



FINAL DRAFT MEMORANDUM

Date: May 7, 2024
To: Paul Dennis, Senior Planner – Jackson Civil
From: Eli Mulberry, AICP – Planner
Subject: Housing Needs and Land Capacity Summary – City of Mossyrock

1. Background

This memo discusses the results of Mossyrock’s Land Capacity analysis to determine housing, population, and employment land capacities. This helps determine whether the jurisdiction has adequate land densities and buildable lands to accommodate future growth. This analysis used the GIS option and methods established by Lewis County, supplemented with guidance for the Department of Commerce for allocating housing by income bracket.

This study analyzed housing capacity according to new 2021 Washington House Bill 1220 requirements, which updated the Growth Management Act (GMA). The new legislation requires that jurisdictions plan for very low-, low-, and moderate-income housing needs when conducting their Comprehensive Plan updates. Jurisdictions are required to demonstrate that land capacity exists in their Urban Growth Areas for housing types that meet these income needs. In other words, *do the current zoning and development regulations allow housing types and quantities that meet need by income bracket*. Whether development occurs to meet this need ultimately depends on private market trends.

This analysis finds that the City has sufficient buildable lands to meet population and housing. However, the City has a slight insufficiency of land for employment, with a projected estimated deficit of 13 jobs (see Exhibit 12).

The following Exhibits show the Lewis County provided population and housing targets.

Exhibit 1 – Population Targets

City (Incorporated + UGA)	2022 Total Population	2045 Population Allocation	20-Year Population Increase	20-Year Growth Rate
Mossyrock	906	1,058	152	16.78%



Exhibit 2 – Housing Targets

Total 2045 Population = 104,951		Permanent Housing Needs by % of Area Median Income								EH
		0-30%		>30-50%	>50-80%	>80-100%	>100-120%	>120%		
		Total	Non-PSH	PSH						
Unincorporated Lewis County	Estimated Housing Supply (2020)	19,519	667	25	3,146	4,704	2,798	2,016	6,163	0
	Allocation Method C (2020-2045)	403	88	38	115	58	28	23	53	21
City of Centralia	Estimated Housing Supply (2020)	7,593	578	14	1,614	3,154	1,153	302	778	38
	Allocation Method C (2020-2045)	767	227	184	0	0	0	134	222	78
City of Chehalis	Estimated Housing Supply (2020)	3,139	140	0	442	1,537	509	140	371	22
	Allocation Method C (2020-2045)	6,215	1,390	563	1,000	900	425	280	1,657	332
City of Morton	Estimated Housing Supply (2020)	506	16	0	167	221	69	8	25	0
	Allocation Method C (2020-2045)	23	5	1	4	3	2	1	7	1
City of Mossyrock	Estimated Housing Supply (2020)	322	10	0	160	108	14	7	23	0
	Allocation Method C (2020-2045)	72	16	5	12	7	5	4	24	4
City of Napavine	Estimated Housing Supply (2020)	718	11	0	135	286	120	42	124	0
	Allocation Method C (2020-2045)	477	89	28	90	75	28	32	135	16
City of Pe Ell	Estimated Housing Supply (2020)	284	6	0	90	157	9	6	16	0
	Allocation Method C (2020-2045)	10	2	1	2	1	1	1	3	1
City of Toledo	Estimated Housing Supply (2020)	303	5	0	64	152	30	13	39	0
	Allocation Method C (2020-2045)	845	92	27	139	210	125	40	211	16
City of Vader	Estimated Housing Supply (2020)	257	0	0	100	90	43	6	18	0
	Allocation Method C (2020-2045)	100	30	7	0	6	2	10	45	5
City of Winlock	Estimated Housing Supply (2020)	564	30	0	121	323	32	16	42	0
	Allocation Method C (2020-2045)	1,248	271	115	282	210	83	50	237	67
Total	Sum of Allocations to Jurisdictions	10,160	2,210	969	1,643	1,471	698	575	2,594	542
	Percent of Sum of Allocations to Jurisdictions	100.00%	21.75%	9.54%	16.17%	14.48%	6.87%	5.66%	25.53%	5.33%

2. Housing Capacity Analysis

2.1 Housing Assumptions

To determine the number of units that can reasonably be accommodated under the land capacity, this analysis uses an assumed density, rather than the maximum zoned density. An assumed density considers both the existing built density and likely density of further development.¹ Where there was a choice, or a scale of possible densities, we selected the most conservative number. The following, Exhibit 3, establishes the assumed housing densities for this analysis. This analysis split areas considered zoned lands in incorporated limits and the Urban Growth Area (UGA) separately, as noted by the zoning designation in the analysis.

¹ Department of Commerce. “Draft Guidance for Evaluating Land Capacity to Meet All Housing Needs.” Washington State Department of Commerce, 2022 <https://deptofcommerce.app.box.com/s/k14gbqe7z8d7ek6z8ibui79zb7bo9vpa>.

Exhibit 3 – Assumed Housing Densities

Zone	Assumed density (du/acre)	Comments
Neighborhood	2	Based on local achieved densities.
Neighborhood – UGA	2	Based on local achieved densities.

Under the Commerce guidance, to compare land capacity with housing need by income band, the analysis needs to assume, based on existing housing diversity and local conditions, what income levels the existing zones reasonably accommodate.² For example, if a single-family residential zone has land values and home costs that would not be affordable to lower income brackets, the analysis allocates the capacity in that zone to higher income brackets using a ratio. Some zones may have housing types that serve multiple income brackets. The analysis adjusted the ratio weights to reflect this. The following Exhibit lists each bracket and the zones that the zones that provide housing affordable to this level. Appendix A discloses the exact allocation ratios by zone and Area Median Income (AMI) level.

Exhibit 4 – Assumed Zones Serving Income Levels

Income Level	Income Bracket	Zones with Housing Serving Each Income Level
0-30% AMI	\$0 - \$20,174	Neighborhood, Neighborhood - UGA
30-50% AMI	\$20,174 - \$33,624	Neighborhood, Neighborhood - UGA
50-80% AMI	\$33,624 - \$53,798	Neighborhood, Neighborhood - UGA
80-100% AMI	\$53,798 - \$67,247	Neighborhood, Neighborhood - UGA
100-120% AMI	\$67,247 - \$80,696	Neighborhood, Neighborhood - UGA
>120% AMI	\$80,696+	Neighborhood, Neighborhood - UGA

2.2 Housing Capacity Results

To determine the total net residential acreage, we first deducted critical areas and percentage deduction factors for infrastructure, future public uses, and market forces. We then converted acreage to housing units based on the assumed density by zone. The results of this analysis are summarized in the following Exhibit 5. See Appendix B for the full deduction factors and calculations.

Exhibit 5 – Housing Capacity

Zone	Net Developable Acres	Residential Capacity (units)
Neighborhood	91.5	183
Neighborhood - UGA	31.0	62
Total	122.4	245

² Department of Commerce. “Draft Guidance for Evaluating Land Capacity to Meet All Housing Needs.” Washington State Department of Commerce, 2022 <https://deptoocommerce.app.box.com/s/k14gbqe7z8d7ek6z8ibui79zb7bo9vpa>.



To assess whether this unit capacity could potentially ensure sufficient housing for population growth, the analysis deducted units based on the local occupancy rates and converted units to individuals based on the local average household size. The US Census Bureau provides the data for census places and tracts for occupancy and household size statistics. We then compared the future population demand target established in Exhibit 1 with the total population capacity to determine whether the jurisdiction has sufficient capacity for future population growth, as seen below in Exhibit 6.

Exhibit 6 – Population Capacity Results

Zone	Total Unit Capacity	Occupancy Rate*	Total Occupied Units	Population Capacity (persons)+
Neighborhood	183	90%	164	511
Neighborhood - UGA	62	90%	56	174
Incorporated Population Capacity				511
UGA Population Capacity				174
Total				685
<i>Target</i>				<i>152</i>
Projected Surplus/ (Deficit)				533

*Based on latest OFM and Census estimates.

+Based on the latest Census estimate for the local average household size of 3.11.

After allocating housing capacity based on our housing affordability assumptions, we can determine whether there is sufficient land and density to accommodate housing demands by income level. This analysis ran two scenarios: (1) where housing growth occurs in both incorporated and UGA areas, seen in Exhibit 7; and (2) if the housing growth only occurs in the incorporated area, shown in Exhibit 8.

Exhibit 7 – UGA+Incorporated: Housing Need Surplus/Deficit Results

Income Level	Income Bracket	Zones Serving Income Levels	Projected Housing Need	Allocated Units	Surplus/ (Deficit)
0-30% AMI	\$0 - \$20,174	Neighborhood, Neighborhood - UGA	21	41	20
30-50% AMI	\$20,174 - \$33,624	Neighborhood, Neighborhood - UGA	12	41	29
50-80% AMI	\$33,624 - \$53,798	Neighborhood, Neighborhood - UGA	7	41	34
80-100% AMI	\$53,798 - \$67,247	Neighborhood, Neighborhood - UGA	5	41	36

Income Level	Income Bracket	Zones Serving Income Levels	Projected Housing Need	Allocated Units	Surplus/ (Deficit)
100-120% AMI	\$67,247 - \$80,696	Neighborhood, Neighborhood - UGA	4	41	37
>120% AMI*	\$80,696+	Neighborhood, Neighborhood UGA	24	41	17
Total			73	245	172

*HB 1220 does not require jurisdictions to demonstrate policy changes to meet sufficient capacity for upper incomes.

Exhibit 8 – Incorporated Only: Housing Need Surplus/Deficit Results

Income Level	Income Bracket	Zones Serving Income Levels	Projected Housing Need	Allocated Units	Surplus/ (Deficit)
0-30% AMI	\$0 - \$20,174	Neighborhood	21	30	9
30-50% AMI	\$20,174 - \$33,624	Neighborhood	12	30	18
50-80% AMI	\$33,624 - \$53,798	Neighborhood	7	30	23
80-100% AMI	\$53,798 - \$67,247	Neighborhood	5	30	25
100-120% AMI	\$67,247 - \$80,696	Neighborhood	4	30	26
>120% AMI*	\$80,696+	Neighborhood	24	30	6
Total			73	183	110

*HB 1220 does not require jurisdictions to demonstrate policy changes to meet sufficient capacity for upper incomes.

3. Employment Capacity Analysis

3.1 Employment Assumptions

To convert total land area into net employment capacity area, we must make a few assumptions. First is the assumed density for employment area. We used Floor Area Ratio (FAR) as our measure of employment density. The assumed FAR by zone used in the analysis are established below in Exhibit 9.

Exhibit 9 – Assumed Employment Densities

Zone	Assumed FAR	Comments
Market	0.4	We are assuming low-density, one-story buildings in their market district. While some older buildings have higher FARs, parking areas tend to drive this down.
Market - UGA	-	No zoned Market designations in the UGA.

This analysis divides job calculations into three employment sectors: industrial, general commercial, and retail. To estimate employment capacity, we follow the Lewis County methodology for Land Capacity Analysis, which allocates square footage per employee as follows: 650 square feet for industrial jobs, 400 square feet for general commercial jobs, and 600 square feet for retail jobs.

Given that nonresidential zones can host multiple types of businesses, we've used allocation ratios to distribute the employment capacity among the three sectors. As a starting point, these ratios were derived by analyzing developed parcels within each zone, identifying the proportion of parcels engaged in industrial, commercial, or retail activities. This approach is based on the premise that the distribution of future jobs will mirror the current pattern of employment across these sectors within the area. These ratios were then adjusted based on a review of the jurisdictions' permitted use table to best reflect the intent of the zone, rather than existing uses alone. Exhibit 10 provides a detailed breakdown of these assumptions.

Exhibit 10 – Assumed Employment Allocation Ratios

Zone	Industrial	General Commercial	Retail
Market	0%	50%	50%
Market - UGA	0%	50%	50%

Numbers total to 100% by row

3.2 Employment Capacity Results

This analysis determined the total net developable land by deducting critical areas and percentage deduction factors for infrastructure, future public uses, and market forces. We then multiplied this net capacity with our assumed densities from Exhibit 9 to find net capacity square footage. Lastly, to consider occupancy and vacancy rates for businesses and leasing space, we assumed a 95% occupancy rate to find the total occupied capacity square footage, found in the following Exhibit 10. See Appendix B for the full deduction factors and calculations.

To convert square footage capacity into jobs, we first allocated a percentage of the square footage capacity into each of the employment sectors for analysis: industrial, general commercial, and retail using the assumptions established in Exhibit 10. We then converted square footage into jobs by dividing by our assumed square footage per employee. The total job capacity for each zone is shown in Exhibit 11.

Exhibit 11 – Employment Capacity Results

Zone	Total Occupied Sq. Ft. Capacity	Industrial		General Commercial		Retail		Total Job Capacity
		Land Capacity (sq. ft)	Jobs	Land Capacity (sq. ft)	Jobs	Land Capacity (sq. ft)	Jobs	
Market	30,677	-	-	15,338	38	15,338	26	64
Market - UGA	-	-	-	-	-	-	-	-

Given that we know the projected housing unit demand, we can then use the American Community Survey’s estimates for job status by households and family to find an average jobs per household number.³ We then multiplied this rate with housing unit demand to determine employment demand.

To determine the projected employment capacity surplus or deficit, we then subtracted demand from total employment capacity, shown in the following Exhibit 12.

Exhibit 12 – Employment Demand Surplus/ Deficit Results

Employment Demand	
20-Year Housing Unit Demand Increase (dwelling units)	73
Assumed jobs / household	1.05
20-year employment demand (jobs)	77
Total Employment Capacity (jobs)	
Incorporated job capacity	64
UGA job capacity	-
Total job capacity (Incorporated + UGA)	64
Projected Surplus/ (Deficit)	
Incorporated only scenario (jobs)	(13)
Incorporated + UGA scenario (jobs)	(13)

³ 2022 ACS, Household Size by Number of Workers.

Appendix A

The following table shows the allocation ratios used to allocate zoned capacity to income bracket. This method recognizes that zones can accommodate more than a single income level or bracket. Ratios add up to 100% by row. The ratios are multiplied with the zone's unit capacity to determine the estimated units at each income level.

Assumed Housing Allocation Ratios Table

Residential Zones	0-30% AMI	30-50% AMI	50-80% AMI	80-100% AMI	100-120% AMI	>120% AMI
LDR 10	0.166667	0.166667	0.166667	0.166667	0.166667	0.166667
LDR 6	0.166667	0.166667	0.166667	0.166667	0.166667	0.166667



Appendix B

Formulas and calculations:

Critical areas were deducted in GIS.

$Net\ Developable = ((Gross\ Dev.\ Land\ minus\ critical\ areas * (1 - Future\ Use\ Deduction)) * (1 - Infrastructure\ Deduction)) * (1 - Market\ Factor\ Deduction)$

$Total\ Capacity = Net\ Developable\ acres * Assumed\ Density$

$Total\ Occupied\ Employment\ Capacity\ (sq.\ ft) = Total\ Sq.\ Foot\ Capacity * Occupancy\ Rate$. We used an occupancy rate of 95%.

Buildable Acre Capacities and Deductions - Housing

Zone	Gross Developable Land minus critical areas (acres)			Future Public Use Deduction			Infrastructure Deduction			Market Factor Deductions			Net Developable Land (acres)				Total Dwelling Unit Capacity
	Vacant	Partially-utilized	Under-utilized	Vacant	Partially-utilized	Under-utilized	Vacant	Partially-utilized	Under-utilized	Vacant	Partially-utilized	Under-utilized	Vacant	Partially-utilized	Under-utilized	Total	
Neighborhood	138.37	0.00	14.33	5%	5%	5%	25%	25%	25%	15%	25%	25%	83.8	0.0	7.7	91.5	183
Neighborhood - UGA	31.63	0.00	22.12	5%	5%	5%	25%	25%	25%	15%	25%	25%	19.2	0.0	11.8	31.0	62

Residential Deduction Summary	
Total gross developable land (minus critical areas)	206.5
Future Public Use - total acres deducted	10.3
Infrastructure - total acres deducted	49.0
Market Factor - total acres deducted	24.7
Total net developable acres	122.4
Total dwelling unit land capacity	245
Total pipeline units	-
Grand total units	245

Buildable Acre Capacities and Deductions – Employment

Zone	Gross Developable Land minus critical areas (acres)			Future Public Use Deduction			Infrastructure Deduction			Market Factor Deductions			Net Developable Land (acres)				Total Sq. Foot Capacity	Total Occupied Employment Capacity (sq. ft)
	Vacant	Partially-utilized	Under-utilized	Vacant	Partially-utilized	Under-utilized	Vacant	Partially-utilized	Under-utilized	Vacant	Partially-utilized	Under-utilized	Vacant	Partially-utilized	Under-utilized	Total		
Market	1.01	0.00	1.67	5%	5%	5%	25%	25%	25%	15%	25%	25%	0.6	0.0	0.9	1.5	0.4	30,677
Market - UGA	0.00	0.00	0.00	5%	5%	5%	25%	25%	25%	15%	25%	25%	0.00	0.00	0.00	0.00	0.00	0.00

Employment Deduction Summary	
Total gross developable land (minus critical areas)	2.7
Future Public Use - total acres deducted	0.1
Infrastructure - total acres deducted	0.6
Market Factor - total acres deducted	0.4
Total net developable acres	1.5
Total Sq. Foot Capacity	32,291
Total occupied sq. ft. land capacity	30,677
Total pipeline sq. ft.	-
Grand total employment capacity (sq. ft)	30,677



Appendix C

This appendix lists this analysis' assumptions and disclosures when implementing the methodology. It also includes disclosures of data limitations.

GIS Analysis Process Assumptions and Data Limitations

- Mossyrock floodplain data. FEMA provides incomplete floodway data. For example, parcel #008701052005 has a stream running through it, but FEMA does not provide any floodway data in the incorporated boundary of the city for it.
- Critical area buffers for deducting nonresidential parcels. All jurisdictions do not have a published critical areas code chapter on their respective code publishing or municode websites. Or, they adopt the County codes by reference. This analysis therefore used county buffer distances for all analysis jurisdictions. The adopted county codes for wetland and stream buffers are based on category and impact.
 - Since the wetland database does not include wetland category or score, nor are we able to identify impact level without a site-level biological study, we took an average buffer size of 120 feet to apply for simplicity to avoid doing a site-by-site GIS analysis.
 - Using DNR stream data, we applied a buffer distance of 150 feet for Fish-containing streams, which is the buffer distance for Type F waters under Lewis County Code 17.38.420. For unknown, non-fish, and waters with no type or designation, we used a buffer distance of 75 feet based on LCC.
- There are several parcels in all cities that are split by zone. To control this, this analysis split these parcels using an intersect geoprocess in GIS to find the gross acreage by zone.
- There are several parcels in all cities that straddle the boundary. Like zoning, these parcels were split using an intersect to only calculate areas within the city boundary and UGA.

Deductions and Assumed Densities

- The criterion for partially-used in the Lewis County methodology has conflicting logic: "Don't count parcels with improvement values >93rd percentile of jurisdiction improvement values unless the parcel is sized 3 times the minimum allowed under zoning." This is the same criteria as is applied for the rest: "Parcel size >3 times the minimum allowed under zoning." We applied this literally and counted all parcels >3 times the minimum.
- For determining a reasonable allocation ratio for jobs under industrial, retail, and general commercial, we assumed that capacity would be split across these sectors consistent with existing splits. To determine existing splits, we isolated developed parcels and used assessor [land use codes](#) to classify them under these three categories. The ratios were then adjusted based on the permitted use tables in the development regulations to better reflect intended uses in each zone.
 - Industrial included codes related to manufacturing, transportation, and resource extraction
 - 21-49
 - 81-89

- General commercial included codes related to services:
 - 61-69
- Retail included codes related to trades:
 - 50-59

The following tables disclose acreage of critical area lands that were deducted in GIS.

Residential Zones	City	UGA	Grand Total
NEIGHBORHOOD	76.5	74.3	150.8

Commercial Zones	City	UGA	Grand Total
MARKET	39	0	39

The following parcels were identified as buildable under the analysis methodology but excluded. The reasons for each are described below.

Parcel	City	Use	Reason For Exclusion
800015002	Mossyrock	commercial	Current use like an easement
8700020005	Mossyrock	commercial	Owned by business on west side, used currently as a drive though
8700020006	Mossyrock	commercial	Used by business on the east side as an outdoor eating area
8701052005	Mossyrock	public/utility/easement	Entrance to the park
8701059000	Mossyrock	public/utility/easement	Property of TDS, maintenance bldg. on north side of property
8701064003	Mossyrock	public/utility/easement	City Hall, shop and work area
8700056001	Mossyrock	public/utility/easement	Parking lot for the church on east side
8701078001	Mossyrock	public/utility/easement	Local cemetery
8701077002	Mossyrock	public/utility/easement	City Reservoir
8701077003	Mossyrock	public/utility/easement	City Reservoir Buffer zone
29127001101	Mossyrock	public/utility/easement	Vacant and wetlands
29121007000	Mossyrock	public/utility/easement	Mostly wetland and pastureland, sliver has single family home on it
29121008000	Mossyrock	public/utility/easement	Pasture land. Extends into the UGA and unlikely to develop
29135005000	Mossyrock	residential	Home and trees
29135011000	Mossyrock	residential	Home and trees
29134016001	Mossyrock	public/utility/easement	right of way, easement
8701084007	Mossyrock	public/utility/easement	FFA Field related to school
8701083000	Mossyrock	public/utility/easement	School track
8701078003	Mossyrock	public/utility/easement	School track

Parcel	City	Use	Reason For Exclusion
28536006000	Mossyrock	public/utility/easement	Road/transportation
008701052005	Mossyrock	public/utility/easement	City Park
028529011000	Mossyrock	residential	Developed residence
028528016000	Mossyrock	residential	Developed residence
028528015000	Mossyrock	residential	Developed residence
028528017000	Mossyrock	residential	Developed residence