SUCCESFUL HSIP APPLICATIONS

CUUATS & CHAMPAIGN COUNTY

Traffic Engineering and Safety Conference

October 15, 2014

CUUATS and Champaign County

- The Champaign-Urbana Urbanized Area Transportation Study (CUUATS) is the Metropolitan Planning Organization (MPO) for the Champaign-Urbana Urbanized Area.
- Champaign County is a CUUATS member agency.
- CUUATS staff provides technical support for Champaign County including crash data analysis and preparation of grant applications.

CUUATS Safety Philosophy

- CUUATS allocates resources received from IDOT and local agencies (local match) towards analyzing crash data, especially on the local roadway system.

- CUUATS staff assist local agencies to identify priority crash locations based on data analysis and preparing grant applications.

- CUUATS' goal is to effectively identify safety problems, direct resources, create reports, evaluate the effectiveness of countermeasures and ultimately, reduce fatalities and serious injuries on all Champaign County's public roadways.

HSIP Funding Projects (Rural)

- Projects funded with "HSIP" grants:
  - 2007: Monticello Road Corridor, $1,363,539
  - 2013: County Road 1 Corridor, $855,000
  - 2014: Rising Rd./Cardinal Rd. Intersection, $818,590

- **Total: $3,037,129**

HSIP Funding Projects (Urban)

- Projects funded with "HSIP" grants:
  - 2007: Goodwin Avenue Corridor, $700,000
  - 2008: Review of Signal Clearance Interval (45 urban intersections), $130,500
  - 2009: Fourth Street Corridor, $1,185,000
  - 2011: Main St./Race St. Intersection, $230,850

- **Total: $2,246,350**

Total HSIP Funding Received

Between 2007 and 2014:

- Seven (7) projects funded

$5,283,479

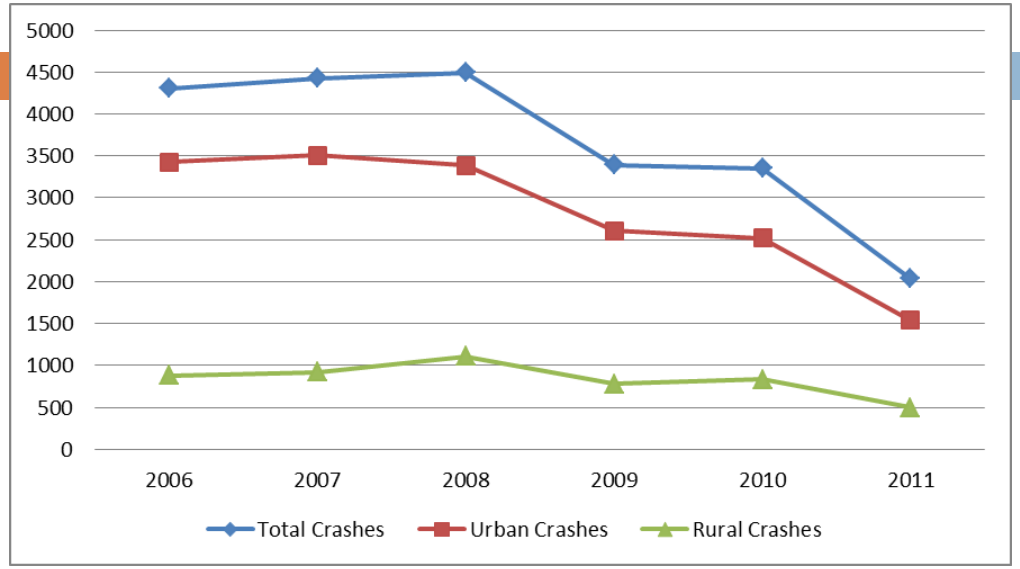
Approximately:

$755,000/year

Process for HSIP Project Identification

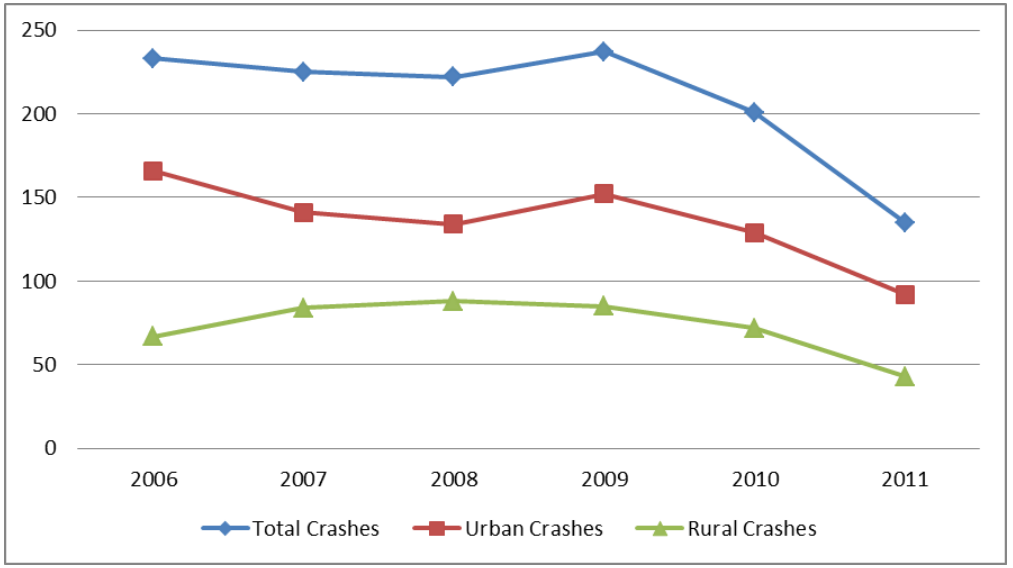
- Conduct a detailed analysis of crashes at the County and urbanized area level
- Identify problematic locations (punctual or system wide)
- Discuss problematic locations between CUUATS staff and local agencies
- Select project for HSIP application

Crash Analysis for Champaign County

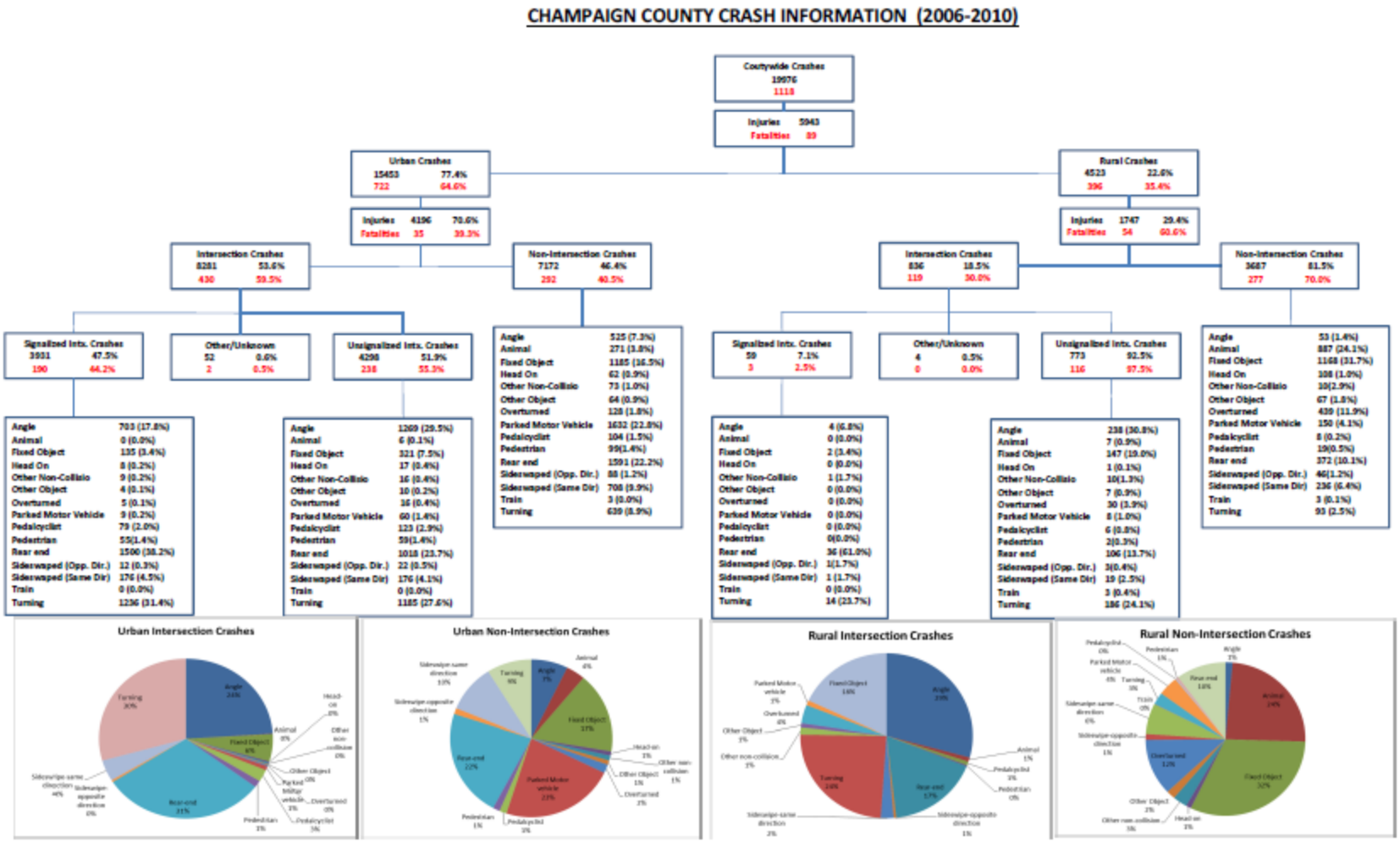


Total Crashes in Champaign County

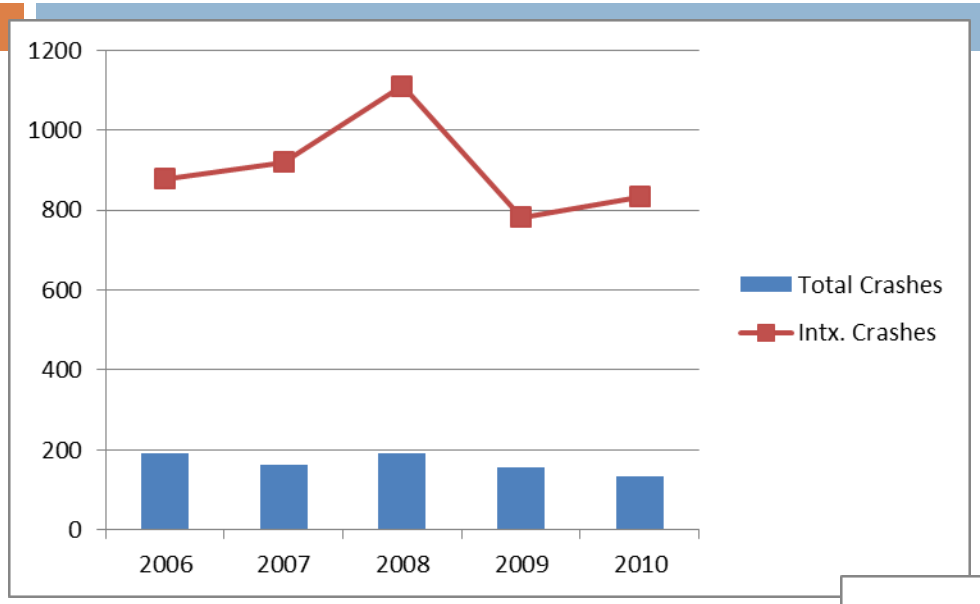
Total Severe Crashes (Fatal & Type A) in Champaign County



Crash Data Overview Champaign County



Crashes in Rural Champaign County



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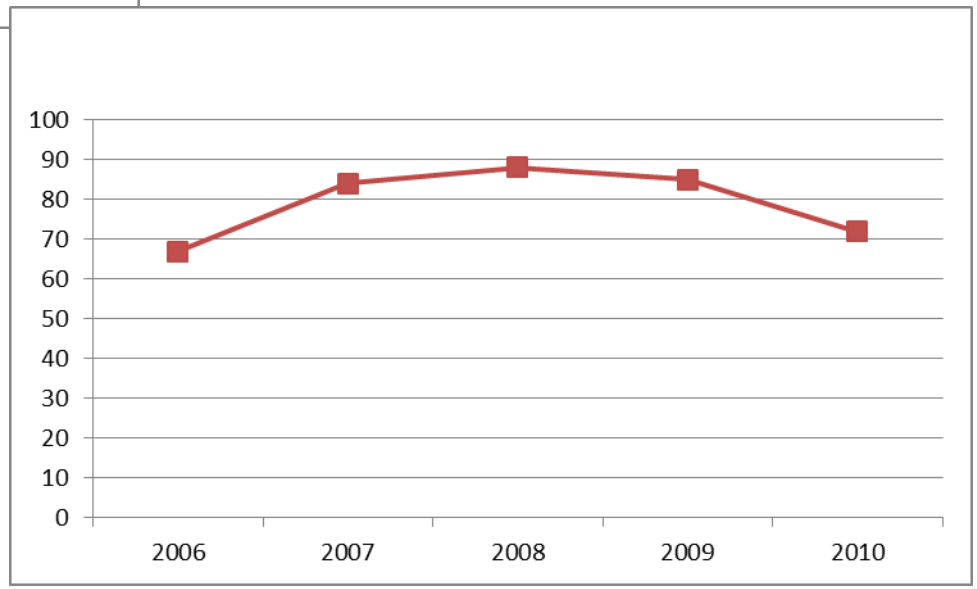

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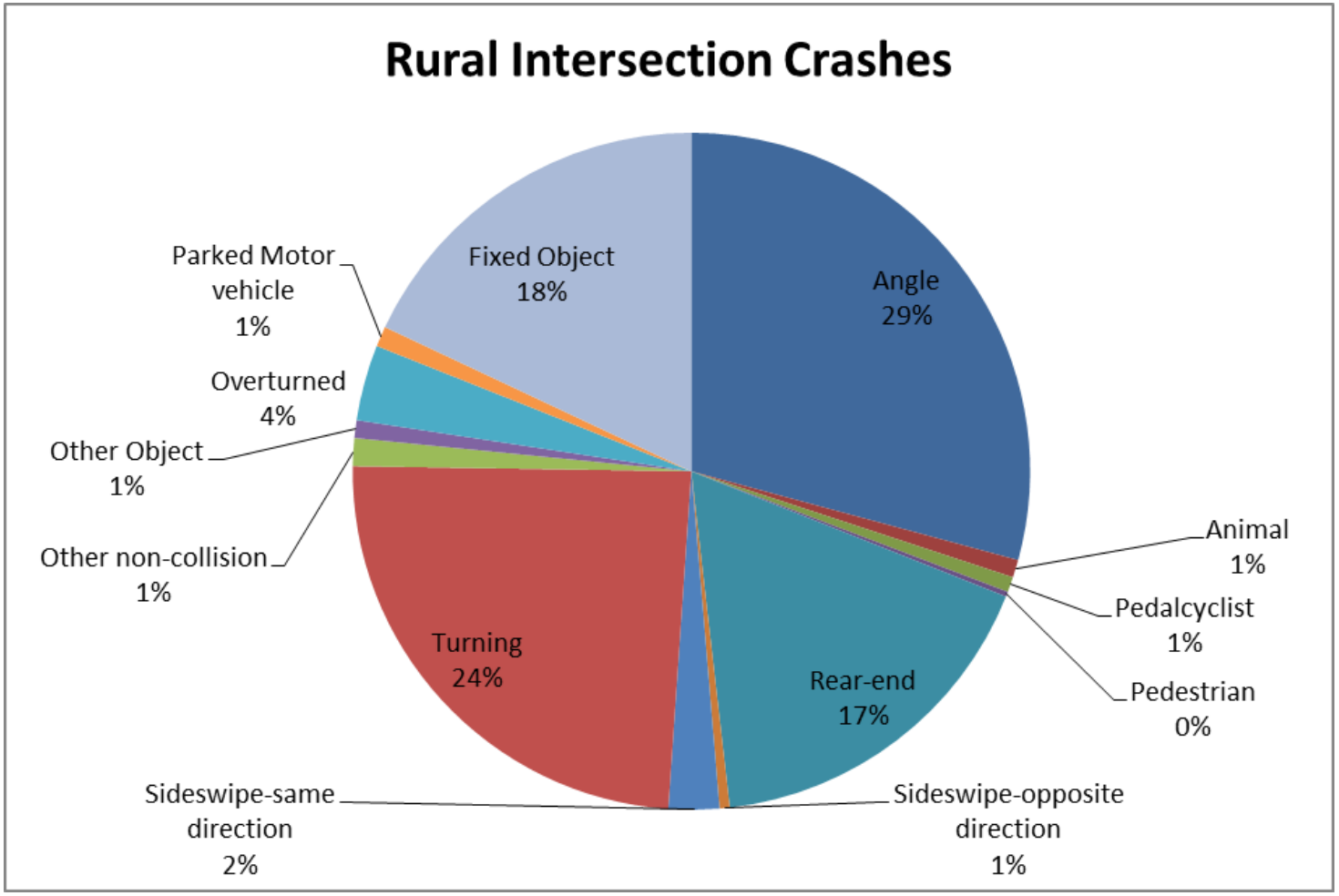

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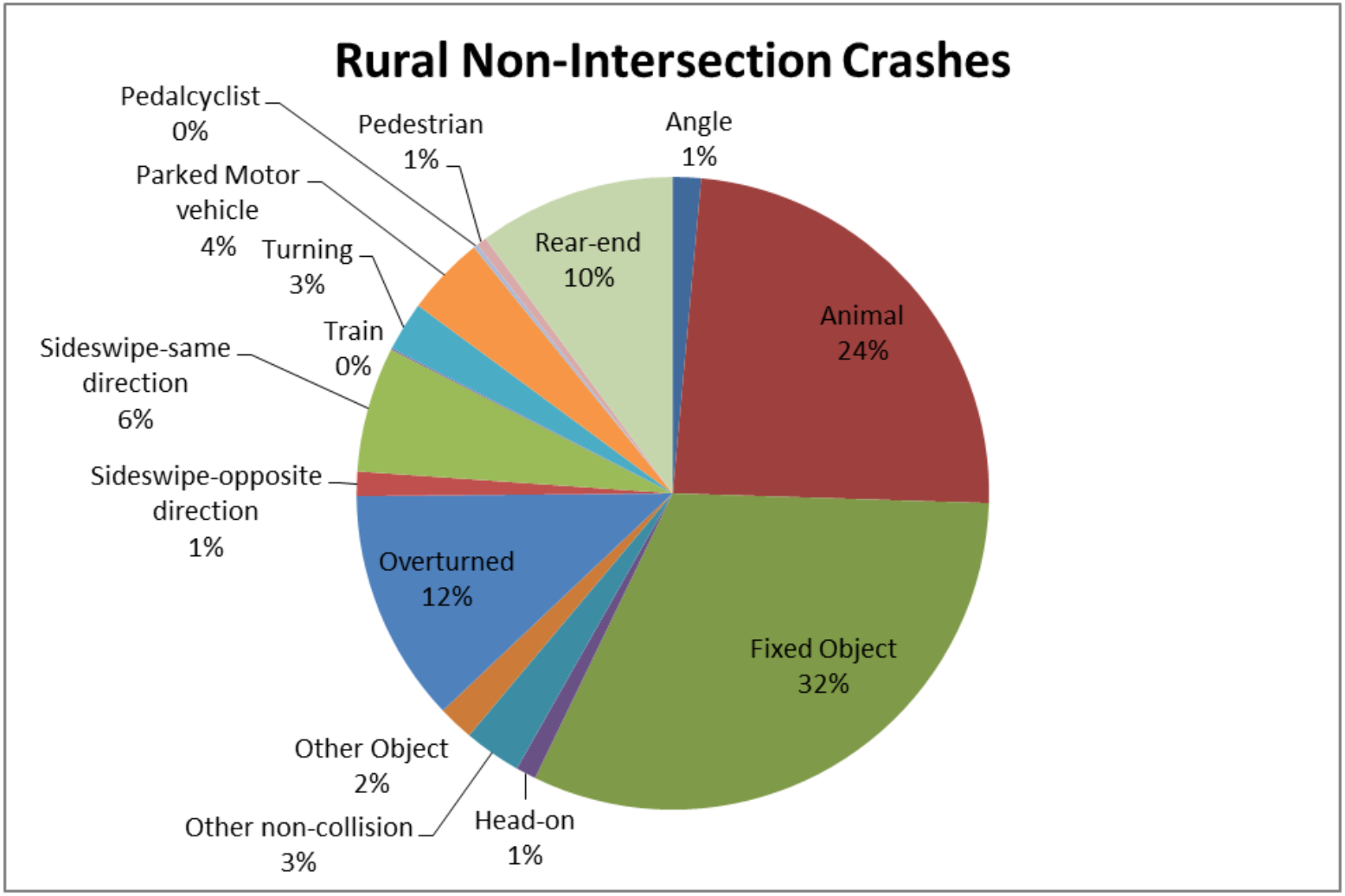
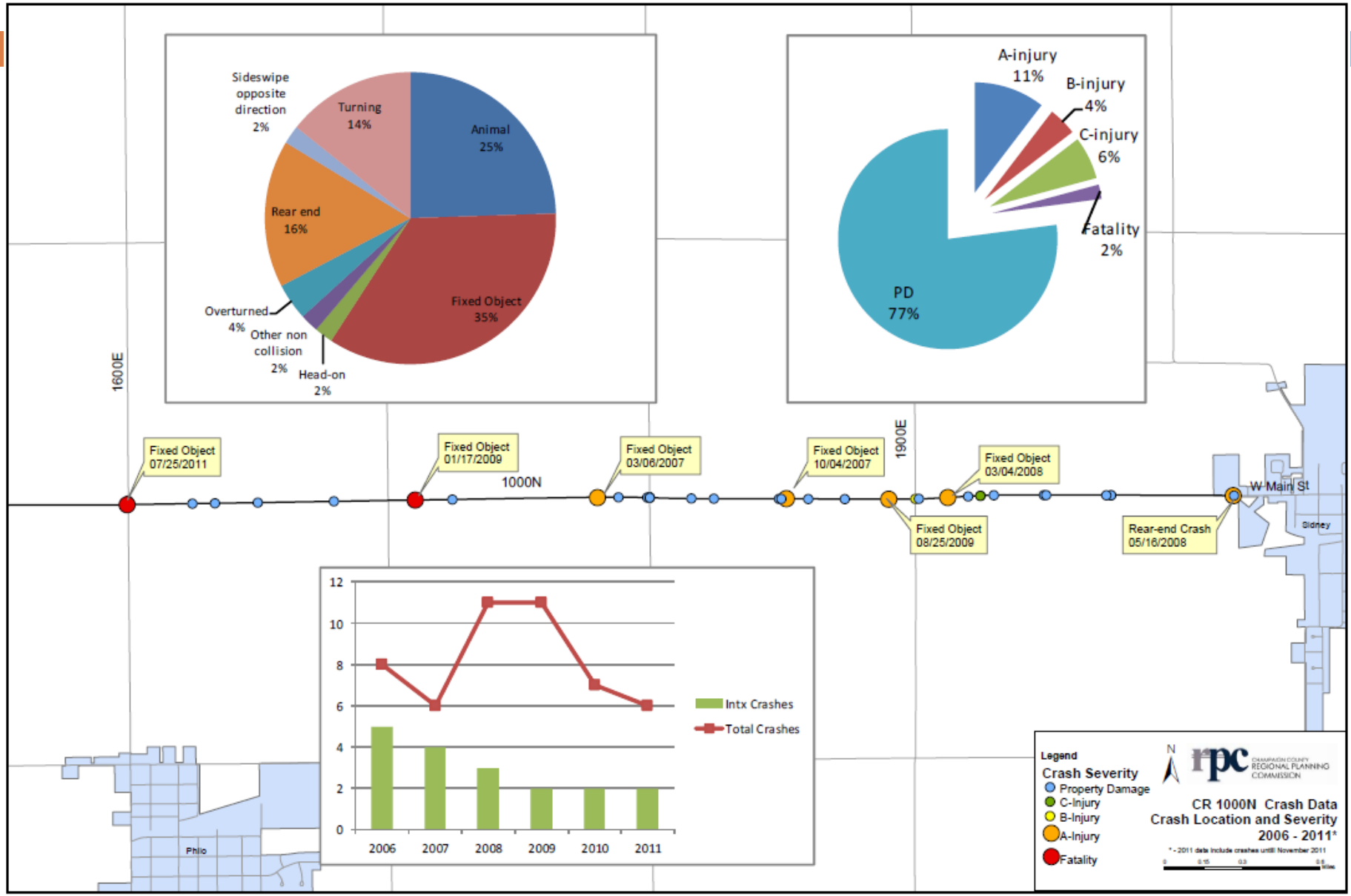
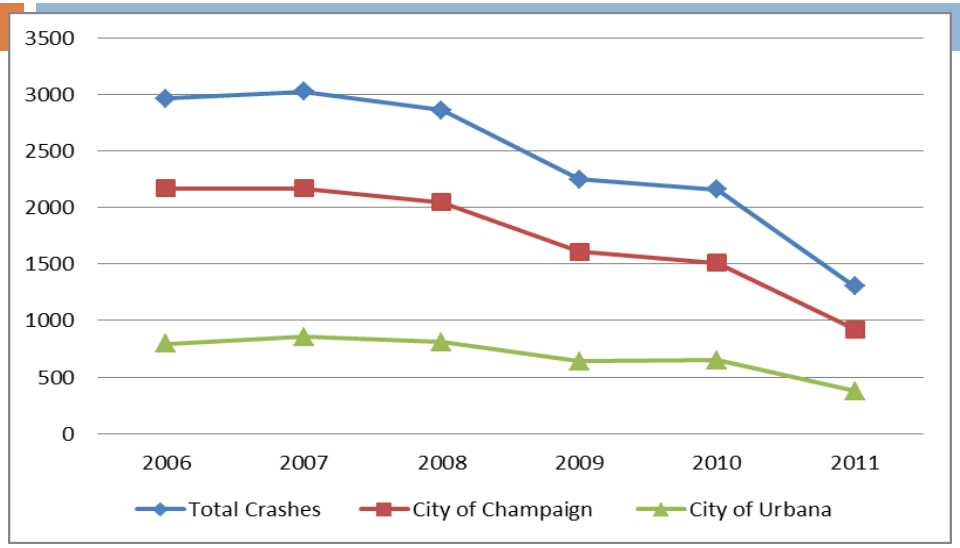


Rural Corridor Analysis



Crashes in Champaign-Urbana



Total Crashes in Champaign County

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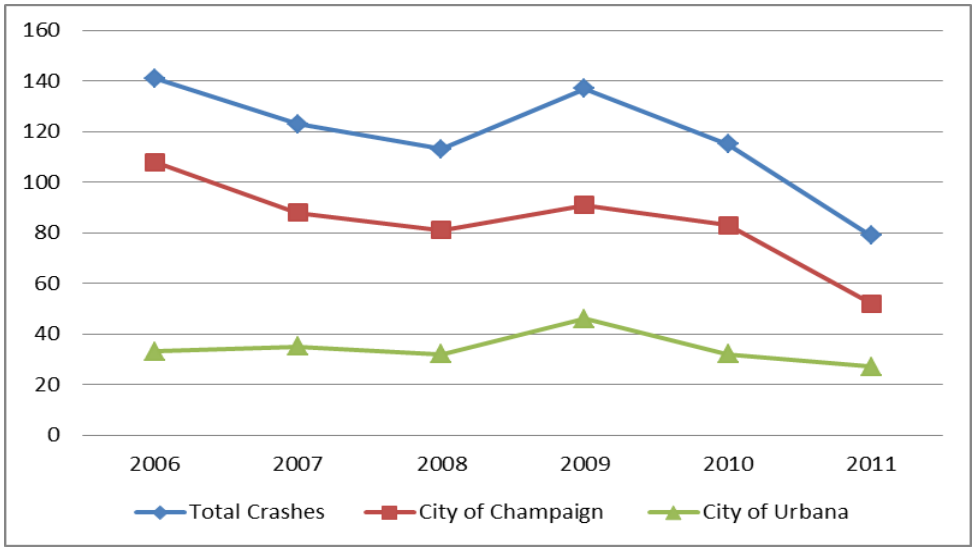
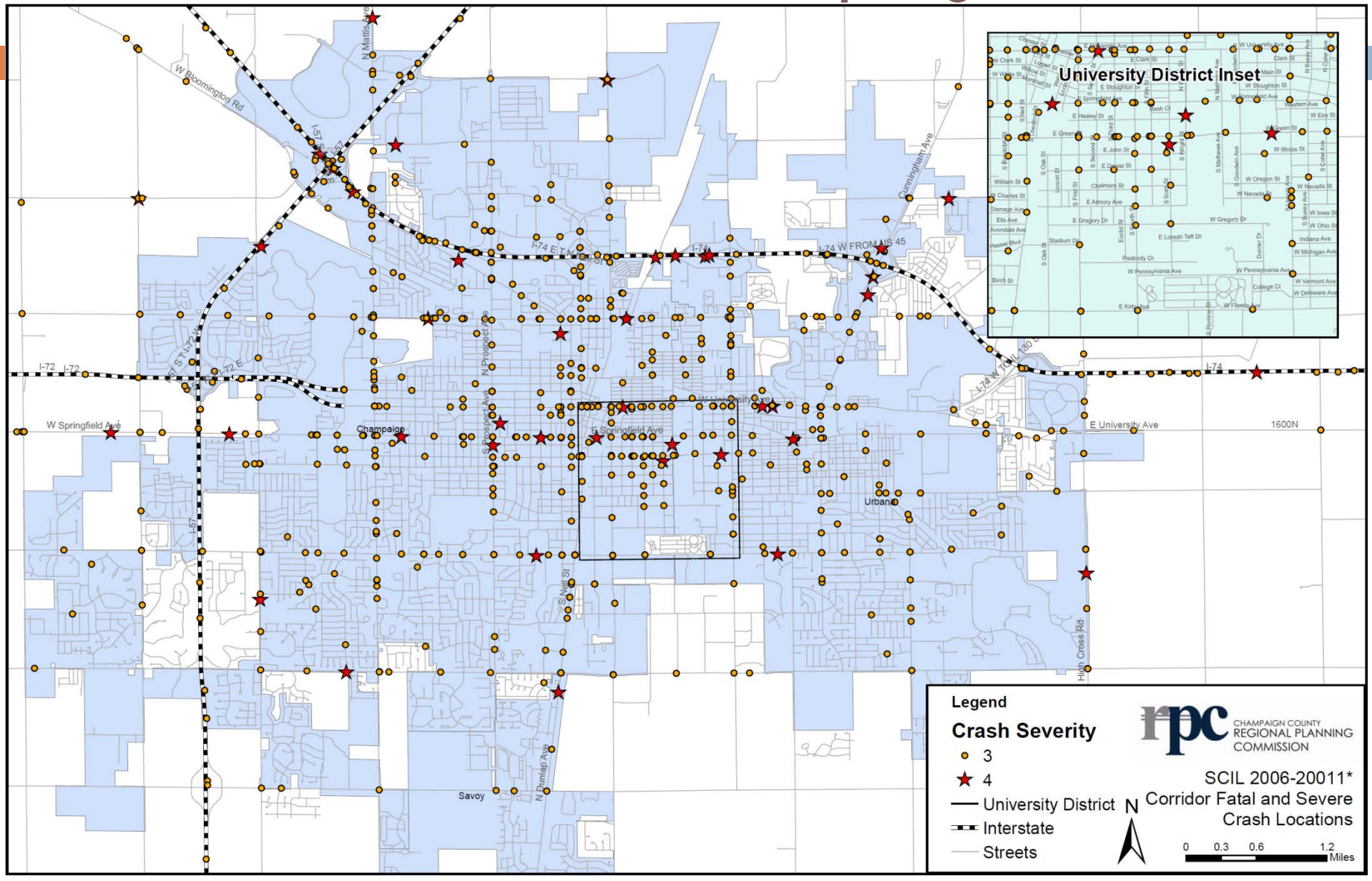
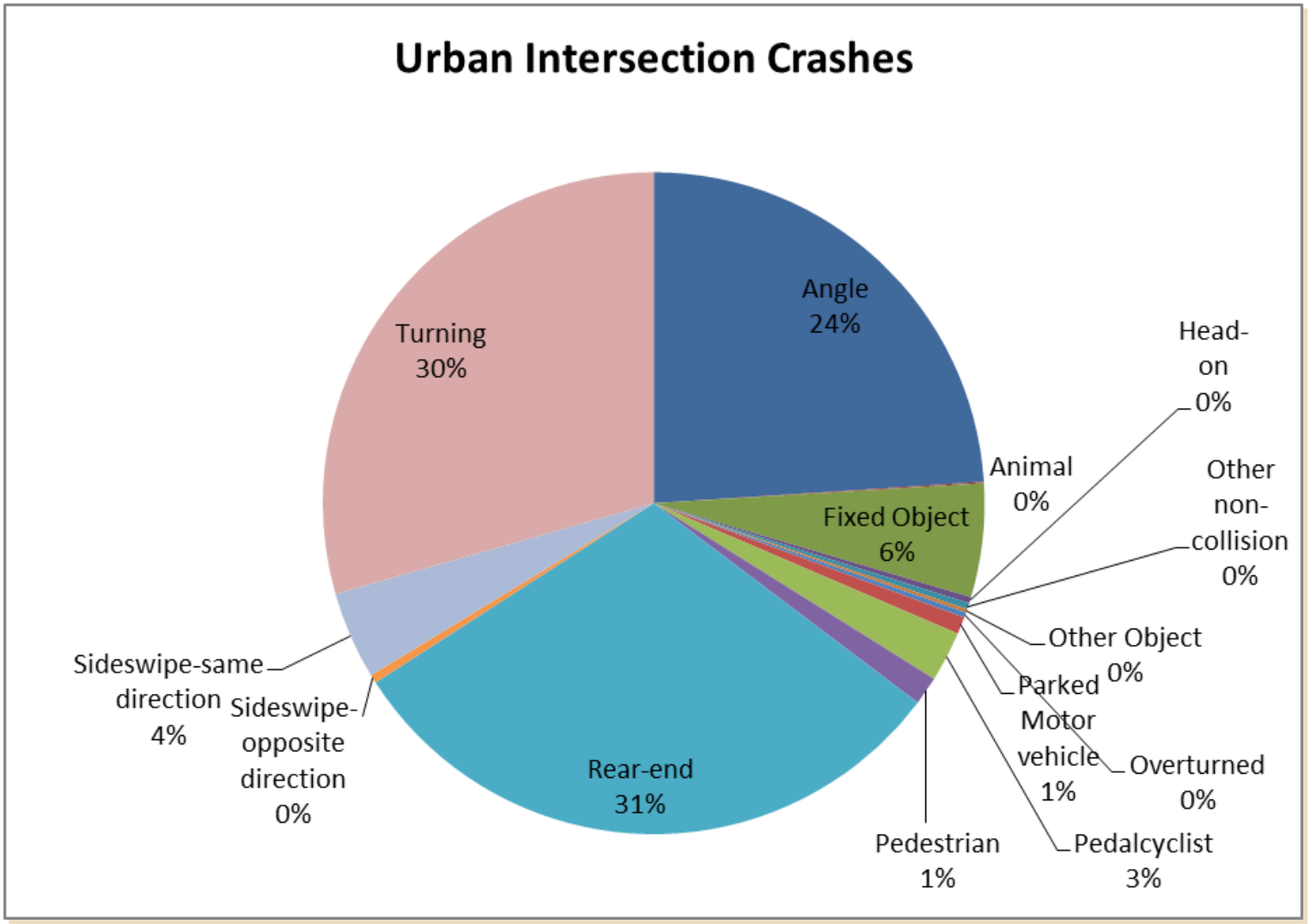


Severe Crashes in Champaign-Urbana



Crashes in Champaign-Urbana



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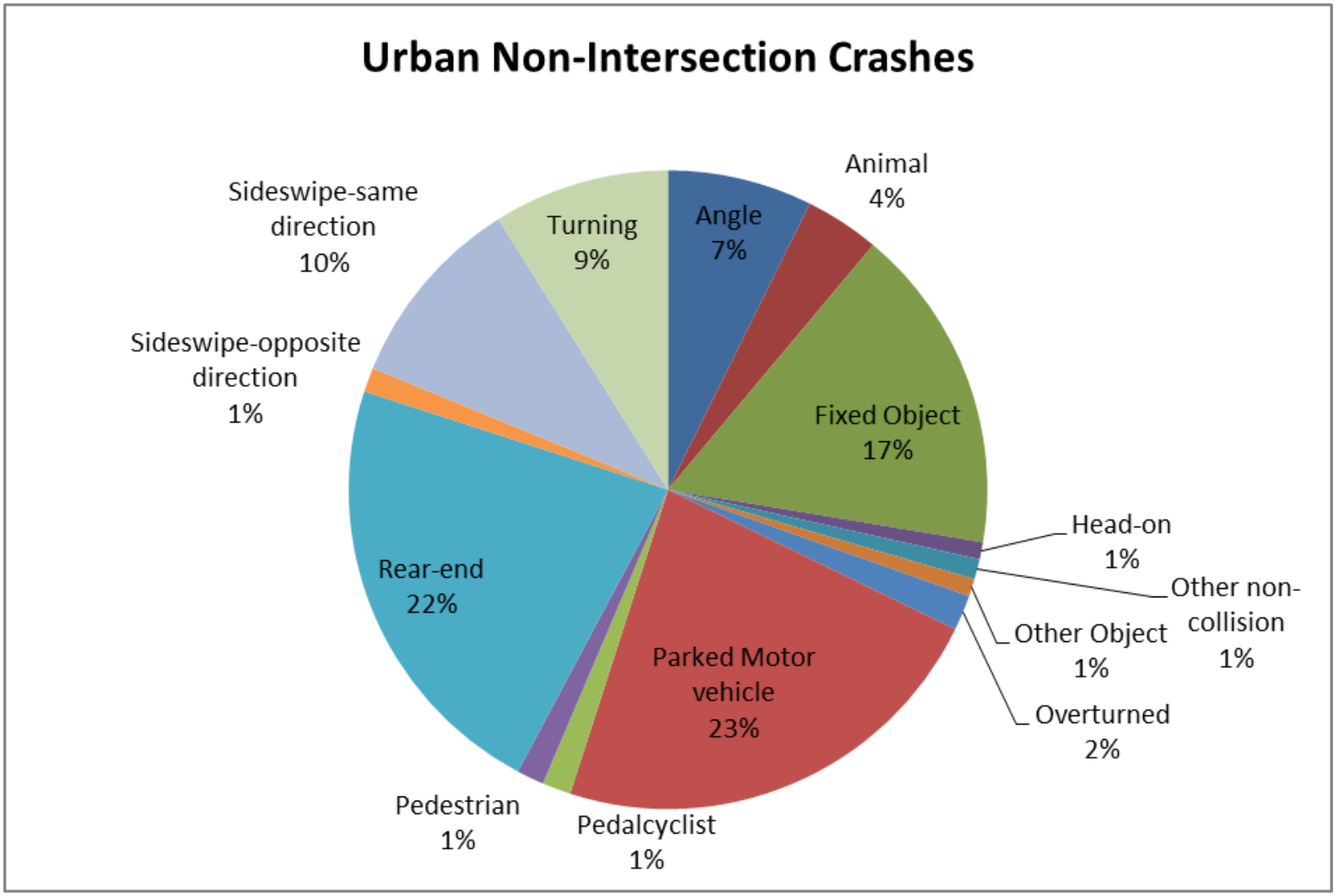
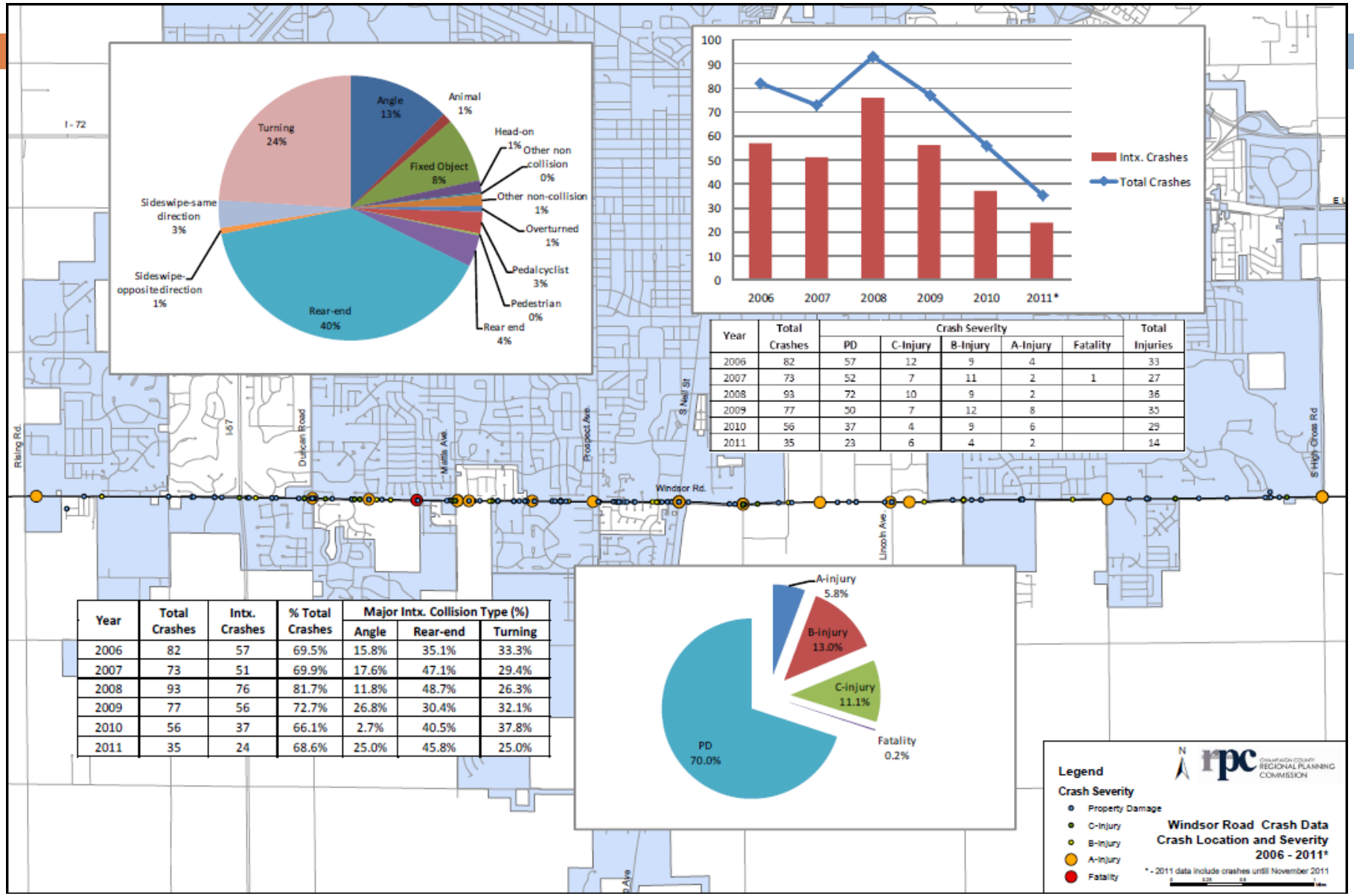


Urban Corridors Priority Identification

Crashes Along Major Corridors in Champaign Urbana

Roadway	Crashes	Injuries	Fatalities	A-Injury Crashes	B-Injury Crashes	C-Injury Crashes	Fatal Crashes
East-West Corridors							
Bradley Avenue	791	274	2	58	69	65	2
University Avenue	1345	440	3	74	142	103	3
Springfield Avenue	1196	369	6	65	108	96	5
Kirby Avenue/Florida Avenue	802	257	2	41	82	72	2
Windsor Road	416	174	1	24	54	46	1
North-South Corridors							
Mattis Avenue	972	341	1	56	102	66	1
Prospect Avenue	1299	348	1	49	92	117	1
Neil Street	1150	360	0	50	115	88	0
Lincoln Avenue	790	215	0	32	81	60	0
Cunningham Ave/Vine St	540	192	1	26	79	43	1
High Cross Road/ IL 130	158	63	2	13	22	9	2
Total	**9459**	**3033**	**19**	**488**	**946**	**765**	**18**

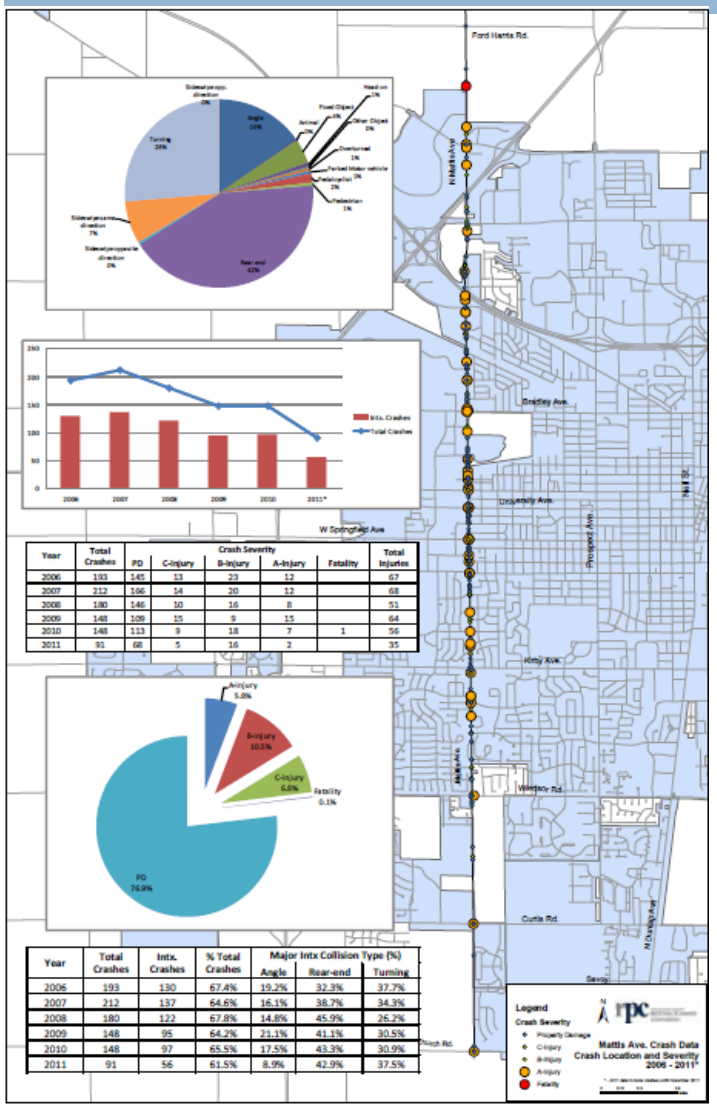
Urban Corridor Analysis



Year	Total Crashes	Crash Severity					Total Injuries
		PD	C-Injury	B-Injury	A-Injury	Fatality	
2006	82	57	12	9	4		33
2007	73	52	7	11	2	1	27
2008	93	72	10	9	2		36
2009	77	50	7	12	8		35
2010	56	37	4	9	6		29
2011	35	23	6	4	2		14

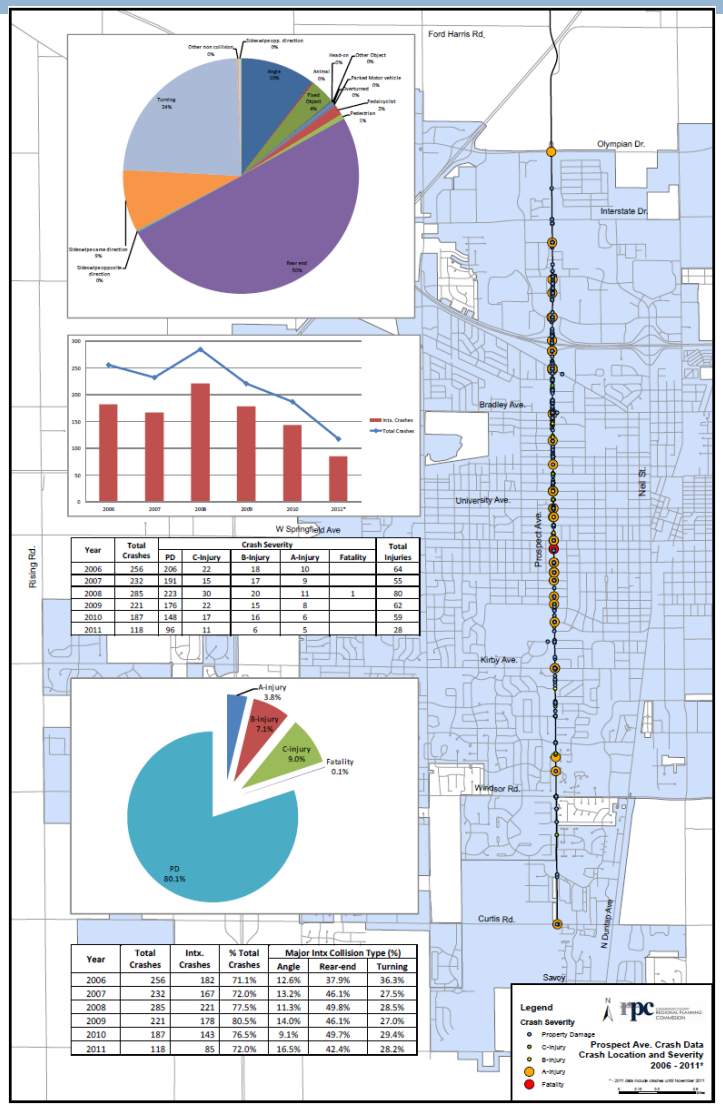
Year	Total Crashes	Intx. Crashes	% Total Crashes	Major Intx. Collision Type (%)		
				Angle	Rear-end	Turning
2006	82	57	69.5%	15.8%	35.1%	33.3%
2007	73	51	69.9%	17.6%	47.1%	29.4%
2008	93	76	81.7%	11.8%	48.7%	26.3%
2009	77	56	72.7%	26.8%	30.4%	32.1%
2010	56	37	66.1%	2.7%	40.5%	37.8%
2011	35	24	68.6%	25.0%	45.8%	25.0%

Urban Corridors Analysis



Year	Total Crashes	Crash Severity					Total Injuries
		PD	C-injury	B-injury	A-injury	Fatality	
2006	193	145	13	23	12		67
2007	212	166	14	20	12		68
2008	180	146	10	16	8		51
2009	148	109	15	9	15		64
2010	148	113	9	18	7	1	56
2011	91	68	5	16	2		35

Year	Total Crashes	Intx. Crashes	% Total Crashes	Major Intx Collision Type (%)		
				Angle	Rear-end	Turning
2006	193	130	67.4%	19.2%	32.3%	37.7%
2007	212	137	64.6%	16.1%	38.7%	34.3%
2008	180	122	67.8%	14.8%	45.9%	26.2%
2009	148	95	64.2%	21.1%	41.1%	30.5%
2010	148	97	65.5%	17.5%	43.3%	30.9%
2011	91	56	61.5%	8.9%	42.9%	37.5%



Year	Total Crashes	Crash Severity					Total Injuries
		PD	C-injury	B-injury	A-injury	Fatality	
2006	256	206	22	18	10		64
2007	232	191	15	17	9		55
2008	285	223	30	20	11	1	80
2009	221	176	22	15	8		62
2010	187	148	17	16	6		59
2011	118	96	11	6	5		28

Year	Total Crashes	Intx. Crashes	% Total Crashes	Major Intx Collision Type (%)		
				Angle	Rear-end	Turning
2006	256	182	71.1%	12.6%	37.9%	36.3%
2007	232	167	72.0%	13.2%	46.1%	27.5%
2008	285	221	77.5%	11.3%	49.8%	28.5%
2009	221	178	80.5%	14.0%	46.1%	27.0%
2010	187	143	76.5%	9.1%	49.7%	29.4%
2011	118	85	72.0%	16.5%	42.4%	28.2%

County Road 1

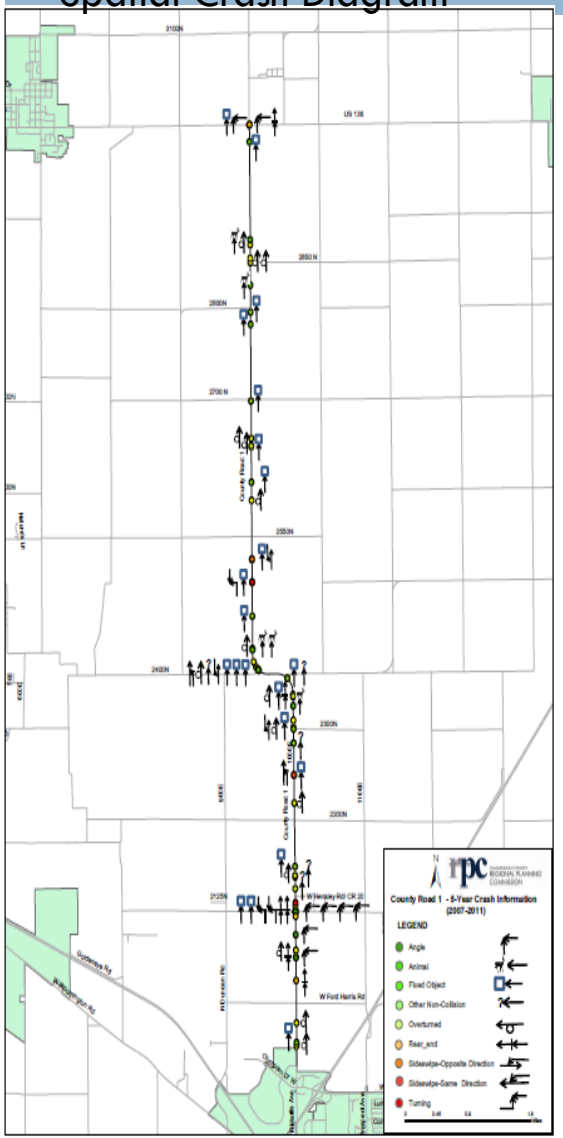
Corridor length: 10.7 miles
Speed limit: 55mph
Width: 24 feet
Shoulder: 2 feet gravel
Geometry: Two consecutive horizontal curves at CR2400N

2009 ADT Volumes

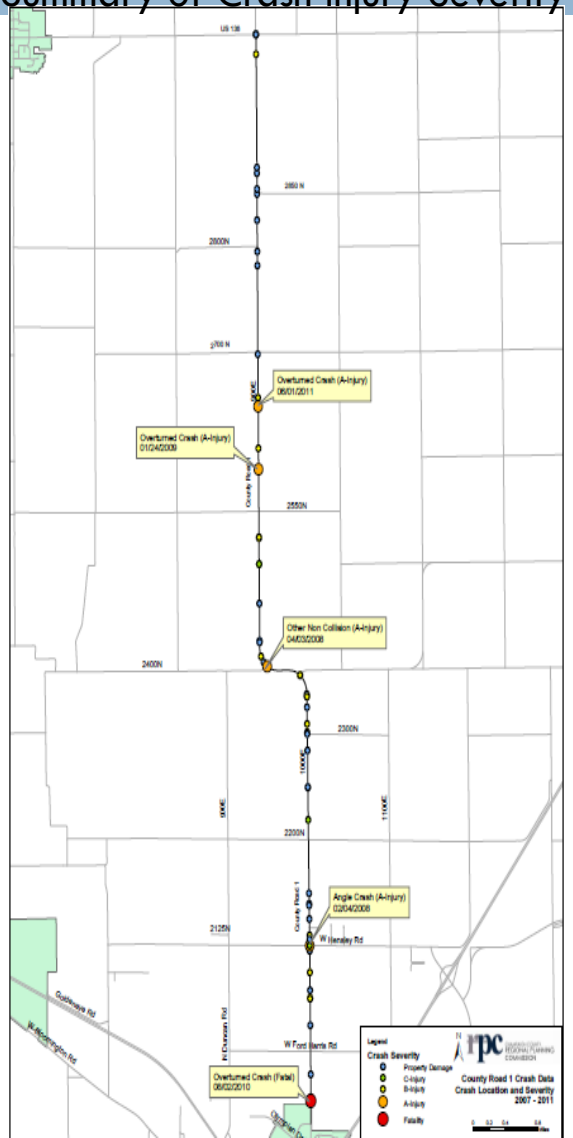
Roadway		2009 AADT
From	To	
County Road 1		
Champaign Municipal Limits	W Hensley Road	2,700
W Hensley Road	CR 2200 N	3,850
CR 2200 N	CR 2400 N	2,350
CR 2400 N	CR 2700 N	2,850
CR 2700 N	CR 3000 N/US 136	2,600

County Road 1

Spatial Crash Diagram

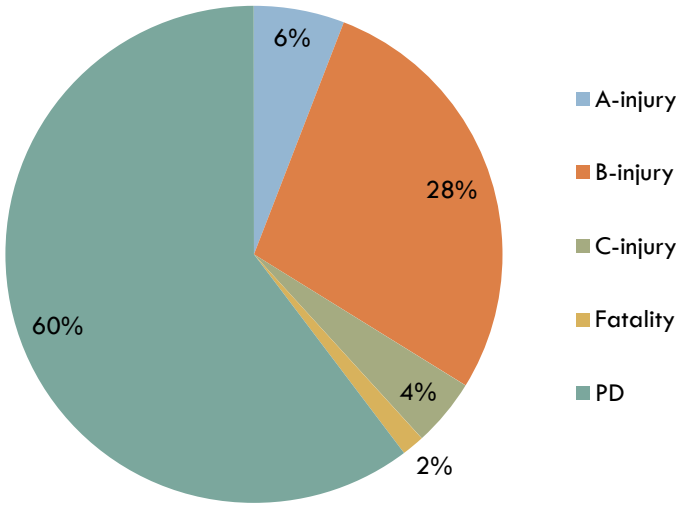


Summary of Crash Injury Severity



County Road 1

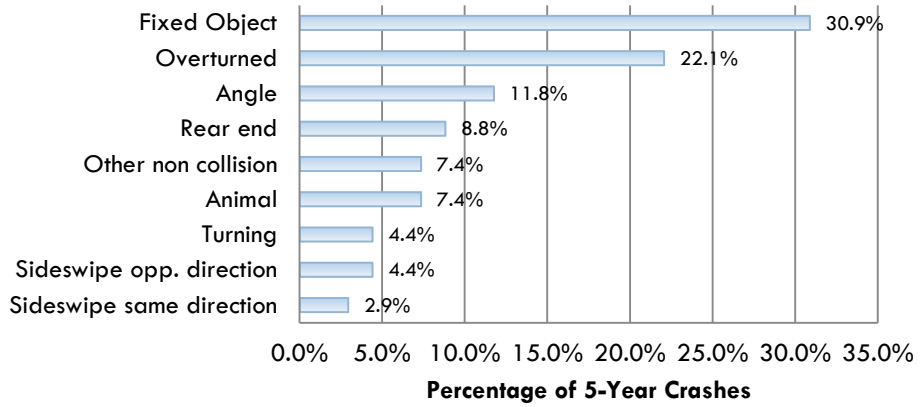
Crash Severity Distribution



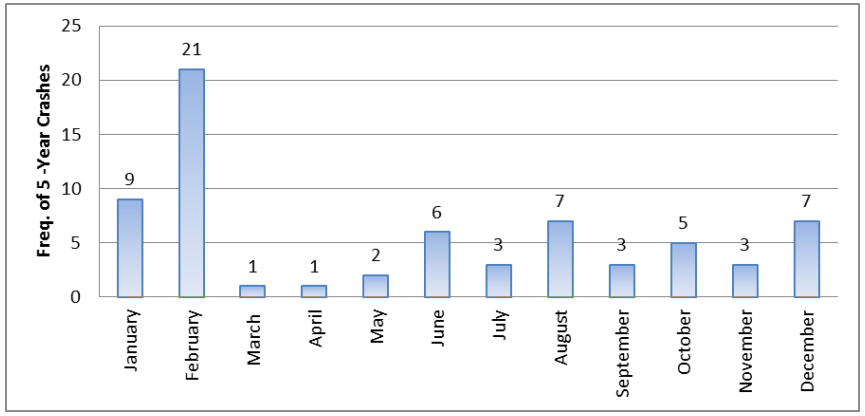
Crash Type Distribution

Crash Type	Year					Total
	2007	2008	2009	2010	2011	
Fixed Object	5	5	2	4	5	21
Overturned		3	3	6	3	15
Angle	2	4		1	1	8
Rear end		2	2	1	1	6
Animal		3	1	1		5
Other non collision		2		1	2	5
Sideswipe opp. direction		1		1	1	3
Turning			2		1	3
Sideswipe same direction		1			1	2
Total	7	21	10	15	15	68

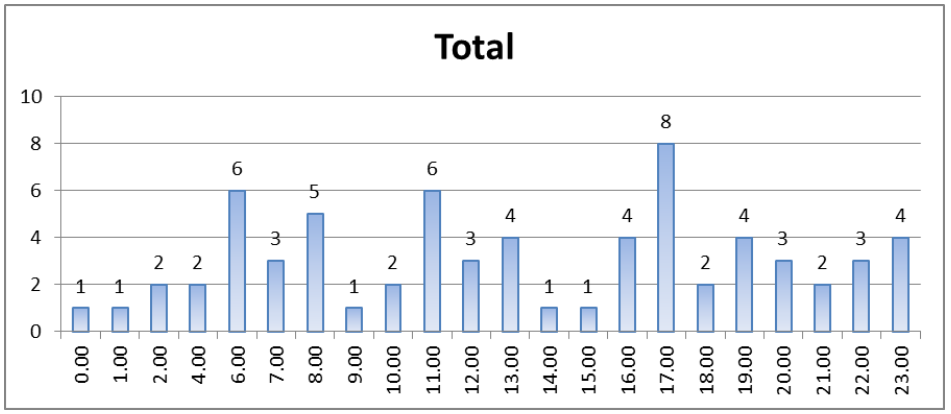
Crash Types



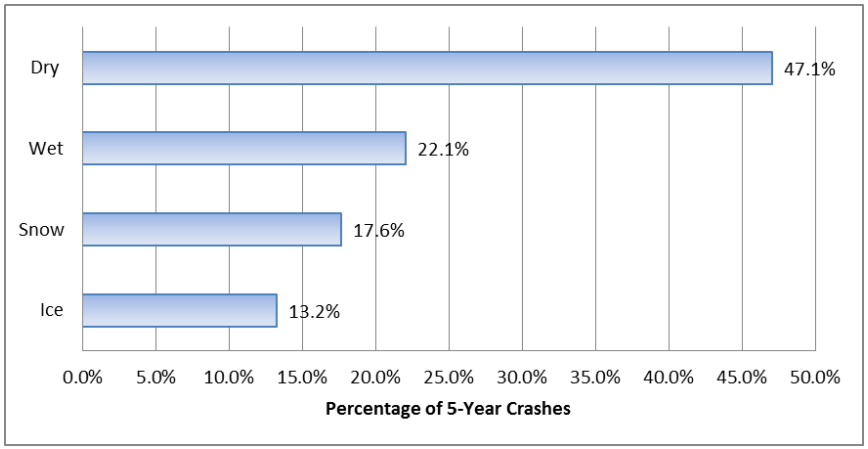
County Road 1



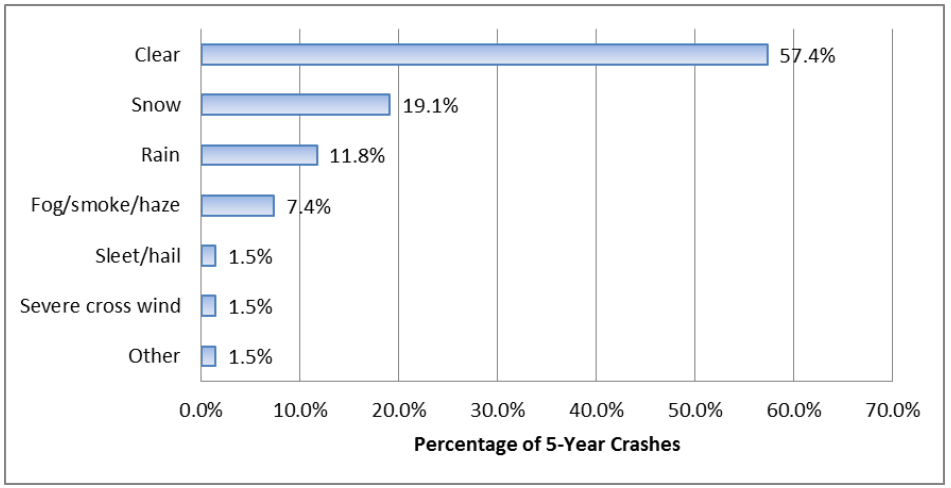
Month of Crashes



Time of Crashes



Roadway Surface Conditions



Weather Conditions

Issue: Absence of paved shoulder and rumble strips

County Road 1 – Champaign County

Solution: Purchase of right-of-way to provide shoulders and rumble strips

Issue: Presence of steep ditches along roadway

County Road 1 – Champaign County

Solution: Provide shoulders along roadway

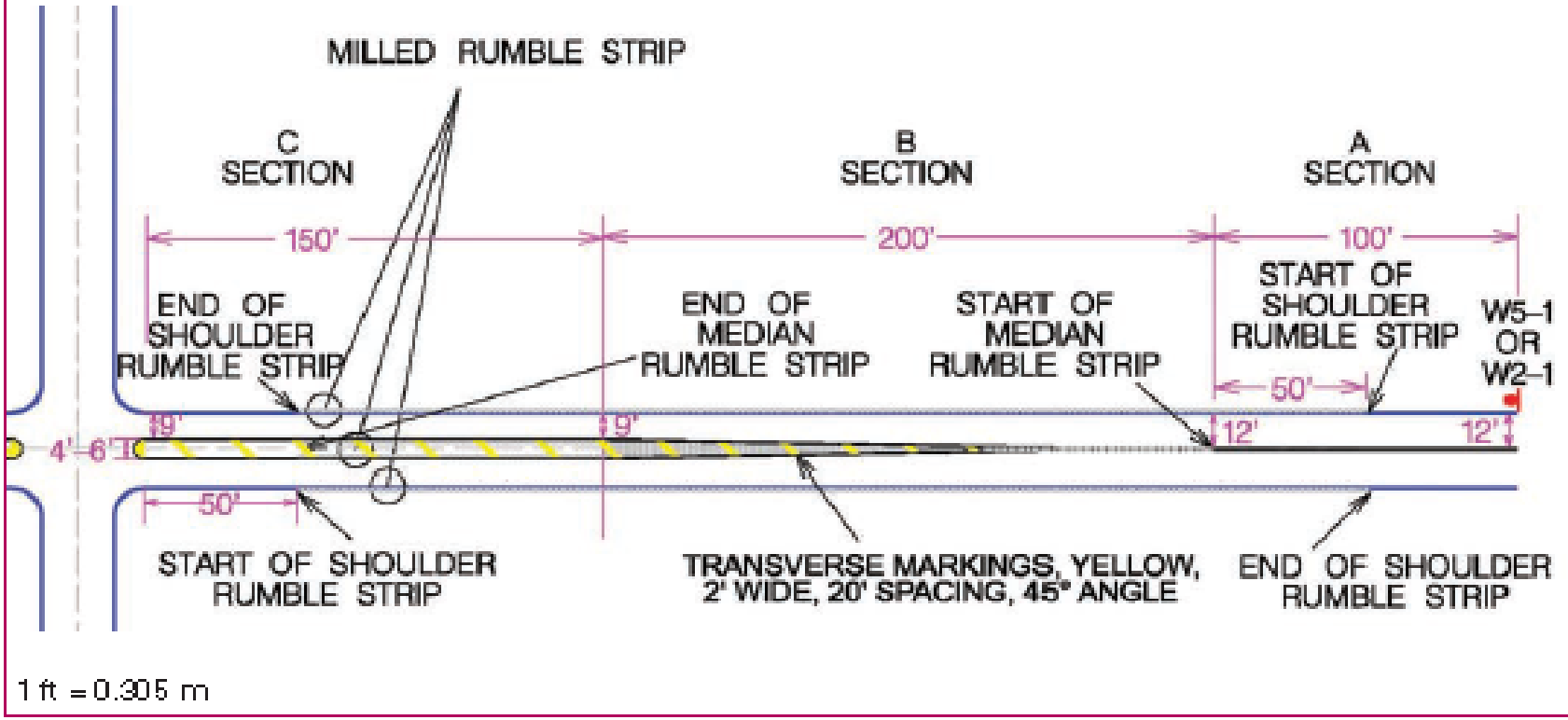
Issue: Unexpected intersections and sharp horizontal curves

County Road 1 – Champaign County

Solution: Reduce approach speed at intersections by reducing lane width, improve warning signs and provide chevrons

Request a Road Safety Audit from the Bureau of Safety Engineering or the District

Figure 6. Typical design of concept 1.



County Road 1

PROJECT DESCRIPTION - PROJECT DATA INPUT (SEGMENTS)

Project:	County Road 1				Prepared by:	Rita Morocoima-Black	
District:	5	County:	Champaign	City:	Date	2/28/2013	
Key Route:		Marked Route:		MilePost:	Current AADT:	3650	
Location Descriptio	County Road 1 between Champaign city limits and US136						
					Length (miles):	10.75	
Crash data:	5	Years			Traffic Growth factor	1.0%	
	From	2007	to	2011	Interest rate	4.0%	
Peer Group:	Peer Group 1 - Rural Two-Lane Highway						

Messages
The combined effect of multiple countermeasures is limited to 0.60 or the smallest CMF.
2.1.9.S1.1 - Pavement Treatments - Rumble Strips (Centerline) AADT is not within HSM limits
2.1.9.S1.1 - Pavement Treatments - Rumble Strips (Centerline) AADT is not within HSM limits

SEGMENTS CRASH SEVERITY DISTRIBUTION BY CRASH TYPE FOR ANALYSIS PERIOD

Crash Type	All Crashes	Angle	Animal	Fixed Object	Head On	Left Turn	Other Noncollision	Other Object	Overturned	Pedestrian	Pedalcyclist	Parked Vehicle	Rear End	Right Turn	Sideswipe Same Direction	Sideswipe Opposite Direction	Turning	Train	Night Time	Wet Pavement	Total
Crash Severity	ALL	AG	AN	FO	HO	LT	OtherNC	OtherO	OVT	PD	PDC	PKV	RE	RT	SSD	SOD	T	TR	NGT	WP	TOT
Fatal Crashes									1												1
A-Injury Crashes		1					1		2												4
B-Injury Crashes		4		7					4				1			2	1				19
C-Injury Crashes		1							1								1				3
PDO Crashes		2	5	14			4		7				5		2	1	1				41

SEGMENTS BENEFIT COST ANALYSIS

BENEFIT CALCULATIONS			COUNTERMEASURE COST CALCULATIONS						
COUNTERMEASURE	CMF *	Crash Type affected by this improvement	Unit Cost	Quantity	Units	Total Cost	Service Life	Present worth	EUAC **
2.1.3.S1.1 - Pavement Treatments - Add or Widen Paved Shoulder	0.67	ROR, FO, HO, OVT, SOD, SSD	$15,000	10	Miles	$150,000	12	$150,000	$13,491
2.1.8.S1.1 - Pavement Treatments - Install Rumble Strips (Shoulder)	0.78	FO, OVT	$7,000	21.5	Miles	$150,500	8	$260,469	$23,427
2.7.3.S1.1 - Roadside Safety - Flatten Sideslopes	0.97	All	$40,000	10.75	Miles	$430,000	15	$430,000	$38,675
2.8.11.AL.1 Lane narrowing	0.80	All	$20,000	4	Unit Qnty	$80,000	3	$320,520	$28,828
TOTAL BENEFIT	$838,995		TOTAL COST						$104,421

BENEFIT / COST	8.00	ANNUAL NUMBER OF FATALITIES POTENTIALLY PREVENTED	0.08

* CMF = Crash Modification Factor

** EUAC = Estimated Uniform Annual Cost

Funding Results

County Road 1 – Champaign County

- Total cost $7.1 million approximately
- $855,000 from HSIP funding
- $3,100,000 STR funding
- $900,000 TARP funding
- $2,235,000 MFT funding
- Engineering 2013/2014
- Construction beginning Spring 2015

HSIP Project Application

- Coordination y collaboration between MPO staff and local agency staff
- Detailed analysis of the problem:
  - Crash severity
  - Crash types
  - Crashes spatial distribution
  - Crash trends
  - Temporal & environmental crash distributions
  - Traffic volumes
- Identification of safety issues and proposed mitigation measures
- Propose improvements
- Economic evaluation (B/C) of proposed improvements

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