs in the Great Recession. With the ensuing recovery, total employment in the region was essentially unchanged when comparing 2006 and 2012. However, the recession did lead to some major changes across industries. Private education recorded the highest growth rate at 25.4 percent from 2006 to 2012, while health and social assistance employers saw the largest net gain in employment with the addition of just over 14,000 jobs during the same period. Construction saw the largest decline, with a loss of around 9,600 jobs, or 20.2 percent of total jobs, in the industry as of 2006. The loss of construction jobs reflects the housing crash that brought residential construction nearly to a halt for several years. Appendix 8 describes the region's employment trends in greater detail.

Aggregating to the sector level, industrial and retail employment declined from 2006 to 2012 while service and government employment increased (Table 1).

Sector	2006 Employment	2012 Employment	Net Change	Percent Change	Avg. Annual Growth Rate
Industrial	244,951	218,311	-26,640	-10.9%	-1.9%
Retail	86,921	84,475	-2,446	-2.8%	-0.5%
Service	396,470	419,516	23,046	5.8%	0.9%
Government	103,736	108,582	4,846	4.7%	0.8%

Table 1 Employment in the three-county area by aggregated sector 2006-2012 *(Clackamas, Multnomah, Washington)* | **Source** *Quarterly Census of Employment and Wages*

Policy considerations

HEALTHY DEBATE AND INFORMED DECISION-MAKING

Though this report strives for completeness, balance, and accuracy, there is always room for debate. At the end of 2014, the Metro Council will be asked to decide if the report provides a reasonable basis for moving forward and making a growth management decision in 2015. Throughout this document, policy questions and topics that have been raised by Metro Council and involved stakeholders are called out for further discussion by policymakers and members of the community.

LAND READINESS OR LAND SUPPLY?

For better or worse, our state land use planning system asks Metro to focus on counting acres of land to determine the region's 20-year growth capacity. Over the years, it's become clear that land supply alone isn't the cause or the solution for all of the region's challenges. Working together, we must make the most of the land we already have inside the urban growth boundary to ensure that those lands are available to maintain, improve, and create the kinds of communities that we all want – today and for generations to come.

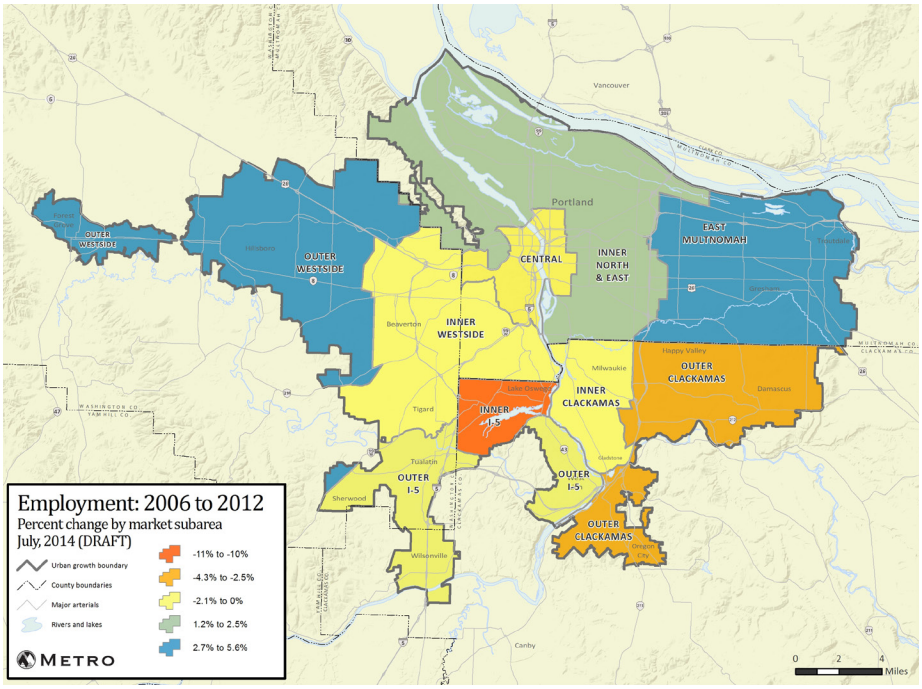
Working together, we can:

- ensure that communities have governance structures in place that can respond to growth and change
- provide the types of infrastructure and services that signal to the development community a site or area is primed for investment
- make the strategic investments needed to clean up and reuse neglected lands.

Policy considerations

CHANGES IN OUR COMMUNITIES

People around the region are concerned about new development in their communities. The concern exists not just in existing urban areas experiencing a new wave of development, but also in areas added to the urban growth boundary. With population growth expected to continue, change is inevitable. What policies and investments are needed to ensure that change is for the better?



Map 2 Employment gains and losses in Metro UGB 2006 - 2012

From 2006 to 2012, there was also a change in where jobs were located in the three-county area (Map 2). While about 25 percent of all jobs could still be found in the central part of the region, the subarea experienced a loss of about 2,300 jobs, or 1.2 percent. The inner I-5 area saw a decline in employment of roughly 2,200 jobs, or 11.0 percent of 2006 employment. This area was home to many firms involved in real estate and finance, industries that were hard hit by the housing collapse and recession. Many businesses in the area, like mortgage and title companies, contracted or closed during this time period. For example, the Kruse Way area in Lake Oswego had an office vacancy rate of 22.4 percent in 2012. In the southeastern part of the region, the outer Clackamas and outer I-5 subareas together lost about 3,400 jobs or 3.2 percent. In contrast, the outer Westside experienced the greatest increase in employment, gaining about 5,800 jobs, an increase of 5.6 percent. The East Multnomah subarea also gained jobs, increasing employment by 1,800 or 2.7 percent.

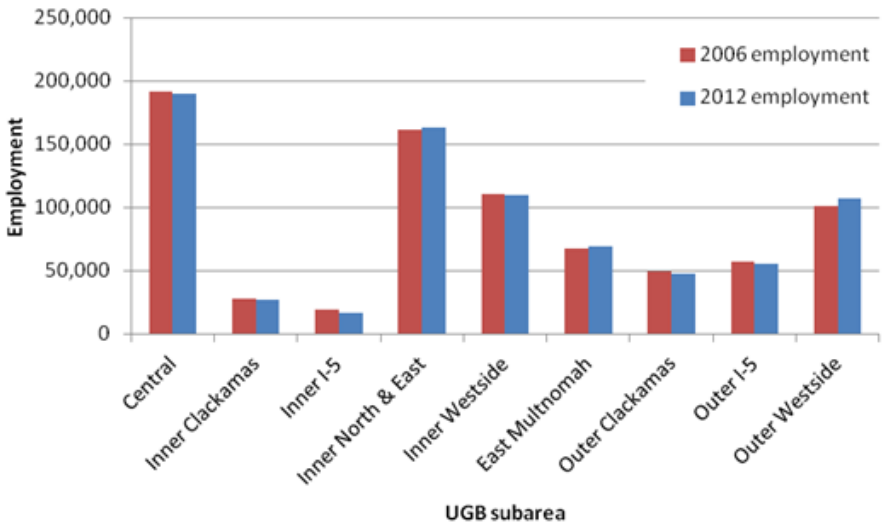


Figure 3 Total employment by subarea for 2006 and 2012

Case study

VILLEBOIS, WILSONVILLE

The Villebois community is one of only a few urban growth boundary expansion areas that has been developed. The roughly 500-acre area was brought into the UGB in 2000. With plans for about 2,600 households, the area quickly rebounded from the recession and is now about half built. Residents benefit from a variety of amenities such as parks, plazas, and community centers.

Case study

HASSALO ON 8TH, LLOYD DISTRICT, PORTLAND

Adjacent to MAX and streetcar stops, construction is now underway on a site that was previously a parking lot. Once built, the development will provide over 600 rental apartments, plazas, office and retail space, more than 1,000 underground car parking places, and space to park more than 1,000 bikes – all in a central location.

Policy considerations

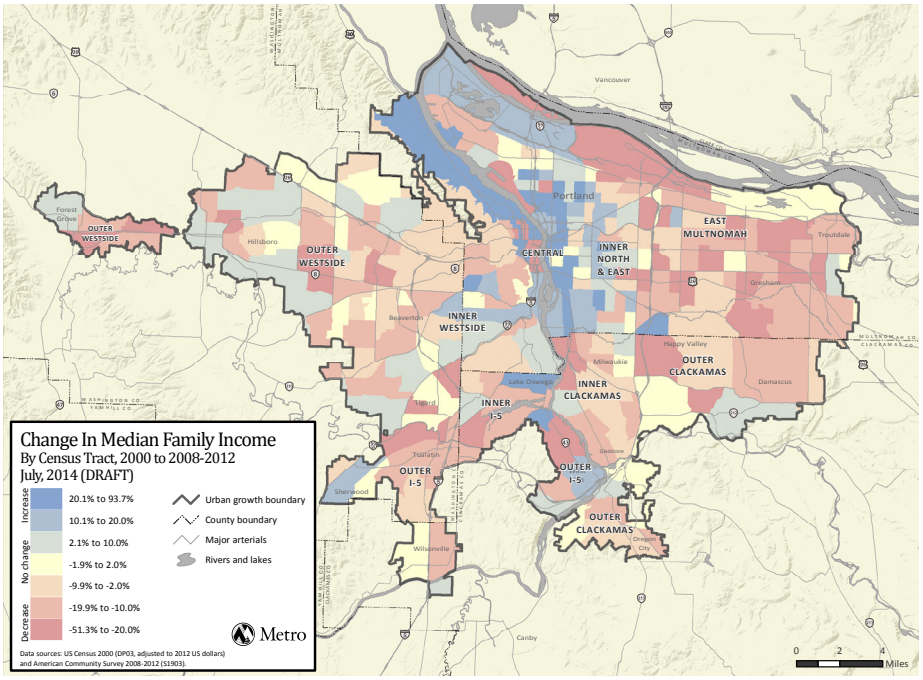
OPPORTUNITIES FOR WORKFORCE HOUSING

Market-rate workforce housing is typically provided by existing housing stock, not new construction. Yet, existing housing in locations with good access to jobs is often too expensive for the region's workforce. What policies, investments, innovative housing designs and construction techniques could provide additional workforce housing in locations with good transportation options? Who has a role?

UNINTENDED CONSEQUENCES OF REDEVELOPMENT

Our region has made a commitment to ensuring its decisions improve quality of life for all. Yet, like many metropolitan areas, we've struggled to make good on that intent. Investments made to encourage redevelopment and revitalization have too often disproportionately impacted those of modest means. The consequence has been that people with lower incomes have often been displaced from their long-time communities when redevelopment in the city center drives up land values and prices follow.

Map 3 shows the change in median family income around the region over the last decade. There is a clear trend of incomes increasing in close-in Northwest, Northeast, and Southeast Portland, Lake Oswego, and West Linn, while incomes have stagnated or decreased elsewhere. Outlying areas like outer east Portland, Gresham, Cornelius, and Aloha stand out as having decreasing incomes. In many cases, increases in incomes in central locations and decreases elsewhere indicate displacement of people from their communities as housing prices increase.



Map 3 Change in median family income 2000-2012

GROWTH WITHOUT SERVICES AND FACILITIES

Over the last couple of decades, the trend of depopulation of the urban core and the movement of the middle class to the suburbs has reversed in many regions in the U.S. The Portland metropolitan region is no exception. While there have been positive outcomes, this has also led to displacement and concentrations of poverty in places that lack adequate services and facilities like sidewalks and transit. Additional information about access to opportunity around the region can be found in Appendix 10. Information about housing and transportation cost burdens can be found in Appendix 12.

COMMUTING TRENDS: THE JOBS-HOUSING BALANCE

For years, leaders have talked about a jobs-housing balance – ensuring there are homes close to employment areas. But evidence and common sense tell us that people's lives don't neatly line up with the available housing inventory. Some people work at or close to home, some commute from one end of the region to the other, and some live halfway between where they work and their spouse works. In other words, putting homes next to major employers doesn't necessarily cut down on commuting.

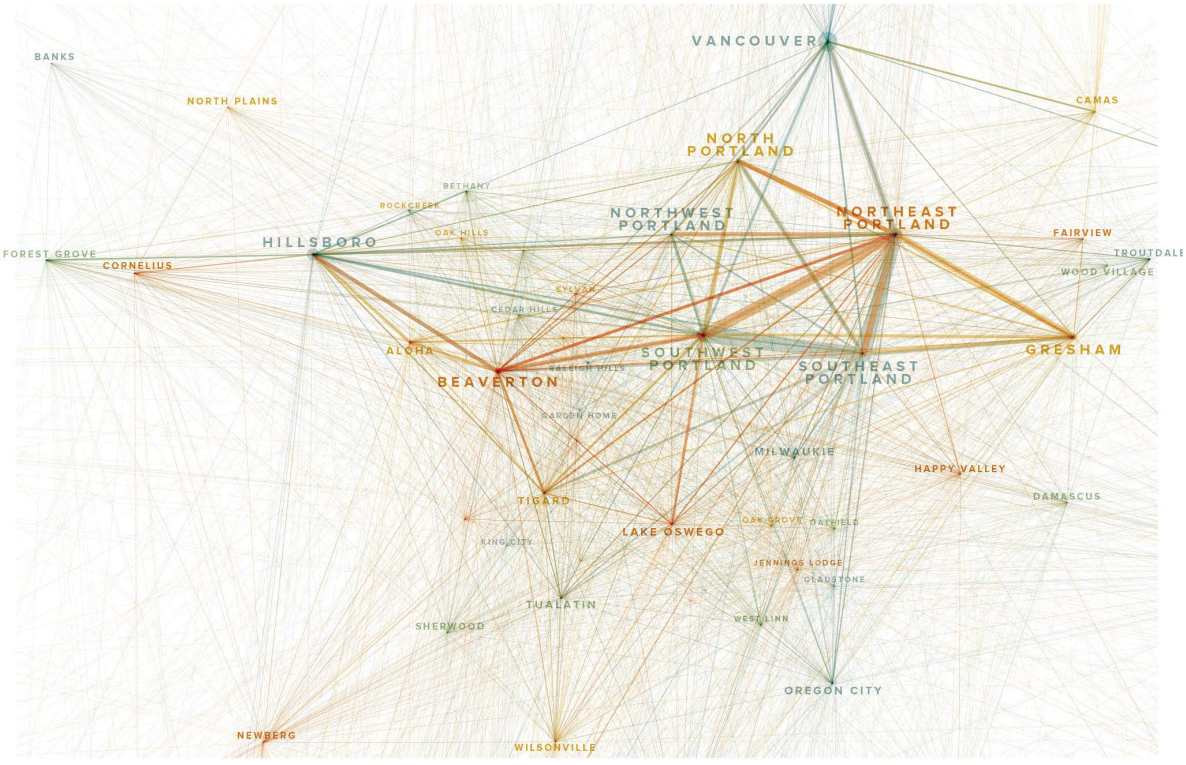
However, services and amenities near residential areas can make our lives outside of jobs and commutes easier and help create strong local economies. When people can go out to eat, do their shopping, visit the bank or see a doctor close to where they live, they spend less time going somewhere and more time with friends and family, actively enjoying their communities and the region.

Map 4 illustrates the region's commute patterns. Using Washington County as an example (2011 data):[iii]

- about 120,000 people who live in Washington County also work there
- about 118,000 people who live outside Washington County work in Washington County
- about 104,000 people who live in Washington County work outside Washington County.

TRAVEL COMMUTE PATTERNS

2011 commute patterns from cities/places in the Portland metropolitan region
Lines connect a person's place of residence to place of employment
Line thickness represents number of people



DATA SOURCE: LONGITUDINAL EMPLOYER-HOUSEHOLD DYNAMICS, U.S. CENSUS BUREAU

Policy considerations

A BIGGER PICTURE

Regional and local policies and investments also interact with actions taken in neighboring cities, Clark County and Salem. What are the best policies for using land efficiently and reducing time spent in traffic?

Policy considerations

MANAGING UNCERTAINTY

- What are the risks and opportunities of planning for higher or lower growth in the forecast range?
- Recognizing that the two forecasts are linked, are there different risks when planning for employment or housing growth?
- Are there different risks when planning for land use, transportation, or for other infrastructure systems?
- Who bears the public and private costs and benefits associated with different growth management options?

How many more people and jobs should we expect in the future?

A core question this report addresses is how many more people and jobs should the region plan for between now and the year 2035. In creating the 2035 forecast, Metro convened a peer review group consisting of economists and demographers from Portland State University, ECONorthwest, Johnson Economics, and NW Natural. The forecast assumptions and results in this report reflect the recommendations of this peer review panel. A summary of the peer review can be found in Appendix 1C.

However, even with a peer review of the forecast, some forecast assumptions will turn out to be incorrect. For that reason, the population and employment forecasts in this report are expressed as ranges, allowing the region's policymakers the opportunity to err on the side of flexibility and resilience in choosing a path forward. As with a weather forecast, this population and employment range forecast is expressed in terms of probability. The baseline forecast (mid-point in the forecast range) is Metro staff's best estimate of what future growth may be. The range is bounded by a low end and a high end. There is a ninety percent chance that actual growth will occur somewhere in this range, but the probability of ending up at the high or low ends of the range is less.

Appendix 1B describes the accuracy of past forecasts. These typically have been reliable, particularly when it comes to population growth. For example, Metro's 1985 to 2005 forecast proved to be off by less than one percent per year for both population and employment over the 20-year time frame.

POPULATION AND JOB GROWTH IN THE SEVEN-COUNTY PORTLAND/VANCOUVER METROPOLITAN AREA

To "show our work" and to understand our region in its economic context, this analysis starts with a forecast for the larger seven-county Portland/Vancouver/Hillsboro metropolitan area.[2] Full documentation of the metropolitan area forecast is available in Appendix 1A. It is estimated that there will be about 470,000 to 725,000 more people in the seven-county area by the year 2035. Mid-point in the forecast range, or best estimate, is for 600,000 more people. This amount of growth would be consistent with how the region has grown in the past; the seven-county area grew by about 600,000 people between 1985 and 2005 and by about 700,000 from 1990 to 2010. Adding 600,000 people would be comparable to adding the current population of the city of Portland to the seven-county area.

The forecast calls for 120,500 to 648,500 additional jobs in the seven-county Portland/Vancouver metropolitan area between 2015 and 2035. The forecast range for employment is wider than the forecast range for population since regional employment is more difficult to predict in a fast-moving global economy. Unexpected events like the Great Recession, technological advances, international relations, and monetary policy can lead to big changes. Mid-point in the forecast range, or best estimate, is for 384,500 additional jobs. This amount of growth would surpass the 240,000 additional jobs that were created in the seven-county metropolitan area during the 20-year period from 1990 to 2010, which included job losses from the recession.

2 The seven-county Portland/Vancouver metropolitan area includes Clackamas, Clark, Columbia, Multnomah, Skamania, Washington, and Yamhill counties.

POPULATION AND JOB GROWTH IN THE METRO UGB

A market-based land and transportation computer model is used to determine how many of the new jobs and households in the seven-county area are likely to locate inside the Metro urban growth boundary. The model indicates that about 75 percent of new households and jobs may locate inside the UGB. The share of regional growth accommodated inside the boundary varies depending on what point in the forecast range is chosen. More detail can be found in Appendices 4 and 6. It is estimated that there will be about 300,000 to 485,000 additional people inside the Metro urban growth boundary between 2015 and 2035 (Figure 4). At mid-point in this range, the UGB will have about 400,000 additional people. This would be comparable to adding more than four times the current population of the city of Hillsboro to the UGB . The population forecast is converted into household growth for this analysis.

It is estimated that there will be about 85,000 to 440,000 additional jobs in the Metro UGB between 2015 and 2035 (Figure 5). At mid-point in this range, there would be about 260,000 additional jobs between 2015 and 2035. This job forecast is converted into demand for acres for this analysis.

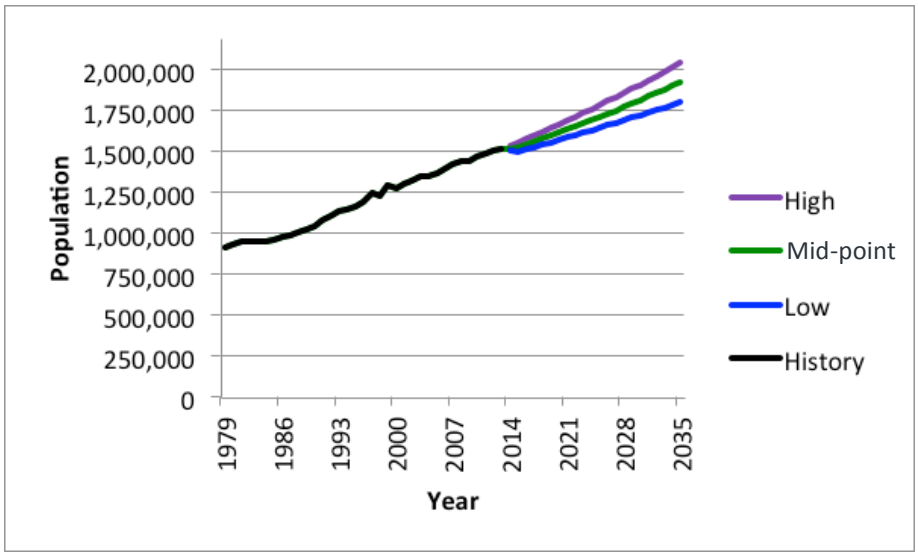


Figure 4 Population history and forecast for Metro UGB *1979 - 2035*

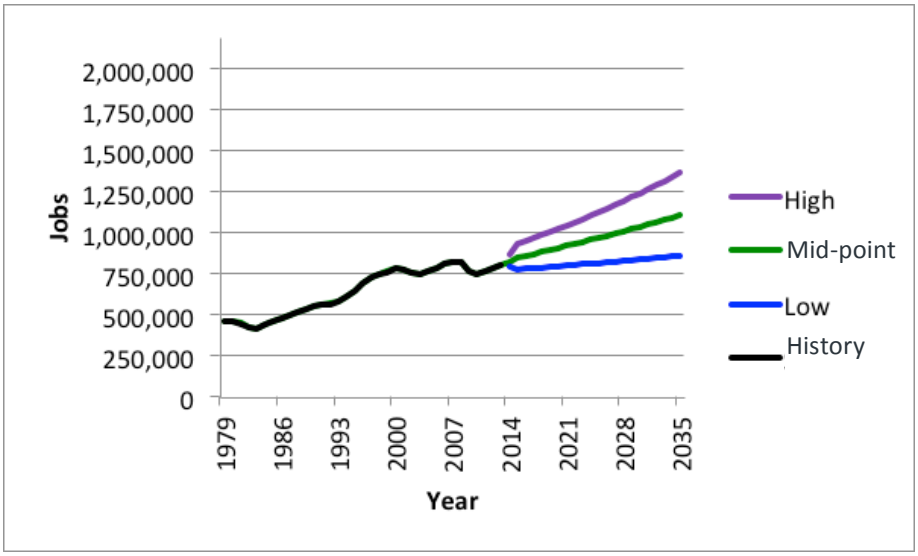


Figure 5 Employment history and forecast for Metro UGB, *1979-2035*

DIDN'T THE STATE LEGISLATURE JUST EXPAND THE UGB?

Signed into state law in the spring of 2014, HB 4078 codifies the fundamental principles behind our region's decision about urban and rural reserves. The legislation provides greater protection for farms, forests and natural areas, offers predictability to our communities, home builders and manufacturers, and makes our land use system more efficient. The legislation also expanded the UGB in several locations in Washington County and described how Metro must account for those lands in this urban growth report.

How much room for growth is there inside the UGB?

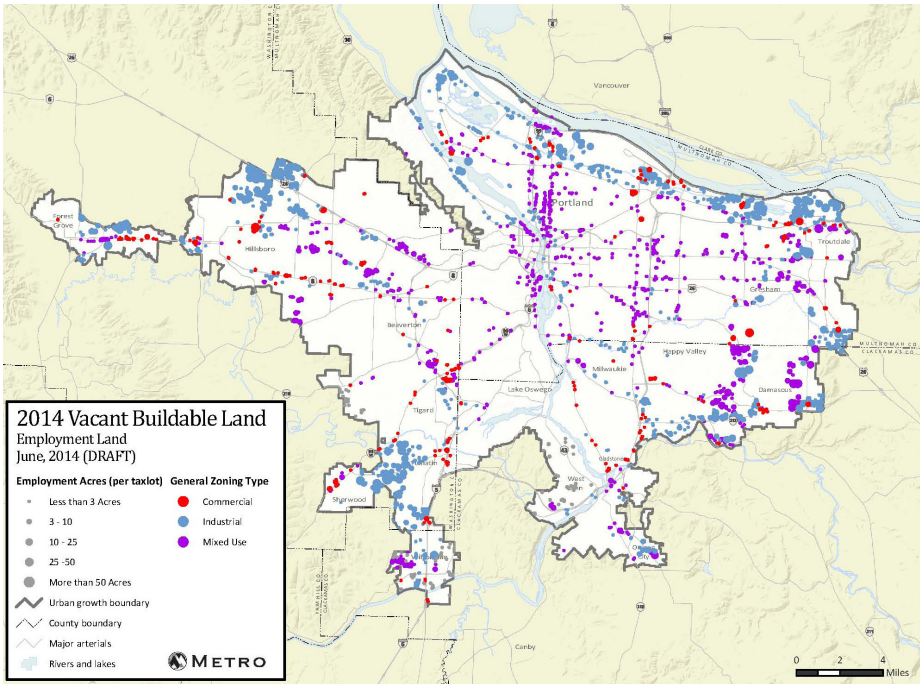
Cities and counties around the region plan for the future and prioritize investments that support their community's vision. In most cases, however, long-term plans for downtowns, main streets and employment areas are more ambitious than what is actually built or redeveloped. One task of this analysis is to help us understand how the market might respond to long-term community plans in the next 20 years.

To analyze the region's growth capacity, detailed aerial photos of all the land inside the urban growth boundary were taken. Factoring in current adopted plans and zoning designations, the photos were used to determine which parcels of land were developed and which were vacant. Methodologies for assessing the redevelopment potential and environmental constraints of the land were developed over the course of a year by Metro and a technical working group consisting of representatives from cities, counties, the state and the private sector (see pages 30-31 for a complete list of technical working group members).

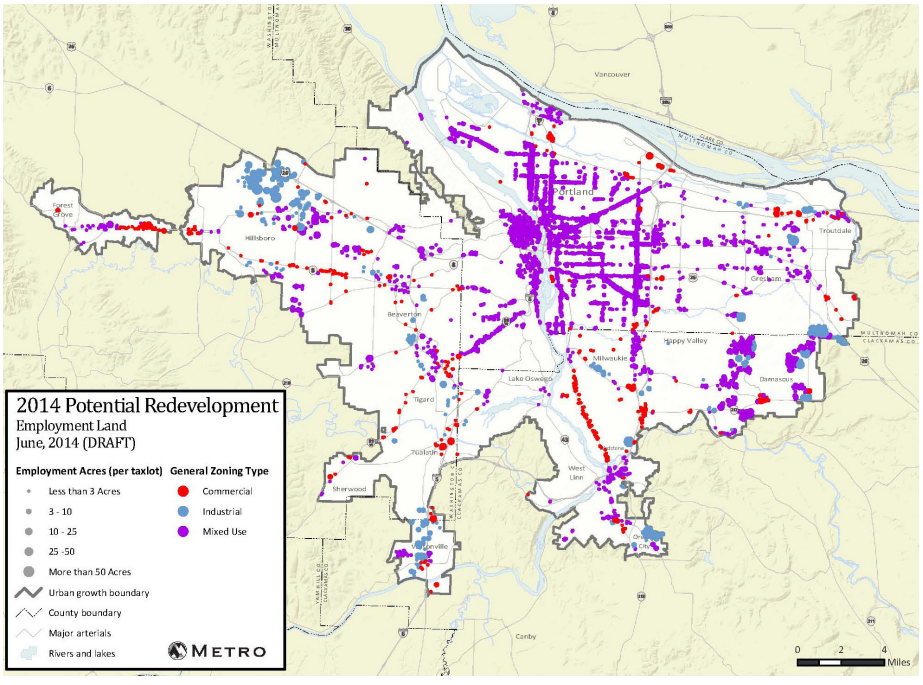
After settling on the methodology described in Appendix 2, Metro produced a preliminary buildable land inventory that local cities and counties had more than two months to review. The draft buildable land inventory described in Appendix 3 reflects refined local knowledge about factors such as environmental constraints including wetlands, steep slopes, and brownfield contamination. Maps 4 through 7 illustrate the buildable land inventory reviewed by local jurisdictions. They are available at a larger scale in Appendix 3. The buildable land inventory is considered a "first cut" at determining the region's growth capacity. For a variety of reasons described in the next section, not all of it may be developable in the 20-year time frame.

ESTIMATING RESIDENTIAL GROWTH CAPACITY

Current plans and zoning allow for a total of almost 1.3 million residences inside the urban growth boundary after accounting for environmental constraints and needs for future streets and sidewalks. About half of that potential capacity is in use today. This urban growth report does not count all of this capacity since doing so would assume that every developed property in the region will redevelop to its maximum density in the next twenty years. A rational developer will only build products that are expected to sell. Redevelopment requires market demand, which is a function of a number of factors, including expected population growth. This affects whether a property will be redeveloped and at what density.



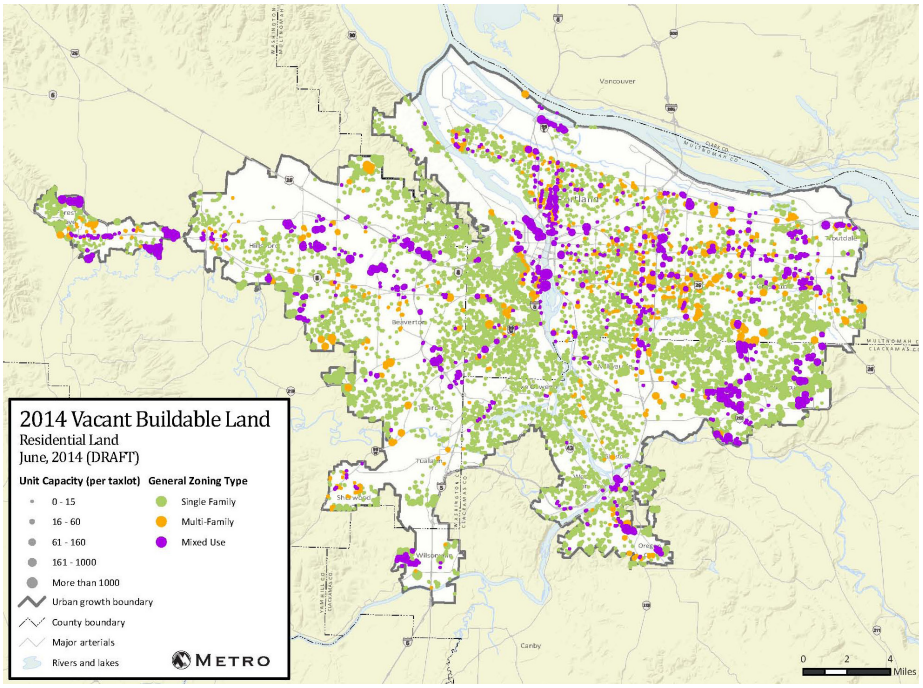
Map 4 Employment vacant buildable tax lots *(reviewed by local jurisdictions)*



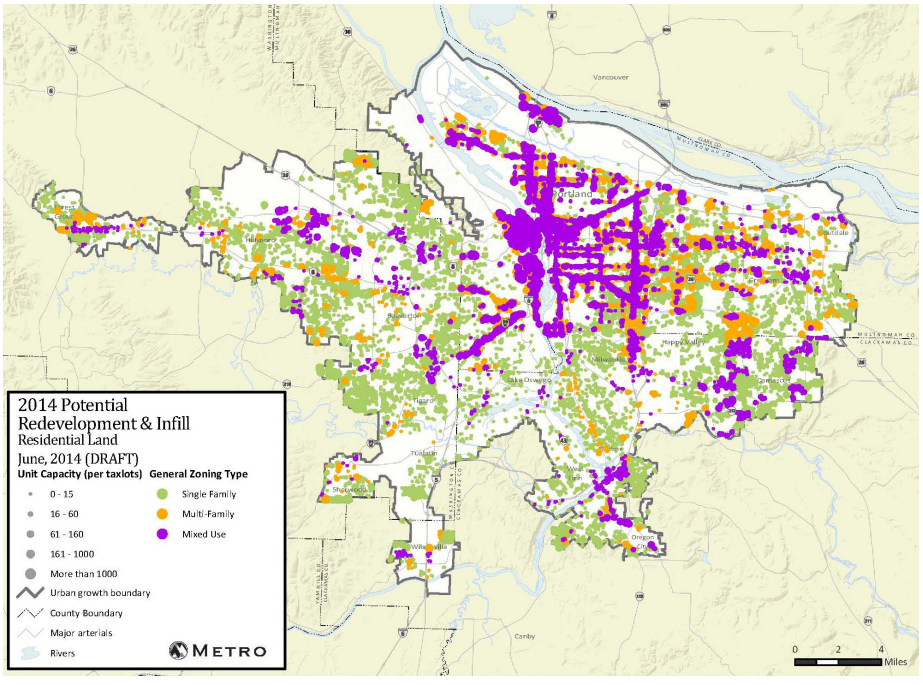
Map 5 Employment infill and redevelopment candidate tax lots *(reviewed by local jurisdictions)*

Acknowledging this complexity, Metro staff convened representatives from cities, counties, the state and the private sector to establish consensus for estimating how much of the region's buildable land inventory might be absorbed by the year 2035 (see pages 30-31 for a complete list of technical working group members). Redevelopment and infill are most common in locations where there is significant demand for housing, so the growth capacity from redevelopment and infill rises with assumptions for population growth. For this reason, the region's residential growth capacity is expressed as a range. The amount of growth capacity that the region has depends, in part, on the point in the household forecast range for which the Metro Council chooses to plan. Appendix 4 describes the approach for identifying the 20-year capacity range for housing.

Map 6 Residential vacant buildable tax lots *(reviewed by local jurisdictions)*



Map 7 Residential redevelopment candidate tax lots *(reviewed by local jurisdictions)*



HOW DO DEVELOPERS EVALUATE REDEVELOPMENT POTENTIAL?

The construction of new infill (original structure intact) and redevelopment (original structure demolished) projects is increasing in some places, fueled by a renewed interest in and market demand for housing and jobs close to the urban core. In order to realize a return on an investment, given the higher costs of urban redevelopment, investors will evaluate the redevelopment potential of the site by considering the following:

- Where is the site located? Is it an up and coming area?
- What is the value of the existing building or structure on the site? What is the value of the land? At what point does the building become worth less than the land it sits on?
- What is the developer allowed to build under the local zoning code?
- What are the construction costs and fees for the new building?
- How much will the developer be able to sell or rent space for in the new building?

Case study
4TH MAIN, HILLSBORO

With a shared vision for an active, historic main street area, Metro, the City of Hillsboro and the Federal Transit Administration worked together to attract private sector redevelopment of a city block adjacent to the Hillsboro Central MAX station. 4th Main offers 71 market-rate apartments, underground parking, and active retail along main street. The existing 1950s era vacant bank building on site is being updated for restaurant and retail use. When 4th Main opened in May 2014, over half the units were leased.

Policy considerations

HOW SHOULD POLICYMAKERS EVALUATE DEVELOPMENT POTENTIAL?

Since the adoption of the 2040 Growth Concept, there has often been skepticism about the viability of redevelopment as a source of growth capacity. Our region's history shows that developing urban growth boundary expansion areas is difficult as well. Aside from developing a concept plan, what other factors support the likelihood that an urban reserve will be developed if brought into the UGB?

ESTIMATING EMPLOYMENT GROWTH CAPACITY

To determine the UGB's employment growth capacity, analysis began with the creation of a buildable land inventory. As with the residential analysis, employment capacity depends on demand since different types of jobs have different space needs. For instance, an office job will have very different location and space needs than a warehouse job. Metro staff convened a group of public and private sector experts to help update these employment demand factors. Appendix 6 describes the approach for identifying the 20-year capacity range. (See pages 30-31 for a complete list of technical working group members).

Different jobs have different space needs

Is there a regional need for additional growth capacity?

Under state law, Metro's analysis must assess regional, not local or subregional, growth capacity needs. While some local jurisdictions may desire additional land for growth, this analysis is required to keep those needs in the regional context, knowing that other locations in the region may have greater growth capacity.

This analysis uses a probabilistic range forecast. The baseline forecast (middle of the range) has the highest probability. Though there is a 90 percent chance that growth will occur within the range, it is less probable at the low and high ends of the range.

DOES THE REGION NEED MORE LAND FOR HOUSING GROWTH?

Regional growth management policy alone cannot ensure adequate housing choices. Other elements that influence what kind of housing gets built include tax policy, lending practices, local plans and decisions, public investments, market demand, and developer responses. All of these factors impact housing production.

Appendix 4 describes in detail the residential demand analysis and includes estimates of potential demand by housing type (single-family and multifamily), tenure (own and rent), average density, as well as detail about demand from different household income brackets. For accounting purposes, the detailed analysis uses rigid supply and demand categories – for instance, single-family and multifamily. In reality, demand for these two housing types is somewhat fluid, particularly as average household sizes continue to decrease. By 2035, about 60 percent of new households are expected to include just one or two people.

WHAT THE NUMBERS SHOW

Population and employment forecasts in the urban growth report are expressed as ranges based on probability. Mid-point in the forecast range is Metro's best estimate of what future growth may be. It is less probable that growth will occur at the high or low ends of the range forecast.

This analysis looks at long-term capacity needs for:

- single-family and multifamily housing
- general industrial employment uses
- large industrial sites
- commercial employment uses.

If policymakers choose to plan for the high end of the growth forecast range, there is a need for additional capacity for jobs and housing. But, at mid-point in the range and below, there is no need for additional growth capacity.

Policy considerations

WHAT ABOUT DAMASCUS?

With its ongoing community and political challenges, how much of Damascus' growth capacity should be counted during the 2015 to 2035 time frame is more of a policy question than a technical question. For this analysis, Metro staff followed the advice of its technical advisory group and used a market-based model to determine that about half of Damascus' estimated buildable land inventory capacity could be counted in the "market-adjusted" residential supply. For modeling purposes, it was assumed that development challenges will persist in Damascus for another decade, delaying its availability to the market. If Damascus' capacity is not available, it may become somewhat more difficult to provide new single-family housing inside the existing urban growth boundary. Does the region have other options for making up for Damascus' capacity if it is not counted?

Policymakers have the challenge of balancing the type of housing and neighborhoods people prefer with funding realities, governance and annexation challenges. They also must consider regional and community goals such as preserving the character of existing neighborhoods, reducing carbon emissions, preserving farms and forests, and creating vibrant downtowns and main streets. To inform that discussion, Metro and a group of public and private sector partners conducted a study on residential preferences across the region and will make results available to policymakers in the early fall of 2014.

The capacity estimation method recommended by Metro's public and private sector advisory group recognizes that infill and redevelopment depend on demand. Consequently, the capacity from those two sources increases with greater household demand (i.e., a higher growth forecast results in a greater housing capacity).

Table 2 and Table 3 summarize the more detailed analysis of residential needs provided in Appendix 4.

Single-family dwelling units

	Buildable land inventory	Market-adjusted supply	Demand	Surplus/ need
Low growth forecast	118,700	76,600	70,600	+6,000
Middle *(baseline)* growth forecast		90,700	89,000	+1,700
High growth forecast		97,700	103,800	-6,100

Table 2 Metro UGB single-family residential needs 2015 to 2035 expressed in dwelling units

Multifamily dwelling units

	Buildable land inventory	Market-adjusted supply	Demand	Surplus/ need
Low growth forecast	274,000	119,100	82,700	+36,400
Middle *(baseline)* growth forecast		130,800	108,400	+22,400
High growth forecast		165,800	132,200	+33,600

Table 3 Metro UGB multifamily residential needs 2015 to 2035 expressed in dwelling units

If policymakers choose to plan for the high end of the growth forecast range, there is a need for additional capacity for jobs and housing. But, at mid-point in the forecast range and below, there is no need for additional growth capacity. No scenarios points to a regional need for additional multifamily housing capacity. However, if policymakers decide to plan for high growth and expand the UGB for residential purposes, there may be valid policy reasons for considering some amount of multifamily housing and commercial uses in the local planning process for the area.

Policy considerations

PROVIDING HOUSING OPPORTUNITIES

As policymakers consider their options for responding to housing needs, there are considerations to keep in mind.

- If policymakers decide that a urban growth boundary expansion is needed to provide room for housing, where should that expansion occur? Metro is aware of two cities in the region that are currently interested in UGB expansions for housing – Sherwood and Wilsonville. Both cities had residential land added to the UGB in 2002 that they have not yet annexed. Sherwood requires voter-approved annexation and voters have twice rejected annexing the area. What is a reasonable time frame for seeing results in past and future UGB expansion areas?
- Given that the region has ample growth capacity for multifamily housing but a more finite supply of single-family growth capacity, should policymakers consider ways to encourage "family-friendly" housing in multifamily and mixed-use zones? To what extent might that address single-family housing needs in this analysis? Are there ways to ensure that housing in downtowns and along main streets remains within reach of families with moderate or low incomes?
- State land use laws and regional policy call for efficient use of any land added to the UGB. However, over the years very little multifamily housing has been built in UGB expansion areas. What is the right mix of housing types in areas added to the UGB in the future and how are they best served?
- How might policymakers balance residential preferences with other concerns such as infrastructure provision, transportation impacts, affordability, and environmental protection?

IMPACT OF MILLENNIALS ON HOUSING

Millennials, those born since 1980, are the biggest age cohort the U.S. has ever had (bigger than the Baby Boomer cohort) and will have a significant influence on the types of housing that are desired in the future. Today, 36 percent of the nation's 18 to 31-year olds are living with their parents.[i] This has variously been attributed to student loan debt, high unemployment or fear of losing a job, and stricter mortgage lending standards. Builders have responded by reducing their housing production and focusing on apartment construction. What will these trends mean for home ownership, housing type, and location choices in the longer term?

Policy considerations

INVESTING IN JOB CREATION

Metro has been actively engaged in the question of regional investment priorities since the release of the 2008 Regional Infrastructure Analysis and consequential discussion with regional community and business leaders through the Community Investment Initiative. From these efforts, Metro established the Regional Infrastructure Supporting our Economy (RISE) team to deliver regionally significant projects and new infrastructure investment to enhance the local and regional economy. Are there areas where RISE should focus its attention to ensure the region can generate job growth?

DOES THE REGION NEED MORE LAND FOR INDUSTRIAL JOB GROWTH?

Industrial employment includes a wide range of jobs like high tech manufacturers, truck drivers, and metal workers. Since it is common to find commercial jobs (offices, stores, restaurant, etc.) in industrial zones, this analysis shifts a portion of the overall industrial redevelopment supply into the commercial category.

Table 4 summarizes regional needs for general industrial employment growth, expressed in acres. Additional detail about this analysis can be found in Appendix 6. The need for large industrial sites (sites with over 25 buildable acres) is described separately. At mid-point in the forecast range, there is no regional need for additional land for general industrial employment uses. At the high end of the forecast range, there is a deficit. However, there are limited areas in urban reserves that may eventually be suitable for industrial uses.

General industrial employment *(acres)*

	Buildable land inventory	Market-adjusted supply	Demand	Surplus/ need
Low growth forecast	7,100	5,800	1,200	+4,600
Middle *(baseline)* growth forecast		5,000	3,800	+1,200
High growth forecast		5,000	6,500	-1,500

Table 4 Metro UGB general industrial acreage needs 2015 to 2035

Note: reflecting real market dynamics where commercial uses locate in industrial zones, the market adjustment shifts some of the region's industrial redevelopment supply into the commercial land supply. The amount varies by demand forecast.

Case study

TROUTDALE REYNOLDS INDUSTRIAL PARK

Located between the Columbia and Sandy rivers and bordered by the Troutdale Airport and Marine Drive, this 700-acre superfund site is being redeveloped with a mix of industrial uses, natural areas and utility and trail access. The Port of Portland is working closely with local, regional and state jurisdictions to redevelop this former aluminum plant brownfield site and return it to productive industrial use with a traded-sector job focus. The Port has invested over $37 million in the acquisition and redevelopment of the site. Today, a portion of the site is home to FedEx Ground's regional distribution center. Another $48 million in investment is needed to make the remainder of the site ready to market to industrial employers. At full build-out, this industrial development is projected to result in 3,500 direct jobs, $410 million in personal income and $41 million in state and local taxes annually (all jobs).

HOW SHOULD THE REGION PRIORITIZE INVESTMENTS IN LARGE INDUSTRIAL SITE READINESS?

The region's economic development strategy focuses on several sectors with anchor firms that sometimes use large industrial sites (over 25 buildable acres). These firms are important because they often pay higher-than-average wages, export goods outside the region (bringing wealth back), produce spin off firms, and induce other economic activity in the region. However, forecasting the recruitment of new firms or growth of existing firms that use large industrial sites is challenging since these events involve the unique decisions of individual firms. To produce an analysis that is as objective as possible, the estimate of future demand for large industrial sites is based on the employment forecast. That assessment and its caveats are described in Appendix 7.

The analysis finds that there may be demand for eight to 34 large industrial sites between 2015 and 2035. There are currently 50 large vacant industrial sites inside the UGB that are not being held for future expansion by existing firms.[3] This does not include sites added to the UGB in 2014 under HB 4078. To exhaust this supply of sites by 2035, the region would need to attract five major industrial firms every two years. In addition to this inventory of 50 sites, there are 24 sites inside the UGB that are being held by existing firms for future expansion (growth of existing firms is implicit in the demand forecast). Given this total supply of 74 large industrial sites and the fact that there are only two areas in urban reserves (near Boring and Tualatin) that may be suitable for eventual industrial use, policymakers can consider whether to focus on land supply or site readiness.

There are a limited number of areas in urban reserves that may be suitable for eventual industrial use. Therefore, this demand analysis may be more useful for informing the level of effort that the region may wish to apply to making its existing large industrial sites development-ready. Existing sites typically require actions such as infrastructure provision, wetland mitigation, site assembly, brownfield cleanup, annexation by cities, and planning to make sites development-ready. Many of these same development-readiness challenges exist in the two urban reserve areas that may eventually be suitable for industrial use. Metro and several public and private sector partners continue to work to understand the actions and investments that are needed to make more of the region's large industrial sites development-ready.

Policy considerations

THE PORTLAND HARBOR

The harbor is a unique environmental, recreational and economic asset that cannot be replaced elsewhere in the Portland region. For more than a century, the harbor has played a critical role in the history of trade and manufacturing in our region. Today, the harbor needs to be cleaned up to continue providing benefits. What is the appropriate balance between environmental and economic goals? What investments and policies can advance those goals?

3 This inventory is preliminary as of June 16, 2014, and will be confirmed by Metro and its partners before Metro Council consideration of the final UGR. This work is being conducted by Mackenzie for an update of the 2012 Regional Industrial Site Readiness project. However, the inventory is not expected to change enough to result in a different conclusion regarding there being no regional need for additional UGB expansion.

Policy considerations

KEEPING SHOPPING AND SERVICES CLOSE BY

It makes sense to locate commercial uses close to where people live. If the Metro Council chooses to plan for a high growth scenario, are there places where it makes sense to expand the UGB for a mix of residential and commercial uses?

DOES THE REGION NEED MORE LAND FOR COMMERCIAL JOB GROWTH?

The commercial employment category includes a diverse mix of jobs such as teachers, restaurant workers, lawyers, doctors and nurses, retail sales people, and government workers. Generally, these are population-serving jobs that are located close to where people live. Table 5 summarizes regional needs for commercial employment growth, expressed in acres. Additional detail about this analysis can be found in Appendix 6. At mid-point in the forecast range, there is no regional need for additional land for commercial employment uses. At the high end of the forecast range, there is a deficit. However, it may not be desirable to locate commercial uses on the urban edge unless those uses are integrated with residential development.

Commercial employment *(acres)*

	Buildable land inventory	Market-adjusted supply	Demand	Surplus/ need
Low growth forecast	4,300	4,200	1,400	+2,800
Middle *(baseline)* **growth forecast**		4,500	3,600	+900
High growth forecast		5,100	5,700	-600

Table 5 Metro UGB commercial acreage needs 2015 to 2035

Note: reflecting real market dynamics where commercial uses locate in industrial zones, the market adjustment shifts some of the region's industrial redevelopment supply into the commercial land supply. The amount varies by demand forecast.

Conclusion

The 2014 urban growth report is more than an accounting of available acres and forecast projections. It provides information about development trends, highlights challenges and opportunities, and encourages policymakers to discuss how we can work together as a region to help communities achieve their visions. This region has seen tremendous change and progress over the last 20 years and we know change will continue. Our shared challenge is to guide development in a responsible and cost-effective manner so that we preserve and enhance the quality of life and ensure that the benefits and costs of growth and change are distributed equitably across the region.

LOCAL LEADERSHIP

Examples of strong partnerships abound already. At the local level, cities and counties are working closely with the private sector to bring new vibrancy to downtowns, more jobs to employment areas, and to provide existing and new neighborhoods with safe and convenient transportation options. Residential and employment areas as varied as Beaverton's Creekside District, Portland's South Waterfront, Hillsboro's AmberGlen, Wilsonville's Villebois, the Gresham Vista Business Park and many others, both large and small, are pointing the way to our region's future.

METRO'S ROLE

At the regional level, Metro supports community work with a variety of financial and staff resources. The Community Planning and Development Grant program has funded over $14 million in local project work to support development readiness. The RISE (Regional Infrastructure Supporting our Economy) program is designed to deliver regionally significant projects and spur infrastructure investment. The Transit-Oriented Development Program provides developers with financial incentives that enhance the economic feasibility of higher density, mixed-used projects served by transit. Corridor projects such as the Southwest Corridor and East Metro Connections Plan are bringing together Metro, local jurisdictions, educational institutions, residents, businesses and others to develop comprehensive land use and transportation plans for individual areas that will support local community and economic development goals.

INVESTING IN OUR COMMUNITIES

These are just a few examples of the kind of work that's happening all across the region. While the Metro Council's growth management decision must address the question of whether to adjust the region's urban growth boundary, the more difficult questions center on how to find the resources needed to develop existing land within our communities and new land in urban growth boundary expansion areas in a way that meets community and regional goals. Many of these questions and policy considerations are highlighted throughout this urban growth report to support policy discussions in the 2015 growth management decision and beyond.

Next steps

JULY THROUGH DECEMBER 2014 The urban growth report helps inform policy discussions for the Metro Policy Advisory Committee (MPAC) and Metro Council.

DECEMBER 2014 The Metro Council will consider a final urban growth report that will serve as the basis for its growth management decision in 2015. The Metro Policy Advisory Committee will be asked to advise the council on whether the urban growth report provides a reasonable basis for its subsequent growth management decision.

JULY 2014 – MAY 2015 Local and regional governments will continue to implement policies and investments to create and enhance great communities while accommodating anticipated growth.

MAY 2015 Local jurisdictions interested in urban growth boundary expansions in urban reserves must complete concept plans for consideration by MPAC and the Metro Council.

SEPTEMBER 2015 Metro's chief operating officer makes a recommendation for the Metro Council's growth management decision that becomes the basis for MPAC and council discussion during fall 2015. The recommendation will take into account the final urban growth report, assessments of urban reserve areas, actions that have been taken at the regional or local level – such as measures that lead to more efficient land use and adopted concept plans for urban reserves – and other new information that may influence our understanding of future growth in the region.

BY THE END OF 2015 If any additional 20-year capacity need remains, the Metro Council will consider UGB expansions into designated urban reserves. The Metro Policy Advisory Committee will be asked to advise the council on the growth management decision.

References

i U.S. Bureau of Economic Analysis, Per Capita Real GDP by Metro Area, accessed online 4/29/14

ii Dean Runyan and Associates, 2013 Preliminary Travel Impacts for Portland Metro, accessed online 4/30/14 at http://www.travelportland.com/about-us/visitor-statistics-research/

iii U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2011)

iv Pew Research Center, A Rising Share of Young Adults Live in Their Parent's Home, August 1, 2013, accessed online 5/20/14 at http://www.pewsocialtrends.org/files/2013/07/SDT-millennials-living-with-parents-07-2013.pdf

ACKNOWLEDGMENTS

Metro staff

Ted Reid, project manager for 2015 urban growth management decision
Martha Bennett, chief operating officer
Elissa Gertler, planning and development director
John Williams, deputy director community development
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Rayna Cleland, senior visual communications designer
Sonny Conder, principal researcher
Paulette Copperstone, program assistant
Jim Cser, associate researcher and modeler
Laura Dawson-Bodner, record and information analyst
Dan Hunt, GIS specialist
Peggy Morell, senior public affairs specialist
Tim O'Brien, principal planner
Juan Carlos Ocaña-Chiu, senior public affairs specialist
Maribeth Todd, associate researcher and modeler
Dennis Yee, chief economist

THE FOLLOWING PEOPLE GRACIOUSLY LENT THEIR EXPERTISE TO INFORM THIS REPORT

2014 Urban Growth Report: buildable land inventory technical working group

The following people advised Metro staff on the methods used for identifying the region's buildable land inventory. Additional review of the preliminary inventory was provided by numerous city and county staff.

Jill Sherman, Gerding Edlen
Eric Cress, Urban Development Partners NW
Steve Kelley, Washington County
Brian Hanes, Washington County
Erin Wardell, Washington County
Colin Cooper, Hillsboro
Ali Turiel, Hillboro
Emily Tritsch, Hillsboro
Ken Rencher, Beaverton
Mike Rizzitiello, Beaverton
Larry Conrad, Clackamas County
Denny Egner, Lake Oswego, Milwaukie
Chris Neamtzu, Wilsonville
Chuck Beasley, Multnomah County
Adam Barber, Multnomah County
Tom Armstrong, Portland
Tyler Bump, Portland (alternate)
Brian Martin, Gresham
Mike Tharp, Norris, Beggs, and Simpson
Bob LeFeber, Commercial Realty Advisors

Drake Butsch, First American Title Company
Stuart Skaug, CB Richard Ellis
Dan Grimberg, Arbor Homes
Jeff Bacharach, Bacharach Law
Andrew Tull, 3J Consulting
Justin Wood, Home Builders Association of Metropolitan Portland
Anne Debbaut, DLCD
Jennifer Donnelly, DLCD
Tom Hogue, DLCD
Gordon Howard, DLCD
Jerry Johnson, Johnson Economics
Eric Hovee, E.D. Hovee and Associates

2014 Urban Growth Report: residential supply range technical working group

This group advised Metro staff on how much of the residential buildable land inventory's redevelopment supply may be developable in the 20-year time horizon.

Erin Wardell, Washington County
Jeannine Rustad, Hillsboro
Emily Tritsch, Hillsboro
Gordon Howard, DLCD
Anne Debbaut, DLCD
Jennifer Donnelly, DLCD
Tom Armstrong, Portland
Justin Wood, Home Builders Association
Jerry Johnson, Johnson Economics
Eric Hovee, E.D. Hovee and Associates

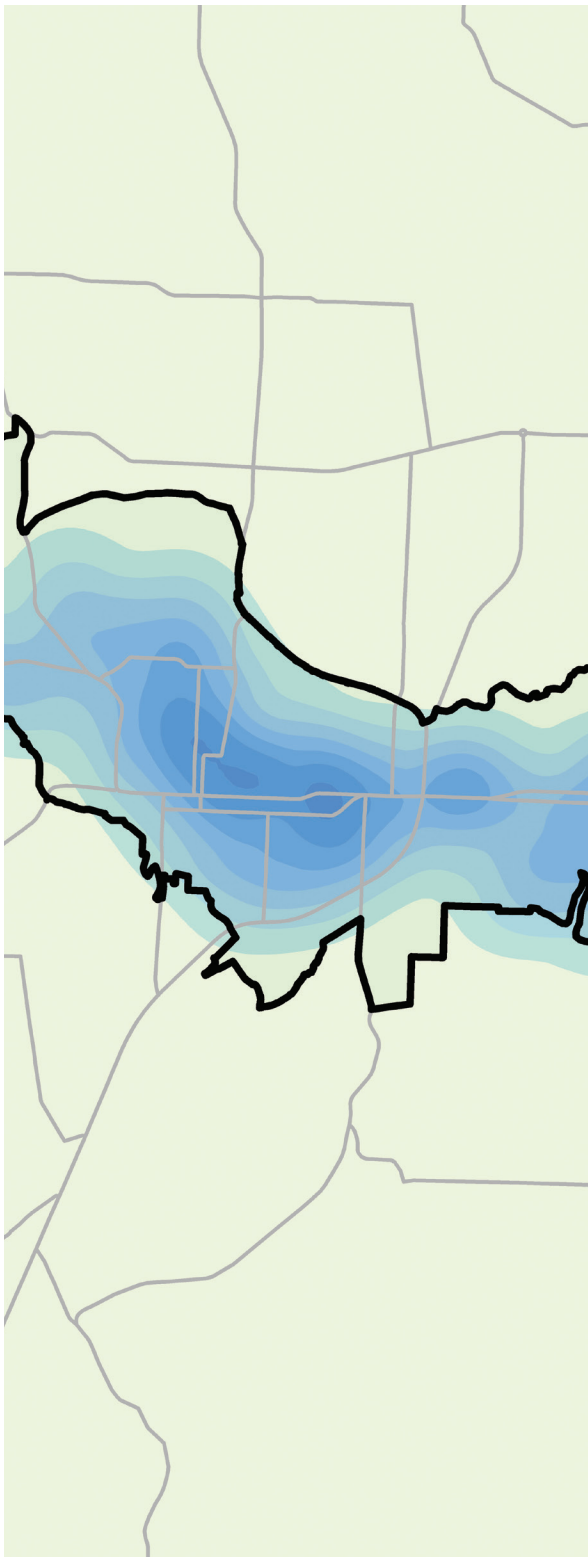
2014 Urban Growth Report: employment land technical working group

This group advised Metro staff on how various employment sectors use building space (square feet per employee and floor-area ratios).

Bob LeFeber, Commercial Realty Advisors
Mark Childs, Capacity Commercial
Steve Kountz, Portland
Tyler Bump, Portland
Brian Owendoff, Capacity Commercial
Mike Tharp, Norris, Beggs, and Simpson

2014 Urban Growth Report: regional forecast advisory panel

Dr. Tom Potiowsky, Chair, Northwest Economic Research Center, PSU
Dr. Jennifer Allen, Institute for Sustainable Solutions, PSU
Jerry Johnson, Johnson Economics
Dr. Jason Jurjevich, Population Research Center, PSU
Dave Lenar, NW Natural
Dr. Randall Pozdena, ECONorthwest
Steve Storm, NW Natural



Urban growth management decision
TIMELINE 2013–2015

Metro

ACTIONS

PHASE 1 - TECHNICAL ENGAGEMENT

PHASE 2 - URBAN GROWTH REPORT

PHASE 3 - GROWTH MANAGEMENT DECISION

2013
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

2014
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

2015
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

1 Major project milestones

- Release draft 20-year population, employment range forecast for 7-county area
- Release draft Urban Growth Report on housing, employment capacity need
- **Council decision** Approve Urban Growth Report as basis for 2015 growth management decision
- COO recommendation to Council on growth management decision
- **Council decision** Adopt measures to meet identified 20-year housing and employment needs

2 Policy engagement (MPAC and Council)

Policy considerations
- Population and employment growth trends and possible implications for future.
- Dealing with uncertainty through adaptive management of growth
- Expectations for concept plans

Policy question
Does the Urban Growth Report provide the Council with a reasonable basis for the growth management decision it will make in 2015?

Note - additional analysis in 2015 will assess growth management alternatives.

Policy considerations
- What are the risks and opportunities of planning for higher or lower population and employment growth rates?
- How can the region best prepare for future housing needs and employment growth?

Policy question
- How much housing and employment growth should the Council plan on?
- What measures should the Council adopt to address growth capacity needs (if any)?

3 Technical/stakeholder engagement

Buildable land inventory technical working group
- Advise on methods for estimating likelihood of future redevelopment and effects of environmental constraints
- Advise on 20-year growth capacity estimates

Residential preference research partnership
- Develop research questions and advise on approach

Local jurisdictions
- Begin concept planning using CPDG funding
- Review preliminary buildable land inventory
- Ongoing refinement of local plans
- Adopt concept plans for urban reserves to be considered for UGB expansion, if necessary

Forecast advisory panel (external economists and demographers)
- **Advise on**
  - Forecast assumptions and results
  - Probabilistic approach to range forecast
  - Scenarios that could lead to high or low growth

Regional Industrial Lands Site Readiness partners
- Update inventory of large industrial sites

Metro Technical Advisory Committee
- As needed, act as technical resource to MPAC as they advise the Metro Council on the Urban Growth Report
- As needed, act as technical resource to MPAC as they advise the Metro Council on the regional growth management decision

Coordination with other major work programs
- Ongoing project staff coordination
- **Decision** Adoption of Regional Transportation Plan
- **Decision** Adoption of Climate Smart Communities preferred scenario
- Interpret growth capacity implications of newly adopted plans

4 General public engagement

- Residential preferences (survey)
- Public hearing on urban growth report
- Attitudes towards growth management (survey)
- Public comment period on growth management decision

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Materials following this page were distributed at the meeting.

Streetcar Corridor Economic Impact Predictive Model

MTAC

August 6, 2014

What is the streetcar predictive model?

An analytical tool to predict real estate development that would be stimulated by streetcar and related investments.

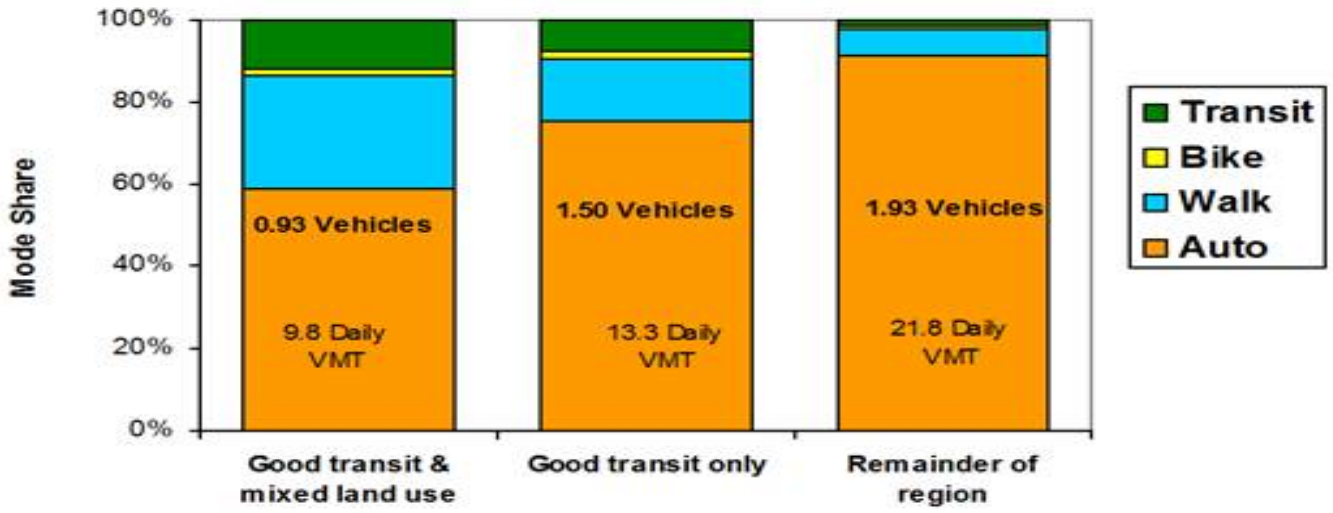
Why do we need the model?

- Existing research/analysis is limited
- Inform decision making processes

Land use influences travel behavior

People take transit, walk and bike more when land uses offer:

- Good design
- Higher density
- Continuity
- Smaller block size
- Mixed uses



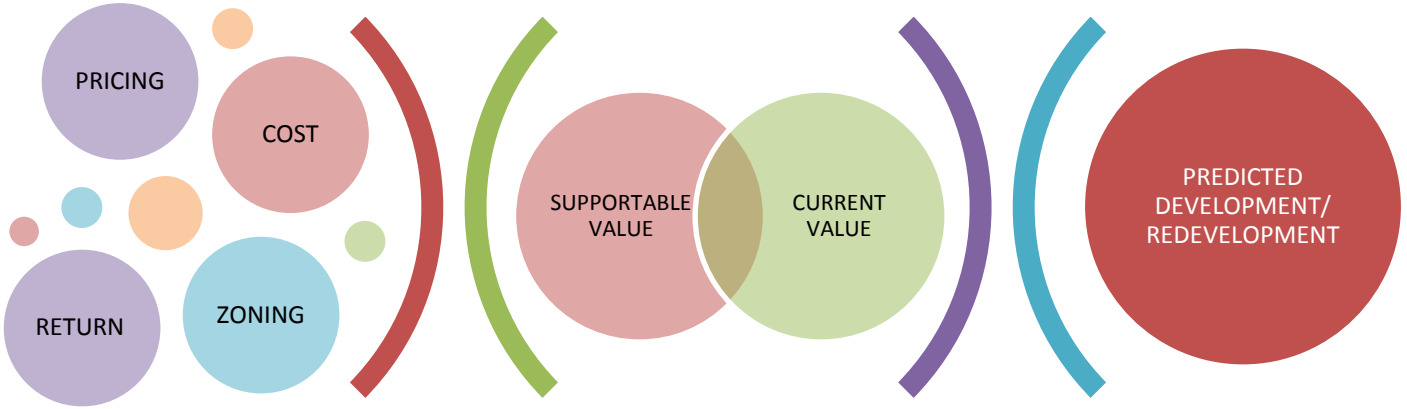
Case studies illustrate success

Research on cause and effect is limited

How the model works…

- Calculates development feasibility
- Compares with and without streetcar improvements

How the model works…



RESIDUAL PROPERTY VALUE MODULE

LIKELIHOOD OF DEVELOPMENT MODULE

PREDICTED MAGNITUDE AND FORM OF DEVELPOMENT

User inputs…

PREDICTIVE ECONOMIC DEVELOPMENT MODEL

PUBLIC INFRASTRUCTURE

TRANSIT AND ACCESSIBILITY

How is the current transit service in the corridor? Will the streetcar improve transit service and connectivity?
Will the streetcar improve accessibility to the city core or other major town center or employment center?

		Existing Conditions	Projected Conditions w/Streetcar	Impact on Development	NEGATIVE High	NEGATIVE Med	NEGATIVE Low	Neutral	POSITIVE Low	POSITIVE Med	POSITIVE High
1	Quality of Transit Service (scale 1-5)	2	3	*Low +*							
2	Average Distance Between Stops (scale 1-5)	5	5	*Neutral*							
3	Will the new streetcar line provide new or vastly improved access to a "Major Destination" district (Central Business District/Town Center/Major Employment Center) that does not exist currently through the traditional street and transit network? (For instance, will the new streetcar line travel above or beneath a previous physical barrier such as a freeway or waterway, to provide a faster/more direct route to the Destination district, whereas the current street system is encumbered by that barrier?) (scale 1-5)		No	*Neutral*							
4	Transit Score (if not available, leave blank)	65	71	*Low +*							
5	Connection to Existing Streetcar Network (Yes/No)		Yes	*Med +*							

PEDESTRIAN ENVIRONMENT

What is the current pedestrian environment in the corridor? Does the streetcar project include improvements to sidewalks and streetscape?
Are there services, shopping and other destinations to walk to?

		Existing Conditions	Projected Conditions w/Streetcar	Impact on Development	NEGATIVE High	NEGATIVE Med	NEGATIVE Low	Neutral	POSITIVE Low	POSITIVE Med	POSITIVE High
6	Quality of Sidewalk Network (scale 1-5)	3	4	*Low +*							
7	Quality of Pedestrian Experience (scale 1-5)	3	4	*Low +*							
8	Availability of Services (Walkscore)	66		*Low +*							

PUBLIC POLICY

Will the streetcar corridor have zoning, financial tools, and other public policy advantages over other similarly zoned corridor in the city?
Are specific changes to zoning and public policy planned as part of streetcar implementation?

		Existing Conditions	Projected Conditions w/Streetcar	Impact on Development	NEGATIVE High	NEGATIVE Med	NEGATIVE Low	Neutral	POSITIVE Low	POSITIVE Med	POSITIVE High
9	Public Tools Available (scale 1-5)	3	4	*Low +*							

Source: Johnson Reid LLC, Angelo Planning Group

Peer review

Keith Bartholomew, JD

Associate Dean , College of Architecture and Planning

University of Utah

Robert Cervero, PhD

Friesen Chair of urban Studies

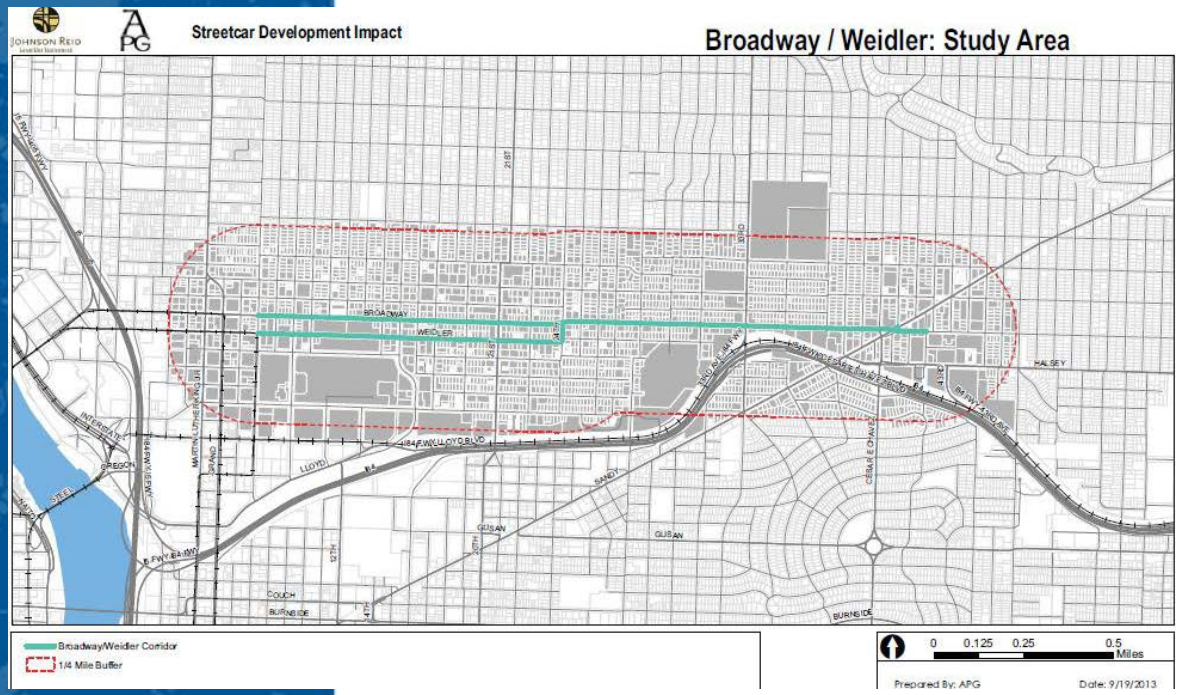
University of California Berkeley

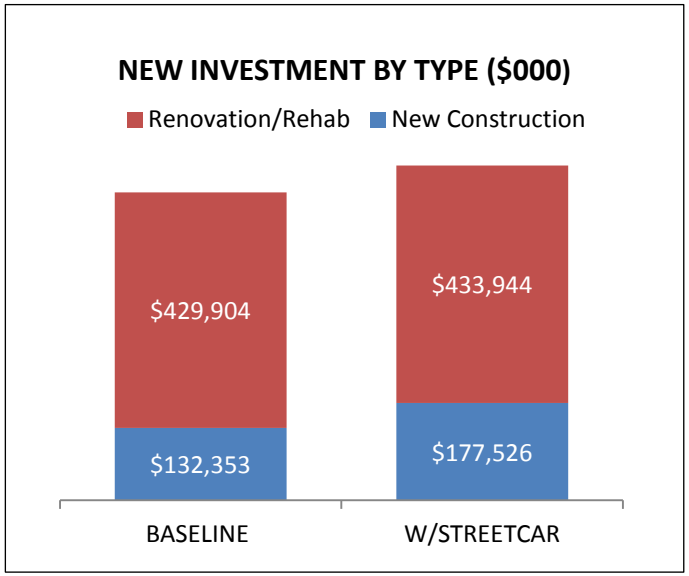
William Lee

Bill Lee Land Econ Consultants

NE Broadway Corridor

The model predicts:
30% increase in housing units
45% increase in commercial space





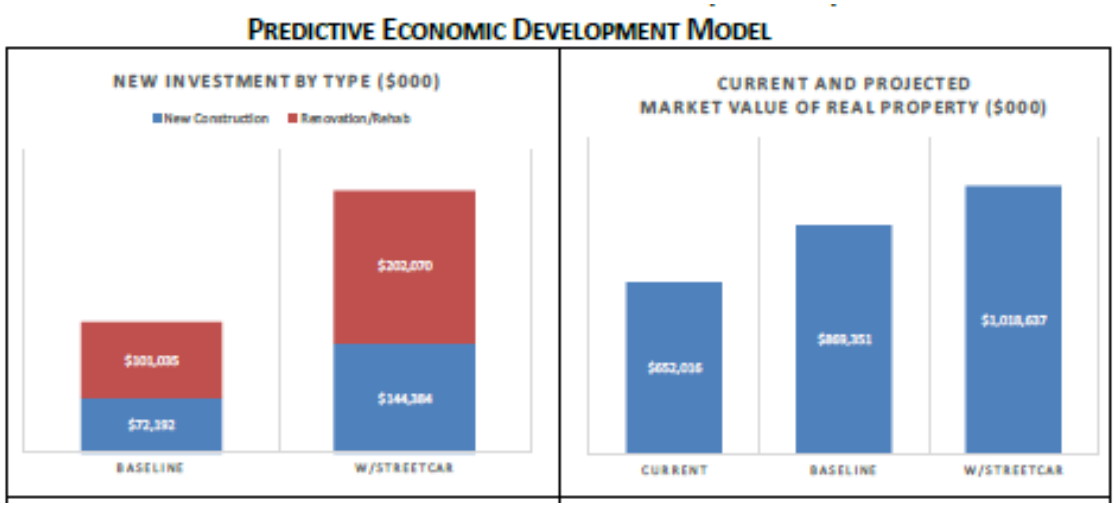
What does it take to run the model?

MARKET DYNAMICS

CURRENT MARKET PRICING (MARGINAL, ASSUMING NEW PRODUCT)			
10	Rental Residential	$2.10	Per Square Foot Per Month
11	Ownership Residential	$210	Per Square Foot
12	Office Space	$18.00	NNN (Triple Net Lease)
13	Retail Space	$18.00	NNN (Triple Net Lease)
14	Parking - Rental Residential	$75.00	Per Covered Secured Space per Month
15	Parking Price - Ownership	$15,000	Per Covered Secured Space
16	Parking - Office Space	$65.00	Per Covered Secured Space per Month
17	Average Annual Pricing Growth Trend (Residential-Rental)	2.0%	AAGR/Inflation Adjusted
18	Average Annual Pricing Growth Trend (Residential-Owner)	2.0%	AAGR/Inflation Adjusted
19	Average Annual Pricing Growth Trend (Office)	0.0%	AAGR/Inflation Adjusted
20	Average Annual Pricing Growth Trend (Retail)	0.0%	AAGR/Inflation Adjusted
OPERATING CHARACTERISTICS			
Structural Vacancy			
24	Rental Residential	5.0%	
25	Office	10.0%	
26	Retail	10.0%	
Operating Expenses			
27	Rental Residential	35.0%	
28	Office	5.0%	
29	Retail	5.0%	
FINANCIAL CHARACTERISTICS			
30	Rental Residential Cap Rate	6.50%	
31	Office Cap Rate	7.50%	
32	Retail Cap Rate	7.50%	
33	Ownership Residential, Return on Cost	20.00%	

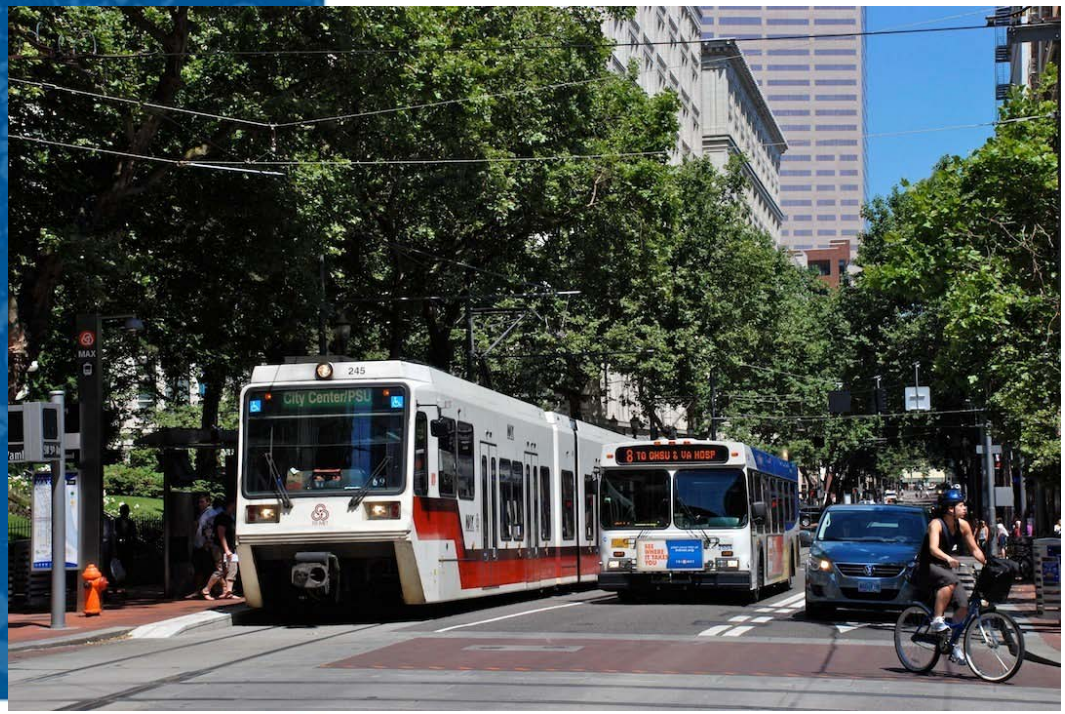
What the model tells us…

1. Magnitude of new development stimulated by public investment
2. How local regulations affect development feasibility
3. Estimated fiscal and economic benefits of development



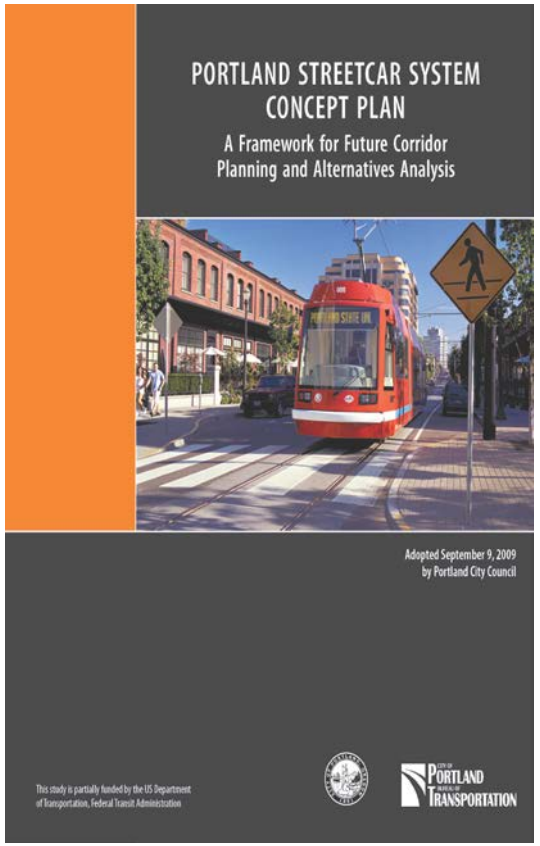
How the model might be applied

- Policy (HCT Plan Update)
- Transit Projects (locally & nationally)



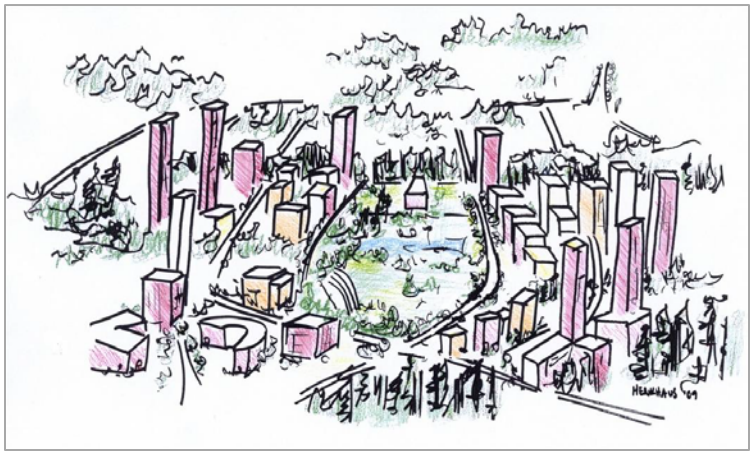
Local Policy application

- The City of Portland is using the model to analyze several corridors identified as potential streetcar routes in the 2009 *Streetcar System Concept Plan*
- The results will feed into the project evaluation process underway as part of the Transportation System Plan update



Local Project application

AmberGlen Redevelopment Plan in Hillsboro

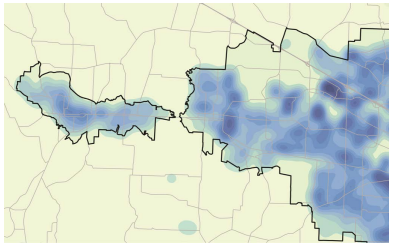


What comes next…

- Policies
- Projects
- Places beyond Portland
- Other ideas?

Questions?

Thank you!



2015 growth management decision

Introduction to the draft 2014 urban growth report

Metro Technical Advisory Committee

8/6/14

Urban growth management decision
TIMELINE

2013
Phase I

TECHNICAL ENGAGEMENT

Jan–Dec 2013
Develop 20-year growth capacity estimates

2014
Phase 2

URBAN GROWTH REPORT

July 2014
Draft urban growth report released

Dec 2014
Metro Council approves UGR

2015
Phase 3

GROWTH MANAGEMENT DECISION

Sept 2015
COO recommendation to Metro Council

Dec 2015
Council decision to adopt measures to meet housing and employment needs

Phase I (2013- 2014)

Transparent technical engagement

- Regional population and employment forecast
- Buildable land inventory
- “Market-feasible” residential supply
- Assumptions about how different jobs use space

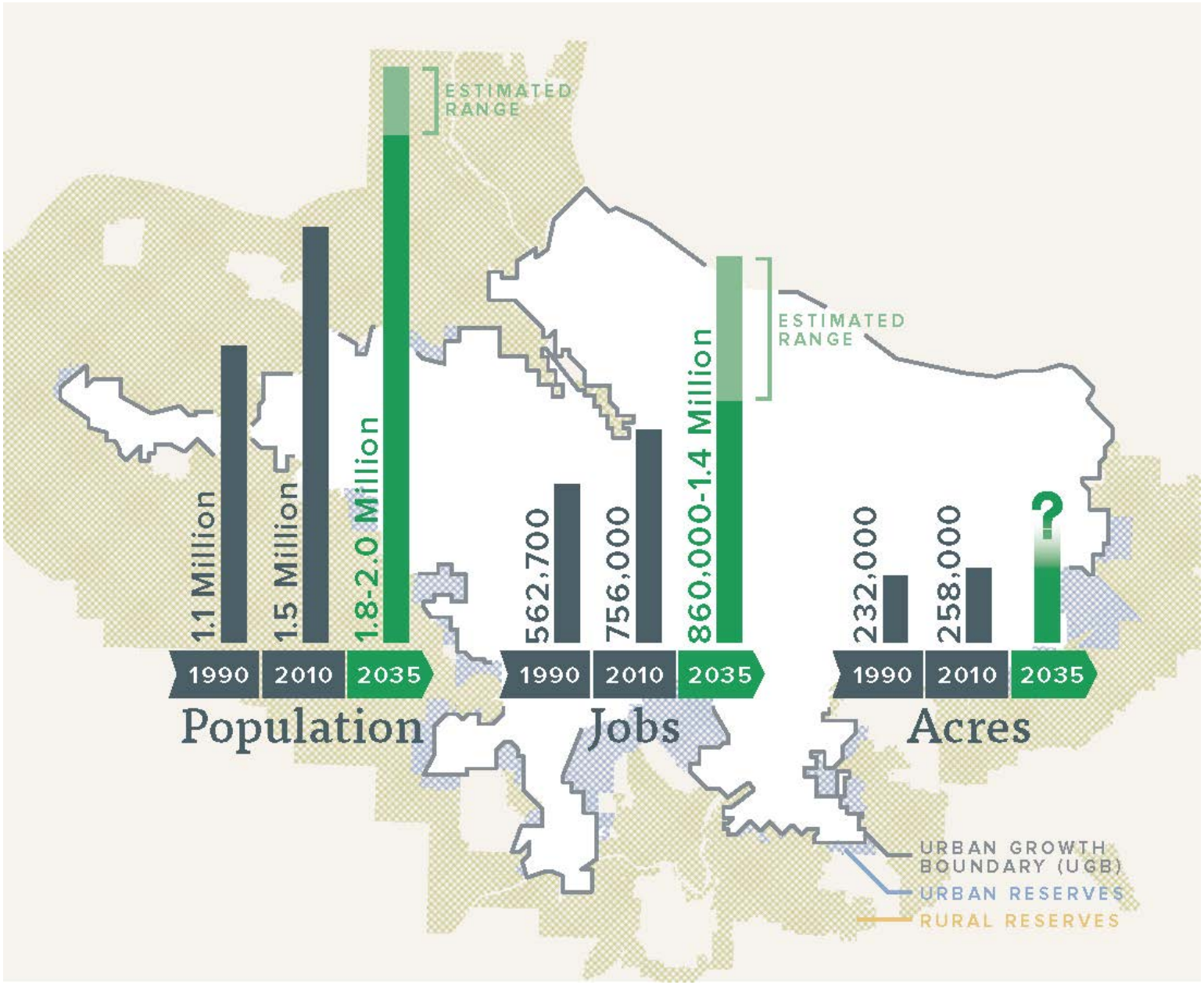
Phase II (2014 Urban Growth Report)

7/22/14	Council – intro to draft UGR
7/23/14	MPAC – intro to draft UGR
9/9/14	Council – residential preference study
9/10/14	MPAC – residential preference study
9/23/14	Council – housing needs
10/7/14	Council – employment needs
10/8/14	MPAC – housing needs
10/22/14	MPAC – employment needs
11/12/14	MPAC – recommendation to Council on UGR
12/4/14	Council – hearing and decision on UGR

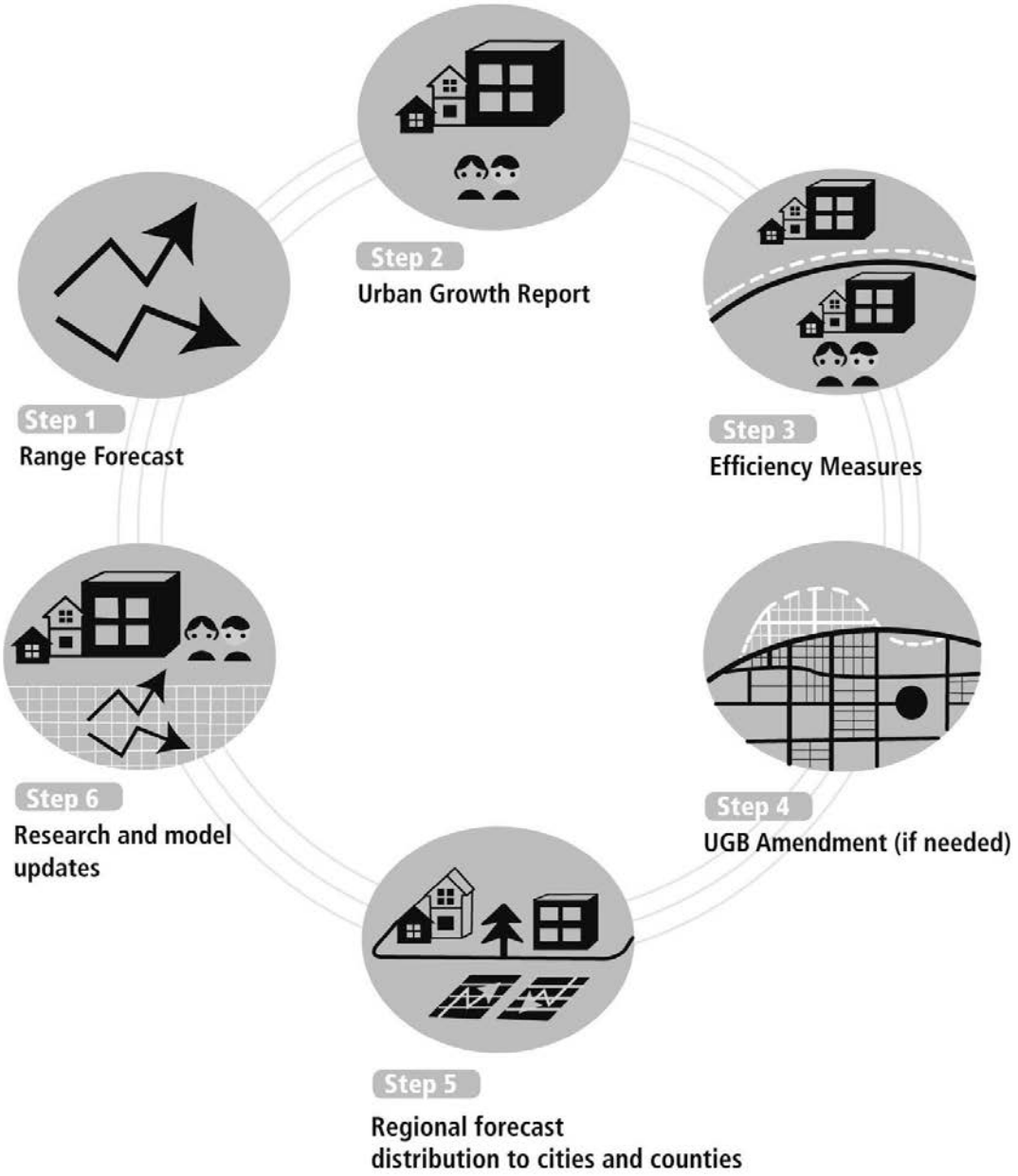
Additional information in draft urban growth report appendices

www.oregonmetro.gov/growth

Past growth – future growth



Forecast coordination cycle



Step 1

Range Forecast

How many more household and jobs will we have in the 7 county area and what share of these will be in the UGB?

Step 2

Urban Growth Report

How much of the region's growth can we meet in the current UGB and what is the additional need, if any?

Step 3

Efficiency Measures

What actions can increase the capacity to meet anticipated growth in the UGB, if needed?

Step 4

UGB Amendment (if needed)

If a UGB expansion is needed, which areas are most suitable to include to meet the region's forecast need for jobs and housing?

Step 5

Regional forecast distribution to cities and counties

Where will the forecast growth locate within the region?

Step 6

Research and model updates

What policy questions do we anticipate for the next UGB review cycle and what analysis can support the decisions?

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Policy considerations when planning for potential population & job growth

- What if we plan for low growth and high growth occurs?
- What if we plan for high growth and low growth occurs?
- Who will realize benefits and who will realize burdens of getting it wrong in either direction?
- What is the best course of action, knowing that we will update the forecast in six years?

Which choices will help the region to achieve desired outcomes?

- Vibrant communities
- Economic competitiveness and prosperity
- Safe and reliable transportation
- Leadership addressing climate change
- Clean air, clean water and healthy ecosystems
- Equity

Successes around the region:

Investing in our communities

Exports

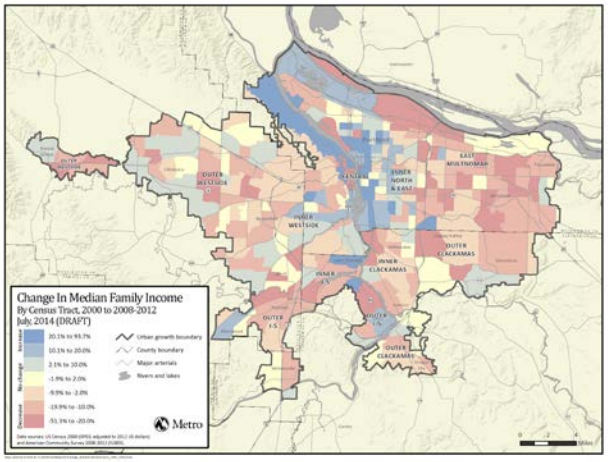
Villebois, Wilsonville

Troutdale Reynolds

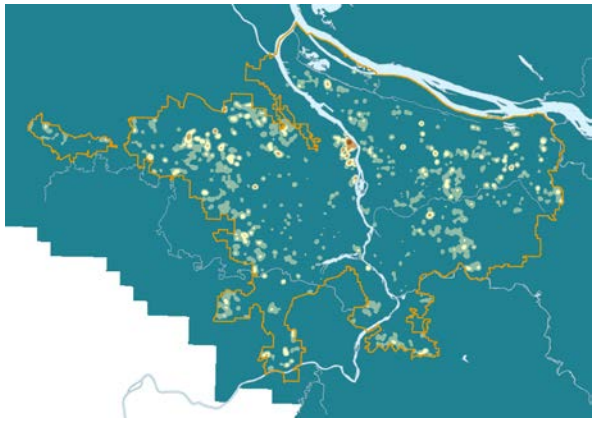
4th Main, Hillsboro

Hassalo on 8th, Portland

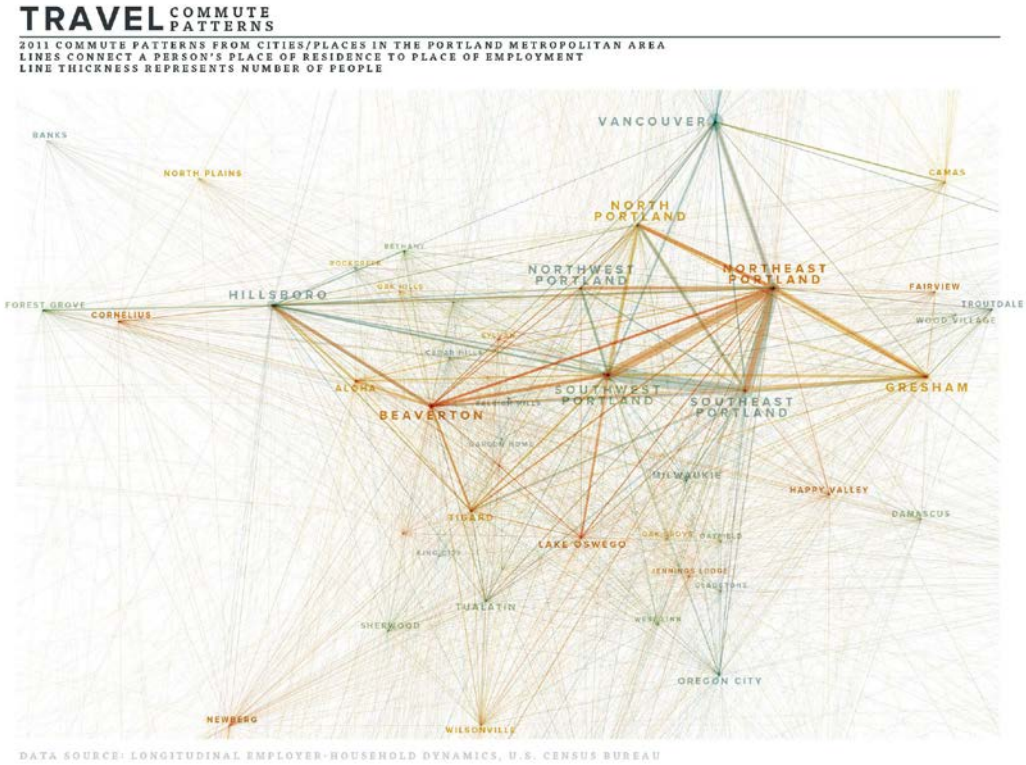
Challenges around the region



Displacement



Concerns with new development



Traffic

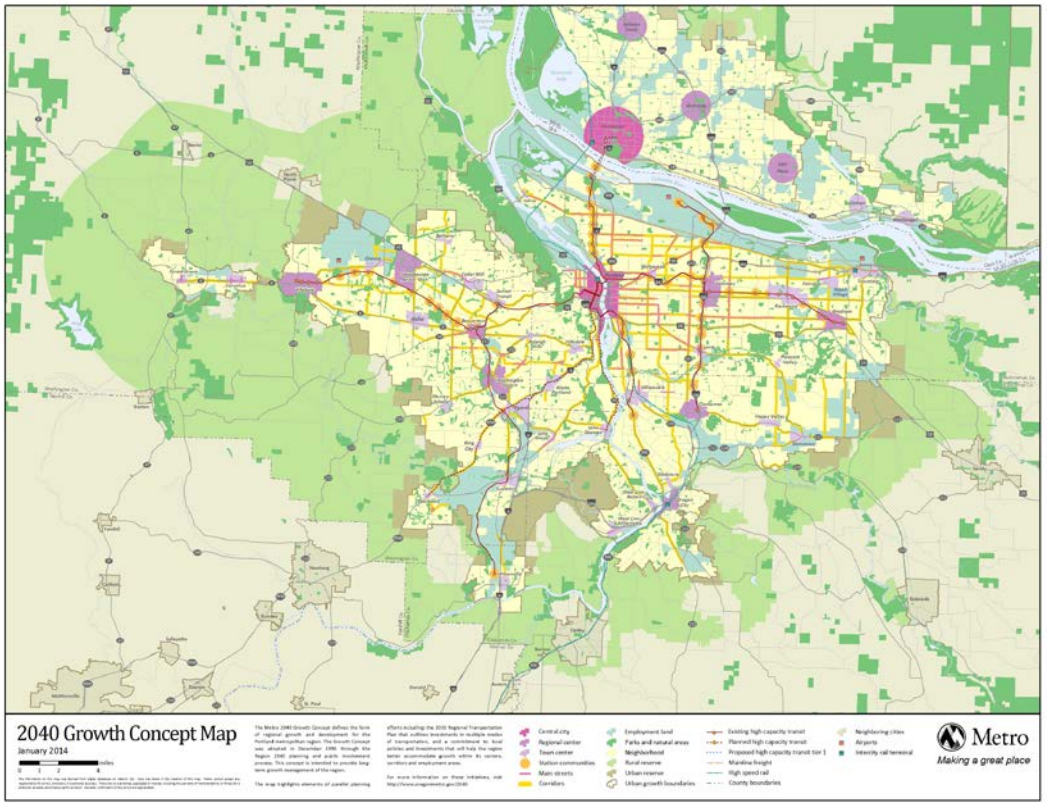
Many have a role in preparing for growth and change

- Metro
- Cities and counties
- Special districts
- Non-profits
- Businesses
- Individuals
- State

One of Metro's roles:

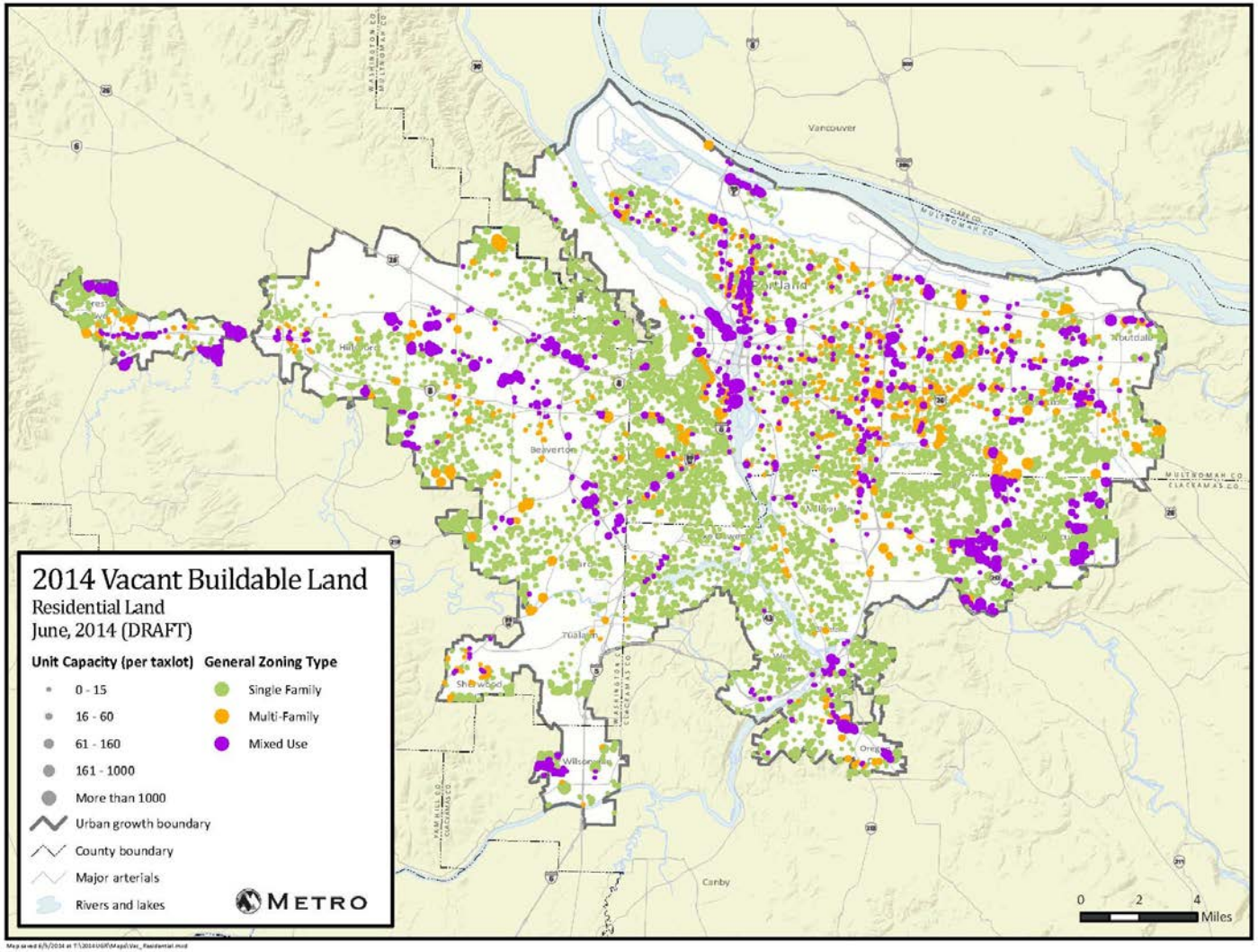
Regional urban growth management

Ensure that there is enough space inside the urban growth boundary for housing and jobs for the next 20 years



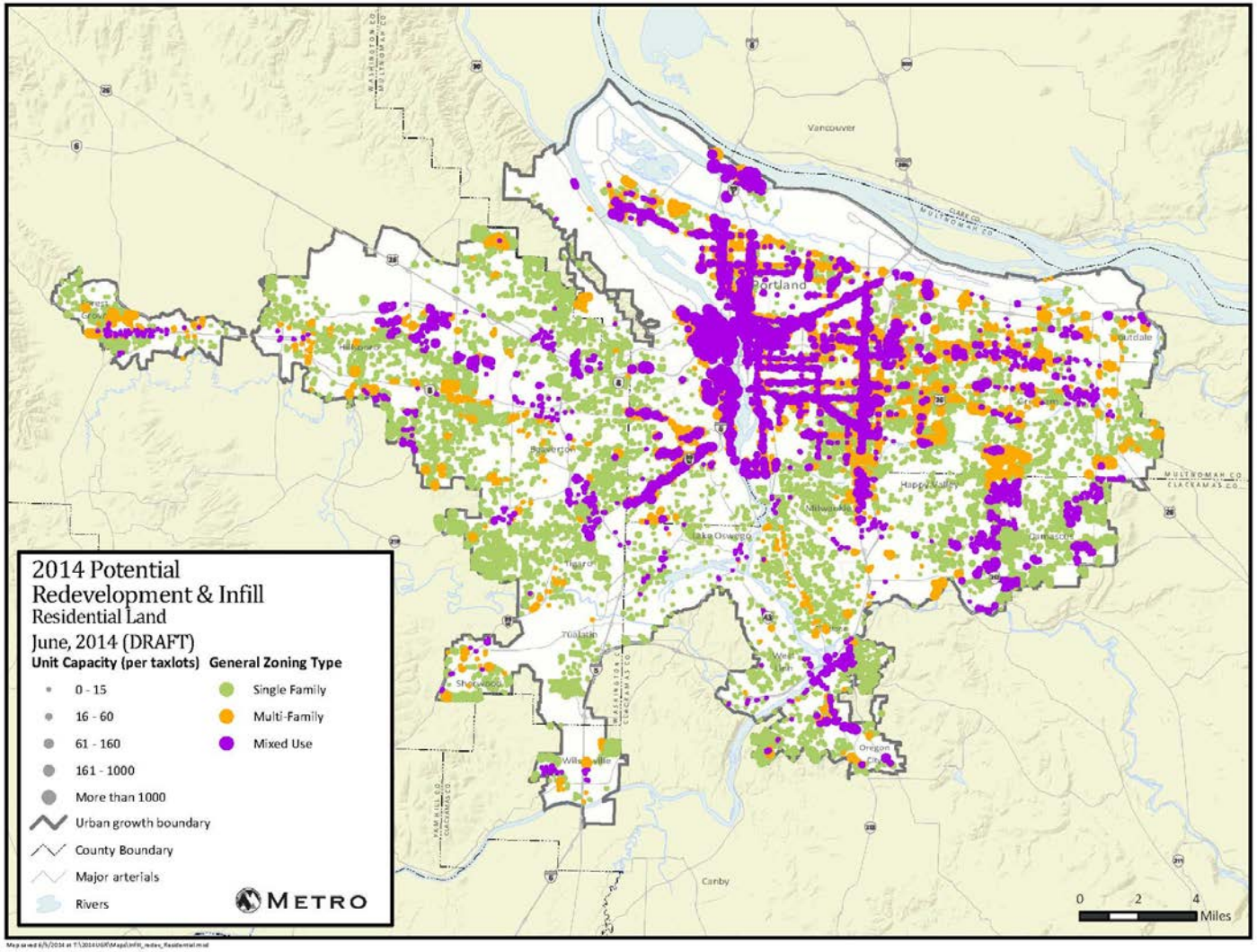
Residential buildable land:

vacant tax lots

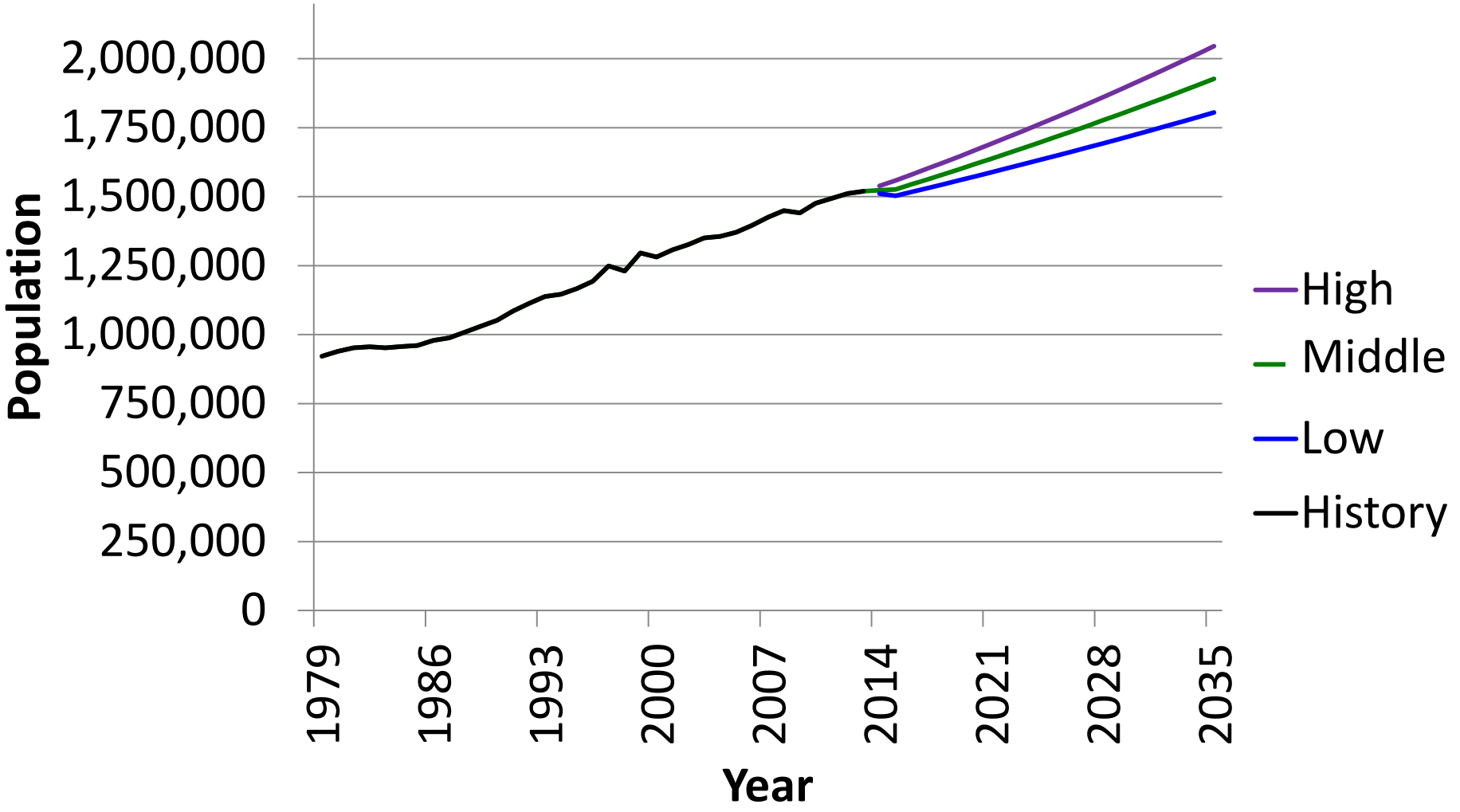


Residential buildable land:

redevelopment and infill candidate tax lots



Estimated population growth for the Metro UGB



Single-family housing capacity needs
(2015 – 2035, Metro UGB)

	Single-family dwelling units			
	Buildable land inventory	**Market-adjusted supply**	**Demand**	**Surplus or need**
Low growth forecast	118,700	76,600	70,600	+6,000
Middle growth forecast		90,700	89,000	+1,700
High growth forecast		97,700	103,800	-6,100

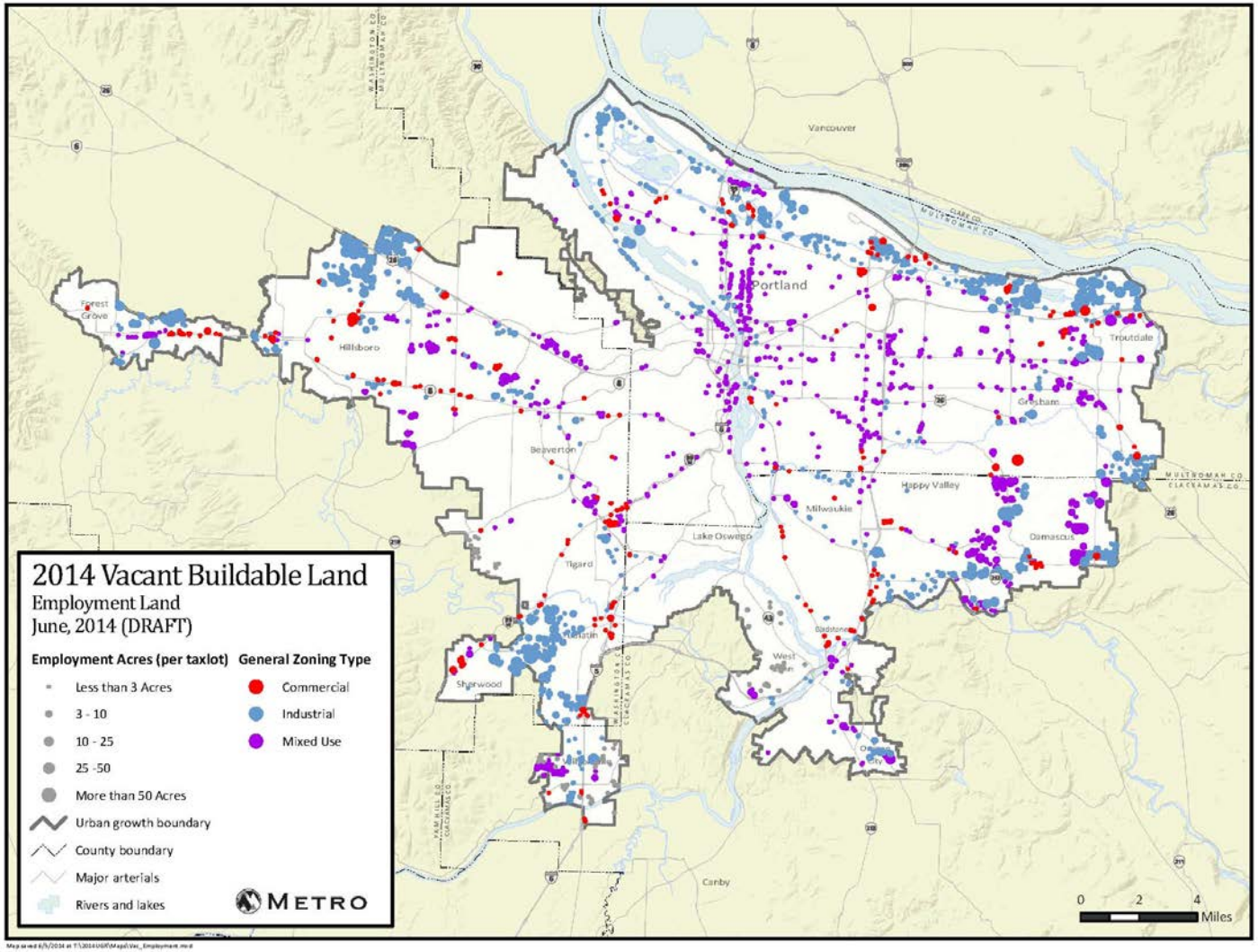
Multifamily housing capacity needs
(2015 – 2035, Metro UGB)

	Multifamily dwelling units			
	Buildable land inventory	**Market-adjusted supply**	**Demand**	**Surplus or need**
Low growth forecast	274,000	119,100	82,700	+36,400
Middle growth forecast		130,800	108,400	+22,400
High growth forecast		165,800	132,200	+33,600

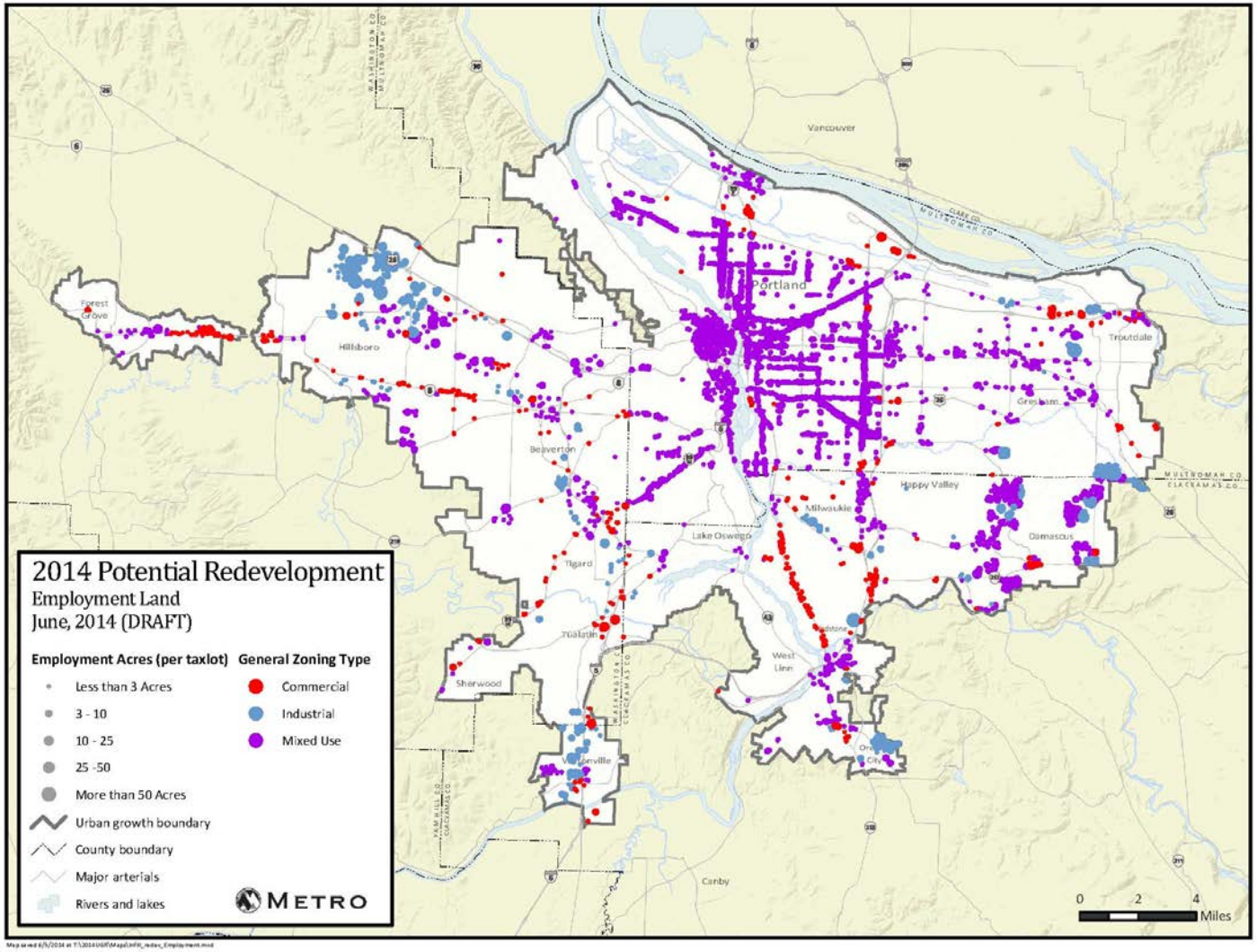
Policy considerations: housing

- Is the real challenge land readiness or land supply?
- How can we encourage “family-friendly” housing in urban areas?
- What is the right mix of housing in UGB expansions?
- How should policy makers balance housing preferences with other concerns such as infrastructure provision and affordability?
- How much can we rely on growth capacity in Damascus? Are there other options that are more viable, either in existing urban areas, urban reserves?

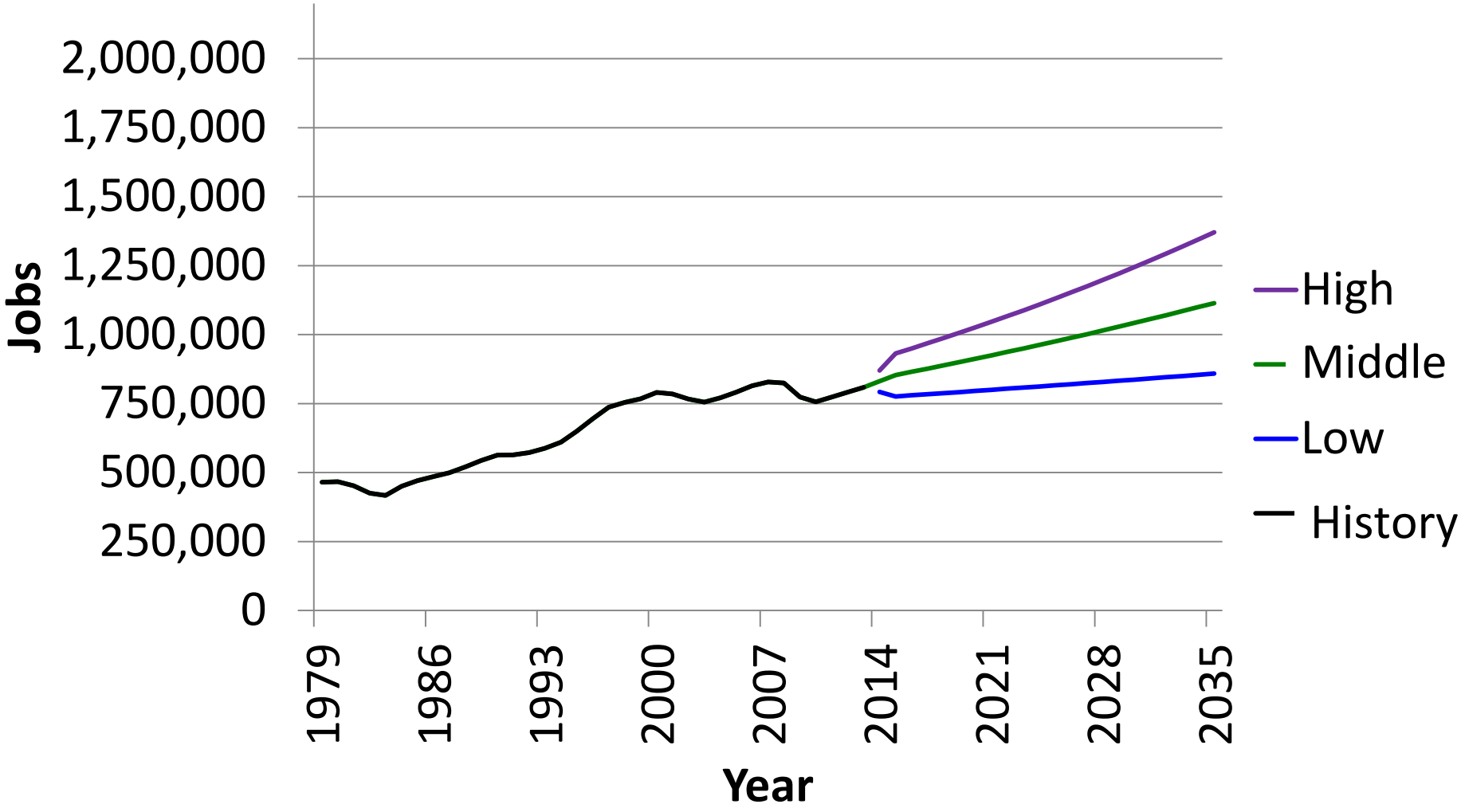
Employment buildable land:
vacant tax lots



Employment buildable land:
redevelopment candidate tax lots



Estimated job growth for the Metro UGB



General industrial capacity needs
(2015 – 2035, Metro UGB)

	General industrial employment (acres)			
	Buildable land inventory	**Market-adjusted supply**	**Demand**	**Surplus or need**
Low growth forecast	7,100	5,800	1,200	+4,600
Middle growth forecast		5,000	3,800	+1,200
High growth forecast		5,000	6,500	-1,500

Large industrial site needs (25+ acres)
(2015 – 2035, Metro UGB)

	Number of sites (preliminary update by Mackenzie)	Demand	Surplus or need
Low growth forecast	74	8	+66
Middle growth forecast		21	+53
High growth forecast		34	+40

Notes:

- *24 of the 74 sites in the inventory are, at this time, being held by firms for future expansion opportunities.*
- *Growth of existing firms is implicit in demand forecast.*
- *Inventory includes vacant land only, not redevelopment or reuse of buildings*

Commercial capacity needs
(2015 – 2035, Metro UGB)

	Commercial employment (acres)			
	Buildable land inventory	**Market-adjusted supply**	**Demand**	**Surplus or need**
Low growth forecast	4,300	4,200	1,400	+2,800
Middle growth forecast		4,500	3,600	+900
High growth forecast		5,100	5,700	-600

Policy considerations: job growth

- Is the real challenge land readiness or land supply?
- Where should RISE focus its attention to ensure the region can generate job growth?
- Are there urban reserve locations where it makes sense to plan for a mix of housing and commercial jobs?

Phase II (2014 Urban Growth Report)

7/22/14	Council – intro to draft UGR
7/23/14	MPAC – intro to draft UGR
9/9/14	Council – residential preference study
9/10/14	MPAC – residential preference study
9/23/14	Council – housing needs
10/7/14	Council – employment needs
10/8/14	MPAC – housing needs
10/22/14	MPAC – employment needs
11/12/14	MPAC – recommendation to Council on UGR
12/4/14	Council – hearing and decision