

Speed Data Presentation



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Colorado Department of Transportation
National Speed Data Workshop
Seattle, WA
June 21, 2010

Speed Data and Colorado

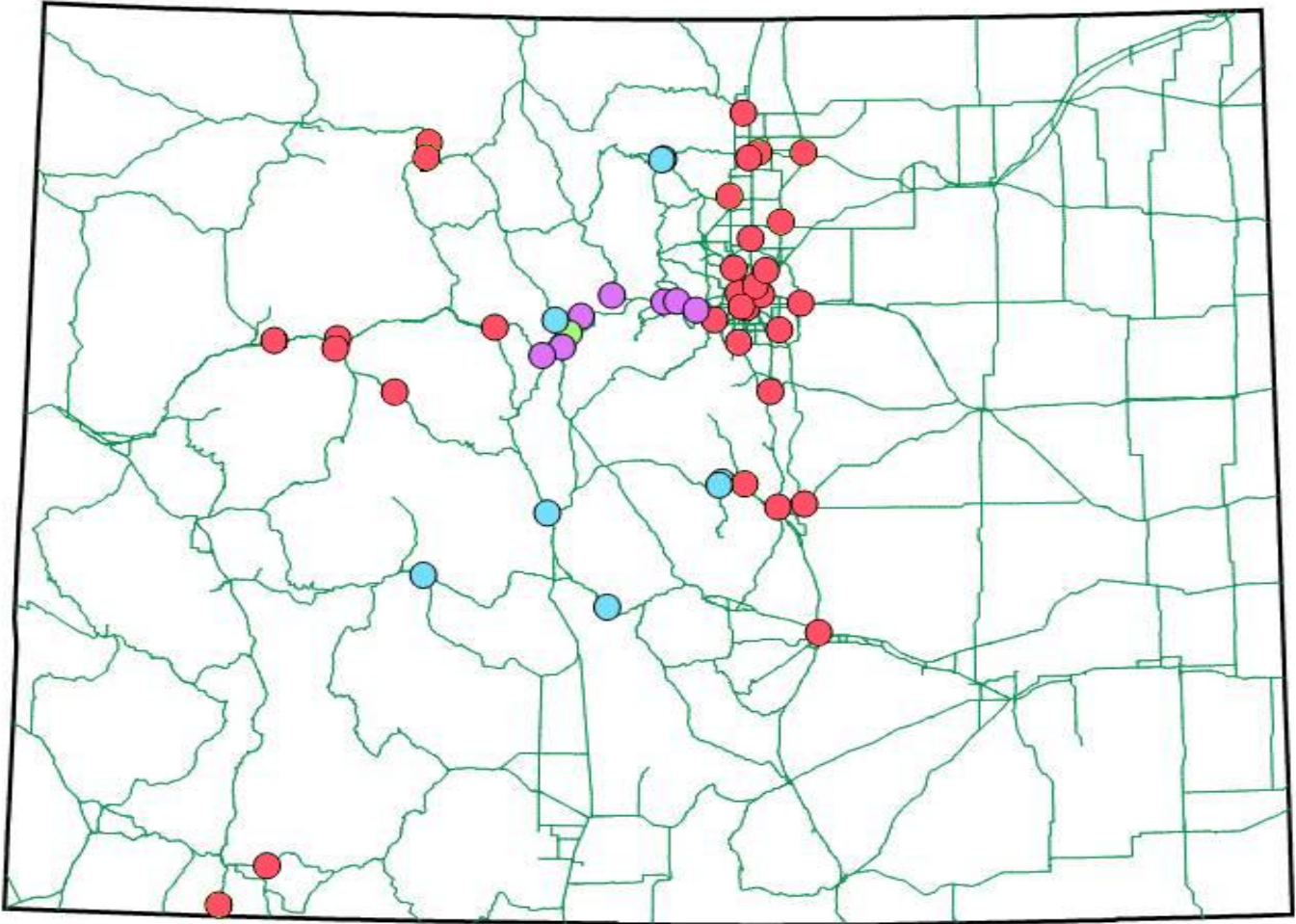
- Several sources of speed data
 - ATR's, ramp metering devices
 - Local agencies (local/city)
- Quarterly/Annual Reports
 - Sent to Regional Traffic Engineers, DTD Division Director



ATR Locations/Annual Report

- 48 Automatic Traffic Recorders (ATR's) used in study
 - 16 sites recreational (25 %)
 - 32 sites commuter (75%)
- All CDOT regions are included in study
- Annual Report is released in February/March for previous year





- Commuter
- Recreational-Summer Only
- Recreational-Winter Only
- Recreational-Winter and Summer



Time Periods for Analysis

- Recreational locations
 - Seasonal issues determined time periods
 - Ex. I-70
- Commuter locations
 - Weekdays, Tuesday, Wednesday or Thursday
 - 6 – 9 AM
 - 3 – 6 PM



TRADAS Automated Report

Colorado Department of Transportation Hourly Speed data for Pos Direction for 02/24/2010

Site Names: 000501, 025A- 207.990- 209.210
Location: ON I-25 S/O SH 6, 6TH AVE, DENVER

County: Denver
Funct. Class: 11 - U Principal Arterial - Interstate

	0-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-120	Avg	Med	85%	
00 - 01	0	0	0	0	0	0	18	46	204	182	58	16	3	3	0	1	60	60	65	531
01 - 02	0	0	0	0	0	3	4	54	142	126	43	8	3	0	0	0	60	60	65	383
02 - 03	1	0	0	0	0	2	14	43	119	112	23	12	2	1	0	0	59	59	64	329
03 - 04	0	0	1	1	1	1	19	56	127	144	55	16	5	2	0	0	60	60	66	428
04 - 05	1	0	0	0	1	0	13	77	298	477	242	81	17	4	0	0	62	62	68	1,209
05 - 06	11	0	0	0	0	1	63	309	917	1,404	968	294	71	8	0	0	62	63	69	4,046
	13	0	1	1	2	7	131	585	1,805	2,445	1,389	427	101	18	0	1	62	62	68	6,926
06 - 07	47	47	68	149	391	549	943	1,477	2,237	1,794	663	114	11	5	0	0	55	56	64	8,495
07 - 08	147	122	137	442	833	1,284	1,796	1,931	1,461	236	19	3	0	0	0	0	47	48	57	8,411
08 - 09	46	51	114	220	652	1,122	1,802	2,131	1,873	495	101	5	2	0	0	0	50	51	58	8,414
09 - 10	12	0	1	16	157	440	833	1,532	1,980	1,583	675	121	8	1	0	1	56	57	64	7,360
10 - 11	11	11	60	86	175	482	748	1,374	1,996	1,558	561	95	5	1	0	0	55	57	64	7,163
11 - 12	17	0	1	11	46	316	701	1,391	2,183	1,807	664	119	9	1	0	0	57	58	64	7,266
	280	231	381	924	2,254	4,193	6,623	9,836	11,730	7,473	2,683	457	35	8	0	1	53	54	62	47,109
12 - 13	22	9	9	31	46	224	668	1,490	2,416	1,785	651	86	5	2	0	1	57	58	64	7,445
13 - 14	9	0	0	4	90	349	801	1,537	2,279	1,734	603	87	2	1	0	0	57	57	64	7,496
14 - 15	5	0	0	28	172	630	1,016	1,909	2,622	1,491	327	24	2	0	0	1	55	56	62	8,227
15 - 16	251	316	564	1,133	1,944	1,832	1,051	402	44	10	0	0	0	0	0	0	38	39	47	7,547
16 - 17	268	395	740	1,252	1,829	1,655	849	318	81	11	1	0	0	0	0	0	37	38	46	7,399
17 - 18	195	198	420	887	1,380	1,638	1,274	873	450	219	76	12	0	0	0	0	42	42	53	7,622
	750	918	1,733	3,335	5,461	6,328	5,659	6,529	7,892	5,250	1,658	209	9	3	0	2	48	49	60	45,736
18 - 19	9	0	2	24	52	194	518	1,248	1,881	1,449	604	108	3	2	0	0	57	58	64	6,094
19 - 20	2	0	0	0	1	12	110	511	1,358	1,448	673	154	11	2	0	0	60	61	66	4,282
20 - 21	4	0	0	0	2	4	33	333	1,039	1,318	605	160	25	2	0	1	61	61	67	3,526
21 - 22	6	0	0	0	0	5	42	279	915	1,061	533	119	13	5	0	0	61	61	67	2,978
22 - 23	2	0	0	0	1	0	22	165	540	676	326	91	12	9	1	1	62	61	68	1,846
23 - 24	0	0	0	0	0	0	6	83	325	387	157	52	4	1	0	0	61	61	67	1,015
	23	0	2	24	56	215	731	2,619	6,058	6,339	2,898	684	68	21	1	2	60	60	66	19,741
	1,066	1,149	2,117	4,284	7,773	10,743	13,144	19,569	27,485	21,507	8,628	1,777	213	50	1	6	53	55	63	119,512

	>=	>= 20	>= 25	>= 30	>= 35	>= 40	>= 45	>= 50	>= 55	>= 60	>= 65	>= 70	>= 75	>= 80	>= 85	>= 90
Count	119,512	118,446	117,297	115,180	110,896	103,123	92,380	79,236	59,667	32,182	10,675	2,047	270	57	7	6
Pct Exceeding	100	99	98	96	93	86	77	66	50	27	9	2	0	0	0	0

85th Percentile

- Several locations reported an 85th percentile less than the posted speed limit. The majority of these locations are located within the Denver metro area
- 85th percentile is key statistic included in the report
 - If an ATR reported an 85th percentile speed of 57 MPH, that means 85% of traffic is traveling at or below 57 MPH



Limitations to Data

- Data is only relative to the specific point on the roadway where the ATR is located
- Speed data collected on the ATR may not reflect the entire corridor
- All sites had incomplete data due to road construction, equipment malfunction and weather related events



Ramp Metering Locations

- Speed data is collected on ramp metering locations throughout the Denver metro area
- Data is extracted from ramp meter server
- Five locations used, all commuter characteristics
- 85th percentile not collected, only average speed
- Only two years of data have been collected



Federal Speed Data Submittal

- Sent to all 14 TRADAS user states
(AZ, CO, DE, IA, IN, KS, KY, MO, NJ, NM, NV, UT, WI, WY)
- Document and evaluate the impact to State DOT's including an evaluation of time, resources, electronic tools, support and other needs
- Evaluation of FHWA's request of submitting continuous counts speed data on a monthly basis
 - Several FHWA sponsored meetings were held in 2009, including the speed summit meeting in Tampa



Challenges of Providing Speed Data

- Standardization of data format
- Database design
- Development of Speed Data Export Utility to provide FHWA with the exported data
- Storage capacity for speed data
- Federal acceptance of speed data submittals



Quality Control and Assurance and Reporting of Speed Data

- DOT's will need to develop QA/QC business processes to ensure quality speed data is prepared for national submittal purposes
- Development of automated electronic tools for the QA/QC of speed data



Speed Program Management

- Requiring states to submit speed data on a monthly basis would require additional time and resources
- Storage space (hardware) and software limitations need to be evaluated



ITS and Other Speed Data Sources

- ITS programs, probe vehicle and ramp metering devices
 - Subject to the same QA/QC challenges
 - Challenge of collecting and processing of this data in a standard federal speed data format



COLORADO DOT

Continuous count data exported from ITS Site

http://itsradsaz.org/atrdev/tmdReport.jsp?id=101319&y=2009&m=01 - Windows Internet Explorer
 http://itsradsaz.org/atrdev/tmdReport.jsp?id=101319&y=2009&m=01

30411101319100901015	337	408	343	249	153	153	210	254	359	418	479	518	546	584	619	570	554	572	551	475	468	356	368	2510
30411101319500901015	714	741	629	501	394	449	516	464	523	645	781	862	944	1031	1061	1018	1019	1005	1077	898	825	749	744	5270
30411101319100901026	192	144	108	89	141	350	552	665	631	640	669	696	759	753	827	747	794	805	681	589	508	486	405	3310
30411101319500901026	437	304	200	332	360	659	1214	1564	1466	1326	1419	1498	1598	1739	1867	1546	1685	1599	1408	1064	1016	900	896	7120
30411101319100901037	304	230	171	85	126	187	324	418	451	556	602	601	684	671	710	670	644	575	627	547	469	500	403	3500
30411101319500901037	603	429	394	277	352	470	660	792	935	1046	1188	1318	1314	1309	1373	1129	1251	1142	1203	1043	885	881	907	6560
30411101319100901041	289	180	235	167	135	189	224	292	393	498	560	562	646	599	618	572	615	579	558	532	439	441	364	2270
30411101319500901041	527	399	439	297	329	402	534	600	721	845	1004	1021	1158	1150	1191	1073	1174	1142	1141	911	789	786	689	5210
30411101319100901052	176	135	116	111	241	527	755	1104	1016	729	679	711	715	917	812	865	945	971	879	598	504	459	386	2530
30411101319500901052	427	272	252	316	451	992	1902	2743	2494	1742	1523	1666	1731	1886	1943	1939	2187	2147	1570	1067	885	864	842	5890
30411101319100901063	165	142	116	86	249	537	770	1179	980	373	1186	1184	1216	1262	1313	1552	2017	2184	1540	963	778	800	625	4670
30411101319500901063	462	365	336	359	435	1002	1886	2740	2492	1787	1667	1717	1836	1756	1959	1876	2210	2353	1701	1185	976	962	846	6170
30411101319100901074	310	232	178	226	514	1208	1546	2150	1795	1292	1129	1079	1138	1254	1371	1492	1889	2086	1555	935	832	794	588	4470
30411101319500901074	464	388	315	324	459	1038	1806	2742	2464	1774	1554	1699	1822	1791	1951	2024	2268	2286	1746	1197	968	930	889	5850
30411101319100901085	355	197	225	228	512	1197	1585	2116	1828	1341	774	1188	1245	1303	1453	1511	2007	2077	1551	970	844	728	603	4450
30411101319500901085	488	394	321	328	493	1046	1879	2805	2526	1802	1128	1817	1847	1843	1986	2012	2332	2326	1504	1120	918	921	975	6140
30411101319100901096	311	295	227	247	503	1168	1592	2046	1858	1312	1125	1207	1289	1370	1430	1611	1987	2141	1658	919	794	766	672	6300
30411101319500901096	475	398	304	329	461	940	1803	2796	2826	1993	1684	1878	1979	1979	2063	2051	2296	2181	1660	1185	1019	1069	980	7920
30411101319100901107	438	346	348	276	349	505	685	792	795	925	928	953	1026	1061	966	1007	1103	1127	957	775	653	755	746	6240
30411101319500901107	597	503	403	390	372	574	859	915	1109	1149	1277	1404	1486	1443	1425	1254	1315	1447	1380	1066	860	942	946	7900
30411101319100901111	450	409	383	300	283	388	443	566	633	719	822	872	914	948	960	879	977	949	889	750	679	597	558	4230
30411101319500901111	505	439	398	293	316	505	685	645	769	940	1128	1127	1281	1175	1205	1121	1224	1143	1178	978	822	778	632	5450
30411101319100901122	292	202	196	216	533	1196	1541	2090	1880	1259	1159	1167	1277	1304	1316	1506	2076	2179	1503	1014	800	693	589	4610
30411101319500901122	384	301	268	306	452	1045	1777	2832	2536	1742	1569	1705	1788	1777	1957	1975	2199	2183	1567	1122	906	856	792	6120
30411101319100901133	306	218	221	240	521	1215	1572	2140	1939	1369	1169	1201	1210	1267	1286	1556	2033	2090	1544	1005	896	720	577	4220
30411101319500901133	451	388	325	327	474	1064	1847	2862	2661	1817	1614	1783	1787	1763	1887	1911	2291	2271	1584	1212	988	958	861	6470
30411101319100901144	263	256	242	197	548	1219	1557	2134	1876	1153	1175	1184	1227	1275	1460	1501	1913	2077	1609	980	814	765	630	4260
30411101319500901144	453	438	328	291	427	1045	1883	2855	2603	1529	1723	1784	1921	1831	2092	1983	2332	2302	1706	1158	957	966	845	6220
30411101319100901155	329	221	217	257	507	1160	1586	2155	1884	1328	1211	1283	1228	1323	1438	1516	2051	2095	1536	1013	825	838	604	4660
30411101319500901155	477	414	346	326	402	1077	1865	2798	2558	1970	1625	1885	1804	1834	2007	1926	2369	2428	1707	1184	1066	1050	926	6680
30411101319100901166	417	292	208	256	487	1125	1554	2102	1913	1258	1264	1227	1258	1446	1548	1598	1962	1970	1519	1050	800	751	718	6360
30411101319500901166	471	358	378	400	469	927	1839	2796	2450	1784	1767	1925	1932	2004	2139	2162	2267	2209	1597	1280	1075	1083	981	7980
30411101319100901177	473	336	400	267	366	537	647	806	886	923	952	1109	1044	1084	1086	1053	1106	1136	1011	938	793	768	749	6090
30411101319500901177	669	525	427	379	439	604	838	1065	1208	1413	1610	1650	1782	1764	1800	1603	1681	1695	1653	1432	1213	1181	1131	8240
30411101319100901181	468	417	462	316	290	408	494	694	705	890	1130	1128	1384	1048	801	830	866	950	870	812	730	683	551	4370
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30411101319100901192	318	241	289	300	501	1050	1320	1632	1365	1143	1145	1114	1217	1268	1334	1338	1442	1550	1259	879	753	688	553	3940
30411101319500901192	388	359	264	376	439	793	1435	1874	1698	1524	1496	1596	1649	1652	1819	1759	1863	1872	1457	1034	917	873	717	5610
30411101319100901203	320	217	171	228	509	1193	1625	2097	1954	1274	1117	1158	1219	1280	1323	1536	2047	2199	1495	947	819	736	612	4700
30411101319500901203	396	358	306	369	489	1012	1904	2869	2660	1810	1524	1838	1820	1765	2002	1957	2202	2343	1691	1206	943	937	856	6000
30411101319100901214	324	227	159	228	523	1133	1592	2180	1846	1272	1151	1194	1258	1313	1366	1506	1969	2153	1543	956	853	795	621	4380
30411101319500901214	460	365	318	355	438	1004	1918	2928	2630	1819	1570	1803	1805	1872	1974	1980	2316	2472	1753	1169	1042	975	898	6480
30411101319100901225	358	223	198	209	524	1140	1531	2182	1880	1325	1195	1204	1270	1250	1387	1578	322	1427	1655	1002	886	798	643	4810
30411101319500901225	486	356	377	358	454	1011	1846	2893	2716	1908	1661	1740	1833	1755	2009	2059	414	1401	1659	1238	1014	1005	891	6620
30411101319100901236	375	293	233	276	521	1052	1506	2087	1888	1355	1190	1221	1314	1347	1461	1566	2026	1980	1413	960	810	811	734	5880
30411101319500901236	490	395	365	370	439	1006	1859	2875	2536	1861	1720	1999	1999	2000	1992	2019	2271	2170	1634	1238	1061	1070	961	7770
30411101319100901247	478	421	398	276	384	563	718	832	922	985	1071	1195	1233	1209	1226	1162	1223	1110	1120	978	833	818	783	7130
30411101319500901247	615	507	472	390	345	570	790	1087	1159	1261	1340	1507	1566	1574	1540	1362	1440	1405	1447	1172	970	1067	1007	8040
30411101319100901251	570	391	518	321	286	373	420	631	651	768	946	1000	992	1178	1085	1008	1062	950	944	846	713	670	555	4360
30411101319500901251	595	496	454	321	309	463	590	682	790	995	1162	1230	1350	1309	1342	1176	1260	1281	1243	1038	842	794	748	5340
30411101319100901262	285	193	197	229	527	1187	1542	2123	1816	1242	1140	1152	1179	1258	1340	1497	1947	2212	1499	908	716	774	596	4320

Done Internet | Protected Mode: On 100%

COLORADO DOT ITS site group in TRADAS

RoadRunner Main Window (Connect Istolz@dtdprod AS TRADAS Administrator; Version 3.1.4)

File View/Edit Work Orders Utilities Window

Select Naming Convention: Rte/RefPtBeg/RefPtEnd

Quick Menu

- View/Edit
 - Product Data
 - Agencies
 - Binding Rules
 - Binning Schemes
 - Counties
 - Device Types
 - Factors
 - Factor Groups
 - Functional Class
 - RDF
 - Sites
 - Site Groups
 - System Parameters
 - Validity Parameters
- Work Order
- Utilities

View Site Group

Name: ITS Sites

Purpose: Data check

Find Filter

Site Group
CITY OF PUEBLO
COLORADO SPRINGS
E470
FactorCheck
Fix Axle
Grand_Junction
Green Box
GrowthFactorGroup_1
I70 Mountain ATR
ITS Sites
Jefferson
La Plata
Northwest Parkway
RAMP_SITES

Sites:

100991
901581
901582
901583
901584
901585
901586
901589
901595
901596
901597
901598
901599
901600
901601
901602
901603
901604

Generate PDF

Insert Delete Edit Close

Volume differences at site

	Total
55	216209
72	159215
80	120857
44	180644
52	161769
39	205143
73	270713
22	214899
65	168151
79	132211
77	193930
13	205472
86	211563
21	164181
63	218181
67	166009
39	122838
74	193880
11	207594
35	209081
-	
83	220688
70	168772
36	145695
72	213746
38	291505
06	220500
63	215026
-	

← Low

Difference = Over 170,000 vehicles

← High

Why is FHWA Seeking the Program?

- Congress and the public demand accountability for taxpayer money spent on highways
- Congress is demanding a performance measurement driven funding mechanism
- White House has begun a renewed emphasis on benefit-cost analysis
- Other potential uses of data



Conclusions

- Additional data considerations, and coordination meetings need to be conducted
- Challenges include extra time, resources, and development of electronic tools to support a federal speed data program

