TRAFFIC MONITORING PROGRAM IN IOWA

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Office of Systems Planning

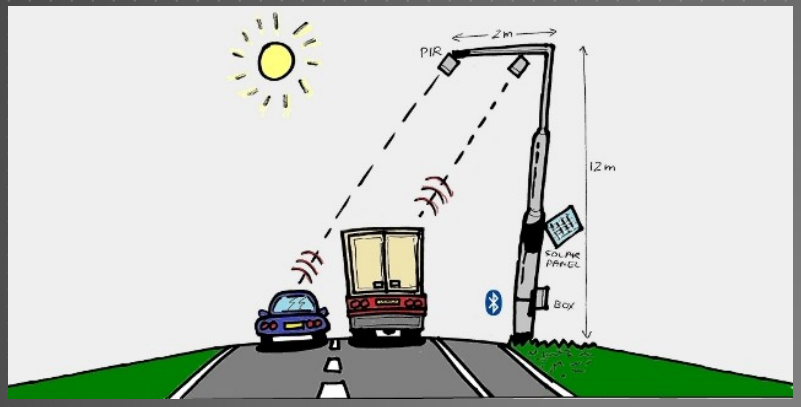
Iowa Department of Transportation

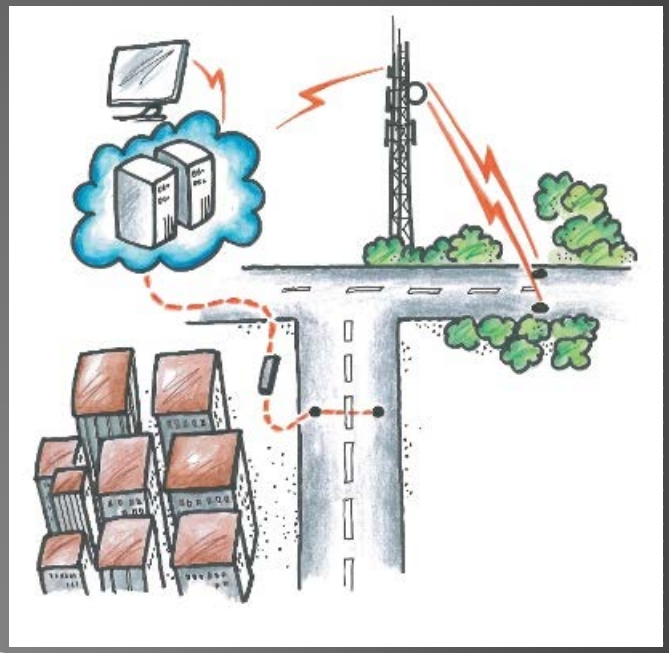
TRAFFIC MONITORING PROGRAM IN IOWA

- Telemetrics
- Traffic Monitoring Program Areas
- Data Collection Methods
- Data Output Examples
- Traffic Monitoring Data Products
- Sources
- Questions

TELEMETRICS

- Telemetrics is a technology that involves the automatic measurement and transmission of data from remote sources.
- The process of measuring data at the source and transmitting it automatically is called *telemetry*.





WHAT DATA IS COLLECTED?

- Data and information on traffic are the foundation to many highway and transportation functions.
  - Volume of Traffic
  - Vehicle Classification
  - Vehicle Speed
  - Vehicle Weight

WHY DO WE COLLECT TRAFFIC DATA?

- Federal Legislation
  - Federal Highway Administration (FHWA) under United States Code of Federal Regulations (CFR) title 23, 420.105(b), which requires States to provide data that supports FHWA's reporting responsibilities to Congress and to the public.
  - Traffic data reported under this Federal regulation is submitted as part of the annual Highway Performance Monitoring System (HPMS) report from each State.
- MAP-21 – Major Focus on Performance Measurement
- Supports Monitoring and Analysis for:

- Highway/Bridge Design
- Asset Management
- Performance Management
- Traffic Forecasting & Modeling
- Safety Analysis
- Maintenance Activities
- Traffic Operations
- Environmental Analysis
- Finance
- Engineering Economics

TRAFFIC MONITORING DATA COLLECTION METHODS

There are two general methods used to collect traffic data:

- Manual – Refers to visually observing number, classification, vehicle occupancy, turning movement counts, or direction of traffic. Methods include using tally sheets or electronic counting boards.

- Automatic – Refers to the collection of traffic data with automatic equipment designed to continuously record the distribution and variation of traffic flow in discrete time periods (e.g. by 5 min., 15 min., hour of the day, day of the week, and month of the year from year to year). Automatic methods may include both permanent and portable counters.

MANUAL COUNTS

- Typically used in places where equipment will not work.
- Counting vehicle turning movements or vehicle occupancy are good examples.

Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

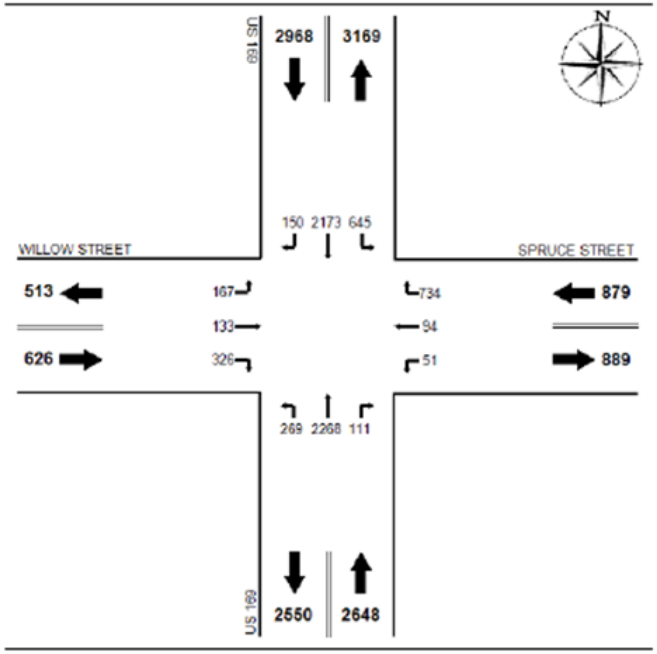
Station Number:
25133701099

Count Date:
Thursday, September 20, 2012

County:
Dallas

Location Description:
US 169, Willow St & Spruce St

Volume Factor: 1.792
Pass Class Factor: 1.811
SU Class Factor: 1.439
Combo Class Factor: 1.400



Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	70	128	6	5	16	106	44	358	13	43	20	26
08:00	56	101	6	5	8	80	18	212	5	9	3	21
11:00	28	105	5	2	7	21	12	116	7	4	7	10
12:00	24	115	6	2	5	25	16	109	5	6	7	21
15:00	67	184	12	8	7	71	17	138	10	5	13	22
16:00	56	289	28	5	4	59	15	149	12	14	13	38
17:00	60	295	21	2	6	48	28	185	10	12	11	44

AUTOMATIC COUNTS

ATR Cabinet

ITS Cameras

Radar Unit

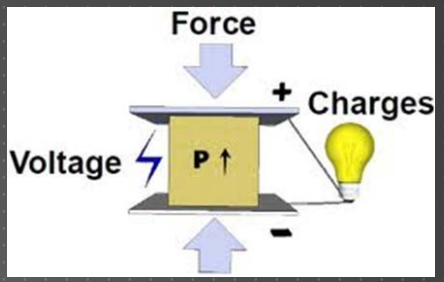
Class/Speed Site

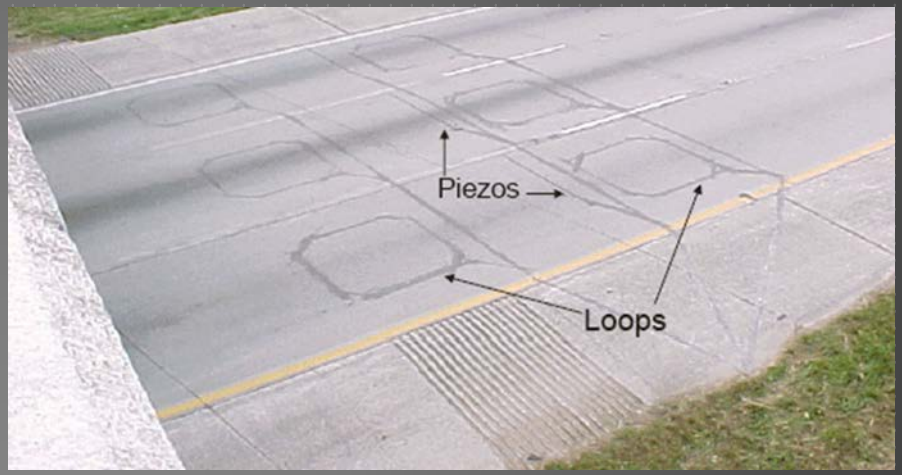
Weigh-in-Motion Site

AUTOMATIC TRAFFIC RECORDER

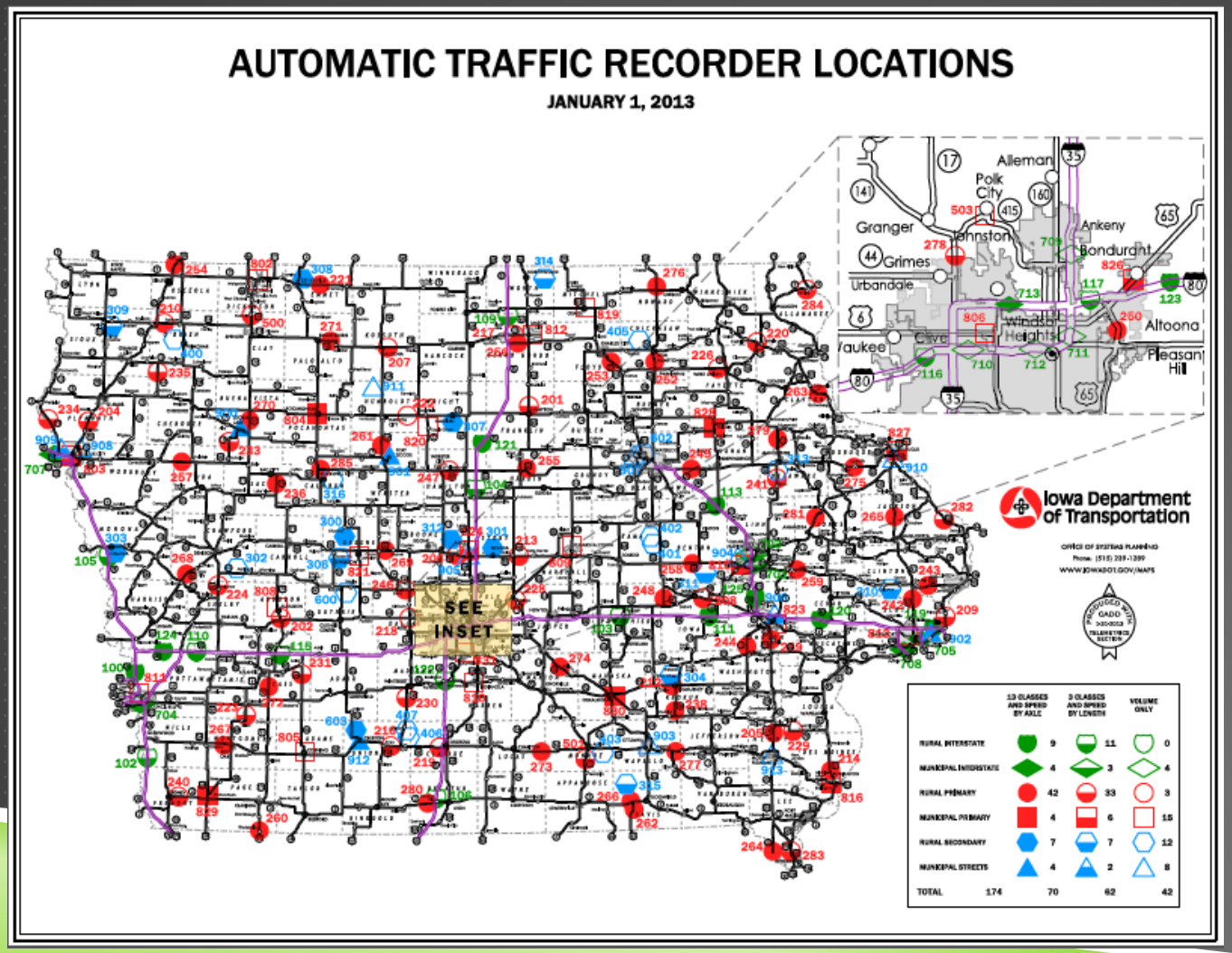
- Volume Only
  - Inductive Loop
- 3-Class and Speed
  - Inductive Loops
- 13-Class and Speed
  - Piezo
  - Inductive Loop
  - Combinations
    - PLP
    - LPL

Piezo





AUTOMATIC TRAFFIC RECORDER LOCATIONS



174 Current

Plan to Expand

Volume Only 42

3-Class/Speed 62

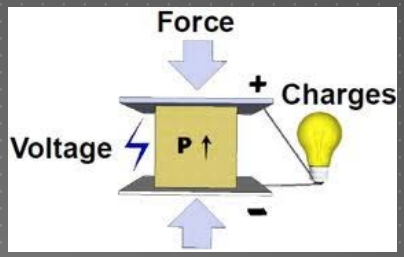
13-Class/Speed 70

AUTOMATIC TRAFFIC RECORDERS

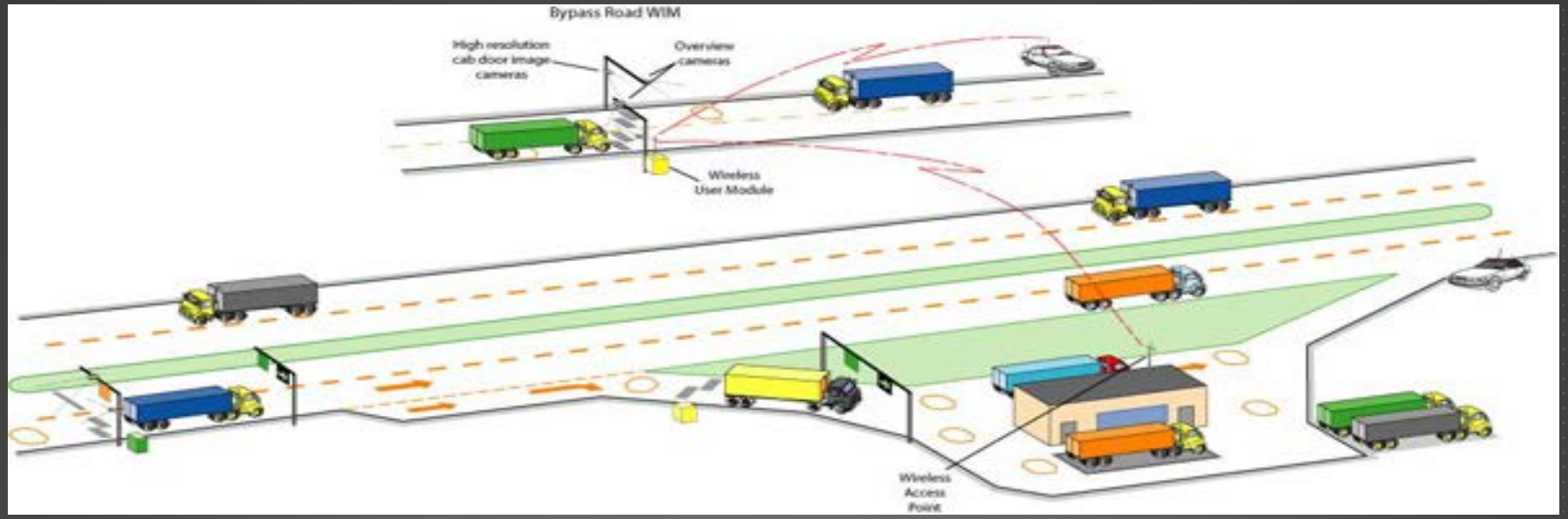
- Most basic function of highway planning and management
- Provide Continuous Traffic Count Data
- Understand DOW and Monthly Changes in Travel
- Data used to facilitate the expansion of short-term manual and portable counts to AADT.
- Aid in Calculating Statewide VMT
- Highway Performance Monitoring System Reporting

WEIGH IN MOTION

- WIM devices capture and record axle weights and gross vehicle weights
- Capable of measuring moving vehicles
- More efficient
- Allows bypass of static scales
- Same Principle Hardware as 13-Class
- Need Two Piezos and One Loop



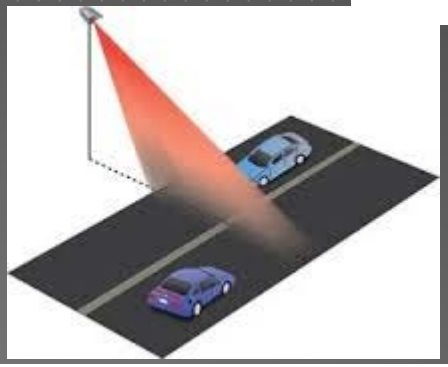
40 Sites

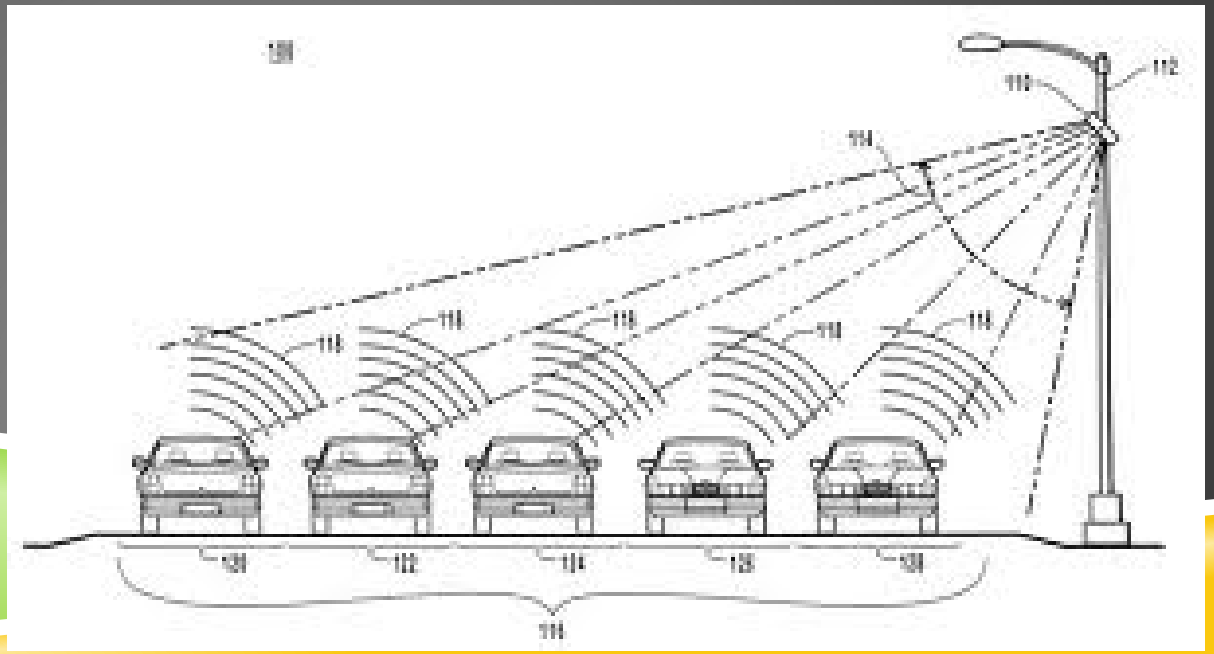

Bypass Road WIM
High resolution cab door image cameras
Overview cameras
Wireless User Module
Wireless Access Point

WIM

WAVETRONIX

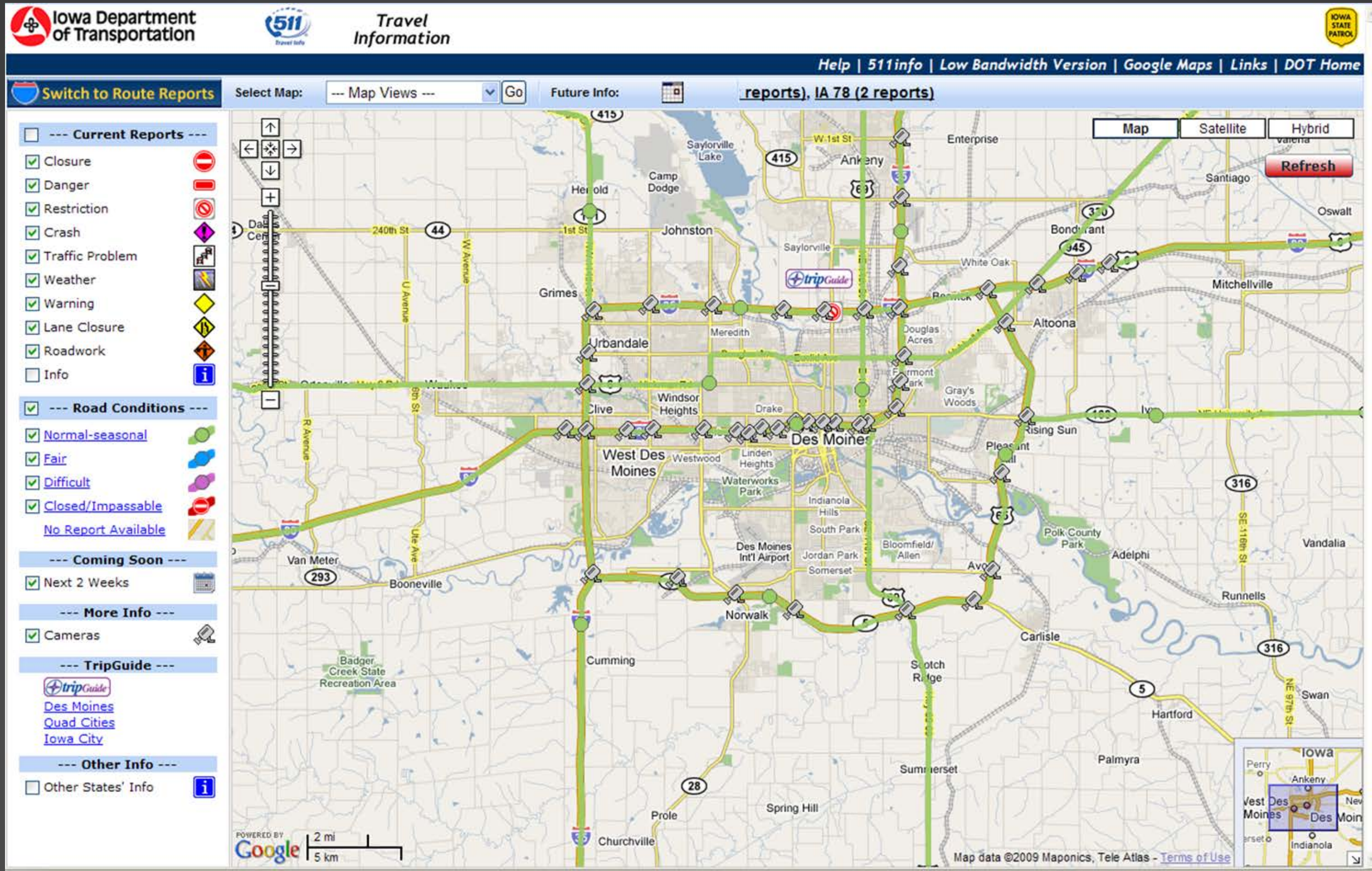
- Count
- 3-Class
- Speed





INTELLIGENT TRANSPORTATION SYSTEMS

- http://www.iowadot.gov/i-235/tripguide_info.htm
- TripGuide covers
  - 62 miles of roadway in the DSM Metro
  - 43 CC TV Cameras
  - Planned 68 Wavetronix SmartSensors
  - Integrated with 511 Website
  - Will provide color coded traffic flow map
  - Originally developed to deal with traffic congestion during I-235 reconstruction



Iowa Department of Transportation
511
Travel Information
Help | 511info | Low Bandwidth Version | Google Maps | Links | DOT Home
Switch to Route Reports
Select Map:
--- Map Views ---
Go
Future Info:
reports), IA 78 (2 reports)
--- Current Reports ---
Closure
Danger
Restriction
Crash
Traffic Problem
Weather
Warning
Lane Closure
Roadwork
Info
--- Road Conditions ---
Normal-seasonal
Fair
Difficult
Closed/Impassable
No Report Available
--- Coming Soon ---
Next 2 Weeks
--- More Info ---
Cameras
--- TripGuide ---
Des Moines
Quad Cities
Iowa City
--- Other Info ---
Other States' Info
Map
Satellite
Hybrid
Refresh
Ankeny
Enterprise
Saylorville Lake
Camp Dodge
Johnston
Saylorville
Grimes
Urbandale
Meredith
Douglas Acres
Altoona
Mitchellville
Santiago
Oswalt
White Oak
Clive
Windsor Heights
Drake
Des Moines
West Des Moines
Westwood
Linden Heights
Waterworks Park
Indianola Hills
South Park
Des Moines Int'l Airport
Jordan Park
Somerset
Bloomfield/ Allen
Gray's Woods
Rising Sun
Pleasant Hill
Polk County Park
Adelphi
Vandalia
Runnells
Carlisle
Norwalk
Van Meter
Booneville
Cumming
Badger Creek State Recreation Area
Hartford
Swan
Palmyra
Spring Hill
Prole
Churchville
Scotch Ridge
Map data ©2009 Maponics, Tele Atlas - Terms of Use
POWERED BY Google
2 mi
5 km
Iowa

I-235: DM - I-235 @ 22nd St in WDM (16)

Load motion video

TRAFFIC DATA FROM ITS UNITS

Des Moines

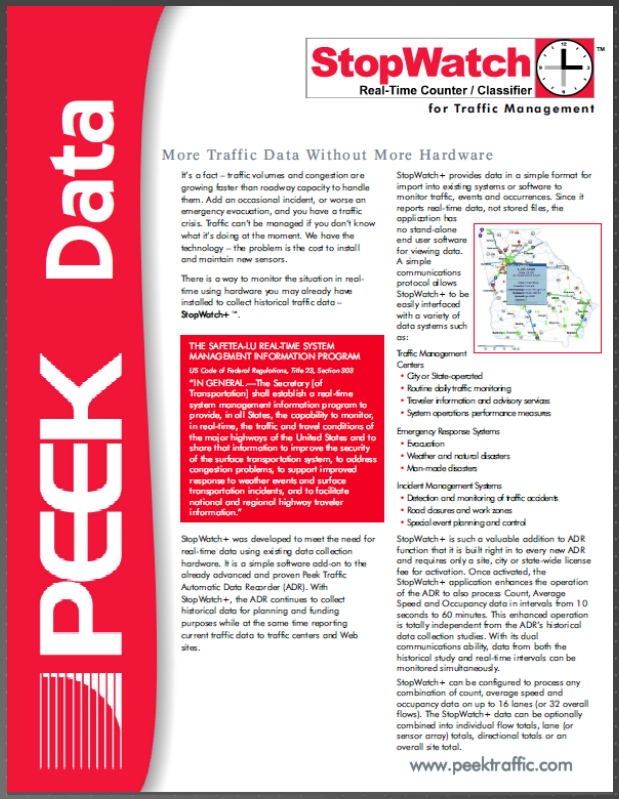
- Collect volume only data from ITS sites
- Wavetronix connects to ADR for data storage
- Ability to collect the data in intervals of our choosing

Iowa City, Cedar Rapids, Council Bluffs, Waterloo and Davenport

- We only get data from the Des Moines sites at this time
- Feds require continuous measurement
- Other ITS sites do not always provide continuous measurement
- Data formatting (e.g. speed bins) is also an issue
  - Feds have certain requirements for reporting

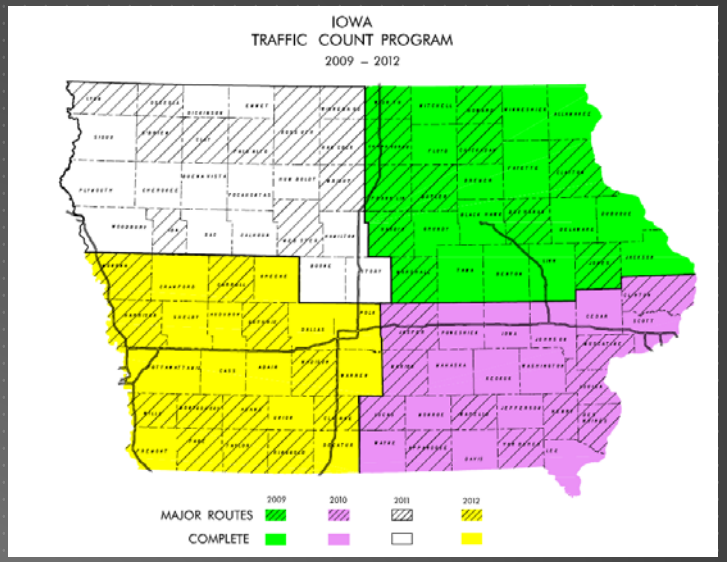
STOPWATCH+ BY PEEK

- SAFETEA-LU Real Time System Management Information Program
  - Requires all States to monitor, in real time, traffic and travel conditions of major highways. This information will be shared to improve security of the surface transportation system, address congestions problems, support improved response to weather events and incidents and facilitate national and regional highway traveler information.
- Real-time traffic speed data integrated with existing hardware
- All current ATR Stations upgraded by end of 2013
- Eventually Integrated with 511 Website



QUADRENNIAL COUNT PROGRAM

- The state is divided into four zones as shown in the map.
- Each year a quarter of the state is selected for collection of traffic counts.
- The counties, which are hatched, are chosen in a cycle for complete counts, which includes the secondary roads and the counts for only the primary roads are collected in the remaining counties in the zone.
  - Thus, for primary (principal) roads, a data collection cycle is completed once every four years (one quarter of the state is counted every year). Secondary (non-principal) roads are counted only every eight years.
- Count data is made available in a variety of formats.



QUADRENNIAL COUNT PROGRAM

- Pneumatic Hoses and Counters
- Peek Traffic Counters

TRADAS
TRAFFIC DATA SYSTEM

- What it is….
  - Comprehensive traffic data collection management, quality control and analysis software from Chaparral Systems Corporation.
  - Oracle Database
  - Meets AASHTO guidelines
  - Used by 15 other states

- Benefits
  - Oracle interface
  - Move away from Mainframe
  - Access to turning movements for other offices
  - Easier to get data into HPMS
  - Off the shelf analysis tools

TRADAS DATA OUTPUT EXAMPLES

Iowa Department of Transportation

Commercial AADT at Continuous Sites for 2012

		Roadway			Neg Dir			Pos Dir		
		AADT	C-AADT	M-AADT	AADT	C-AADT	M-AADT	AADT	C-AADT	M-AADT
100 I 29 2.0 MI N OF I 680 HONEY CREEK	Pottawattamie	19,899	3,807	3,147	10,017	1,912	1,584	9,882	1,895	1,563
104 I 35 3.0 MI N OF IA 175 JEWELL	Hamilton	22,702	4,877	4,141	11,469	2,490	2,119	11,233	2,387	2,022
111 I 80 2.0 MI E OF IA 149 WILLIAMSBURG	Iowa	30,166	9,041	8,227	15,100	4,544	4,152	15,066	4,497	4,075

Percent of MADT at Continuous Count Vehicle Class Sites for 2012

Site Names: 111
County: Iowa
FunctClass: Rural Principal Arterial - Interstate
Location: I 80 2.0 MI E OF IA 149 WILLIAMSBURG

Seasonal Factor Type: Rural Interstate
Daily Factor Type: Rural Interstate
Axle Factor Type: Rural Interstate
Growth Factor Type: Rural Interstate

	2012 Traffic Year												
Class	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AADT
MC	.2	.2					.6	1	.5	.2	.1	.1	.4
CAR	53.6	54.6					59.5	59.4	57.6	57.1	60.3	60	57.8
PU	10.8	10.7					10.4	10.5	10.7	10.8	10.9	11	10.7
BUS	.8	.8					.6	.6	.7	.7	.6	.5	.7
2D	1.8	1.8					1.9	2.2	2.6	2.5	2.1	2	2.1
SU 3	.5	.5					.4	.5	.6	.6	.5	.5	.5
SU 4+	0	0					0	0	0	0	0	0	0
ST 4-	1.2	1.3					1.8	2.6	1.4	1.3	1	.9	1.5
ST 5	28.9	28.1					20.2	21.4	24.2	25	22.8	23.4	23.9
ST 6+	.2	.2					.2	.2	.2	.2	.2	.2	.2
MT 5-	1.2	1.2					.8	.9	.9	1	.9	.9	1
MT 6	.5	.5					.4	.4	.5	.5	.5	.4	.5
MT 7+	0	0					0	0	0	0	0	0	0
OFFSCALE	0	0					0	0	0	0	0	0	0
UNCLS	0	0					0	0	0	0	0	0	.1
MADT	23492	25138				35003	34687	36355	32441	31130	31468	26730	30348
UNCLS	0	0					0	0	0	0	0	0	.1

NOTE: Report values are rounded for more precise numbers, so totals may not add up.

TRAFFIC BOOK

Volume of Traffic on the Primary Road System

Iowa Department of Transportation

Printable PDF | Introduction | Select a Route by County | OR | Enter a route number for a statewide listing: Submit | Explanation of Headings

Route	2012 Primary Route Section Description	Rural/Municipal	Section Length (miles)	Annual Average Daily Traffic	Vehicle Classification Distribution of Annual Average Daily Traffic											Average Daily Vehicle Miles	
					Motorcycles	Cars, Vans and Pickups	Total Trucks and Buses	Single Unit Trucks				Combination Trucks				All Vehicles	Trucks and Buses
								Buses	2 Axle	3 Axle	4 or more Axles	4 or less Axles	5 Axle	6 or more Axles	Multiple Trailer		

Introduction

The Office of Transportation Data, in cooperation with the Federal Highway Administration, prepares this biennial traffic report. This report is used by federal, state, and local governmental agencies in determining highway needs, construction priorities, route location and environmental impact studies, and the application of appropriate design standards. The general public uses this information in determining the amount of traffic that passes a given area as they make their development plans and propose land use changes. The above reflects only a few of the many technical uses for this data.

The traffic volumes depicted in this report are derived form data obtained at 8,000 count locations during 2009, 2010, 2011, and 2012. The 2009, 2010, and 2011 count data has been updated to reflect 2012 annual average daily traffic volumes. All primary roads were considered open to normal traffic flow, that is, roads that were under construction or carried detour routes have been estimated to reflect normal conditions. An asterisk has been placed at the right in the Section Description to identify where the traffic was estimated from previous years count data.

Each primary route is subdivided into sections which are listed in order from west to east or from south to north. The length of each section is governed by county lines, corporation lines, junctions, and high volume intersections. Section lengths are shown to the nearest 1000th of a mile. The route number and length of each section reflect the official road conditions as of January 1, 2013. Annual average daily traffic volumes shown at the end of each route tabulation represent the weighted values for that route.

Innerlegs, ramps, loops, and connections at interchanges or grade level intersections are not shown in this report. Traffic volumes for these road segments may be obtained from the Office of Transportation Data (515-239-1323) or by emailing Ron Bunting.

TRAFFIC BOOK

Volume of Traffic on the Primary Road System

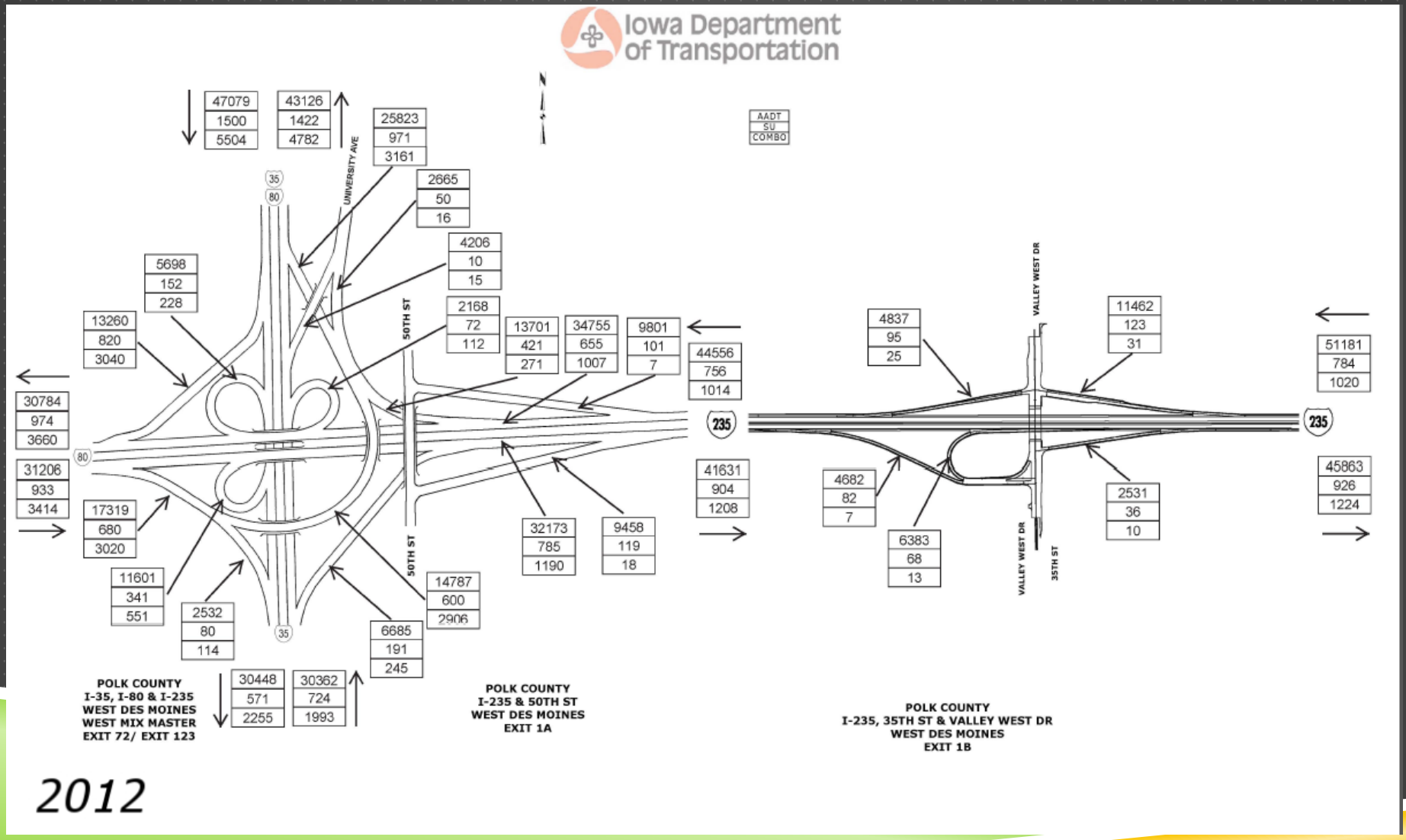
Iowa Department of Transportation

Printable PDF | Introduction | Select a Route by County | OR | Enter a route number for a statewide listing: 35 Submit | Explanation of Headings

2012

Route	Primary Route Section Description	Rural/Municipal	Section Length (miles)	Annual Average Daily Traffic	Vehicle Classification Distribution of Annual Average Daily Traffic										Average Daily Vehicle Miles	
					Motorcycles	Cars, Vans and Pickups	Total Trucks and Buses	Single Unit Trucks				Combination Trucks				All Vehicles	Trucks and Buses
								Buses	2 Axle	3 Axle	4 or more Axles	4 or less Axles	5 Axle	6 or more Axles	Multiple Trailer		
35	US 69 INTERCHANGE	R	4.169	11600	47	7580	3973	89	273	69	4	251	3150	41	96	48360	16563
35	EAST-NORTH WEST-NORTH RAMP	R	0.249	730	4	670	56	7	21	5	0	2	20	0	0	182	14
35	SOUTH-EAST SOUTH-WEST RAMP	R	0.379	330	2	290	38	5	16	4	0	1	11	0	0	125	14
35	EAST-SOUTH WEST-SOUTH RAMP	R	0.249	430	2	367	61	9	28	7	0	1	15	0	0	107	15
35	NORTH-EAST NORTH-WEST RAMP	R	0.373	730	4	656	70	9	28	7	0	2	22	0	0	272	26
35	IA 2 INTERCHANGE	R	8.635	12400	52	8348	4000	90	278	70	4	253	3167	41	96	107074	34540
35	EAST-NORTH WEST-NORTH RAMP	R	0.267	520	3	421	97	9	28	7	0	4	47	1	2	139	26
35	SOUTH-EAST SOUTH-WEST RAMP	R	0.348	350	2	285	63	5	14	3	0	3	36	0	1	122	22
35	EAST-SOUTH WEST-SOUTH RAMP	R	0.249	380	2	340	38	2	6	2	0	2	25	0	0	95	9
35	NORTH-EAST NORTH-WEST RAMP	R	0.348	560	3	437	120	5	16	4	0	7	84	1	2	195	42
35	CO RD R34 & CO RD J20 INTCHG	R	5.124	12700	53	8532	4116	98	302	76	4	258	3237	42	99	65075	21090
35	EAST-NORTH WEST-NORTH RAMP	R	0.249	260	1	236	23	1	4	1	0	1	14	0	0	65	6
35	SOUTH-EAST SOUTH-WEST RAMP	R	0.311	45	0	32	12	1	3	1	0	1	7	0	0	14	4
35	EAST-SOUTH WEST-SOUTH RAMP	R	0.249	40	0	34	6	1	3	1	0	0	2	0	0	10	1
35	NORTH-EAST NORTH-WEST RAMP	R	0.311	320	2	283	35	4	12	3	0	1	14	0	0	100	11
35	CO RD J14 INTERCHANGE	R	4.344	13200	56	8989	4156	102	313	79	4	260	3256	42	99	57341	18054
35	EAST-NORTH WEST-NORTH RAMP	R	0.249	290	2	273	15	2	7	2	0	0	4	0	0	72	4
35	SOUTH-EAST SOUTH-WEST RAMP	R	0.261	70	0	54	16	1	4	1	0	1	8	0	0	18	4
	EAST-SOUTH WEST-SOUTH																

STRIP MAPS

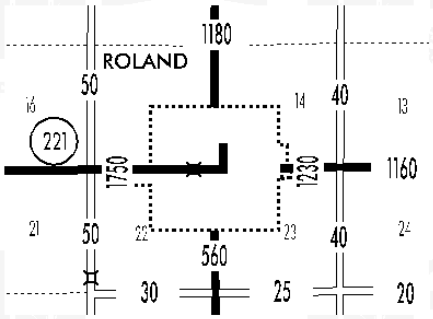


2012

CITY/COUNTY TRAFFIC MAPS

Iowa Department of Transportation **Annual Average Daily Traffic**

City and County Annual Average Daily Traffic (AADT) Maps



The City and County Annual Average Daily Traffic (AADT) maps available on the pages that follow are in Adobe Portable Document Format (PDF). In order to view these files, you must have Adobe's Free Reader. Click on the link below to go to Adobe's website and follow the installation instructions. The larger PDF files can be up to 1 MB in size and may take considerable time to load.

AADT is a general unit of measure for traffic, which represents the annual average traffic per day. Each city/county traffic map is updated every 4 years. To obtain additional traffic information, please call Ron Bunting at 515-239-1323 or email ronald.bunting@dot.iowa.gov.

New! View the turning movement diagrams New!

View the county and city traffic maps

View the state traffic maps

Help with printing PDF files

Iowa Department of Transportation **Annual Average Daily Traffic**

Transportation Data - AADT PDF Files

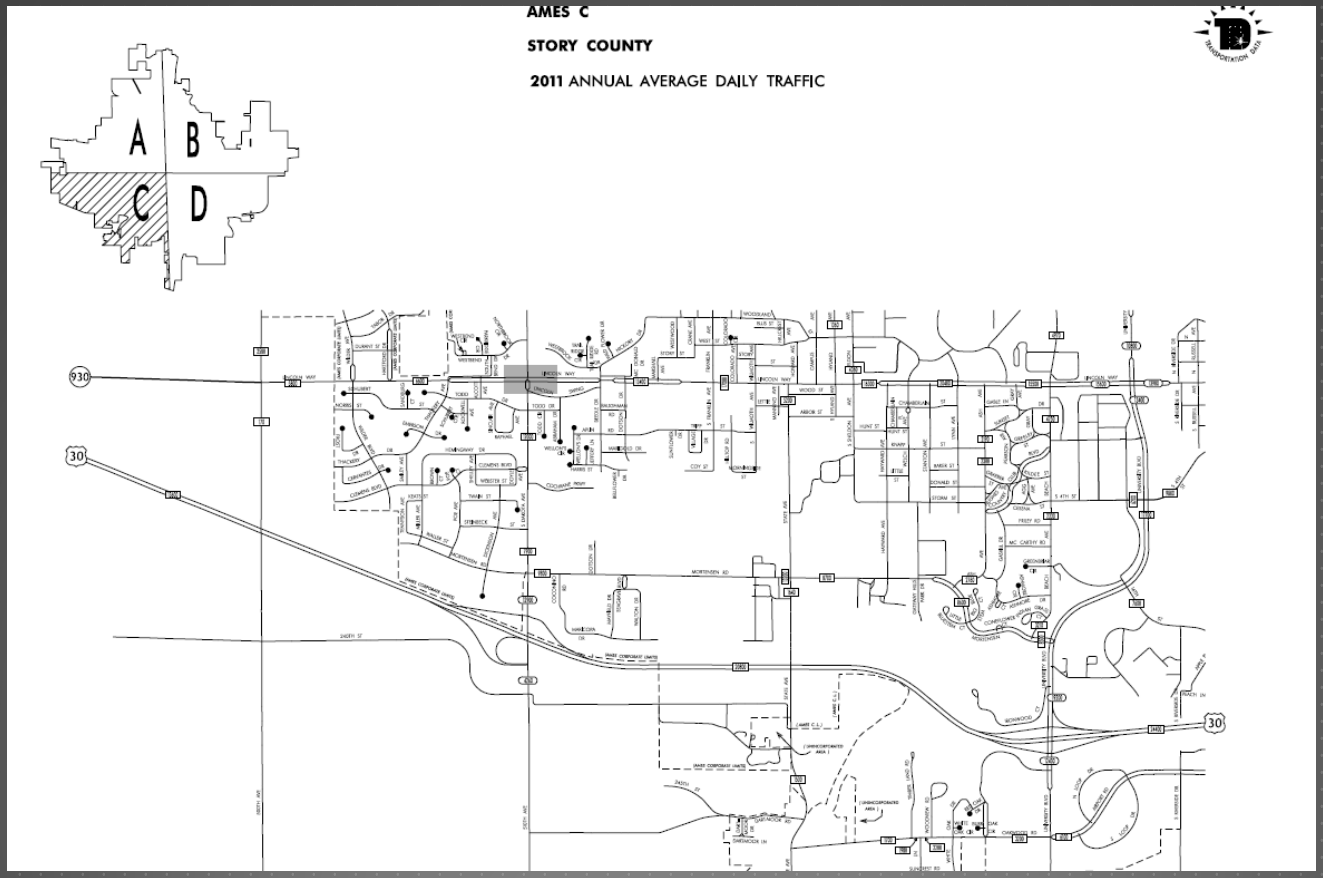
City Search A-C Find

Jump to County: A-B C D-G H-K L-M O-S T-W

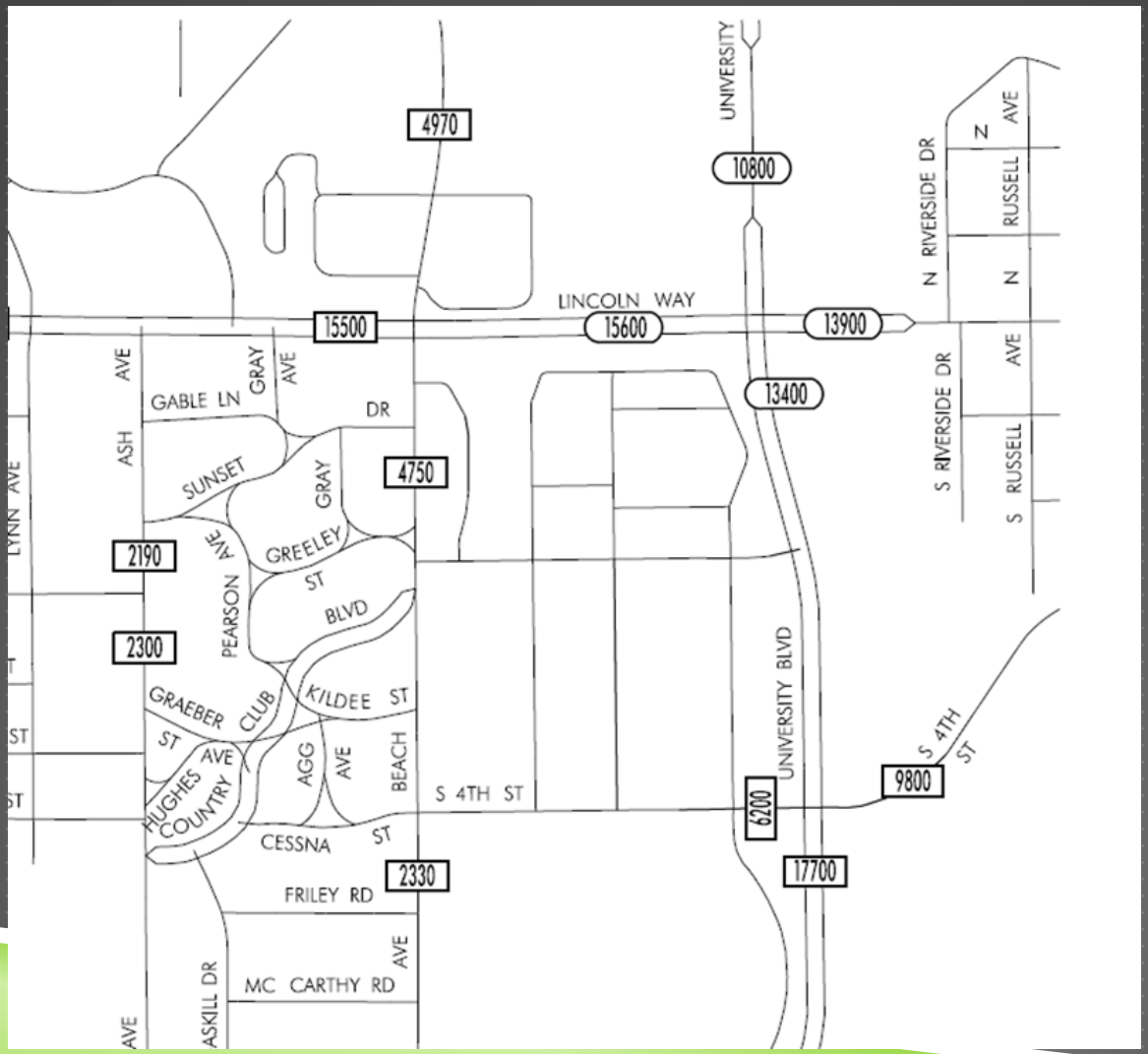
Jump to City: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Map Name	Current Year	Historical Year	Historical Year	Historical Year
A				
Ackley	2009	2005	2001	
Ackworth	2012	2008	2004	2000
Adair	2012	2008	2004	2000
Adel	2012	2008	2004	2000
Afton	2012	2008	2004	2000
Agency	2010	2006	2002	1998
Ainsworth	2010	2006	2002	1998
Akron	2011	2007	2003	1999
Albert City	2011	2007	2003	1999
Albia	2010	2006	2002	1998
Albion	2009	2005	2001	
Alburnett	2009	2005	2001	
Alden	2009	2005	2001	
Alexander	2009	2005	2001	
Algona	2011	2007	2003	1999
Alleman	2012	2008	2004	2000
Allerton	2010	2006	2002	1998
Allison	2009	2005	2001	
Alta	2011	2007	2003	1999
Alta Vista	2009	2005	2001	

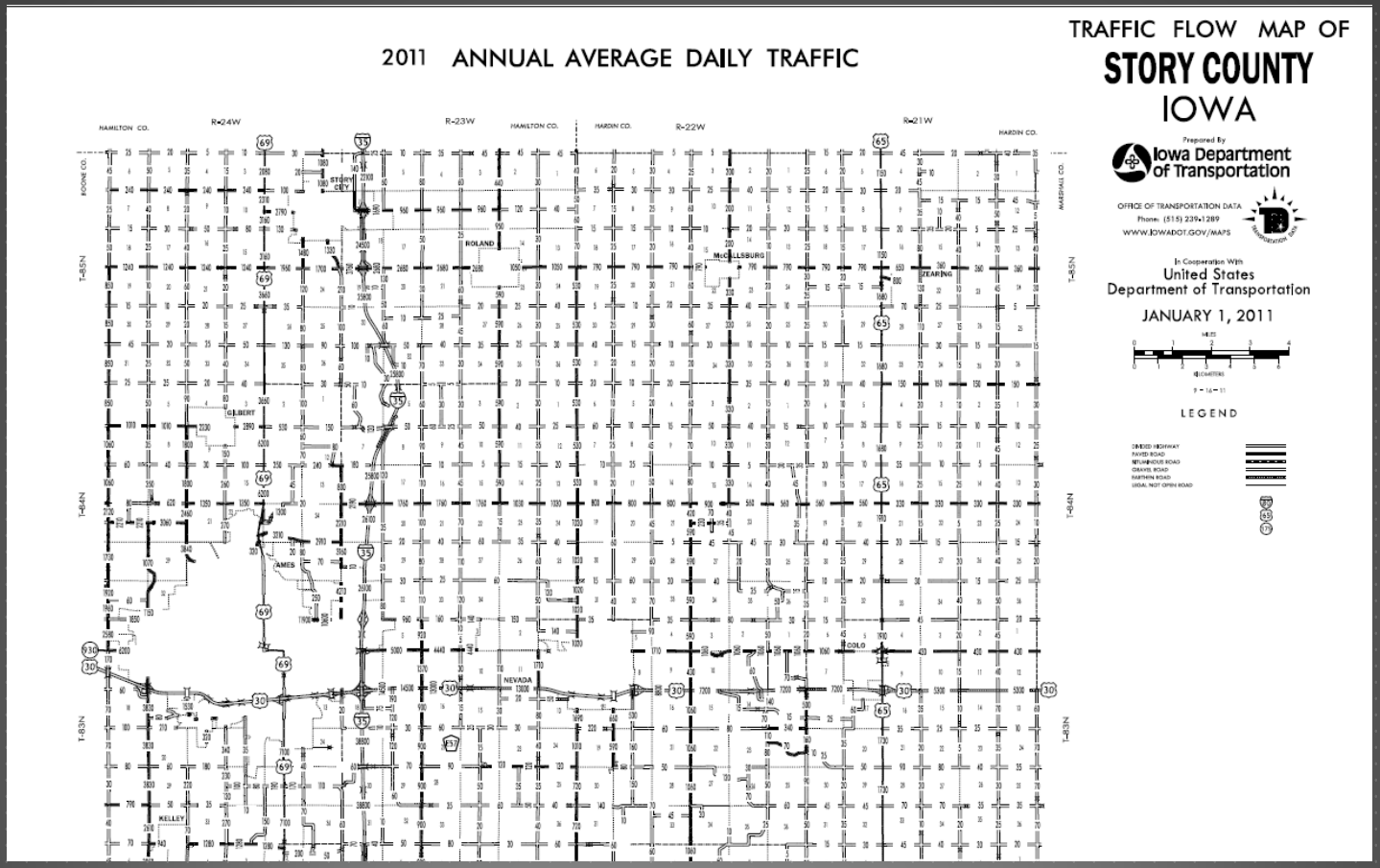
CITY/COUNTY TRAFFIC MAPS



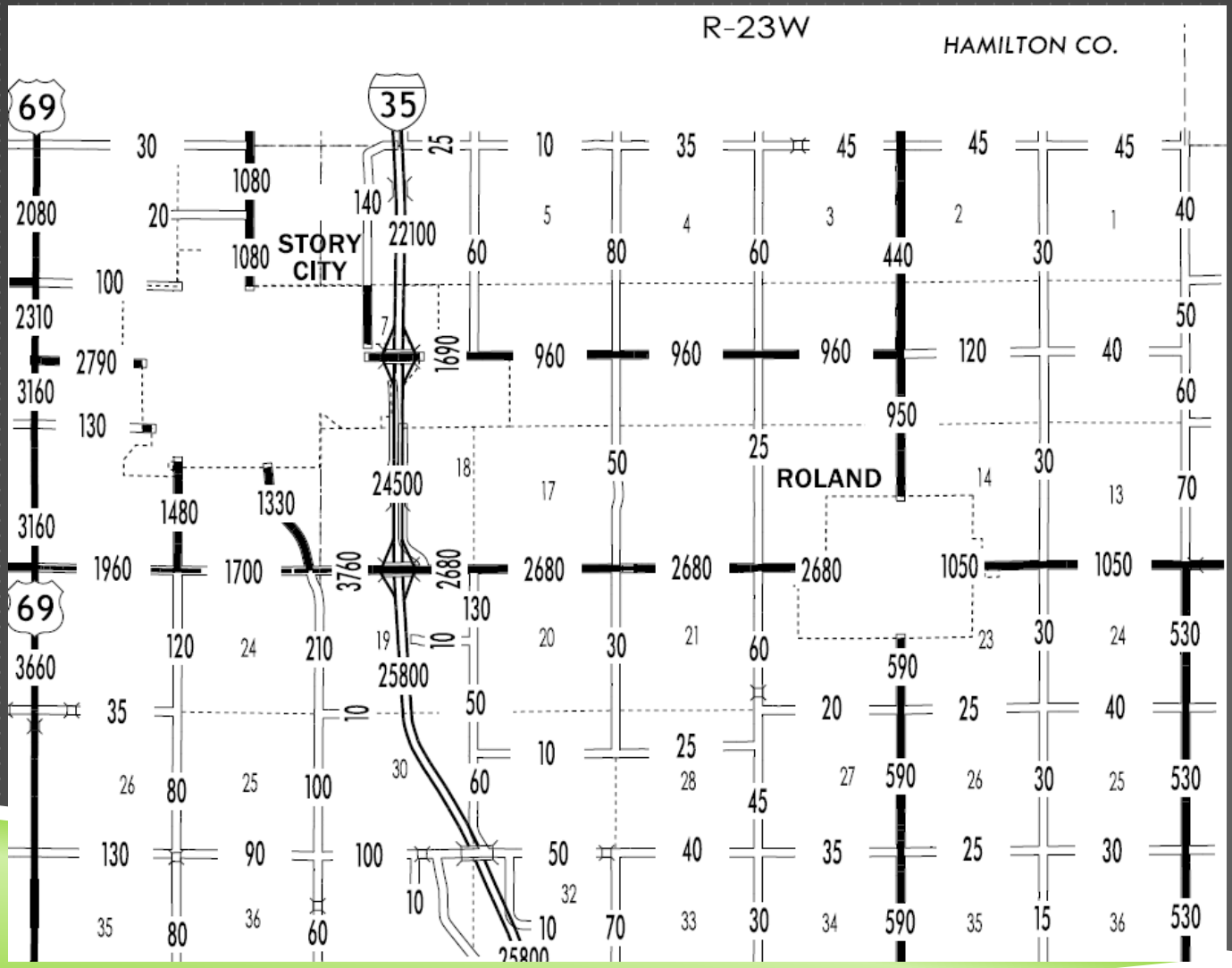
CITY/COUNTY TRAFFIC MAPS



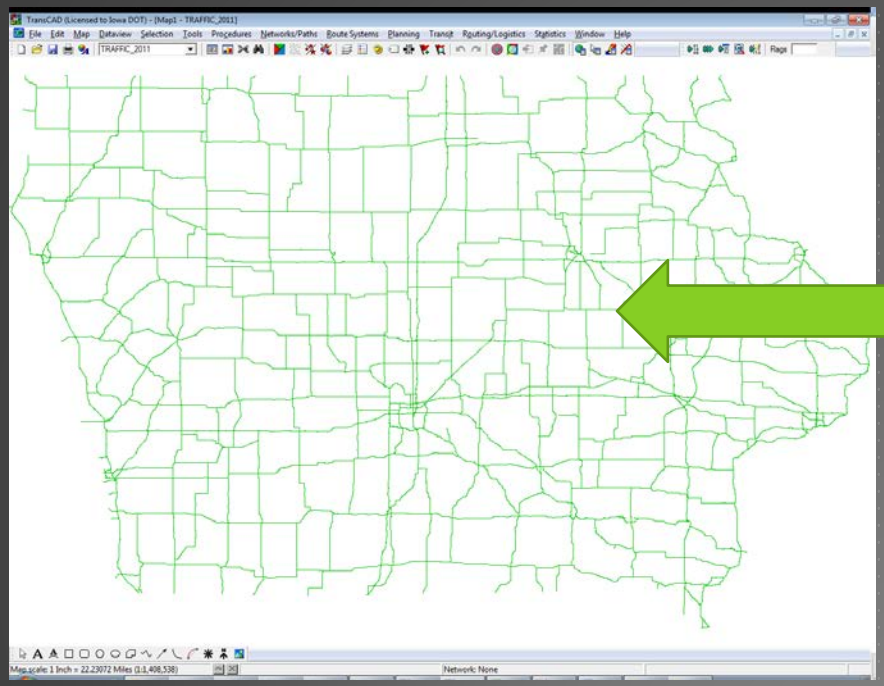
CITY/COUNTY TRAFFIC MAPS



CITY/COUNTY TRAFFIC MAPS

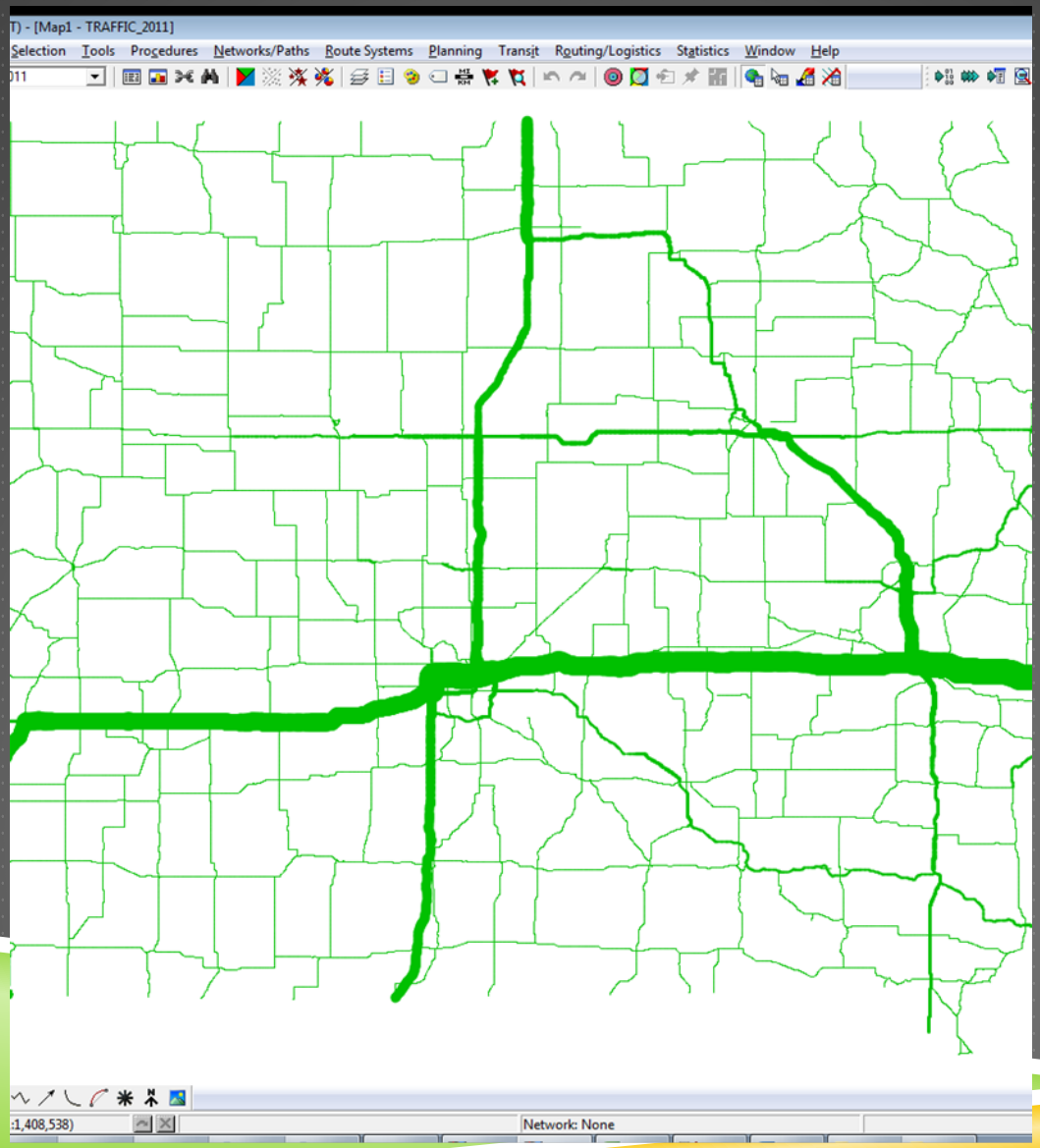


GIMS TRAFFIC



AUTOMOBILE	PICKUP	BUS	SU2AXLE	SU3AXLE	SU4AXLE	ST4AXLE	ST5AXLE	ST6AXLE	MT5AXLE	MT6AXLE	MT7AXLE
3321	917	32	135	40	4	39	269	8	8	1	2
13561	2658	145	407	114	6	521	5966	71	71	92	9
1088	300	16	67	20	2	8	57	2	2	0	0
865	239	9	38	11	1	7	50	2	2	0	0
1297	358	17	73	21	2	25	175	5	5	0	1
5874	1622	48	205	60	6	88	611	19	19	2	4
8899	3272	18	160	32	6	11	56	6	6	0	2
1383	382	10	44	13	1	15	105	3	3	0	1
5248	1450	40	171	50	5	165	1152	35	35	3	8
5248	1450	40	171	50	5	165	1152	35	35	3	8
2827	781	28	120	35	4	77	540	17	17	1	4
1277	353	14	61	18	2	5	38	1	1	0	0
2214	612	19	80	23	3	80	555	17	17	1	4
4083	1128	35	150	44	5	39	269	8	8	1	2
514	142	2	9	3	0	1	5	0	0	0	0
		28	120	35	4	77	540	17	17	1	4
		24	105	31	3	69	481	15	15	1	3
		19	169	34	6	70	342	35	35	1	14
5597	2058	19	169	34	6	70	342	35	35	1	14
2160	597	10	42	12	1	33	232	7	7	1	2
4229	1555	13	111	22	4	7	36	4	4	0	1
805	222	5	21	6	1	3	20	1	1	0	0
1694	468	15	62	18	2	22	156	5	5	0	1
651	180	8	35	10	1	9	66	2	2	0	0
613	169	8	35	10	1	6	40	1	1	0	0
651	180	8	35	10	1	6	41	1	1	0	0
4259	1176	35	152	44	5	59	409	13	13	1	3
2551	705	34	147	43	5	59	409	13	13	1	3
5521	1525	50	214	63	7	139	972	30	30	2	7
4847	1339	48	206	60	7	113	789	24	24	2	5
4820	1331	50	214	63	7	139	972	30	30	2	7
4625	1701	18	160	32	6	62	304	31	31	1	13
5498	2021	23	203	40	7	69	335	34	34	1	14
5425	1995	23	203	40	7	69	335	34	34	1	14
4649	1284	46	199	58	6	121	843	26	26	2	6
504	139	5	22	7	1	15	105	3	3	0	1
396	109	10	45	13	1	9	59	2	2	0	0
1499	414	41	178	52	6	53	370	11	11	1	3
1499	414	41	178	52	6	53	370	11	11	1	3
1471	406	41	175	51	6	52	362	11	11	1	2
1519	420	18	76	22	2	29	199	6	6	1	1
1450	400	21	90	26	3	24	164	5	5	0	1
2280	630	18	79	23	2	22	157	5	5	0	1
6623	1829	33	143	42	5	44	310	9	9	1	2
2744	758	17	74	22	2	20	142	4	4	0	1

GIMS TRAFFIC



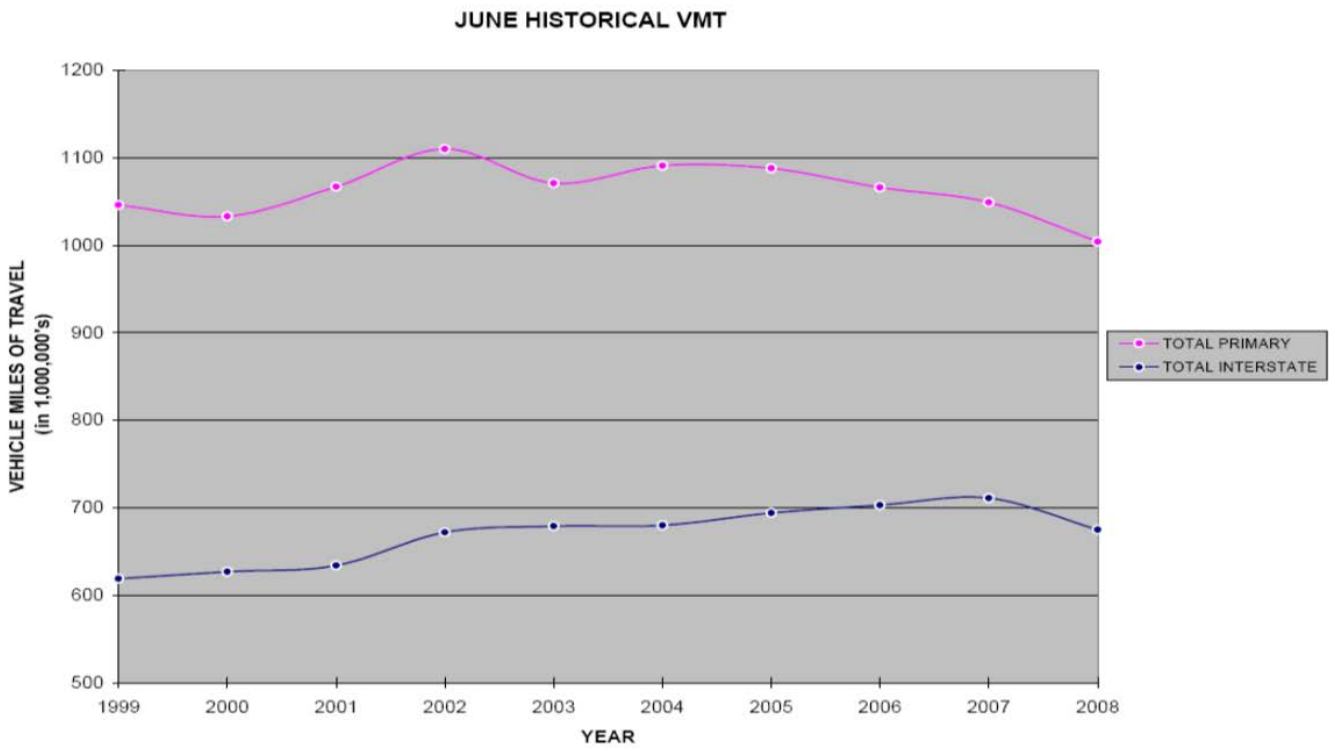
MONTHLY ATR REPORTS

TRAFFIC VOLUME VARIATIONS ON THE IOWA ROAD SYSTEM

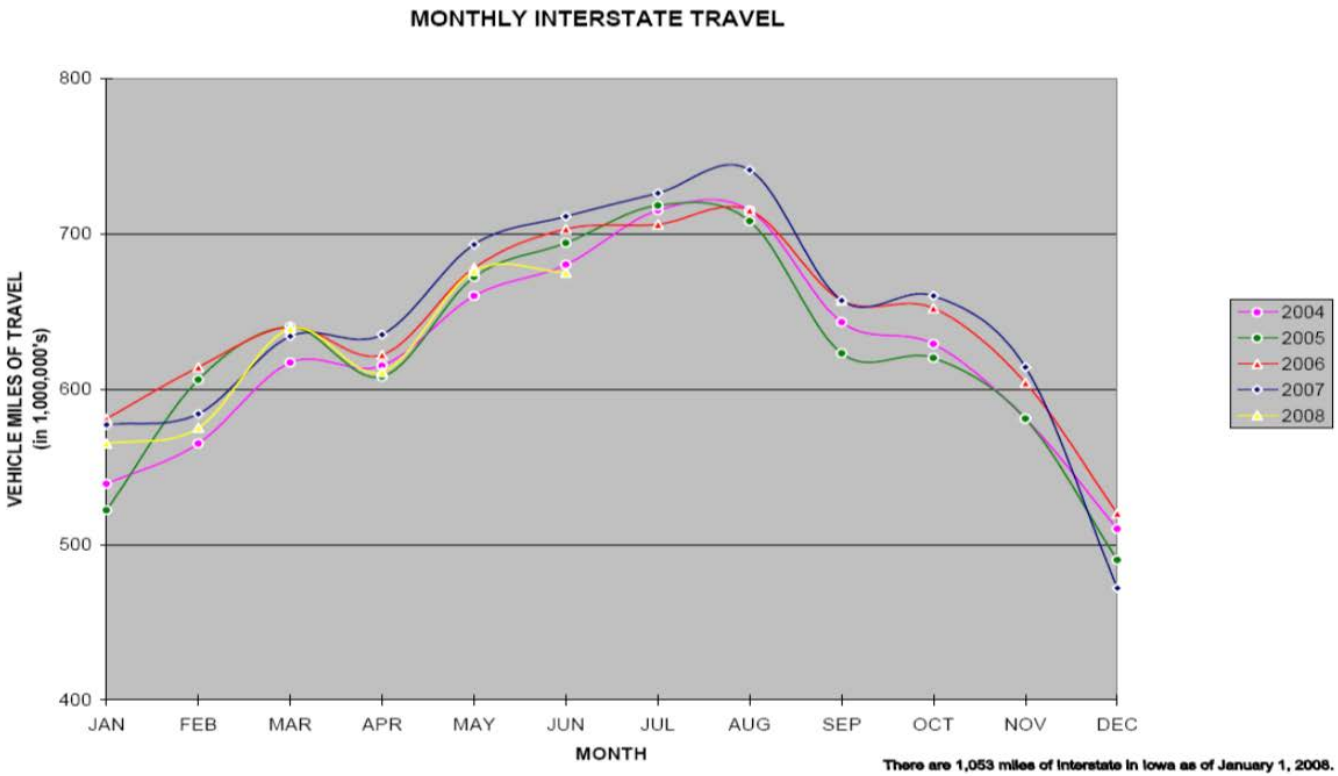
	JUNE 2008	COMPARED TO	JUNE 2007	YEAR TO DATE 2008 / 2007
RURAL				
	INTERSTATE		-6.1%	-2.7%
	PRIMARY		-4.4%	-1.6%
	SECONDARY		-5.3%	-4.8%
SUBTOTAL			**-5.1%**	**-2.8%**
MUNICIPAL				
	INTERSTATE		-2.7%	-1.8%
	PRIMARY		-4.0%	-3.1%
	STREETS		NO CHANGE	-1.4%
SUBTOTAL			**-1.5%**	**-1.9%**
STATE TOTAL			**-3.7%**	**-2.5%**

Data collected at the 144 continuous automatic traffic recorder locations shown on the following pages were utilized to compute the above percentages. The rural, municipal and state totals were weighted based on estimated vehicle miles of travel.

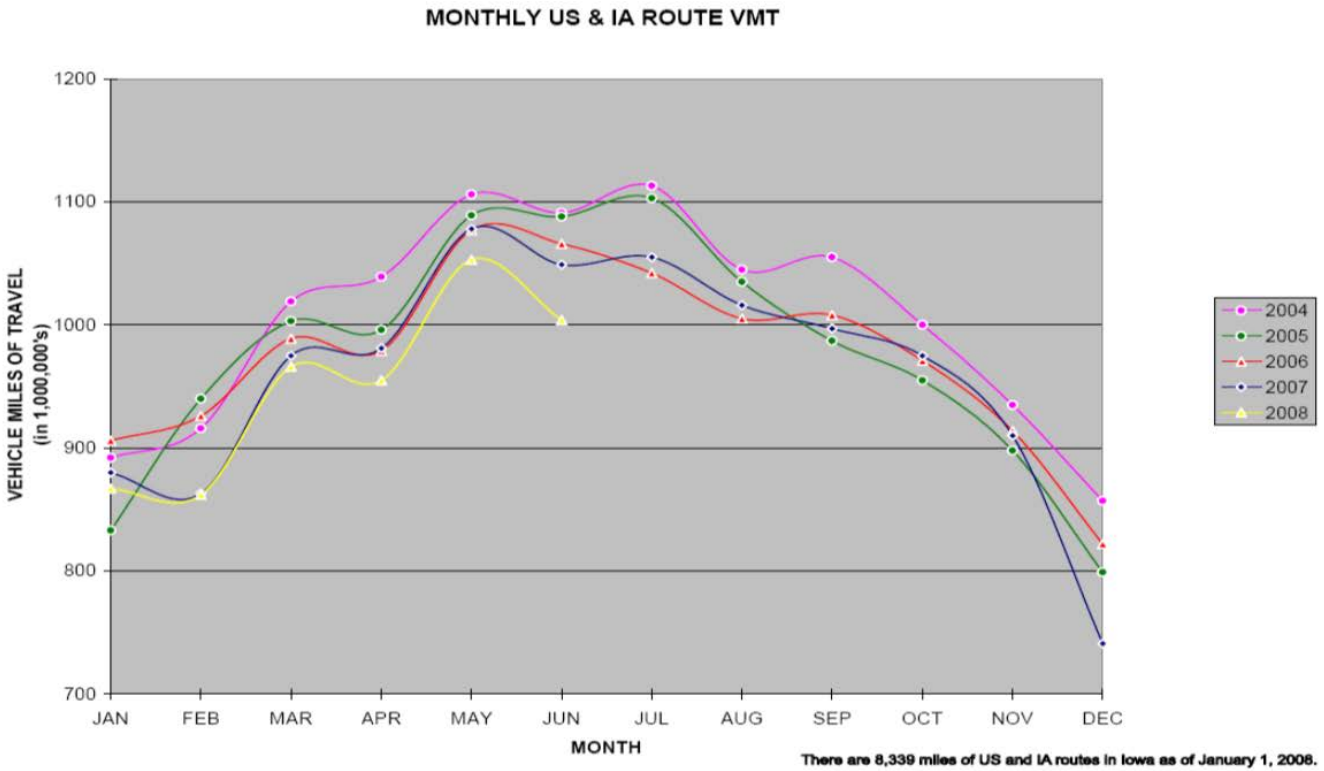
HISTORICAL MONTHLY TRENDS



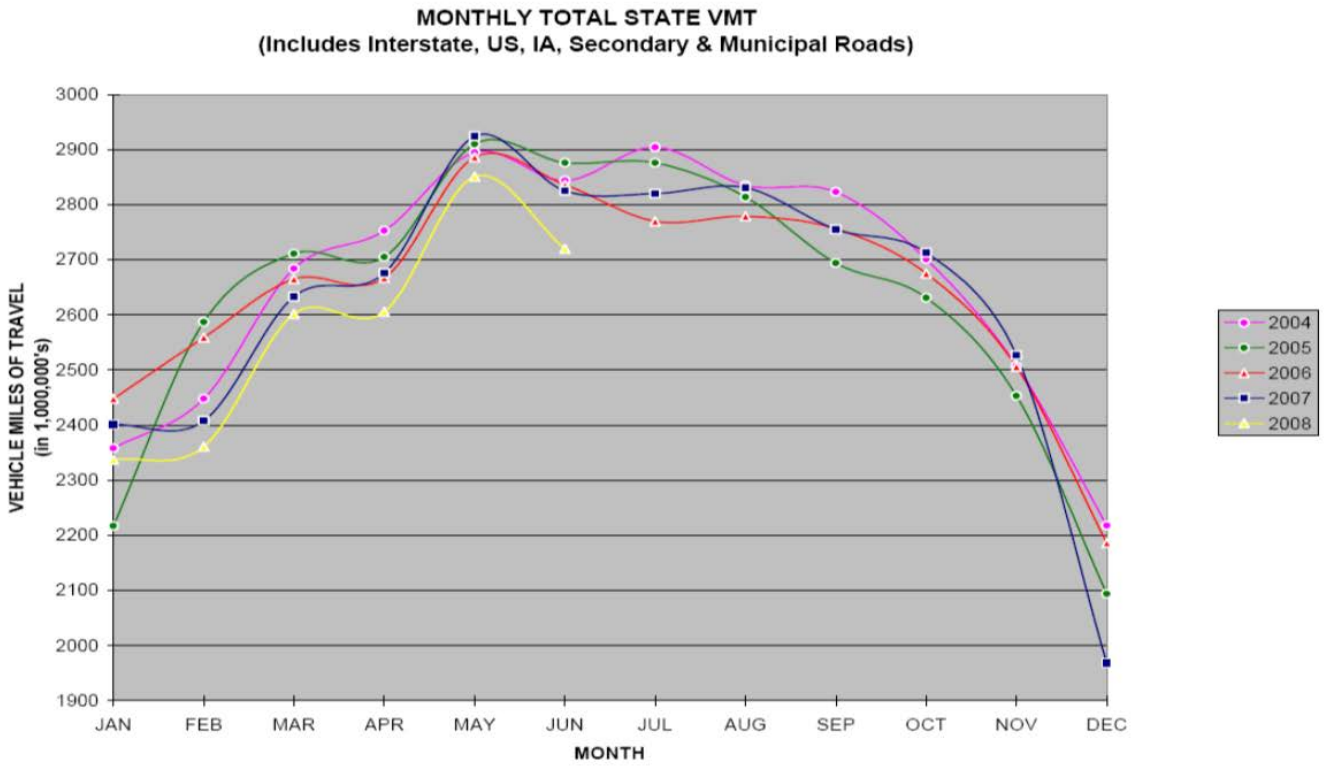
INTERSTATE TRAFFIC TRENDS



PRIMARY ROUTE TRAFFIC TRENDS



STATE TRAFFIC TRENDS



VMT REPORTS

Iowa Department of Transportation

Vehicle Miles of Travel (VMT)

The vehicle miles of travel (VMT) summary information is calculated from traffic counts taken on state, county, and city roadways from both manual counts as well as automatic traffic recorders. The resulting traffic volume data is combined with the roadway length from the Geographic Information Management System and summarized in several formats. The information is used to meet Federal Highway Administration reporting requirements as part of the Highway Performance Monitoring System and provides a measure of highway vehicle travel usage over a geographic area, such as a county, state, or highway system. These estimates also provide a basis in calculating crash and fatality rates for measuring highway safety.

Definitions for Vehicle Miles of Travel (VMT)

30-Year Historical VMT By System

1991-2000 Historical VMT By County & System

VMT by County and System	VMT by Classification	Monthly VMT
2012	2012	2012
2011	2011	2011
2010	2010	2010
2009	2009	2009
2008	2008	2008
2007	2007	2007
2006	2006	2006
2005	2005	2005
2004	2004	2004
2003	2003	2003
2002	2002	2002

VMT REPORTS

VMT BY COUNTY/SYSTEM
AS OF DECEMBER 31 2012
(1,000'S)

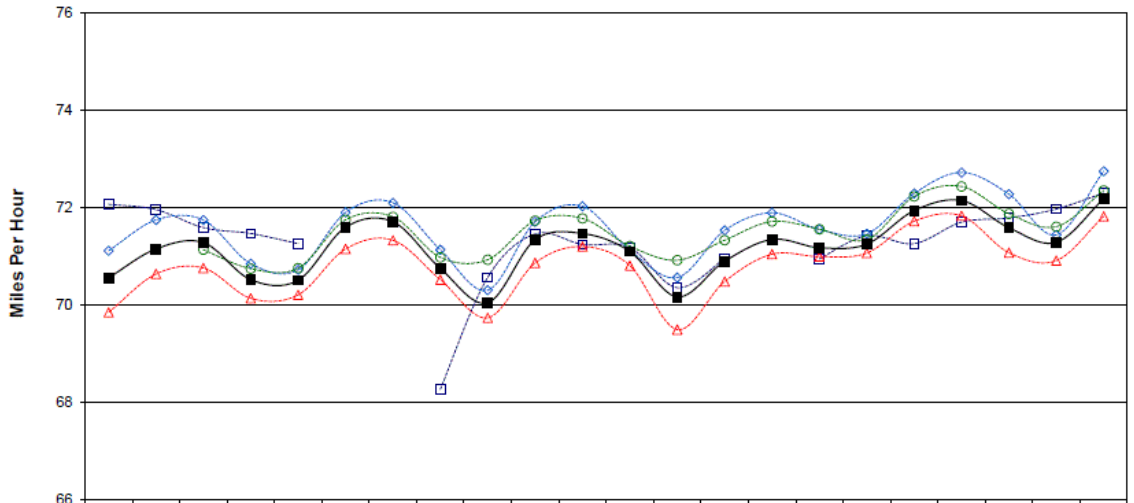
COUNTY	RUR_INT	RUR_PRI	SEC	TOT_RUR	MUN_INT	MUN_PRI	MUN	TOT_MUN	TOTAL
ADAIR	163440	31771	32030	227241	23849	4942	9294	38085	**265326**
ADAMS		28475	18494	46969		1912	3545	5457	**52426**
ALLAMAKEE		57119	45301	102420		10113	9621	19734	**122154**
APPANOOSE		44904	36724	81628		11688	15703	27391	**109019**
AUDUBON		30025	20516	50541		4555	4879	9434	**59975**
BENTON	51025	116728	84173	251926	9693	7902	27622	45217	**297143**
BLACK HAWK	78920	130774	94177	303871	64795	317461	480474	862730	**1166601**
BOONE		134252	59802	194054		17001	48230	65231	**259285**
BREMER		133518	50850	184368		38558	29041	67599	**251967**
BUCHANAN	38547	116584	73766	228897		13592	26634	40226	**269123**
BUENA VISTA		74894	56237	131131		14971	30266	45237	**176368**
BUTLER		52769	47550	100319		9115	13878	22993	**123312**
CALHOUN		65476	43681	109157		5701	12949	18650	**127807**
CARROLL		82425	54416	136841		19237	29640	48877	**185718**
CASS	170955	65538	22679	259172		16375	17892	34267	**293439**
CEDAR	291125	54569	57797	403491	107	8393	16597	25097	**428588**
CERRO GORDO	131802	108221	76126	316149	20988	82904	134883	238775	**554924**
CHEROKEE		50957	41504	92461		8771	13565	22336	**114797**
CHICKASAW		70741	40538	111279		12183	10845	23028	**134307**
CLARKE	91437	36687	15188	143312	11152	11306	8143	30601	**173913**
CLAY		67670	55365	123035		25639	34090	59729	**182764**
CLAYTON		86658	59874	146532		19377	14446	33823	**180355**
CLINTON		142576	69795	212371		84500	111758	196258	**408629**
CRAWFORD		91044	32454	123498		18466	19144	37610	**161108**
DALLAS	212663	124709	75587	412959	49268	76987	148300	274555	**687514**
DAVIS		44522	29368	73890		3629	4794	8423	**82313**
DECATUR	111635	22273	22077	155985		5564	6888	12452	**168437**
DELAWARE		107831	65540	173371		20426	19456	39882	**213253**
DES MOINES		92339	56699	149038		50652	110902	161554	**310592**
DICKINSON		77833	49090	126923		40038	28666	68704	**195627**
DUBUQUE		227117	99390	326507		172512	230567	403079	**729586**
EMMET		31609	22453	54062		11343	15227	26570	**80632**
FAYETTE		80680	60146	140826		17525	22611	40136	**180962**
FLOYD		110047	50686	160733		16461	21746	38207	**198940**
FRANKLIN	118370	36300	44618	199288		8435	10763	19198	**218486**
FREMONT	104026	41147	35305	180478		2319	6690	9009	**189487**

RURAL INTERSTATE SPEED REPORTS

Iowa Department of Transportation

Rural Interstate Speed Information

Average Speeds by Quarter on Iowa Rural Interstates

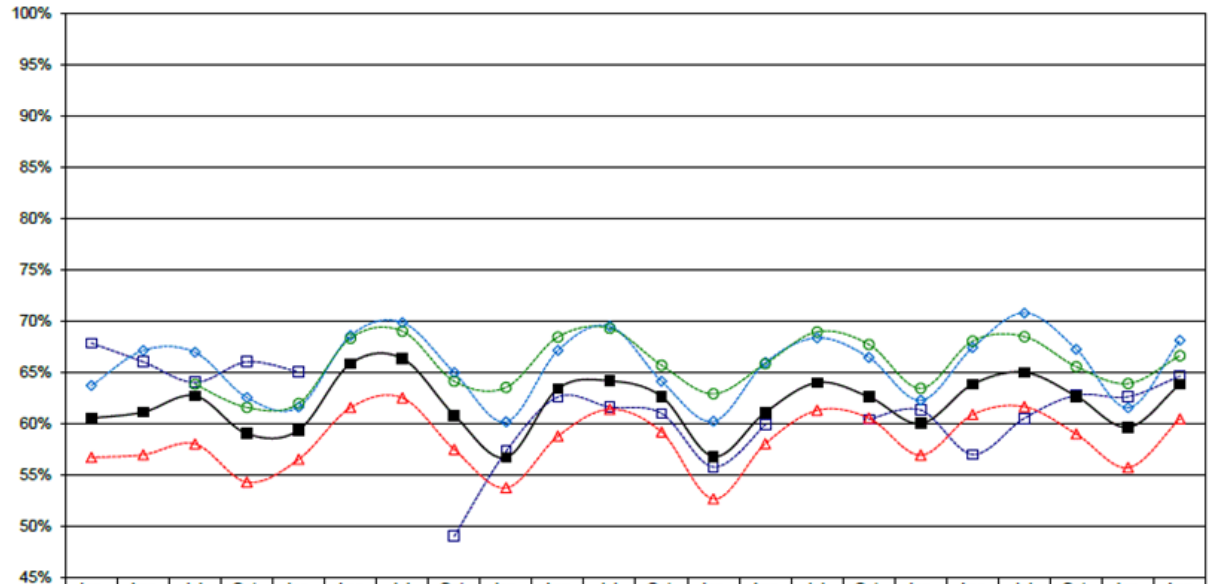


	Jan-Mar 2008	Apr-Jun 2008	Jul-Sep 2008	Oct-Dec 2008	Jan-Mar 2009	Apr-Jun 2009	Jul-Sep 2009	Oct-Dec 2009	Jan-Mar 2010	Apr-Jun 2010	Jul-Sep 2010	Oct-Dec 2010	Jan-Mar 2011	Apr-Jun 2011	Jul-Sep 2011	Oct-Dec 2011	Jan-Mar 2012	Apr-Jun 2012	Jul-Sep 2012	Oct-Dec 2012	Jan-Mar 2013	Apr-Jun 2013
I 29	72.06	71.95	71.58	71.46	71.25	N.A.	N.A.	68.26	70.56	71.45	71.23	71.17	70.35	70.95	N.A.	70.94	71.41	71.25	71.69	71.78	71.96	72.29
I 35	71.10	71.74	71.73	70.84	70.71	71.89	72.09	71.12	70.29	71.70	72.02	71.11	70.55	71.52	71.88	71.54	71.45	72.28	72.71	72.26	71.43	72.74
I 80	69.84	70.63	70.75	70.13	70.20	71.14	71.32	70.51	69.73	70.85	71.19	70.80	69.49	70.47	71.03	70.99	71.06	71.71	71.82	71.07	70.90	71.81
I 380	N.A.	N.A.	71.13	70.74	70.75	71.74	71.80	70.97	70.92	71.72	71.77	71.20	70.91	71.32	71.70	71.55	71.33	72.22	72.42	71.86	71.60	72.34
ALL SITES	70.55	71.14	71.27	70.51	70.50	71.58	71.70	70.74	70.04	71.33	71.46	71.09	70.16	70.89	71.33	71.17	71.24	71.93	72.13	71.58	71.28	72.17

- I-29 speed data is unavailable from April of 2008 through December of 2009 due to road construction at the data collection sites.
- Lower speeds on I-29 for the Oct-Dec 2009 quarter were due to only having valid speed data in December 2009.
- I-29 speed numbers for April of 2008 through March of 2009 were calculated using only the northbound traffic speed data from the Honey Creek site.
- I-80 speed calculations for July of 2011 through September of 2011 include westbound only data for sites #110, #120 and #123.

% OVER SPEED LIMIT REPORT

Percent of Traffic Driving over the Posted Speed by Quarter on Iowa Rural Interstates



	Jan-Mar 2008	Apr-Jun 2008	Jul-Sep 2008	Oct-Dec 2008	Jan-Mar 2009	Apr-Jun 2009	Jul-Sep 2009	Oct-Dec 2009	Jan-Mar 2010	Apr-Jun 2010	Jul-Sep 2010	Oct-Dec 2010	Jan-Mar 2011	Apr-Jun 2011	Jul-Sep 2011	Oct-Dec 2011	Jan-Mar 2012	Apr-Jun 2012	Jul-Sep 2012	Oct-Dec 2012	Jan-Mar 2013	Apr-Jun 2013
I 29	68%	66%	64%	66%	65%	N.A.	N.A.	49%	57%	63%	62%	61%	56%	60%	N.A.	60%	61%	57%	61%	63%	63%	65%
I 35	64%	67%	67%	63%	62%	69%	70%	65%	60%	67%	69%	64%	60%	66%	68%	66%	62%	67%	71%	67%	62%	68%
I 80	57%	57%	58%	54%	57%	62%	62%	57%	54%	59%	61%	59%	53%	58%	61%	61%	57%	61%	62%	59%	56%	60%
I 380	N.A.	N.A.	64%	62%	62%	68%	69%	64%	64%	68%	69%	66%	63%	66%	69%	68%	63%	68%	68%	66%	64%	67%
ALL SITES	61%	61%	63%	59%	59%	66%	66%	61%	57%	63%	64%	63%	57%	61%	64%	63%	60%	64%	65%	63%	60%	64%

- I-29 speed data is unavailable from April of 2008 through December of 2009 due to road construction at the data collection sites.
- Lower speeds on I-29 for the Oct-Dec 2009 quarter were due to only having valid speed data in December 2009.
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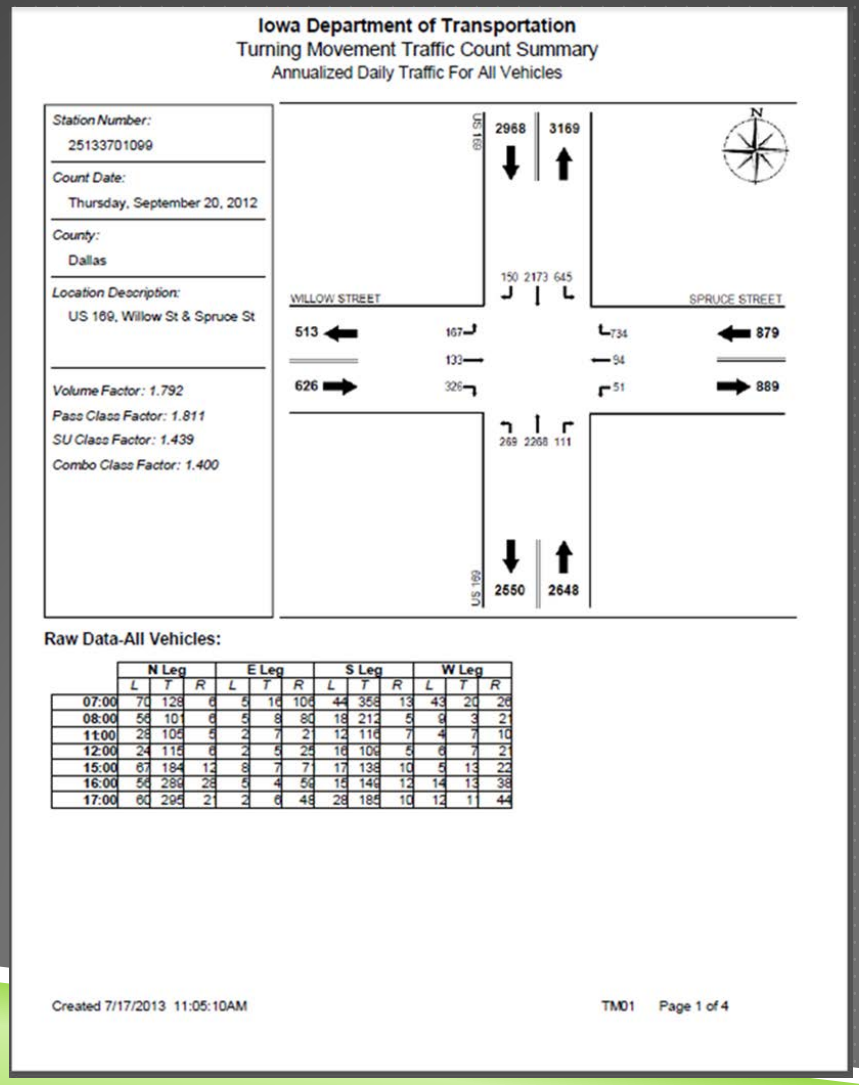
TURNING MOVEMENT DIAGRAMS



Iowa Department of Transportation

Turning Movement Traffic Count Summary

Annualized Daily Traffic For All Vehicles

Station Number:
25133701099

Count Date:
Thursday, September 20, 2012

County:
Dallas

Location Description:
US 169, Willow St & Spruce St

Volume Factor: 1.792
Pass Class Factor: 1.811
SU Class Factor: 1.439
Combo Class Factor: 1.400

US 169
2968
3169
150 2173 645
WILLOW STREET
SPRUCE STREET
513
167
734
879
132
94
626
326
51
889
269 2268 111
US 169
2550
2648
N

Raw Data-All Vehicles:

	N Leg			E Leg			S Leg			W Leg		
	L	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
07:00	70	128	6	5	16	106	44	358	13	43	20	26
08:00	56	101	6	5	8	80	18	212	5	9	3	21
11:00	28	105	5	2	7	2	12	116	7	4	7	10
12:00	24	115	6	2	5	25	16	109	5	6	7	2
15:00	67	184	12	8	7	7	17	138	10	5	13	22
16:00	56	289	28	5	4	59	15	149	12	14	13	38
17:00	60	295	21	2	6	48	28	185	10	12	11	44

Created 7/17/2013 11:05:10AM

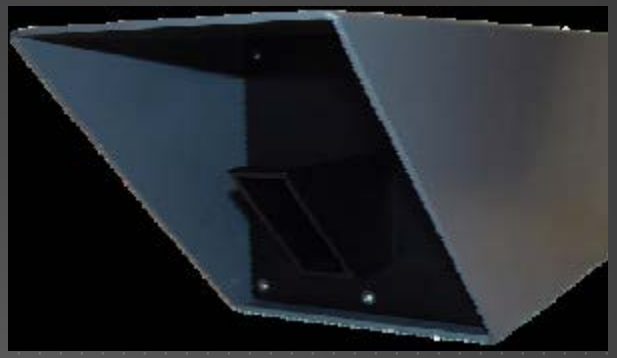
TM01 Page 1 of 4

TRADAS TIE TO LINEAR REFERENCING SYSTEM

- Both systems in Oracle
- Traffic count locations are being populated using transport links and nodes
- 117,000 Recorder sites (from 20 yrs)
- 6,000 Manual Count sites
- Tie will ease integration of traffic data with other agency data.

AXLELIGHT

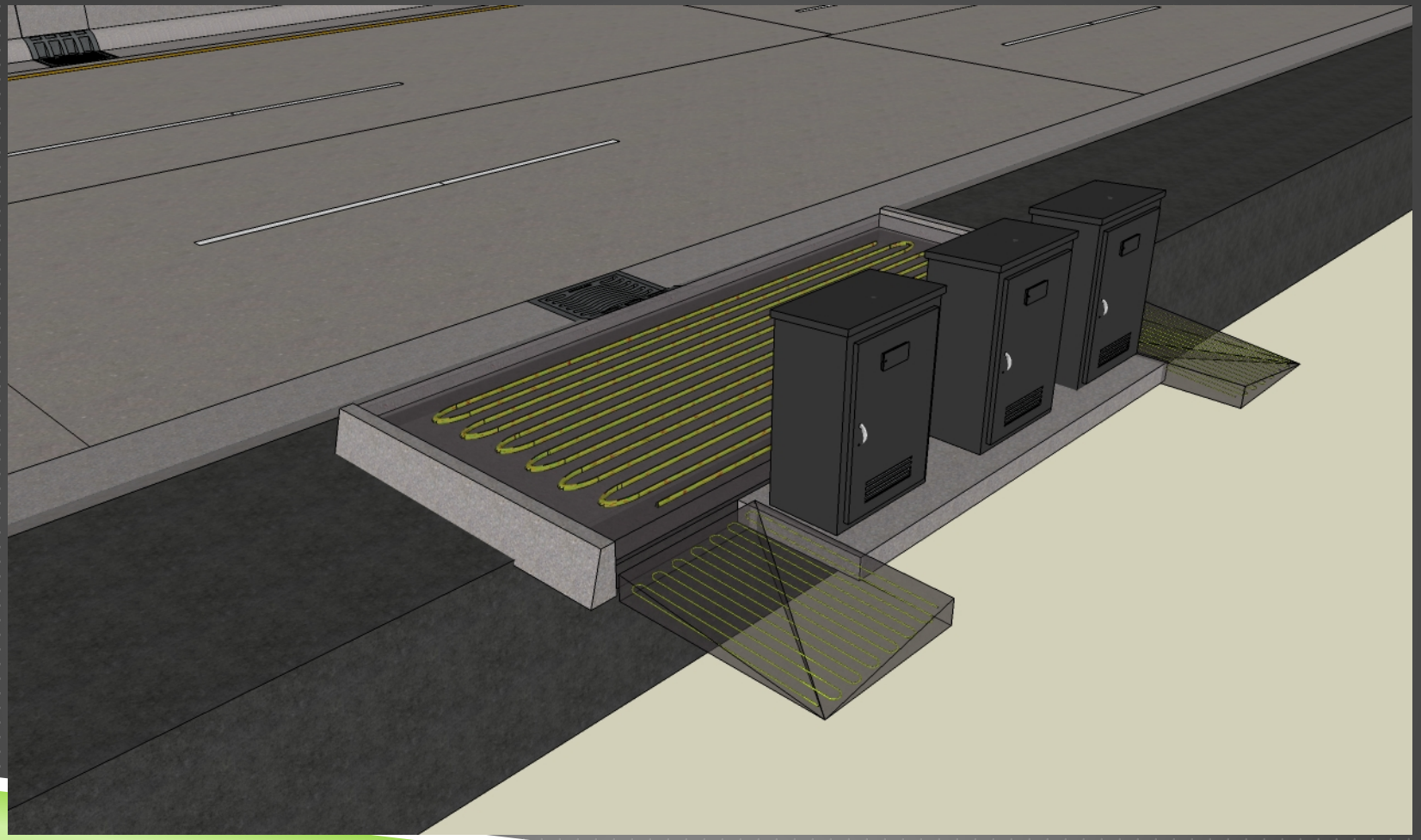
- AxleLight – non-intrusive laser axle sensor system. First permanent installation in the country.
- Simplified Installation and Maintenance
  - Roadside cabinet
  - Close to the ground (ankle height)
  - Easy access
- Sensors
  - Infrared axle sensor (non visible)
  - Parallel beams ~ 10 feet apart
  - Capable of vehicle classification, length, speed, etc.
  - Detects axles in 1 to 4 lanes
- Safety
  - No equipment required in or on the highway
  - No lane closures
- Power
  - Initially powered by solar panel
  - Most of Iowa's ATR's are powered by solar, 2 by direct electricity
  - Augmented solar with the wind turbine.



Turned out AxleLight needed more power than the solar and battery could provide. Direct power was needed.

AXLELIGHT OBSTACLES AND SOLUTIONS

AXLELIGHT OBSTACLES AND SOLUTIONS



AXLELIGHT OBSTACLES AND SOLUTIONS

AXLELIGHT OBSTACLES AND SOLUTIONS

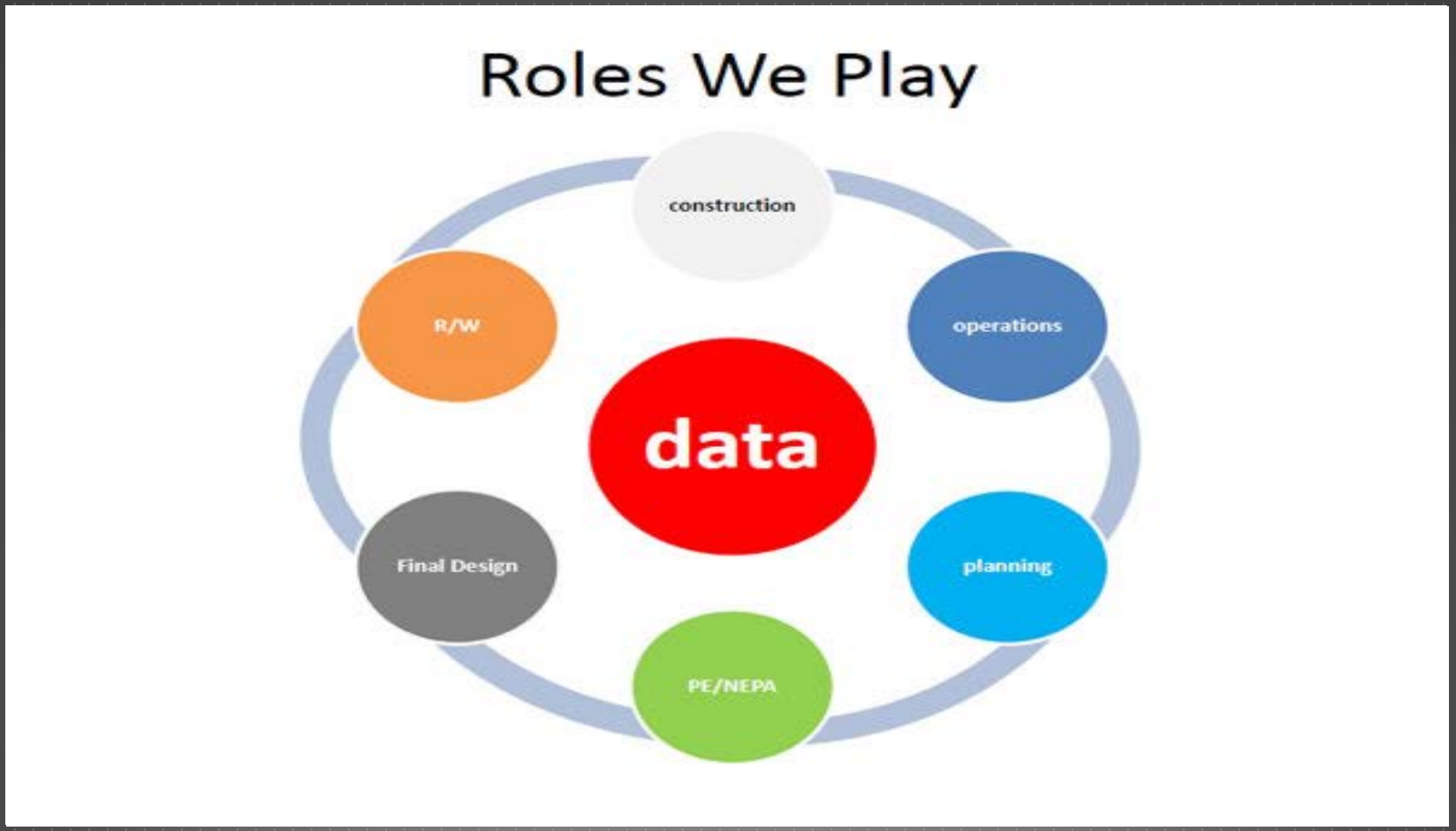
AXLELIGHT OBSTACLES AND SOLUTIONS

TIRTL

- Purchased in June 2008 to use as a permanent installation.
- Captures traffic volumes, speed and classification.
- High tech cabinets in Jersey barrier.
- No success in getting a functioning system
- Poor technical support which created rising installation costs.
- Project scrapped with lawsuit for refund

TIRTL

TRAFFIC MONITORING DATA USES



WHAT'S AHEAD?

- Evaluating new technology to improve the data quality and create a safer environment for installation and maintenance.
- Seek other feasible methods for conducting manual and recorder counts.
- Add to the ATR and WIM Systems
- Utilization of ITS data.
- Complete the move of traffic data to an Oracle database.
- Continue to use of the Linear Referencing System to improve the collection process and create the ability for more potential customers to utilize traffic data.

SOURCES

- FHWA Office of Highway Policy Information - http://www.fhwa.dot.gov/policyinformation/
- Traffic Monitoring Guide - http://www.fhwa.dot.gov/ohim/tmguide/
- TRADAS (TRAffic DAta System) – Chaparral Systems Corporation - http://chapsys.com/index.html
- TripGuide - http://www.iowadot.gov/i-235/tripguide_info.htm
- IowaDOTMaps - http://www.iowadot.gov/maps//

QUESTIONS