

APPENDIX C: TRANSPORTATION PLAN FORECASTS

To determine future roadway capacity needs, year 2040 traffic forecasts were prepared using the Metropolitan Council travel demand model. The model was refined for application specifically for Arden Hills. The 2040 projections were compared against the assumed 2040 roadway network to see where roadway segment capacity deficiencies may result. The 2040 roadway network assumed capacity improvements to I-35W (managed lane) and I-694 east of Lexington Avenue to I-35E as identified in the 2040 Transportation Policy Plan.

While the travel demand model is a valuable tool for identifying future traffic based on the proposed land use impacts, it is not meant for use in detailed traffic operations studies. For a more accurate representation of the transportation impacts from specific developments, detailed traffic studies should be conducted to determine the operational impacts on adjacent roadways and intersections.

A central concept of travel demand forecasting is the use of Transportation Analysis Zones (TAZs). Each forecast study area, in this case the City of Arden Hills, is divided into a series of TAZs. Each TAZ has land use data which indicates trip generation and trip attraction including population, household, and employment data. Figure C.1 displays Metropolitan Council TAZs within Arden Hills.

The results of the Arden Hills modeling process are summarized on Figure C.2, which displays 2040 projected average daily traffic volumes compared to the existing (2014) traffic volumes. Table C.1 provides the population, household, and employment allocations by TAZ assumed in the Metropolitan Council model.

Although not used in the forecasted traffic volumes analysis, Table C.2 provides the population, household, and employment allocations by TAZ based on the Arden Hills Land Use Plan. These revisions incorporate the population, household, and employment assumptions used in the TCAAP AUAR minimum development scenario, which has been utilized by the City and Ramsey County throughout the planning and implementation of the TCAAP development area. The values provided in Table C.2 can be used by the Metropolitan Council to assist in allocating socio-economic data for future updates to the regional travel demand model. Table C.3 provides a summary of changes between Table C.1 and Table C.2.

Figure C.1 – TAZs within City of Arden Hills

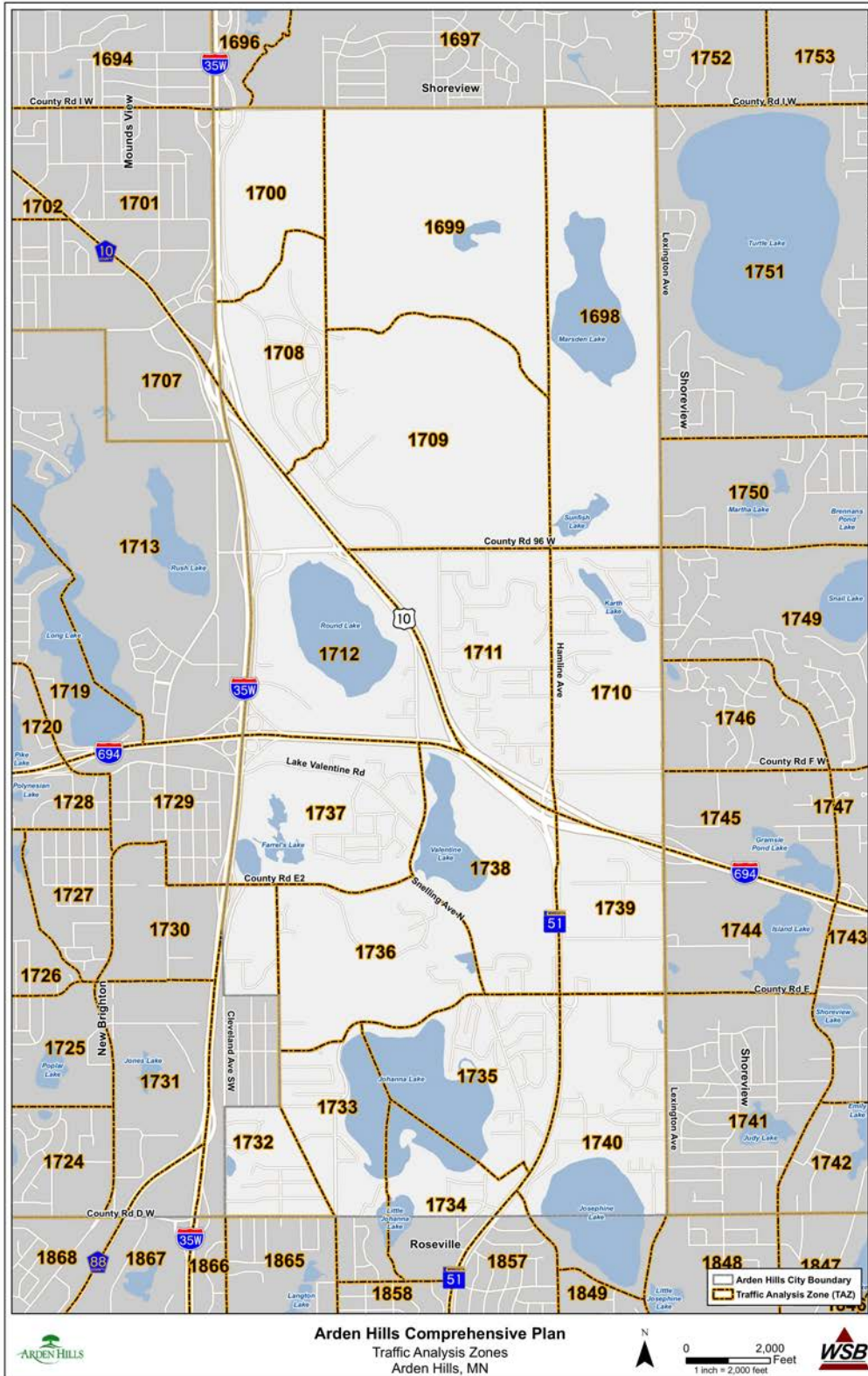


Figure C.2 – Existing and Forecasted Traffic Volumes

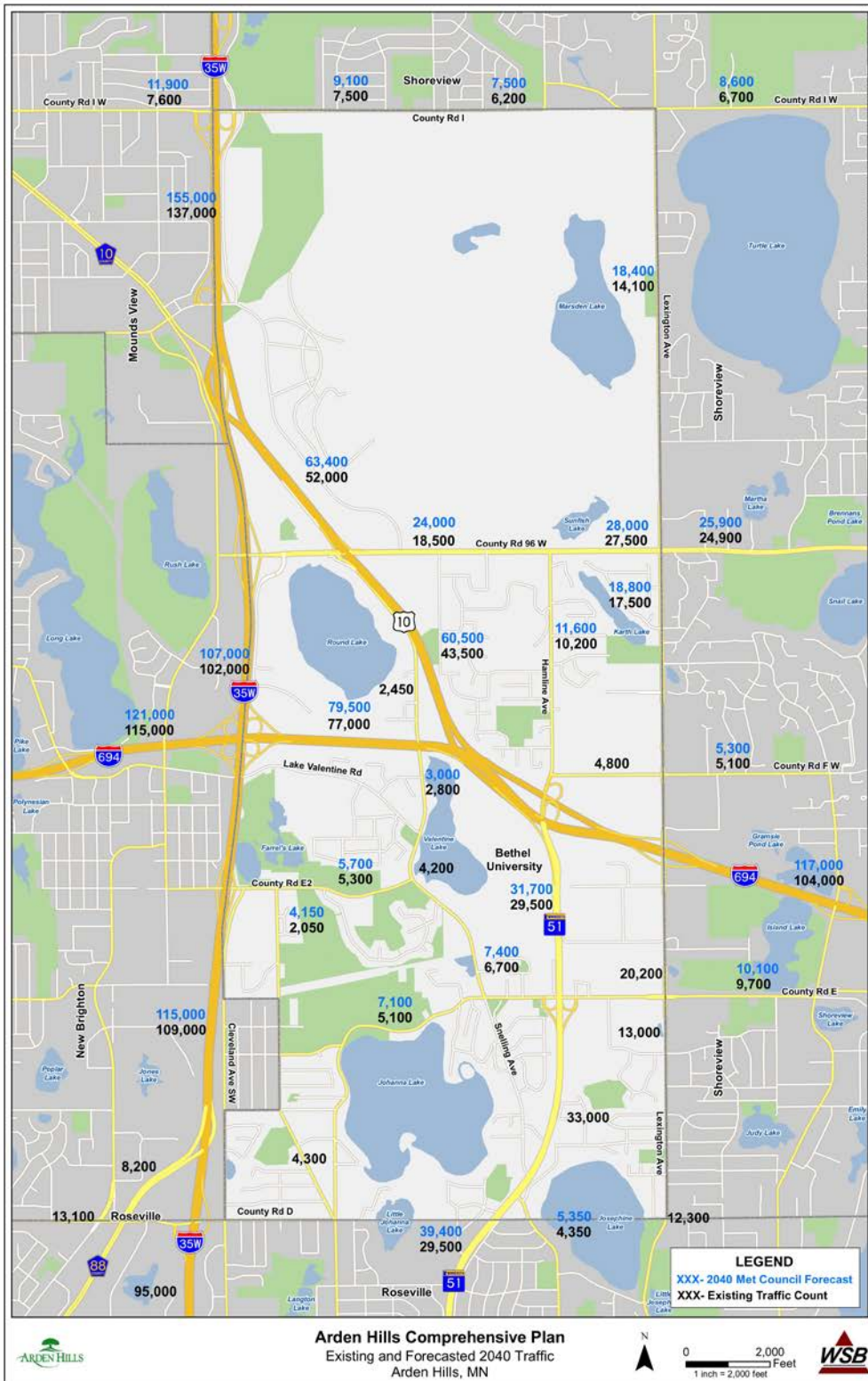


Table C.1 – Metropolitan Council Current TAZ Data - City of Arden Hills (Raw Data - Unadjusted)

| TAZ | 2010 Census | | | 2020 Forecast | | | 2030 Forecast | | | 2040 Forecast | | |
|---------------|--------------|--------------|---------------|---------------|--------------|---------------|---------------|--------------|---------------|---------------|--------------|---------------|
| | Population | Households | Employment | Population | Households | Employment | Population | Households | Employment | Population | Households | Employment |
| 1698 | 0 | 0 | 36 | 159 | 66 | 94 | 220 | 93 | 98 | 194 | 79 | 91 |
| 1699 | 0 | 0 | 0 | 148 | 61 | 22 | 205 | 86 | 57 | 181 | 73 | 99 |
| 1700 | 0 | 0 | 64 | 15 | 6 | 152 | 21 | 9 | 181 | 19 | 8 | 167 |
| 1708 | 0 | 0 | 0 | 197 | 82 | 23 | 903 | 390 | 170 | 1721 | 730 | 510 |
| 1709 | 0 | 0 | 21 | 199 | 83 | 96 | 612 | 264 | 121 | 924 | 390 | 82 |
| 1710 | 757 | 265 | 5402 | 697 | 273 | 4906 | 736 | 297 | 5229 | 753 | 295 | 5504 |
| 1711 | 1377 | 579 | 54 | 1237 | 545 | 199 | 1325 | 607 | 327 | 1372 | 614 | 443 |
| 1712 | 866 | 356 | 902 | 707 | 318 | 895 | 801 | 362 | 967 | 864 | 373 | 1030 |
| 1732* | 802 | 320 | 20 | 743 | 318 | 57 | 779 | 348 | 77 | 784 | 345 | 96 |
| 1733* | 481 | 189 | 482 | 483 | 206 | 847 | 596 | 265 | 1062 | 688 | 301 | 1215 |
| 1734* | 57 | 29 | 80 | 67 | 29 | 60 | 74 | 33 | 103 | 76 | 33 | 140 |
| 1735 | 1065 | 407 | 19 | 1199 | 405 | 23 | 1250 | 434 | 29 | 1264 | 427 | 33 |
| 1736 | 561 | 189 | 67 | 439 | 188 | 116 | 463 | 206 | 160 | 467 | 204 | 202 |
| 1737 | 581 | 218 | 339 | 505 | 199 | 349 | 561 | 230 | 406 | 597 | 239 | 456 |
| 1738 | 1965 | 62 | 1152 | 2083 | 64 | 1093 | 2279 | 83 | 1104 | 2409 | 94 | 1107 |
| 1739 | 256 | 0 | 2695 | 360 | 53 | 4849 | 379 | 58 | 4859 | 387 | 58 | 4854 |
| 1740* | 774 | 338 | 1069 | 751 | 300 | 1218 | 785 | 330 | 1350 | 787 | 332 | 1471 |
| 1857* | 10 | 5 | 0 | 11 | 4 | 0 | 11 | 5 | 0 | 13 | 5 | 0 |
| Totals | 9,552 | 2,957 | 12,402 | 10,000 | 3,200 | 15,000 | 12,000 | 4,100 | 16,300 | 13,500 | 4,600 | 17,500 |

*Portion of TAZ boundaries extend beyond Arden Hills. Values only reflect estimates for area within the City of Arden Hills per Metropolitan Council data.

This data was used in the forecasted traffic volumes analysis reflected in Figure C.2.

Source: Metropolitan Council

Table C.2 – City of Arden Hills 2040 Land Use Plan Allocation of Forecasts by TAZ - TCAAP AUAR Minimum Development Scenario*

| TAZ | 2010 Census | | | 2020 Forecast | | | 2030 Forecast | | | 2040 Forecast | | |
|--------------------------------|-------------|------------|------------|---------------|------------|------------|---------------|------------|------------|---------------|------------|------------|
| | Population | Households | Employment | Population | Households | Employment | Population | Households | Employment | Population | Households | Employment |
| 1698 | 0 | 0 | 36 | 159 | 66 | 94 | 220 | 93 | 98 | 194 | 79 | 91 |
| 1699 | 0 | 0 | 0 | 148 | 61 | 22 | 205 | 86 | 57 | 181 | 73 | 99 |
| 1700 | 0 | 0 | 64 | 0 | 0 | 344 | 0 | 0 | 2163 | 0 | 0 | 2862 |
| 1708 | 0 | 0 | 0 | 299 | 115 | 269 | 2244 | 863 | 2018 | 2990 | 1150 | 2691 |
| 1709 | 0 | 0 | 21 | 80 | 31 | 102 | 605 | 233 | 627 | 805 | 310 | 829 |
| 1710 | 757 | 265 | 5402 | 697 | 273 | 4906 | 736 | 297 | 5229 | 753 | 295 | 5504 |
| 1711 | 1377 | 579 | 54 | 1237 | 545 | 199 | 1325 | 607 | 327 | 1372 | 614 | 443 |
| 1712 | 866 | 356 | 902 | 707 | 318 | 895 | 801 | 362 | 967 | 864 | 373 | 1030 |
| 1732** | 802 | 320 | 20 | 743 | 318 | 57 | 779 | 348 | 77 | 784 | 345 | 96 |
| 1733** | 481 | 189 | 482 | 483 | 206 | 847 | 596 | 265 | 1062 | 688 | 301 | 1215 |
| 1734** | 57 | 29 | 80 | 67 | 29 | 60 | 74 | 33 | 103 | 76 | 33 | 140 |
| 1735 | 1065 | 407 | 19 | 1199 | 405 | 23 | 1250 | 434 | 29 | 1264 | 427 | 33 |
| 1736 | 561 | 189 | 67 | 439 | 188 | 116 | 463 | 206 | 160 | 467 | 204 | 202 |
| 1737 | 581 | 218 | 339 | 505 | 199 | 349 | 561 | 230 | 406 | 597 | 239 | 456 |
| 1738 | 1965 | 62 | 1152 | 2083 | 64 | 1093 | 2279 | 83 | 1104 | 2409 | 94 | 1107 |
| 1739 | 256 | 0 | 2695 | 360 | 53 | 4849 | 379 | 58 | 4859 | 387 | 58 | 4854 |
| 1740** | 774 | 338 | 1069 | 751 | 300 | 1218 | 785 | 330 | 1350 | 787 | 332 | 1471 |
| 1857** | 10 | 5 | 0 | 11 | 4 | 0 | 11 | 5 | 0 | 13 | 5 | 0 |
| 2040 Land Use Plan Totals | 9,552 | 2,957 | 12,402 | 9,968 | 3,175 | 15,444 | 13,313 | 4,533 | 20,636 | 14,631 | 4,932 | 23,123 |
| Metropolitan Council Forecasts | 9,552 | 2,957 | 12,402 | 10,000 | 3,200 | 15,000 | 12,000 | 4,100 | 16,300 | 13,500 | 4,600 | 17,500 |

*Light-orange shaded cells highlight growth adjustments made per TCAAP AUAR minimum development scenario. All other numbers shown are from Metropolitan Council. This data was not used in the forecasted traffic volumes analysis reflected in Figure C.2.

**Values only reflect estimates for area within the City of Arden Hills per Metropolitan Council data.

Table C.3 – Summary of TAZ Adjustments by Forecast Year

| 2020 Growth Adjustments | 2030 Growth Adjustments | 2040 Growth Adjustments |
|--------------------------------|----------------------------------|--------------------------------|
| TAZ 1700: Added 280 employment | TAZ 1700: Added 1,819 employment | TAZ 1700: Added 699 employment |
| TAZ 1708: Added 115 households | TAZ 1708: Added 748 households | TAZ 1708: Added 287 households |
| TAZ 1708: Added 299 population | TAZ 1708: Added 2,416 population | TAZ 1708: Added 746 population |
| TAZ 1708: Added 269 employment | TAZ 1708: Added 1,749 employment | TAZ 1708: Added 673 employment |
| TAZ 1709: Added 31 households | TAZ 1709: Added 202 households | TAZ 1709: Added 77 households |
| TAZ 1709: Added 80 population | TAZ 1709: Added 525 population | TAZ 1709: Added 200 population |
| TAZ 1709: Added 81 employment | TAZ 1709: Added 525 employment | TAZ 1709: Added 202 employment |

1. 2040 FUTURE ROADWAY CAPACITY IMPROVEMENT NEEDS

To identify the need for potential future capacity improvements, Metropolitan Council 2040 forecasts were compared to planning-level roadway capacities for Principal and A-Minor Arterial Roadways. Planning-level roadway capacities used for this analysis are illustrated in Table C.4 below. Based on this comparison, I-35W and I-694 are expected to continue experiencing congestion based on the forecasted Metropolitan Council 2040 travel demands. Recent and programmed improvements on these roadways will ease but not alleviate congestion levels over the 20-year planning horizon due to regional population growth.

Table C.4 – Planning-Level Roadway Capacity

| Facility Type | | Daily Two-Way Volume | |
|------------------|--|--|------------------|
| | | Lower Threshold | Higher Threshold |
| Arterials | Two-lane undivided | 10,000 | 12,000 |
| | Two-lane divided or three-lane undivided | 15,000 | 17,000 |
| | Four-lane undivided | 18,000 | 22,000 |
| | Four-lane divided or five-lane undivided | 28,000 | 32,000 |
| Freeways | Four-lane freeway | 60,000 | 80,000 |
| | Six-lane freeway | 90,000 | 120,000 |
| | Eight-lane freeway or higher | Calculated on a segment by segment basis | |