

8th National TRB Access Management Conference
Baltimore, New Jersey
July 13-17, 2008

Impacts of Access Management Case Study:
Dave Ward Drive, Hwy 60, Conway, AR

Metroplan
501 West Markham Street
Suite B
Little Rock, AR 72201

Minh Le, PE
Richard Magee, ACIP
Casey Covington, PE
Diane Welch
Jonathon Lupton

Graphics:
Jean Dahms
Hans Haustein

Dave Ward Drive Property Value & Accident Analysis

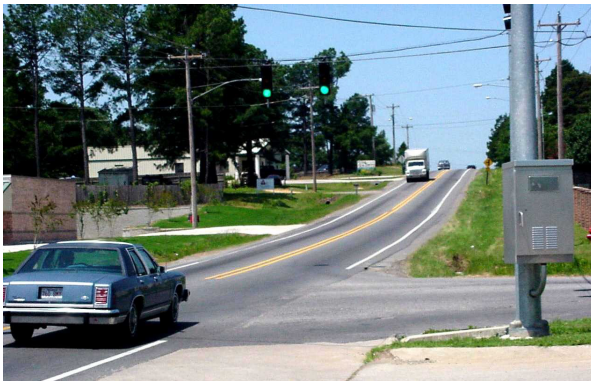
Summary of Findings

History

Dave Ward Drive (DWD), or Hwy 60, from Tucker Creek to Harkrider (Hwy 65B/365), is a critical east-west principal arterial with some major land uses adjacent to the roadway such as University of Central Arkansas (UCA), AmTran, Wal-Mart and other commercial strip development and apartments. The study area consists of 520 acres of land. The Arkansas Highway and Transportation Department (AHTD) widened Dave Ward Drive (Highway 60) from two-lanes to a four-lane, median-divided roadway from Tucker Creek bridge to just west of the Union Pacific Railroad overpass. In 1999, in cooperation with the City of Conway, AHTD and Metroplan adopted an access management plan regulating access along Dave Ward Drive, see Appendix A. The plan was adopted to protect the capacity of the roadway while enhancing the safety of the corridor. It specifies minimum distances required for roadway elements such as median breaks, signalized intersections, driveways, etc. Right-of-way acquisition along Dave Ward Drive began in September 2000, construction began in April 2001 and the roadway officially opened November 11, 2003. In 1999, DWD carried approximately 18,500 average daily traffic (ADT) and approximately 26,500 ADT in 2006. It is anticipated to carry 30,000+ ADT in the near future.

Purpose

The purpose of this report is to document property value and accident history along this section of Dave Ward Drive prior to, during and after roadway improvements were completed.



The above photos (looking west), the before (left) and after (right), were taken at the intersection of Dave Ward Drive with Salem Road.

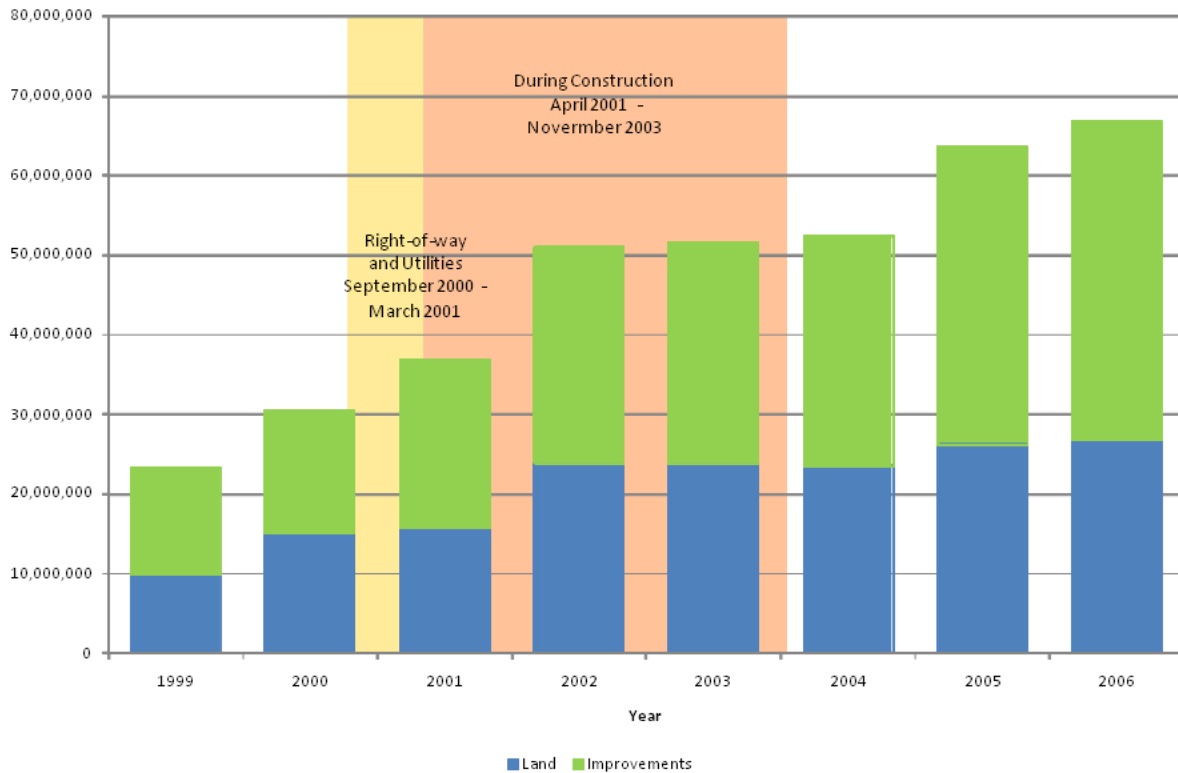
Analysis

Property value data were collected from records of the Faulkner County Assessor for the years 1999 to 2006 for all properties fronting along or with side yard access to Dave Ward Drive. Values reflect appraised value, not real estate sales value. Changes in appraised value can occur when 1) improvements are made to the land or building, 2) new ownership, or 3) after a countywide reappraisal. By law, the county must reappraise all properties every three years. Faulkner County finished a countywide reappraisal in 2002. The previous countywide reappraisal occurred in 1999,

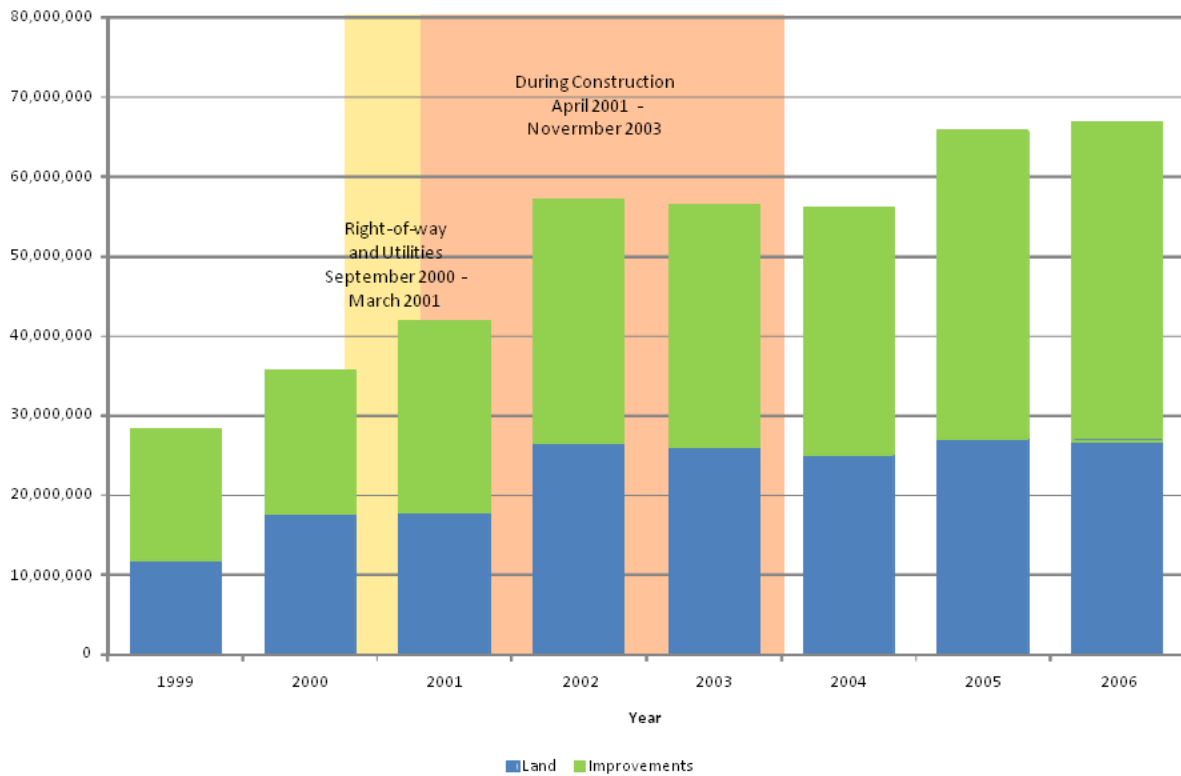
and value changes from that reappraisal were applied in 2000. Total property value includes both building and land values. If no building is located on the property the land and total values are the same. Properties denoted with N/A either did not exist in that year or no data were available for the property.

Property values rose in the corridor during the years 1999-2006. Total appraised property value rose 185% – more than double – during these years, or 136% after adjusting for inflation. The total value of structures (improvements) on these properties rose slightly faster than land values. Total improved value rose 193%, or 142% after adjusting for inflation, during the study period. Land value rose almost as fast, 185% (136% after inflation).

Dave Ward Drive Total Property Values 1999-2006
(Nominal Dollars)



Dave Ward Drive Total Property Values 1999-2006
(Inflation-Adjusted Dollars)

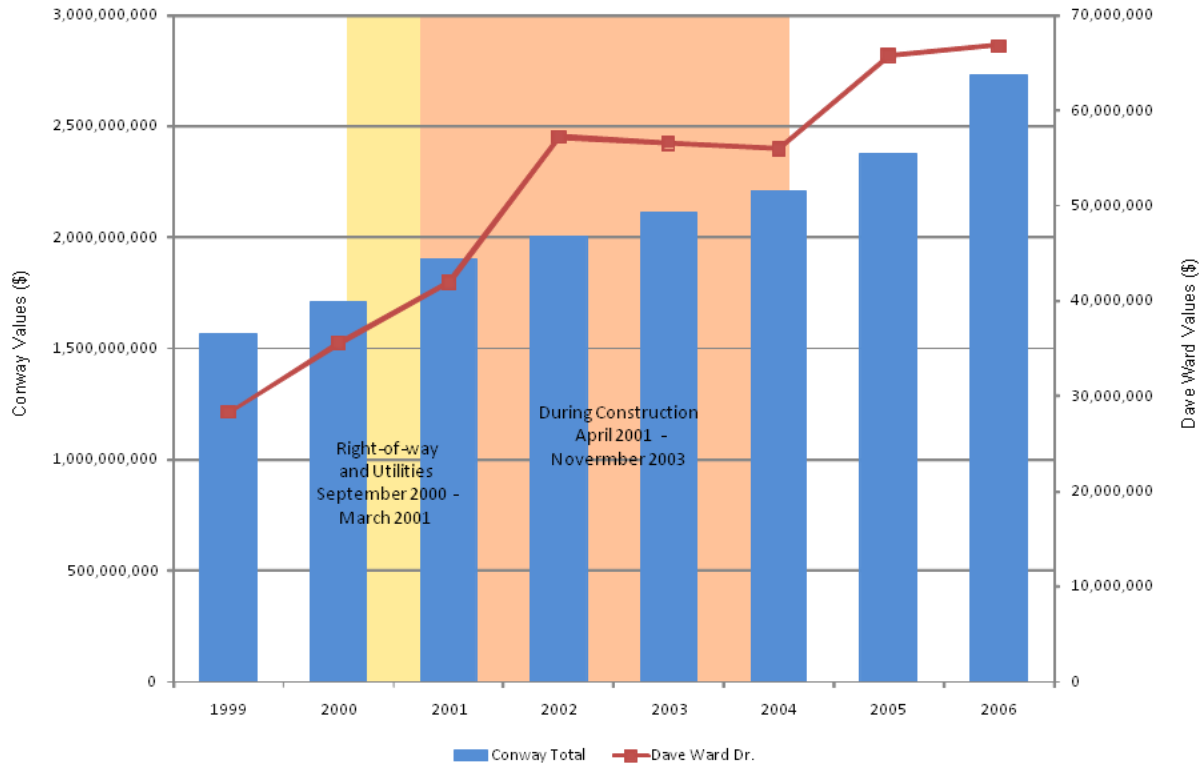


Value per acre increased as well. Land value per acre rose from \$23,434 on average in 1999 to \$64,231 in 2006. Even after adjusting for inflation, land value rose from \$28,357 to \$64,231, an increase of \$35,874 per acre.

The previous charts show that values did not grow at a steady pace the whole time. Gains were rapid 1999-2000, caused mainly by the split of properties in two retail areas at opposite ends of the corridor – the Conway Marketplace area to the west, including Wal-Mart, and the Ruby Subdivision/Quicklube/Generation Replat/Germantown Replat area at the junction of Hartje Rd and Dave Ward Drive on the east. Land values peaked around 2002, then declined slightly even in nominal dollars (and declined by more in inflation-adjusted dollars) during the period 2003-2004. Land values then climbed again in 2005 and 2006. Improvement values continued rising throughout the study period as more new structures were completed.

The chart on the following page compares total property values along the Dave Ward corridor with total property values for the City from 1999-2006, in inflation-adjusted figures. Total property values in Conway rose 75% during these years, while Dave Ward property values rose 136% in real (inflation-adjusted) dollars. Seen another way, Dave Ward properties rose from 1.8% of total Conway values in 1999 to 2.4% by 2006.

**Conway Total Property Values vs. Dave Ward Drive Values 1999-2006
(Inflation-Adjusted)**



Zoning Analysis

Changes in zoning designations occurred along the corridor during this period as well, as shown in the table at the top of page 5. Slightly over 50 acres within the study area in 1998 remained outside the corporate limits of Conway with no zoning designation, but by 2005 all the unincorporated area had been annexed and, for the most part, brought in as A-1, agricultural.

As the following table shows, declines occurred in several residential categories, including R-1, R-2, and MF-3. The category S-1, or “institutional,” includes UCA and remained the same from 1998 to 2005. There were gains in C-2 and C-3 zoning, but since most of the land in the corridor’s major shopping centers had already been zoned for commercial use just prior to the beginning of the study, the absolute gains in these zones were small. The biggest gains (aside from the advent of 21.72 acres of A-1 zoning, explained above) were in office (O-1 and O-2) and light industrial (I-1) categories. It appears that the gain in industrial property occurred as a result of annexation, since the additional I-1 area in 2005 was unincorporated in 1998 and, additionally, was located adjacent to I-1 property that was already within the city in 1998.

Dave Ward Corridor - Zoning 1998-2005

Zoning Class	Acres 1998	Acres 2005	Percent Change
A-1	0.7	21.72	3002.9
C-2	2.41	3.41	41.5
C-3	102.26	106.26	3.9
County/unzoned	50.73	0	-100.9
I-1	13.05	25.98	99.1
I-2 /RU-1*	0.63	0.63	0.0
I-3	77.18	77.18	0.0
MF-3	20.04	18.54	-7.5
O-1	14.85	23.68	59.5
O-2	10.72	17.71	65.2
PUD	59.68	65.54	9.8
R-1	40.43	32.41	-19.8
R-2	52.73	52.35	-0.7
RMH	19.52	19.52	0.0
S-1	55.66	55.66	0.0
Grand Total	520.59	520.59	

Assumptions and Methodology

This study was done based on a data set showing total property value, land value, and zoning for a grand total of 135 properties.

Exempt Properties

A significant share of the properties (UCA, churches, AHTD) is exempt from taxation, and reflected inconsistent property values. In many cases, the properties began the study period in private hands, with reported property values, but were purchased by a church or the University of Central Arkansas and became exempt during the study period. Such parcels were removed from the value-analysis portion of the data set to keep reporting assumptions consistent. The parcels purchased by the Arkansas Highway and Transportation Department (AHTD) as a result of the roadway improvements were also excluded from any analysis. The exempt properties accounted for a total of 101.9 acres.

Analysis of Value per Acre

The non-exempt data set consisted of a total of 115 properties in 1999, at the beginning of the study period, and 121 properties in 2006, at the end of the study period. The total area for this data set was 418.7 acres. Value per acre was thus calculated by simply dividing total property value by the number of acres.

One property had only improved values, with no land values. This was a Murphy Oil station on Wal-Mart property. Although no land value was reported for this property, it was counted with the value-per-acre figures for improved value based on the Wal-Mart-owned property it occupied.

Safety Analysis

A safety analysis of vehicular crashes (i.e. accidents) along DWD was performed to evaluate the roadway safety (motorized and non-motorized) for pre, during, and post-construction conditions.

Procedure

Using available crash data from the Arkansas State Police (ASP), crashes were divided into 36 months preconstruction, 31 months during construction, and 36 months post-construction. Given previous research/experience using the crash data, the following steps were followed while querying the Faulkner County crash data to determine the crashes that occurred within the project limits (in order).

1. State Highway: Route "60" only if the Direction & Distance from known reference point is within project limits
2. Local Street: Route "Dave Ward Drive" only if the Direction & Distance from known reference point is within project limits
3. Sidestreets: Non-"rearend" crashes on any side streets that are "at intersecting street" with Dave Ward Drive or Route 60 and within project limits
4. State Highway: Rte "60", Sect "0", corrected LM "0.41 to 4.2"
5. Private Driveways: used google maps to verify that private driveways/business locations are within project limits

Results

There were a total of 773 crashes for the time periods evaluated. Respectively, there were 249, 264, and 260 crashes pre, during, and post-construction. The tables show the frequency of crashes by their severity (i.e. fatal, incapacitated, non-incapacitated, possible injury, and property damage only), whether or not it occurred at an intersecting roadway/driveway, and the type of collision for the time periods shown. Crashes without injury and resulting in less than \$1000 in vehicle damage are not required to be reported to the ASP. Thus, these types of crashes may be underrepresented.

Pre-Construction

During the 36 months prior to construction there were a total of 249 crashes, with 162 or 65% being property damage only. These crashes are shown graphically on a map at the end of this report. Of the serious crashes (fatal or incapacitated), 1 was fatal and 32 resulted in incapacitated injuries, or, 13% of the total pre-construction crashes. The fatal crash was in 1998, with one out of the four persons involved being fatally injured. This two-vehicle, head-on crash occurred at 2:05 AM under "Dark but lighted" conditions. The crash report shows that both drivers had alcohol in their blood system.

Pre-Construction Crashes (4/1/1998-3/31/2001)

Crash Frequency	Not at Intersection					Total	At Intersection					Total	Grand
	Crash Severity						Crash Severity						
CollisionType	1	2	3	4	5		1	2	3	4	5		
Angle	0	3	2	4	8	17	0	8	3	9	25	45	62
Backing	0	0	0	1	1	2	0	0	0	0	1	1	3
Head On	1	1	1	0	1	4	0	0	0	1	1	2	6
Rear End	0	11	4	16	82	113	0	4	3	6	17	30	143
Sideswipe Opp. Dir.	0	0	0	0	2	2	0	0	0	0	2	2	4
Sideswipe Same	0	0	0	0	3	3	0	0	0	0	3	3	6
Single Vehicle Crash	0	1	0	2	10	13	0	4	0	1	4	9	22
Unknown	0	0	0	1	1	2	0	0	0	0	0	0	2
Other	0	0	0	0	0	0	0	0	0	0	1	1	1
Grand Total	1	16	7	24	108	156	0	16	6	17	54	93	249

Crash Severity: 1-fatal, 2-incapacitated injury, 3-nonincapacitated injury, 4-possible injury, 5-property damage

Among collision types, 62 were “angle” crashes, 6 “head on”, and 143 “rear end”. There were 93, or 37%, crashes that occurred “at intersecting street”. Additionally, there was one pedestrian related crash in 2000. Note: DWD was re-striped to two lanes with a TWLTL from Donaghey to Ash, approximately 0.40 miles (10% of project length) in 1989.

During Construction

During the 31 months construction period there were 264 crashes with 49.2% being property damage only. This is a 6% increase in crashes from “before” conditions. There were 11 serious crashes during construction, two were fatal (with one fatality each) and nine resulted in

During-Construction Crashes (4/1/2001-10/31/2003)

Crash Frequency	Not at Intersection					Total	At Intersection					Total	Grand
	Crash Severity						Crash Severity						
CollisionType	1	2	3	4	5		1	2	3	4	5		
Angle	1	0	3	8	10	21	0	3	10	15	28	56	77
Backing	0	0	0	1	1	2	0	0	0	0	1	1	3
Head On	1	1	1	1	1	5	0	0	0	1	1	2	7
Rear End	0	5	11	38	54	108	0	0	6	20	20	46	154
Sideswipe Opp. Dir.	0	0	2	1	3	6	0	0	0	1	0	1	7
Sideswipe Same	0	0	0	0	5	5	0	0	1	0	3	4	9
Single Vehicle Crash	0	0	0	1	1	2	0	0	2	1	2	5	7
Grand Total	2	6	16	50	75	149	0	3	19	38	55	115	264

Crash Severity: 1-fatal, 2-incapacitated injury, 3-nonincapacitated injury, 4-possible injury, 5-property damage

incapacitation. One of the fatal crashes involved alcohol or drugs. Serious crashes made up 4.2% of the total during construction crashes.

Among the types of collisions, 77 were “angle” crashes (24% increase), seven “head on” (17% increase), and 154 “rear end” (8% increase). About 44% of the crashes occurred “at intersecting street” (24% increase). Additionally, there was one bicyclist related crash in 2001 and one pedestrian related crash in 2003.

Post-Construction

During the first 36 months after construction there were a total of 260 crashes with 126 or 49% being property damage only. Although there was a slight increase in the number of crashes between the “pre” and “post” construction, t-test revealed that the difference is not significant (alpha=0.05). These crashes are shown graphically on a map at the end of this report. Of the 8 serious crashes, three were fatal (with four fatalities) and five resulted in incapacitation. This represents a 76% reduction in the most severe crashes from the pre-construction phase. The 2003 fatal crash occurred shortly after the official opening of the Dave Ward Drive widening project. The crash occurred under “dark” lighting conditions at approximately 4:42 A.M. It occurred between South German Lane and the new connection with Center Street. Two vehicles were involved. The first vehicle was traveling WB and rolled over into EB traffic after striking the median curb. It was hit by an oncoming EB vehicle. Lab tests later revealed that the driver of the WB vehicle was alcohol impaired.

Post-Construction Crashes (11/1/2003-10/31/2006)

Crash Frequency	Not at Intersection					Total	At Intersection					Total	Grand
	Crash Severity						Crash Severity						
CollisionType	1	2	3	4	5		1	2	3	4	5		
Angle	1	0	4	1	11	17	2	4	19	31	35	91	108
Backing	0	0	0	0	0	0	0	0	0	4	3	7	7
Head On	0	0	0	0	0	0	0	0	0	0	1	1	1
Rear End	0	1	3	16	25	45	0	0	1	27	20	48	93
Sideswipe Opp. Dir.	0	0	0	0	1	1	0	0	0	1	2	3	4
Sideswipe Same	0	0	0	4	14	18	0	0	0	5	7	12	30
Single Vehicle Crash	0	0	3	1	1	5	0	0	4	2	6	12	17
Grand Total	1	1	10	22	52	86	2	4	24	70	74	174	260

Crash Severity: 1-fatal, 2-incapacitated injury, 3-nonincapacitated injury, 4-possible injury, 5-property damage

Two fatal crashes occurred at the signalized intersection of Dave Ward Drive and South German during 2006, each resulting in 1 fatality. These accidents occurred when left turning westbound traffic failed to yield to eastbound vehicles during a permitted phase of the traffic signal. The first of these crashes happened after the traffic signal had changed to yellow when the westbound vehicle turned pulled into the path of an eastbound motorcycle. The motorcyclist had changed lanes to avoid a stopping vehicle before entering the intersection and colliding with the left turning vehicle, causing the fatality of the motorcyclist. The second of these accidents happened when the left turning vehicle turned in front of opposing traffic and overturned, trapping the driver under the car. The driver of the left turning vehicle was found to be impaired.

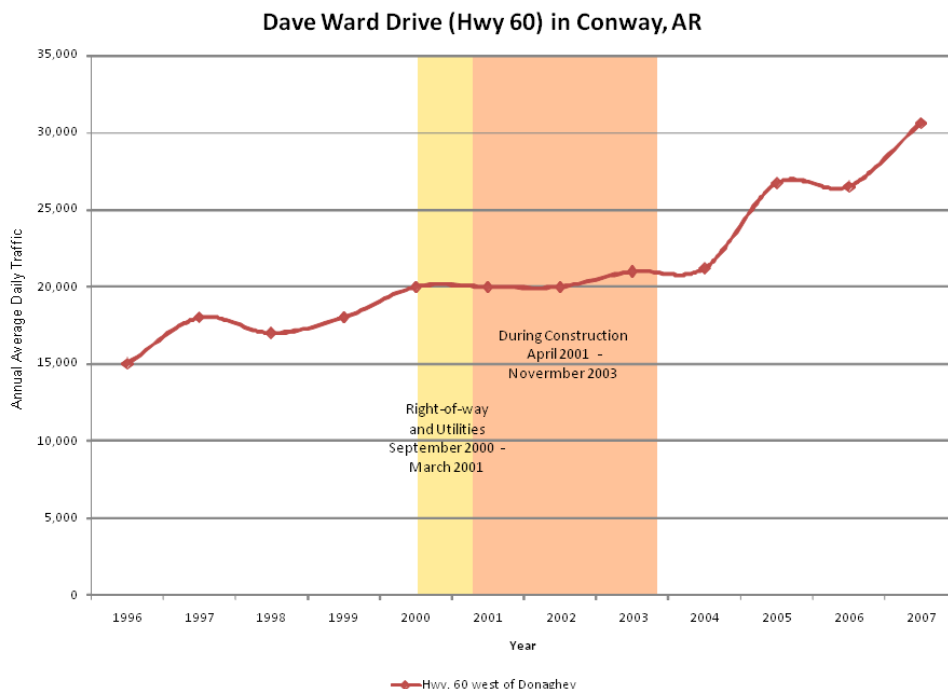
Among the types of collisions, 108 were “angle” crashes (74% increase), one “head on” (83% decrease), and 93 “rear end” (35% decrease). This is not surprising given that more turn movements are likely to be concentrated at median breaks (which are mainly at side streets) as evidenced by the 87% increase in the crashes that occurred “at intersecting street”. Due to this increase, further investigation revealed that only five crashes (2%) involved a vehicle trying to make a U-turn movement. The one “head on” collision occurred at Salem Road which is a major intersection along DWD. There was also one bicyclist related crash in 2005. No new traffic signals were installed as part of the roadway improvements.

Generally, midblock crashes were reduced and crashes at intersections increased, particularly at signalized intersections. For example, midblock crashes were reduced between Salem and Farris and between Ash and South German with the improvements. In fact, rear end collisions were drastically reduced whereas angle crashes increased in both segments. Note: a number of existing driveways between Ash Street and South German Lane were ‘grandfathered’ as part of the overall improvements. These driveways will be removed or relocated per spacing requirements of the adopted access management plan upon redevelopment.

Crash Rates

Another way of assessing the safety level along a roadway is by calculating a crash rate. Crash rates are often used to account for differences in traffic volume and time periods, which indicates the relative exposure to vehicles. The rate is a ratio of the number of crashes per year to the average daily traffic (ADT) per mile of roadway length, expressed as the number of crashes per million vehicle-miles (MVM) traveled. Chart shows the annual ADT at two locations within the project limits. From 1998 to 2006, traffic volumes increased 56% west of Donaghey. This represents an average annual increase of 7.0%, respectively. DWD is expected to have at least 32,000 vehicles per day by 2030.

The table on page 10 shows the crash rates for DWD for the three time periods evaluated. It also shows the serious crash rates (fatal plus incapacitated) in parenthesis. Interestingly, the overall crash rate on DWD has decreased 20% and the serious crash rate has decreased 83% from pre-construction.



Crash Rates Comparison (per million vehicle miles)

Facility	Pre Construction	During Construction	Post Construction
Dave Ward Drive (Hwy 60)	3.00 (0.40)	3.45 (0.14)	2.41 (0.07)

Economic and Comprehensive Costs to Society

Economic cost is an estimate of the productivity lost and expenses incurred due to crashes. Comprehensive cost is the economic cost plus what society is willing to pay to prevent these injuries. Typically, the comprehensive cost is used to determine a benefit cost ratio for evaluation of possible mitigation measures (Injury Facts, 2008). Table shows the economic and comprehensive costs for the before, during, and after construction injuries.

Economic and Comprehensive Costs to Society for DWD Crashes

Injury Severity	Pre Const.	Costs		Total
		Economic	Comprehensive	
Fatal	1	1,210,000	4,000,000	5,120,000
Incapacitating Injury	49	3,062,500	9,853,900	12,916,400
Non-Incapacitating Injury	29	588,700	1,490,600	2,079,300
Possible Injury	71	816,500	1,732,400	2,548,900
*Property Damage	569	4,665,800	1,251,800	5,917,600
Total	719	19,343,500	18,328,700	\$28,672,200
Injury Severity	During Const.	Costs		
		Economic	Comprehensive	
Fatal	2	2,420,000	8,000,000	10,420,000
Incapacitating Injury	10	625,000	2,011,000	2,636,000
Non-Incapacitating Injury	55	1,116,500	2,827,000	3,943,500
Possible Injury	216	2,484,000	5,270,400	7,754,400
*Property Damage	541	4,436,200	1,190,200	5,626,400
Total	824	11,081,700	19,298,600	\$30,380,300
Injury Severity	Post Const.	Costs		
		Economic	Comprehensive	
Fatal	4	4,840,000	16,000,000	20,840,000
Incapacitating Injury	8	500,000	1,608,800	2,108,800
Non-Incapacitating Injury	53	1,075,900	2,724,200	3,800,100
Possible Injury	262	3,013,000	6,392,800	9,405,800
*Property Damage	440	3,608,000	968,000	4,576,000
Total	767	13,036,900	27,693,800	\$40,730,700

*includes minor injuries for economic costs only

There were 719, 824, and 767 persons involved in crashes along DWD for pre, during, and post-construction conditions. This represents comprehensive costs of \$28.7 million (M), \$30.4 M, and \$15.4 M, respectively. However, there were 50 pre-construction serious injuries (fatal plus incapacitated) totaling \$18.1 M as opposed to the 12 post-construction totaling \$22.9 M.

Conflict Points

Since safety is a concern with any roadway project, it should always receive careful attention. Conflict points are points of potential vehicular, or pedestrian-vehicular, conflict in any roadway element (e.g. intersections, median breaks, curb cuts, etc.). Counting these conflict points is a way of identifying the potential number of incidents that could occur at these roadway locations. There are four types of vehicular conflict points: diverging, merging, weaving, and crossing (See Appendix B). The table below is divided into three possible facility types: existing, as designed, and a multilane arterial with a Two-Way-Left-Turn Lane (TWLTL). Conflict points were inventoried by counting the number of possible conflict points in each travel lane. Existing conditions consist of a two-lane, undivided roadway.

Facility Type	Vehicular	Ped.-Veh.	Total
2-Lane Undivided* (Existing)	1297	1330	2627
TWLTL*	1595	1540	3135
4-Lane Divided (As Designed)	920	1236	2156
% Difference w/Existing	-29	-7	-18
% Difference w/TWLTL	-42	-20	-31

*Driveways directly across from each other were treated as four-legged intersections.

The designed facility type is a four-lane roadway with a raised median, and with left turn bays at selected intersections and driveways along the corridor. It also has provisions for U-turn movements. Under the median designed facility type, all eligible median breaks were assumed to convert to four-legged intersections. The TWLTL facility type is a four-lane arterial with a continuous center turn lane. Note that under the existing and TWLTL facility types driveways directly across from each other were treated as four-legged intersections. The table shows that in comparison to the existing facility type, the proposed median design would result in an 18% reduction in total conflict points. The comparison also shows that the proposed design (raised median) would have 31% fewer conflict points than a roadway with a TWLTL. Both comparisons resulted in a 7% and 20% reduction in pedestrian-vehicular conflicts, respectively. Additionally, a TWLTL increases the crossing distance for pedestrians and therefore increases exposure time to vehicular traffic whereas a raised median provides a pedestrian refuge which allows them to safely cross one traffic stream at a time.

It is important to recognize that with the Dave Ward Drive (Hwy 60) Access Management Plan agreement in place the four-lane median divided (as designed) will only see marginal increases in the number of conflict points as new driveways are permitted. Whereas, under the TWLTL type (without an access management plan) the number of conflict points would dramatically increase as development occurs and new driveways are permitted.

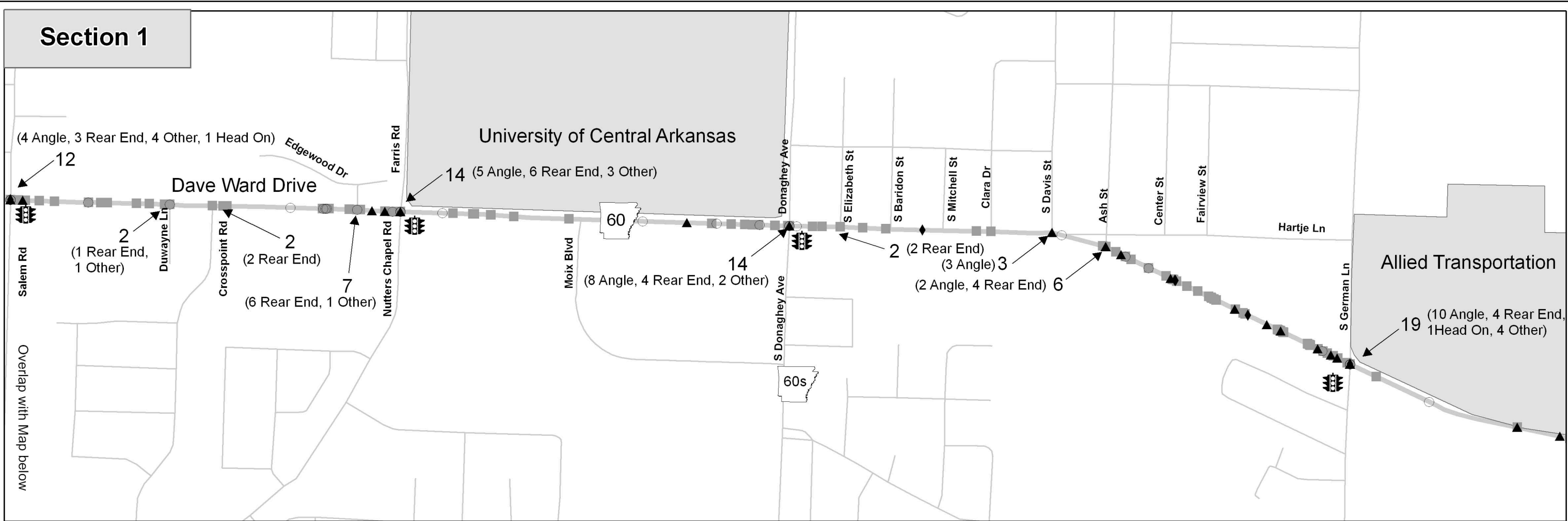
Conclusions

Dave Ward Drive was widened to a four-lane, median-divided roadway to improve traffic operations and roadway safety. An access management plan that regulates direct access was also adopted along with the widening project. The plan was aimed at protecting the capacity of the roadway while enhancing the safety of the corridor.

Has the widening/design improvements and supportive access management plan been successful in protecting the capacity of the roadway while enhancing the safety of the corridor?

The AADT increased up to 56%. The total number of crashes increased by 11, or 4%. The types of crashes changed substantially from predominately rear end crashes to angle crashes. The overall crash rate per million vehicle miles decreased 20%, while the serious crash rate decreased 83% even though the number of fatalities actually increased. Due to those increased fatalities however, the economic and comprehensive social costs of serious (fatal plus incapacitated) injury accidents increased 26.6%. The facility as designed decreased the number of conflict points 18%.

While this preliminary analysis shows improvement, it is too early to assess the true effectiveness of the improvements and/or the access management techniques employed.



Crashes On Dave Ward Drive

Pre-Construction
(4/1/1998 - 3/31/2001)

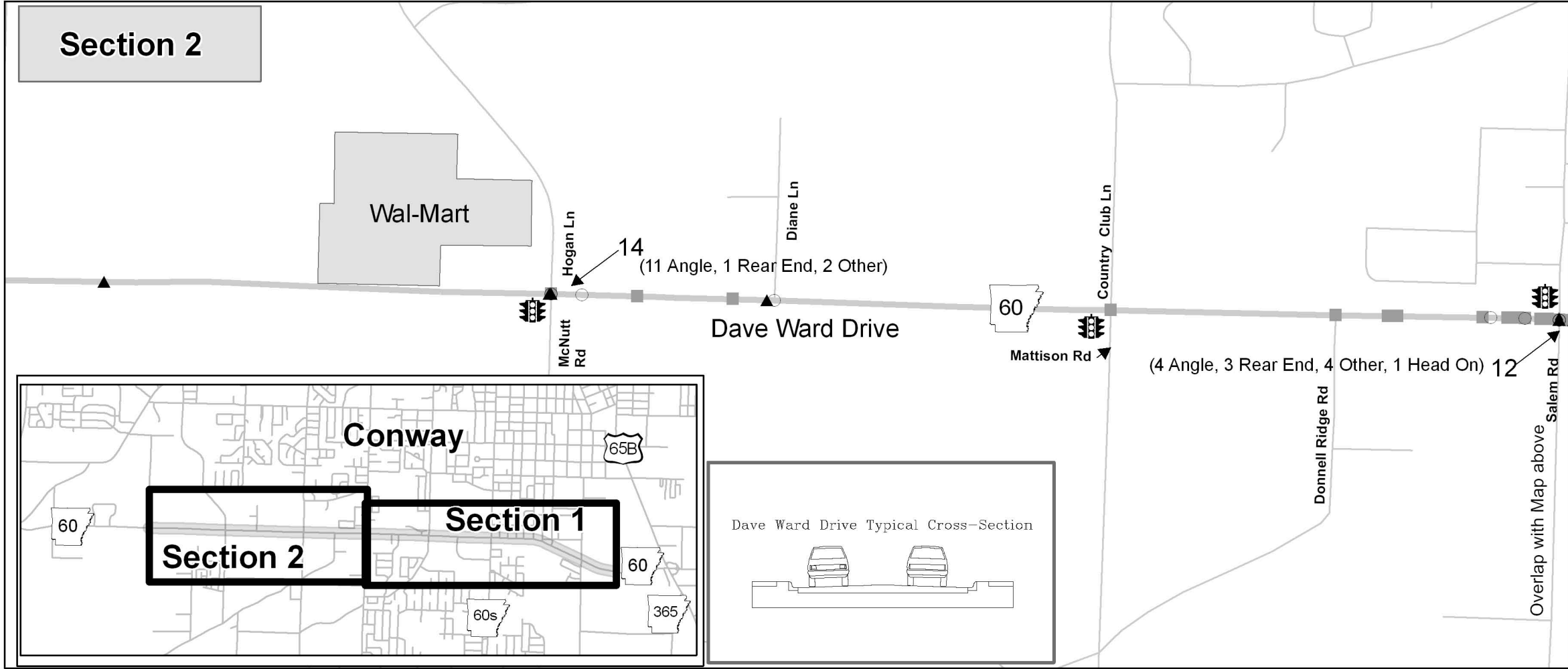
Collision Type

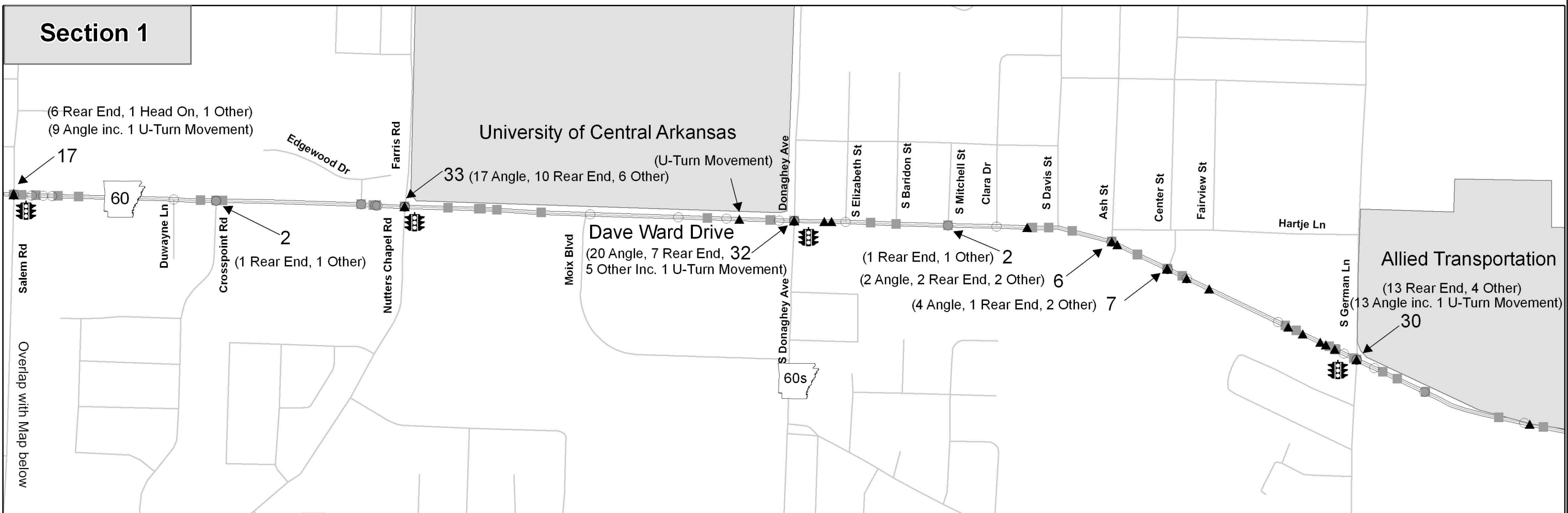
- ◆ Head On
- Rear End
- ▲ Angle
- Other
- Roads

0 0.125 0.25
Miles

N

Data Source:
Arkansas State Police Crash Data





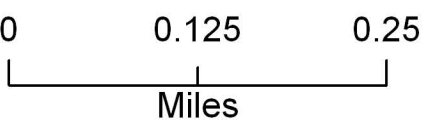
Crashes On Dave Ward Drive

Post-Construction
(11/1/2003 - 10/31/2006)

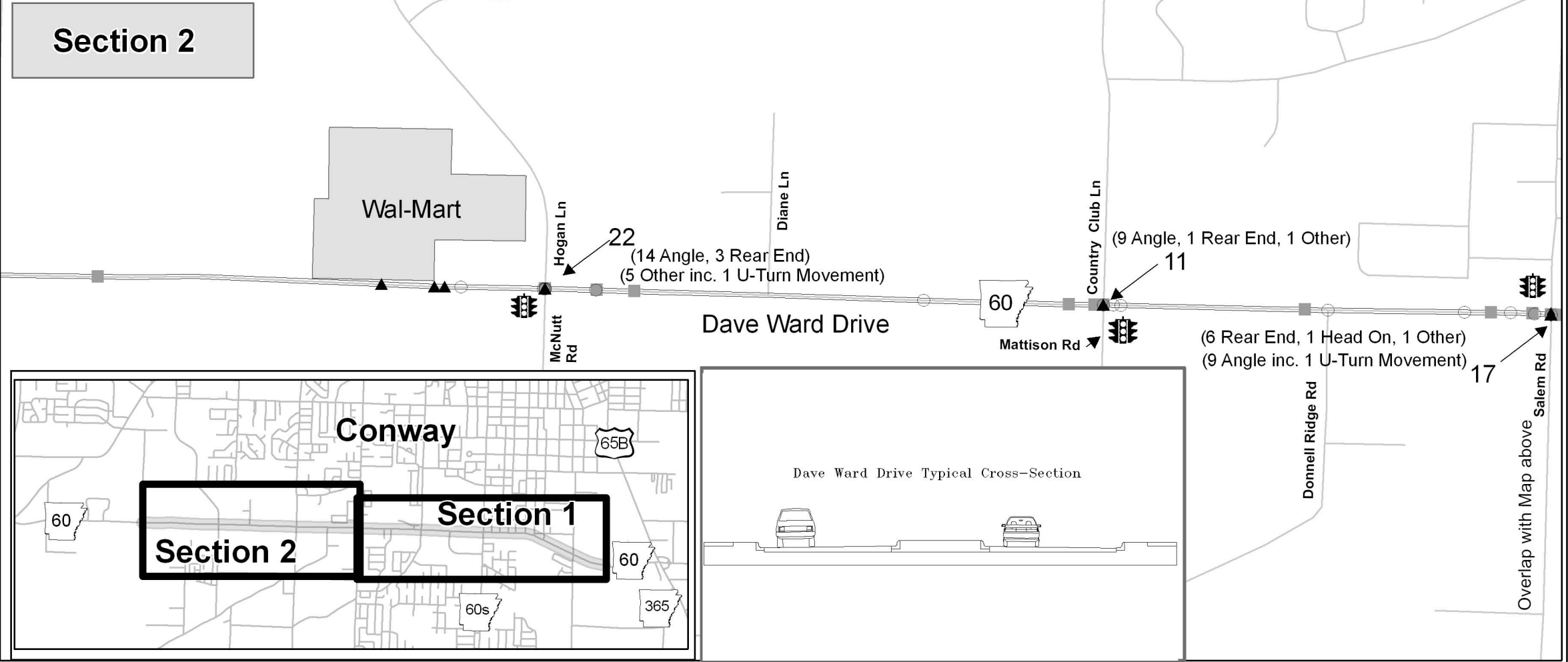
Collision Type

- ◆ Head On
- Rear End
- ▲ Angle
- Other

- Median Divided
- Roads



Data Source:
Arkansas State Police Crash Data



Appendix A

Dave Ward Drive Access Management Plan

ACCESS MANAGEMENT PLAN
For
STATE HIGHWAY 60/DAVE WARD DRIVE

- I. **PARTIES** – This agreement is made between the City of Conway (the City), the Arkansas State Highway Commission (the Commission) acting through the Arkansas State Highway and Transportation Department (the Department) and Metroplan as the designated metropolitan planning organization for central Arkansas under federal transportation regulations (the MPO).
- II. **ROUTE** – This access management agreement pertains to State Highway 60, also known as Dave Ward Drive, from the overpass at Harkrider (State Highway 365) west to the Arkansas River, (the Roadway). For the purposes of this agreement, the route is divided into two segments. See Appendix A. Route Map.
- A. Segment I from SH 365 to Tucker Creek is subject to a Specific Access Management Plan as contained in Appendix B.
- B. Segment II from Tucker Creek to the Arkansas River is subject to a General Access Management Plan as contained in Appendix C.
- III. **STATEMENT OF PURPOSE** – Highway 60/Dave Ward Drive is a principal arterial on the City master street plan and serves as an intra-regional arterial roadway connecting the City to its economic region. The primary purpose for this agreement is to protect the capacity of the roadway to carry significant local and intra-regional traffic. The secondary purpose is to increase the safety for drivers and pedestrians that use this facility. It is the intent of this agreement to provide access to abutting properties consistent with the primary and secondary objectives.
- IV. **AUTHORITY** – Both the City and the Commission have specific legal authority to regulate access to public roads. In the case of the City, it is found in Arkansas Code Annotated 14-56-419. In the case of the Commission, it is found in Arkansas Code Annotated 27-65-107. The MPO is hereby granted standing in this access management agreement by the City and the Commission in consideration of the financial

contribution which the MPO contributed to improvements on the Roadway and in recognition of its role in transportation planning within the metropolitan area.

V. ACCESS PLAN – Management of access to the roadway is necessary to achieve both the primary and secondary purposes of the agreement. The access management plan (the Plan) is detailed in Appendices B and C. The Plan for Segment I is a Specific Access Management Plan in which all median breaks and curb cuts are specifically identified. Standards for driveways are established to be applied during plat review prior to development approval by the City. In addition, local street networks, property interconnect agreements and requirements, new local roadways developed as part of this project and land use and zoning plans that are necessary to achieve the objectives of this agreement are specified in this Specific Plan. The Plan for Segment II is a General Access management Plan which specifies the typical roadway cross-section, right-of-way requirements, the location of median breaks and standards for location and construction of driveways.

VI. AGREEMENT ADOPTION/TERMINATION/MODIFICATION – This agreement will be deemed adopted when passed in identical form by the Conway City Council, the Metroplan Board of Directors and the Arkansas State Highway Commission and signed by their proper representatives. This agreement may be terminated or modified, in whole or in part only by mutual agreement of all of the parties as evidenced by resolutions adopted by each governing body.

VII. PLAN ADMINISTRATION –

A. Permit Application. A permit issued by the Department will be required for new driveway access to the Roadway. Any legal person owning property abutting the Roadway may request a driveway access permit. The permit will be requested through a designated administrative process from the City of Conway. The applicant is required to submit a detailed plan for the driveway including a map showing its exact location and a design that shows the curb radii, driveway throat length and that specifies the projected volume of turns into and out of the driveway. Any joint access agreements with other property owners should also be submitted.

After review of the application, the City determines whether the request is within the allowable parameters established by the Plan. If so, the City communicates the request to the MPO for review and approval. Upon MPO approval, the City will submit the application to the Department for review and approval. If the City and the MPO have approved the application as evidenced by the signatures of properly designated administrative representatives and if the application meets all Department criteria for issuance of such a permit, the Department will issue a permit to the applicant. If the signatures of any of the parties to this agreement are missing from the permit application, the Department will not issue a permit.

If any of the parties determine that the request is not within the allowable parameters of the Plan, that party will deny the request and instruct the applicant how they may amend the request to receive approval or that they may seek to amend the Plan pursuant to the following section.

B. Amending the Plan.

A Plan amendment will be considered at the request of any of the parties to this agreement or at the request of an applicant whose permit request has been denied by any of the parties.

The proposed amendment must be adopted in identical form by the Conway City Council, the Metroplan Board of Directors and the Arkansas State Highway Commission to become effective.

Pursuant to Resolution No. 99-60 of the Conway City Council approved on the 23rd day of November, 1999 and Ordinance 0-00-38 approved on 11th day of April, 2000.

Tab Townsell, Mayor

Pursuant to Resolution No. 99-34 of the Metroplan Board of Directors approved on the 15th day of December, 1999.

Judge John Wayne Carter, President

Pursuant to Minute Order No. 2000-021 of the Arkansas State Highway Commission approved on 11th day of January, 2000.

Dan Flowers, Director
Arkansas Highway and Transportation Department

APPENDIX A

HIGHWAY 60/DAVE WARD DRIVE DESIGN CONCEPT

As a principal arterial, the proposed design for Highway 60 is intended to balance the need to provide for long distance travel on the roadway and reasonable access to abutting properties while at the same time maintaining the capacity of the roadway to operate in a safe and efficient manner. Consequently, access to abutting property is subordinate to the goal of traffic movement and subject to necessary management of entrances and exits.

Definitions –

Full directional breaks - breaks in which vehicular movements, including left turns, are allowed from all directions of a four-point intersection (see diagrams).

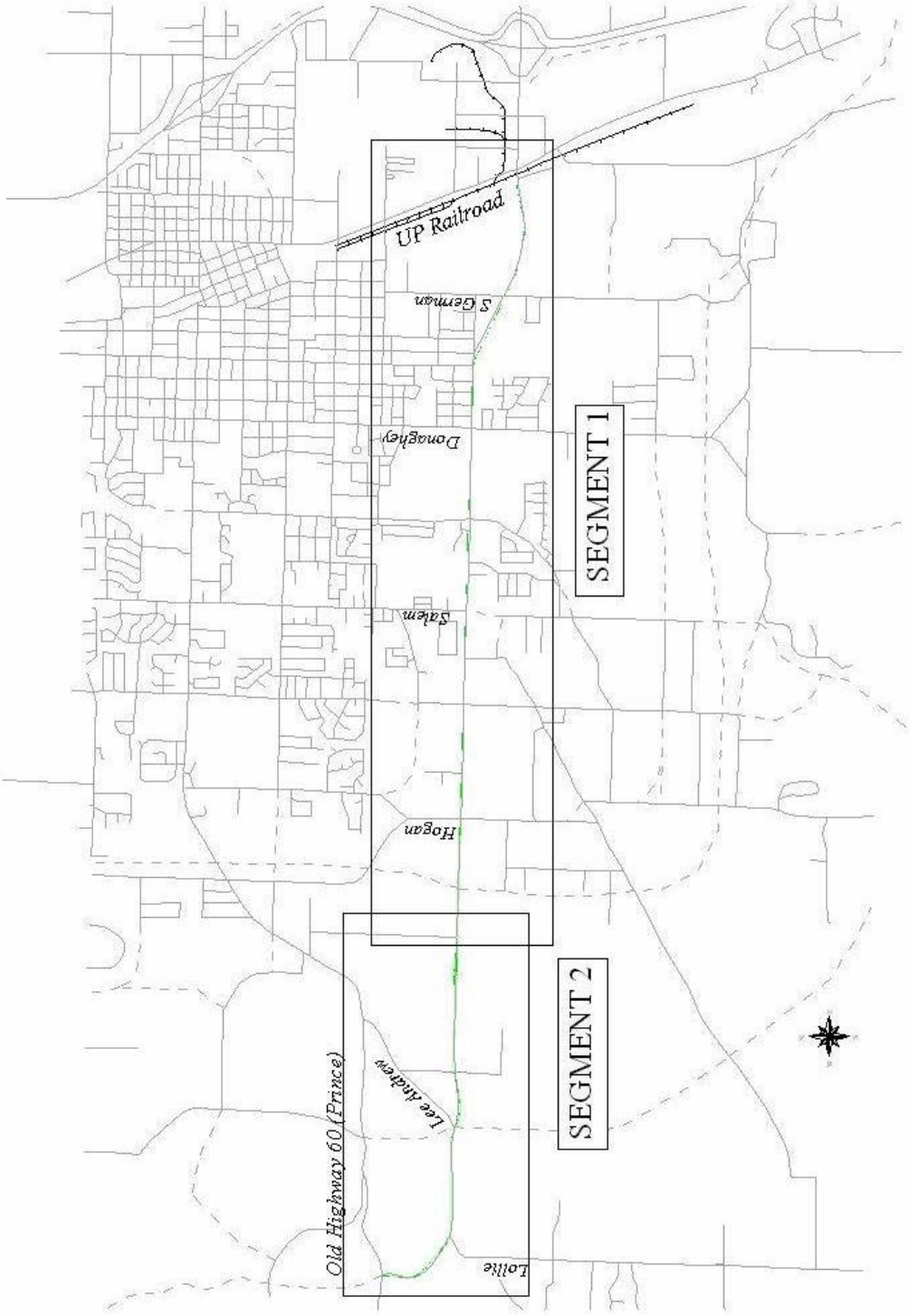
Partial directional breaks - breaks in which vehicular movements, including left turns, from one or more directions are unavailable (see diagrams).

Bi-directional quick turnarounds – breaks which allow passenger vehicles to negotiate U-turns from opposing directions only (see diagrams).

Left-only directional turn bays - breaks which allow protected left-only turns from the main travel lanes into existing commercial areas (see diagrams).

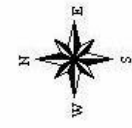
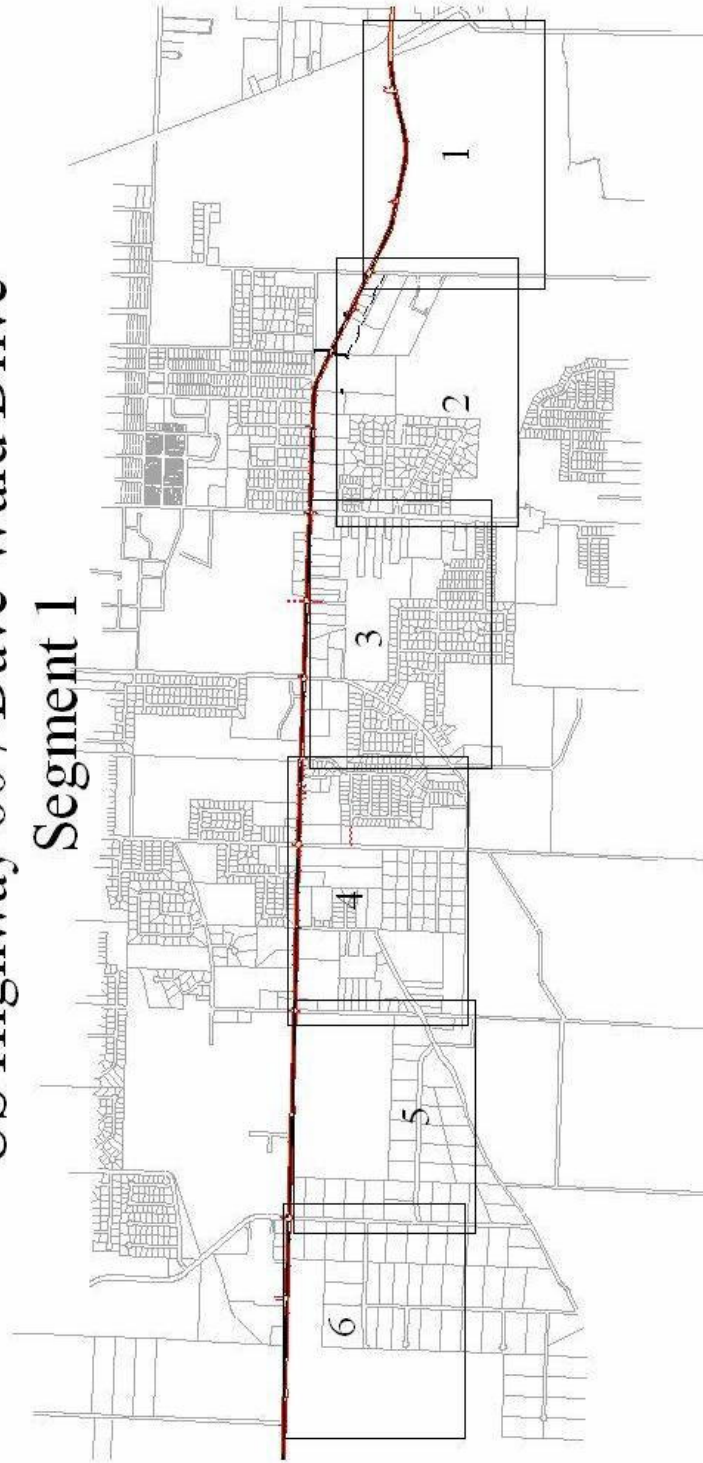
(See route map on following page)

APPENDIX A - ROUTE MAP



APPENDIX B

Index Sheet for US Highway 60 / Dave Ward Drive Segment 1



6	5	4	3	2	1
MAP SHEET INDEX					

SEGMENT 1 - UPRR OVERPASS to TUCKER CREEK BRIDGE

General design framework – Raised median-divided facility with median breaks spaced at ¼ mile intervals; left-only turn bays at selected locations generally at 1/8 mile spacing, and traffic signals generally spaced at ½ mile intervals. Future signal locations will be determined by meeting warrants, on a case by case basis. Typical cross-section is four lane divided on 100' right-of-way.

Specific Design Elements

15' Raised Median-divided facility

Driveway Spacing of 300 feet.

½ Mile Traffic Signal Spacing

Quick turn-around (bulb-out) design at most median breaks to allow U-turns.

Nineteen (19) Median Breaks (identified by number MB# on the attached map)

- Seven (7) full directional breaks at the following:

Six (6) Existing intersections:

MB#2-S. German Road,
MB#6-Donaghey Street,
MB#8-Farris/Nutter Chapel Road,
MB#11-Salem Road,
MB#14-Country Club/Mattison Road, and
MB#16-Hogan Road.

One (1) Future intersections:

MB#4-S. Center Street Intersection.

- Five (5) partial directional breaks at the following locations:
(Eligible for retrofits to full directional breaks only after meeting signal warrants)
MB#1-Amtran Parking Lot,
MB#7-UCA Entrance,
MB#9-Crosspoint Road,
MB#13-Donnell Ridge Road, and
MB#18-Wal-Mart west entrance.

- Two (2) interim bi-directional quick turnarounds at the following locations: (Eligible for retrofits to partial directional breaks when area development warrants)
MB#15-midway between Salem Rd & Country Club/Mattison Road, and
MB#19-just east of the Tucker Creek Bridge. And,
- Five (5) left-only directional turn bays (generally at 1/8 mile spacing) proposed as mitigation for existing businesses or institutions at the following selected locations: (Left-only directional turn bays are proposed with certain conditions and are not eligible for retrofits of any kind, except closure or removal.)
MB#3-between S. German Road and S. Center Street Int.,
MB#5-at Clara Street,
MB#10-between Crosspoint Road and Salem Road,
MB#12-between Salem Road and Donnell Ridge Road,
MB#17-between Hogan Road and the Wal Mart west entrance.

CONCEPT SPECIFICS OF EACH MEDIAN BREAK

-SECTION A- UPRR OVERPASS to S. GERMAN ROAD -

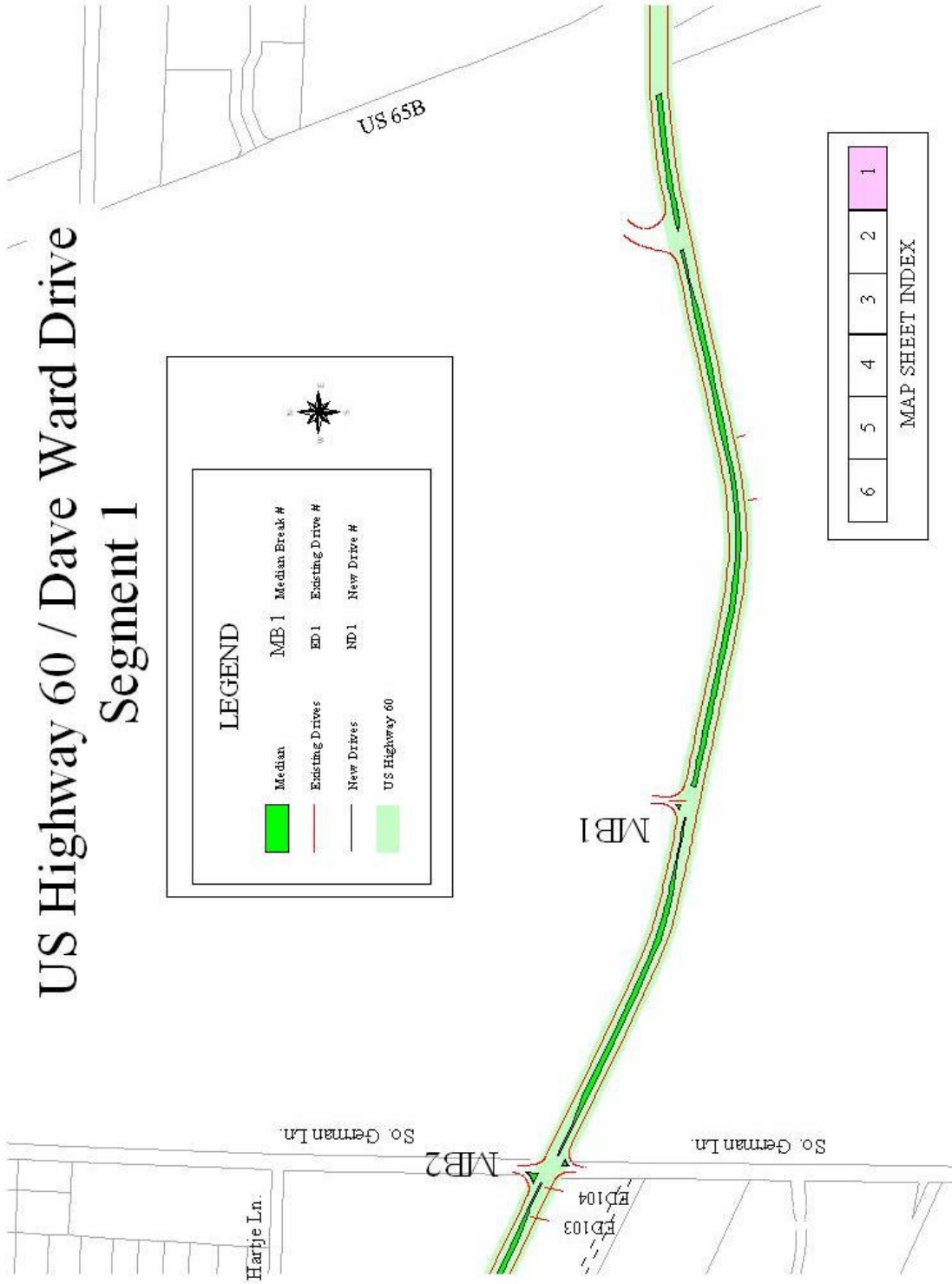
MB #1 – Amtran Parking Lot – Partial directional break –

Rationale - Proposed break serves existing industrial parking lot. Due to a possible plant expansion, Amtran officials have indicated that, at some point in the future, the current employee parking lot may need to be relocated eastward in order to connect more directly with planned development along the south side of the highway. If, or when that happens, MB#1 could be moved eastward to serve the new development scheme. Due to existing conditions, this break is the only partial directional break where a warranted signal may be installed prior to retrofitting the break to a full directional break.




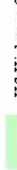
Conditions- In no case shall more than one median break exist between the current Amtran/Railroad overpass entrance (which will be closed in the future if a similar access road is developed on the south side of the highway) and S. German Road, nor violate the required ¼ mile break spacing.

Financial Responsibilities - Funding for the relocation of the proposed median break to another location eastward is the responsibility of the City of Conway and/or Amtran.

US Highway 60 / Dave Ward Drive Segment 1



LEGEND

	Median		Existing Drives		New Drives		US Highway 60
	Median Break #		Existing Drive #		New Drive #		
	MB 1		ED 1		ND 1		

North Arrow

6	5	4	3	2	1
MAP SHEET INDEX					

-SECTION B- S. GERMAN ROAD to DONAGHEY ROAD -

MB #2 – S. German Road - Full directional break, with quick turnarounds

Conditions – Existing driveways along Hwy. 60 closer than 125 feet from the radius of the new intersection may be closed.

MB #3 – Left-Only directional turn bay –

Rationale - A left-only directional turn bay is proposed in this segment of the roadway solely in an effort to minimize impacts on existing businesses, yet maintaining the overall integrity of the roadway to operate safely and efficiently. Due to the 1/8 mile minimum spacing requirements, a turning bay is proposed for only one side of the roadway. The directional turn bay to the north serves a recently completed commercial shopping center development and an existing commercial property immediately to the east. This option also provides connectivity through the new shopping center to Hartje Street to the north.

Conditions - The property owner of the new shopping center on the north side agrees with moving the eastern driveway (ED#4) as far as possible to the east in order to meet the distance requirements of the proposed left-only directional turn bay from the Center Street intersection, and to entering into an access agreement with the property owner to the east for joint-use of the newly relocated driveway. Likewise, the property owner to the east of the new shopping center agrees to the closure of his western driveway (ED#3) for replacement with a connecting driveway (ND#1) to the new joint-access driveway.

Financial Responsibilities – Because of a drainage issue between these properties, AHTD agrees to design and build the roadway drainage infrastructure adequate to make construction of the connecting driveway between the north side properties possible. Funding for construction of the connecting driveway (ND#1) between the two properties discussed in above is an access mitigation issue and the responsibility of Metroplan. Regardless which option is chosen, the City of Conway agrees to pursue joint-access agreements and development of connecting

driveways with property owners along the south side of the roadway during their normal platting and redevelopment processes.

MB #4 - S. Center Street Intersection – Full directional break, with quick turnarounds –

Rationale - This full directional intersection and supporting local street connection are proposed for this location in an effort to address major issues related to accessing two existing commercial establishments and an adjacent mobile home park, yet maintaining the overall median break spacing requirements of the project.

Conditions -The commercial and mobile home park property owners agree to the necessary closure, relocation and consolidation of driveways to accomplish development of this intersection and supporting local street connects. This means that driveways along Hwy. 60 closer than 125 feet from the radius of the new intersection may be closed (ED#6, ED#96, ED#97 & ED#98). If required, the closure and consolidation of driveways (EDs# 97 & 98) for the Satterfield property will provide a single right-in, right-out driveway centered on the intersection of a line extending from the apex of the canopy roof with the highway right-of-way.

Access to this intersection from the funeral home located approximately 600 feet to the west is very important in order to retain their ability to direct funeral processions westward onto Hwy. 60. Both, the owner of the funeral home and owner of the mobile home park, agree to enter into a joint-access agreement which allows for the construction of a connecting driveway (ND#2) from the southwest corner of the funeral home property onto the mobile home park property and the joint-use of the mobile home park street which connects to the supporting local street and new intersection.

Additionally, the owner of the mobile home park requests (a) landscaping on the west side of the supporting local street be included as part of the project in order to screen the mobile

home park from lights of the commercial development to the east and (b) the rezoning of land immediately south of the existing mobile home park to allow for the relocation of mobile homes displaced by the widening of Hwy. 60 be approved by the City of Conway.

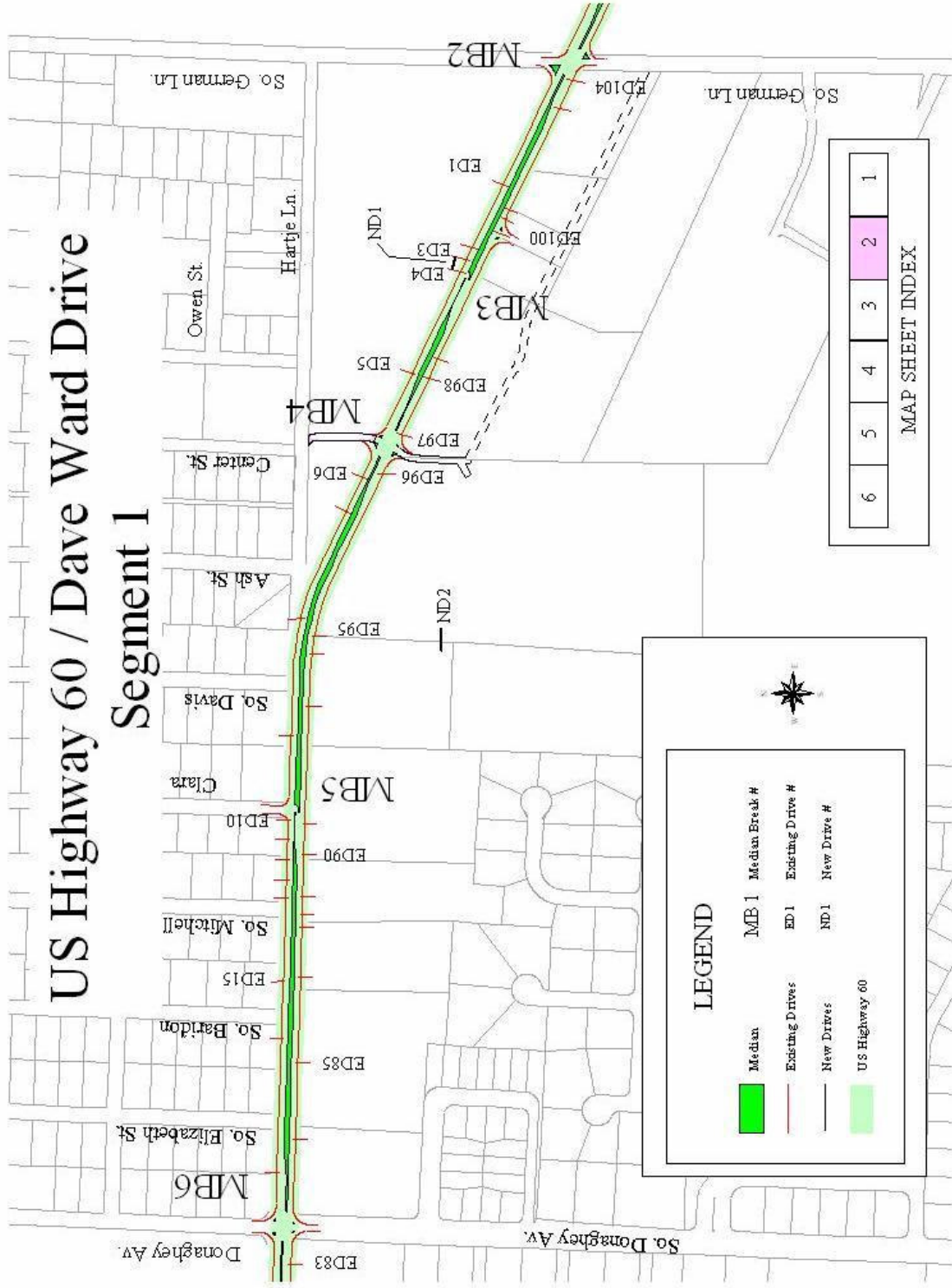
Financial Responsibilities - Metroplan agrees to provide funding for development of the supporting local street, the funeral home/mobile home connecting driveway (ND#2) and landscaping materials matched by the City of Conway on an 80/20 ratio. Besides the matching requirements, the City of Conway agrees to provide the labor necessary for the landscaping effort and to consider the request for rezoning as expeditiously as possible. AHTD agrees to design the supporting local street component as an integral part of the Hwy. 60 project.

MB #5 – Left-Only directional turn bay to the north, with quick turnaround at Clara Street –

Rationale - This median break is proposed as described above, rather than a full directional break, in an effort to balance the need for providing multiple travel options to the departing traffic from the churches located along the south side of the highway tempered by the desire to minimize the impact of through traffic on the residential neighborhood to the north as much as possible.

US Highway 60 / Dave Ward Drive

Segment 1



LEGEND

- Median
- Existing Drives
- New Drives
- US Highway 60
- MB 1 Median Break #
- ED 1 Existing Drive #
- ND 1 New Drive #



MAP SHEET INDEX

6	5	4	3	2	1
---	---	---	---	---	---

**-SECTION C- DONAGHEY ROAD to FARRIS/NUTTERS
CHAPEL ROAD -**

MB #6 - Donaghey Road - Full directional break, with quick turnarounds-

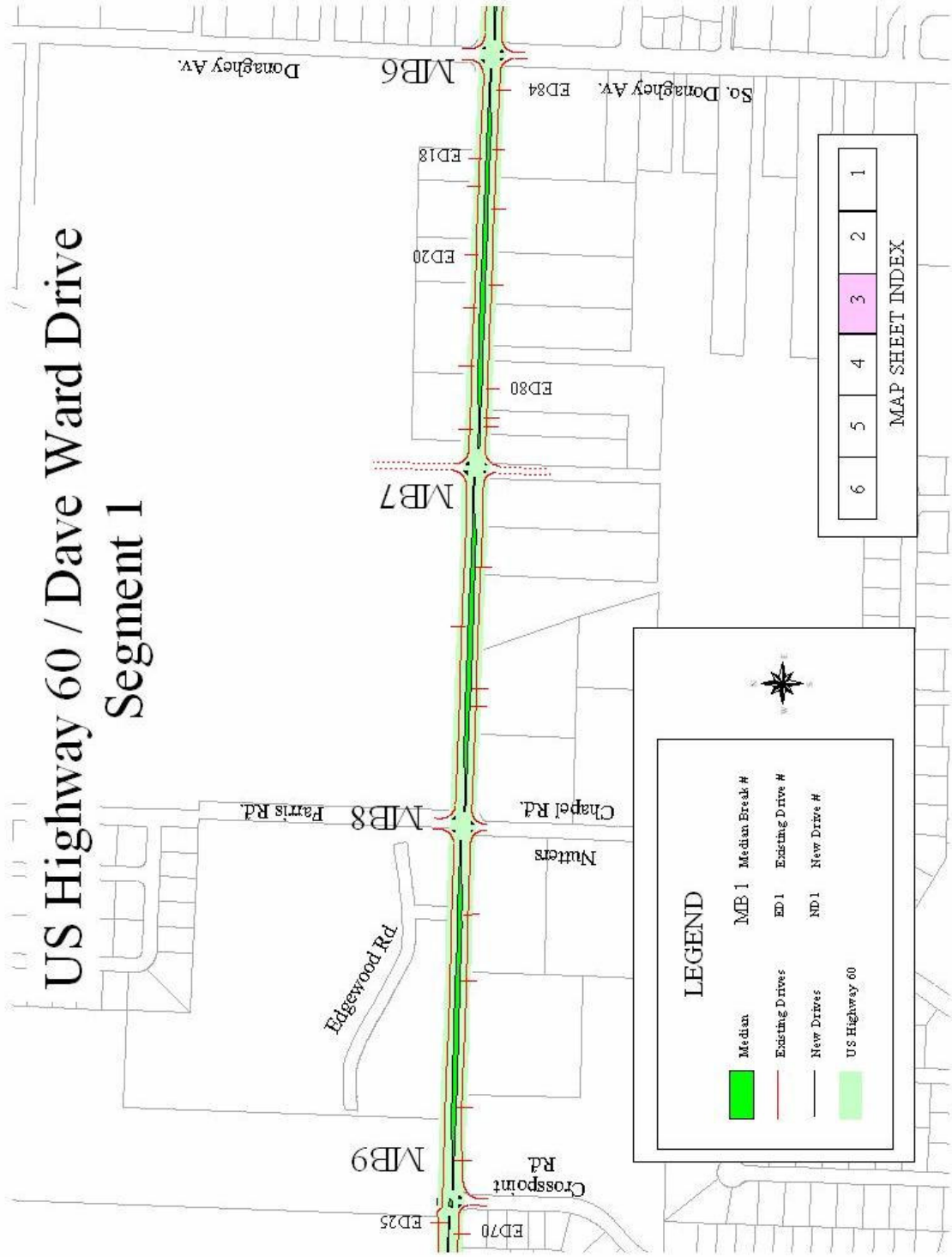
Conditions – Existing driveways along Hwy. 60 closer than 125 feet from the radius of the new intersection may be closed.

MB #7 - UCA Entrance - Partial directional break, with quick turnarounds-

Rationale - Proposed midway between Donaghey Road and Farris/Nutters Chapel Roads in an effort to align an already approved street access from the south side of the highway with a proposed new UCA entrance on the north side. The break can be retrofitted to a full directional break after traffic signal warrants are met.

Conditions - UCA agrees to align their new street with the proposed median break. Existing driveways along Hwy. 60 closer than 125 feet from the radius of the new intersection may be closed.

US Highway 60 / Dave Ward Drive Segment 1



-SECTION D- FARRIS/NUTTERS CHAPEL ROAD to SALEM ROAD -

MB #8 - Farris/Nutters Chapel Road - Full directional break, with quick turnarounds –

Conditions – Existing driveways along Hwy. 60 closer than 125 feet from the radius of the new intersection may be closed.

MB #9 – Crosspoint Road – Partial directional break, with quick turnarounds –

Rationale - Since development does not currently exist on the north side of the highway, this median break is proposed as a partial directional break, with quick turnarounds. The initial phase will not provide for left turns from Crosspoint Road onto Hwy. 60. The break can be retrofitted to a full directional break after traffic signal warrants are met.

Conditions - The owner of property immediately to the north of the break agrees to replatting an already approved residential subdivision in order to realign the new street with the proposed median break. Alignment of this new street with the median break can facilitate future joint-access agreements with adjoining property owners to the west. Currently, the owner of property immediately to the north of the break is unwilling to enter into joint-access agreements with other property owners due to a history of problems associated with residents from the adjacent mobile home park.

MB #10 – Left-Only directional turn bay to the south -

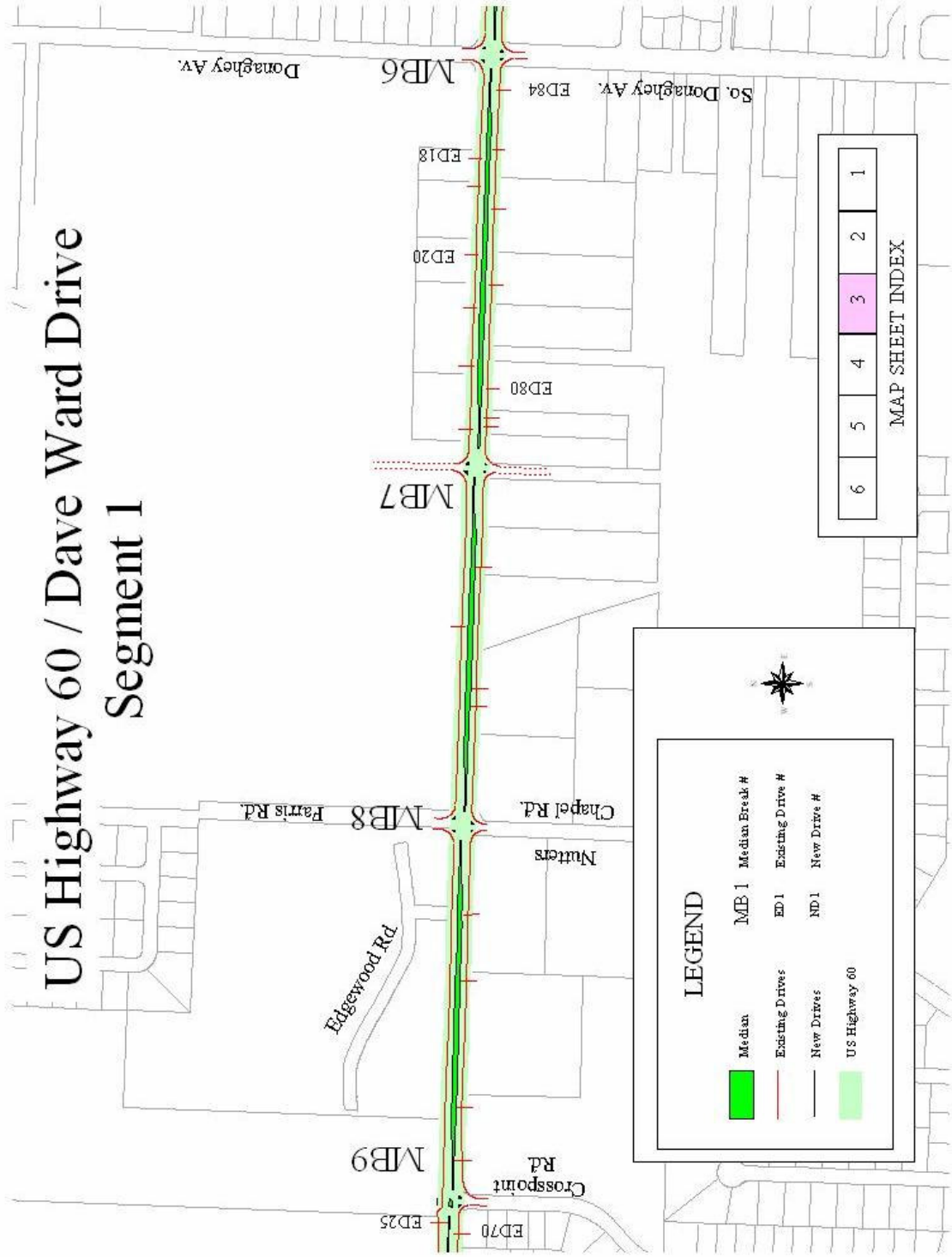
Rationale - This break is proposed to serve existing commercial development along the south side of the highway. The driveway aligned with the break will be sited midpoint on the property line between the two major property owners so that joint-access to both properties can be achieved with one median break. Development of the new driveway will necessitate the removal and consolidation of several existing driveways (ED#63-ED#67)and require joint-access agreements between the two

landowners. One of the property owners supports the proposal, while the other believes that the proposed break does not provide the access required of his business.

Staff believes the proposal does provide reasonable access to both properties while maintaining the general spacing principles held along the entire facility. The mobile home park property owner on the north side of the roadway is not satisfied with the proposed left-only directional break to the south, fearing access problems for mobile homes. However, if joint-access agreements can be worked out in the future with property owners along the north side to the east for joint access to the full directional break at Crosspoint Road, his concerns would be alleviated.

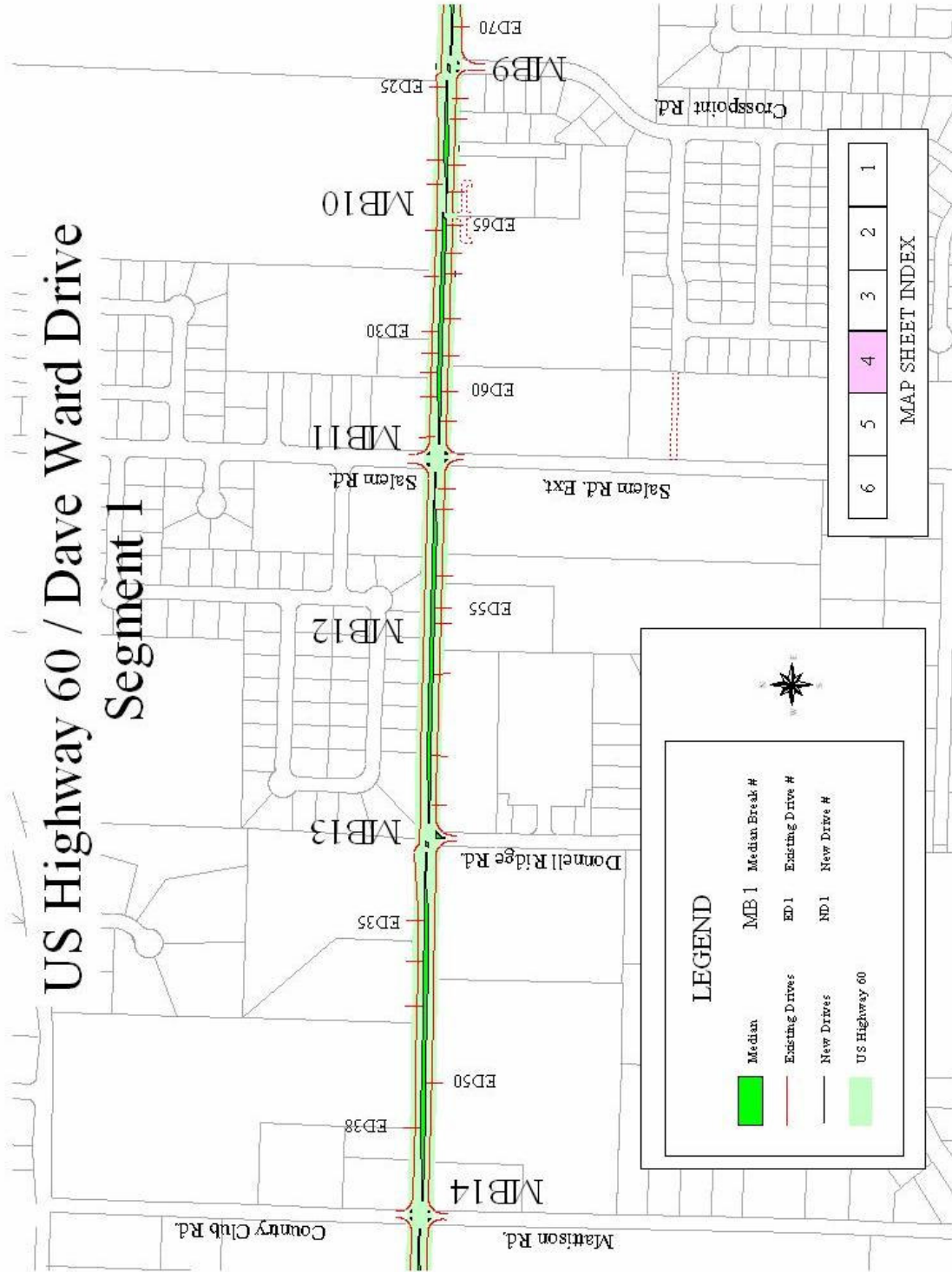
Conditions - Inclusion of this left-only directional median break and joint driveway is predicated on the willingness of the two property owners to enter into a joint-access agreement with each other and their concurrence with any necessary driveway closures and consolidations on their properties. The City of Conway agrees to pursue the issue of joint-access agreements or easements for properties along the north side of the highway through their normal platting and subdivision review processes.

US Highway 60 / Dave Ward Drive Segment 1



US Highway 60 / Dave Ward Drive

Segment I



SECTION E- SALEM ROAD to COUNTRY CLUB/MATTISON ROAD -

MB #11 - SALEM ROAD – Full directional break, with quick turnarounds –

Conditions –Existing driveways along Hwy. 60 closer than 125 feet from the radius of the new intersection may be closed.

MB #12 – Left-Only directional turn bay to the south –

Rationale - This median break is proposed to serve existing commercial development.

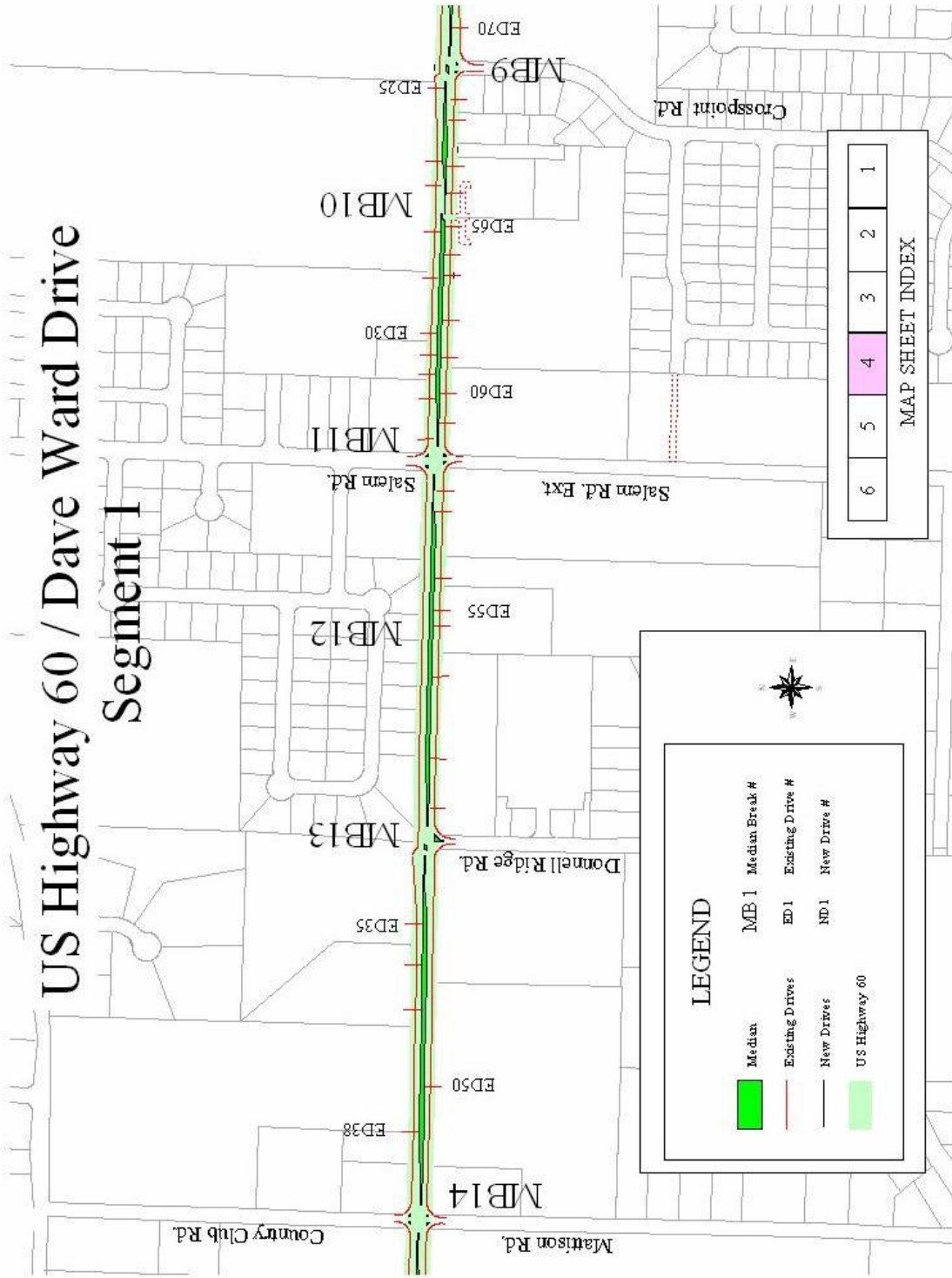
Conditions - The break is depicted on the map by number only (MB#12) since its development is conditional. Although the distance requirement of 1/8 mile for the directional break is achieved, in order to actually develop the median break the problem with sight distance on the hillside must be remedied. However, the practicality of providing this break is problematic. Actual determination as to whether the break can be provided cannot be made until design of the facility is completed.

MB #13 – DONNELL RIDGE ROAD – Partial directional break, with quick turnarounds –








Rationale - Since no development currently exists on the north side of the highway, this median break is proposed as a partial directional break, with quick turnarounds. Due to sight distance issues on the hillside, the initial phase of this intersection will not provide for left turns from Donnell Ridge Road onto Hwy. 60. This break can be retrofitted to a full directional break after traffic signal warrants are met.

US Highway 60 / Dave Ward Drive


Segment I



LEGEND

	Median		US Highway 60
	Existing Drives		Existing Drive #
	New Drives		New Drive #
	Median Break #		

MB 1
ED 1
ND 1



MAP SHEET INDEX

6	5	4	3	2	1
---	---	---	---	---	---

-SECTION F- COUNTRY CLUB/MATTISON ROAD to HOGAN ROAD -

MB #14 – Country Club/Mattison Road – Full directional break, with quick turnarounds –

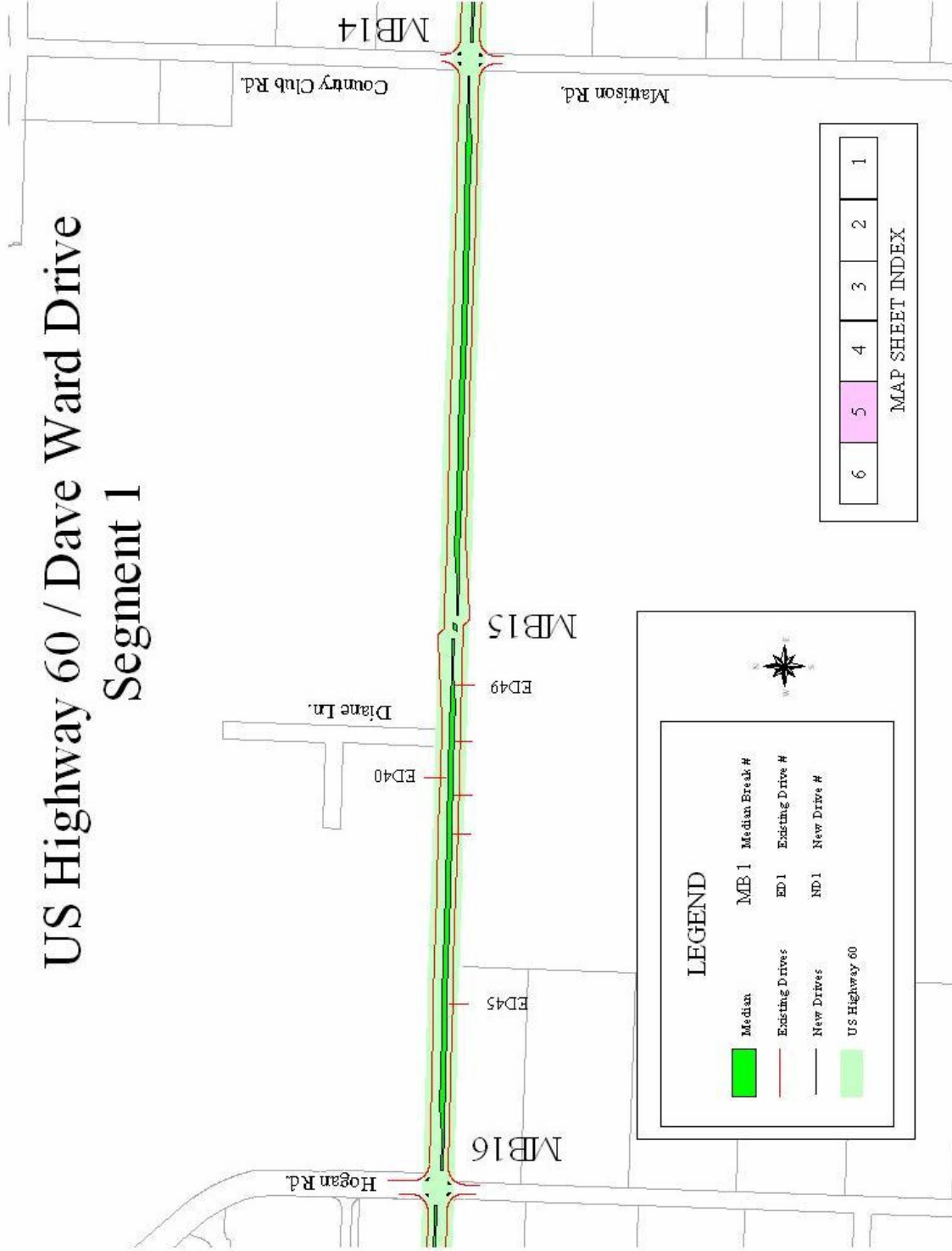
Conditions – Existing driveways along Hwy. 60 closer than 125 feet from the radius of the new intersection may be closed.

MB #15 – Midway between Country Club Road and Hogan – Bi-directional quick turnaround –

Rationale - Since no development exists on either side of the highway, this median break is proposed as a bi-directional quick turnaround only. The break can be retrofitted to a partial directional break when development within the area warrants and to a full directional break after traffic signal warrants are met.

Financial Responsibilities - The City of Conway agrees to pursue joint/access issues for properties within this segment through their normal platting and subdivision processes.

US Highway 60 / Dave Ward Drive Segment 1



LEGEND

	Median		Median Break #
	Existing Drives		Existing Drive #
	New Drives		New Drive #
	US Highway 60		

North Arrow

MAP SHEET INDEX

6	5	4	3	2	1
---	---	---	---	---	---

-SECTION G- HOGAN ROAD to TUCKER CREEK BRIDGE -

MB #16 - Hogan Road – Full directional break, with quick turnarounds –

Conditions – Existing driveways along Hwy. 60 closer than 125 feet from the radius of the new intersection may be closed.

MB #17 - Temporary Left-Only directional turn bay to the south –

Rationale - This break meets the required 1/8-mile spacing requirements and is proposed to serve an existing truck repair facility.

Conditions - This proposal requires the closure and relocation of the existing driveway onto the property (ED#43) to align with the proposed median break. As agreed to by the owner of this property, this left-turn bay is proposed as a temporary access for the trucking facility only and would be removed in the event that the truck repair facility ceases operation. Should a major vehicular turnaround be constructed during the next widening phase of Dave Ward Drive west of Tucker Creek, the temporary access turn bay will be closed if (1) determined to be an unnecessary duplication and (2) if reasonable access to the truck repair property would not be significantly impacted.

MB #18 - Wal Mart west entrance – Partial directional break –

Rationale - This break is proposed so as not to allow left-turns onto Hwy. 60 in order to reduce the possibility of a future signal at this location. However, the break can be retrofitted to a full directional break after traffic signal warrants are met.

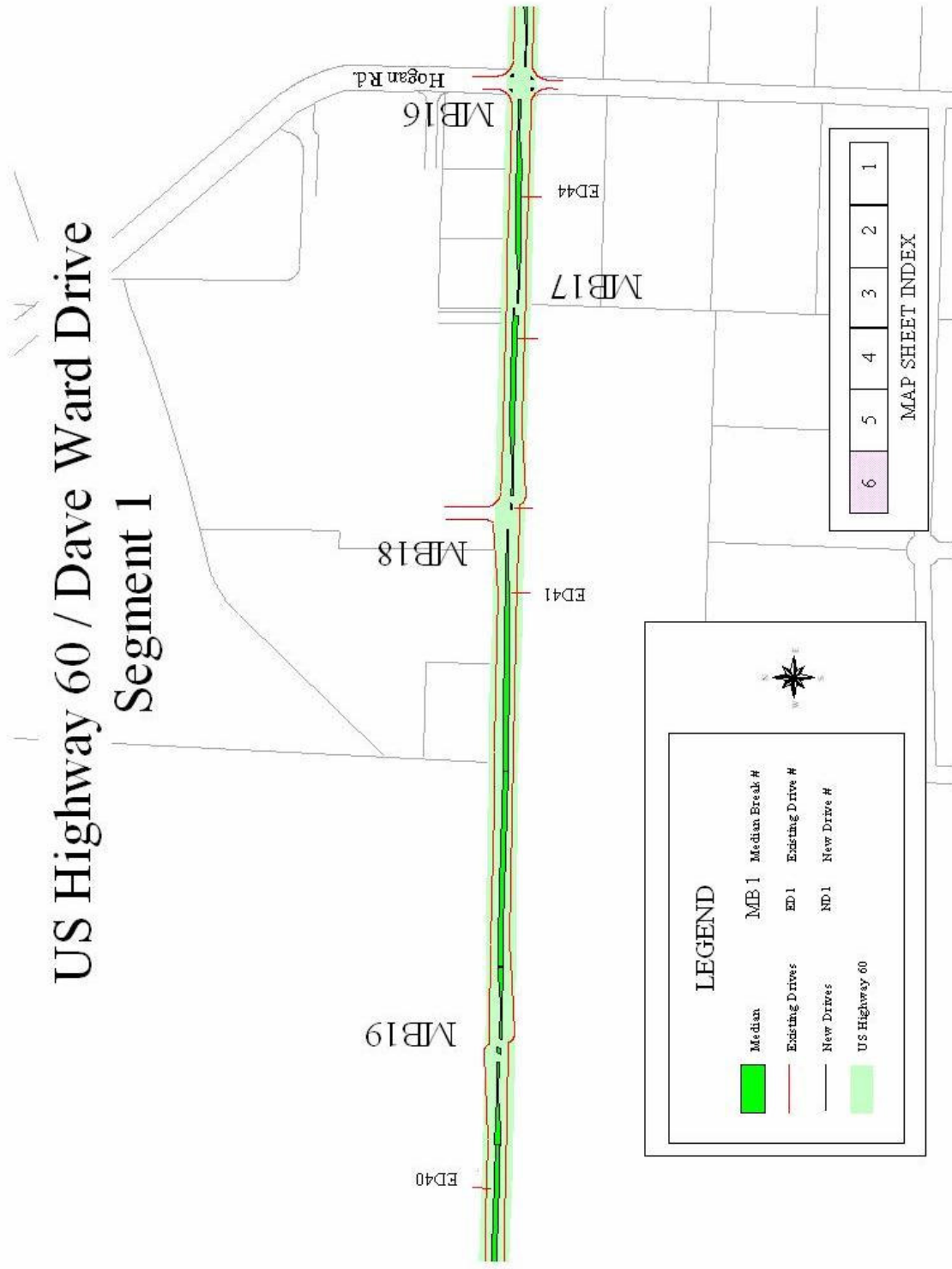
MB #19 – Bi-directional quick turnaround -

Rationale - Since no development exists on either side of the highway, this median break is designed initially as a bi-directional quick turnaround only. The break can be retrofitted to a partial directional break when development within the area warrants and to a full directional break after traffic signal warrants are met.

Financial Responsibilities - The City of Conway agrees to pursue joint/access issues for properties within this segment through their normal platting and subdivision processes.

US Highway 60 / Dave Ward Drive

Segment 1



APPENDIX C

SEGMENT 2 - TUCKER CREEK BRIDGE to PRINCE STREET

General design framework – Raised median-divided facility with median breaks spaced at ¼ mile minimum intervals; and traffic signals generally spaced at ½ mile intervals. Future signal locations will be determined by meeting warrants, on a case by case basis. Typical cross-section is four lane divided on 100' right-of-way.

Specific Design Elements

15' Raised Median-divided facility

Driveway Spacing of 300 feet.

½ Mile Traffic Signal Spacing

Quick turn-around (bulb-out) design at most median breaks to allow U-turns.

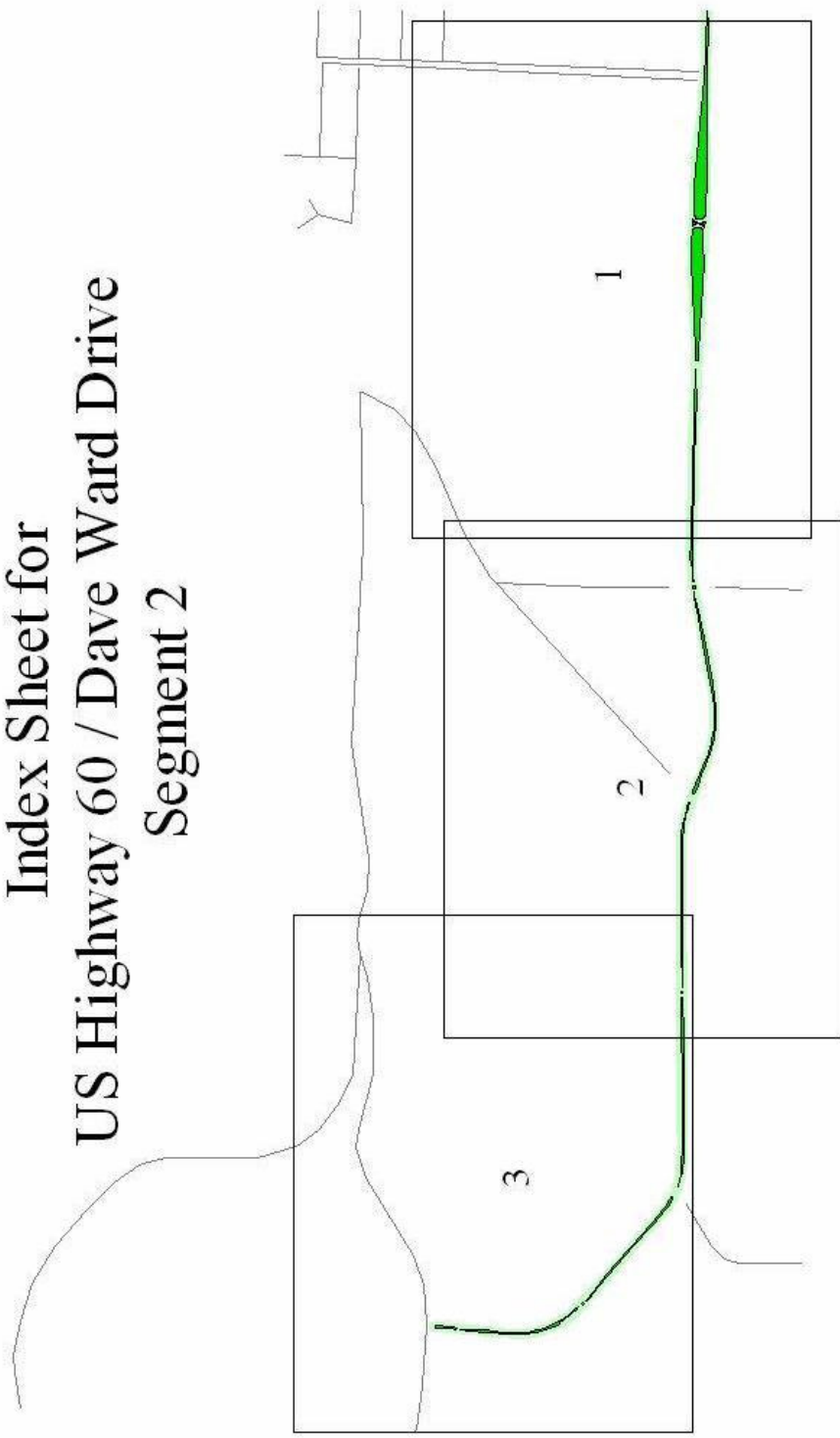
Eight (8) Median Breaks (identified by number MB# on the attached map)

- Five (5) partial directional breaks at the following locations:
(Eligible for retrofits to full directional breaks only after meeting signal warrants)
 - MB#21-Quail Run Circle (westernmost entrance),
 - MB#22-Trey Lane,
 - MB#23-Lee Andrew Lane,
 - MB#25-Lollie Road,
 - MB#26-Katie Lane,

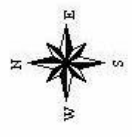
- Two (2) interim bi-directional quick turnarounds at the following locations: (Eligible for retrofits to partial directional breaks when area development warrants)
 - MB#20-midway between Tucker Creek Bridge & Quail Run Circle (westernmost entrance), and
 - MB#24-midway Lee Andrew Lane and Lollie Road.

- One (1) left-only directional turn bay proposed as mitigation for existing institution at the following selected location: (Left-only directional turn bays are proposed with certain conditions and are not eligible for retrofits of any kind, except closure or removal.)
 - MB#27- Entrance to Toad Suck Park (US Corps of Engineers)

Index Sheet for US Highway 60 / Dave Ward Drive Segment 2



3	2	1
MAP SHEET INDEX		



CONCEPT SPECIFICS OF EACH MEDIAN BREAK

-SECTION H-TUCKER CREEK Br. To Lee ANDREW LANE-

MB #20 – Midway between Tucker Creek Bridge and Quail Run Circle (westernmost entrance) – Bi-directional quick turnaround –

Rationale - Since no development exists on either side of the highway, this median break is proposed as a bi-directional quick turnaround only. The break can be retrofitted to a partial directional break when development within the area warrants and to a full directional break after traffic signal warrants are met.

Financial Responsibilities - The City of Conway agrees to pursue joint/access issues for properties within this segment through their normal platting and subdivision processes.

MB #21 – Quail Run Circle (westernmost entrance) – Partial directional break, with quick turnarounds –

Rationale - Since no development currently exists on the south side of the highway, this median break is proposed as a partial directional break, with quick turnarounds. This break can be retrofitted to a full directional break after traffic signal warrants are met.

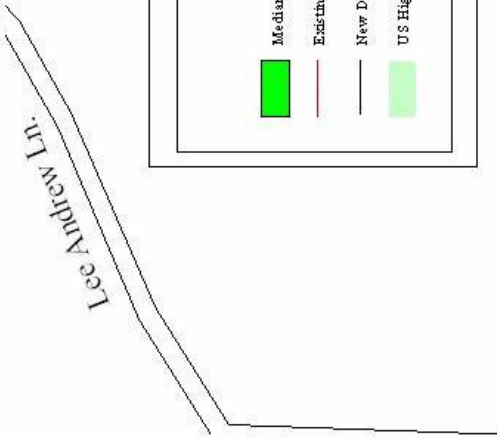
MB #22 – Trey Lane – Partial directional break, with quick turnarounds-

Rationale - Since this median break aligns with a local residential street to the north and on development on the south, it is proposed as a partial directional break only. Left-turns from Hwy. 60 into these residential areas will be accommodated, left-turns from these areas onto Hwy. 60 will be prohibited. The break can be retrofitted to a full directional break after traffic signal warrants are met.

MB #23 – Lee Andrew Lane – Partial directional break, with quick turnarounds –

Rationale - Since no development currently exists on the south side of the highway, this median break is proposed as a partial directional break, with quick turnarounds. This break can be retrofitted to a full directional break after traffic signal warrants are met.

US Highway 60 / Dave Ward Drive Segment 2

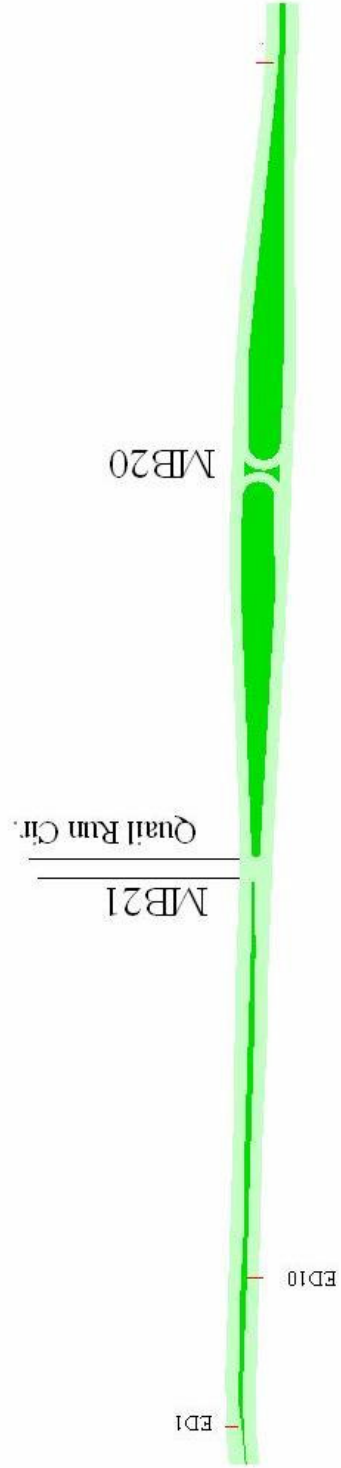


LEGEND

	Median	MB 1	Median Break #
	Existing Drives	ED1	Existing Drive #
	New Drives	ND1	New Drive #
	US Highway 60		

N
S
E
W

3	2	1
MAP SHEET INDEX		



-SECTION I- LEE ANDREW LANE to PRINCE STREET

MB #24 – Midway between Lee Andrew Lane and Lollie Road – Bi-directional quick turnaround –

Rationale - Since no development exists on either side of the highway, this median break is proposed as a bi-directional quick turnaround only. The break can be retrofitted to a partial directional break when development within the area warrants and to a full directional break after traffic signal warrants are met.

Financial Responsibilities - The City of Conway agrees to pursue joint/access issues for properties within this segment through their normal platting and subdivision processes.

MB #25 – Lollie Road – Partial directional break, with quick turnarounds –

Rationale - Since no development currently exists on the north side of the highway, this median break is proposed as a partial directional break, with quick turnarounds. This break can be retrofitted to a full directional break after traffic signal warrants are met.

MB #26 – Katie Lane – Partial directional break, with quick turnarounds-

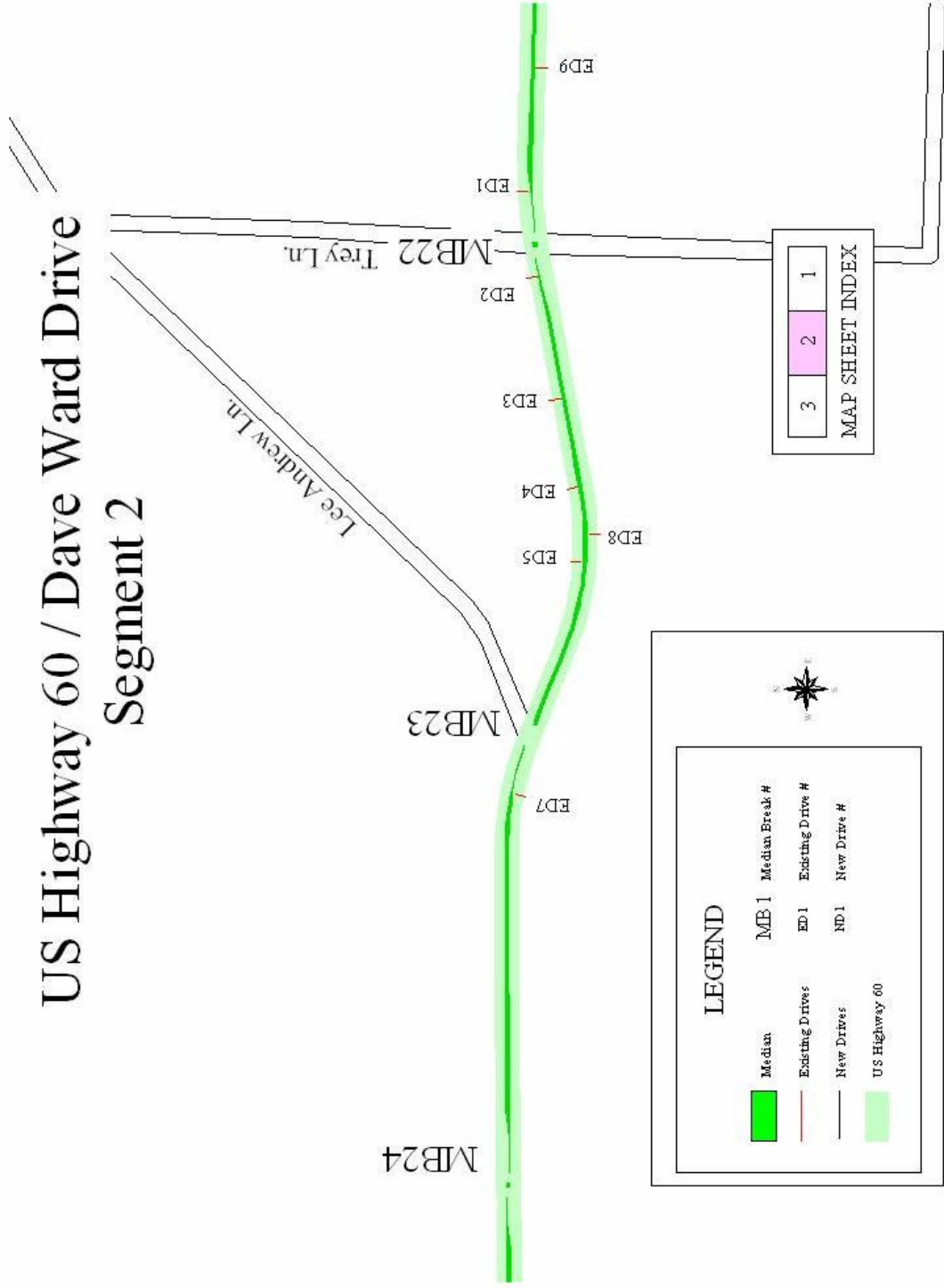
Rationale - Since this median break aligns with a local residential street to the north and a residential driveway to the south, it is proposed as a partial directional break only. Left-turns from Hwy. 60 into these residential areas will be accommodated, left-turns from these areas onto Hwy. 60 will be prohibited. The break can be retrofitted to a full directional break after traffic signal warrants are met.

MB #27 – Toad Suck Park - Left-Only directional turn bay to the south -








Rationale - This left-only directional turn bay is proposed to serve the existing entrance into Toad Suck Park..


US Highway 60 / Dave Ward Drive

Segment 2



LEGEND

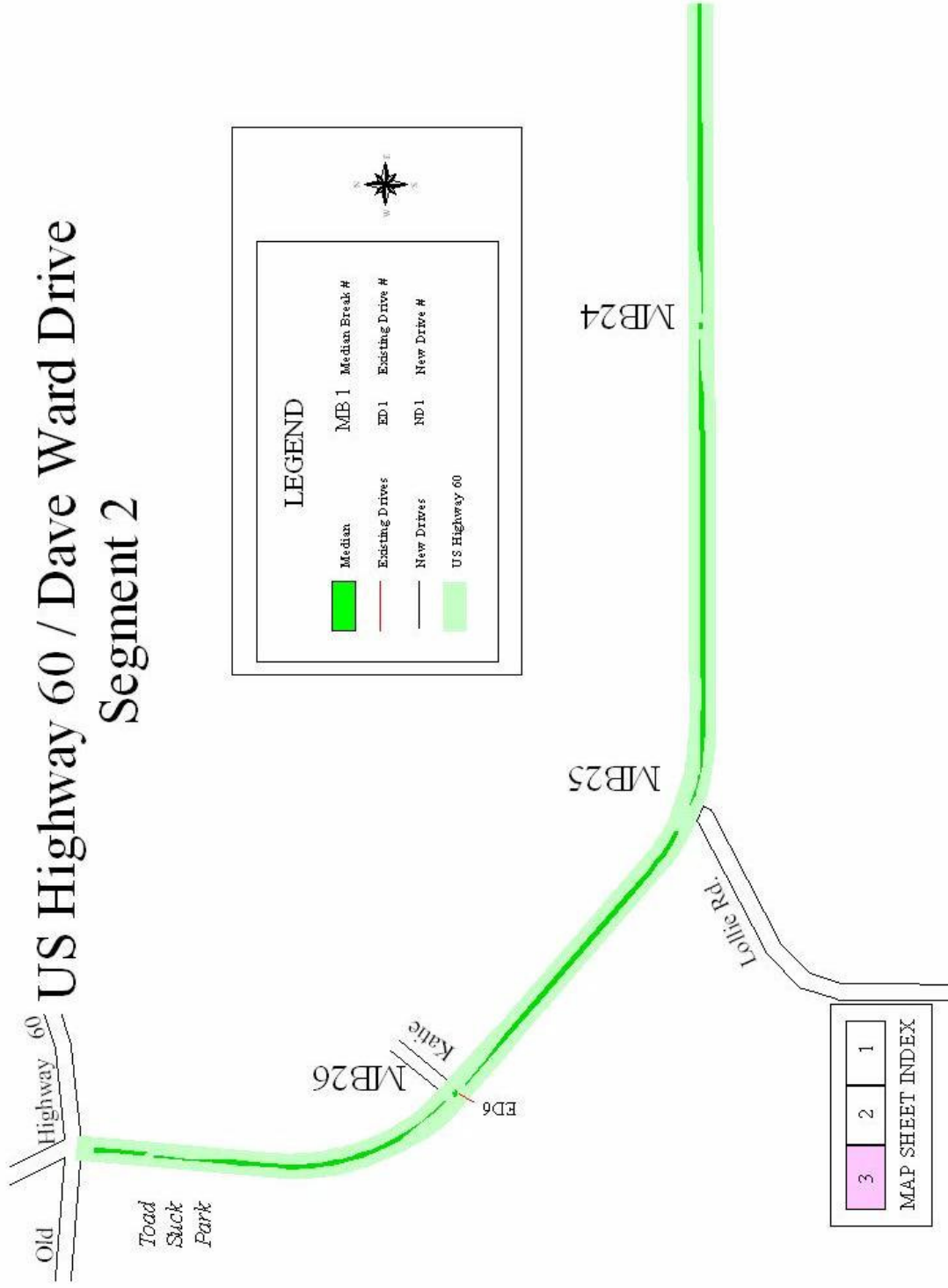
	Median		Median Break #
	Existing Drives		Existing Drive #
	New Drives		New Drive #
	US Highway 60		


 N
E
S
W

MAP SHEET INDEX

3	2	1
---	---	---

US Highway 60 / Dave Ward Drive Segment 2



Appendix B

Conflict Point Diagrams

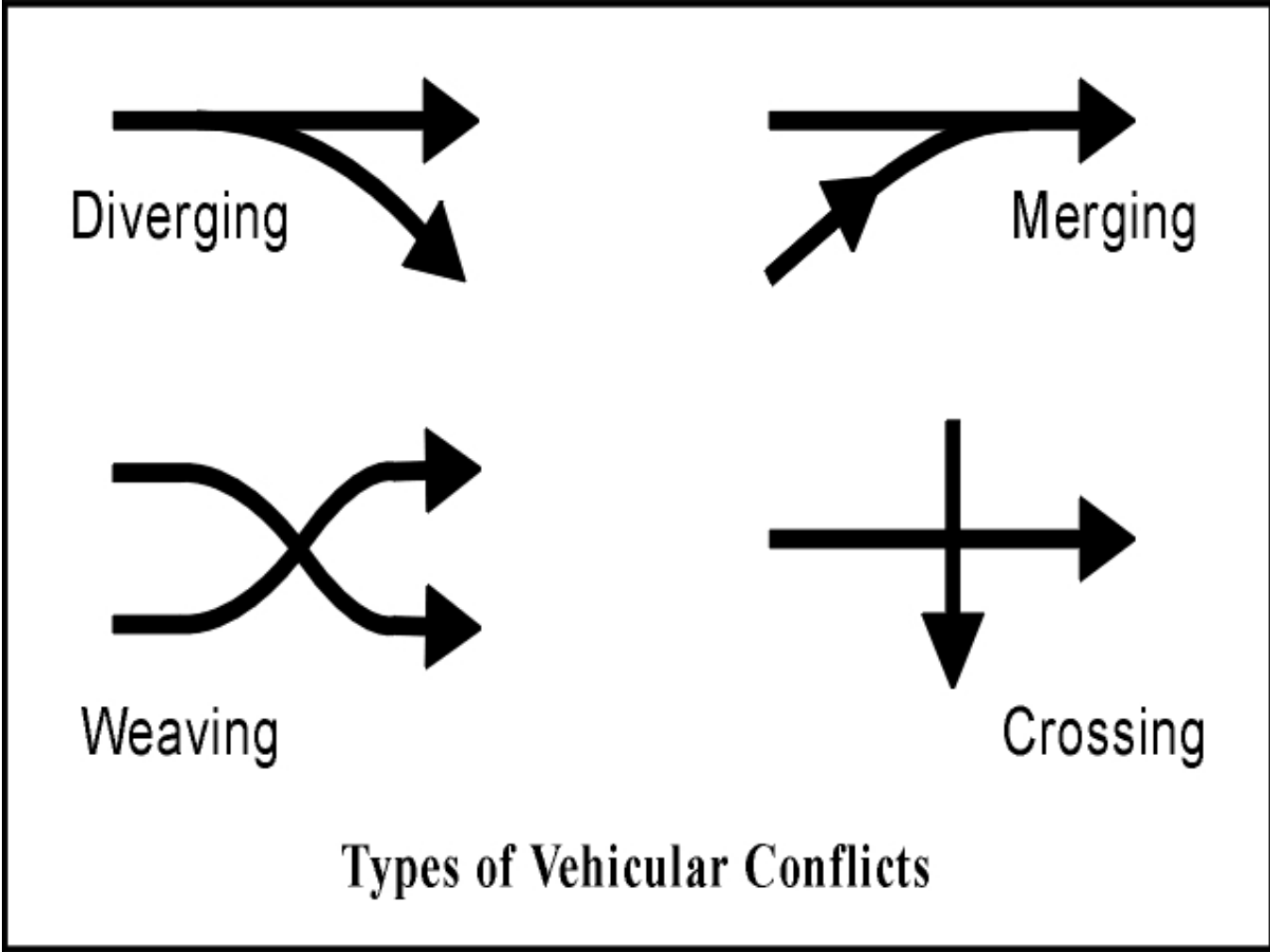
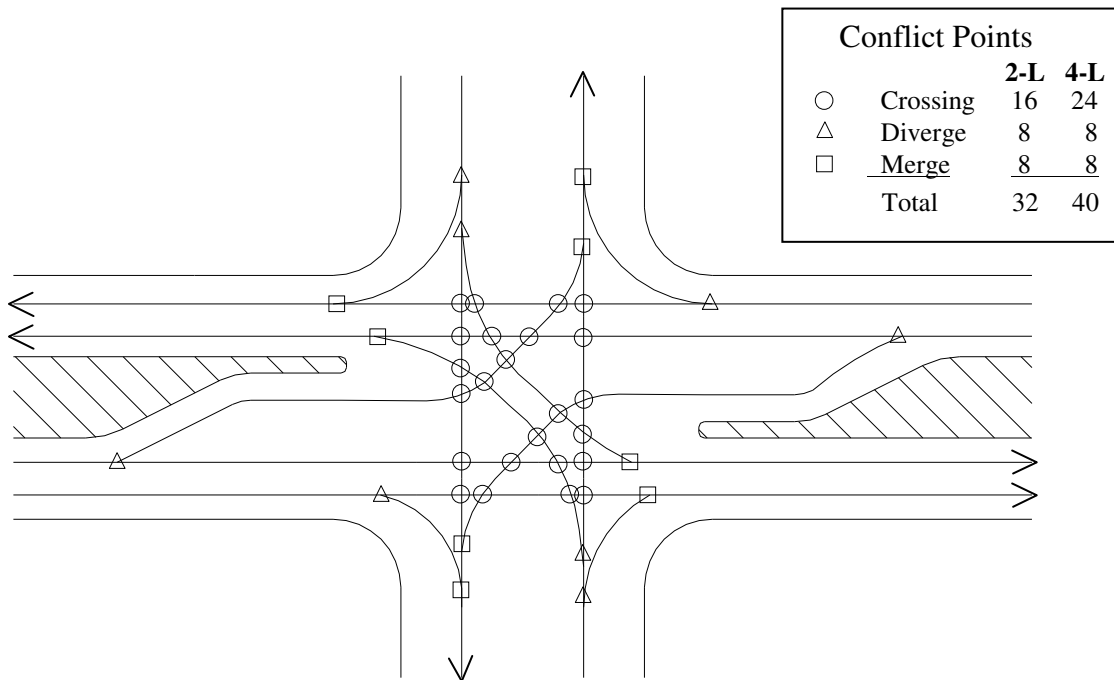


Figure B-1

Vehicular Conflicts at Full Directional Break



Vehicular and Pedestrian Conflicts at a Full Directional Break

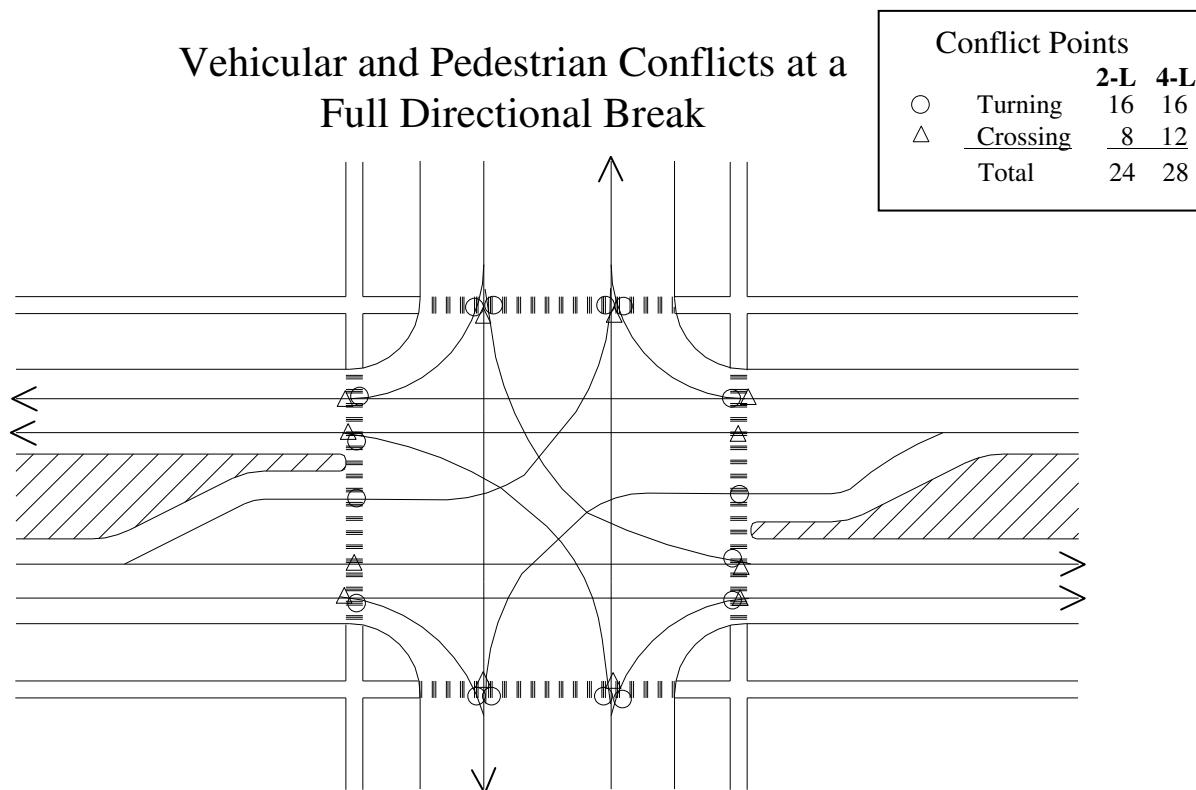
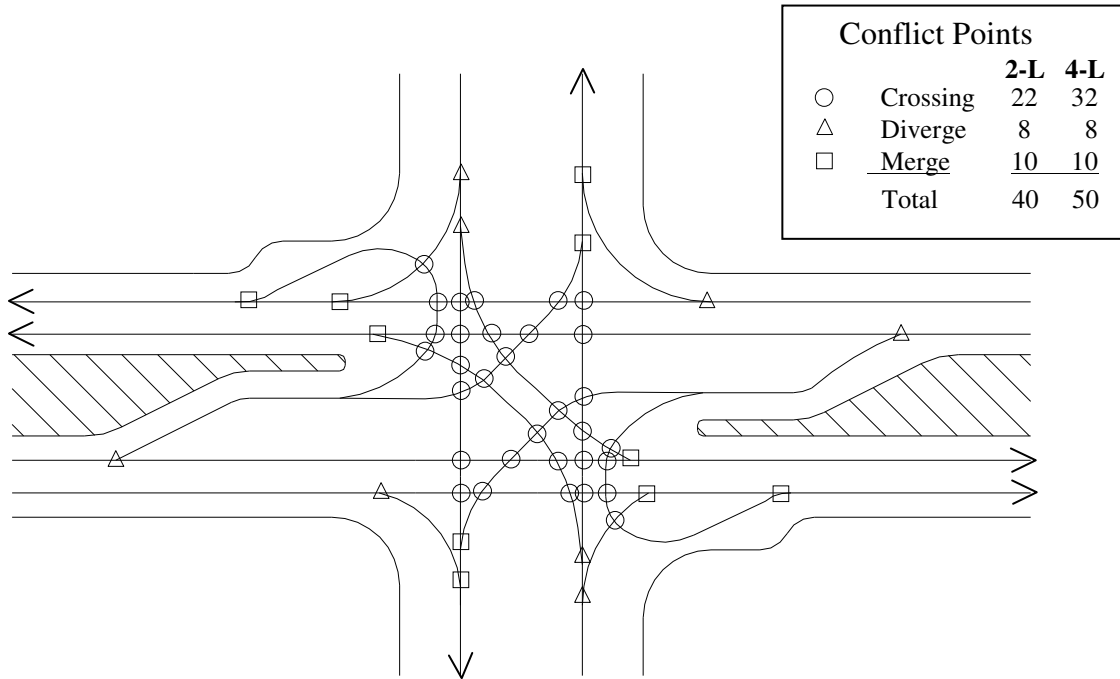


Figure B-2

Vehicular Conflicts at Full Directional Break with U-turns



Vehicular and Pedestrian Conflicts at a Full Median Break with U-turns

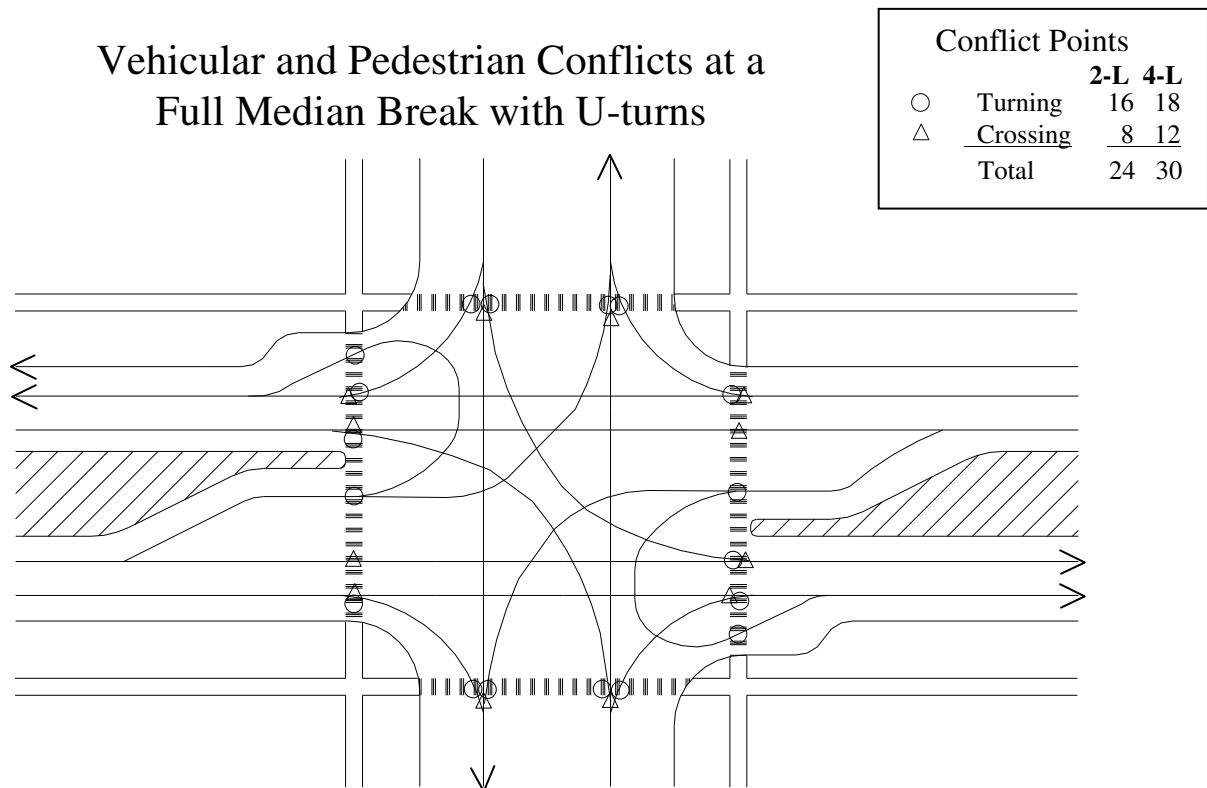
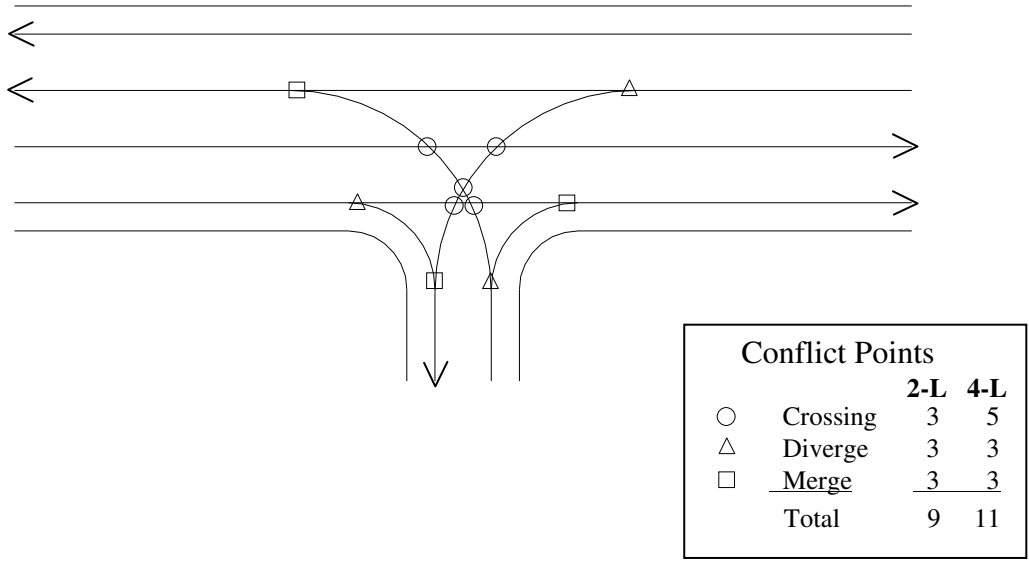


Figure B-3

Vehicular Conflicts at Partial Directional Break



Vehicular and Pedestrian Conflicts at Partial Directional Break

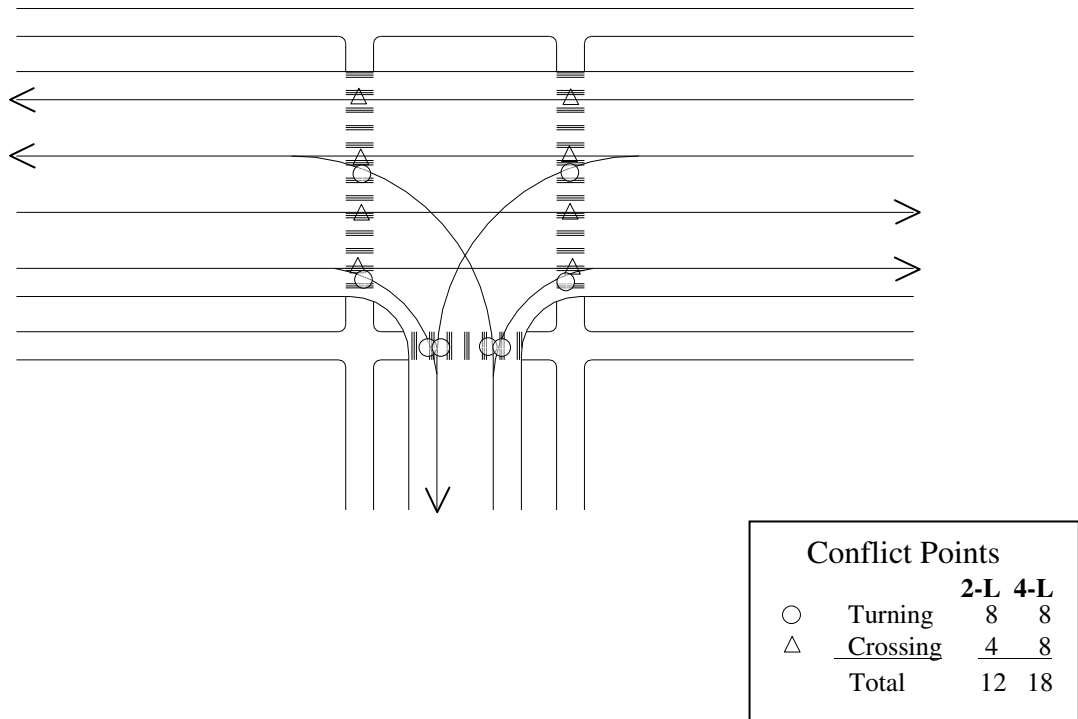
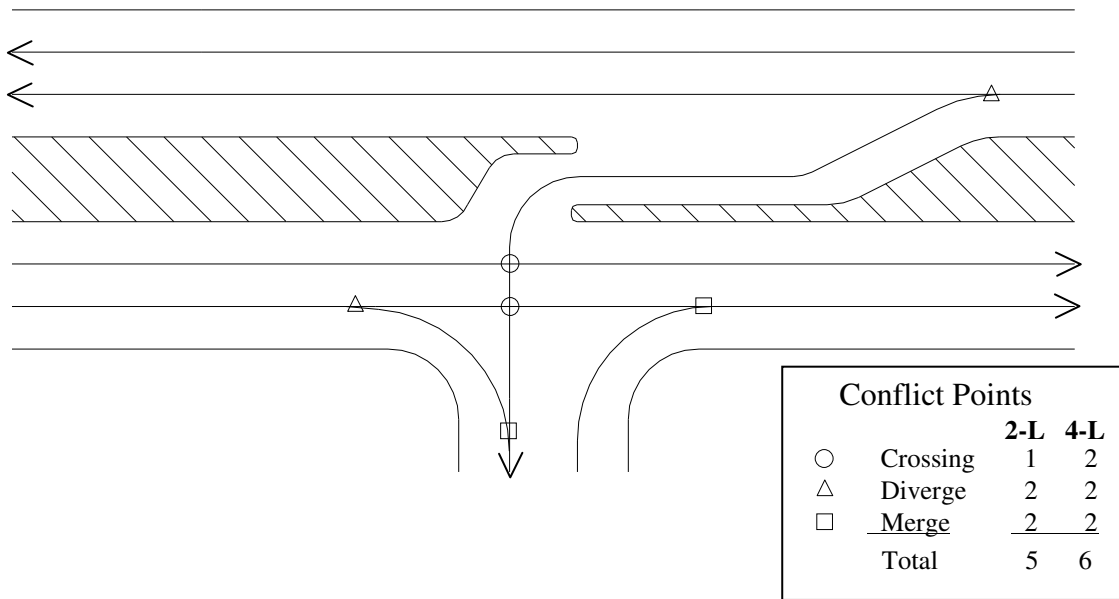


Figure B-4

Vehicular Conflicts at Left-only Turn Directional Turn Bay



Vehicular and Pedestrian Conflicts at a Left Turn Directional Bay

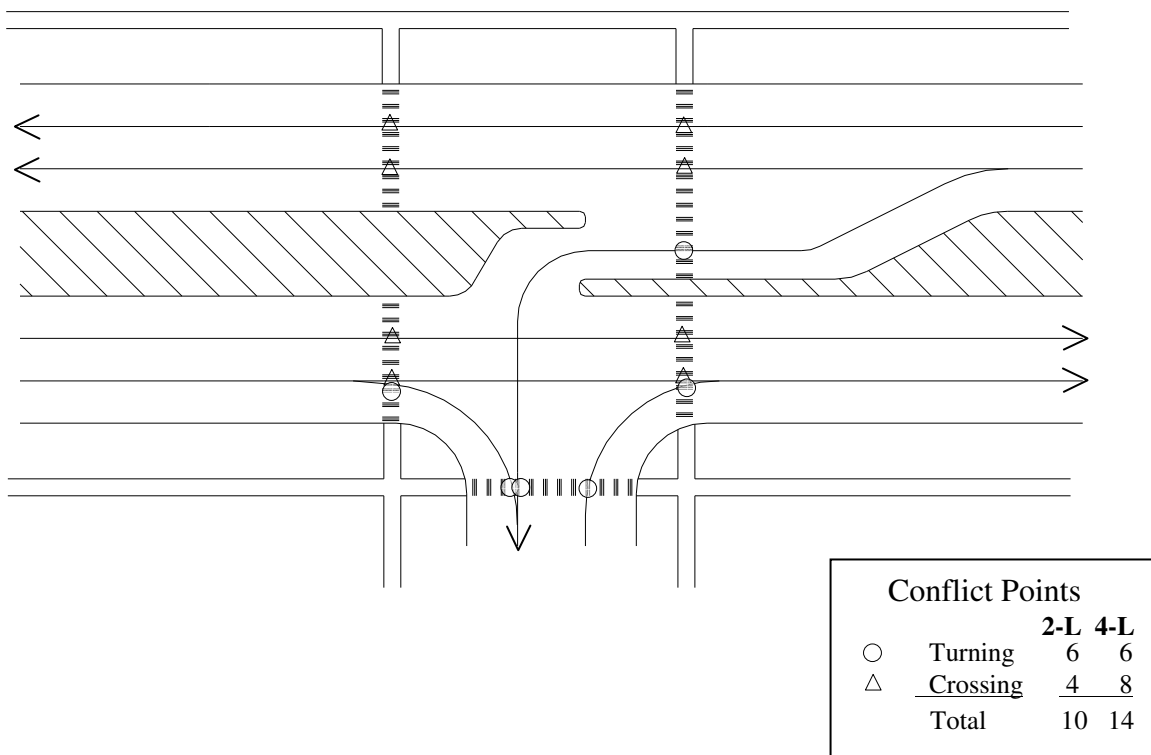
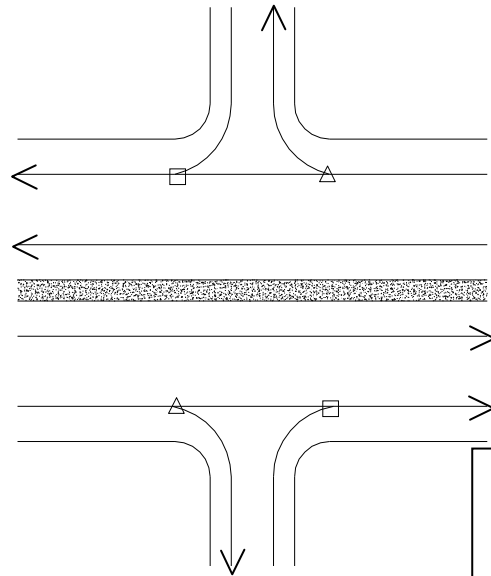


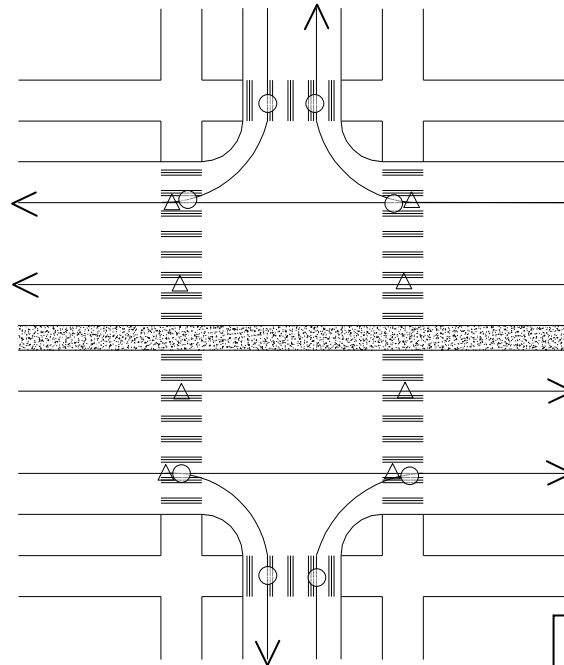
Figure B-5

Vehicular Conflicts at Driveways



Conflict Points			
		2-L	4-L
○	Crossing	0	0
△	Diverge	2	2
□	Merge	2	2
	Total	4	4

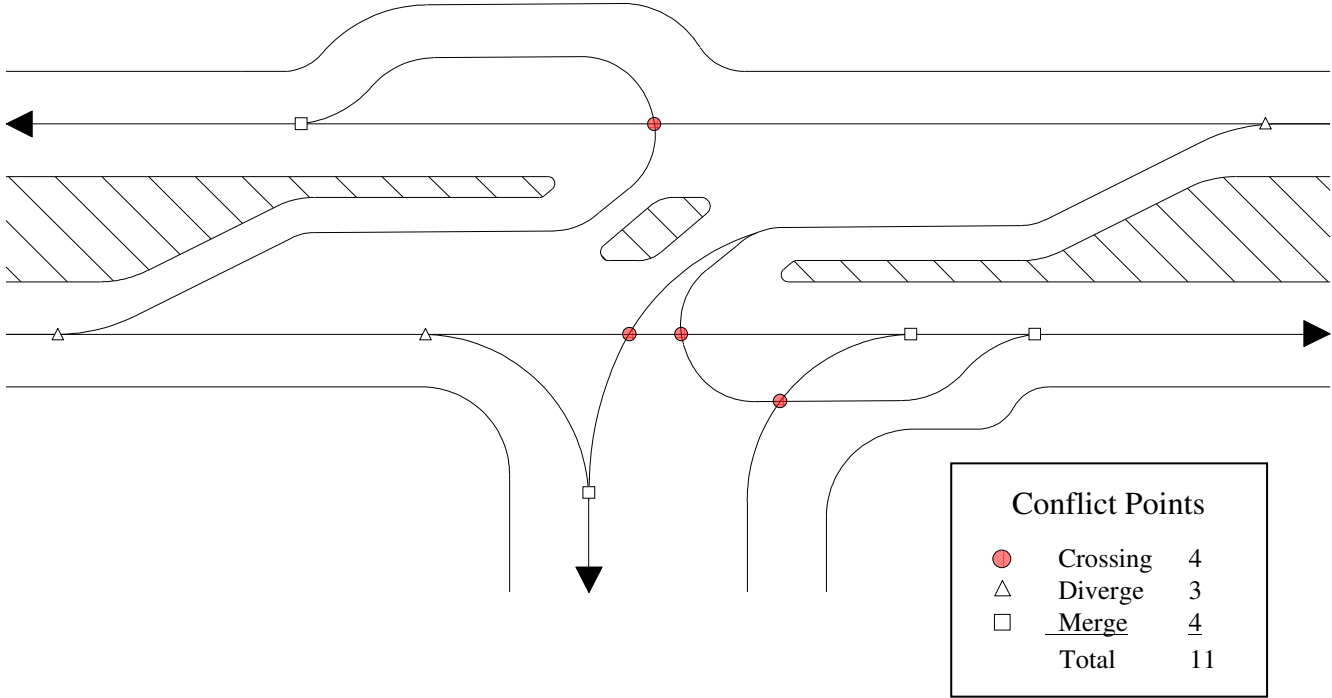
Vehicular and Pedestrian Conflicts at Driveways



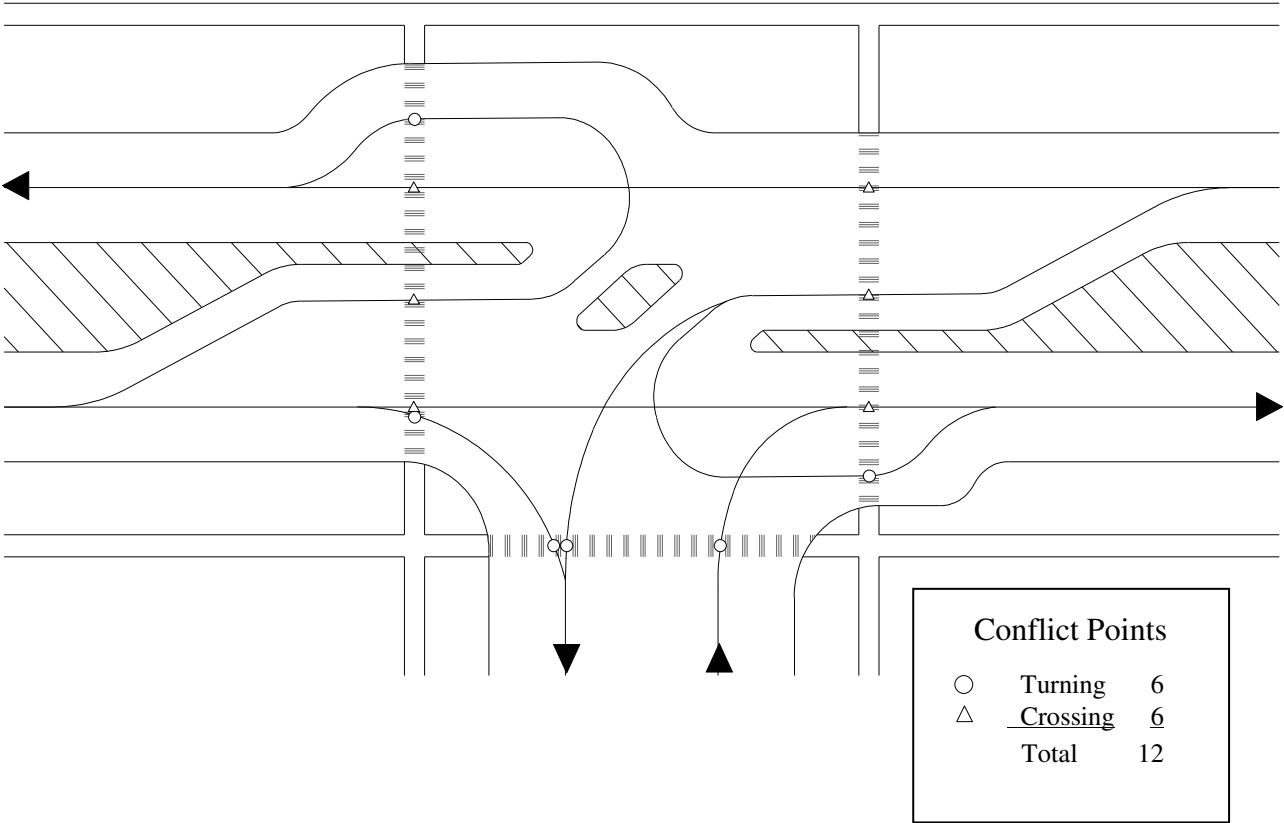
Conflict Points			
		2-L	4-L
○	Turning	8	8
△	Crossing	4	8
	Total	12	16

Figure B-6

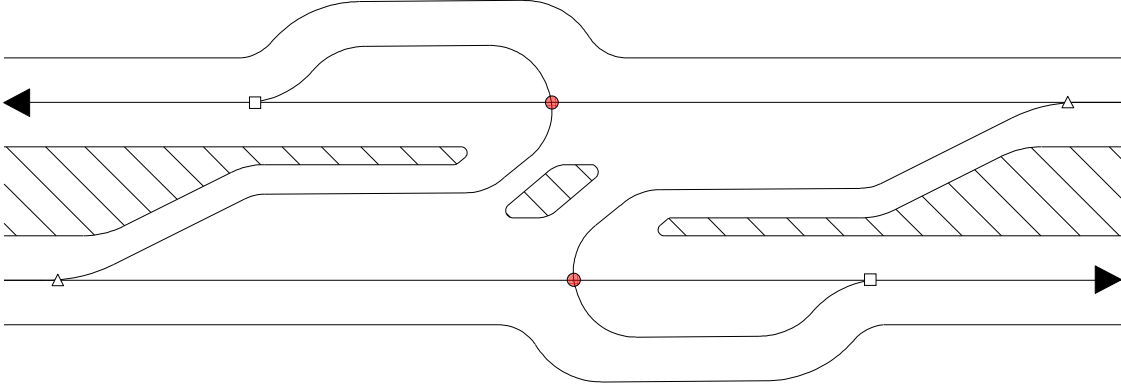
Vehicular Conflicts at Partial Directional Break with U-turns



Vehicular and Pedestrian Conflicts at a Directional Break with U-turns



Vehicular Conflicts at Bi-directional Quick Turnaround



Conflict Points		
●	Crossing	2
△	Diverge	2
□	<u>Merge</u>	<u>2</u>
	Total	6