

This appendix describes the methods used to select case-study areas and catalytic sites within those areas, and to evaluate the extent to which parcelization poses challenges to development.

The reduction of parcelization is not the fundamental policy objective – developing good centers, corridors, neighborhoods, and employment centers is. Thus, the approach that follows focuses on identifying places that are not developing (i.e., where 2040 design types are not being achieved fast enough or at all), and then looking at the degree to which parcelization contributes to that lack of development.

The methods center on case studies, not on the creation of a comprehensive parcel file or broad assessment of the regional magnitude of the problem. The sites selected for evaluation in the case studies were not selected primarily because they had small parcels that might be causing problems, but because they were in locations that presented the best opportunities for the kind of develop that might transform neighborhoods in the directions encouraged by regional policy. Those methods focus the research on the question “Why are sites that on a cursory inspection appear to be in a good area for development not developing?”

This appendix describes the methods in four sections:

- **A.1, Selection of case-study areas.** How the project team selected which regionally significant *case-study areas* to examine.
- **A.2, Selection of potentially redevelopable parcels.** How the project team filtered *parcels* in case-study areas to obtain a subset that are potentially developable.
- **A.3, Selection of catalytic sites.** How the project team identified potentially *catalytic sites* – made up of one or more parcels each – within each study area.
- **A.4, Assessment of the contribution of parcelization to development problems.** How the project team used the case studies and catalytic sites to examine the question: Given a site suitable for development, if it has not already developed with a mix of development desired by regional and local plans and generally viable in the region, what are the likely causes and how big a cause is parcelization?.

A.1 SELECTION OF CASE-STUDY AREAS

Metro policy is clear: it would like to see development in the Portland region that is consistent with the 2040 Concept Plan and Design Types. Metro observes that in many subareas of the region, in Design Type categories that support higher density and mixed use, development of desired types is not occurring.

Metro staff reviewed these subareas to create a list of 10 case-study evaluation; it considered:

- Initial, informal determination that parcelization may be a challenge in the area.
- Local jurisdiction interest in being included in study (suggestions were solicited at the Metro Technical Advisory Committee, the Metro Policy Advisory Committee and in conversations with local jurisdiction staff).
- The existence of clear local and regional goals for development or redevelopment.
- Existence of other efforts, plans, or public investments that support development (e.g., area is inside or includes an urban renewal or other focus area).
- 2040 design type (to get a mix of different types for the case studies).
- Geographic and jurisdictional distribution (to get a mix for the case studies).
- Market conditions (to get a mix for the case studies).

Based on a preliminary selection of case-study areas, the project team confirmed that they were likely to contain sites suitable for the evaluation. The team did a preliminary investigation of parcels. It excluded parcels not targeted for redevelopment. It then looked at the following factors:

- Ripeness: Is there independent interest in the development of some area? Is a developer trying to do something? Are public investment decisions pending (e.g., Portland / Milwaukie LRT)? Is a local government or Metro doing a planning study in some area? (We are interested in regionally significant areas).
- Geographic dispersion about the region (we did not want all 10 case studies in just two or three cities).
- Land use (there are different types of land uses in any design type: we want a mix).

- Degree of economic activity and development. Is the area thriving or lagging? Is there are lot of development or a little? Is there are lot of vacant and redevelopable land, or a little? (We want a mix of study areas, possibly focusing on the areas that need the most help or have the most opportunity).
- Urban renewal districts (some in, some out for variety in area-wide financing mechanisms).

Figure A1 below summarizes the 10 case-study areas by location, design type, other identifying characteristics, and (if applicable) inclusion in local and regional plans.

Figure A1: Case-study areas

Label	Study Area	City	County	2040 Design Types	Boundary
1	Lake Oswego Downtown	Lake Oswego	Clackamas	Town Center	East End Urban Renewal Area, including the proposed library site at N. Anchor
2	McLoughlin Blvd	Milwaukie	Clackamas	Station Community, Industrial / Employment Area, Corridor	McLoughlin Area Plan; quarter mile buffer around SE McLoughlin Blvd
3	Hillsdale	Portland	Multnomah	Town Center, potential future Station Community	SW Corridor Plan focus area, including SW 13th Ave and SW Barbur Blvd
4	West Gresham / Rockwood	Gresham	Multnomah	Town Center, Station Community	Rockwood-West Gresham Urban Renewal Area, including parcels within a quarter mile buffer of E Burnside St
5	Close-in SE PDX corridors	Portland	Multnomah	Corridor	One block buffer of SE corridors: SE Hawthorne, SE Division, SE Belmont, and SE 50th Ave., between 12th Ave. and 50th Ave
6	Beaverton Downtown	Beaverton	Washington	Town Center, Station Community, Main Streets	One-third to one-half mile buffer of area around intersection of SW Canyon Rd, SW Beaverdam Rd, and SW Milikan Way
7	Beaverton Industrial / Employment Area	Beaverton	Washington	Industrial / Employment Area	Beaverton urban renewal commercial, office, and industrial employment area, including Metro Title 4 lands east of Highway 217
8	Tigard Downtown	Tigard	Washington	Town Center, Station Community	SW Corridor Plan focus area
9	Tualatin Downtown	Tualatin	Washington	Town Center, potential future Station Community	SW Corridor Plan focus area
10	Hillsboro Old Town	Hillsboro	Washington	Industrial / Employment Area	Old Town Hillsboro Refinement Plan Southwest Plan Area

Source: ECONorthwest.

The preliminary boundaries of the case-study areas were modified to reach the final study area boundaries based on further input from Metro and local jurisdictions. The modifications allowed the project team to identify and include locally significant locations and areas with high

redevelopment potential (e.g., urban renewal areas), and exclude areas with low significance and low potential for redevelopment. The case-study area boundaries were further modified as follows:¹

1 Lake Oswego Downtown (Lake Oswego):

- Include East End Urban Renewal Area, including the proposed library site.
- Include the neighborhood and businesses surrounding the proposed library site.
- Exclude single-family residential areas north of B Ave. and west of 4th St.

3 Hillsdale (Portland):

- Include parcels within the Hillsdale Metro SW Corridor Plan focus area.
- Exclude the single-family residential neighborhood located south of Interstate-5.
- Extend the boundary south to SW 30th Ave. along SW Capitol Highway.

4 West Gresham / Rockwood (Gresham):

- Include parcels within a quarter mile buffer of E Burnside St. between two light rail stops (E Burnside St. and 197th Ave. in the east, and E Burnside St. and 148th Ave. to the west).
- Include parcels within the Rockwood-West Gresham Urban Renewal Area.

5 Close-in SE corridor areas (Portland):

- Exclude parcels west of SE 12th Ave., so that the final study area boundary includes parcels that are a homogenous mix of residential and commercial uses.
- Include parcels along SE Division St. up to 60th Ave.
- Include the SE Foster and SE Powell intersection.

7 Beaverton Industrial / Employment Area (Beaverton):

¹ Note that the absence of a study area from this list indicates that the broad study area and final study area boundary designations are the same.

- Include Beaverton Urban Renewal Area, based on a request from the City.
- Include Metro Title 4 Industrial and Employment designated land located just east of Highway 217

8 Tigard Downtown (Tigard):

- Include parcels within the Downtown Tigard Metro SW Corridor Plan focus area.
- Include parcels around Main St., an area the City feels has issues of parcelization and has requested be examined.

9 Tualatin Downtown (Tualatin):

- Include parcels within the Downtown Tualatin Metro SW Corridor Plan focus area.
- Exclude parcels located east of Interstate-5.

The project team agreed that the research would be stronger if it did not pre-judge parcelization to be the cause of the problem (i.e., a failure to achieve regional and community goals for development) and then select for study as “problem areas” those areas that analysis shows are highly parcelized. For this reason the project team used previously established planning boundaries or focus areas. These boundaries (1) were not created with the intent to bound highly parcelized areas and (2) they indicate areas that local jurisdictions feel are significant due to underdevelopment, underutilization, the presence of incompatible uses, etc.

The question that created this study was whether parcelization (the division of land into smaller and smaller parcels, usually associated with an increasing number of different owners per acre) contributes, perhaps significantly, to the failure of the market to provide development of the type and in the places that Metro policies desire. Reduced parcelization, to the extent it is a policy objective, is an intermediate one: the ultimate objective is quality development of certain types, in certain locations, in some reasonable time frame. Thus, we assessed our final study areas (i.e., the problem areas) based their failure to meet those objectives, not on their degree of parcelization. Degree of parcelization was a component of our final study area selection criteria, but it was not the major driver of our selection process.

A.2 SELECTION OF POTENTIALLY REDEVELOPABLE PARCELS

Using GIS analysis techniques, we filtered study area parcels to obtain a potentially redevelopable subset to evaluate for: (1) catalytic potential, and (2) failure to develop as policy desires. The process of using filters to identify potentially redevelopable parcels a typical task effort in Oregon land-use planning: create a list of sites based on a mix of beneficial characteristics such as location, zoning and ownership status, and other positive market signals. These are sites local *planners* feel are able to fill a local need (e.g., medium- or high-density housing, mixed-use redevelopment, etc.) because of their size, location, and level of development or use. It is then up to *developers* – list in hand – to determine which sites, if any, have the correct combination of acquisition price, location, competitive advantage, and physical and legal characteristics to justify investment.

The Metro RLIS GIS-based parcel dataset, plus a database of additional parcel characteristics drawn from county assessor databases, allowed the project team to find sites where conditions suggest good development potential using a set of criteria important to a developer, such as access to transportation and utility infrastructure, proximity to schools, slope steepness, and location inside a floodplain zone. We calculated a ratio of improvement to land value using real market values reported by county assessors to derive a general understanding of existing conditions: is each site fully developed or underutilized?²

This process mimics the one typical local efforts to identify buildable and redevelopable land. First, look for underdeveloped parcels with the correct combination of physical and legal characteristics, and within an area serviced by public infrastructure. Then, once candidate sites are selected, asks private-sector real-estate professionals to evaluate market factors in these areas (e.g., price, risk, and return on investment). Within GIS, we dissolved parcels (actually, tax lots) that met our criteria into contiguous pieces of land (which we called “sites”) to begin to understand how adjacent parcels may be assembled through this process.

We used the following filters to hone our selection of potentially redevelopable sites (a site is two or more tax lots) within each study area: (the city planner role). The filters were applied in order:

- **Existing conditions.** The land within the study areas is predominately developed. Accordingly, new development in many

² See Section A.5 for a more detailed description of this analysis.

of the case-study areas will result primarily from infill or redevelopment. We assessed existing conditions (e.g., development status) to determine whether parcels have the potential to attract developer investment. Parcels that are not realizing their highest and best use are more likely to attract investment relative to fully developed parcels. We derived a general understanding of existing conditions as follows:

- Using the RLIS dataset, which includes county assessor data for all tax lots in the Metro region, we divided estimated real market improvement value by real market land value. The lower that value, the less of an obstacle existing development is to new development (other things being equal). Though the scale is continuous (the values will be in range of 0 to 100), our analysis used a value of 0.75 as a threshold.
- We also consulted a vacant land inventory and building footprint database – both part of RLIS – and a brownfields database from the Oregon Department of Environmental Quality to further understand existing development status.
- **Physical geography.** Environmental constraints were identified and removed from the study area if any of the following environmental conditions were present. These constraints are known as Title 3: Metro’s designation for land within its Stream and Floodplain Protection Plan. Title 3 parcels were considered constrained to development for physical or economic reasons:
 - Steep Slopes (equal to or greater than 25%)
 - Presence of National Wetlands Inventory designation or otherwise identified Wetlands
 - Stream buffer incursion (as per Metro Functional Plan Title 3)
 - Floodplains (based on FEMA 100-year designations)
 - Riparian designated areas
- **Zoning.** Based on the knowledge of local plans and desired development products, we focused our analysis on parcels that are currently – or could become – mixed-use, multi-family, commercial, or industrial. Single family residential parcels were largely excluded from the analysis, except in some cases where their zoning designation allows for higher density redevelopment. We also excluded public, institutional, and utility uses from the final analysis. We excluded these parcels because they are entrenched and unlikely to change through redevelopment in the near future, or

especially in the case of single family residential parcels, are characterized by small lots and may bias our analysis of those property types we are concerned with: mixed-use, multi-family, commercial, or industrial.

- **Urban amenities.** Proximity to various urban amenities is one factor that increases the likelihood of parcel development: developers generally pay lower development fees, and residents and customers value accessibility. The following amenities were identified for each study area:
 - Access to the regional transit system
 - Walk/Bike access, measured using the transportation network, including sidewalks, paths and bikeways.
 - Distance to retail and service locations that may support new and existing residents.

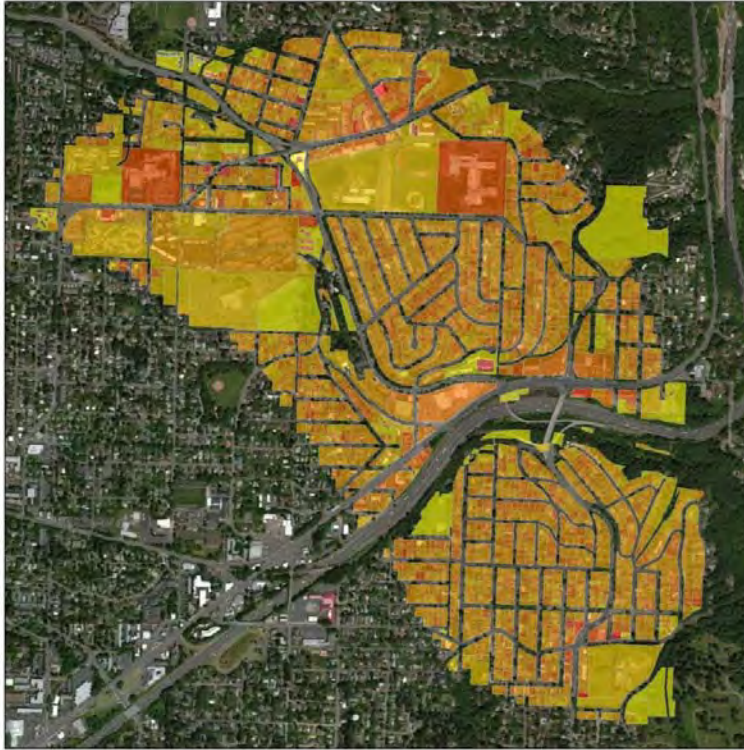
The following is an example of the process applied to one of the study areas, from final boundary area (Figure A2) to a map of potentially redevelopable sites and urban amenities (Figure A6).

Figure A2. Study area boundary



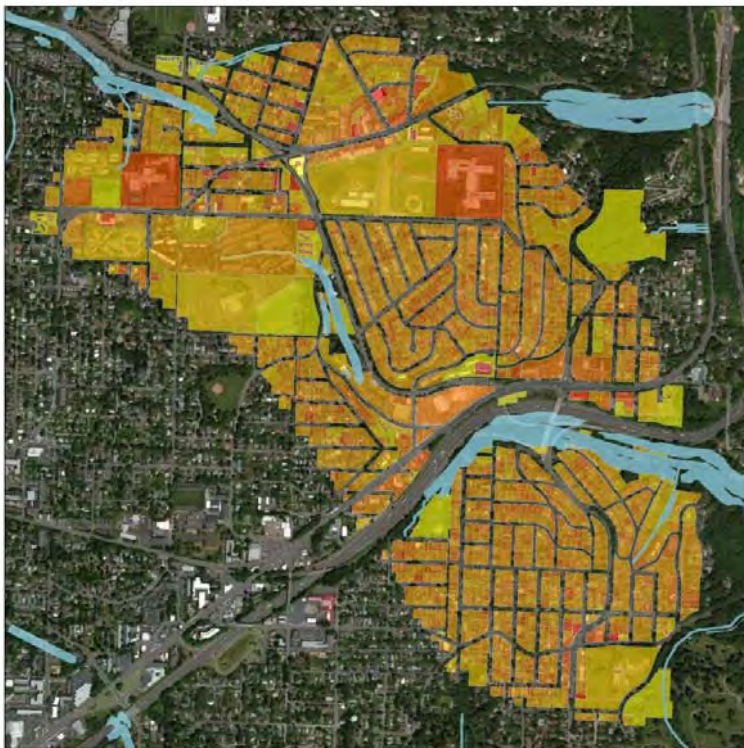
Source: Fregonese and Associates/ECONorthwest

Figure A3. Determine assessor real market value (land plus improvements) to estimate existing conditions



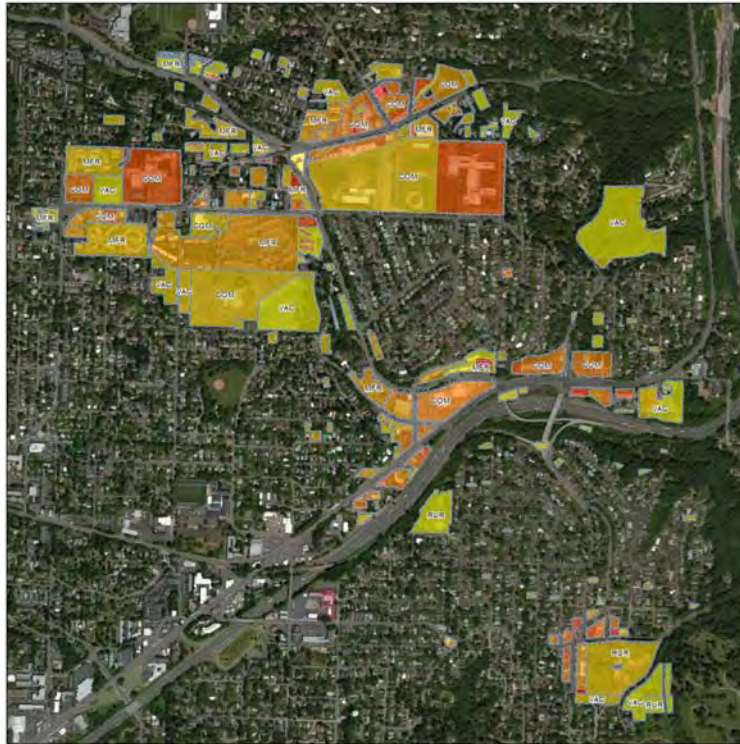
Source: Fregonese and Associates/ECONorthwest

Figure A4. Physical geography filter



Source: Fregonese and Associates/ECONorthwest

Figure A5. Zoning filter



Source: Fregonese and Associates/ECONorthwest

Figure A6. Final study area and potentially redevelopable parcels, with urban amenities



Source: Fregonese and Associates/ECONorthwest

A.3 SELECTION OF CATALYTIC SITES

The GIS filters described in Section A.2 allowed us to produce maps of the parcels (tax lots) most ripe for development, given the standard and supportable assumption that vacant parcels would be easier to develop than developed parcels. Our focus was vacant parcels, with larger ones being preferable (fewer land assembly problems) to smaller ones. We used these parcels as guides for identifying one to two *catalytic sites* in each study area made up of one or more parcels that a reasonable developer might attempt to develop.

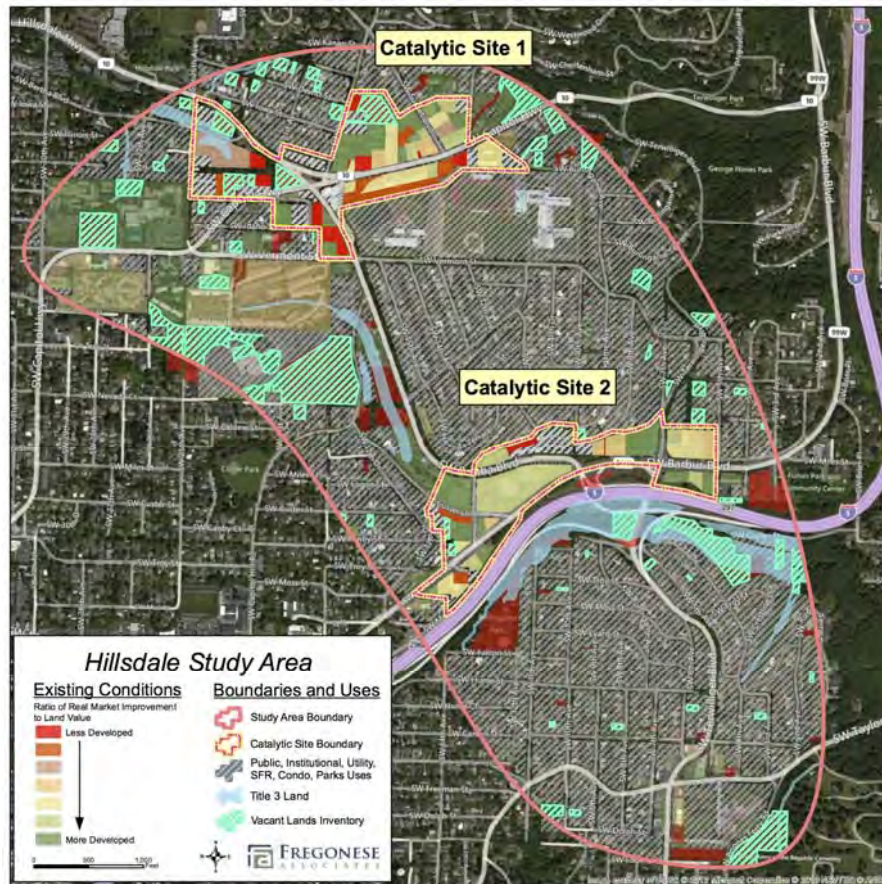
The process we used to identify catalytic sites was to one that a private-sector developer would take (in contrast to the supply-side process more typical for local-government planning). Once potentially redevelopable candidate sites are identified by city planners, developers examine the feasibility of different development types and compatibility to weigh price, risk, and return on investment. Sometimes vacant parcels are the most attractive for development; other times previously developed parcels present the greatest upside. From a developer's perspective, the most attractive parcels are in places that market forces and the developer's concept of development can make more valuable.

Catalytic sites are not the easiest sites to develop, but they are not necessarily the hardest. They do, theoretically, provide the best opportunities for getting the kind of development that the 2040 Growth Concept, Design Types, and Framework Plan are trying to achieve. The selection of these catalytic sites allowed us to address parcelization in the broader context of desired development. Specifically, the sites selected for evaluation in the case studies were not selected because they had small parcels that might be causing problems, but because they were in locations that presented the best opportunities for the kind of development that might transform neighborhoods in the directions encouraged by regional policy.

We confirmed that the chosen sites are "potentially catalytic" with representatives of public entities that have jurisdiction in each of the ten study areas. Given extensive knowledge of their jurisdictions, we asked these representatives if the sites we selected provide good opportunities for (1) the kind of development that local and regional plans are trying to achieve, and (2) "catalyzing" similar or related development in the study area. We gave our respondents the opportunity to suggest alternative catalytic sites if they did not agree with our initial assessment.

Figure A7 below presents a map of two catalytic sites – denoted by the red-beige boundaries – selected for one of the study areas (Hillsdale). These sites contain many of the same potentially redevelopable parcels identified in Figure A6. Parcels may have been added, however, to catalytic site boundaries not because they are vacant or underutilized but because they are located in an area that presents opportunities for development, yet has failed to provide development of the type that Metro policies desire. Our goal is to determine to what extent, if any, parcelization has inhibited development at these catalytic sites.

Figure A7. Catalytic sites with land use and real market value.



Source: Fregonese and Associates/ECONorthwest

A.4 ASSESSMENT OF THE CONTRIBUTION OF PARCELIZATION TO DEVELOPMENT PROBLEMS

The analysis described in Sections A.2 and A.3 of this appendix helped determine the supply of sites suitable for regionally viable development within the study areas. The analysis described in this section examined the demand (e.g., given a site suitable for development, why isn't it already

developed with a regionally viable building product mix?). The answer may be parcelization, but it may be other factors. This exercise (1) evaluated the overall feasibility of assembling the parcels for development, and (2) examined to what extent parcelization has hindered or helped development at each site from a market demand perspective, and to what extent it may be tied to other causes:

- Parcelization: is the site too small, fragmented, or oddly shaped?
- Expectation of owners: do individual property owners overvalue their property above what the market says it is worth?
- Neighborhood opposition: local politics might make a certain development type unfeasible, regardless of property conditions.
- Personal motives: individual property owners might not have an incentive to sell or develop (e.g., being close to retirement, realizing a perpetual positive cash flow).

For each catalytic site, we addressed (1) the extent of parcelization, (2) the extent of development challenges, (3) the extent to which we can attribute the development challenges to parcelization (relative to other causes), and (4) potential ways to reduce the challenges of parcelization.³ Our assessment of the contribution of parcelization to development challenges at each catalytic site is based on the project's overarching question (How big an obstacle is parcelization to the development of desired building types in certain 2040 Design Types, relative to other obstacles?), and not on individual parcels. We did not, for instance, examine individual parcels within the catalytic sites for issues that inhibit development (e.g., lack of driveway entitlements, etc.) but determined, on average, why parcels in each study area have not developed as desired by the 2040 Growth Concept. Our focus was on the obstacles preventing development in the catalytic sites, and on the relative importance of parcelization as an obstacle.

We used three methods for evaluating the contribution of parcelization to development problems at each of the study areas and catalytic sites:

- **A.4.1 Evaluation of quantitative metrics** describes how we selected and measured factors that help us to evaluate development challenges for each case study. For each metric we estimated its overall contribution to case study development challenges.

³ The results of our study area and catalytic site analysis are presented in Appendix B of this report.

- **A.4.2 Selection of building types** explains how we identified example building product types to test whether characteristics of parcelization are inhibiting development. If certain building types cannot be built on existing developable parcels without assembly (e.g., the parcels are too small or fragmented), then parcelization may be an issue preventing desired development.
- **A.4.3 Investigation of other obstacles for development** explains that we considered the effects other difficult-to-measure factors impose on development feasibility. We considered anything normally listed in a development pro forma that affects overall financial feasibility.

A.4.1 GIS EVALUATION OF SITE CHARACTERISTICS

For each catalytic site we used GIS analysis techniques to assess development challenges for a set of quantitative metrics. We measured these metrics in one of two ways: Measurement Type I and Type II, which indicate whether a higher or lower metric value suggests a greater or lesser contribution to development challenges (Figure A8).

Figure A8. Measurement type description for determining quantitative metric contribution to development challenges

Measurement Type I		
Symbol	Description	Contribution to Development Challenges
○	Greater than 10% <u>above</u> SA average	Low
■	10% below to 10% above SA average	Neutral
✘	Greater than 10% <u>below</u> SA average	High
Measurement Type II		
Symbol	Description	Contribution to Development Challenges
○	Greater than 10% <u>below</u> SA average	Low
■	10% below to 10% above SA average	Neutral
✘	Greater than 10% <u>above</u> SA average	High

Source: ECONorthwest.

The concept is simple. The greater presence of some measurable attributes makes development easier, so development is less of a challenge (Type I); the greater presence of other measurable attributes makes development harder so development is less of a challenge (Type I); *Measurement Type I* is used when a greater metric value indicates a lower contribution to development challenges. Metrics are evaluated relative to the study area average: a value 10% above or below the study area average moves the contribution to development challenges from “neutral” to “low” or “high” depending on the measurement type. For example, if Catalytic Site X has a value on some desirable (Type I) metric that is 10% greater per acre than the study area it belongs to, this metric is designated as posing a

“Low” challenge to development at that catalytic site, *relative* to the study area.⁴

The symbols are consistent across the measurement types with respect to “level of challenge”: the green circle indicates the challenge is relatively “Low,” the blue square indicates that the challenge is about verger (“Neutral”) for the study area, and the red X indicates “High” challenges to development relative to the study-area average.

Figure A9 below contains (for each metric) a description, its units of measurement, data source, and measurement type:

Figure A9. Description of quantitative metric

Metric	Units	Description / Source	Measurement Type
of Land Availability			
Vacancy	SqFt/Acre	Metro vacant lands inventory, excludes parks and open space; RLIS April 2012.	Type I
Brownfields	SqFt/Acre	Vacant, underused, potentially contaminated sites; Oregon DEQ 2012.	Type II
IMP/LV Ratio	SqFt/Acre Over .75	Real market improvement value divided by land value; RLIS April 2012.	Type II
Metro Title 3 Land	SqFt/Acre	Areas within Metro's Stream and Floodplain Protection Plan; RLIS April 2012.	Type II
of Parcelization			
Parcel Size	Parcels/Acre	Size of individual taxlots based on assessor records; RLIS April 2012.	Type II
Ownership	Owners/Acre	Unique property owners based on assessor records; RLIS April 2012.	Type II
Lot Coverage	Sqft Covered / Acre	Metro's building footprint database and assessor records; RLIS April 2012.	Type II

Source: ECONorthwest.

The metrics are divided into two categories of: (1) land availability; and (2) parcelization:

Metrics of land availability:

- **Vacancy.** This metric measures vacant land (e.g., without buildings, improvements, or identifiable land use) as determined by Metro. Parks and open spaces are not included in this metric. Higher average vacant square footage per acre indicates a greater supply of land available for development.
- **Brownfields.** Vacant, underused, and potentially contaminated sites are included in this metric. Unlike the Vacancy metric, Brownfields

⁴ The study area averages for each of the characteristics excludes single family residential, condominium, public, institutional, and utility land uses.

indicates sites that may otherwise appear ripe for development, but will likely add a (potentially fatal) cost to development: for cleanup and remediation of contamination. The presence of brownfields indicate greater contribution to development challenges.

- **IMP/LV Ratio.** Assessor-estimated real market value is one measure of a property's value.⁵ Total real market is made up of two estimated market values: land and improvements. Calculating the ratio of land to improvement value is a method for estimating existing development conditions on a property. An improvement to land value ratio of below 1 indicates that the land is valued at more than the land and perhaps it is not being used for its highest and best use (i.e., it is being underutilized). The rents one would generate in perpetuity with a \$50,000 building, for instance, would not justify an investment of \$1 million for the land underneath. A surface parking lot in a high demand area (e.g., the downtown core) may be an exception to this observation. We use the threshold of .75 for our evaluation metric; the more square feet per acre above this threshold, the less area is available for redevelopment.
- **Title 3 land.** Title 3 is Metro's designation for land within its Stream and Floodplain Protection Plan. We use this metric as a proxy for land that is vulnerable to natural hazards such as flooding and soil erosion. Development of these lands comes with the added cost associated with mitigation and remediation of these hazards. The presence of Title 3 land indicates greater contribution to development challenges.

Metrics of parcelization:

- **Parcel size.** This metric measures the number of parcels per acre: more parcels per acre indicates a smaller average parcel size, a greater need to assemble parcels for development, and therefore a greater contribution to development challenges.
- **Ownership.** The effects of small parcel size can be reduced if the parcels are under a single ownership. This metric accounts for where parcels owned by identical owners reduces the challenges posed by land assembly. A higher concentration of unique owners per acre indicates greater contribution to development challenges.

⁵ Other methods, such as professional appraisal or a pro forma analysis of the ratio of annual net operating income to capitalization rate requires careful examination on a property-by-property basis. It would not be practical to use these methods across ten study areas and thousands of individual properties to estimate value.

- **Lot coverage.** Lot coverage is a measure of parcel density. Lot coverage, and similarly floor-area ratios (FARs), is highest in dense areas where land values are greatest. A higher lot coverage indicates greater contribution to development challenges stemming from higher land prices, less physical space to meet parking and zoning standards, and greater need to assemble parcels for development.

Section A.2 of this appendix explains that our analysis is focused on parcels that are currently – or could become – mixed-use, multi-family, or commercial. Single-family residential parcels were largely excluded from the analysis, except in some cases where their zoning designation allows for higher-density redevelopment. We also excluded public, institutional, and utility uses from the final analysis. Our analysis of the evaluation metrics does not consider these excluded parcels; for the remaining parcels, the metrics are comparable across study areas, and are normalized by acre.

Figure A10 displays a sample study area evaluation using the metrics described in Figures A8 and A9.

Figure A10. Sample study area evaluation for Hillsdale

Metric	Units	Catalytic Site Relative to Study Area		Average Values for:	
		1	2	Study Area	Region
				Hillsdale	UGB
of Land Availability					
Vacancy	SqFt/Acre	○	✘	2,490.9	7,309.9
Brownfields	SqFt/Acre	✘	✘	738.5	1,917.7
IMP/LV Ratio	SqFt/Acre Over .75	○	✘	25,859.8	15,122.9
Metro Title 3 Land	SqFt/Acre	○	○	1,889.3	5,167.5
of Parcelization					
Parcel Size	Parcels/Acre	✘	✘	1.2	0.6
Ownership	Owners/Acre	✘	✘	1.4	0.3
Lot Coverage	SqFt/Acre	✘	✘	6,631.2	5,212.4

Source: ECONorthwest.

Note: Real market value figures exclude public, institutional, and residential uses.

Figure A10 indicates, for instance, that vacancy in Catalytic Site 1 is greater than 10% above the study area average, per acre. It is the opposite for Catalytic Site 2. Yet, vacancy within the UGB is almost three times as high, per acre, relative to the Hillsdale study area. Figure A10 also indicates both catalytic sites show characteristics of parcelization: more parcels and owners per acre relative to the study area and UGB.

We were careful not to assess the prevalence of parcelization with too low a threshold. It is very likely that some areas with low amounts of recent development will also be areas with few large parcels. That seems inevitable, for example, in most Portland neighborhoods: they are almost all without large parcels, and some of them are growing at slower rates than

others. These areas may exhibit characteristics that indicate parcelization (e.g., small parcel sizes, many unique owners), but have in fact developed consistent with goals found in the 2040 Growth Concept. The more difficult research question is sorting out the degree to which the parcelization is contributing to the problem in those areas that are not realizing development consistent with regional goals.

If parcelization is more or less ubiquitous for some jurisdictions or design types, and if some design types in some jurisdictions are performing well, then parcelization, by itself, is not a sufficient condition for identifying under-performing development. In fact we determined that some areas in the region score “High” for development challenges under the parcelization metrics, yet are generally considered places of successful development (NW 23rd Avenue and the Pearl District are two examples).

Given that finding, our challenge was to use the case study analyses in Appendix B to try to describe what other conditions contribute to under performance, how parcelization interacts with those conditions, and what combinations of conditions are likely to make parcelization more or less important.

A.4.2 EVALUATION OF BUILDING TYPES

Metro’s *Climate Smart Communities* study has defined 16 development typologies and 30 building product types as regionally viable, meaning they are consistent with regional goals for density and character. We used the building types to test whether characteristics of parcelization (small parcels, many owners) are inhibiting development. We began by identifying relevant development typologies – at least a block in size but no more than several blocks – for our study areas and then boiled down to a set of compatible building types using existing *Climate Smart* guidelines that define an appropriate building type mix for each development typology. Development typologies are at least a block in size, and are made up of a mix of building types and land uses. To select building types, we (1) identified development typologies within each study area and then (2) selected a subset of building types that would be potentially viable, eliminating product types that would be incompatible in every study area due to a use, lot size, density, or market mismatch (e.g., a mixed-use high rise tower, heavy industrial factory or warehouse, large format retailer, etc.).

Identification of development typologies within study areas

The *Climate Smart Communities* work has identified 16 “development typologies” that are “classification of places, defined in terms of their

character, role, and function.” Development typologies resemble Metro 2040 design types – both definitions identify regionally preferred styles of development – except that the former are defined quantitatively: by dwelling units and jobs per acre, and mix of uses. Metro 2040 design types are defined by policy. Within each development typology, usually applied on a block by block basis, there exist a combination of building types that achieve these quantitative targets. Each study area is made up of a handful of typologies, and within each typology, a mix of building types are used to “create or enhance a place.”⁶

Figure A11 below displays the development typologies consistent with the 10 study areas, based on housing and employment density, and land use mix. We find that 11 of the 16 typologies are consistent with existing and preferred development in our study areas. The building types that fall outside these bounds were eliminated from our analysis.

Figure A11. Study area target development typologies, with net densities and land use mix.

Development Typology	Dwelling Units/Acre	Jobs/Acre	Land Use Mix			
			SFR	MFR	COM	IND
1 Urban Residential	200	31	0%	88%	12%	0%
2 Commercial Node	N/A	40	0%	0%	100%	0%
3 Neighborhood Node	N/A	30	0%	0%	100%	0%
4 Historic Downtown	24	72	0%	39%	61%	0%
5 Urban Transit Corridor	47	74	0%	52%	48%	0%
6 Regional Corridor	43	42	0%	61%	39%	0%
7 Main Street	69	52	0%	65%	35%	0%
8 Urban Neighborhood	20	7	39%	46%	15%	0%
9 Transitional Neighborhood	13	3	59%	33%	8%	0%
10 Suburban Neighborhood	8	N/A	88%	12%	0%	0%
11 Light Industrial / Campus District	N/A	14	0%	0%	0%	100%

Source: *Climate Smart Communities*.

Identification of building types compatible with study areas

The project team identified applicable building types by first eliminating those types that do not belong in the final study areas based on development typologies found in Figure A11. The following is a list of *Climate Smart Communities* building types that were eliminated from consideration for all study areas based on the development typology densities shown in Figure A11. A short description of each excluded building type, with average size and density, and a reason for exclusion follows:

⁶ Source of quotations: *Climate Smart Communities* Development Typologies Descriptions, September 2011.

Residential and Mixed-Use:

- **A1 SFR Large Lot (3,000 sqft/unit; 6 units/acre).** The density, measured in dwelling units per acre, is much lower than the targeted development typologies residential densities.
- **A2 SFR Houses - Suburban Medium Lot (2,500 sqft/unit; 7 units/acre).** The residential density is similar to that of the Suburban Neighborhood typology, but is much lower than any of the other typologies.
- **A3 SFR Houses - Urban Medium Lot (2,250 sqft/unit; 10 units/acre).** Although this building type represents a higher residential density, it is not a type we wish to test for development because of small lot size.
- **B SFR Narrow Lot Houses (1,750 sqft/unit; 17 units/acre).** Although this building type represents a high residential density, it is not a type we wish to test for development because of small lot size.
- **G SRO Housing (300 sqft/unit; 202 units/acre; 42 employees/acre).** While this building type is at the high end for our target development typologies residential density, it would be out of character with our study areas.
- **K High Rise Tower (1,200 sqft/unit; 268 units/acre; 17 employees/acre).** This building type is too dense for the target development typologies residential density, and would be out of character with our study areas.
- **N Mixed-Use High Rise Point Tower (800 sqft/unit; 394 units/acre; 17 employees/acre).** This building type is too dense for the target development typologies residential density, and would be out of character with our study areas.

Commercial:

- **L2 High Rise Office (40,000 sqft lot; 892 employees/acre).** This building type is too dense for the target development typologies employment density, and would be out of character with our study areas.
- **L3 Low Density Commercial (20,000 sqft lot; 19 employees/acre).** Although the employment density is consistent with the target development typologies, this is not a building type we wish to test because it is low density and is not the preferred development type found in many local redevelopment plans.

- **L6 Large Format Retail (100,000 sqft lot; 12 employees/acre).** Although this building type represents an employment density consistent to the target development typologies, it is not a type we wish to test for development because of large lot size.

Industrial:

- **M2 Heavy Industrial (250,000 sqft lot; 6 employees/acre).** The employment density is too low, the lot size is too large, and this building type would be out of character with our study areas.

After eliminating incompatible building types, we examined each study area as a reasonable developer might and asked: Given we are interested in Area X, where would we develop and what would it look like? Are available sites suitable for the type of product we want to build? The answers to these questions were based on (1) a quantitative assessment of average building type development costs, lot sizes, uses, and densities; and (2) a professional assessment of the feasibility of the building types at each of the catalytic sites.

From the remaining subset of suitable building types, we selected those types that align to each study area's goals. Additionally, we compared average development type sizes, densities, and market rents against the catalytic sites identified in each study area (Section A.3 of this appendix) and asked: can the viable building types fit on parcels within the selected sites? Do the types conform to the local aesthetic? Are market rents aligned to area demographics and competitive with nearby properties? Our goal was to test several building types in each study area to help understand why a certain product types work in Area X but has failed in Area Y.

Figure A12 shows the project team's quantitative assessment of building types. It contains a description of each of the retained building types. It was the basis for eliminating incompatible or unfeasible building types (e.g., a building that requires an average lot size of 20,000 square feet cannot be built in areas where lots are less than 10,000 square feet). This process allowed us to focus on building types appropriate for every study area.⁷

⁷ Note that the selected sites and building types are intended to be illustrative. There is no assertion on behalf of the project team – or Metro – that these individual sites should be or will be developed as illustrated. The intent is to use these sites to draw general conclusions about the extent of parcelization in each study area.

Figure A12. Retained building type matrix.

Code	Description	Dwelling Units/Acre	Jobs/Acre	Lot Size (sqft)	Height (stories)	FAR	Est. Land Value (/sqft)	Development Typologies
C	Attached Houses, Medium Density	29	N/A	10,000	3	1.13	\$8	4, 8, 9, 10
D	Attached Houses, High Density	37	N/A	10,000	3	1.02	\$9	4, 5, 6, 8
E	Plexes	35	N/A	5,000	2	0.80	\$10	4, 5, 6, 8
E1	MFR Moderate Density	49	N/A	20,000	3	1.06	\$10	5, 6
E2	MFR Medium Density	70	N/A	43,560	4	1.32	\$10	5, 6, 7
E3	MFR High Density, Small Units	313	N/A	15,000	6	4.67	\$10	1, 5
E4	MFR High Density, Large Units	154	N/A	15,000	6	3.93	\$10	1, 5
F	Corridor Apartments	64	N/A	20,000	4	1.34	\$10	5, 6, 7
H	Neighborhood Mixed-Use	89	24	10,000	4	4.00	\$12	5, 6, 7
H1	Suburban MUR, Low Density	32	9	10,000	3	1.08	\$8	4, 5, 6, 7, 8
H2	Suburban MUR, Medium Density	88	40	39,200	4	3.40	\$10	5, 6, 7
H3	Suburban MUR, High Density	106	46	43,560	5	4.25	\$10	5, 6, 7
I	Mid-Rise Mixed-Use, Small Units	166	21	40,000	6	3.52	\$10	1, 5, 6, 7
I1	Mod-Rise Mixed-Use, Small Units	399	109	40,000	12	8.51	\$10	1, 5
J	Mid-Rise Mixed-Use, Large Units	112	15	40,000	6	4.29	\$10	1, 5, 6, 7
L1	Low Rise Office	N/A	96	40,000	5	0.83	\$20	2, 3, 4, 5, 7
L4	Main Street Commercial	N/A	124	5,000	2	1.90	\$20	2, 3, 4, 5, 7
L7	Business Park / Campus Industrial	N/A	11	150,000	1	0.32	\$5	11
M1	Light Industrial	N/A	14	100,000	1	0.33	\$7	11

Source: *Climate Smart Communities*.

Note: Development typologies number corresponds to Figure A11.

The project team confirmed the viability of the building product types by asking jurisdiction representatives the following:

- The sites fall into two general categories: (1) residential, commercial, mixed-use; and (2) industrial. Based on the building type codes listed in Figure A12, we believe codes suitable for Category 1 are C, D, E, E1, E2, E3, E4, F, H, H1, H2, H3, I, I1, J, L1, L4, and for Category 2 are L1, L7, M1. Which building types would you select for the case study sites we have chosen in your jurisdiction (i.e., which building types represent the development you want to see in your community)?
- Are the building densities and character acceptable to you? If not, what alternative building types not shown in Figure A12 would you recommend, and why?

We used the building types to test whether characteristics of parcelization (small parcels, many owners) are inhibiting development. If a preferred building type requires a lot size of 5,000 square feet, for instance, and no contiguous group of vacant or underutilized parcels of this size exist within a catalytic site, then we may infer that parcelization may be rendering such a hypothetical development infeasible. We may determine that regardless of market rents, regionally preferred building types are being inhibited by the fact that many small parcels are making land holdings under a single ownership too small for effective development.

A.4.3 INVESTIGATION OF OTHER OBSTACLES TO DEVELOPMENT

We considered the effects other difficult-to-measure factors have on development feasibility; for example, general market trends, accessibility (transportation and transit), parking, development fees, and zoning codes. We considered anything normally listed in a development pro forma that affects overall financial feasibility. Exhibit 1 in the main report displays a model of all these factors that contribute to the price of built space. By showing how many factors can affect housing price (and, thus, production), Exhibit 1 implies that changes in any of these factors can affect the production of real estate products – can make development more or less likely. In the context of this study, the question is: which of these factors can potentially be (1) significant *obstacles* to development, and (2) influenced by public policy.

Local developers and representatives of public sector jurisdictions within each of the case-study areas were consulted to determine the magnitude each of these factors plays as an obstacle for development feasibility relative to the obstacle of parcelization. We also investigated these obstacles based on our experience in real estate economics, and a review of the professional literature. The factors are discussed in detail in Chapter 3 of the main report and are analyzed on a case study basis in Appendix B.

The results of this exercise allow us to explain what factors are working for and against development – within each case-study area – and to what degree parcelization fits in the discussion.⁸ We then generalized from the case studies to make an estimate of the magnitude of problems parcelization poses regionally (see Chapter 3 of the report).

⁸ Note that we did not investigate every obstacle to development; instead, we investigated factors that influence development and estimated where parcelization falls in scale of severity.