



# INDIANA DEPARTMENT OF TRANSPORTATION

*Driving Indiana's Economic Growth*

March 17, 2010

## ANNUAL AVERAGE DAILY TRAFFIC (AADT) ESTIMATES

The Indiana Department of Transportation (INDOT), through its Traffic Monitoring Section, collects, summarizes and interprets information on the traffic traveling on the state's highway system. The data is used to assess transportation needs, system performance and to develop highway planning and programming recommendations. Traffic data also plays a very important role in route planning and in the design of highway projects.

To collect this information, the Department operates two traffic monitoring systems:

1. A Statewide Traffic Monitoring System consisting of 110 permanent continuous count stations that collect volume, speed and vehicle classification data 24 hours per day, 365 days per year. Fifty of these sites also utilize weigh-in motion (WIM) technology to collect continuous truck weight data. These sites are located throughout the state to monitor overall traffic trends. Information from these counters is used to determine ANNUAL TRAFFIC GROWTH trends as well as develop AXLE, WEEKDAY and SEASONAL adjustment factors used with the state's coverage count program to determine estimates of annual average daily traffic (AADT).
2. The statewide coverage count program utilizes portable pneumatic road-tubes traffic counters to collect 48 hour traffic counts on all State Highway System traffic sections and in rural and small urban areas on all highway performance monitoring sections (HPMS). The coverage count program operates on a three-year cycle, counting one-third of all sections annually, or approximately 10,000 of the 30,000 count sites. Wherever possible, portable classifiers are used so that approximately 65% of all coverage counts collected are classification counts. Additional counts are taken within this program to support specific state projects. Traffic counting operations are primarily done by INDOT forces, consultant contracts or through contracts with the Metropolitan Planning Organizations (MPOs) through a data partnership program.

## ADJUSTMENT FACTORS

Adjustment factors are necessary to convert an Average Daily Traffic (ADT) volume into an Annual Average Daily Traffic (AADT) estimate. Depending on the type of counter, the seasonal period of the setting, multiple factors may be necessary. These include axle, weekday and seasonal adjustment factors. For the 2/3's of the system not counted in the current year, the previously derived AADTs can be adjusted to the current year by utilizing the annual growth factors.

### **AXLE ADJUSTMENT FACTORS**

There are times when portable classifiers cannot be set due to number of lanes or the lack of free-flow speeds. In these cases, portable traffic counters utilizing single pneumatic road-tubes stretched across a lane or roadway are used. These types of counters register two axle impacts as one vehicle so when vehicles with three or more axles cross the road-tube they will be counted as multiple vehicles. Whenever possible axle adjustment factors should be developed from vehicle classification counters set on the same route within the vicinity of the axle counter and during the same relative time period. If this is not possible then the use of these Axle Adjustment factors applied by factor groups (FG) and month are considered acceptable.

### **WEEKDAY ADJUSTMENT FACTORS**

The purpose of these factors is to normalize the variability of traffic counts that exists between counts taken during the weekday, Friday, Saturdays and/or Sundays. In developing the weekday factors we found no significant statistical difference in the Monday through Thursday trends and for this reason combine these into a weekday factor. This is further justified as counts taken for INDOT will usually span a Monday through Wednesday or a Tuesday through Thursday count period.

### **SEASONAL (MONTHLY) ADJUSTMENT FACTORS**

Seasonal or monthly adjustment factors convert average daily traffic (ADT) to annual average daily traffic (AADT). Observed traffic volumes at a location often vary from month to month with higher summer traffic volumes and lower winter traffic volumes. To compare traffic volume data collected in different months, seasonal adjustment factors must be applied. The ADT is multiplied by the seasonal factor to obtain the AADT value. The continuous counter sites are grouped into five major factor groups. Currently there are two urban factor groups and three rural factor groups which are based on grouped functional classifications.

### **ANNUAL GROWTH FACTORS**

As not all road sections are counted each year, there are times when previous years AADTs will need to be factored in order to estimate current year values. Annual Growth Factors are used in these situations and are developed by comparisons of previous years AADTs at INDOT's 110 continuous counting telemetry sites and averaged for the five factor groups.

## 2009 AVERAGE AXLE ADJUSTMENT FACTORS\*

Urban - Interstate (11)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	0.786	0.818	0.826	0.826	0.830	0.826	0.838	0.810	0.796	0.810	0.818	0.822
2008	0.764	0.756	0.770	0.758	0.764	0.784	0.776	0.768	0.772	0.800	0.830	0.806

Urban - Freeways and Expressways (12) Principal Arterials (14)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	0.946	0.946	0.952	0.952	0.948	0.944	0.938	0.932	0.930	0.944	0.944	0.942
2008	0.932	0.930	0.932	0.924	0.920	0.918	0.918	0.928	0.926	0.932	0.938	0.950

Urban - Minor Arterials (16), Collectors (17), Locals (19)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	0.948	0.938	0.952	0.962	0.958	0.946	0.944	0.944	0.954	0.952	0.952	0.960
2008	0.914	0.890	0.922	0.892	0.828	0.826	0.820	0.802	0.808	0.828	0.878	0.944

Rural - Interstate (01)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	0.688	0.732	0.744	0.756	0.754	0.770	0.772	0.740	0.736	0.720	0.718	0.716
2008	0.700	0.706	0.722	0.706	0.724	0.730	0.752	0.742	0.724	0.718	0.732	0.742

Rural - Principal Arterials (02), Minor Arterials (06)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	0.846	0.852	0.840	0.846	0.868	0.874	0.864	0.864	0.868	0.866	0.862	0.858
2008	0.824	0.860	0.854	0.832	0.842	0.858	0.846	0.842	0.834	0.836	0.848	0.854

Rural - Major Collectors (07), Minor Collectors (08), Locals (09)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	0.834	0.848	0.874	0.878	0.882	0.870	0.870	0.878	0.900	0.866	0.896	0.878
2008	0.836	0.798	0.800	0.782	0.842	0.862	0.874	0.876	0.864	0.894	0.894	0.878

\*Axle Adjustment Factors are applied to counts taken with portable counters utilizing a single pneumatic road tube. This type of counter registers two axle impacts as one vehicle. The axle factor is used to account for vehicle types having more than two axles, typically trucks with three or more axles.

## 2009 WEEKDAY FACTORS

Urban - Interstate (11), Freeways and Expressways (12)													
	Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Weekdays</b>	<b>0.960</b>	<b>0.963</b>	<b>0.954</b>	<b>0.965</b>	<b>0.968</b>	<b>0.972</b>	<b>0.968</b>	<b>0.950</b>	<b>0.963</b>	<b>0.971</b>	<b>0.958</b>	<b>0.951</b>	<b>0.941</b>
<b>Friday</b>	0.867	0.844	0.830	0.841	0.860	0.850	0.866	0.885	0.874	0.843	0.874	0.909	0.932
<b>Saturday</b>	1.150	1.139	1.169	1.135	1.132	1.135	1.141	1.244	1.147	1.130	1.167	1.133	1.129
<b>Sunday</b>	1.288	1.331	1.388	1.337	1.277	1.264	1.242	1.214	1.256	1.293	1.257	1.283	1.310

Urban - Principal Arterials (14), Minor Arterials (16), Collectors (17), Locals (19)													
	Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Weekdays</b>	<b>0.953</b>	<b>0.969</b>	<b>0.960</b>	<b>0.950</b>	<b>0.960</b>	<b>0.968</b>	<b>0.944</b>	<b>0.929</b>	<b>0.953</b>	<b>0.962</b>	<b>0.952</b>	<b>0.954</b>	<b>0.932</b>
<b>Friday</b>	0.874	0.835	0.844	0.862	0.872	0.858	0.883	0.889	0.885	0.857	0.876	0.886	0.946
<b>Saturday</b>	1.106	1.081	1.094	1.112	1.062	1.077	1.132	1.230	1.099	1.096	1.102	1.092	1.091
<b>Sunday</b>	1.382	1.403	1.418	1.414	1.391	1.341	1.371	1.367	1.349	1.378	1.380	1.368	1.401

Rural - Interstate (01)													
	Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Weekdays</b>	<b>1.027</b>	<b>1.015</b>	<b>1.001</b>	<b>1.032</b>	<b>1.027</b>	<b>1.034</b>	<b>1.047</b>	<b>1.032</b>	<b>1.046</b>	<b>1.048</b>	<b>1.035</b>	<b>1.024</b>	<b>0.983</b>
<b>Friday</b>	0.848	0.839	0.802	0.817	0.832	0.825	0.843	0.849	0.864	0.809	0.839	0.912	0.948
<b>Saturday</b>	1.072	1.069	1.135	1.062	1.087	1.059	1.040	1.144	1.032	1.033	1.097	1.039	1.067
<b>Sunday</b>	1.036	1.097	1.169	1.068	1.042	1.046	0.989	0.955	0.970	1.039	0.985	0.992	1.083

Rural - Principal Arterials (02), Minor Arterials (06)													
	Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Weekdays</b>	<b>0.977</b>	<b>0.967</b>	<b>0.962</b>	<b>0.969</b>	<b>0.980</b>	<b>0.992</b>	<b>0.994</b>	<b>0.980</b>	<b>0.995</b>	<b>1.006</b>	<b>0.976</b>	<b>0.961</b>	<b>0.942</b>
<b>Friday</b>	0.863	0.839	0.829	0.848	0.861	0.852	0.870	0.868	0.862	0.841	0.869	0.884	0.930
<b>Saturday</b>	1.069	1.108	1.120	1.082	1.046	1.049	1.032	1.114	1.036	1.008	1.076	1.074	1.079
<b>Sunday</b>	1.282	1.360	1.380	1.341	1.296	1.232	1.208	1.192	1.204	1.235	1.252	1.322	1.356

Rural - Major Collectors (07), Minor Collectors (08), Locals (09)													
	Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Weekdays</b>	<b>0.968</b>	<b>0.970</b>	<b>0.945</b>	<b>0.955</b>	<b>0.987</b>	<b>0.982</b>	<b>0.979</b>	<b>0.960</b>	<b>0.973</b>	<b>0.991</b>	<b>0.969</b>	<b>0.967</b>	<b>0.936</b>
<b>Friday</b>	0.887	0.860	0.864	0.873	0.871	0.885	0.894	0.898	0.887	0.872	0.895	0.900	0.944
<b>Saturday</b>	1.068	1.114	1.149	1.096	1.017	1.044	1.030	1.107	1.052	1.016	1.059	1.042	1.092
<b>Sunday</b>	1.294	1.326	1.396	1.364	1.265	1.231	1.230	1.253	1.261	1.238	1.286	1.293	1.386

**Note: Weekday factors are used to normalize the variability of traffic counts that exists between counts taken on the Weekdays, Friday, Saturday and or Sunday.**

## SEASONAL ADJUSTMENT FACTORS BY FUNCTIONAL CLASSIFICATION 2005-2009

Urban - Interstate (11), Freeways and Expressways (12)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	1.193	1.075	1.013	1.003	0.981	0.945	0.943	0.938	0.966	0.973	0.986	1.047
2008	1.092	1.071	1.006	0.980	0.971	0.964	0.960	0.934	1.001	0.988	1.036	1.059
2007	1.088	1.114	1.008	0.985	0.972	0.946	0.944	0.939	0.984	0.977	1.014	1.088
2006	1.111	1.069	1.032	0.999	0.971	0.944	0.963	0.959	0.978	0.983	1.014	1.048
2005	1.155	1.067	1.031	1.001	0.969	0.931	0.931	0.932	0.996	0.982	1.002	1.059
5 YR AVG	1.128	1.079	1.018	0.994	0.973	0.946	0.948	0.940	0.985	0.980	1.010	1.060

Urban - Principal Arterials (14), Minor Arterials (16), Collectors (17), Locals (19)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	1.137	1.014	1.000	0.978	0.953	0.954	0.971	0.961	1.009	1.010	1.016	1.044
2008	1.056	1.023	1.008	0.957	1.018	1.020	1.039	0.972	0.959	0.955	1.007	1.062
2007	1.063	1.074	0.970	0.967	0.952	0.968	0.993	0.967	0.991	0.987	1.037	1.088
2006	1.067	1.019	1.023	0.985	0.975	0.952	0.984	0.966	0.983	0.971	1.019	1.027
2005	1.095	1.008	1.039	0.975	0.982	0.944	0.957	0.956	0.990	0.987	1.039	1.089
5 YR AVG	1.084	1.028	1.008	0.972	0.976	0.968	0.989	0.964	0.986	0.982	1.024	1.062

Rural - Interstate (01)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	1.254	1.132	1.037	1.007	0.968	0.900	0.870	0.904	0.968	0.987	0.997	1.097
2008	1.179	1.157	1.025	1.015	0.960	0.910	0.883	0.889	0.999	0.982	1.005	1.120
2007	1.164	1.183	1.048	1.004	0.961	0.908	0.897	0.898	0.971	0.957	0.978	1.100
2006	1.177	1.131	1.048	1.012	0.973	0.909	0.906	0.912	0.985	0.975	0.997	1.078
2005	1.222	1.120	1.044	1.021	0.961	0.900	0.878	0.905	1.002	0.985	0.999	1.087
5 YR AVG	1.199	1.145	1.040	1.012	0.964	0.905	0.887	0.902	0.985	0.977	0.995	1.096

Rural - Principal Arterials (02), Minor Arterials (06)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	1.205	1.081	1.025	1.002	0.961	0.936	0.940	0.939	0.948	0.981	1.002	1.072
2008	1.160	1.084	1.029	0.966	0.950	0.938	0.932	0.941	0.996	0.989	1.041	1.142
2007	1.121	1.137	1.017	0.993	0.960	0.925	0.946	0.941	0.961	0.964	1.028	1.092
2006	1.087	1.055	1.028	0.991	0.965	0.936	0.963	0.971	0.977	0.994	1.032	1.062
2005	1.164	1.074	1.046	0.988	0.940	0.907	0.921	0.934	0.974	0.985	1.042	1.103
5 YR AVG	1.147	1.086	1.029	0.988	0.955	0.928	0.940	0.945	0.971	0.982	1.029	1.094

Rural - Major Collectors (07), Minor Collectors (08), Locals (09)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	1.207	1.099	1.039	0.994	0.936	0.910	0.936	0.951	0.962	0.980	1.017	1.074
2008	1.083	1.093	1.040	0.977	0.956	0.923	0.957	0.957	0.979	0.976	1.038	1.133
2007	1.108	1.119	1.013	0.977	0.927	0.927	0.962	0.948	0.957	0.973	1.043	1.109
2006	1.095	1.060	1.037	0.973	0.946	0.925	0.958	0.960	0.972	0.997	1.029	1.058
2005	1.123	1.066	1.060	0.980	0.958	0.936	0.937	0.928	0.982	0.980	1.032	1.110
5 YR AVG	1.123	1.087	1.038	0.980	0.945	0.924	0.950	0.949	0.970	0.981	1.032	1.097

*Note: The seasonal adjustment factors are used to expand average 24-hour volumes to estimated Annual Average Daily Traffic (AADT).*

March 2010

# ANNUAL GROWTH FACTORS BY FUNCTIONAL CLASSIFICATION 2000 - 2009

YEAR TO	YEAR FROM									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Urban - Interstate (11), Freeways and Expressways (12)</b>										
2000	-	0.921	0.890	0.863	0.853	0.831	0.817	0.786	0.803	0.788
2001	1.086	-	0.966	0.937	0.926	0.903	0.887	0.853	0.872	0.855
2002	1.124	1.035	-	0.970	0.958	0.934	0.919	0.883	0.902	0.885
2003	1.159	1.067	1.031	-	0.988	0.963	0.947	0.911	0.930	0.913
2004	1.173	1.080	1.043	1.012	-	0.975	0.958	0.922	0.941	0.924
2005	1.203	1.108	1.070	1.038	1.026	-	0.983	0.945	0.966	0.948
2006	1.224	1.127	1.089	1.056	1.043	1.017	-	0.962	0.982	0.964
2007	1.273	1.172	1.132	1.098	1.085	1.058	1.040	-	1.021	1.002
2008	1.246	1.147	1.108	1.075	1.062	1.035	1.018	0.979	-	0.981
2009	1.270	1.169	1.130	1.096	1.083	1.055	1.038	0.998	1.019	-
<b>Urban - Principal Arterials (14), Minor Arterials (16), Collectors (17), Local (19)</b>										
2000	-	0.969	0.914	0.926	0.937	0.936	0.930	0.942	0.972	0.976
2001	1.032	-	0.943	0.956	0.967	0.966	0.960	0.972	1.003	1.008
2002	1.094	1.060	-	1.013	1.025	1.024	1.017	1.031	1.064	1.068
2003	1.080	1.046	0.987	-	1.012	1.011	1.004	1.017	1.050	1.054
2004	1.067	1.034	0.975	0.988	-	0.999	0.992	1.005	1.037	1.041
2005	1.068	1.035	0.976	0.989	1.001	-	0.993	1.006	1.038	1.042
2006	1.075	1.042	0.983	0.996	1.008	1.007	-	1.013	1.046	1.050
2007	1.061	1.028	0.970	0.983	0.995	0.994	0.987	-	1.032	1.036
2008	1.028	0.997	0.940	0.952	0.964	0.963	0.956	0.969	-	1.004
2009	1.024	0.993	0.936	0.949	0.960	0.959	0.953	0.965	0.996	-
<b>Rural - Interstate (01)</b>										
2000	-	0.968	0.923	0.918	0.906	0.902	0.895	0.888	0.903	0.911
2001	1.033	-	0.953	0.949	0.936	0.932	0.924	0.917	0.933	0.941
2002	1.084	1.049	-	0.995	0.982	0.977	0.970	0.962	0.979	0.987
2003	1.089	1.054	1.005	-	0.987	0.982	0.974	0.967	0.983	0.992
2004	1.103	1.068	1.018	1.013	-	0.995	0.987	0.979	0.996	1.005
2005	1.109	1.073	1.023	1.018	1.005	-	0.992	0.984	1.001	1.010
2006	1.118	1.082	1.031	1.026	1.013	1.008	-	0.992	1.009	1.018
2007	1.127	1.091	1.040	1.034	1.021	1.016	1.008	-	1.017	1.027
2008	1.107	1.072	1.022	1.017	1.004	0.999	0.991	0.983	-	1.009
2009	1.097	1.062	1.013	1.008	0.995	0.990	0.982	0.974	0.991	-
<b>Rural - Principal Arterials (02), Minor Arterials (06)</b>										
2000	-	0.978	0.966	0.988	0.961	0.962	0.953	0.953	1.002	1.007
2001	1.022	-	0.987	1.009	0.982	0.983	0.974	0.974	1.024	1.029
2002	1.035	1.013	-	1.022	0.995	0.996	0.987	0.987	1.038	1.043
2003	1.013	0.991	0.978	-	0.973	0.974	0.965	0.965	1.015	1.020
2004	1.041	1.018	1.005	1.028	-	1.001	0.992	0.992	1.043	1.048
2005	1.040	1.017	1.004	1.027	0.999	-	0.991	0.991	1.042	1.047
2006	1.049	1.027	1.013	1.036	1.008	1.009	-	1.000	1.052	1.057
2007	1.049	1.027	1.013	1.036	1.008	1.009	1.000	-	1.052	1.057
2008	0.998	0.976	0.964	0.985	0.959	0.960	0.951	0.951	-	1.005
2009	0.993	0.971	0.959	0.981	0.954	0.955	0.946	0.946	0.995	-
<b>Rural - Major Collectors (07), Minor Collectors (08), Locals (09)</b>										
2000	-	1.002	0.980	0.978	0.974	0.986	0.991	0.984	1.053	1.045
2001	0.998	-	0.978	0.976	0.972	0.984	0.989	0.983	1.051	1.042
2002	1.020	1.022	-	0.997	0.993	1.006	1.011	1.004	1.074	1.065
2003	1.023	1.025	1.003	-	0.996	1.009	1.014	1.007	1.077	1.069
2004	1.027	1.029	1.007	1.004	-	1.013	1.018	1.011	1.081	1.073
2005	1.014	1.016	0.994	0.991	0.987	-	1.005	0.998	1.067	1.059
2006	1.009	1.011	0.989	0.986	0.982	0.995	-	0.993	1.062	1.054
2007	1.016	1.018	0.996	0.993	0.989	1.002	1.007	-	1.070	1.061
2008	0.950	0.952	0.931	0.928	0.925	0.937	0.942	0.935	-	0.992
2009	0.957	0.959	0.939	0.936	0.932	0.944	0.949	0.942	1.008	-

*Note: Factors in this table are used to adjust previous year AADTs to a more current year for similarly classed roads (e.g. to adjust a 2006 urban interstate AADT to a 2009 equivalent, you would multiply the 2006 AADT by 1.038).*