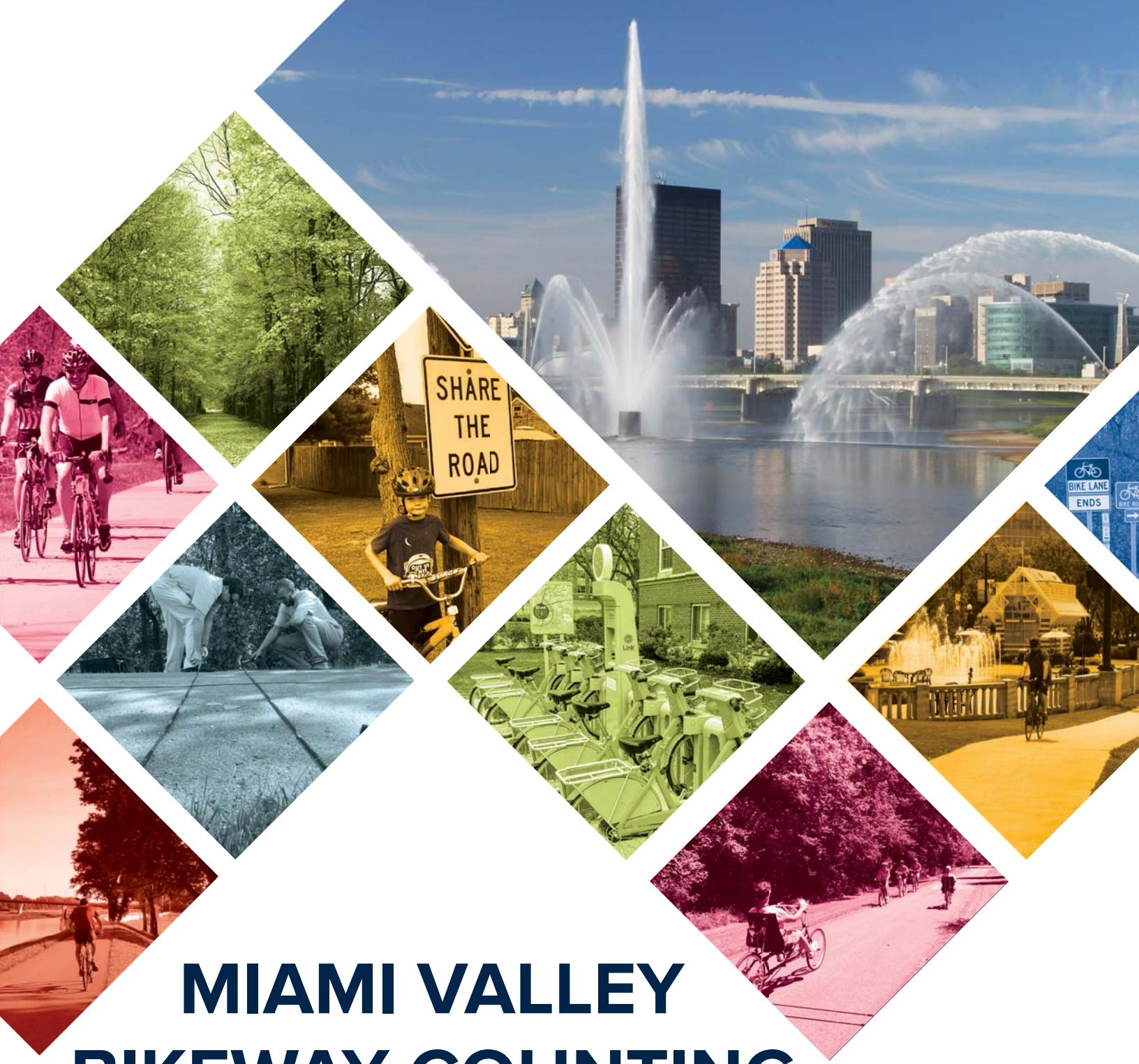


MIAMI VALLEY BIKEWAY COUNTING

PROGRAM SUMMARY

DECEMBER 2017

MIAMI VALLEY
Regional Planning Commission

Miami Valley Regional Planning Commission
10 North Ludlow Street
Suite 700
Dayton, Ohio 45402

This document is the product of a study financed by the U.S. Department of Transportation (U.S. DOT), the Ohio Department of Transportation (ODOT), and the Miami Valley Regional Planning Commission.

MIAMI VALLEY
Regional Planning Commission

MVRPC Bikeway Counting Program

Data Collection & Analysis

The Miami Valley Regional Planning Commission used bikeway count data collected in 2014-16 to continue the development of a preliminary understanding of regional bikeway usage. Monthly and weekday factors were calculated for use in expanding short-term count studies.
The following presents a summary of the count data, annual totals, and factors.

Data

- Data from **five agencies** that manage trails across the MVRPC MPO region (Greene, Miami, Montgomery, and northern Warren Counties). The City of Kettering provided data from 2014 to 2015.
- Counts were taken from **29 trail counters** permanently installed. Two trail counters active in 2014 did not take counts in 2015. **Additionally, two trail counters** active in 2015 did not take counts in 2016.
- Counts represent **all types of trail users** and provide no differentiation between bicyclists or pedestrians.
- All locations, but two, are **based on daily totals**. The two locations are monthly totals.
- Only **eight** locations had **all 365 days counted**. However, 24 locations had at least 75% of the year (275 days) with counts.

Methodology

- Daily counts and locations were compared to events, closures, and weather data. Daily counts with abnormal peaks were replaced with the average for the same day of the week of that particular month. If a particular day of the week did not provide a sufficient number of days for the month, the count is scrapped.
- Annual totals are rounded to the nearest hundred.
- Any location counter with substantial malfunctions on a given year was omitted from regional averaging and developing factors.
- Additionally, any location counters with **less than 75% of the year** (275 days) counted on a given year were omitted from regional factors.
- Further details of the methodology are provided in Appendix A.

Findings

- Monthly and Daily Adjustment Factors (*Tables 1 & 2*).
- Weeks per Month (*Table 3*).
- 2014-16 Average Percent of Annual Counts by Month for All Locations (*Chart 1*).
- 2014-16 Average Weekday Percent of Weekly Counts for All locations (*Chart 2*).
- Appendix A – Bicycle Count Report Example.
- Appendix B – 2014-16 Bikeway Count Totals (*Map 1*).
- Appendix B – 2014-16 Bikeway Est. Annual Totals & ADT Averages (*Map 2*).
- Appendix B – 2015-17 Short-Term Bike Counts (*Map 3*).

Table 1: Monthly Factors (2014-2016)

MONTH	FACTOR
Jan	2.25%
Feb	2.88%
Mar	6.12%
Apr	9.53%
May	12.29%
Jun	12.14%
Jul	13.78%
Aug	12.45%
Sep	11.47%
Oct	8.51%
Nov	5.25%
Dec	3.33%

Table 2: Weekday Factors (2014-2016)

MONTH	FACTOR
Sunday	19.18%
Monday	12.60%
Tuesday	12.88%
Wednesday	12.19%
Thursday	11.92%
Friday	12.33%
Saturday	18.90%

Table 3: Weeks per Month

MONTH	FACTOR
Jan	4.43
Feb	4.00
Mar	4.43
Apr	4.29
May	4.43
Jun	4.29
Jul	4.43
Aug	4.43
Sep	4.29
Oct	4.43
Nov	4.29
Dec	4.43

Chart 1

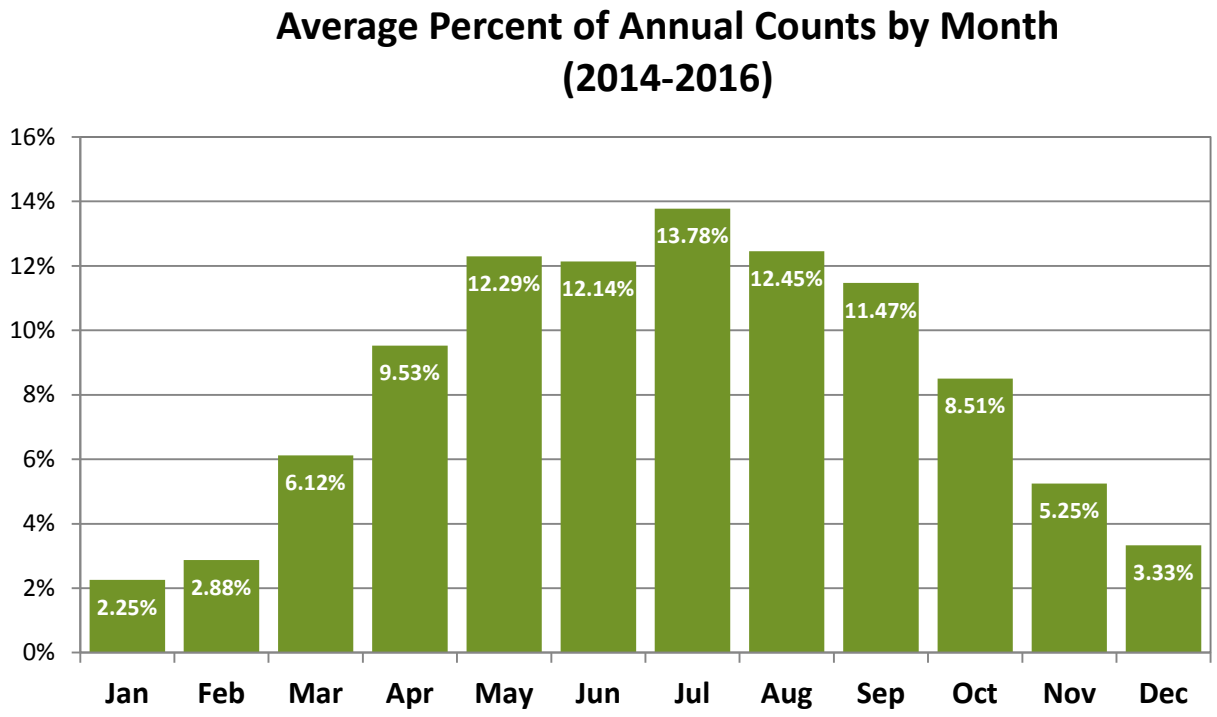
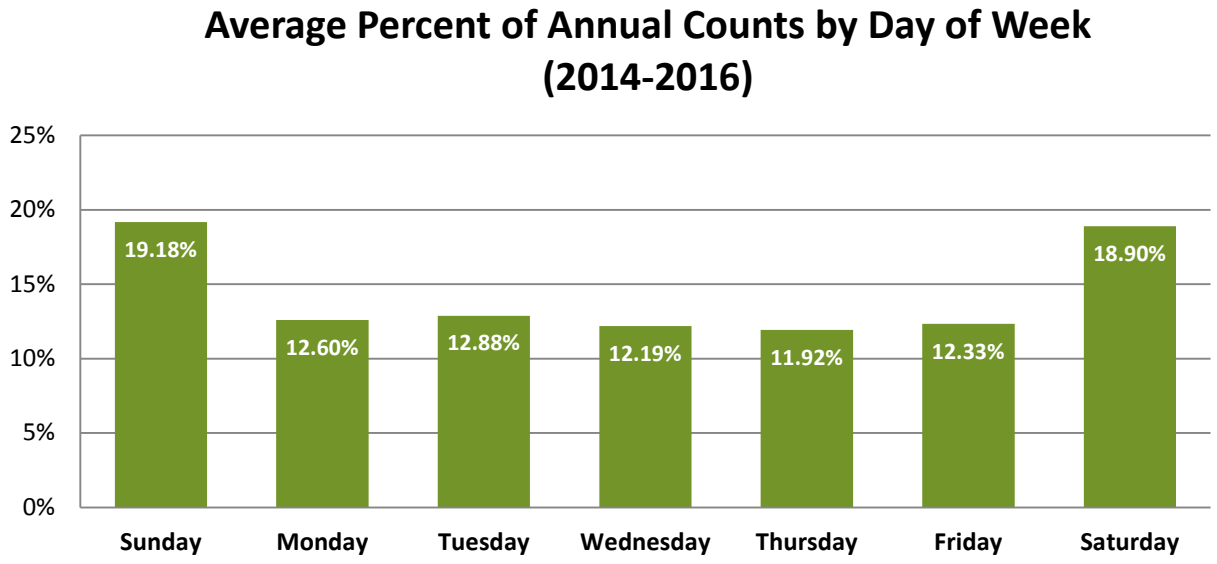


Chart 2



Appendix A
Methodology

Data Sources

Counts: Data was collected in Excel (.xls) format from each of the six trail agencies.
2016 data was collected at 29 locations. Two (2) locations were monthly only.

Weather: Daily weather data for 2014-16 was downloaded from the NOAA National Climatic Data Center (http://www.ncdc.noaa.gov/cdo-web/). Station data from Dayton International Airport was used.

Data Preparation

Counts

1. TRAFx data was sent with date in Year-Month-Day (YMD) format. Date was converted to proper date format (mm/dd/yy) by using Excel's Text-to-Columns tool. All screens in tool's wizard were skipped but for step 3 of 3 where column data format was set to Date: YMD.
2. Eco-Counter original data's time and date was in European format (DMY). Text-to-Columns tool was used to with a fixed-width separator between the date and time (step 1 and 2 of tool's wizard), and in step 3 the date column was set as DMY.

Weather

1. DATE was converted using Text-to-Columns fixed width between each digit in YYYYMMDD format.
2. PRCP was converted from tenths mm to inches.
3. TMAX was converted from tenths Celsius to Fahrenheit.

Both datasets were inputted into an Access Database.

Analysis

1. Counts were charted by weather (max temp and precipitation) and daily and monthly totals to analyze normalcy and peaks at each location.

2. Days that had abnormally high counts (a peak) were flagged. For flagged counts, the average for other counts on that same day of week in that particular month was averaged, and the average count replaced the flagged count.

   For example, a location had an abnormally high count on Wednesday July 13th, 2016. The average of the count on the other 3 Wednesdays in July was taken and replaced the July 13th count.

   In the 2014-16 data, there were 32 flagged counts.

3. Locations and daily counts were compared to historical news/events page posted on www.miamivalleytrails.org. Locations that had substantial closures were omitted.

   In 2014-16, there were eight such locations.

4. Locations that had less than 75% days of the year (366 x 0.75 = 275) counted were omitted from overall averages and factors.

   In 2014-16, 13 of the 29 locations had less than 75% days counted for a minimum of one year.

5. Locations with over 75% of days counted, but still had months with missing counts, had an estimated total count calculated for that month based on the daily average counted in that month, multiplied by the number of days in that month.

   For example, location ID 31, had only 16 days counted in April. The total counted on those 17 days was 1432, for a daily average of 89.5 (1432/17). April has 30 days. Therefore, the estimated total for September for location 31 was 2685 (89.5*30).

6. The sum of the estimate monthly totals was used as the estimated annual total for each count location. Locations with less than 75% of days counted, or with closures, likely had entire months of no counts and therefore did not have enough information available to calculate an estimated annual total.

   A simple ADT or daily average was calculated for each location by taking the estimated annual total diving by the number of days in the 2016 (366).

Developing Factors

1. The estimated monthly totals for all locations with at least 75% of days counted, and no anomalies (like prolonged closure) were summed by month. Factors were developed by taking the percentage of the annual total calculated for each month.

   For example, in 2016, the monthly factor was based on 23 locations. All the monthly counted locations with less than 75% days counted, and the location with a long closure were omitted.

2. Counts by weekday were made into a cross-tabbed table for each location with the percent of counts by weekday calculated. The overall average per weekday for all locations with a daily count, and with at least 75% of days counted was used to develop factors.

   For example, in 2016, the weekday factor was based on 21 locations. The locations with only monthly counts, and locations with less than 75% days counted were omitted.

3. If the daily average was 0, such as location ID 40 in 2016, the count was not used to develop factors.

Three-Year Average

1. The estimated yearly totals for all locations were estimated to the nearest hundred for each year counted.

   In 2014-16, 19 of the 32 locations had all years with more than 75% days counted. In the same period, seven of the 32 locations had two years with more than 75% days counted and four of the 32 locations had only one year with more than 75% days counted. Two locations had no years with more than 75% days counted. These counts were still averaged over the three-year period.

Short-Term Study Calculations

1. The number of bikes is counted for a one week period.

   For example, there were 854 bikes counted along the Great Miami River Trail at Deeds Point Park in Dayton.

2. The weekly total is then divided by seven days times the number of weeks for the month of the period being studied which results in the estimated number of bikes for the month.

   854 bikes was divided by the number of days in the week (7) and then multiplied by the number of weeks in July (4.29 via Table 3) which results in 3,660 bikes for the month.

3. The estimated monthly number is then divided by the monthly factor calculated from the monthly adjustment factors table which results in the number of bikes for 2016 at the studied location.

   3,660 bikes were then divided by the monthly factor from the monthly adjustment factors table (8.89% or 0.0889 via Table 1) which results in 41,149 bikes for the estimated annual count.

Appendix A: Bicycle Count Report - Example

Short-Term Study

Location	**Deeds Point MetroPark Dayton**
Date (start/end)	4/25/2017 5/3/2017
Type	Bikeway
Near Bikeway Trail Counter ID	N/A

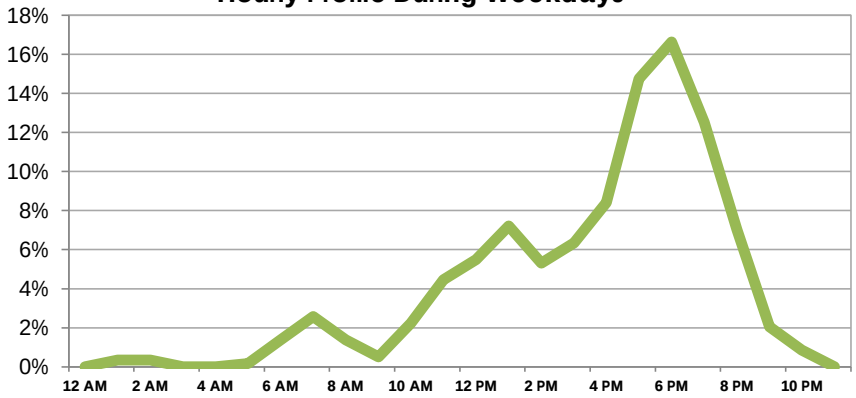
Total Count in Week	854
Days in Month	30
Weeks in Month	4.29 ← **See Table 3**
Estimated Month	3,660
Factor	8.89% ← **See Table 1**
Estimated Annual	**41,149**

Total Count in Study Period

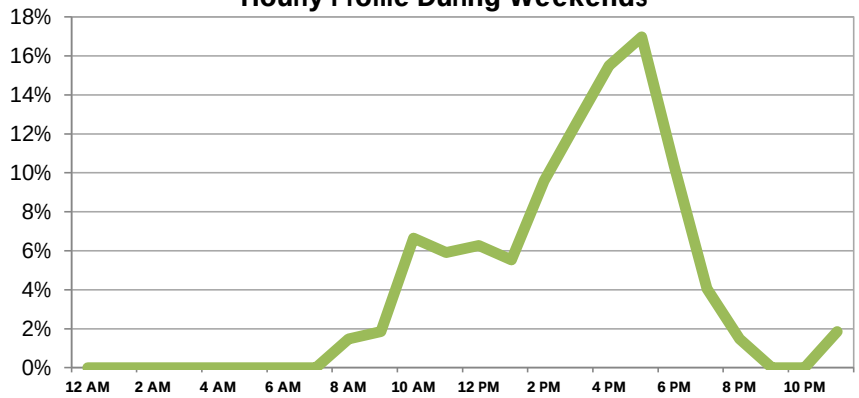
Day	Both Directions	NB: OUT	SB: IN	% Week
Sun	168	78	90	20%
Mon	31	15	16	4%
Tue	256	130	126	30%
Wed	211	104	107	25%
Thu	43	24	19	5%
Fri	42	21	21	5%
Sat	103	49	54	12%
	854	**49%**	**51%**	**100%**

SB = Southbound, NB = Northbound, WB = Westbound, EB = Eastbound

Hourly Profile During Weekdays

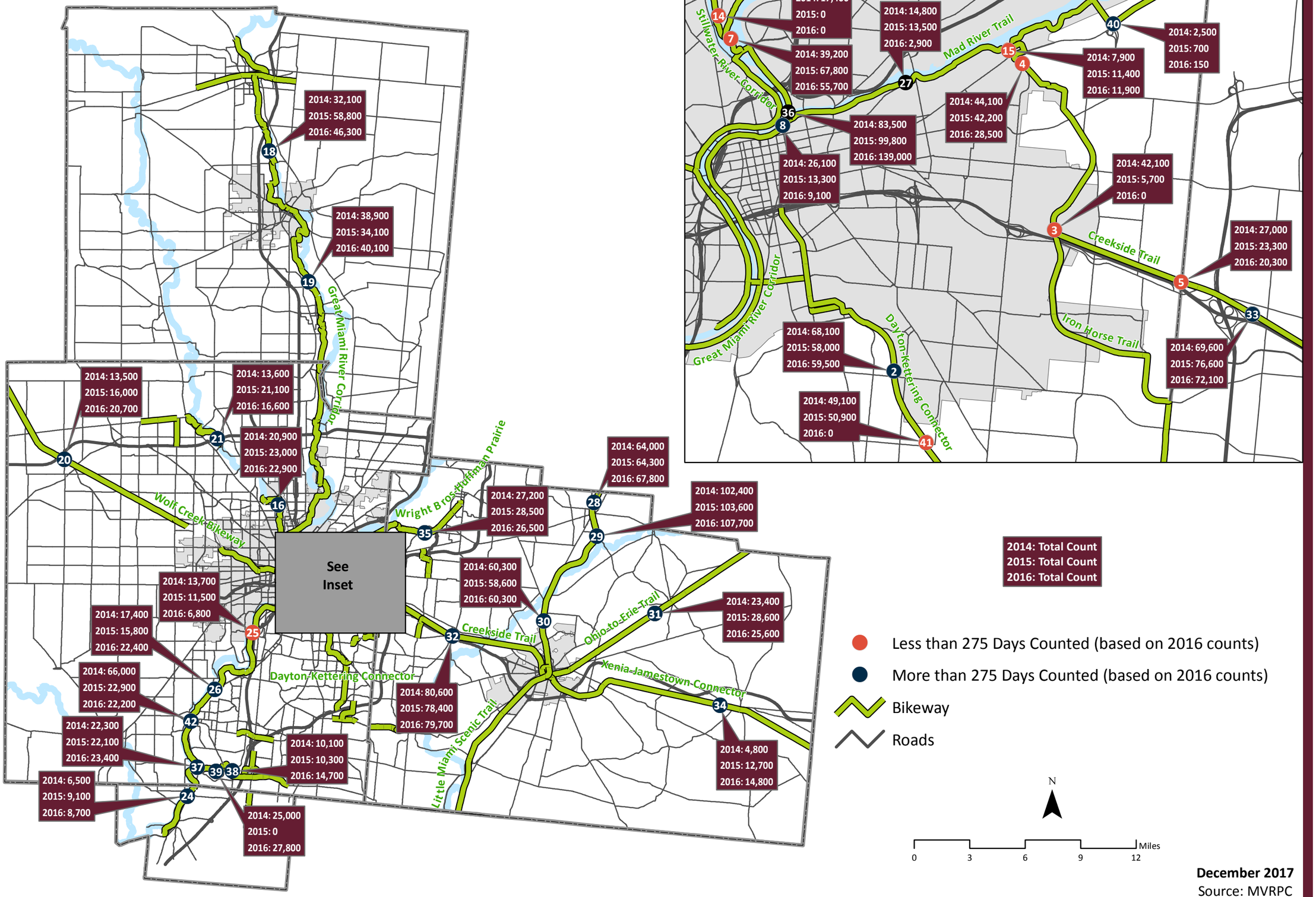


Hourly Profile During Weekends



Data collected with automatic bicycle-only counter equipment installed or provided by the Miami Valley Regional Planning Commission (MVRPC).
For more information, contact (937) 223-6323 or email alee@mvrpc.org

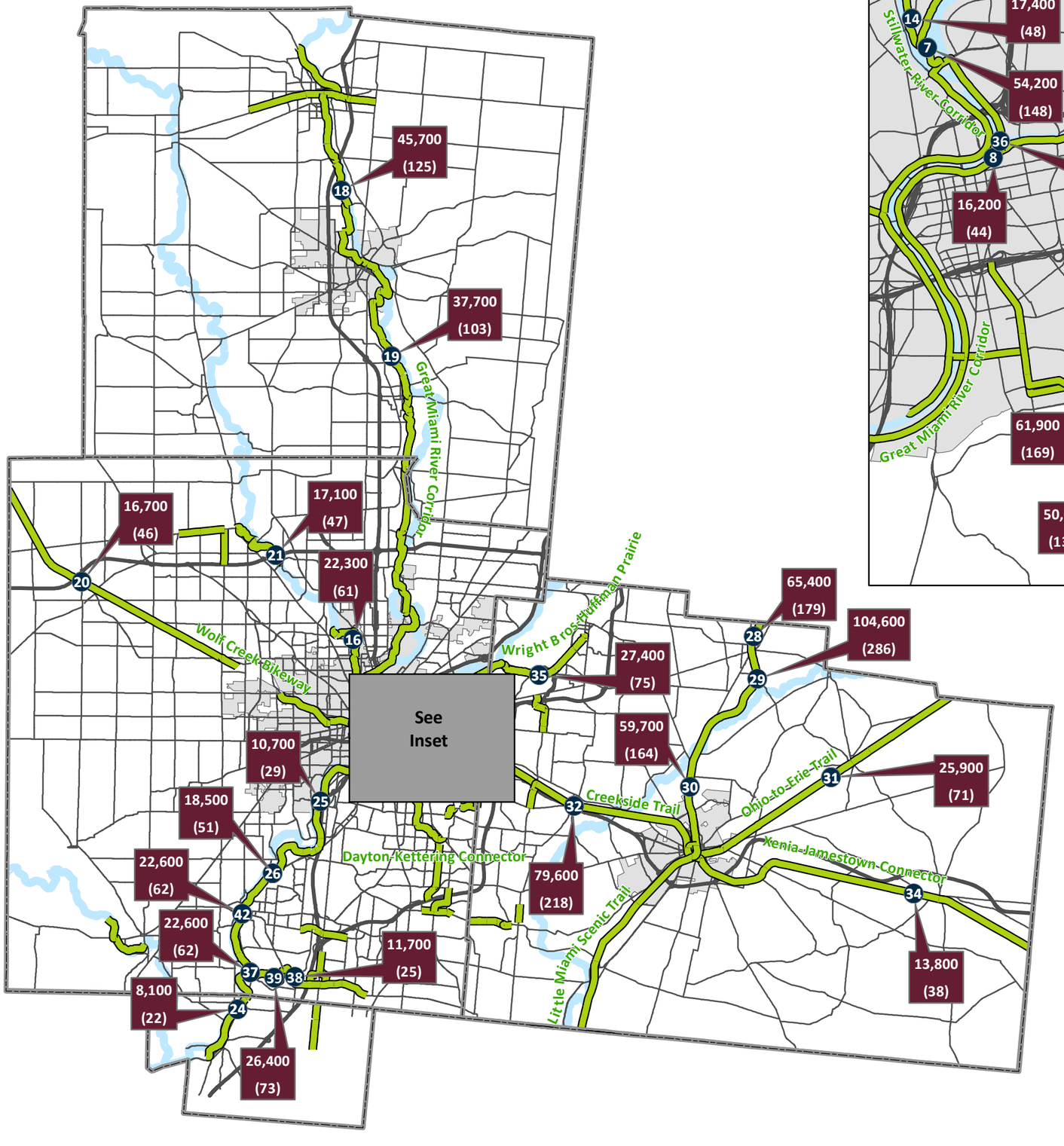
Appendix B: Map 1
Regional Bikeway Count Totals
(2014 - 2016)

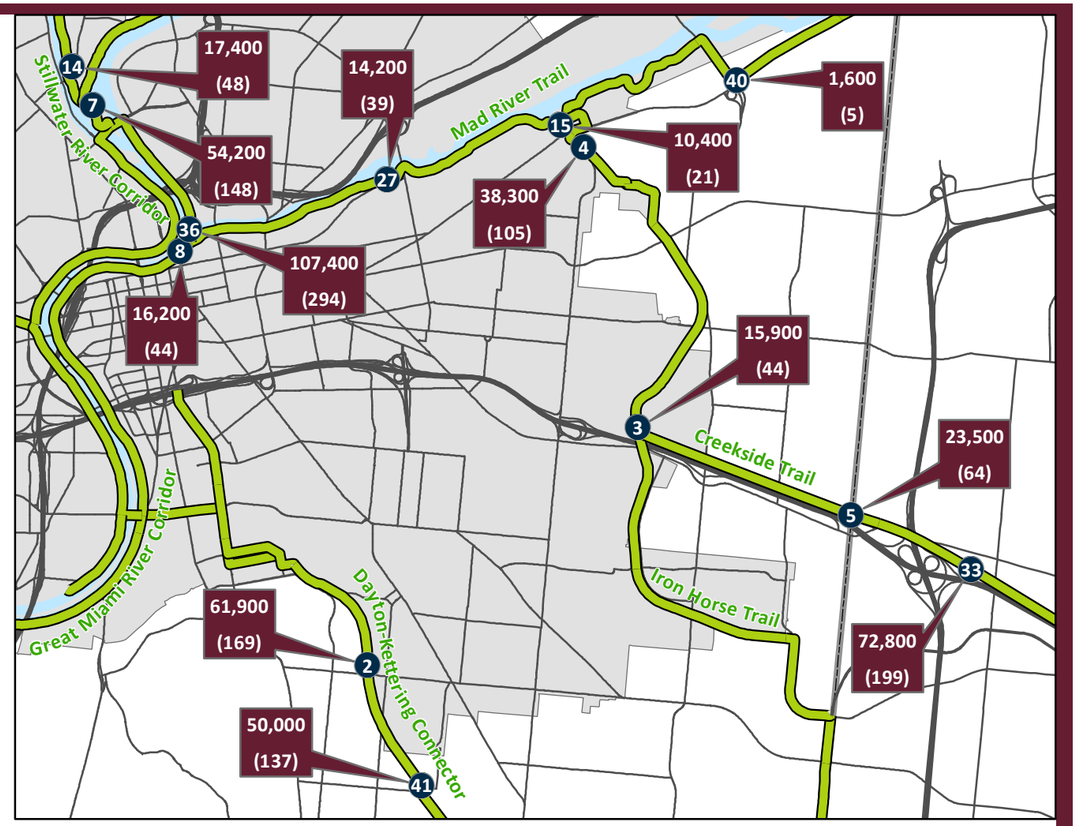


December 2017
Source: MVRPC

MVRPC

Appendix B: Map 2
Regional Bikeway Est. Annual Totals & ADT Averages (2014-2016)





Est. Annual Total
Est. Annual Daily Avg (ADT)

Note: Averages based on years with at least 275 days counted.

Bikeway

Roads

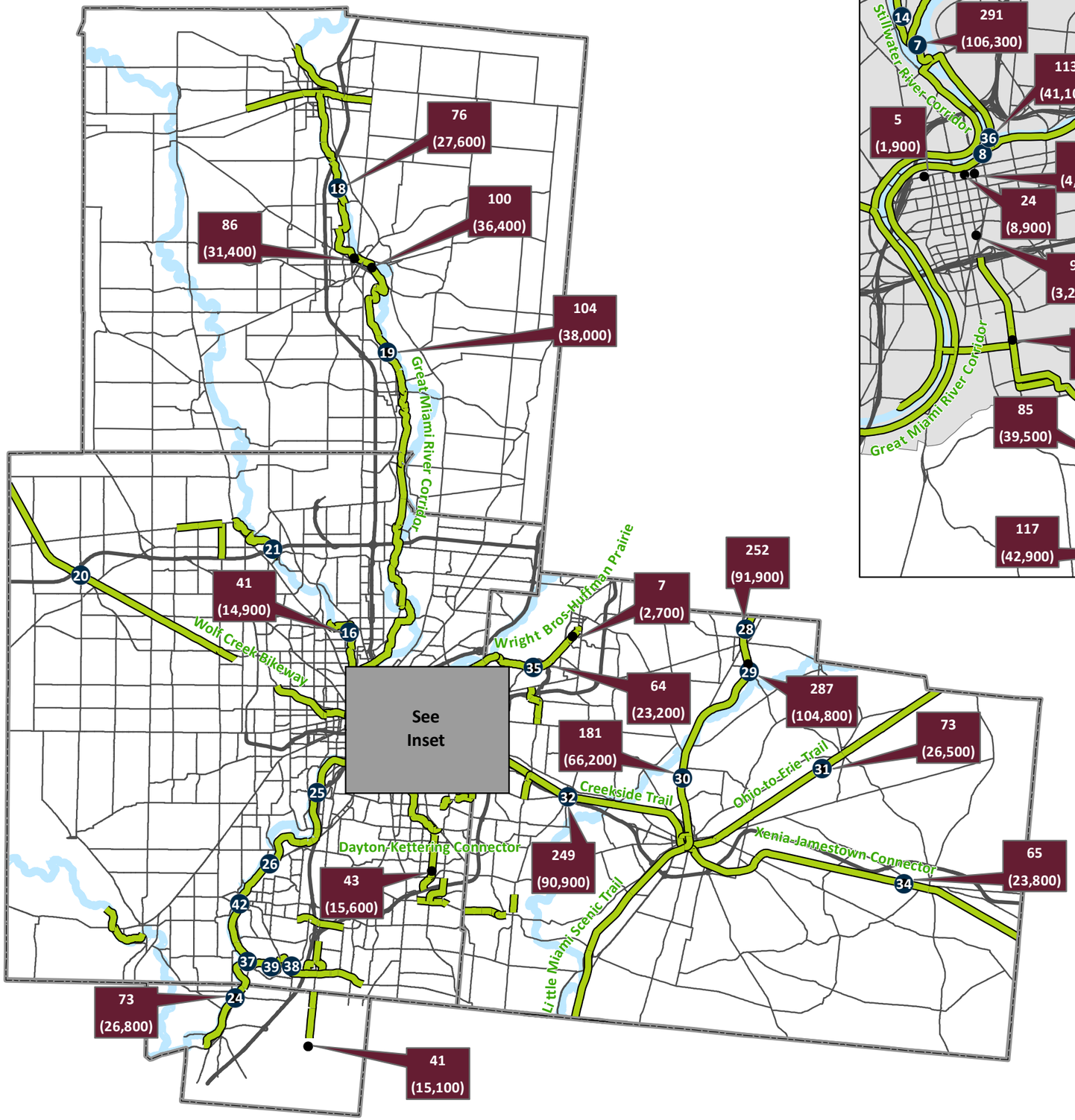
N

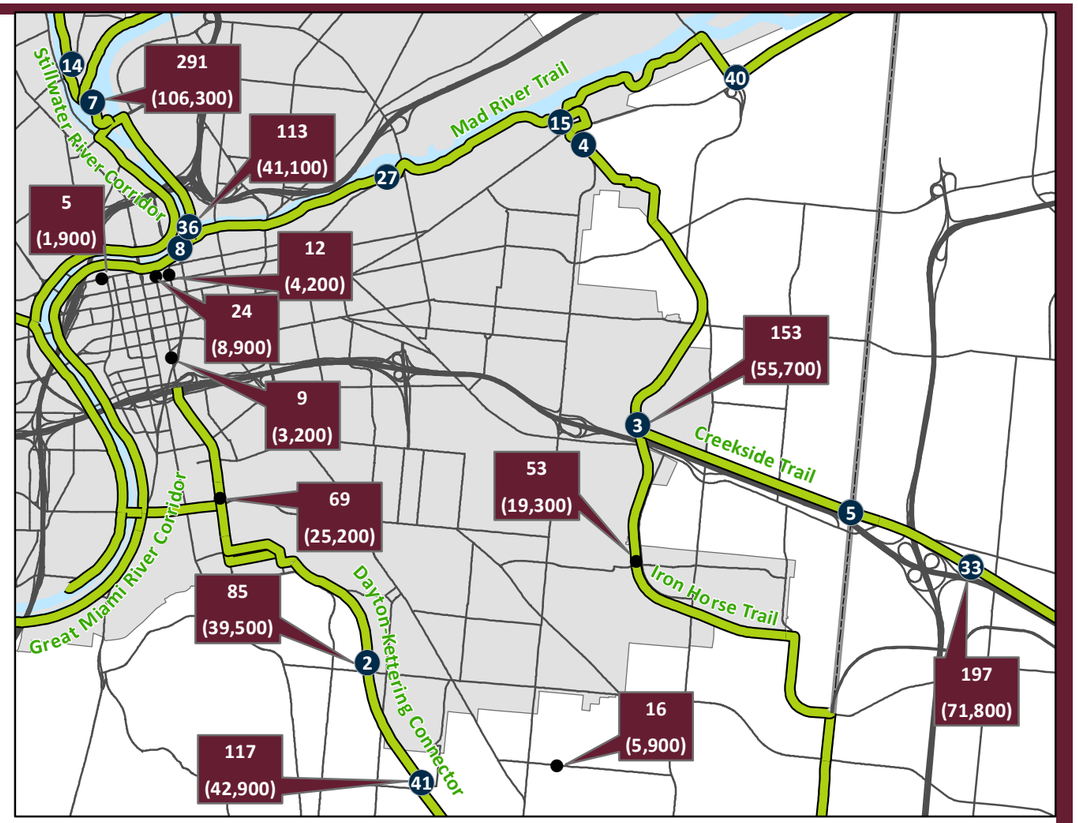
0 3 6 9 12 Miles

December 2017
Source: MVRPC

MVRPC

Appendix B: Map 3
Short-Term Bike Counts
(2015 - 2017)





Actual Daily Count
(Est. Annual Count)

Weekly counts taken in 2015, 2016, 2017

Bikeway
Roads
Permanent Locations
Short-Term Locations

N

0 3 6 9 12 Miles

December 2017
Source: MVRPC