



# DRAFT

September 9, 2009

## MEMORANDUM

TO: File

FROM: David E. Hattan, P.E. and Ryan D. Germeroth, P.E.

SUBJECT: Commerce City Intersection Accident Summary – Updated Memo

PROJECT: Commerce City Transportation Plan  
FHU # 08-219-01

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The following is a summary of the accident pattern analyses for the 14 intersections with the most accidents in Commerce City. The top 10 intersections presented were selected for analysis based on 2007 accident data rankings provided by the Commerce City Police Department. An additional 4 intersections were selected based on accident data compiled by FHU for the DRCOG Safety Survey that identified high accident locations throughout the Denver Metro region. **Figure 1** shows the location of these 14 intersections.

The accident data presented in this memorandum is based on information provided by CDOT, and the study period includes 2000 through 2005. This data was used since it is readily available for intersections located on the State Highway system. While most accidents involve two vehicles, this database also includes reported accidents involving pedestrians and bicyclists. **Table 1** summarizing the accident totals at each of the 14 intersections is attached to this memo. Of note, the accident totals shown in this table are based on CDOT data, and therefore the Commerce City Police intersection rankings do not correlate with the CDOT accident totals shown in the table.

### Highway 85 at 56<sup>th</sup> Avenue (Signalized)

During the study period at Highway 85 and 56<sup>th</sup> Avenue there were 186 property damage only (PDO) accidents, 74 injury accidents and 1 fatal accident. The following is a summary of the most frequent/significant accident types:

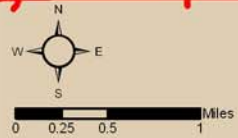
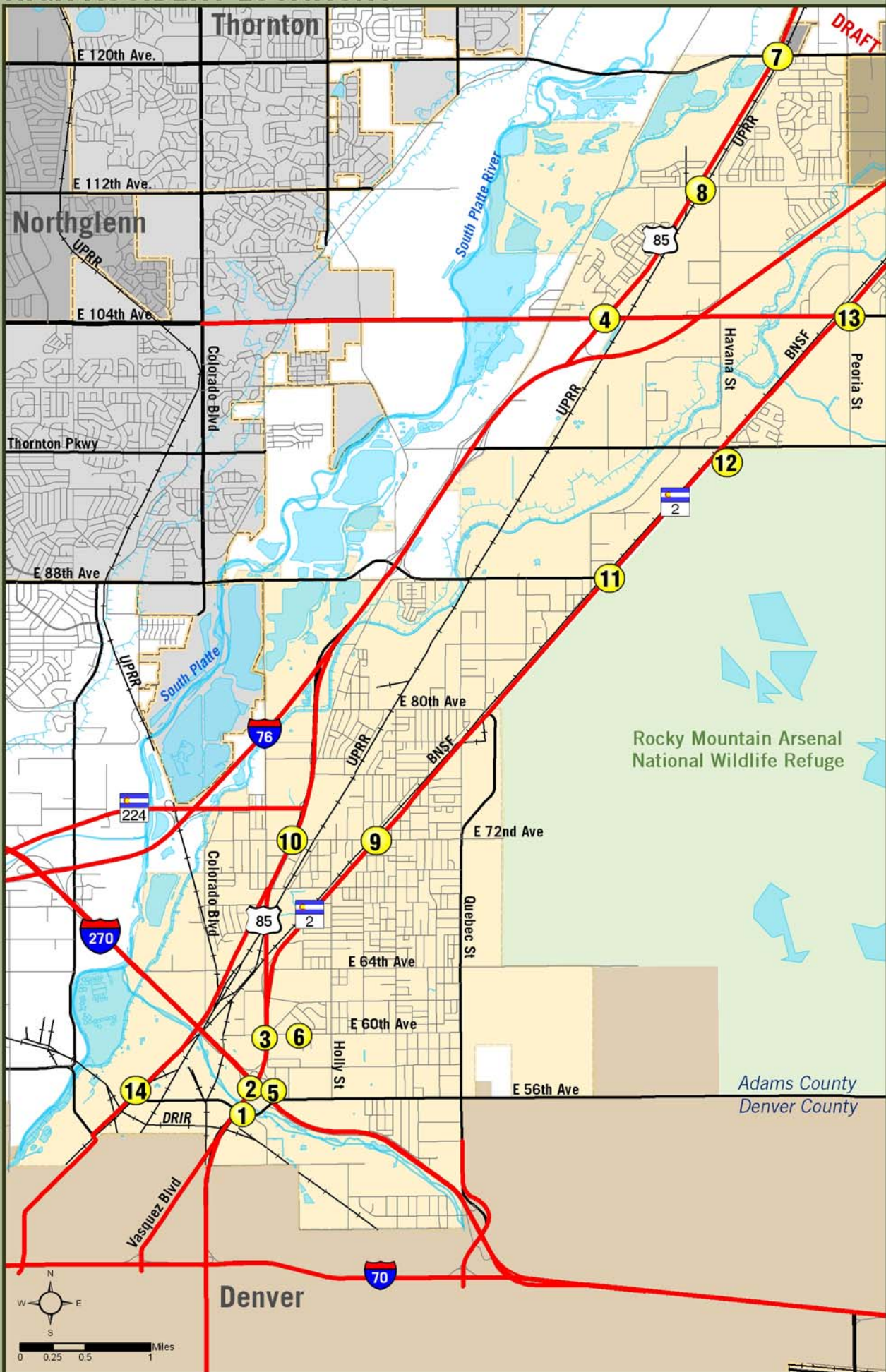
- At this intersection, there were 69 approach turn accidents during the study period. Most occurred when either a SB left turner (35) or a NB left turner (23) turned out in front of the opposing through traffic. One of these accidents was fatal. The occurrence of this accident type was primarily focused around AM, Noon and PM traffic peaks. However, the northbound and southbound left turn movements are now protected-only so this pattern is likely no longer relevant.
- At this intersection, there were 50 broadside accidents during the study period. The majority of accidents were caused by either a SB (26) or a NB (10) vehicle striking either an EB or WB vehicle. The largest concentration of this accident type was focused around noon. The existing clearance intervals and signal visibility should be reviewed and adjusted if needed.

# HIGH ACCIDENT LOCATIONS



## Legend

- High Accident Locations
- Main Highways
- Arterial Roads
- Local Roads
- Railroad
- Streams
- Lakes
- Commerce City Limits



**Table 1. Accident Statistics (2000 to 2005 from CDOT)**

2007 C3 Ranking	Intersection	2000 to 2005 Accident Totals					
		PDO	Injury	Fatal	Total	Pedestrian	Bicycle
1	Highway 85 at 56th Ave	186	74	1	261	0	0
2	On 270 @ Hwy 85	107	23	0	130	0	0
3	Highway 85 at 60th Ave	112	32	0	144	0	0
4	Highway 85 at 104th Ave	61	29	0	90	0	0
5	On Hwy 85 @ 270	80	19	0	99	1	0
6	4800 E. 59th (WalMart)	No CDOT Data Available			0	-	-
7	Highway 85 at 120th Ave	28	27	0	55	0	0
8	Highway 85 at 112th Ave	37	23	0	60	0	0
9	Highway 2 at 72nd Ave	41	16	0	57	1	0
10	Highway 85 at 72nd Ave	64	34	1	99	1	1 (Fatal)
Intersections in Addition to Commerce City Top 10							
11	Highway 2 at 88th Ave	17	4	0	21	0	0
12	Highway 2 at 96th Ave	10	2	1	13	0	0
13	Highway 2 at 104th Ave	14	6	0	20	0	0
14	Brighton Blvd at 56th Ave	11	1	0	12	0	0
Note:							
<ul style="list-style-type: none"> <li>Ranking for top 10 intersections is based on information provided by C3 Police in February 2009 memo. Intersections 11 thru 14 were selected based on information in DRCOG / FHU Safety Survey</li> <li>All accident totals presented in this table are based on CDOT data for 2000 thru 2005</li> </ul>							

- At this intersection, there were 32 sideswipe same direction accidents during the study period. Most occurred in the SB direction (16) followed by the WB direction (7). It is likely that this pattern is due to the short distance between the I-270 off-ramp and 56<sup>th</sup> Avenue where a southbound vehicle attempting to make a left turn at 56<sup>th</sup> Avenue has to weave from the ramp to the southbound turn lane.

**Highway 85 at I-270 Interchange (Cloverleaf interchange)**

During the study period within the I-270 interchange with Highway 85, there were a total of 187 PDO accidents and 42 injury accidents. The following is a summary of the most frequent accident types:

- In the vicinity of the interchange, there were a total of 92 rear end accidents during the study period. The majority of these accidents occurred during the PM peak when traffic conditions are more congested. Of note, even though this was the most frequent accident type at this interchange, the occurrence of this accident type was not found to be significant.
- In addition, there were a total of 54 sideswipe same direction accidents during the study period. As with rear end accidents, the majority of these accidents occurred during the PM peak so they are likely related to congestion. However, review the current striping at the intersection to assure there is clear delineation between lanes.

- Finally, there were 45 guard rail accidents during the study period most of which occurred on I-270. The majority (27) were in the eastbound direction. However, the guardrail at the ramp gores was recently reconstructed in order to help reduce the number of guard rail accidents in the vicinity of the interchange so this pattern may no longer be relevant.

#### **Highway 85 at 60<sup>th</sup> Avenue (Signalized)**

During the study period, there were 112 PDO and 32 injury accidents at the intersection of Highway 85 and 60<sup>th</sup> Avenue. The following is a summary of the most frequent/significant accident types:

- At this intersection, there were 81 rear end accidents during the study period. This accident type was found to be significant at this location. The majority of the rear end accidents occurred between noon and 6PM. Most (45) occurred in the NB direction with another 20 occurring in the SB direction.
- During the study period, there were a total of 22 sideswipe same direction accidents. Most of these accidents occurred during the AM and PM peaks and the balance between NB and SB was fairly equal so this accident type is likely congestion related. However, review the current striping at the intersection to assure there is clear delineation between lanes.

#### **Highway 85 at 104<sup>th</sup> Avenue (Signalized)**

During the study period, there were 61 PDO and 29 injury accidents at this intersection. The following is a summary of the most frequent/significant accident types:

- The first significant accident type was rear ends. There were a total of 53 rear end accidents during the study period. The majority of these accidents occurred in the SB direction (25). In addition, as with other intersections, the majority of the rear end type accidents occurred during the AM and PM peak hours.
- The other significant accident type at this intersection was broadside type accidents. During the study period there were 20 broadside accidents. The distribution of the accident occurrences was nearly uniform across all four approaches to the intersection. The existing red/yellow clearance intervals should be reviewed to assure that they are sufficient for the posted speed. In addition, dilemma zone detection could also be considered if not currently in place.

#### **Highway 85 at 120<sup>th</sup> Avenue (Recently Signalized)**

During the study period, there were a total of 28 PDO and 27 injury accidents at this intersection. The number of injury accidents at this intersection is fairly significant since they make up nearly half of the accident total at this intersection. During the study period there were 34 broadside accidents and 10 approach turn accidents. However, this intersection changed from an unsignalized to signalized intersection at some point during the study period so the accident patterns represented by the data may no longer be applicable.

#### **Highway 85 at 112<sup>th</sup> Avenue (Signalized)**

During the study period there were a total of 37 PDO and 23 injury accidents at this intersection. Rear end accidents (29) were the most frequent accident type followed by approach turn accidents (14). However, based on significance testing the occurrence of either of these accident types were not found to be unusual.

### **Highway 2 at 72<sup>nd</sup> Avenue (Signalized)**

During the study period there were a total of 41 PDO and 16 injury accidents at this intersection. Rear end accidents (21) were the most frequent accident type followed by broadside (12) and sideswipe same direction (10). However, broadside and sideswipe same direction were the only significant accident types at this intersection. The following is a summary of these two accident types.

- Most of the broadsides (5) were caused by a SB vehicle and the majority of the broadside accidents occurred around noon. The current yellow/red clearance intervals should be reviewed to verify they are sufficient and the visibility of the existing signal heads should also be reviewed.
- There were a total of 10 sideswipe same direction accidents. The majority of these accidents (4 each way) were in the EB and WB directions. Most of these accidents occurred during the PM peak hour. This is likely a congestion related problem but review the current striping at the intersection to assure there is clear delineation between lanes.

### **Highway 85 at 72<sup>nd</sup> Avenue (Signalized)**

During the study period there were a total of 64 PDO, 34 injury and 1 fatal accident. The one fatal accident at this intersection was a bicycle related crash. Broadside type accidents were the most frequent and significant accident type at this intersection with 33 occurrences. Most of the broadside accidents were caused by a SB vehicle (16) followed by NB vehicles (9). Most of the broadside accidents occurred around the noon and PM peaks. However, the number of broadside accidents was cut in half from 2003 to 2004/2005 so this accident pattern may already have been addressed.

### **Highway 2 at 88<sup>th</sup> Avenue (Recently signalized)**

During the study period there were a total of 17 PDO and 4 injury accidents at this intersection. The most frequent / significant accident types were broadsides (8) and fence related accidents. However, this intersection was recently reconstructed and signalized so this accident pattern may no longer be valid.

### **Highway 2 at 96<sup>th</sup> Avenue (Signalized)**

During the study period there were a total of 10 PDO, 2 injury and 1 fatal accident at this intersection. The fatal accident at this intersection involved a collision with a rail vehicle. However, due to the low occurrence of accidents at this intersection, there is not a correctable pattern at this intersection.

### **Highway 2 at 104<sup>th</sup> Avenue (Signalized)**

During the study period there were a total of 14 PDO and 6 injury accidents at this intersection. Broadside (7), Rear end (7) and approach turn (5) type accidents were the most frequent crashes at this intersection. However, this intersection was recently reconstructed so the above pattern may no longer be valid.

### **Brighton Blvd and 56<sup>th</sup> Avenue (Unsignalized)**

During the study period there were a total of 11 PDO and 1 injury accident at this intersection. The most significant accident type at this intersection was broadside accidents (6). All six of these accidents were caused by a WB vehicle striking a NB vehicle.

## Summary

The most common accident types at the fourteen intersections reviewed and analyzed for this study were Broadside, Rear End, Sideswipe Same Direction, Approach Turn and Guard Rail. The majority of these accidents occurred during peak traffic times. There are several measures, previously mentioned, that can be investigated / implemented that could help to reduce the number of accidents at these intersections. Below is a summary for each accident type:

- Broadside – Review current yellow and red clearance intervals, especially on high speed arterials, to verify that what is currently provided is sufficient. Dilemma zone detection should also be considered where currently not in place on the high speed arterials within the City. In addition, the visibility of signal heads on all approaches to intersections with a broadside problem should be reviewed. Additional signal heads or signal backplates should be added where needed.
- Rear End – As with broadside accidents, review the current yellow and red clearance intervals at intersections with rear end problems to assure that sufficient clearance time is provided. The visibility of the signal heads should also be reviewed at intersection with rear end problems.
- Sideswipe Same Direction – Review current striping at intersections with a sideswipe problem to assure there is clear delineation between lanes.
- Approach Turn – Review current yellow and red clearance intervals to verify there is sufficient time for left turning vehicles to clear the intersection. In addition, consideration should be given to converting protected/permitted left turns to protected only left turns at locations where there is a significant approach turn problem.
- Guard Rail – This accident type correlates directly to I-270 near the Highway 85 interchange. Recent work has/will remove some of the guard rail in the vicinity of the ramp gores. Consideration, if need be, should be given to updating/repairing additional guard rail so that it is up to current design standards.