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Clay Creek Meadows

Traffic Impact Analysis

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Prepared for:
Clay Creek Meadows, LLC

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Introduction

This document was prepared to analyze the potential traffic impacts of the proposed Clay Creek Meadows development in Smithville, Missouri. The site is bounded by US 169, Route W, Corbyn Lane and Lake Meadows Drive as shown in Figure 3. The proposed layout of the site is shown in Figure 4. The intersections evaluated in this study are US 169 @ Route W, US 169 @ Lake Meadows Drive, Route W @ Corbyn Lane and Lake Meadows Drive @ Proposed Corbyn Lane.

Existing Conditions

Corbyn Lane is a public street with access to Missouri Highway W as well as a proposed intersection with Lake Meadows Dr. US 169 is a 2-lane expressway with a posted speed of 55 mph. Route W is a two-lane roadway with a posted speed of 55 MPH. Lake Meadows Dr. is a local road with a posted speed of 25 mph. AADT data was obtained from MoDOT and outlined below in Table 1.

Table 1: MoDOT AADT

AADT	AM	PM	DAILY
US 169 NB	202	349	4969
US 169 SB	160	370	4969
Route W WB	109	115	1583
Route W EB	97	154	1477

Intersection turning movements counts for Lake Meadows Drive and Corbyn Lane were collected in traffic observation conducted in Early June 2024. US 169 is closed south of Route W, so directional splits are not available and have been assumed.

US 169 @ Lake Meadows Dr. is a 3-way intersection with a stop sign on Lake Meadows Dr. There is a dedicated NB right turn lane on US 169. EB Lake Meadows Drive is wide enough for two lanes at the approach to US 169 but there are no pavement markings or signage to designate lane usage. Lake Meadows Drive currently serves a residential neighborhood of 152 single family homes.

US 169 @ Route W is a 3-way intersection with a stop sign on Route W. There is a northbound right turn lane and southbound left turn lane on US 169.

Route W @ Corbyn Lane is a 3-way intersection with a stop sign on Corbyn Lane. There is an Eastbound right turn lane on Route W. Corbyn Lane is wide enough for a left turn lane and right turn lane, but with no striping or signing to delineate. Corbyn Lane serves an existing townhome complex of 124 units as well as a splash park.

Intersection Sight Distance

Intersection sight distance is the distance the driver of a vehicle approaching an intersection needs to have an unobstructed view of the entire intersection, including any traffic control devices, and sufficient

lengths along the intersecting major roadway to permit the driver on the approaching roadway to anticipate and avoid potential collisions. Sight Distance was measured in the field as:

US 169 @ Lake Meadows Drive
Northbound: 660'
Southbound: 1,035'
US 169 @ Route W:
Northbound: 972'
Southbound: 734'

Using Table 233.2.1 Intersection Sight Distance from MoDOT's Engineering Policy Guide, the required minimum sight distance for 55 MPH is 610'. Therefore, no improvements are recommended at the intersection of US 169 @ Route W. At the intersection of US 169 @ Lake Meadows Drive, the stop bar is placed approximately 40' behind the edge line of US 169 NB. During observation of traffic, motorists do not stop at the stop bar, and pull up closer to the edge line to judge potential gaps to complete their turn. Therefore, we would recommend the removal of this stop bar.

Proposed Conditions

Clay Creek Meadows is a proposed subdivision of 196 townhomes and 13 single family homes located in Smithville, Missouri. There will be two access points to the development off Corbyn Lane for the townhomes. Additionally, Corbyn Lane will be extended to the south to create additional access to this development from Lake Meadows Drive. The single-family homes will have driveways on Lake Meadows Dr. as shown in Figure 2.

Trip Generation

Using the 11th edition of the ITE Trip Generation Manual, we have estimated the new trips that will be generated by the proposed Clay Creek Meadows. Land Use Code 220 was used for the Townhomes and Land Use Code 210 was used for the Single Family homes. The estimate AM and PM Peak Hour traffic volumes are shown below in Table 2.

Table 2: Trips Generated, Peak Hour

USE	UNITS	AM IN	AM OUT	PM IN	PM OUT	DAILY
Townhomes (ITE 220)	203	19	62	65	36	1368
Single Family (ITE 210)	13	2	7	8	4	123
TOTAL	216	21	69	73	40	1491

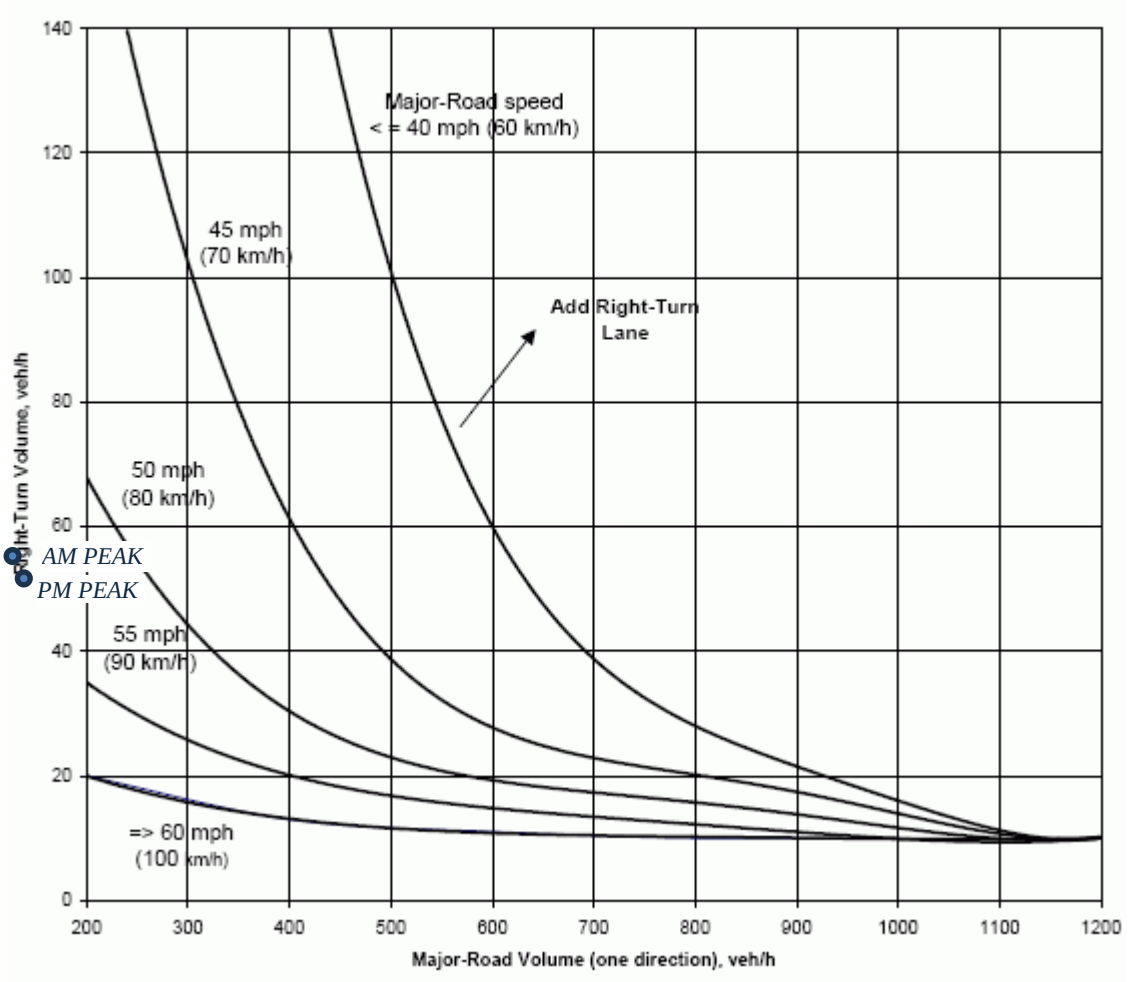
Trip Distribution

Based on existing traffic flows and general observation of the surrounding areas, we have assumed that 60% of the trips will be entering and exiting the development to/from the south and 40% of the trips will be entering and exiting and exiting the development to/from the north.

Right Turn Lane Analysis

The intersection of Route W @ US 169 was evaluated for an EB right turn lane. The peak hour counts in Figures 1 and 2 and the right turn lane guidelines outlined in MoDOT's EPG Section 940 were used to conduct this evaluation. There is not enough volume on Route W to warrant an EB right turn lane at this intersection at this time.

940.9.8 Right Turn Lane Guidelines for Two-Lane Roadways



Traffic Signal Warrants

The need for traffic signals was evaluated using the Manual on Uniform Traffic Control Devices Chapter 4C and MoDOT EPG Section 902.3. The only intersection with appropriate volumes for signal analysis is US 169 @ Route W.

Warrant 1:
The intersection of US 169 @ Route W was evaluated for a signal using both the 8-hour and 4-hour warrant. The results of the 8-hour warrant analysis are summarized in Table 3 below.

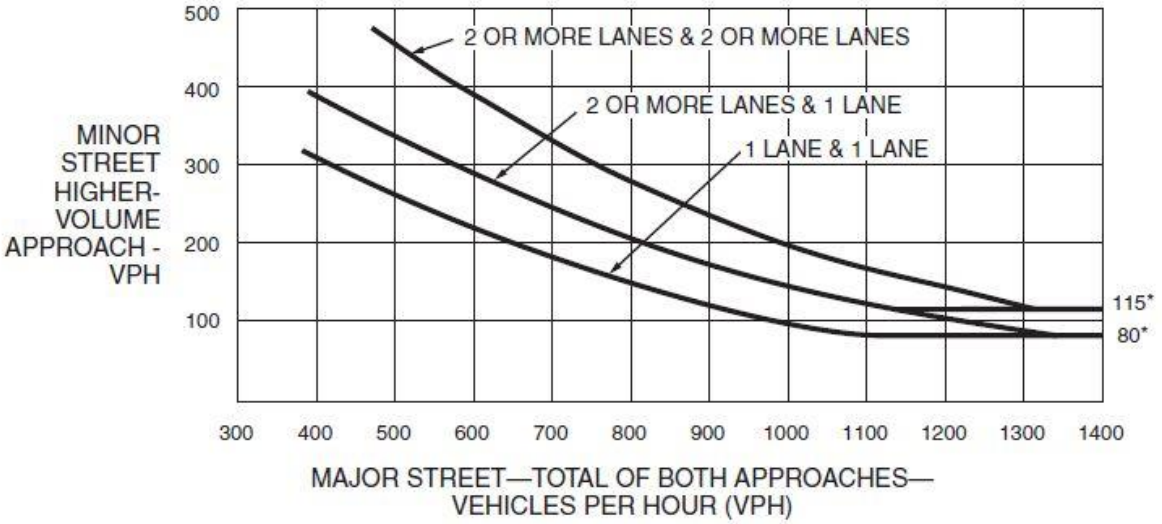
Table 3 Existing and Proposed, Conditions A and B

EXISTING			Warrant 1, Eight Hour Vehicular Volume			
			Condition A		Condition B	
Time	US 169	Route W	Major	Minor	Major	Minor
11:00	618	91	Yes	NO	NO	Yes
12:00	647	95	Yes	NO	NO	Yes
1:00	658	97	Yes	NO	NO	Yes
2:00	673	100	Yes	NO	NO	Yes
3:00	698	105	Yes	NO	NO	Yes
4:00	719	110	Yes	NO	NO	Yes
5:00	704	107	Yes	NO	NO	Yes
6:00	643	98	Yes	NO	NO	Yes

PROPOSED			Warrant 1, Eight Hour Vehicular Volume			
			Condition A		Condition B	
Time	US 169	Route W	Major	Minor	Major	Minor
11:00	618	101	Yes	NO	NO	Yes
12:00	647	105	Yes	NO	NO	Yes
1:00	658	107	Yes	NO	NO	Yes
2:00	673	110	Yes	NO	NO	Yes
3:00	698	115	Yes	NO	NO	Yes
4:00	719	125	Yes	NO	NO	Yes
5:00	704	117	Yes	NO	NO	Yes
6:00	643	108	Yes	NO	NO	Yes

This warrant was not satisfied for either existing or proposed conditions at US 169 @ Route W.

Warrant 2:
Figure 902.3.4.1 was used to analyze the AADT data for the 4-hour warrant.



- The intersection of US 169 @ Route W was evaluated. The major street (US 169) had an average of 700 vehicles/hour and the minor street (Route W) had an average of 105 existing and 117 proposed vehicles/hour for the 4 peak hours. This warrant was not satisfied for either existing or proposed conditions at US 169 @ Route W.

- The intersection of US 169 @ Lake Meadows Dr. was not evaluated for signal warrants due to the volume on Lake Meadows Dr. below the minimum of 115 vehicles per hour on a 2 lane minor approach that is required for the 4 hour warrant.

- The intersection of Route W @ Corbyn Lane was not evaluated for signal warrants due to the volume on Corbyn Lane below the minimum of 115 vehicles per hour on a 2 lane minor approach that is required for the 4 hour warrant.

- The intersection of Lake Meadows Dr. @ Corbyn Lane Corbyn Lane was not evaluated for signal warrants due to traffic volumes being below the minimum of 80 vehicles per hour on a 1 lane minor approach that is required for the 4 hour warrant.

Crash History

Crash history was reviewed for all 3 existing intersections using the State of Missouri STARS reporting system. There were no reported crashes at the intersection of Route W at Corbyn Lane.

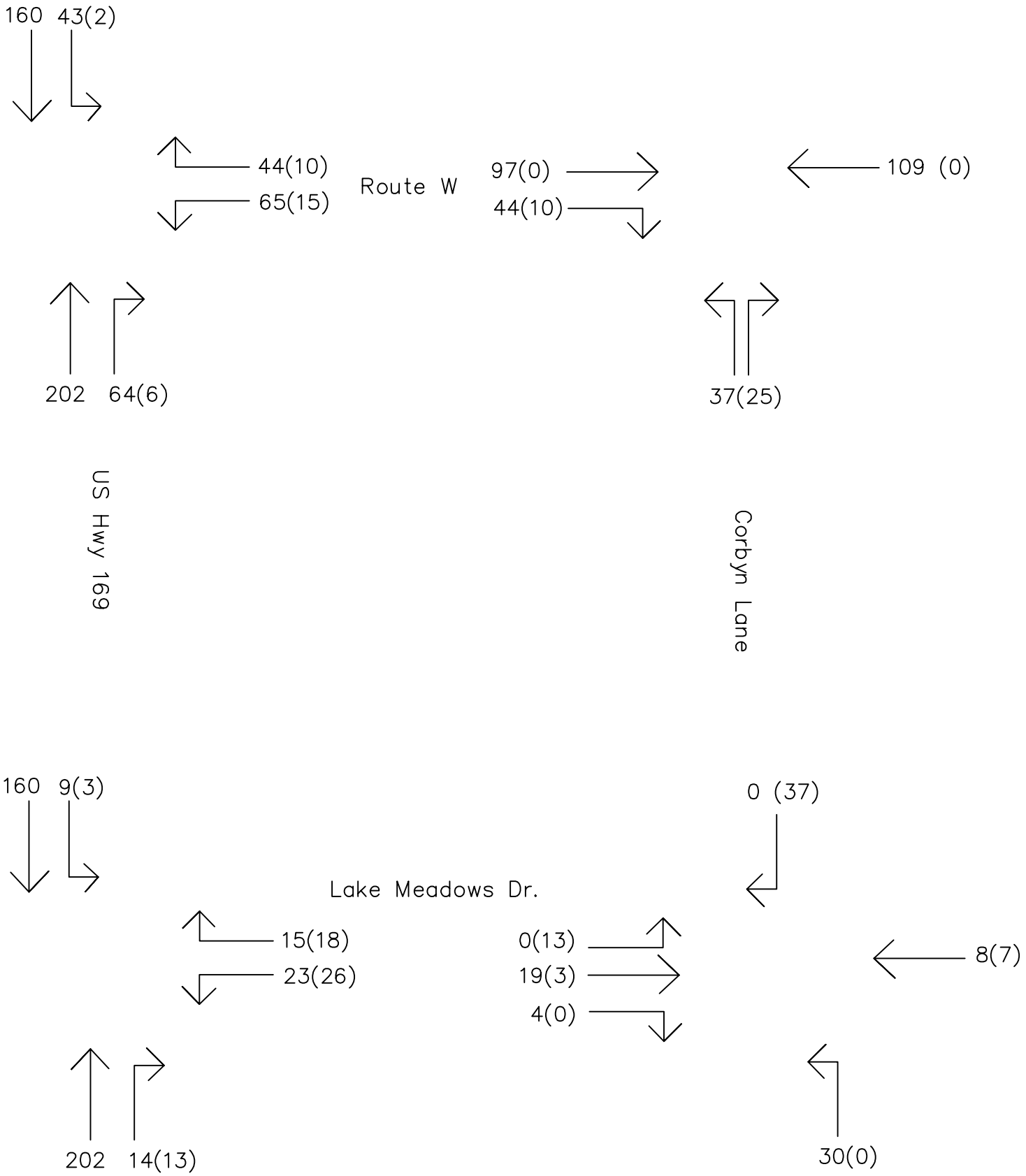
- US 169 @ Route W
  - 2019: 1 Property Damage Only
  - 2020: 1 Property Damage Only
  - 2021: No crashes
  - 2022: 1 Property Damage Only
  - 2023: 1 Injury
- US 169 @ Lake Meadows Dr
  - 2019: 3 Injury
  - 2020: 1 Injury

- 2021: No crashes
- 2022: 1 Injury
- 2023: 1 Injury

Conclusion

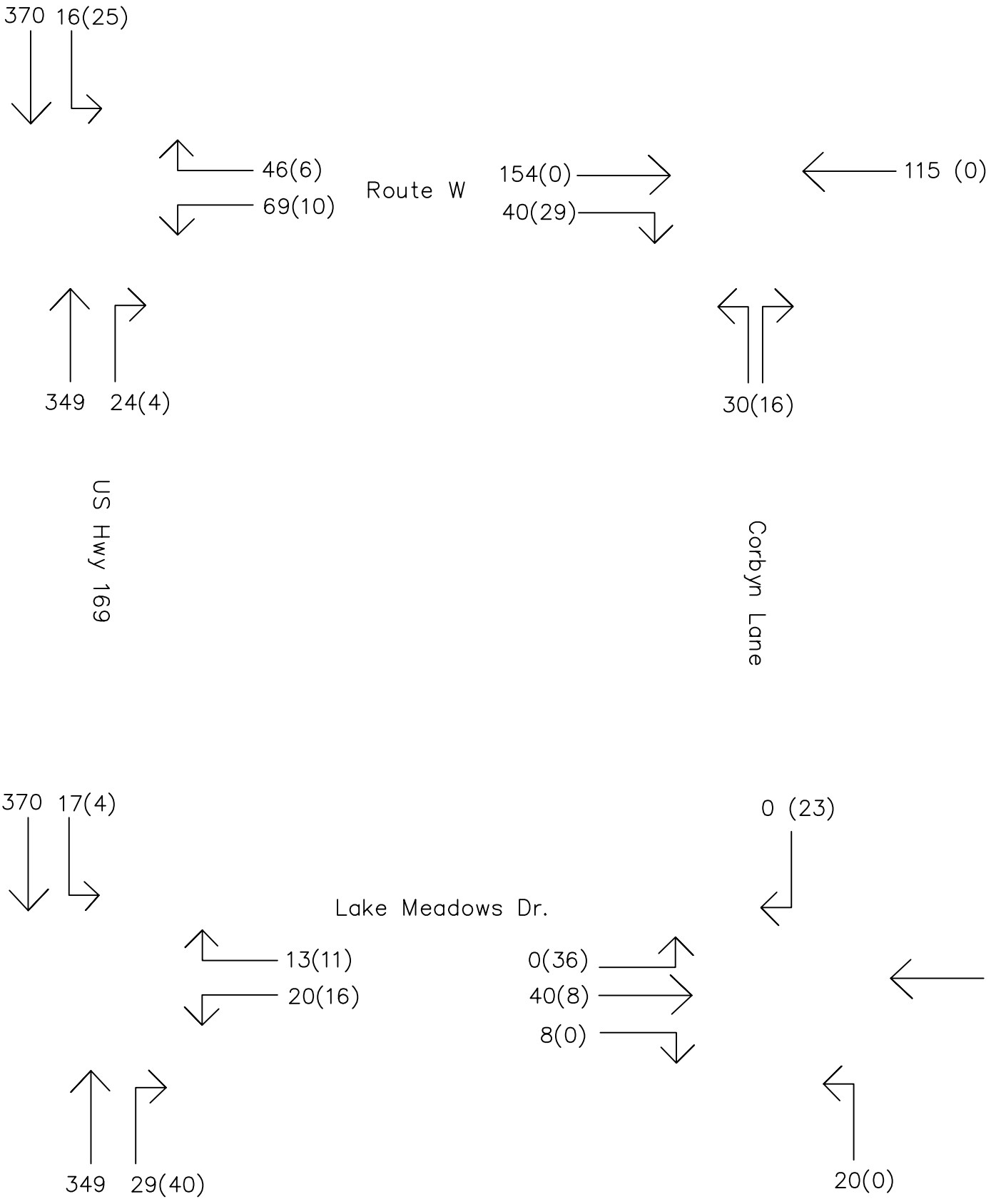
This study examined the potential impacts associated with the proposed Clay Creek Medows development of Multi-Family and Single Family homes. The new intersection of Lake Meadows Drive at Corbyn Lane that will be constructed with this development should be stop controlled, with stop signs on Corbyn Lane. The stop bar at the intersection of Lake Meadows Drive @ US 169 should be removed, as traffic needs to stop closer to US 169 to adequately gauge gaps. No additional traffic improvements will be required as a result of this development.

FIGURE 1 CLAY CREEK MEADOWS
AM TURNING MVMT COUNTS



EXISITNG (PROPOSED)

FIGURE 2 CLAY CREEK MEADOWS
PM TURNING MVMT COUNTS



EXISITNG (PROPOSED)

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CLAY CREEK MEADOWS

SITE LAYOUT