Minnesota Department of Transportation

Greater Minnesota Transit Investment Plan

Transit Needs Calculation Tech Memo

August 2010

SRF Consulting Group, Inc.

1. Executive Summary

Introduction

The level of passenger utilization of transit services across Greater Minnesota varies from community to community. Factors that affect transit ridership include the demographic make-up of the community as well as the level of transit service provided. In order to better understand total transit service needs in Greater Minnesota, and in response to legislative mandate, Mn/DOT has developed a model to estimate future year transit needs and to help guide potential investment strategies for future services.

Need Estimation Approaches

Demand estimation techniques often form the basis for establishing transit needs. Transportation demand modeling is well established in urban areas across the country; however, such models do not generally exist for estimating demand in outlying areas. Transit demand estimation in Greater Minnesota is further complicated by the widely varied service areas (from rural to urban), the wide array of current service types (on-demand, route deviation, fixed route) and the levels of service provided (span, frequency). In order to develop a transit demand estimation approach suitable for the Greater Minnesota Transit Investment Plan, a review of models used in other states was conducted. The following is an overview of the existing models identified:

- **Minnesota Peer Model** – Uses current year per capita trip rates from existing Minnesota transit systems to estimate annual transit demand (one-way trips).
- **Arkansas Model** – Estimates unlinked passenger trip demand for transit dependent markets (elderly, disabled and low-income populations), using trip generation factors obtained from existing service from exemplary systems across the country.
- **Arizona Model** – A variation of the Arkansas Model using trip rates for population 60 and over, disabled population under 60 years and population living in poverty under 60 years, developed to reflect current transit utilization.
- **Washington State Model** – Uses peer groupings to establish trip rates for transit dependent populations for differing types of service attributes such as level of fare charged from sampled systems within Washington.
- **Mobility Gap Model** – Uses trip rates observed for households owning one or more personal vehicles, compared to trip rates for households having similar characteristics but owning no personal vehicles, to identify the number of additional trips (gap) that might be taken if all households had equal access to a personal vehicle or other high-quality transportation service.

Minnesota Hybrid Model Development

Upon review of available models for estimating transit needs, it was determined that an alternative approach was needed for the *Greater Minnesota Transit Investment Plan*. A new model was developed to be more responsive to the diversity of transit services and service areas found across Greater Minnesota. The Minnesota Hybrid Model has two basic components:

1. All Greater Minnesota counties have a base level of public transit need which can be adequately represented by looking at the transit dependent population. The Arkansas Model, factored to Minnesota trip utilization, is used as the basis for this component.
2. In counties with a large urban center (population above 50,000), an additional component of transit need is present which accounts for expanded markets for commuters, students and general travelers. The Mobility Gap model is used as a starting point for this component, and is then factored to calibrate to current large urban use patterns.

   In addition, select counties with special service conditions exhibit a high level of need, exceeding the base level of public transit need represented by the Arkansas Model. Current services in these locations reflect unique operating environments such as providing service to college students or other unique travel markets. In order to account for this need, a component of the Mobility Gap Model is included and factored to replicate current utilization patterns.

Each component of the Minnesota Hybrid Model was calibrated using year 2009 transit trip rates. The initial information from the Arkansas Model and Mobility Gap trip rates were factored to represent the 100th percentile passengers per capita rates found across all Greater Minnesota transit systems in 2009. The Mobility Gap Model trip rate was additionally factored to have the combined results represent the levels of need currently being met in large urban areas and select counties with special service conditions, per current utilization data from Mn/DOT and the on-board user survey results.

Minnesota Hybrid Model

Annual Demand by County =
4.2 X population 65 years or older +
15.0 X disabled population less than 65 years +
7.0 X low income, non-disabled population less than 65 years +
"P" X households with zero vehicles in counties with major urban centers and special service conditions counties X 3.0 trips per day X 365 days per year
(where "P" varies by urban center to calibrate to current demand, ranges from 20 to 50%)

Results and Next Steps

The Minnesota Hybrid Model produces an estimate of total transit service needs in Greater Minnesota, measured in annual one-way passenger trips potentially using public transit. Transit need estimates were developed at a county level for the years 2010, 2020, and 2030 and were then aggregated to produce a total for each Minnesota Development Region and a statewide total for Greater Minnesota. The following are the statewide need estimates developed as part of this process:

Annual transit need estimates – Greater Minnesota totals (trips)

- Year 2010: 18,132,881
- Year 2020: 20,163,267
- Year 2030: 22,007,376

These results will be utilized in conjunction with the level of service analysis conducted as part of the development of the *Greater Minnesota Transit Investment Plan* to identify the size of the investment gap between current transit services and projected needs.

2. Background

The level of passenger utilization of transit services across Greater Minnesota varies from community to community. Factors that affect transit ridership include the demographic make-up of the community as well as the level of transit service provided. Mn/DOT has developed estimates of future year transit needs to help guide potential investment strategies for future services.

Mn/DOT's efforts are guided by legislation that specifies "the commissioner shall develop a *Greater Minnesota Transit Investment Plan*" to address future year service needs. This shall include "an analysis of ridership and total transit service needs throughout Greater Minnesota."

Demand estimation techniques often form the basis for establishing transit needs. For this work, passenger demand estimates, established through a modeling process of statewide demographic information, are serving as estimates of need.

These estimates are developed at the county level to reflect available future year demographic information. The output represents annual one-way passenger trips potentially using public transit.

3. Approaches to Estimating Transit Needs

Transportation demand modeling is well established in urban areas across the country. Data sets representing the area population, employment, income, roadway and transit network, and transportation related costs are used to develop a model of current and projected travel behavior. Such models do not generally exist for estimating demand in outlying areas, so other techniques must be employed to generate transit need estimates. To generate estimates for the Transit Investment Plan, several alternative methods were considered.

Minnesota Peer System Model

In 2009, Mn/DOT prepared an estimate of transit need for Greater Minnesota, using trips per capita rates from current Minnesota transit systems. This information was presented in the *Greater Minnesota Transit Plan 2010-2030*.

Trip rates were developed for the six service type categories maintained by Mn/DOT to manage statewide transit programs:

1. Urban fixed route systems
2. ADA paratransit systems
3. County systems
4. Multi-county systems
5. Small urban systems (population over 10,000)
6. Small urban systems (population under 10,000)

These rates were applied to the population of the local service area to generate future year estimates. The rates themselves represented the 80th percentile of the current year passengers per capita measures within each of those six peer groupings. This level was selected as the target as it represents better than average, or 50th percentile performance, but not as high of a level as the best performers, essentially the 100th percentile. It was considered a reasonable future year target for all systems based on the current range of performance across the state.

MN Peer System Model

Annual Demand Estimate =

80th percentile per capita demand rate within service categories X area population.

Advantages:

The method uses actual Minnesota transit trip rates which relate to the current service configurations and service levels. Also, the method is relatively easy to apply as the only forecast variable required is service area population. The method was easily applied in both urban and rural settings.

Disadvantages:

Since the per capita utilization rates do reflect current services, the Project Management Team felt that this method did not adequately address general levels of need across the state. In addition, use of the 80th percentile utilization rates was confusing and difficult to communicate to project stakeholders.

Arkansas Model

In 1992, the state of Arkansas prepared a Public Transportation Needs Assessment and Action Plan. Within that work, estimates of transit needs were developed for transit dependent markets represented by the elderly, disabled and low-income populations. Trip generation factors for the different transit markets were obtained from transit operations representing exemplary services from across the county and then applied to the local area population.

Trip rates for the elderly market were initially based on data from the Pennsylvania shared-ride transportation program and then validated using data from the Wisconsin transit program. Disabled population trip rates were based on program data from Dayton, Ohio and adjusted to better match actual use data from Arkansas programs. Data from the 1977 National Personal Transportation Survey was used as the basis to develop trip rates for the low income population. It was estimated that the applicable rates should be 55 percent higher than elderly population trip rates with a final adjustment to use the 80th percentile sample rates to better reflect Arkansas conditions.

Arkansas Model

Unlinked Passenger Trip Demand =
8.4 X population 65 years or older +
30.0 X disabled population less than 65 years +
14.5 X low income, nondisabled population less than 65 years.

Advantages:

The model focuses on three primary markets of public transit users: the elderly, disabled, and low-income. These variables are generally available for current years making calibration to current conditions relatively straight forward. The model is generally acknowledged to produce sound estimates for demand-response type services.

Disadvantages:

Results of the model for forward year projections depend on accurate projection of the input variables. In most cases, it is not easy to project the level of disabled population or low-income population. Also, it is acknowledged that the model does not represent urban fixed route conditions very well.

Arizona Model

Developed in 2007 for a statewide transit plan, the Arizona Model is one of the many variations of the Arkansas Model developed over the years. The key variables of this model were

population 60 and over, disabled population under 60 years and population living in poverty under 60 years. Trip rates were developed to reflect current transit utilization across Arizona.

Arizona Model

Transit Demand per Year (1-way trips) =
6.79 X population 60 years and older +
4.49 X disabled population under 60 years +
20.5 X population living in poverty under 60 years.

Advantages:

The model was seen to generate good results for transit dependent markets in rural areas.

Disadvantages:

The method does not apply to fixed route transit services in urban areas.

Washington State Model

In 1999, Washington State University developed a model to estimate annual transit rides for county-type services in the state. This research-based method utilizes peer groupings to establish trip rates for differing types of service attributes such as level of fare charged. The trip rates represent average values from sampled systems within Washington. The key variables of the model are elderly population, total population, disabled adult population, and population above the poverty level.

Washington State Model

Predicted Rides per Year =
6.4 X elderly population + 12.5 X total population +
120 X mobility limited population adults and 65 years and older /
percent of population above poverty level

Advantages:

Model calibrates well against current conditions. Also, it appears to incorporate some measures to address broader transit markets and service types beyond transit dependent and on-demand services.

Disadvantages:

The model is applicable only in rural areas.

Mobility Gap Model

The Mobility Gap approach is based on research initially conducted as part of the *Greater Minnesota Transit Plan 2010-2030*. In this method, trip rates observed for households owning one or more personal vehicles are compared to trip rates observed for households having similar characteristics but owning no personal vehicles. This approach builds on the observation that households with a personal vehicle have few travel limitations and make all the trips they "need," while households without vehicles are limited in travel options, which results in significantly

lower trip rates. The difference in trip rates – the "gap" – is then multiplied by the number of households in an area, yielding an estimate of the number of additional trips that might be taken if all households had equal access to a personal vehicle or other high-quality transportation service. The trip rate "gap" for Minnesota is based on data from the 2001 National Household Transportation Survey, West North Central Division. From that data, it was estimated that the "gap" rate was about 3 trips per day, per household.

Mobility Gap

Annual Trips =
3.0 X households with zero vehicles X 365 days

Advantages:

This model is very straight forward to apply, requiring only the number of households without access to a personal vehicle.

Disadvantages:

It is widely acknowledged that this model produces very high estimates of need, not correlated at all to current transit services or levels. It is not reasonable to assume the full amount of "gap" defined need can be affectively served by public transit. Also, it is difficult to project the number of zero car households into the future.

Minnesota Hybrid Model

Upon review of available models for estimating transit needs in varying urban and rural geographies, and in representing a wide array of current service types (on-demand, route deviation, fixed route) and levels of service (span, frequency), it was determined by the Project Management Team that an alternative approach to the Minnesota Peer System Model was needed for the *Greater Minnesota Transit Investment Plan*. The new model was developed to be more responsive to the diversity of transit services and service areas across Greater Minnesota.

The Minnesota Hybrid Model incorporates components from two popular approaches used to varying degrees across the country to identify transit needs. First, the basic tenets of the Arkansas Model appeared to be greatly accepted in many locations as a good basis to estimate the needs of transit dependent markets in rural and small urban areas, for typically on-demand services. Second, the Mobility Gap approach has been characterized as a measure of unmet need and it is generally accepted that a certain level of that gap can be considered to represent the needs related to public transit. When applied in urban areas, this correlates to the availability of fixed route transit services. The blending of the two models to represent statewide need levels was identified in a recent study in South Carolina.

The Minnesota Hybrid Model has two basic components:

1. All Greater Minnesota counties have a level of public transit need which can be adequately represented by looking at the transit dependent population. The Arkansas Model, factored to Minnesota trip utilization, is used as the basis for this component.

2. In counties with a large urban center (population above 50,000), an additional component of transit need is present which accounts for expanded markets for commuters, students and general travelers. The Mobility Gap model is used as a starting point for this component, and is then factored to calibrate to current large urban use patterns.

   In addition, select counties with special service conditions exhibit a high level of need, exceeding the base level of public transit need represented by the Arkansas Model. Current services in these locations reflect unique operating environments such as providing service to college students or other unique travel markets. In order to account for this need, a component of the Mobility Gap Model is included and factored to replicate current utilization patterns.

Each component of the Minnesota Hybrid Model was calibrated using year 2009 transit trip rates. The initial information from the Arkansas Model and Mobility Gap trip rates were factored to represent the 100th percentile passengers per capita rates found across all Greater Minnesota transit systems in 2009. The Mobility Gap Model trip rate was additionally factored to have the combined results represent the levels of need currently being met in large urban areas and select counties with special service conditions, per current utilization data from Mn/DOT and the on-board user survey results.

Minnesota Hybrid Model

Annual Demand by County =
4.2 X population 65 years or older +
15.0 X disabled population less than 65 years +
7.0 X low income, non-disabled population less than 65 years +
"P" X households with zero vehicles in counties with major urban centers and special service conditions counties X 3.0 trips per day X 365 days per year
(where "P" varies by urban center to calibrate to current demand, ranges from 20 to 50%)

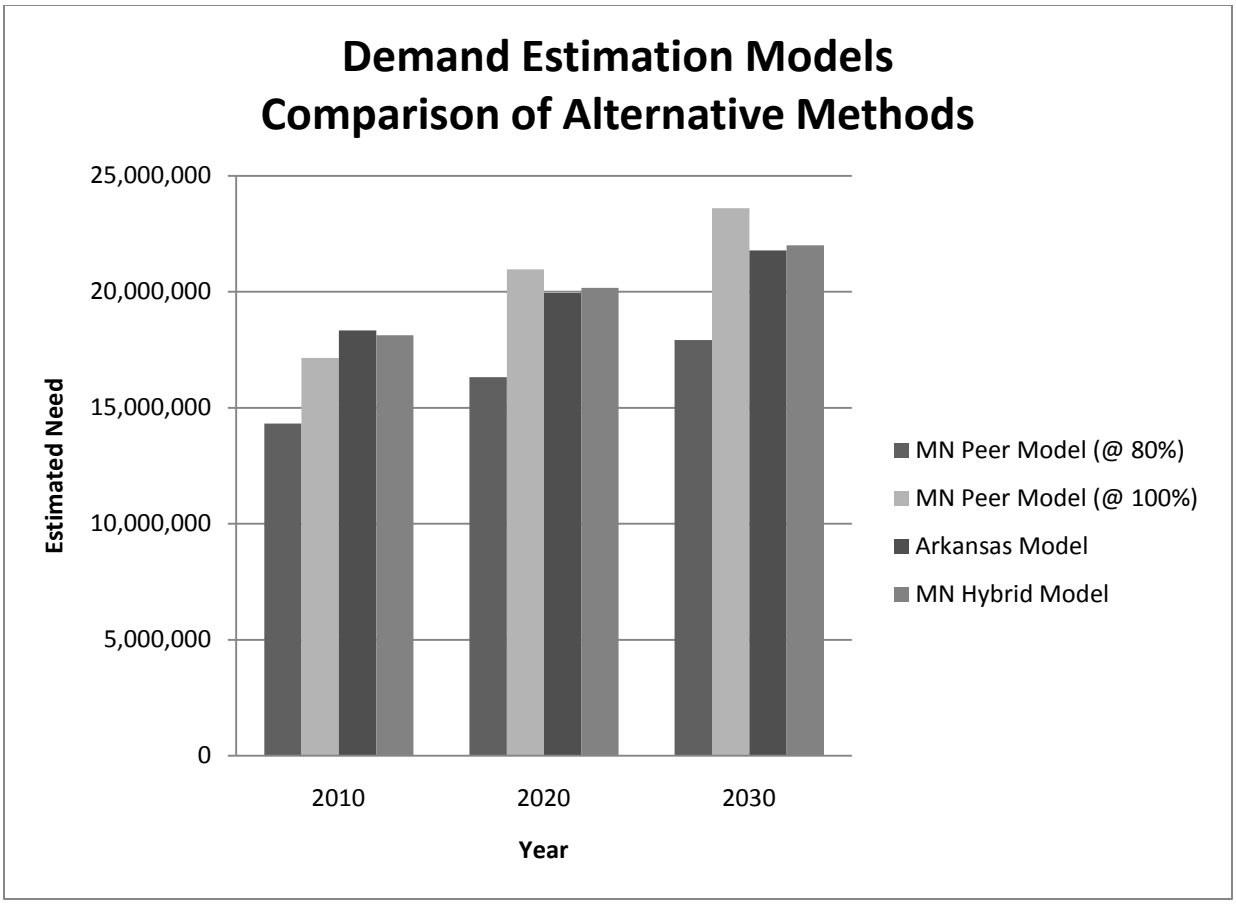
Advantages:

This model incorporates key components of two widely accepted models to represent transit needs under widely varying conditions. It incorporates one component for the primary transit dependent markets found in many rural and small urban settings and adds another component in the larger urban areas to account for the broader user markets related to fixed route services.

Disadvantages:

This model requires development of factors specific to each large urban area to reflect current utilization patterns, but those can be developed at any point as needed.

The chart below presents a summary of the results of the various passenger demand estimation approaches employed for Great Minnesota. Included are two separate versions of the Minnesota Peer Model, calibrated to the 80th and 100th percentile of the current year (2009) passengers per capita, the Arkansas Model, and the Minnesota Hybrid Model.


Demand Estimation Models
Comparison of Alternative Methods
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
Estimated Need
2010
2020
2030
Year
MN Peer Model (@ 80%)
MN Peer Model (@ 100%)
Arkansas Model
MN Hybrid Model

4. Minnesota Hybrid Model Development

Minnesota Hybrid Model Methodology and Input Data

The transit needs estimates for the Minnesota Hybrid Model were developed at a county level. The county values were then aggregated to produce a total for each Minnesota Development Region and then a statewide total. The model was developed using data which is readily available from two sources: the Minnesota Department of Administration, State Demographic Center and the US Census Bureau. The following table provides an overview of the raw data inputs used in the model and their source.

Minnesota Hybrid Model Data Inputs and Sources

Model Input	Source
Base year population (2000)	US Census Bureau (Census 2000)
Base year elderly population (65 years or older)	US Census Bureau (Census 2000)
Base year population in poverty estimate (2000)	US Census Bureau (Census 2000)
Base year disabled population estimate (2000)	US Census Bureau (Census 2000)
Base year zero vehicle households (2000)	US Census Bureau (Census 2000)
Base year total occupied households (2000)	US Census Bureau (Census 2000)
Projected population (2010, 2020, 2030)	MN Demographer (general population projections)
Projected elderly population (2010, 2020, 2030)	MN Demographer (general population projections)

Minnesota Hybrid Model Template

In order to develop the transit needs estimate using the Minnesota Hybrid model approach, an electronic template was created. This template is maintained by Mn/DOT and can be used to recreate/update the model results as needed (e.g., as new data becomes available).

The Minnesota Hybrid Model template is a spreadsheet workbook designed to produce the model results once the input data has been entered. The model results (transit need estimates) are displayed by county, Minnesota Development Region, and as a statewide total. The model template includes four separate worksheets:

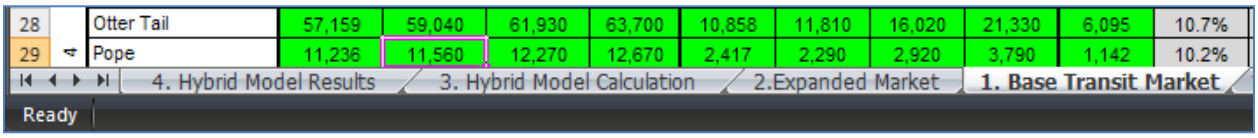
1. Base Transit Market Calculation
2. Expanded Fixed Route Need Calculation (large urban and select special condition counties)
3. Hybrid Model Calculation
4. Hybrid Model Summary

The model can be replicated or updated with new input data, using the template. To facilitate future updates, the spreadsheet cells which require data input have been highlighted in **green** and the results are displayed in a standalone summary report, separate from the input data. The

following is a step by step overview of the template, including instructions to re-run the model using new input data.

1. Base Transit Market Calculation

To access this worksheet in the model template, click the tab labeled "**1. Base Transit Market**" at the bottom of the page.



In this worksheet the annual need for transit dependent populations (elderly, disabled, low-income) is developed for each county, using predetermined trip generation factors. The input data used in this worksheet is as follows:

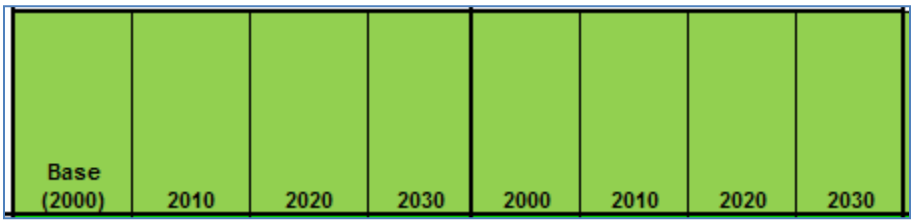
- Base year population
- Base year elderly population
- Population for projection years (2010, 2020, 2030 or later years as new data becomes available)
- Elderly population for projection years (2010, 2020, 2030 or later years as new data becomes available – i.e., 2020, 2030, 2040)
- Poverty estimates (base year)
- Disabled population 16-64 (base year)

Note that the "base year" listed above and used throughout this section of the document corresponds to the year of the demographic data used as model inputs. For development of the initial model, the base year is 2000, corresponding to the most recent census data. As new data becomes available, the base year should be updated (i.e., as 2010 census data becomes available).

To update this worksheet, enter the data described above in columns **C through K and column P** (highlighted in green), in the appropriate row for each county (note: the rows for each county are organized by Minnesota Development Region).

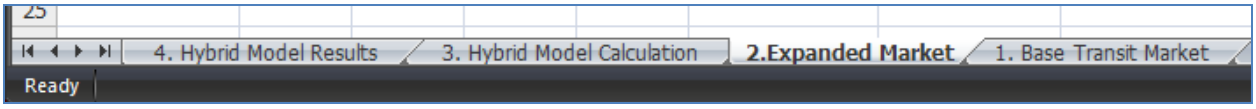
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Greater Minnesota Transit Demand Projections by County															
2	Arkansas Model (Sum of 65+, Disabled and Low Income)															
3			Population				Elderly Population (65+)				Poverty (2005)					
4	Region		Base (2000)	2010	2020	2030	2000	2010	2020	2030	Poverty Estimate All Ages	Poverty Percent All Ages	Projected Population in Poverty			Total Disabilities for pop. 16 - 64 (2000 Census)
5		County											2010	2020	2030	
6	1	Kittson	5,285	4,420	4,000	3,720	1,141	1,040	1,220	1,390	454	8.6%	380	344	320	800
7		Marshall	10,155	9,860	9,990	10,010	1,881	1,790	2,120	2,560	1,027	10.1%	997	1,010	1,012	1,429
8		Norman	7,442	6,900	6,990	7,040	1,558	1,340	1,430	1,780	806	10.8%	747	757	762	1,146
9		Pennington	13,584	14,050	14,760	15,210	2,145	2,250	2,970	3,760	1,326	9.8%	1,371	1,441	1,485	2,441
10		Polk	31,369	31,850	33,370	34,280	5,463	5,280	6,660	8,340	3,603	11.5%	3,658	3,833	3,937	5,071
11		Red Lake	4,299	4,350	4,520	4,600	819	810	1,030	1,370	430	10.0%	435	452	460	592
12		Roseau	16,338	17,080	18,330	19,170	2,055	2,160	2,970	4,320	1,096	6.7%	1,146	1,230	1,286	2,395
13		Beltrami	39,650	46,590	52,380	56,430	4,622	5,480	7,990	11,090	7,845	19.8%	9,218	10,364	11,165	7,402

Change the labels for the base and projected years in row 5, as appropriate (i.e,, change base year from 2000 to 2010, change projected years from 2010, 2020, 2030 to 2020, 2030, 2040).



2. *Expanded Fixed Route Need Calculation (Large Urban Counties Only)*

To access this worksheet in the model template, click the tab labeled "**2. Expanded Market**" at the bottom of the page.



In this worksheet the expanded market need for counties with large urban areas is developed using predetermined trip generation factors. The input data used in this worksheet is as follows:

- Base year population
- Population for projection years (2010, 2020, 2030 or later years as new data becomes available)
- Households with zero vehicles available (base year)
- Total occupied households (base year)

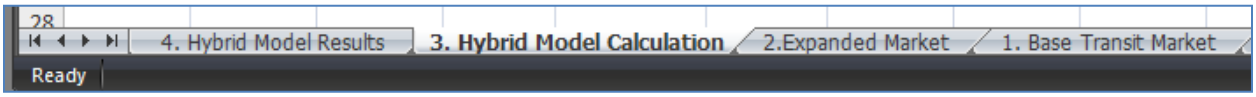
To update this worksheet, enter the data described above in columns **B through G** (highlighted in green), in the appropriate row for each of the urban area counties.

	A	B	C	D	E	F	G
1							
2	**Household with No Vehicles Projections (Urban Counties)**						
3		**Population**				**No Vehicles Available (2000)**	**Total Occupied Households (2000)**
4		**2000 (Base)**	**2010**	**2020**	**2030**		
5	St. Louis Co.	200,528	198,010	200,490	202,040	8,452	82,619
6	Clay Co.	51,229	57,080	63,020	66,910	1,370	18,670
7	Stearns Co.	133,166	154,220	173,520	188,760	2,864	47,604
8	Benton Co	34,226	43,730	51,490	56,970	1,046	13,065
9	Blue Earth Co.	55,941	60,830	64,730	68,060	1,534	21,062
10	Olmsted Co.	124,277	148,130	168,400	183,290	3,136	47,807

Change the labels for the base and projected years in row 4, as appropriate (i.e,, change base year from 2000 to 2010, change projected years from 2010, 2020, 2030 to 2020, 2030, 2040).

3. Hybrid Model Calculation

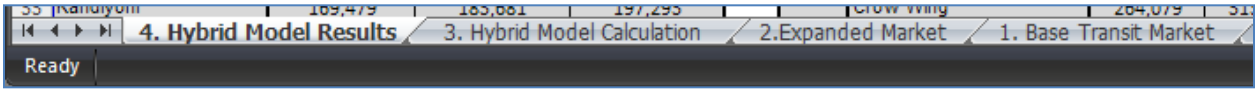
To access this worksheet click the tab labeled "**3. Hybrid Model Calculation**" at the bottom of the page.



In this worksheet the results of the base transit market calculation for each county and the expanded market results for counties with urban areas are combined and calibrated to reflect existing conditions in Greater Minnesota. Upon the completion of worksheets 1 and 2, this worksheet will update automatically, with no input data required.

4. Hybrid Model Summary

To access this worksheet in the model template, click the tab labeled "**4. Hybrid Model Results**" at the bottom of the page.



This worksheet displays the Minnesota Hybrid Model results, by county, RDC, and statewide total. This worksheet will update automatically and with no input data is needed, however, the labels for the base and projected years in rows 3 and 88 should be updated as appropriate (i.e., change base year from 2000 to 2010, change projected years from 2010, 2020, 2030 to 2020, 2030, 2040).

Results and Next Steps

Minnesota Hybrid Model Results

The Minnesota Hybrid Model demand estimation technique produces passenger demand estimates based on statewide demographic information. The model output represents annual one-way passenger trips potentially using public transit, which serves as a proxy for annual transit need. As part of the modeling process, transit need estimates were developed at a county level for the years 2010, 2020, and 2030. The county values were then aggregated to produce a total for each Minnesota Development Region, and a statewide total for Greater Minnesota. The following are the statewide need estimates developed as part of this process:

Annual transit need estimates – Greater Minnesota totals (trips)

- Year 2010: 18,132,881
- Year 2020: 20,163,267
- Year 2030: 22,007,376

Tables 1 and 2 below summarize the model results. Table 1 shows the model results for each of the Minnesota Development Regions and Table 2 on the following pages includes county level results.

Table 1: Minnesota Hybrid Model Results by Minnesota Development Region

REGION	2010	2020	2030
REGION 1	331,188	357,403	385,234
REGION 2	389,578	439,417	483,111
REGION 3	5,057,148	5,217,479	5,349,043
REGION 4	1,267,433	1,415,185	1,543,078
REGION 5	740,639	846,886	943,193
REGION 6E	431,207	474,720	518,918
REGION 6W	189,735	193,016	200,705
REGION 7E	683,555	861,459	1,036,003
REGION 7W	3,850,077	4,579,758	5,229,874
REGION 8	453,325	468,522	491,152
REGION 9	1,173,346	1,265,685	1,361,797
REGION 10	3,565,651	4,043,736	4,465,269
TOTAL	**18,132,881**	**20,163,267**	**22,007,376**

Table 2: Minnesota Hybrid Model Results by County

COUNTY	2010	2020	2030
Aitkin	85,239	98,100	108,215
Becker	141,026	163,880	179,766
Beltrami	218,007	252,781	282,751
Benton	879,525	1,042,173	1,163,583
Big Stone	21,951	22,084	23,311
Blue Earth	580,684	624,863	666,653
Brown County	79,874	84,996	92,581
Carlton	139,459	164,446	187,988
Cass	152,420	175,435	193,662
Chippewa	44,894	48,046	51,649
Chisago	181,987	241,122	302,901
Clay	543,480	606,453	654,609
Clearwater	39,367	42,841	45,899
Cook	17,207	20,851	23,979
Cottonwood	41,626	42,649	45,052
Crow Wing	264,079	313,356	358,334
Dodge	55,539	67,268	79,346
Douglas	148,942	174,549	199,125
Faribault	56,735	57,993	60,830
Fillmore	79,917	86,306	93,982
Freeborn	130,082	135,025	141,060
Goodhue	149,457	172,957	197,086
Grant	22,296	23,975	25,828
Houston	67,082	74,190	83,656
Hubbard	82,070	91,425	99,630
Isanti	155,023	206,943	260,373
Itasca	208,039	228,479	244,773
Jackson	34,933	36,212	38,588
Kanabec	80,667	93,538	104,636
Kandiyohi	169,479	183,681	197,293
Kittson	17,062	16,612	16,521
Koochiching	64,259	65,833	67,057
Lac qui Parle	26,188	26,248	27,037
Lake	42,938	47,166	51,715
Lake of the Woods	19,575	21,117	22,737
Le Sueur	98,014	116,896	134,790
Lincoln	20,360	20,543	21,502
Lyon	78,908	81,653	85,791
Mahnomen	30,560	31,253	32,094
Marshall	35,310	37,063	38,967
Martin	108,012	109,031	111,806
McLeod	119,180	135,565	152,428
Meeker	86,480	96,046	104,950
Mille Lacs	128,886	161,390	190,668

Table 2: Minnesota Hybrid Model Results by County – Continued

COUNTY	2010	2020	2030
Morrison	137,652	155,828	173,977
Mower	149,021	157,116	168,417
Murray	31,943	33,075	35,174
Nicollet	94,281	106,245	116,870
Nobles	83,612	87,788	91,938
Norman	26,797	27,451	29,075
Olmsted	2,280,431	2,617,663	2,890,053
Otter Tail	247,151	274,503	302,727
Pennington	56,921	62,344	67,183
Pine	136,992	158,467	177,425
Pipestone	57,277	58,383	60,083
Polk	125,015	135,719	145,713
Pope	43,430	48,152	52,976
Red Lake	15,433	16,827	18,476
Redwood	59,782	60,773	63,096
Renville	56,069	59,428	64,248
Rice	223,678	263,168	300,850
Rock	44,883	47,444	49,929
Roseau	54,649	61,387	69,298
Sherburne	275,647	379,925	483,725
Sibley	51,374	54,315	58,428
St. Louis	4,500,007	4,592,606	4,665,316
Stearns	2,298,396	2,608,648	2,872,829
Steele	117,885	137,238	156,572
Stevens	83,693	86,561	89,745
Swift	62,856	61,859	62,651
Todd	113,584	122,561	130,474
Traverse	13,222	11,671	11,220
Wabasha	73,139	81,819	89,887
Wadena	72,904	79,706	86,746
Waseca	64,209	70,525	77,447
Watonwan	40,162	40,820	42,392
Wilkin	24,193	25,441	27,080
Winona	239,421	250,986	264,358
Wright	396,509	549,012	709,737
Yellow Medicine	33,846	34,779	36,057
TOTAL	**18,132,881**	**20,163,267**	**22,007,376**

Results of the Minnesota Hybrid model for estimating future year transit needs across Greater Minnesota will be used to help identify the size and location of the gap between existing transit services and future needs. The information will be used with projected level of service information also at the county level to identify the amount of service required to meet those projected needs.