600 NE Grand Ave.
Portland, OR 97232-2736

Metro | *Agenda*

Meeting: **Metro Council Work Session**
Date: Tuesday, July 29, 2014
Time: 2 p.m.
Place: Council Chamber

CALL TO ORDER AND ROLL CALL

2 PM	**1.**	**ADMINISTRATIVE/ COUNCIL AGENDA FOR JULY 31, 2014/ CHIEF OPERATING OFFICER COMMUNICATION**	
2:10 PM (30 Min)	**2.**	**EQUITABLE HOUSING DEVELOPMENT WORK PLAN – INFORMATION/DISCUSSION**	**Elissa Gertler, Metro** **Megan Gibb, Metro** **Jonathan Williams, Metro**
2:40 PM (20 MIN)	**3.**	**STREETCAR PREDICTIVE DEVELOPMENT MODEL PRESENTATION – INFORMATION/ DISCUSSION**	**Elissa Gertler, Metro** **Jamie Snook, Metro** **Meganne Steele, Metro** **Jonathan Williams, Metro**
3:00 PM	**4.**	**COUNCIL COMMUNICATION**	

ADJOURN

Agenda Item No. 2.0

EQUITABLE HOUSING DEVELOPMENT WORK PLAN

Metro Council Work Session
Tuesday, July 29, 2014
Metro, Council Chamber

METRO COUNCIL

Work Session Worksheet

PRESENTATION DATE: July 29, 2014 **LENGTH:** 30 minutes

PRESENTATION TITLE: Equitable Housing Development Work Plan
DEPARTMENT: Planning and Development

PRESENTER(S): Elissa Gertler x1752 elissa.gertler@oregonmetro.gov
Megan Gibb x1753 megan.gibb@oregonmetro.gov
Jonathan Williams x1931 jonathan.williams@oregonmetro.gov

WORK SESSION PURPOSE & DESIRED OUTCOMES

- Purpose: Review and discuss proposed work plan for a $200,000 initiative to promote regional housing choice and affordability.
- Outcome: Confirmation or refinement of proposed approach.

TOPIC BACKGROUND & FRAMING THE WORK SESSION DISCUSSION

Recognizing the continuing need to address the issue of housing affordability, Metro Councilor Sam Chase has proposed and Metro Council has approved a FY 2014-2015 budget amendment of $200,000 to 1) develop and deploy technical support tools for jurisdictions seeking to eliminate barriers to affordable housing 2) develop and promote local, regional, and statewide policies to support affordable housing, and 3) develop a long range strategy for funding workforce housing development. Staff will present a work plan that responds to these goals and seeks feedback on the proposed approach.

QUESTIONS FOR COUNCIL CONSIDERATION

- What questions does Council have?

PACKET MATERIALS

- Would legislation be required for Council action ☐ Yes X No
- If yes, is draft legislation attached? ☐ Yes ☐ No
- What other materials are you presenting today? Staff will distribute copies of the proposed work plan and provide context through a short PowerPoint presentation.

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Equitable Housing Development Strategy Work Plan

Megan Gibb, Program Manager

GOAL: Promote equitable housing opportunities that support vibrant communities across the region.

METRO ROLE: Establish partnerships with local jurisdictions, affordable housing developers and funders to support policies and programs that promote equitable housing opportunities across the region.

PROGRAM OBJECTIVES:

- Investigate and document statewide and national best practices regarding local, regional, and state policies and financing approaches.
- Investigate and document capacity (policies, expertise, resources) of local jurisdictions and Metro to support and promote equitable housing development.
- Develop shared understanding among jurisdictions and other stakeholders regarding best practices, needs, and opportunities for collaboration.
- Establish mechanism for formal partnerships between Metro and jurisdictions to support implementation of best practices for equitable development.
- Establish mechanism for formal partnerships between Metro, foundations, and other public and private funding sources to support equitable development in the region.

BACKGROUND:

Metro has a long history of commitment to equity, housing choice, and affordable housing. In 2000, Metro adopted Title 7 of the Urban Growth Management Functional Plan which requires local jurisdictions to support the preservation and development of affordable housing through their comprehensive plans and provides voluntary targets for affordable housing production. In 2006, Metro accepted the Regional Housing Choice Implementation Strategy which made four primary recommendations including:

1) Integrating housing supply concerns, particularly affordable housing, into all policy making and funding allocations in order to achieve regional housing choice equity through promotion of affordable housing as a regional function on par with transportation and green spaces.
2) Direct efforts towards development of resources, and especially a new permanent regional resource for affordable housing, and join and lead advocacy for increased funding at the Federal, State, and regional levels.
3) Promote strategies to remove regulatory barriers and reduce the cost of developing housing and affordable workforce housing specifically, especially in 2040 Centers and Corridors.
4) Prioritize the budget for housing to provide technical assistance to local governments such as land/site inventory, model codes, etc.

Metro's Transit Oriented Development Strategic Plan calls for staff to "work with stakeholders to develop a strategy around equitable TOD and identify funding needs and leveraging opportunities." To date, the TOD program has helped support the production of approximately 2,800 workforce housing units near transit, including 662 units reserved exclusively for households with incomes at 60% of Area Median Income or less.

In addition to Metro and local jurisdictional partners, the region is home to an experienced and knowledgeable community of for profit and not for profit affordable housing developers, Low Income Housing Tax credit equity syndicators, lenders, property managers, and advocates. Since 2003, the Oregon Housing Alliance has convened members of the broader affordable housing community including jurisdictions and strategic partners to develop and promote statewide legislative support for affordable housing.

While some of the recommendations of the 2006 Regional Housing Choice Implementation Strategy have been successfully implemented, other components of the Strategy have not moved forward, and housing affordability continues to be a significant regional concern. Recognizing this continuing need to address the issue of housing affordability, Metro Councilor Sam Chase has proposed an FY 2014-2015 budget amendment of $200,000 to: 1) develop and deploy technical support tools for jurisdictions seeking to eliminate barriers to affordable housing; 2) develop and promote local, regional, and statewide policies to support affordable housing; and 3) develop a long range strategy for funding workforce housing development.

WORK PROGRAM ELEMENTS:

Phase 1: Engage and Research

1) Brief staff and elected officials from local jurisdictions on goals and timeline of Equitable Housing Development Strategy. Request feedback on top local concerns regarding equitable housing development, and follow up to gather information on existing programs, opportunities, and constraints facing local jurisdictions as they work to promote equitable development. Invite participation at planned Equitable Development Summit.
   Deliverable: Report on Opportunities and Constraints Facing Local Communities in Promoting Equitable Development.
   Lead: Metro Staff.

2) Analyze the affordability challenge facing households on a regional level but also at the jurisdictional and neighborhood level. Staff will review existing datasets prepared for Urban Growth Report and national best practices in analyzing housing affordability. While scope of analysis will be refined based on available data and best practices, Staff anticipates documenting the following:
   - Changes in median rent versus median household income over time;
   - Distribution of rental and ownership housing units by price points and number of bedrooms;
   - Distribution of households by size, rent versus own tenure, and income;
   - Supply and demand balance for rental units at different price points;

- Concentrations of poverty across region.
- Distribution of low cost rental housing units across region

Deliverable: Report on Housing Affordability in the Portland Metropolitan Region.
Lead: Metro Staff.

3) Document the progress of the Regional Housing Choice Implementation Strategy including recommendations that have been successfully implemented and those that have failed to gain traction. Through engagement with internal Metro staff and external stakeholders, Staff will report why certain recommendations were able to be successfully implemented while others were not—particularly with regard to efforts to achieve permanent resources for affordable housing.
Deliverable: Report on Progress and Lessons Learned from 2006 Regional Housing Choice Implementation Strategy
Lead: Metro Staff.

4) Review best practices including both policy and financial incentives other regions have utilized to promote the development of economically diverse housing alternatives across neighborhoods and jurisdictions. Potential case studies could include Fair Share Housing Requirements in Massachusetts and New Jersey, inclusionary zoning requirements in California, and regional affordable housing funds initiated by governments and by foundations.
Deliverable: Report on National Best Practices in Regional Housing Choice.
Lead: Consultant.

5) Drawing on interviews with Oregon jurisdictions, affordable housing developers, and others identify and describe best practices of local jurisdictions within Oregon that have made leading efforts to promote affordable housing.
Deliverable: Report on Local Best Practices in Affordable Housing.
Lead: Consultant.

Phase 2: Convene

Convene an Equitable Development Summit consisting of local jurisdictions' elected officials, market rate and affordable housing developers, land preservation interests, and elected Metro officials at which research findings are presented. Present research findings regarding best local practices, regional policy opportunities, and financial partnership models. Solicit confirmation and feedback on findings preferred approaches, and interest in partnerships.
Deliverable: Report on Regional Consensus on Equitable Development.
Lead: Metro Staff.

Phase 3: Partner

1) Reflecting Phase I research and feedback from Equitable Development Summit prepare and distribute a best practices toolkit for jurisdictions seeking to promote housing choice within their communities, and provide recommendations for Metro Council regarding programs, policies and incentives to encourage and support local jurisdictions in implementing best practices.

Deliverables: Equitable Development Toolkit, and work plan for Metro Council consideration to implement policies and incentives to support local implementation of best practices.
Lead: Metro Staff.

2) Reflecting models identified in Phase I, provide Metro Council with recommendation for facilitating establishment of a regional fund to support Equitable Development which pools resources from a variety of outside partners, and identify appropriate entity to manage/distribute funds.
Deliverable: Work plan for Metro Council consideration to facilitate formation of a regional fund to support equitable development.
Lead: Metro Staff.

RELATED PROJECTS/PROGRAMS:

- Transit Oriented Development Program
- RISE initiative
- Regional coordination for local economic opportunity analysis and comprehensive plan updates
- Housing and Equity Opportunity Mapping
- Community Development and Planning Grants
- Powell-Division Transit and Land Use Planning
- Metro Equity Initiative
- Urban Growth Report

ADVISORY COMMITTEE COMPOSITION:

- Oregon Housing Alliance
- Local jurisdictional representation
- Affordable housing developer representation
- Affordable housing finance representation
- Market rate housing developer representation
- Foundation/funder representation

ADVISORY COMMITTEE ROLE:

- Review and endorse research scope.
- Review and accept research findings.
- Assist in securing cooperation and assistance from respective organizations and entities in information sharing, research cooperation, and feedback.
- Inform and endorse recommendations.
- Serve as liaison in building relationships and partnerships with respective organizations and entities.

COUNCIL ROLE: *(TBD liaison)*

- Chair Equitable Development Summit.
- Serve as liaison to Council on policy recommendations.

ANTICIPATED KEY MILESTONES AND DECISIONS TIMELINE (WORK IN PROGRESS)

1. Metro Council direction on overall work program	July 29, 2014

2. Engage consultant and recruit and hire staff	October 2014
3. Phase I: Engage and Research	Winter 2014-2015
4. Phase II: Equitable Housing Summit	Spring 2015
5. Phase III: Recommendations for Council action	Summer-Fall 2015

EVENTS AND PRODUCTS TO ACTUALIZE KEY MILESTONES

Phase 1: Winter 2015

- Report on Opportunities and Constraints Facing Local Communities in Promoting Equitable Development.
- Report on Housing Affordability in the Portland Metropolitan Region. Lead: Metro Staff.
- Report on Progress and Lessons Learned from 2006 Regional Housing Choice Implementation Strategy.
- Report on National Best Practices in Regional Housing Choice.
- Report on Local Best Practices in Affordable Housing.

Phase 2: Spring 2015

- Equitable Housing Development Summit.
- Report on Regional Consensus on Equitable Development.

Phase 3: Summer-Fall 2015

- Recommendation to Metro Council regarding programs, policies and incentives to encourage and support local jurisdictions in implementing best practices.
- Recommendation to Metro Council for establishing a regional fund to support Equitable Development which pools resources from a variety of outside partners, and identifies appropriate entity to manage/distribute funds.

RESOURCES CURRENTLY ALLOCATED BY PLANNING AND DEVELOPMENT FY 2014-2015

$200,000 with 50% allocated for Phase I research and 50% for work associated with Phase III and implementation.

In addition, Planning and Development Department will allocate 1.0 FTE through a limited duration position to lead Metro's portion of the work effort.

Note: does not include staff in other departments

Agenda Item No. 3.0

STREETCAR PREDICTIVE DEVELOPMENT MODEL PRESENTATION

Metro Council Work Session
Tuesday, July 29, 2014
Metro, Council Chamber

METRO COUNCIL

Work Session Worksheet

PRESENTATION DATE: July 29, 2014 **LENGTH:** 20 minutes

PRESENTATION TITLE: Streetcar Predictive Development Model presentation

DEPARTMENT: Planning and Development

PRESENTER(S): Elissa Gertler, Planning and Development Director,
elissa.gertler@oregonmetro.gov, ext 1752
Jamie Snook , jamie.snook@oregonmetro.gov, ext 1751
Meganne Steele, meganne.steele@oregonmetro.gov, ext 1736
Jonathan Williams, jonathan.williams@oregonmetro.gov, ext 1931

WORK SESSION PURPOSE & DESIRED OUTCOMES

- Purpose: Review and discuss the Streetcar Predictive Model tool with Council.
- Outcome: Metro Council is informed and aware of a new analysis tool, understands how staff will be engaging with partners, and has provided input on hos this too could be applied.

TOPIC BACKGROUND & FRAMING THE WORK SESSION DISCUSSION

Federal Transit Administration (FTA) and Metro have been working for years to integrate land use and development into the New Starts/Small Starts criteria. FTA agreed to fund our efforts to create innovative evaluation methods.

Metro partnered with TriMet, City of Portland, City of Hillsboro and Portland Streetcar Inc (PSI) to build an economic tool that would help link transportation investment to development outcomes. Johnson Economics was hired to help us with this endeavor.

The process of building the model was illustrative in itself. We not only built it, but learned we had to test it and calibrate the model.

Staff is excited about the opportunity to apply this tool locally and regionally to help us look at future public and private investments.

Staff wants to share key lessons with the Council and local communities so we can consider how this model can be applied.

QUESTIONS FOR COUNCIL CONSIDERATION

- What questions does Council have?

PACKET MATERIALS

- Would legislation be required for Council action ☐ Yes ☒ No
- If yes, is draft legislation attached? ☐ Yes ☐ No
- What other materials are you presenting today? N/A

Click here for full Final Project Report

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

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Materials following this page were distributed at the meeting.

600 NE Grand Ave.
Portland, OR 97232-2736

Metro | *Agenda*

Meeting: Metro Council
Date: Thursday, July 31, 2014
Time: 2:00 p.m.
Place: Metro, Council Chamber

CALL TO ORDER AND ROLL CALL

1.	**INTRODUCTIONS**	
2.	**CITIZEN COMMUNICATION**	
3.	**CONSIDERATION OF COUNCIL MEETING MINUTES FOR JULY 24, 2014.**	
4.	**RESOLUTIONS**	
4.1	**Resolution No. 14-4538,** For the Purpose of Endorsing the Oregon Zoo's Education, Outreach and Research Efforts to Reduce Lead Exposure in Wildlife and Humans from Spent Lead Ammunition.	**David Shepherdson, Metro**
4.2	**Resolution No. 14-4532**, For the Purpose of Adopting the 2015-2018 Metropolitan Transportation Improvement Program for the Portland Metropolitan Area.	**Ted Leybold, Metro**
5.	**ORDINANCES –SECOND READ**	
5.1	**Ordinance No. 14-1336,** For the Purpose of Amending Maps in Titles 4 and 14 of the Urban Growth Management Functional Plan to Conform with Changes Enacted by the Oregon Legislature in House Bill 4078.	**Tim O'Brien, Metro**
5.1.1	**Public Hearing on Ordinance No. 14-1336**	
6.	**CHIEF OPERATING OFFICER COMMUNICATION**	**Martha Bennett, Metro**
7.	**COUNCILOR COMMUNICATION**	

ADJOURN

AN EXECUTIVE SESSION WILL BE HELD IMMEDIATELY FOLLOWING THE PUBLIC HEARING PURSUANT TO ORS 192.660(2)(e), TO CONDUCT DELIBERATIONS WITH PERSONS DESIGNATED BY GOVERNING BODY TO NEGOTIATE REAL PROPERTY TRANSACTIONS.

Television schedule for July 31, 2014 Metro Council meeting

Clackamas, Multnomah and Washington counties, and Vancouver, WA Channel 30 – Community Access Network *Web site*: www.tvctv.org *Ph*: 503-629-8534 *Date*: Thursday, July 31	**Portland** Channel 30 – Portland Community Media *Web site*: www.pcmtv.org *Ph*: 503-288-1515 *Date:* Sunday, August 3, 7:30 p.m. *Date*: Monday, August 4, 9 a.m.
Gresham Channel 30 - MCTV *Web site*: www.metroeast.org *Ph*: 503-491-7636 *Date*: Monday, August 4, 2 p.m.	**Washington County and West Linn** Channel 30– TVC TV *Web site*: www.tvctv.org *Ph*: 503-629-8534 *Date*: Saturday, August 2, 11 p.m. *Date*: Sunday, August 3, 11 p.m. *Date*: Tuesday, August 5, 6 a.m. *Date*: Wednesday, August 6, 4 p.m.
Oregon City and Gladstone Channel 28 – Willamette Falls Television *Web site*: http://www.wftvmedia.org/ *Ph*: 503-650-0275 Call or visit web site for program times.	

PLEASE NOTE: Show times are tentative and in some cases the entire meeting may not be shown due to length. Call or check your community access station web site to confirm program times. Agenda items may not be considered in the exact order. For questions about the agenda, call the Metro Council Office at 503-797-1540. Public hearings are held on all ordinances second read. Documents for the record must be submitted to the Regional Engagement and Legislative Coordinator to be included in the meeting record. Documents can be submitted by e-mail, fax or mail or in person to the Regional Engagement and Legislative Coordinator. For additional information about testifying before the Metro Council please go to the Metro web site www.oregonmetro.gov and click on public comment opportunities.

Metro's nondiscrimination notice
Metro respects civil rights. Metro fully complies with Title VI of the Civil Rights Act of 1964 that bans discrimination on the basis of race, color or national origin. For more information on Metro's civil rights program, or to obtain a Title VI complaint form, visit www.oregonmetro.gov/civilrights or call 503-797-1536. Metro provides services or accommodations upon request to persons with disabilities and people who need an interpreter at public meetings. All Metro meetings are wheelchair accessible. If you need a sign language interpreter, communication aid or language assistance, call 503-797-1536 or TDD/TTY 503-797-1804 (8 a.m. to 5 p.m. weekdays) 7 business days in advance of the meeting to accommodate your request. For up-to-date public transportation information, visit TriMet's website at www.trimet.org.

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Equitable Housing Development Strategy Work Plan

Megan Gibb, Program Manager

GOAL: Promote equitable housing opportunities that support vibrant communities across the region.

METRO ROLE: Establish partnerships with local jurisdictions, affordable housing developers and funders to support policies and programs that promote equitable housing opportunities across the region.

PROGRAM OBJECTIVES:

- Investigate and document statewide and national best practices regarding local, regional, and state policies and financing approaches.
- Investigate and document capacity (policies, expertise, resources) of local jurisdictions and Metro to support and promote equitable housing development.
- Develop shared understanding among jurisdictions and other stakeholders regarding best practices, needs, and opportunities for collaboration.
- Establish mechanism for formal partnerships between Metro and jurisdictions to support implementation of best practices for equitable development.
- Establish mechanism for formal partnerships between Metro, foundations, and other public and private funding sources to support equitable development in the region.

BACKGROUND:

Metro has a long history of commitment to equity, housing choice, and affordable housing. In 2000, Metro adopted Title 7 of the Urban Growth Management Functional Plan which requires local jurisdictions to support the preservation and development of affordable housing through their comprehensive plans and provides voluntary targets for affordable housing production. In 2006, Metro accepted the Regional Housing Choice Implementation Strategy which made four primary recommendations including:

1) Integrating housing supply concerns, particularly affordable housing, into all policy making and funding allocations in order to achieve regional housing choice equity through promotion of affordable housing as a regional function on par with transportation and green spaces.
2) Direct efforts towards development of resources, and especially a new permanent regional resource for affordable housing, and join and lead advocacy for increased funding at the Federal, State, and regional levels.
3) Promote strategies to remove regulatory barriers and reduce the cost of developing housing and affordable workforce housing specifically, especially in 2040 Centers and Corridors.
4) Prioritize the budget for housing to provide technical assistance to local governments such as land/site inventory, model codes, etc.

Metro's Transit Oriented Development Strategic Plan calls for staff to "work with stakeholders to develop a strategy around equitable TOD and identify funding needs and leveraging opportunities." To date, the TOD program has helped support the production of approximately 2,800 workforce housing units near transit, including 662 units reserved exclusively for households with incomes at 60% of Area Median Income or less.

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While some of the recommendations of the 2006 Regional Housing Choice Implementation Strategy have been successfully implemented, other components of the Strategy have not moved forward, and housing affordability continues to be a significant regional concern. Recognizing this continuing need to address the issue of housing affordability, Metro Councilor Sam Chase proposed and Metro Council has approved a FY 2014-2015 budget amendment of $200,000 to: 1) develop and deploy technical support tools for jurisdictions seeking to eliminate barriers to affordable housing; 2) develop and promote local, regional, and statewide policies to support affordable housing; and 3) develop a long range strategy for funding workforce housing development.

WORK PROGRAM ELEMENTS:

Phase 1. Building the Foundation (Fall 2014- Spring 2015)

<u>Partnership</u>
Lead: *Community Based Organization*

- Convene Equitable Housing Working Group of public, private, and community partners to help identify short and long term opportunities for equitable housing development

- Engage local government, housing developers, funders, and other partners to identify opportunities and barriers to equitable housing development

- Highlight local best practices and case studies that demonstrate equitable housing development in Local Best Practices Assessment

<u>Planning</u>
Lead: *Metro Staff*

- Build an analytical and technical foundation that connects with community based efforts to identify short and long term opportunities for equitable housing development.

- Produce Progress and Lessons Learned Assessment: Engage internal and external stakeholders to review and reflect on status of action from 2006 Regional Housing Choice Implementation Strategy to help focus current efforts on areas of consensus and opportunity.

- Produce Affordability Assessment: Analyze Urban Growth Report, other datasets, and nationally available housing research to focus on financial and economic barriers to housing affordability.

- Produce National Best Practices Assessment: Review policy and financial tools that have been utilized successfully to promote the development of economically diverse housing alternatives across neighborhoods and jurisdictions.

Implementation (Spring 2015)
Lead: *Working Group*

- Convene an Equitable Housing Development Summit consisting of local jurisdictions' elected officials, market rate and affordable housing developers, land preservation interests, and elected Metro officials at which research findings are presented. Present research findings regarding best local practices, regional policy opportunities, and financial partnership models. Achieve consensus on next steps to move forward to accomplish recommendations.

Phase 2. Activating Opportunities (Summer 2015- Winter 2016)

Partnership
Lead: *Community Based Organization*

- Utilize Equitable Housing Workgroup to assist with implementation of recommendations from Phase 1

Planning
Lead: *Metro Staff*

- Establish Equitable Housing Challenge Grant program to provide small grants to local government and community based partners who need resources to assist their efforts to implement equitable housing.

Implementation
Lead: *Working Group*

- Provide recommendation regarding establishment of regional equitable housing funding collaborative that reflects the technical and community efforts from Phase 1.

Phase 3: Moving Forward (Winter 2016-Spring 2016)

- Based on work from Phase 1 and Phase 2, Metro Council will consider how to move forward at the completion of two-year pilot effort.

RELATED PROJECTS/PROGRAMS:

- Transit Oriented Development Program
- RISE initiative
- Regional coordination for local economic opportunity analysis and comprehensive plan updates
- Housing and Equity Opportunity Mapping
- Community Development and Planning Grants
- Powell-Division Transit and Land Use Planning
- Metro Equity Initiative
- Urban Growth Report

COUNCIL ROLE: *(TBD liaison)*

- Chair Equitable Development Summit.
- Serve as liaison to Council on policy recommendations.

RESOURCES CURRENTLY ALLOCATED BY PLANNING AND DEVELOPMENT FY 2014-2015

$200,000 with 50% allocated for Phase I research and 50% for work associated with Phase II and implementation.

In addition, Planning and Development Department will allocate 1.0 FTE through a limited duration position to lead Metro's portion of the work effort.

Note: does not include staff in other departments

UGB Inclusionary Housing Concept:

Condition UGB expansions for residential needs by requiring inclusion of a percentage of permanent affordable housing based on the number of units of housing allowed by the UGB expansion.

Procedure

Metro first determines whether there is a need for additional residential development through urban growth boundary expansion (beyond the capacity of the existing urban area).

Second, Metro identifies the number of dwelling units needed through UGB expansion and announces a minimum required percentage of those units that must be provided permanently at costs affordable to households below regional median income. Applicants for UGB expansion must demonstrate how they will provide the required percentage of affordable housing units. Applicants proposing a higher percentage of units, greater affordability or both will receive favorable consideration over other applicants for the expansion.

Possible variations

Successful proposers could be allowed to either include the required number of affordable housing units within the urban growth boundary expansion area, or transfer the affordable housing to a more central, better-served area within the same community. The developers and property owners in the UGB expansion area would retain responsibility for meeting the affordable housing requirements concurrently with the rate of market-housing development, under either of these options.

Timing

This procedure should be ready for the next urban growth boundary decision, which will occur in calendar year 2015 based upon the Metro urban growth report adopted at the end of 2014.

Issues and Questions

Legality as "incentive-based" (question for OMA)

How to ensure creation of additional affordable housing beyond current production level of affordable housing providers—not simply displacing other funding sources

Capacity of affordable housing community (public, nonprofit and private) to develop & manage additional housing mandated by this program

Level of investment per affordable unit needed from developers of new urban growth areas

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

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ACKNOWLEDGMENTS

The following staff and contributors were instrumental in this project.

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Andrew Parish, Planner

This project was funded through a grant from the Federal Transit Administration (FTA) to Metro.

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.

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

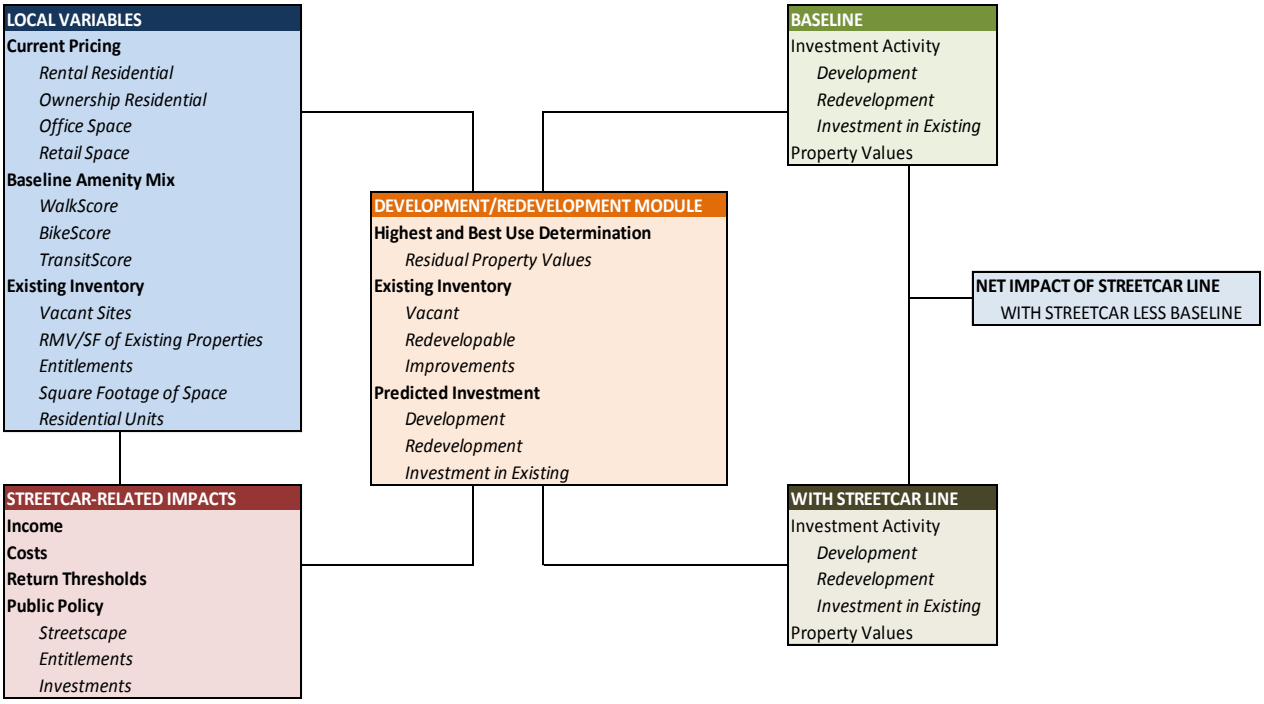
REVENUE
COST
RETURN
ENTITLEMENTS

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

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.

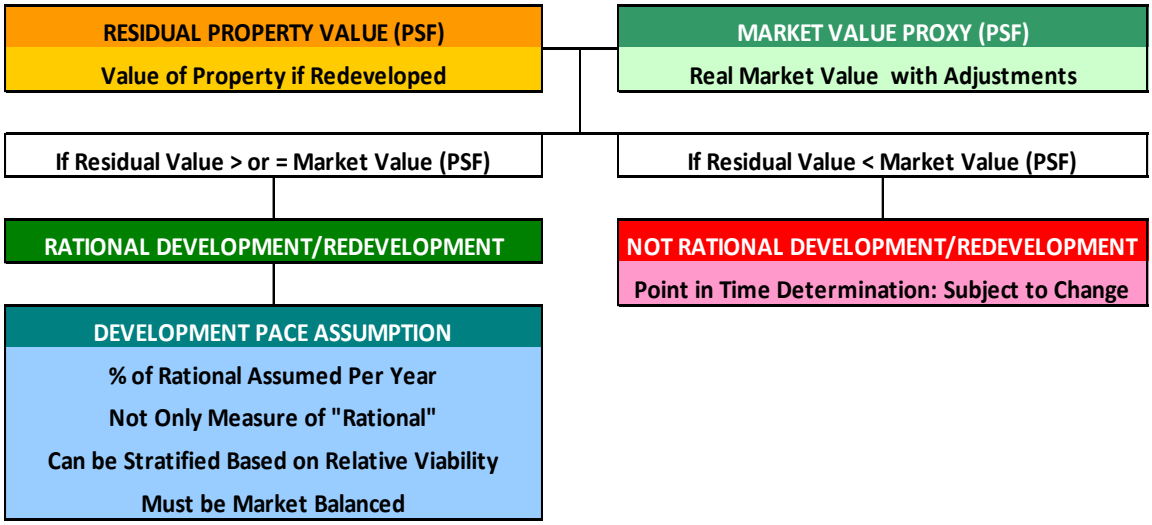
Threshold for Development

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)

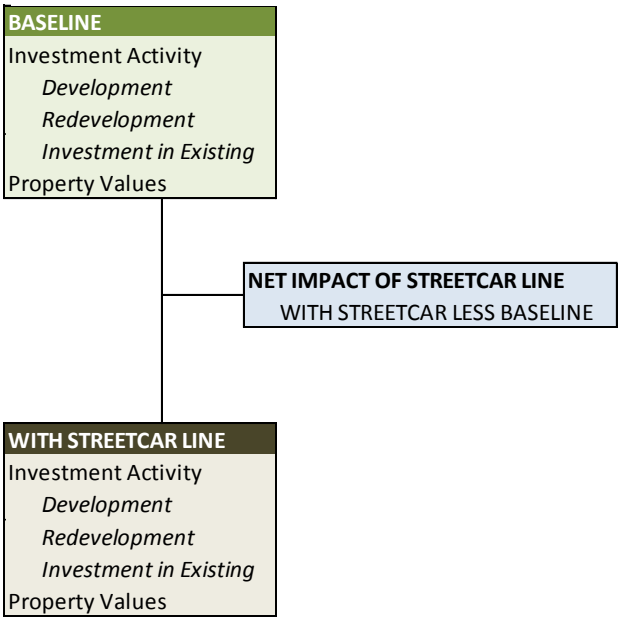


G. Measures of Development Impacts (Outputs)

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.

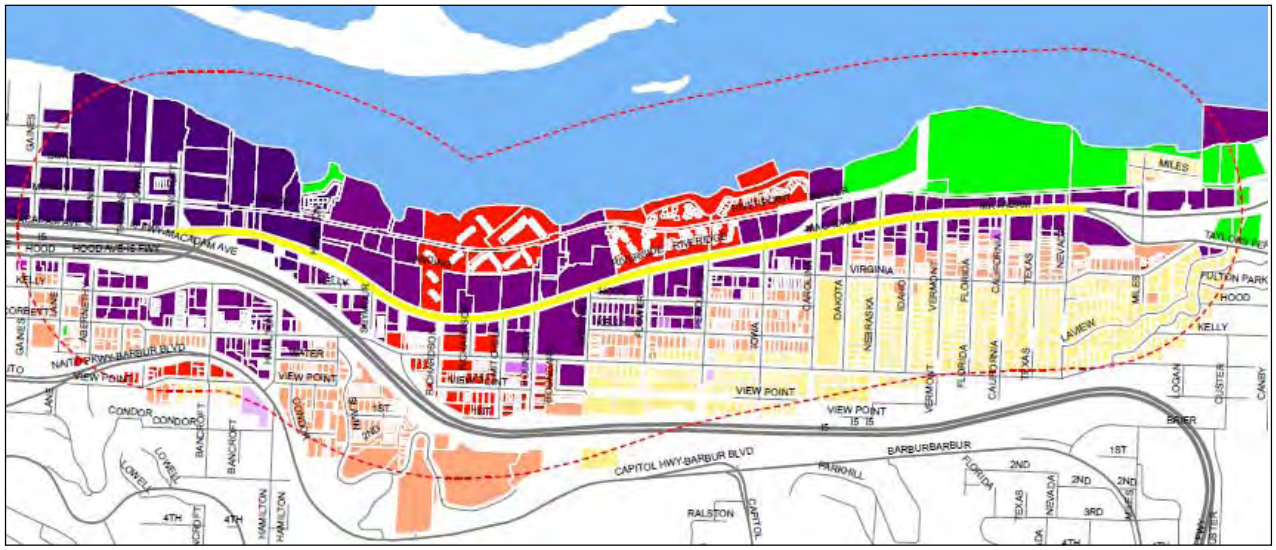
IV. TEST RUN OF MODEL

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

							RMV/Residual Category				
Parcel	Code	RMV	SF	RMV/SF	Residual	RMV/Residual	<.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)					
	RMV/Residual Category					
ZONING	<.75	.75-1.25	1.25-2.0	2.0-4.0	>4.0	Total
RH	22,163	995	661	0	0	23,819
R1	29,215	10,275	6,991	0	0	46,481
R2	63,931	15,445	5,251	0	0	84,626
R5	0	0	0	0	0	0
CS	73,648	5,373	276	0	0	79,298
CN1	0	0	0	0	0	0
CX	151,985	15,054	5,821	0	0	172,860
CG	1,251	2,789	0	0	0	4,040
OS	0	0	0	0	0	0
CO2	0	0	88	0	0	88
CM	2,168	0	0	0	0	2,168
TOTAL	344,361	49,931	19,088	0	0	413,381

	Predicted Development Yield			RMV/		Net
Predicted Predominant	Construction	Residential	Commercial	Dev. or	Current	Change in
Development Form	Investment	Units	Space	Redev.	RMV	RMV
residential mid/struc 2	$14,625,157	80	0	$20,551,520	$1,828,776	$18,722,744
3-story wood townhome	$3,625,511	27	0	$7,990,451	$2,825,265	$5,165,186
3-story wood townhome	$6,600,856	50	0	$14,547,967	$4,055,286	$10,492,681
N/A	$0	0	0	$0	$0	$0
3-story wood Zero Park	$21,102,527	229	0	$41,957,599	$5,862,776	$36,094,823
3-story wood townhome	$0	0	0	$0	$0	$0
MU res/ret mid/surf	$25,068,217	224	21,054	$51,561,072	$7,604,201	$43,956,871
MU res/ret mid/surf	$585,938	5	492	$1,205,175	$341,383	$863,792
N/A	$0	0	0	$0	$0	$0
3-story wood townhome	$6,845	0	0	$15,086	$10,853	$4,233
3-story wood Zero Park	$576,909	6	0	$1,147,054	$146,702	$1,000,352
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**

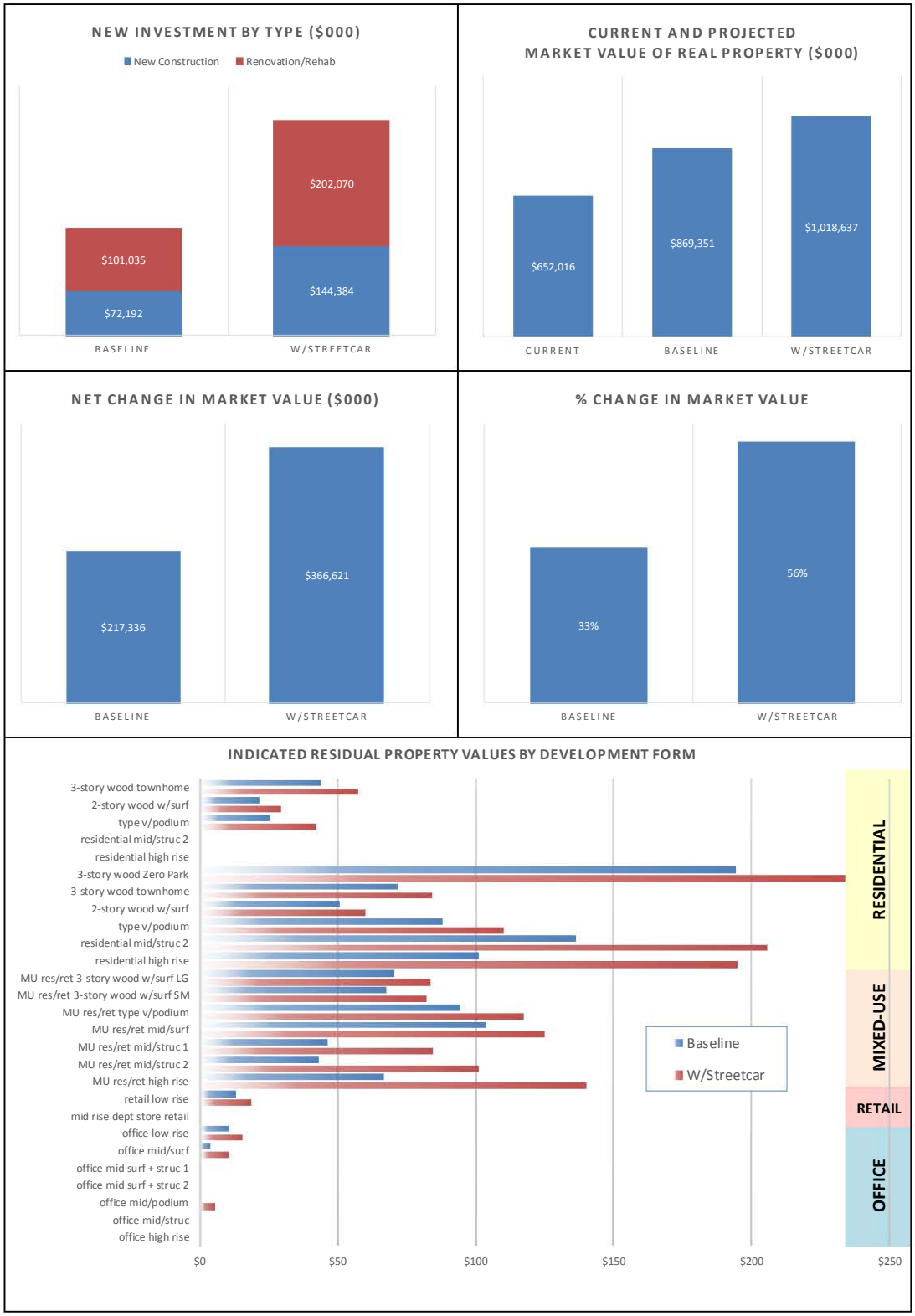
WITH STREETCAR IMPROVEMENTS					
		Predicted Development Yield			Net
ZONING	Predicted Predominant Development Form	Construction Investment	Residential Units	Commercial Space	Change in RMV
RH	residential mid/struc 2	$15,070,361	85	0	$22,537,186
R1	3-story wood townhome	$3,657,731	28	0	$6,378,431
R2	3-story 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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