CITY OF REDMOND

TASK 4 - LAND USE ALTERNATIVES

MAY 26, 2020

VERSION 4

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EXECUTIVE SUMMARY

PROCESS OVERVIEW

The City of Redmond is currently undertaking a periodic update of the Redmond Comprehensive Plan. A technical team, led by IBI Group, conducted a community visioning process designed to determine where growth should go and what growth should look like. This work was completed through the production of two models: A baseline model that assessed and development potential under current regulations; and a parametric model that created an infinite number of possible growth scenarios to test the optimal results under two distinct land use conditions. The baseline model may or may not have met the minimum growth targets set by the City of Redmond, whereas development potential under the two parametric scenarios was required to be compatible with planned growth. The parametric scenario led to two distinct scenarios: a more centralized Centers Scenario and a more decentralized Centers and Corridors Scenario. These scenarios were assessed to meet a series of performance metrics built into the model, providing a numeric score, as well as an overall land use trend.

SCENARIO CONCLUSIONS

The two scenarios resulted in relatively comparable scores in the end. This was not intentional, but does show that whether the growth is contained to the urban centers, or whether it is created along some or all of the studied arterials, the desired measurable outcomes can be reached. The Centers Scenario has a slightly greater overall score, due to greater amounts of home ownership potential, improved walkability, lower displacement risk, and reduced distance to bike lanes.

However, the score of the Centers and Corridors Scenario is very close. The Centers and Corridors Scenario also better matches the results obtained during the public engagement activity. In the Centers and Corridors Scenario, we see that there is a much greater use of residential-only typologies, which have fewer stories. Given this, the number of overall parcels used is greater, as these typologies do not contribute as many units given their lower FAR.

The Centers and Corridors Scenario uses 162 parcels, whereas the Centers Scenario uses only 96. There are no uses of the two new high-rise typologies in the Centers and Corridors Scenario - all development is 10 stories of less in this scenario model. In the Centers Scenario, there are multiple uses of the two new high-rise typologies.

The challenge across both models was meeting the jobs goal of 20,000. Both required ample use of the mixed-use typology to meet this goal, but in the Centers scenario, the model did not have to go as far over the housing target to meet the job goals. Overlake holds much of the development in both scenarios, and particularly much of the job

1.0 INTRODUCTION

1.1 REDMOND VISIONING PROCESS AND PROJECT SUMMARY

The City of Redmond is currently undertaking a periodic update of the Redmond Comprehensive Plan. A significant focus of this update is accommodating growth, and in particular planning for urban centers and light rail station areas. The goal of the Redmond Comprehensive Plan Visioning Process is to direct the location and form of future growth in a way that best meets the community vision and regional policy goals. To that end, the City of Redmond and the technical team, IBI Group with ECONorthwest and 3Si, are conducting a community visioning process designed to determine where growth should go and what growth should look like. Outcomes from this visioning process will inform the planning process and ultimately the location and form of growth over the next three decades.

1.2 LAND USE ALTERNATIVES ANALYSIS PURPOSE AND GOALS

A critical part of the Redmond Comprehensive Plan update are the components that fall within the "Task 4 Land Use Alternatives" effort of IBI Group's work. This task included a range of quantitative and qualitative analysis to answer questions about the location and form of growth. The analysis included the following:

- Market analysis of real estate conditions
- Analysis of land use under current zoning
- Development of potential land use scenarios for future growth

The combined work is designed to answer two questions:

- Where should future development occur?
- What form should that development take?

The City of Redmond anticipates needing to accommodate 20,000 new units of housing and 20,000 new jobs between 2019 and 2044. To be consistent with the Regional Growth Strategy in VISION 2050, 65% of new residential growth and 75% of new job growth must occur within urban centers and light rail station areas.

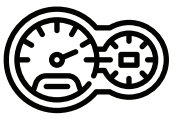
During the "Task 2 Existing Conditions" analysis, the technical team gathered relevant information to inform the process for answering those questions. That information included an evaluation of current real estate conditions, a review of policies and regulations that set requirements for development, and a review of recent and relevant public outreach from other related planning initiatives.

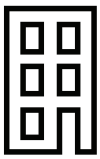
Policies that guide the analysis include the Redmond Comprehensive Plan, Marymoor

Village Design Standards, the Southeast Redmond Neighborhood Plan, Sound Transit's East Link Environmental Impact Statement, and the Overlake Neighborhood Plan Update and Implementation Project EIS. These documents set the standards for development in and around the city's urban centers. Understanding the existing conditions played an important role in establishing the metrics and goals used to evaluate the land use alternative scenarios.

Table 1.0: Growth Metrics lists the original, high-level metrics chosen to evaluate the growth scenarios, and provides rationales for why they were used. These metrics were used to begin the model creation process from our earlier technical studies, and evolved into the performance metrics described in *Table 4.3: Performance Metrics for Growth Assignment Criteria.*

TABLE 1.0: GROWTH METRICS

METRIC	*RATIONALE*	*REFERENCE DOCUMENT*	*COMMUNITY SUPPORT*
Housing Affordability and Diversity 	By planning for a diversity of housing types, the Redmond 2050 plan will improve access to housing for people of all income levels, particularly focused on the need for housing for households with lower incomes identified in the Housing Action Plan. A mix of housing forms and tenures is preferred.	Housing Needs Assessment, Housing Action Plan, Community Strategic Plan	High
Vehicle Miles Traveled (VMT) 	According to the City of Redmond's 2020 Environmental Sustainability Action Plan, the transportation sector accounts for about one quarter of all greenhouse gas emissions in Redmond and is therefore a significant contributor to climate change. Housing typology and location can be used to model VMT. Outcomes that allow people to drive less, thereby reducing VMT, are preferred.	Sustainability Action Plan, Community Strategic Plan	High

Density 	Density is the primary metric by which residential growth is measured. The land use alternatives analyzed will include building typologies of different densities, as well as different distributions across the study area. Context-appropriate density that maintains existing character, preserves open space, reduces sprawl, and concentrates development near transit is preferred.	Regional Centers Framework Update (PSRC), Comprehensive Plan – Urban Centers, Overlake, and Downtown	Medium
Station Area Floor Area Ratio (FAR) 	FAR measures the density of an individual building and is calculated by dividing the combined total area of each floor of a building by the land area of the site. Station Area FAR will be used to analyze development potential in the areas immediately surrounding planned light rail stations. Increased FAR in station areas is preferred.	Comprehensive Plan – Overlake and Downtown, Overlake Neighborhood EIR	Medium
Walkability 	Cities that are designed to provide higher concentrations of amenities (such as shopping, childcare, or health and wellness services) within walking distance of where people live are better able to support sustainability goals. Walkability can be quantified through land use type and metrics like intersection density.	Comprehensive Plan – Overlake and Downtown, Overlake Village Street Design Guidelines, Downtown East-West Corridor Study Master Plan	High

2.0 LAND USE SCENARIO OVERVIEW

2.1 BASELINE MODEL VS. PARAMETRIC MODEL

There were two separate analysis performed by the IBI Group team:

1. BASELINE MODEL - A baseline development feasibility analysis was performed to understand development potential under current regulations and whether those regulations are compatible with expected and planned growth.
   This model was constructed separately from our parametric analysis and does not come with a scorecard of performance metrics. It does, however, use the same parcel criteria to select considered growth locations, for consistency with the parametric model.

2. PARAMETRIC MODEL - A parametric analysis was developed to create an infinite number of possible growth scenarios and test the optimal results under two conditions – a Centers Scenario and a Centers and Corridors Scenario. Development potential under these two scenarios is intentionally required to be compatible with expected and planned growth per the constraints constructed in the model.

Both the baseline model and the parametric model are considering 95% of the total growth in Redmond. The goals of 20,000 units of housing and 20,000 jobs are indicative of 95% of total growth in the City of Redmond. It is anticipated and unmodelled that 5% of growth would happen beyond the boundaries of the selected parcels throughout the remainder of Redmond neighborhoods. Thrghout the report, and reference to growth targets and goals is speaking of this 95% of growth and an additional 5% of growth should be assumed elsewhere in the city.

2.2 PARCEL SELECTION

For consistency, both models began with a data set of parcels that the city categorized as likely to redevelop in its King County Buildable Lands Analysis. From this data set of parcels, the model only included those that met at least one of the following conditions:

1. Within ¼ mile of urban centers as defined by the Puget Sound Regional Council (PSRC),
2. Within 300 feet of the following arterials: Willows Road, Avondale Road, 148th Avenue NE, Old Redmond Road, and Redmond Way,
3. Within 1,000 feet of bus stops for routes planned to operate with 15-minute or

better headways in the year 2040 according to the Metro Connects long-range service plan.

The total amount of developable land and number of parcels for the Downtown and Overlake neighborhoods are shown in *Table 2.0: Developable Area*. These are parcels

TABLE 2.0: DEVELOPABLE AREA

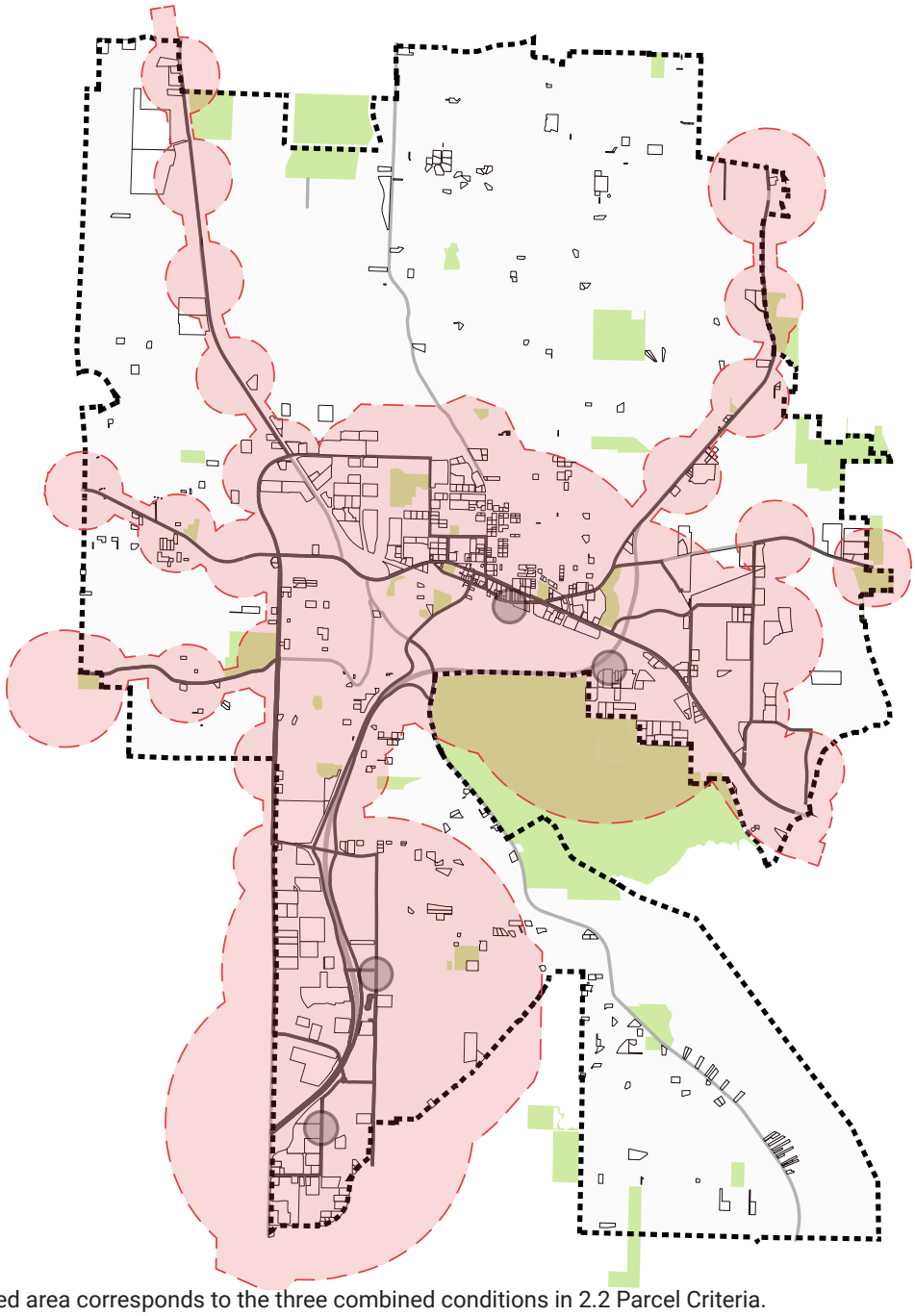
NEIGHBORHOOD	TOTAL PARCEL AREA (SQ. FT.)	NUMBER OF PARCELS
Downtown (Urban Center)	7,505,406	249
Overlake (Urban Center)	5,772,889	59
Outside of Urban Centers	14,211,705	211
TOTAL	27,500,000	519

2.3 URBAN CENTER BOUNDARIES

For calculating the amount of growth in urban centers, both models defined the boundaries of these areas in the same way:

1. "Downtown" is the Regional Center area defined by the Puget Sound Regional Council (PSRC) combined with a ¼ mile radius from both the Downtown Redmond and SE Redmond / Marymoor Village stations
2. "Overlake" is the Regional Center area defined by the Puget Sound Regional Council (PSRC) combined with a ¼ mile radius from both the Overlake Village and Redmond Technology stations

FIGURE 2.1: PARCEL SELECTION CRITERIA



Red area corresponds to the three combined conditions in 2.2 Parcel Criteria.

3.0 BASELINE DEVELOPMENT FEASIBILITY ANALYSIS

The technical team completed a baseline analysis to quantify how much residential and employment growth could be realistically absorbed under current regulations and within the current area boundaries. This allowed the team to have a "no action" scenario against which to measure future development scenarios. This is a separate analysis than the parametric analysis (see *2.1 Baseline Model vs. Parametric model*) and thus did not allow for the same assessment criteria from the parametric model to be applied. This model is purely a theoretical mathematical assessment of the available density under current regulations. This model used the parcel selection criteria as described in *2.2 Parcel Selection*, which is consistent throughout the baseline and parametric scenarios.

The output from the model indicates the upper threshold of developability per the current zoning of each parcel. However, the model does not capture some common barriers to redevelopment such as unforeseen economic disruption, inertia, public opposition, or other specific market factors. The model did incorporate a standard 85% market factor to account for this uncertainty, meaning we anticipated 85% of the available parcels would be available for build-out and development.

3.1 BASELINE DEVELOPMENT POTENTIAL

The model identified the total amount of housing and jobs that could be accommodated under current zoning. The results are illustrated in *Table 3.0: Baseline Development Potential - Output Data* and *Figure 3.1: Baseline Scenario Parcel Map*, which indicates the current land-use of each parcel.

For reference, the City of Redmond conducted a similar analysis based on the King County Buildable Lands and calculated a current capacity of approximately 14,000 jobs and 17,000 housing units. Our outputs are within the same general range as these results, with different market factor assumptions accounting for most of the difference.

TABLE 3.0: BASELINE DEVELOPMENT POTENTIAL - OUTPUT DATA

	# OF UNITS			% IN URBAN CENTERS		
	IN MODEL	GOAL	DIFFERENCE	IN MODEL	REQUIRED	DIFFERENCE
Units of Housing	19,901	20,000	*- 99*	79.4%	65.0%	*+ 14.4%*
Jobs	18,390	20,000	*- 610*	59.0%	75.0%	*- 16%*

FIGURE 3.2: BASELINE SCENARIO - LAND USE TRENDS

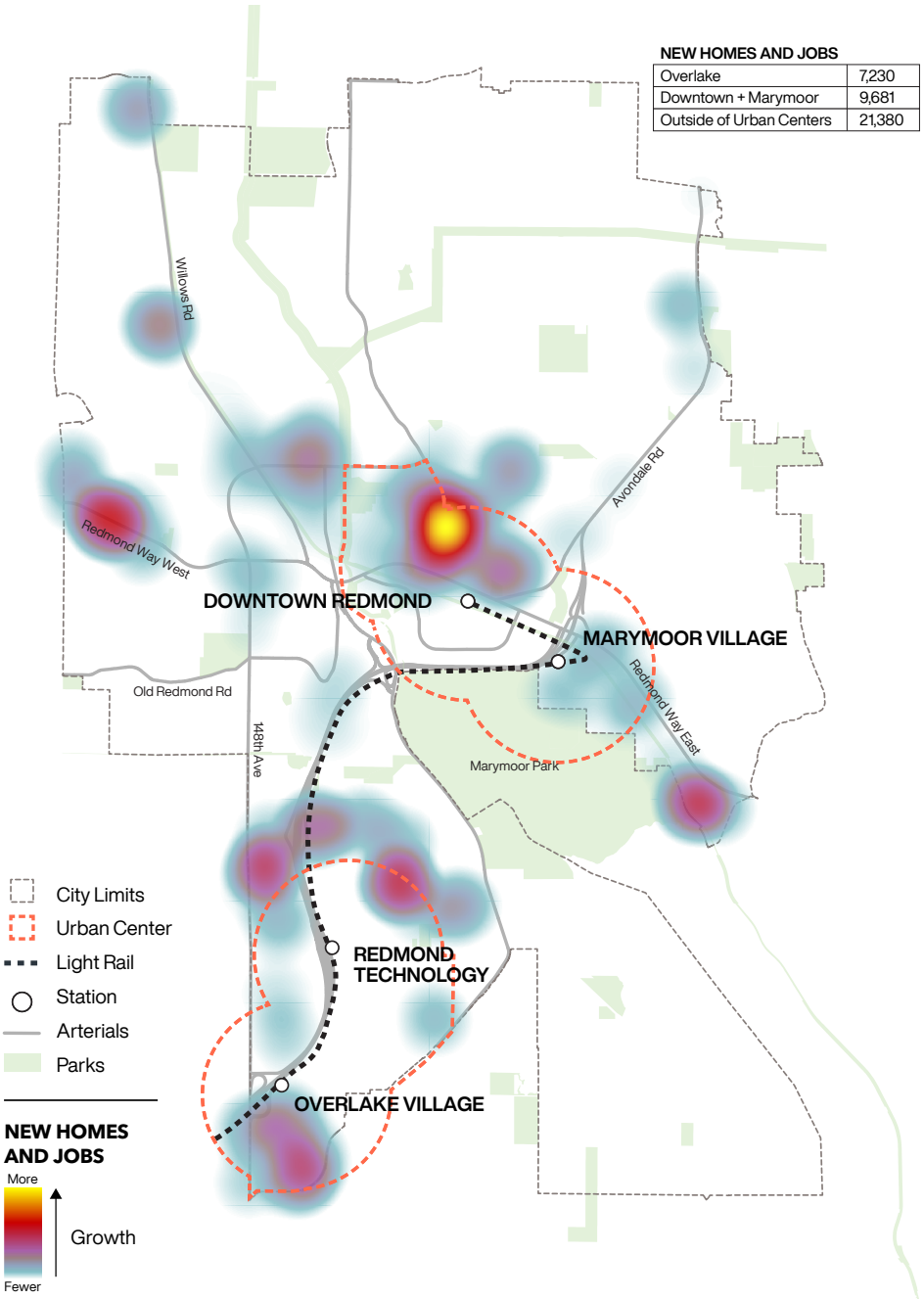


TABLE 3.3: BASELINE DEVELOPMENT POTENTIAL - DEVELOPMENT SUMMARY

	# OF UNITS		% IN URBAN CENTERS (OF 20,000 GOAL)			
	HOUSING	JOBS	HOUSING		JOBS	
Overlake Urban Center	7,920	6,468	39.6%	68.9%	32.4%	55.2%
Downtown Urban Center	5,850	4,557	29.3%		22.8%	
Outside of Urban Centers	6,131	7,365	20.1%		33.0%	
TOTAL	19,901	18,390	99.5%		92.0%	

In the baseline model, Redmond comes close to, but narrowly misses, the growth goals of 20,000 units of housing and 20,000 jobs. Additionally, job growth would not come close to the required 75% in the urban centers. The baseline model does meet the units of housing goal for the urban centers. Note that this calculation is estimated by treating all identified buildable lands equally, and it does not consider future changes to development that would encourage policy priorities, such as affordability and access to transit. In other words, while the growth model scenarios presented in the following sections optimize policy objectives, the baseline model does not and treats all parcels identified as equally available.

3.2 BASELINE DEVELOPMENT CONCLUSIONS

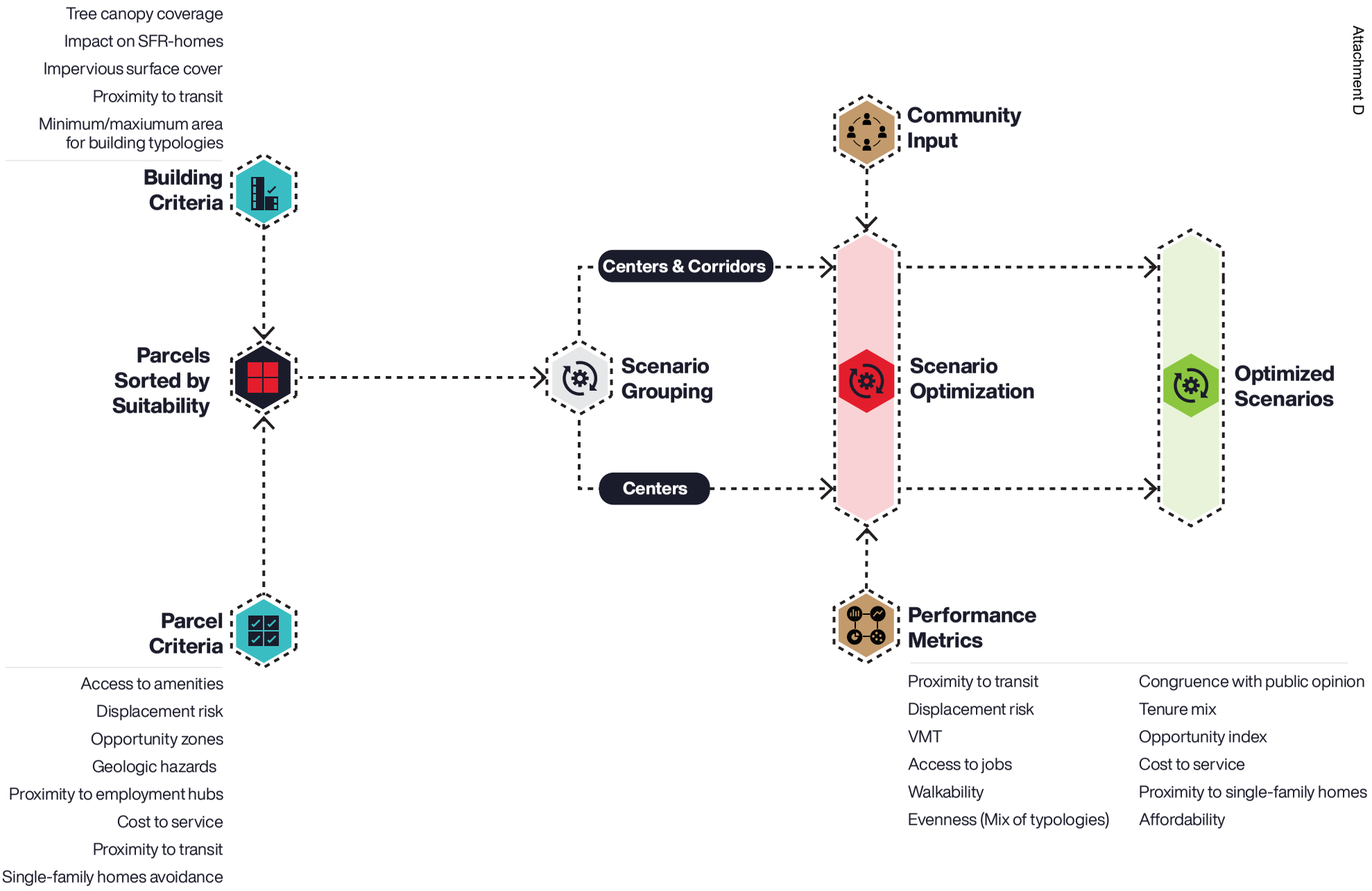
Although current zoning and development patterns could accommodate approximately the aggregate amount of growth projected, current regulations do not accommodate sufficient job growth within the urban centers and light rail station areas to meet VISION 2050 requirements. The baseline scenario projects widely dispersed growth that may create significant impacts on less-densely developed single-family neighborhoods. The growth that occurs may also not be close enough to high-quality transit to encourage mode shift from private autos to transit, which in turn decreases transit ridership potential and increases VMT and emissions. By contrast, the modeled growth scenarios are designed to mitigate these impacts through parcel and typology criteria, as well as use performance metrics to measure the success against policy goals. Our parametric scenarios allocate growth to meet city policy objectives related to affordability, sustainability, and community character, whereas the baseline model only considers those community priorities and goals in place when the zoning regulations were adopted.

4.0 PARAMETRIC ANALYSIS OVERVIEW AND METHODOLOGY

Parametric analysis uses the power of computers to analyze large datasets to answer design questions. This section provides an overview of our construction for the parametric model and the methodology used to answer the questions of where and in what form development should occur.

To create optimized growth scenarios, the model incorporated both parcel criteria and building criteria. Together these criteria were applied to the parcels selected as described in *2.2 Parcel Selection* to create an infinite number of possible growth solutions that meet the growth goals of 20,000 units of housing and 20,000 jobs (with the required amount of growth in the urban centers). These scenarios were then evaluated using a series of performance metrics, as well as community input, to provide two optimized scenarios: one Centers and Corridors Scenario and one Centers Scenario. This process is diagrammed in *Figure 4.0: Parametric Analysis Methodology* and described throughout the rest of this section in more detail.

FIGURE 4.0: PARAMETRIC ANALYSIS METHODOLOGY



4.1 PARCEL AND BUILDING CRITERIA

Parcel criteria are those datasets used in evaluation that are specific to a particular location. For example, a parcel scores higher on walkability when it is in an area with shorter blocks and greater concentrations of higher-density, mixed-use development. When evaluating which parcels are best for redevelopment, the model evaluated the parcel against the criteria in *Table 4.1: Parcel Criteria Descriptions*. Inputs were selectively weighted to prioritize some of these variables used in the model over others in consideration of community input. The total weight of all variables is equal to 100, with each weight indicating a percentage of prioritization. If each variable were weighted equally, it would have a weight of 12.5, so variables less than 12.5 are a low priority, while those above 12.5 are a high priority.

The alignment with community priorities, as indicated in *Table 4.1: Parcel Criteria Descriptions*, comes from our preliminary engagement on "Gains and Pains" seeking feedback on the priorities and concerns of Redmond residents as well as those that work, shop, and play in Redmond.

TABLE 4.1: PARCEL CRITERIA DESCRIPTIONS

PARCEL CRITERIA	*DESCRIPTION*	*ALIGNMENT WITH COMMUNITY PRIORITIES*	*WEIGHTING*
Walkability	Measures how easily residents or tenants of a particular parcel can access nearby amenities (such as shopping or key activity centers) on foot.	Walkability is a top priority of things currently working well in Redmond that should be maintained (Gains: Now)	19 - Highest
Displacement Risk	Measures how vulnerable residents of a parcel may be to displacement, based on housing affordability metrics.	Improving housing affordability is the top future goal for Redmond (Gains: Future)	16 - High
Opportunity	Measures whether a parcel falls within an economic opportunity zone (as defined by the Puget Sound Regional Council), potentially making it eligible for government incentives.	Not discussed in community engagement, but considered under equity goals	9 - Low

Hazards	Measures whether a parcel falls within geological hazard zones (landslide, flood, erosion, seismic risk).	Not discussed in community engagement, but considered under sustainability goals	8 - Low
Employment	Measures distance to higher concentrations of jobs.	Community feedback prioritized maintaining small local businesses (Pains: Now)	15 - High
Cost to Service	Measures the cost of providing infrastructure and services, such as new police or fire coverage or new storm water/sewer treatments.	Community feedback wants to see infrastructure be maintained at the rate of growth (Gains: Now)	14 - Medium
Transit	Measures distance to public transit, with proximity to light rail ranking higher than bus.	A strong transportation system is the second-highest ranked priority for the future (Gains: Future)	15 - High
Single Family Homes	Measures whether the parcel avoids low-density, single-family home neighborhoods.	Community feedback wants to see existing neighborhood character preserved (Gains: Future)	4 - Low

In contrast to the parcel criteria, building criteria are those datasets that are specific to the types of buildings, ranging from lower-density development such as townhouses, to higher-density mixed-use development encompassing both residential and commercial uses within multi-story buildings.

During the "Task 2 Existing Conditions" effort, the technical team, led by ECONorthwest, evaluated current market opportunities for development in Redmond. The team identified 12 building typologies that range from townhomes to high rise office buildings. The range of building typologies were selected because they represent a reasonable range of potential typologies that would be needed to accommodate growth, acceptable to the community, and financially feasible. Two of these typologies exceed maximum height limits in the City's zoning code – High Rise 19 (Mixed-use) and Office High Rise 13 (Commercial). However, they are supported by the current market conditions.

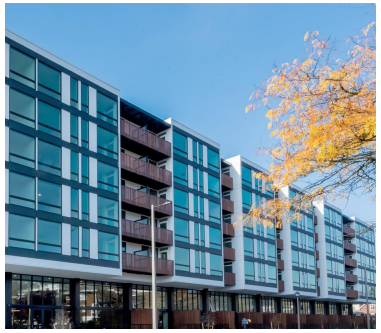
Full typology information is organized in *Table 4.2: Typology Criteria*, which assigns characteristics to each building typology such as maximum permitted height, minimum/maximum lot size required, and average number of residents or jobs that are typically found in each type. More details on this typology work can be found in a separate report compiled by ECONorthwest.

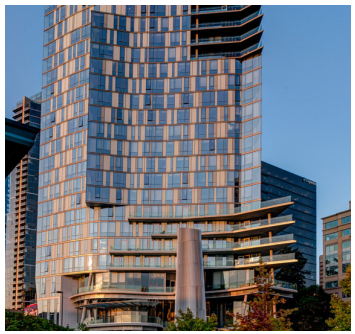
Together, the parcel criteria and building criteria create profiles in the model that are a function of their characteristics. For example, a taller building with a relatively small floor plate may generate potentially greater impacts on the surrounding area (due to building height or the amount of traffic generated by the project), but also have lower impervious surface cover and protect greater amounts of green space due to its height. The parcel on which it is located would have the same access to nature/parks or proximity to transit regardless of which building type is located there, but the density of development on the parcel would dictate how many residents, tenants, or visitors of the building would have access to nearby amenities. These combinations of parcel criteria and building criteria are referred to as growth assignment criteria.

	RESIDENTIAL TYPOLOGIES			
	Townhouse 3	Stacked Flats 3	Stacked Flats 4	Podium 5
Short Name	TH Own	Stacked Flats A	Stacked Flats B	4 Over 1
Parking	Garage	Surface	Surface	Podium
Height (Stories)	3	3	4	5
Minimum Lot Size	11,100	26,700	32,000	18,800
Maximum Lot Size	11,100	60,000	60,000	60,000
Impervious Coverage	80%	80%	80%	85%
Residential FAR	1.2	0.9	1.0	1.2
Office FAR	0.0	0.0	0.0	0.0
Retail FAR	0.0	0.0	0.0	0.0
Average Residential Unit Size (sf)	2,000	785	785	865
Average Office per Employee (sf)	0	0	0	0
Average Retail per Employee (sf)	0	0	0	0
Residual Land Value	$32	$20	$31	$29
Residual Land Value (TOD Area)	$32	$31	$44	$50
Can this occur in aquifer?	Yes	Yes	Yes	Yes
Tenure Split (% Ownership)	90%	0%	0%	0%
Affordability %	0%	10%	10%	5%

TABLE 4.2b: TYPOLOGY CRITERIA

	MIXED-USE TYPOLOGIES		
	Podium 6	High Rise 10	High Rise 19
Short Name	4 over 2	7 over 3	16 over 3 + 3
Parking	Podium	Podium	Underground / Podium
Height (Stories)	6	10	19
Minimum Lot Size	180,000	18,000	18,000
Maximum Lot Size	49,300	41,000	44,400
Impervious Coverage	85%	85%	85%
Residential FAR	2.2	3.7	7.7
Office FAR	0.0	0.0	0.0
Retail FAR	0.14	0.21	0.20
Average Residential Unit Size (sf)	865	965	965
Average Office per Employee (sf)	0	0	0
Average Retail per Employee (sf)	470	470	470
Residual Land Value	$86	$93	$130
Residual Land Value (TOD Area)	$126	$178	$310
Can this occur in aquifer?	Yes	Yes	No
Tenure Split (% Ownership)	0%	50%	50%
Affordability %	5%	0%	0%





	COMMERCIAL TYPOLOGIES				
	Office Low Rise 4	Office Mid Rise 6*	Office Mid Rise Campus 6	Office High Rise 8	Office High Rise 13
		-			
Short Name	Short Box	3 over 3	3 over 3	5 over 3 + 1	10 over 3 + 3
Parking	Surface	Podium	Podium	Underground / Podium	Underground / Podium
Height (Stories)	4	6	6	8	13
Minimum Lot Size	40,000	10,700	10,700	13,000	16,200
Maximum Lot Size	60,000	40,000	40,000	30,600	40,400
Impervious Coverage	80%	85%	85%	85%	85%
Residential FAR	0.0	0.0	0.0	0.0	0.0
Office FAR	0.8	2.5	2.5	3.6	5.4
Retail FAR	0.0	0.16	0.16	0.26	0.22
Average Residential Unit Size (sf)	0	0	0	0	0
Average Office per Employee (sf)	350	350	350	350	350
Average Retail per Employee (sf)	0	470	470	470	470
Residual Land Value	$13	($79)	($9)	($9)	($80)
Residual Land Value (TOD Area)	$36	($1)	$146	$122	$118
Can this occur in aquifer?	Yes	Yes	Yes	Yes	No
Tenure Split (% Ownership)	-	-	-	-	-
Affordability %	-	-	-	-	-

* Typology currently not financially viable

4.2 GROWTH ASSIGNMENT CRITERIA AND PERFORMANCE METRICS

The parametric model analyzes every parcel of land within the project study area (as determined in *2.2 Parcel Selection*) and simulates thousands of development scenarios by allocating different combinations of the building typologies to parcels to generate a growth assignment criteria score. This score is measured using a series of performance metrics that are output with each variation of the model, allowing us to choose the most highly scoring scenario. The original metrics are discussed in *1.2 Land Use Alternatives Analysis Purpose and Goals*, but also include new metrics that were developed during the construction of the model. These include:

- Evenness: how much of a mixture between housing typologies is found in each scenario,
- Congruence with public opinion: measured from the growth scenarios submitted by community members,
- Renter/owner mix: the balance between households that own vs. rent their homes in an area.

As the model runs and creates combinations of buildings and parcels, it works by:

1. Comparing how well each scenario scores on the performance metrics for the growth assignment criteria,
2. Preserving scenarios that better meet these growth assignment criteria as the model runs, and comparing them to other combinations,
3. Discarding poorer-performing scenarios: the model excludes any combinations that are impractical or infeasible, as well as those scoring poorly on the performance metrics,
4. Refining each iteration of the large number of possible combinations, preserving those output scenarios that best meet the project goals while scoring as highly as possible on the performance metrics

To meet the project goals, the model ensures that all scenarios it is choosing meet the requirement of allocating at least 65% of residential growth and 75% of job growth in urban centers. The model measures this requirement based on the 20,000 units of housing and 20,000 jobs goals. 65% of total residential growth may not fall in the Urban Center if the model reaches a higher number of overall housing units (which is possible due to the strong market characteristics of mixed-use typologies), but 65% of the required growth is met within the centers.

The outputs from the model are ranked according to how well they satisfy the performance criteria and optimized so that stakeholders can compare two distinct but feasible alternatives. These two alternatives will provide the Redmond community two options, each with their own trade-offs to consider. The two optimized outputs can generally be described as a more decentralized Centers and Corridors Scenario that consumes a greater amount of overall land area in the city, and a Centers Scenario that centralizes the overall land area of parcels used to include higher density growth in the urban centers.

The way the model was constructed, a higher score is always preferred in order to compare and rank the scenarios. This is sometimes counterintuitive, such as how a higher displacement score represents a lower displacement risk. The below rationale explains how all performance metrics were used in the model.

TABLE 4.3: PERFORMANCE METRICS FOR GROWTH ASSIGNMENT CRITERIA

PERFORMANCE METRIC	RATIONALE
Renter/Owner Mix	Also known as tenure mix. Looks at the balance between renters and owners in housing. A relatively equal balance was preferred, and this is represented in the model by a higher score.
Housing Affordability	Percentage of housing units designated as affordable, with a higher percentage preferred.
Displacement Risk	Measures how vulnerable residents of a parcel may be to displacement, with a higher score representing less overall displacement.
VMT Score	A composite Vehicle Miles Travelled (VMT) score constructed from a series of metrics: the number of adults per household near transit, access to bike and pedestrian ways, as well as the number of affordable housing units with access to transit. Typically, greater density and more affordable units near transit can reduce VMT. In our constructed score, a high score correlates to overall lower vehicle miles traveled.

Walkability	Intersection of density and access to transit, retail, and grocery (including proposed mixed-use). A higher score is preferred and indicates greater walkability. The metric prioritized transit stations over bus stops (75%-25%), rather than treating them with equal weighting (50%-50%).
Average Distance to Transit (Unscored, but measured and used to define parcel selection)	A measure of walkability. Average distance of units and jobs to a train station or high-frequency bus stop, with lower distances preferred.
Average Distance to Bike Lane (Unscored, but measured and used to define parcel selection)	A measure of walkability. Average distance of units and jobs to a bike lane, with lower distances preferred.
Jobs Access	Access and proximity to existing and potential new employment in the scenarios is preferred, and greater proximity is indicated by a higher score.
Impervious Surface Coverage	A higher impervious surface score indicates a lower percent of ground covered by buildings, thus a higher score is preferred. Impervious surface coverage has a relationship with the tree canopy, as lower impervious surface coverage could allow for more tree coverage, but it not a direct proxy measurement.
Typology Diversity	A greater number of housing typologies, to provide a diversity of housing options, is preferred.
Public Opinion	The scenario is compared to the input from the public engagement model. A higher number is more aligned with public opinion and is preferred.

5.0 GROWTH SCENARIOS

This section discusses the top patterns that came to light in the two scenario options: the Centers and Corridors Scenario and the Centers Scenario. For both, we looked at the patterns and trends that resulted out of the top performing scenarios to provide an overall approach to land use, as well as provided a specific example at the parcel level of a top-performing scenario, with specific output metrics for analysis related to that parcel level land us plan.

5.1 CENTERS AND CORRIDORS SCENARIO RESULTS

The trends in optimal land use for this scenario are presented in *Figure 5.0 Centers and Corridors Scenario - Land Use Trends*.

This scenario uses 162 of the 519, or 31%, of the parcels identified in *Table 2.0: Developable Area*.

This scenario meets the goal development percentage within urban centers, providing 66.3% of housing units of the required 20,000 in the urban centers and 89.7% of the required jobs. This scenario significantly exceeds the units growth target (27,481 units of the required 20,000, or 137.4% of the target) due to its use of the mixed-use typology in order to meet the jobs goal. It provides just over the required amount of jobs. Distribution of the required growth in Overlake, Downtown, and outside of the urban centers is provided in *Table 5.1: Centers and Corridors Scenario - Development Summary*.

In this scenario, the model did not select either of the two new typologies currently not permissible under Redmond zoning (High Rise 19 and Office High Rise 13). This was not an intentional choice of the model, but an interesting outcome worth noting when reviewing the diversity of typologies. This is visible in *Table 5.2: Centers and Corridors Scenario - Typology Distribution*, and this table corresponds with the typologies shown on the map in *Figure 5.3: Centers and Corridors Scenario - Land Use Plan*.

A closer look at what is occurring in both the Overlake and Downtown urban centers is provided in *Figure 5.4: Centers and Corridors Scenario - Overlake* and *Figure 5.5: Centers and Corridors Scenario - Downtown*.

FIGURE 5.0: CENTERS AND CORRIDORS SCENARIO - LAND USE TRENDS

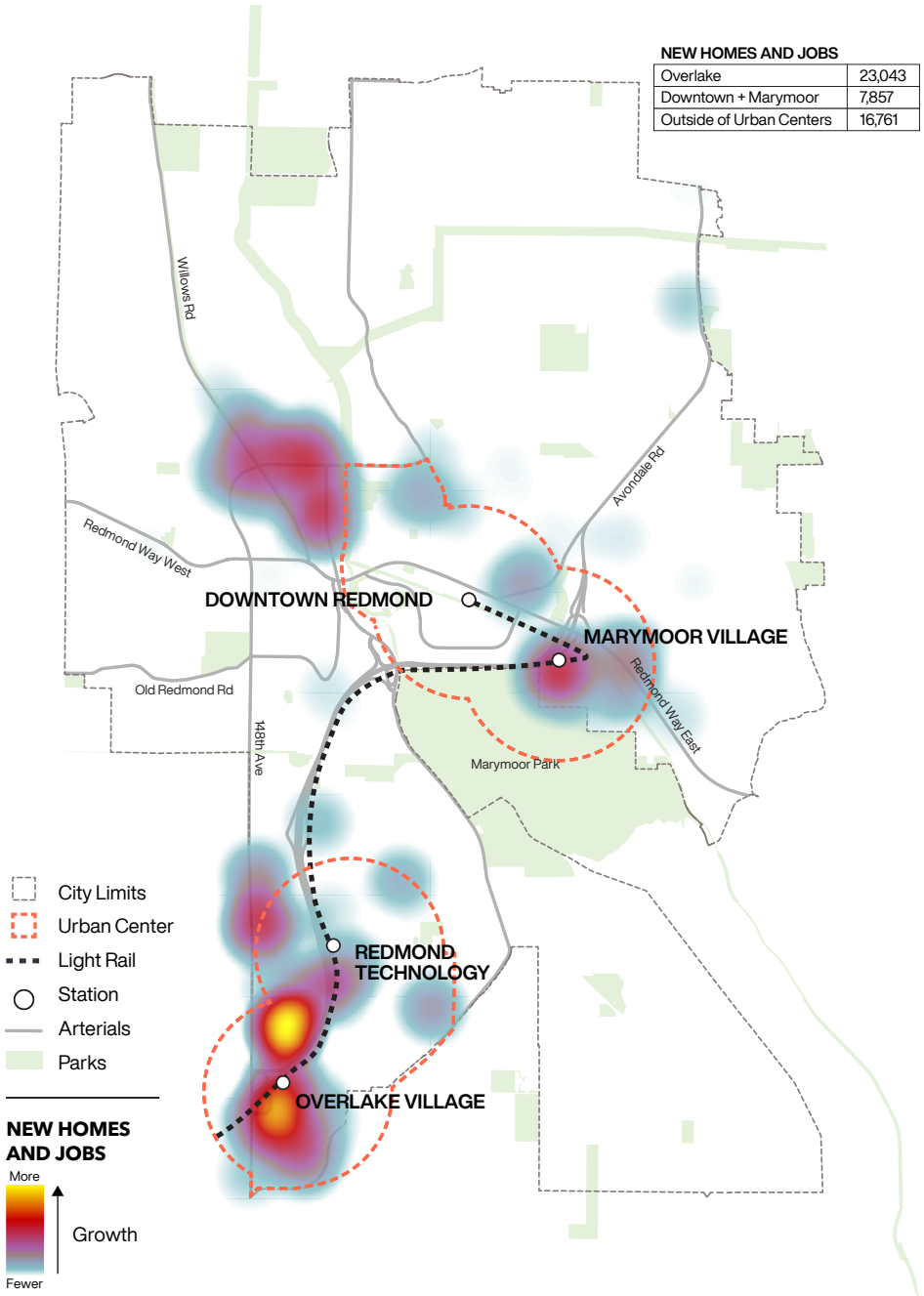


TABLE 5.1: CENTERS AND CORRIDORS SCENARIO - DEVELOPMENT SUMMARY

	# OF UNITS		% IN URBAN CENTERS (OF 20,000 GOAL)			
	HOUSING	JOBS	HOUSING		JOBS	
Overlake Urban Center	9,305	14,038	46.5%	66.3%	70.2%	89.7%
Downtown Urban Center	3,962	3,895	19.8%		19.5%	
Outside of Urban Centers	14,214	2,547	71.1%		12.7%	
TOTAL	27,481	20,480	137.4%		102.4%	

TABLE 5.2: CENTERS AND CORRIDORS SCENARIO - TYPOLOGY DISTRIBUTION

	Typology	Parking	Stories	Parcel Count
	Townhouse 3	Garage	3	19
	Stacked Flats 3	Surface	3	19
	Stacked Flats 4	Surface	4	3
	Podium 5	Podium	5	2
	Podium 6	Podium	6	46
	High Rise 10	Podium	10	36
	High Rise 19	UG/Podium	19	0
	Office Low Rise 4	Surface	4	7
-	Office Mid Rise 6*	Podium	6	0
	Office Mid Rise Campus 6	Podium	6	20
	Office High Rise 8	UG/Podium	8	10
	Office High Rise 13	UG/Podium	13	0
			TOTAL PARCELS USED	162

* Typology currently not financially viable

** “Parcel Count” is number of parcels identified for each typology

TABLE 5.6: CENTERS AND CORRIDORS SCENARIO - SCORECARD

VARIABLE	SCORE	METRIC
Renter/Owner Mix Score	75	A measure out of 100 as defined by the model
Housing Affordability Score	3.67	Equivalent to % of units likely to be affordable
Displacement Risk Score	63	Equivalent to % likelihood of displacement of existing units/jobs
VMT Score	56	A measure out of 100 as defined by the model
Walkability Score	71	A measure out of 100 as defined by the model
Jobs Access Score	11	A measure out of 100 as defined by the model
Impervious Surface Score	16	A measure out of 100 as defined by the model
Alignment with Public Opinion Score	58	Equivalent to % of how well land uses matches with the public engagement model
Typology Diversity Score	64	A measure out of 100 as defined by the model
Points Assigned by Model to Ensure Jobs and Housing Goals Were Met	96.5	Used to prioritize meeting the minimum required units

UNSCORED METRICS	SCORE	METRIC
% Ownership	28%	% of units likely to be owned
Average Distance to Transit	839’	Feet
Average Distance to Bike Lane	406’	Feet
Impervious Surface Coverage	82.9%	% estimated hardscape
Typology Diversity	7	# of typologies with more than 5 occurrences

5.2 CENTERS SCENARIO RESULTS

The trends in optimal land use for this scenario are presented in *Figure 5.8 Centers Scenario - Land Use Trends*.

This scenario uses 96 of the 519, or 18%, of the parcels identified in *Table 2.0: Developable Area*.

This scenario meets the goal development percentage within urban centers, providing 93.0% of housing units of the required 20,000 in the urban centers and 96.1% of the required jobs. This scenario once again significantly exceeds the units growth target (24,142 units of the required 20,000, or 120.7% of the target) due to its use of the mixed-use typology in order to meet the jobs goal. It again provides just over the required amount of jobs. Distribution of the required growth in Overlake, Downtown, and outside of the urban centers is provided in *Table 5.9: Centers Scenario - Development Summary*.

In this scenario, the model is using the two new typologies currently not permissible under Redmond zoning (High Rise 19 and Office High Rise 13). They are not considered feasible in either the Downtown or SE Redmond / Marymoor area given the aquifer, and the model did not place any of these typologies in this urban center. They are exclusively used in Overlake. This is visible in *Table 5.10: Centers Scenario - Typology Distribution*, and this table corresponds with the typologies shown on the map in *Figure 5.11: Centers Scenario - Land Use Plan*.

A closer look at what is occurring in both the Overlake and Downtown urban centers is provided in *Figure 5.12: Centers and Corridors Scenario - Overlake* and *Figure 5.13: Centers and Corridors Scenario - Downtown*.

FIGURE 5.8: CENTERS AND CORRIDORS SCENARIO - LAND USE TRENDS

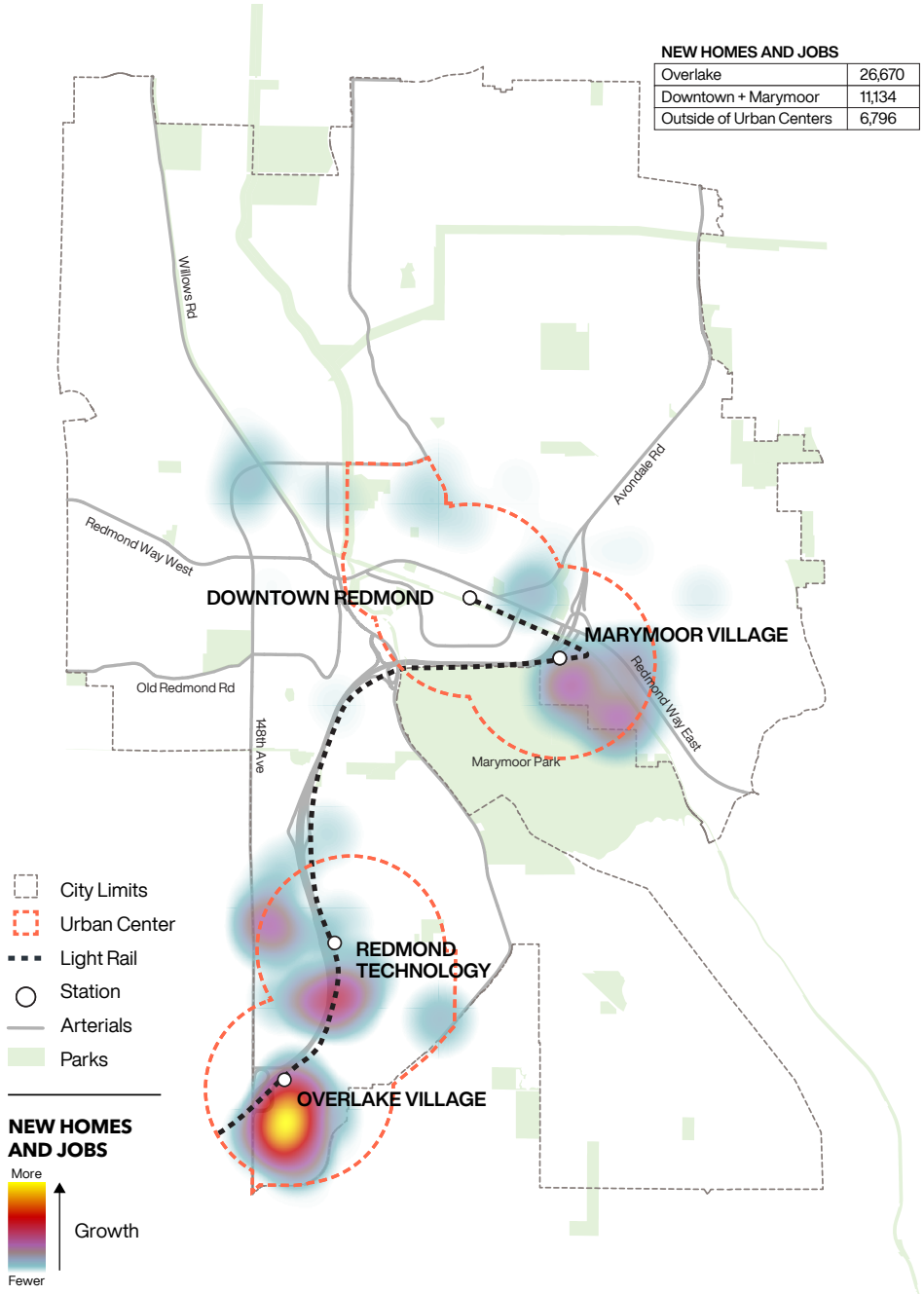


TABLE 5.9: CENTERS SCENARIO - DEVELOPMENT SUMMARY

	# OF UNITS		% IN URBAN CENTERS (OF 20,000 GOAL)			
	HOUSING	JOBS	HOUSING		JOBS	
Overlake Urban Center	12,990	13,680	64.9%	93.0%	68.4%	96.1%
Downtown Urban Center	5,604	5,530	28.0%		27.7%	
Outside of Urban Centers	5,548	1,248	27.7%		6.24%	
TOTAL	24,142	20,458	120.7%		102.3%	

TABLE 5.10: CENTERS SCENARIO - TYPOLOGY DISTRIBUTION

	Typology	Parking	Stories	Parcel Count
	Townhouse 3	Garage	3	12
	Stacked Flats 3	Surface	3	10
	Stacked Flats 4	Surface	4	1
	Podium 5	Podium	5	1
	Podium 6	Podium	6	21
	High Rise 10	Podium	10	10
	High Rise 19	UG/Podium	19	9
	Office Low Rise 4	Surface	4	4
-	Office Mid Rise 6*	Podium	6	0
	Office Mid Rise Campus 6	Podium	6	5
	Office High Rise 8	UG/Podium	8	15
	Office High Rise 13	UG/Podium	13	8
			TOTAL PARCELS USED	96

* Typology currently not financially viable

** "Parcel Count" is number of parcels identified for each typology

TABLE 5.14: CENTERS SCENARIO - SCORECARD

VARIABLE	SCORE	METRIC
Renter/Owner Mix Score	100	A measure out of 100 as defined by the model
Housing Affordability Score	2.8	Equivalent to % of units likely to be affordable
Displacement Risk Score	75	Equivalent to % likelihood of displacement of existing units/jobs
VMT Score	56	A measure out of 100 as defined by the model
Walkability Score	74	A measure out of 100 as defined by the model
Job Access Score	12	A measure out of 100 as defined by the model
Impervious Surface Score	16	A measure out of 100 as defined by the model
Alignment with Public Opinion Score	50	Equivalent to % of how well land uses matches with the public engagement model
Typology Diversity Score	64	A measure out of 100 as defined by the model
Points Assigned by Model to Ensure Jobs and Housing Goals Were Met	96.5	Used to prioritize meeting the minimum required units

UNSCORED METRICS	SCORE	METRIC
% Ownership	35%	% of units likely to be owned
Average Distance to Transit	880’	Feet
Average Distance to Bike Lane	301’	Feet
Impervious Surface Coverage	83.5%	% estimated hardscape
Typology Diversity	7	# of typologies with more than 5 occurrences

6.0 SCENARIO COMPARISON AND FINAL RESULTS

This section compares the baseline model with the parametric model (the Centers and Corridors Scenario and the Centers Scenario) in order to help determine the best land use model for the City of Redmond to meet it's growth targets.

6.1 REQUIRED GROWTH TARGETS

The baseline model is slightly under the targets for accommodating 20,000 new housing units and 20,000 new jobs. Additionally, the model is significantly under the required 75% of job growth in the urban centers. Both parametric model scenarios meet the required targets.

TABLE 6.0: REQUIRED GROWTH TARGETS

	UNITS OF HOUSING			JOBS		
	IN MODEL	% OF REQUIRED IN CENTERS	REQUIRED	IN MODEL	% OF REQUIRED IN CENTERS	REQUIRED
Baseline Model	19,901	79.4%	65%	18,390	59.0%	75%
Centers and Corridors Scenario	27,481	66.3%		20,480	89.7%	
Centers Scenario	24,142	93.0%		20,458	96.1%	

6.2 PERFORMANCE METRICS AND SCORECARD

When compared to the performance metrics, the Centers and Corridors Scenario and Centers Scenario demonstrate trade-offs as illustrated in *Figure 6.1: Scorecard Comparison*. The Centers Scenario has a slightly greater overall score (72 total points out of 100 available), due to greater amounts of home ownership potential, improved walkability, lower displacement risk, and reduced distance to bike lanes.

However, the score of the Centers and Corridors Scenario is very close, at 70 points out of 100 available. This scenario performs better when looking at affordable housing

(producing a slightly higher likelihood of affordable units per ECONorthwests' typology information) and a smaller amount of impervious surface coverage. It also results in a slightly lower average distance to transit, mainly due to development being spread out along arterial streets and therefore located closer to bus service. The Centers and Corridors Scenario also better matches the results obtained during the public engagement activity.

A full comparison of each performance metric is discussed in *Figure 6.1: Scorecard Comparison.*

Generally, the two scores for the Scenarios are relatively comparable. This was not intentional, but does show that whether the growth is contained to the urban centers, or whether it is created along some or all of the studied arterials, the desired measurable outcomes can be reached. This ensures that urban design, community engagement, and the environmental review process can impact the final outcomes of this long-range planning effort as either scenario can meet the high-level goals of the study with approximately the same amount of success.

6.3 LOCATION AND HEIGHT OF GROWTH

Looking finally at *Figure 6.2 Typology Comparison* and *Figure 6.3 Land Use Plan Comparison*, there are some key differences to the location and scale of growth presented in each scenario. Across both scenarios, the mixed-use typology plays a large role and is the most prevalent form of development recommend by the model.

In the Centers and Corridors Scenario, we see that there is a much greater use of residential-only typologies, which have fewer stories. Given this, the number of overall parcels used is greater, as these typologies do not contribute as many units given their lower FAR. The Centers and Corridors Scenario uses 162 parcels, whereas the Centers Scenario uses only 96. There are no uses of the two new high-rise typologies in the Centers and Corridors Scenario - all development is 10 stories of less in this scenario model. The primary typologies in this model are Podium 6 (mixed-use) and High Rise 10 (mixed-use).

In the Centers Scenario, we see far fewer residential-only typologies, though there are some of each type. There are multiple uses of the two new high-rise typologies, though they are less prevalent than the similar lower height options. In this scenario, the primary typologies are Podium 6 (mixed-use) and Office High Rise 8 (commercial).

The use of the two Office High Rise typologies explains why there is less overage on the Units of Housing goal in this scenario. The challenge across both models was meeting the jobs goal of 20,000. Both required ample use of the mixed-use typology to meet this goal, but in the Centers scenario, the model did not have to go as far over the housing target to meet the job goals (i.e. ~27,000 units of housing are provided in the Centers and Corridors Scenario, while ~24,000 units of housing are provided in the Centers Scenario, due to the use of the Office High Rise 8 and 13 typologies).

Finally, locationally we can see that where growth is being placed in the two scenarios has many similar trends. Overlake holds much of the development in both scenarios. The development in the Downtown Urban Center in both scenarios clusters near the SE Redmond / Marymoor station. In the Centers and Corridors scenario, mixed-use development along Willows Road is favored by the model, and it finds more opportunities for mixed-use density in the Downtown station area. There are smaller parcels that indicate a trend for some mixed-use growth along Redmond Way and in the 148th Ave NE area.

The Centers model prioritizes the taller typologies (High Rise 10 and 19, Office High Rise 8 and 13) in the previously identified areas - in Overlake and the SE Redmond / Marymoor station area.

FIGURE 6.2: TYPOLOGY COMPARISON

CENTERS AND CORRIDORS SCENARIO

	# OF UNITS			
	HOUSING		JOBS	
Overlake Urban Center	9,305	34%	14,038	67%
Downtown Urban Center	3,962	14%	3,895	27%
Outside of Urban Centers	14,214	52%	2,547	6%
TOTAL	27,481		20,480	

	TYPOLOGY	PARCEL COUNT	% OF TOTAL PARCELS
	Townhouse 3	19	12%
	Stacked Flats 3	19	12%
	Stacked Flats 4	3	2%
	Podium 5	2	1%
	Podium 6	46	28%
	High Rise 10	36	22%
	High Rise 19	0	0%
	Office Low Rise 4	7	4%
-	Office Mid Rise 6*	0	0%
	Office Mid Rise Campus 6	20	12%
	Office High Rise 8	10	6%
	Office High Rise 13	0	0%
	TOTAL PARCELS USED	162	100%

CENTERS SCENARIO

	# OF UNITS			
	HOUSING		JOBS	
Overlake Urban Center	12,990	54%	13,680	67%
Downtown Urban Center	5,604	23%	5,530	27%
Outside of Urban Centers	5,548	23%	1,248	6%
TOTAL	24,142		20,458	

	TYPOLOGY	PARCEL COUNT	% OF TOTAL PARCELS
	Townhouse 3	12	13%
	Stacked Flats 3	10	10%
	Stacked Flats 4	1	1%
	Podium 5	1	1%
	Podium 6	21	22%
	High Rise 10	10	10%
	High Rise 19	9	9%
	Office Low Rise 4	4	4%
-	Office Mid Rise 6*	0	0%
	Office Mid Rise Campus 6	5	5%
	Office High Rise 8	15	16%
	Office High Rise 13	8	8%
	TOTAL PARCELS USED	96	100%

* Typology currently not financially viable

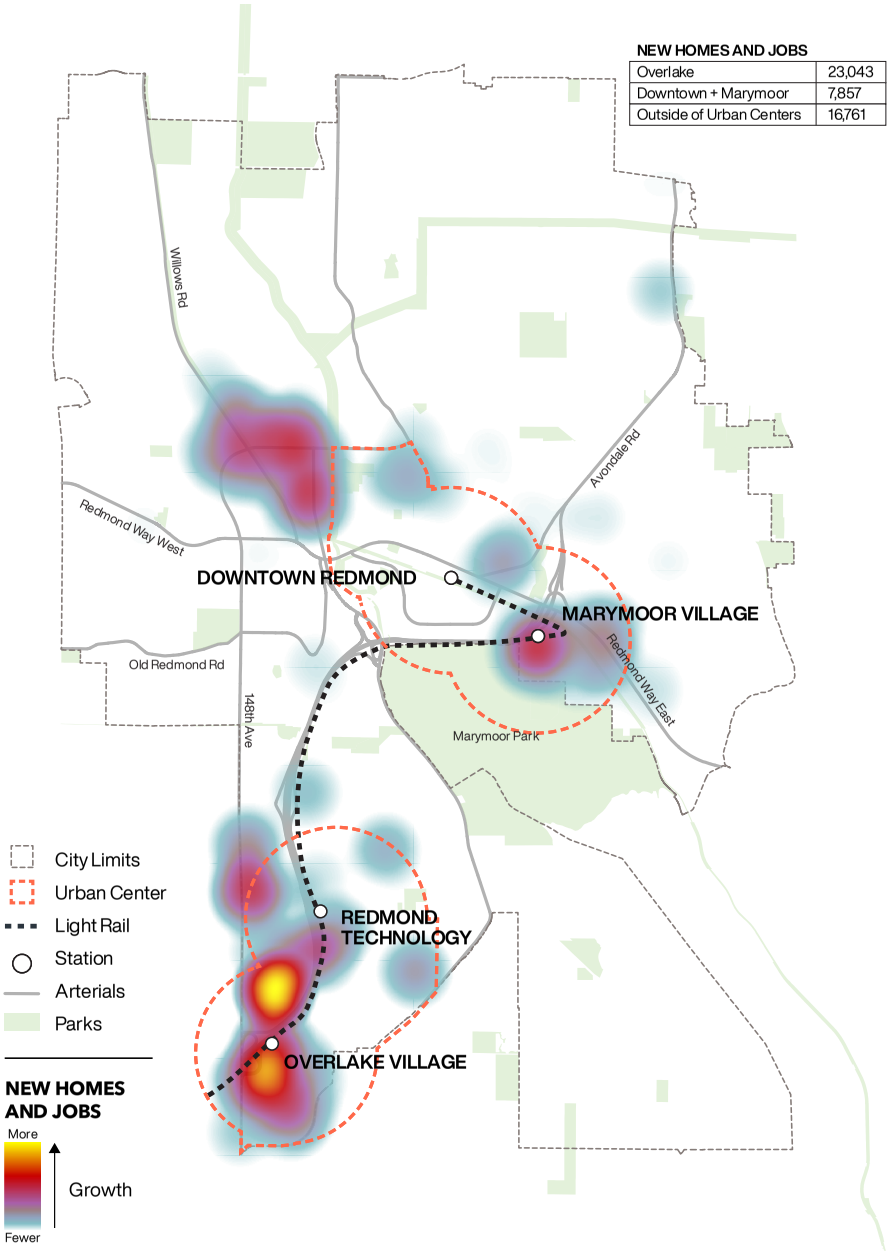
** "Parcel Count" is number of parcels identified for each typology

Attachment D

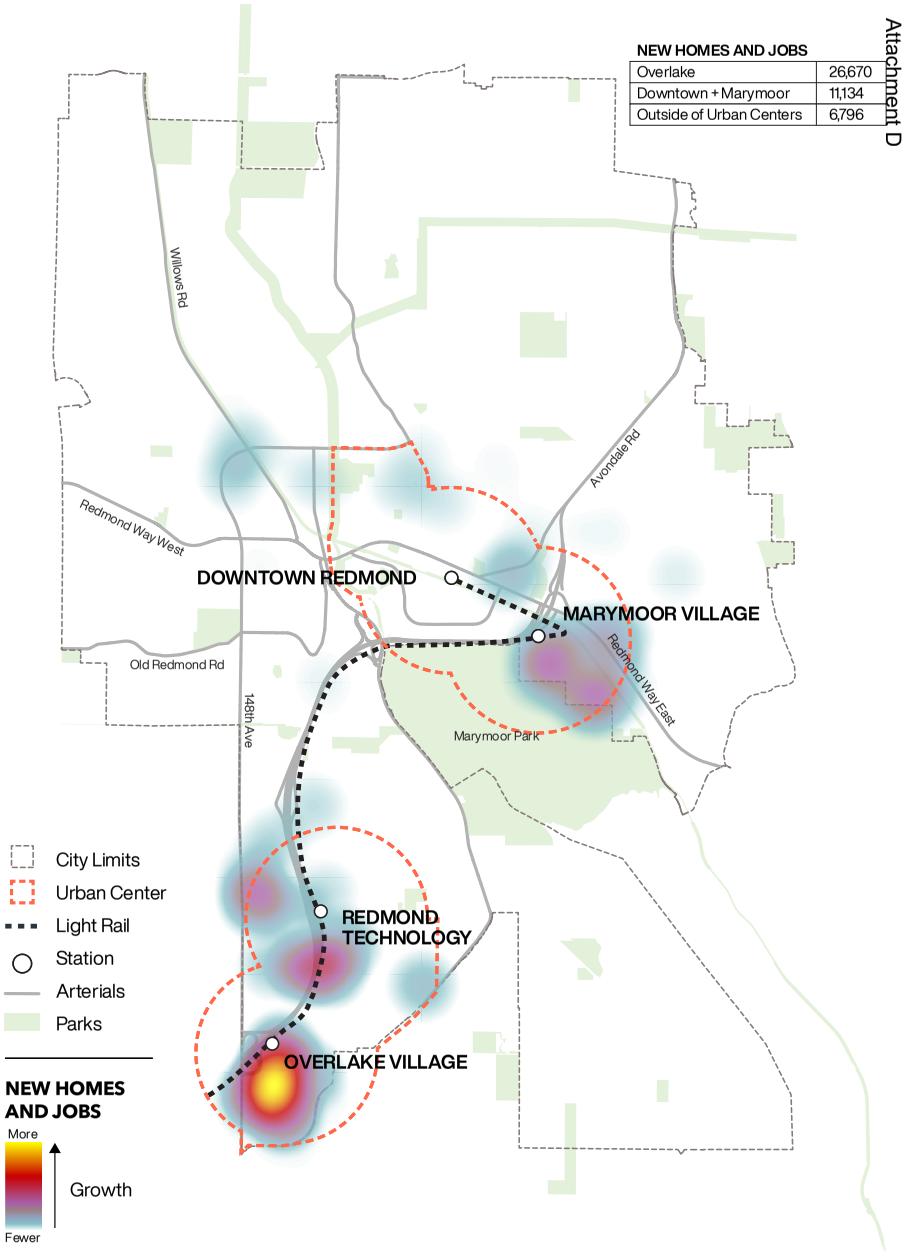
	VARIABLE	CENTERS AND CORRIDORS SCENARIO SCORE	CENTERS SCENARIO SCORE	COMPARISON
RENTER/OWNER MIX	Tenure Score	75	100	The typologies in the Centers Scenario provide a greater likely percentage of new housing units that would be an ownership tenure. This is further illustrated in the unscored metric of "% Ownership".
	% Ownership	28%	35% ++	
HOUSING AFFORDABILITY	% Affordable	3.67% +	2.8%	The typologies in the Centers and Corridors Scenario provide a slightly higher amount of new housing units that would be a typology likely to be used in affordable housing
DISPLACEMENT RISK	Displacement Risk	63	75 +	The Centers scenario has a lower risk of displacement for existing housing units and jobs.
VMT SCORE	VMT Score	56	56	Both scenarios have very comparable VMT scores.
WALKABILITY	Walkability	71	74 +	Walkability is higher in the Centers Scenario. This is further illustrated in the unscored metrics. Primary transit routes (stations and buses) are slightly more accessible to new development in the Centers and Corridors Scenario by an average of about 40'. Bike lanes are more accessible to new development in the Centers Scenario by over 100'.
	Avg. Distance to Transit	839' +	880'	
	Avg. Distance to Bike Lane	406'	301' ++	
JOBS ACCESS	Access to New and Existing Jobs	11	12 +	While the Centers Scenario performs slightly better, the overall access to jobs scores are both low due to the concentration of employment in Overlake, thus not encouraging spread across Redmond.
SURFACE COVERAGE	Impervious Surface Score	16	16	Both scenarios have very comparable Impervious Surface Scores. When converted back to a percentage of coverage, the Centers and Corridors scenario performs slightly better.
	Impervious Surface Coverage	82.9% +	83.5%	
TYPOLOGY DIVERSITY	Typology Diversity Score	64	64	Both scenarios have a comparable diversity of typologies, and both have 7 typologies that occur on more than 5 parcels.
	Typology Diversity	7	7	
PUBLIC OPINION	Alignment with Public Opinion	58% +	50%	The Centers and Corridors Scenario aligns slightly better the public opinion model collected in our public engagement exercise.

FIGURE 6.4: LAND USE TRENDS COMPARISON

CENTERS AND CORRIDORS SCENARIO



CENTERS SCENARIO



7.0 NEXT STEPS

IBI Group will be using these results, along with our community engagement work, to assist with Implementation strategies for both of the parametric scenarios. In tandem, the baseline model, Centers and Corridors Scenario, and Centers Scenario will be presented publicly for further community review by the City of Redmond team.

Under a concurrent SEPA review process, the baseline model will help inform the "no action" alternative while the two parametric model scenarios will inform the two bookends in their environmental review. This process will allow the City of Redmond to make their final decisions regarding land use planning as informed by this early scenario work.