

Land Development Code Revision – “Report Card” Documentation

Page 1 – Council Goal Metrics

Total Housing Capacity

The analysis to determine the total housing capacity of the proposed LDC and zoning map was conducted using Envision Tomorrow, a land use scenario model. The process by which this was done includes four major steps:

1. **Development Feasibility.** Determine which parcels will develop or redevelop based on market data and pro-forma analysis. Only parcels identified in this step are included in the next two steps.
2. **Base Build-Out Density Assumptions.** Unit production is calculated per zone based on a mix development types allowed in the zone.
3. **Estimated Bonus Production.** Bonus unit production is calculated per zone based on a multiplier.
4. **Estimated Income-Restricted Bonus Capacity.** Affordable capacity is a percentage of the bonus.

For more information, see Envision Tomorrow documentation on the LDC Revision website.

Housing Capacity Within ½ Mile of Imagine Austin Centers and Corridors and the ASMP Transit Priority Network

Total housing capacity (base + bonus capacity) was selected using capacity geography centroids and ½ mile radial buffers around [Imagine Austin Centers](#), [Imagine Austin Corridors](#), and the [ASMP Transit Priority Network](#).

Total Housing Capacity by Type

For base capacity, units were binned as follows using information on “units in structure” and “lot size” in Envision Tomorrow:

- Standard / Large Lot SF – Single units on lots larger than 5,000 square feet
- Small Lot SF – single units on lots 5,000 square feet and smaller
- Missing middle housing – 2-10 units on any lot size
- Multifamily – More than 10 units on any lot size

For bonus units, it is not possible to ascertain unit type, so they are displayed as separate categories in the Report Card. Envision Tomorrow does not estimate unit type for bonus units, rather this is estimated as a post-process. For more information on how bonus units were estimated, see Envision Tomorrow documentation on the LDC Revision website.

Page 2 – Complete Communities

Per Household Daily Residential Vehicle Miles Traveled

Residential Vehicle Miles Traveled (VMT) represents passenger vehicle miles attributed to residents. Thus, it does not include trips attributed to business operations (though it does include commute trips). Residential VMT was calculated according to the Mixed-Use Development (MXD) method, which

Land Development Code Revision – “Report Card” Documentation

consists of statistical models based on research of observed relationships between characteristics known as “D” factors and travel behavior in cities and regions across the US. In order to produce comparable estimates for both “Nearest Equivalency” and “Revised LDC” scenarios, a total future household increase of 135,000 was assumed as a control total for both scenarios. For more information see module documentation [here](#).

Percent of Trips by Mode

Percent of trips by mode was calculated using the same MXD methodology described above. As above, the assumed future household change was 135,000 was assumed for both “Nearest Equivalency” and “Revised LDC”. In addition, the [Transit Priority Network](#) from the Austin Strategic Mobility plan was assumed to be fully built and operational for both scenarios. This impacts mode split because it would offer improved transit access and likely encourage lower “drive alone” mode selections.

One important caveat for this indicator is that the MXD transportation module used in this analysis produces estimates for auto, transit, and bike/walk trips only, not the more detailed break-down shown in the Report Card. Moreover, the estimates reported are for **all trips** undertaken by residents and not commute trips as is reported in the Report Card.

In order to translate the outputs of the MXD model into a metric comparable to the commute mode split goal set forth in the Austin Strategic Mobility Plan, it was assumed that the shift in mode choice away from the existing conditions for all trips would mirror the same shift for commute trips. For example, a 3% increase in all walk trips would equate to a 3% increase in commute walk trips as well.

The first step in this analysis was to expand the three mode categories (auto, bike/walk, transit) reported by the MXD module into categories comparable to the ASMP and the American Community Survey (ACS) Journey-to-Work dataset. Table 1 below shows the raw outputs of the MXD module for all trips in the mode categories that the module natively reports.

Table 1: All Trips by Mode - MXD Module Categories	Existing	Nearest Equivalency	Revised LDC
Walk/Bike	11.8%	11.4%	15.5%
Transit	2.2%	2.0%	3.5%
Auto	78.1%	78.7%	73.2%

Table 2 shows the 2017 estimates for commute mode split, which was used as the “existing condition” in the ASMP. Using the relationships between these modes, the values in table 1 were expanded into this broader set of categories. For instance, the ratio of bike mode split to walk mode split was used to break apart the walk/bike reporting category from the MXD module.

Table 2: Commute Trips by Mode - ACS	2017 5-Year ACS
Transit	3.9%
Telework	7.9%
Carpool/Taxicab	10.8%
Bicycle	1.3%
Walk	2.3%
Drive Alone	73.8%

Land Development Code Revision – “Report Card” Documentation

Table 3 shows how the relationships in table 2 were applied to the raw model outputs in table 1 to create a more detailed mode choice report for all trips.

Table 3: All Trips by Mode - ACS/ASMP Categories	Existing	Nearest Equivalency	Revised LDC
Transit	2.2%	2.0%	3.5%
Telework	7.9%	7.9%	7.9%
Carpool/Taxicab	10.0%	10.1%	9.3%
Bicycle	4.3%	4.2%	5.7%
Walk	7.4%	7.2%	9.8%
Drive Alone	68.1%	68.7%	63.8%

The final step in this process was to use the percentage point changes between “Nearest Equivalency” and “Existing” and “Revised LDC” and “Existing” to estimate the mode shift away from 2017 ACS data. Again, this was based on the assumption that “all trip” change would be equal in magnitude to “commute trip” change. Table 4 below shows the final estimated commute mode share based on the MXD module results transformed to commute mode share. For example, table 3 shows a 0.2 percentage point drop in transit mode share between “Existing” and “Nearest Equivalency”. This same percentage point drop was applied to the 2017 ACS column in table 4 to produce the value for transit mode share for “Nearest Equivalency” of 3.7%.

Table 4: Commute Trips by Mode - ACS/ASMP Categories	2017 5-Year ACS	Nearest Equivalency	Revised LDC
Transit	3.9%	3.7%	5.2%
Telework	7.9%	7.9%	7.9%
Carpool/Taxicab	10.8%	10.9%	10.2%
Bicycle	1.3%	1.2%	2.7%
Walk	2.3%	2.0%	4.6%
Drive Alone	73.8%	74.3%	69.4%

Housing Capacity Within ½ Mile of the ASMP Transit Priority Network

Total housing capacity (base + bonus capacity) was selected using capacity geography centroids and ½ mile radial buffers around the [ASMP Transit Priority Network](#).

Household Income Spent on Transportation

An output of the MXD module, this metric uses residential VMT to estimate the average household cost of gasoline and vehicle maintenance. Does not include vehicle purchase or lease costs or transit fares. Median household income was used as a comparator to generate percentages. The median assumed was \$67,755 which is the 2017 5-year ACS estimate for the City of Austin. Gasoline price per gallon was assumed to be \$2.34 which was the [average price for Texas](#) as of October 1st according to the EIA. Fuel economy, which is used for both fuel cost and maintenance cost metrics was assumed to be 23.3, the 2012 national average for light duty vehicles [according to the US Bureau of Transportation Statistics](#).

Land Development Code Revision – “Report Card” Documentation

Page 3: Paths to Prosperity

Small Lot Single-Family and “Missing Middle” Housing Capacity

This metric uses the capacity estimates from the “Total Housing Capacity by Type” metric from page 1, but excludes bonus units.

Percent of Residents that can Reach 25% of Regional Jobs

Calculated using transit network access polygons generated by the MXD module. This metric measures the area accessible via a 30-minute transit trip assuming a future transit network that includes improvements in the ASMP Transit Priority Network. It uses these transit access area polygons to select the amount of future employment in each scenario accessible to residents by census block group geography.

Total housing capacity within 1/2-mile of 2016 Mobility Bond corridors

Total housing capacity (base + bonus capacity) was selected using capacity geography boundaries and ½ mile radial buffers around the [Corridor Mobility Bond Corridors](#)

Income-restricted bonus unit capacity

Estimate of income-restricted bonus units that would be produced alongside market-rate bonus units. Also displayed on page 1, Total Housing Capacity metric.

Page 4: Thriving

Total housing capacity within 1/4 mile of cultural assets

Total housing capacity (base + bonus capacity) was selected using capacity geography boundaries and ¼ mile radial buffers around cultural assets in the [Cultural Asset Mapping Project](#) database. Database was filtered to show only the following asset types: Bar/Club/Venue, Creative Workspace, Event Venue, Event/Festival, Gallery/Museum, Landmark/Public Space, Library, Community Center, Restaurant, or Theater.

Missing middle housing capacity within 1/4 mile of schools

Total housing capacity (base + bonus capacity) was selected using capacity geography boundaries and ¼ mile radial buffers around public, private, and charter schools. Public and charter schools data from [Texas Education Agency](#). Private schools data came from the [Homeland Infrastructure Foundation-Level Data \(HIFLD\)](#)

Total housing capacity within 1/4 mile of parks

Total housing capacity (base + bonus capacity) was selected using capacity geography boundaries and ¼ mile radial buffers around [City of Austin Parks](#).

Income-restricted affordable housing capacity within Areas of Opportunity

Income-restricted affordable housing capacity was selected using capacity geography centroids if within [Opportunity360 Index Areas of Opportunity](#).

Land Development Code Revision – “Report Card” Documentation

Page 5: Nature into City

Per household annual greenhouse gas emissions by source

The metric estimates per household building emissions (residential buildings), water emissions (from the purification and delivery of water for residential consumption), and vehicle emissions (resulting from residential VMT). This metric relies on several outputs from the MXD travel module including VMT and fuel economy. As with the VMT and mode split metric, it assumes a future household increase of 135,000 and the full build-out of the ASMP Transit Priority Network.

Maximum allowable impervious cover per unit

Impervious cover estimates were produced by the Austin Watershed Department based on existing and future housing capacity estimates, produced by Envision Tomorrow, for the “Nearest Equivalency,” and “Revised LDC” scenarios.

Average daily residential water use per household

Metric estimated using national average data on water use per housing unit (by type) and per job (by type) as well as external water use per square foot of landscaped area. Those assumptions are included for reference below.

Table 1: Default Residential Indoor Water Use Parameters

Parameter	Default Value
Detached Single-Family Use Per Capita - Large Lot	55 gallons/person/day
Detached Single-Family Use Per Capita - Small Lot	55 gallons/person/day
Attached Single-Family Use Per Capita	45 gallons/person/day
Multi-Family Use Per Capita	45 gallons/person/day

Table 2: Default Commercial Indoor Water Use Parameters

Parameter	Default Value
Retail Services Use Per Employee	29 gallons/person/day
Restaurant Services Use Per Employee	161 gallons/person/day
Accommodation Services Use Per Employee	161 gallons/person/day
Arts Entertainment Use Per Employee	161 gallons/person/day
Other Services Per Use Employee	29 gallons/person/day
Office Employment Use Per Employee	29 gallons/person/day
Education Employment Use Per Employee	121 gallons/person/day
Public Administration Use Per Employee	29 gallons/person/day
Medical Services Use Per Employee	121 gallons/person/day
Wholesale Use Per Employee	62 gallons/person/day
Transport Warehousing Use Per Employee	62 gallons/person/day
Construction Per Use Employee	25 gallons/person/day
Utilities Use Per Employee	25 gallons/person/day
Manufacturing Use Per Employee	284 gallons/person/day
Extraction Use Per Employee	19 gallons/person/day
Military Use Per Employee	62 gallons/person/day
Agriculture Use Per Employee	0 gallons/person/day