

Performance Measure Summary - Winston-Salem NC

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2020. There is no single performance measure that experts agree "says it all". A few key points should be recognized by users of the Urban Mobility Scorecard data.

Use the trends - The multi-year performance measures are better indicators, in most cases, than any single year. Examining a few measures over many years reduces the chance that data variations or the estimating procedures may have caused a "spike" in any single year. (5 years is 5 times better than 1 year.)

Use several measures - Each performance measure illustrates a different element of congestion. (The view is more interesting from atop several measures.)

Compare to similar regions - Congestion analyses that compare areas with similar characteristics (for example, population, growth rate, road and public transportation system design) are usually more insightful than comparisons of different regions. (Los Angeles is not Peoria.)

Compare ranking changes and performance measure values - In some performance measures, a small change in the value may cause a significant change in rank from one year to the next. This is the case when there are several regions with nearly the same value. (15 hours is only 1 hour more than 14 hours.)

Consider the scope of improvement options - Any improvement project in a corridor within most of the regions will only have a modest effect on the regional congestion level. (To have an effect on areawide congestion, there must be significant change in the system or service.)

Performance Measures and Definition of Terms

Travel Time Index - A measure of congestion that focuses on each trip and each mile of travel. It is calculated as the ratio of travel time in the peak period to travel time in free-flow. A value of 1.30 indicates that a 20-minute free-flow trip takes 26 minutes in the peak.

Planning Time Index - A travel time reliability measure that represents the total travel time that should be planned for a trip. Computed with the 95th percentile travel time it represents the amount of time that should be planned for a commute trip to be late for only 1 day a month. If it is computed with the 80th percentile travel time it represents the amount of time that should be planned for a trip to be late for only 1 day a week. A PTI of 2.00 means that for a 20-minute trip in light traffic, 40 minutes should be planned.

Peak Commuters - Number of travelers who begin a trip during the morning or evening peak travel periods (6 to 10 a.m. and 3 to 7 p.m.). "Commuters" are private vehicle users unless specifically noted.

Annual Delay per Commuter - A yearly sum of all the per-trip delays for those persons who travel in the peak period (6 to 10 a.m. and 3 to 7 p.m.). This measure illustrates the effect of traffic slowdowns as well as the length of each trip.

Total Delay - The overall size of the congestion problem. Measured by the total travel time above that needed to complete a trip at free-flow speeds. The ranking of total delay usually follows the population ranking (larger regions usually have more delay).

Free-Flow Speeds - These values are derived from time periods with lighter traffic volumes in the INRIX speed database. They are used as the national comparison thresholds. Other speed thresholds may be appropriate for urban project evaluations or sub-region studies.

Excess Fuel Consumed - Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

Congestion Cost - Value of travel delay for 2020 (estimated at \$20.17 per hour of person travel and \$55.24 per hour of truck time) and excess fuel consumption estimated using state average cost per gallon.

Urban Area - The developed area (population density more than 1,000 persons per square mile) within a metropolitan region. The urban area boundaries change frequently (every year for most growing areas), so increases include both new growth and development that was previously in areas designated as rural.

Number of Rush Hours - Time when the road system might have congestion.

Annual Greenhouse Gases (CO2) Produced - Tons of CO2 produced from all vehicle travel.

Excess Greenhouse Gases (CO2) Produced due to Congestion - Tons of CO2 produced due to congested portion of travel. The excess CO2 is a subset of the total CO2 produced.

Mobility Data for Winston-Salem NC

Inventory Measures	2020	2019	2018	2017	2016	2015
Urban Area Information						
Population (1000s)	420	420	420	420	415	415
Rank	84	84	84	84	84	84
Commuters (1000s)	217	217	217	217	214	214
Daily Vehicle-Miles of Travel (1000s)						
Freeway	5,501	6,359	6,577	6,390	6,306	5,871
Arterial Streets	2,265	2,618	2,596	2,527	2,440	2,440
Cost Components						
Value of Time (\$/hour)	20.17	19.14	18.71	18.12	17.91	17.69
Commercial Cost (\$/hour)	55.24	49.49	54.71	52.14	50.20	46.87
Gasoline (\$/gallon)	2.19	2.43	2.71	2.20	2.10	2.15
Diesel (\$/gallon)	2.70	2.88	3.10	2.45	2.23	2.47
System Performance	2020	2019	2018	2017	2016	2015
Congested Travel (% of peak VMT)	--	--	--	12.2	--	--
Congested System (% of lane-miles)	--	--	--	9.2	--	--
Congested Time (number of "Rush Hours")	--	--	--	0.9	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	1,606	2,794	2,802	2,738	2,676	2,616
Rank	92	94	95	95	95	95
Fuel per Peak Auto Commuter (gallons)	6	10	10	10	9	9
Rank	95	98	98	98	98	98
Annual Delay						
Total Delay (1000s of person-hours)	4,455	7,752	7,842	7,930	7,642	7,278
Rank	90	90	90	90	91	91
Delay per Auto Commuter (pers-hrs)	15	26	27	27	26	24
Rank	94	98	97	97	97	97
Travel Time Index	1.04	1.10	1.11	1.11	1.11	1.11
Rank	101	97	96	96	96	96
Commuter Stress Index	1.04	1.11	1.12	1.12	--	--
Rank	101	98	97	96	--	--
Freeway Planning Time Index (95th Pctile)	--	1.28	1.23	1.24	--	--
Rank	--	75	85	87	--	--
Congestion Cost						
Total Cost (\$ millions)	99	164	168	168	159	149
Rank	90	92	90	90	91	91
Cost per Auto Commuter (\$)	303	503	515	514	498	474
Rank	96	99	99	98	98	98
Truck Congestion						
Annual Person-Hours of Delay (000)	195	290	304	333	321	306
Rank	90	95	94	91	92	92
Annual Gallons of Wasted Fuel (000)	315	470	490	535	523	511
Rank	92	95	95	93	93	93
Annual Congestion Cost (\$ million)	10	14	17	17	16	15
Rank	91	96	94	92	92	91
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)	16,029	27,893	--	--	--	--
Rank	92	94	--	--	--	--
Due to All Travel (tons)	956,204	1,663,949	--	--	--	--
Rank	82	82	--	--	--	--
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)	3,439	5,127	--	--	--	--
Rank	92	95	--	--	--	--
Due to Truck Travel (tons)	257,548	383,953	--	--	--	--
Rank	79	80	--	--	--	--

* Note: Zeroes in the table reflect values less than 0.5.

Mobility Data for Winston-Salem NC

Inventory Measures	2014	2013	2012	2011	2010	2009
Urban Area Information						
Population (1000s)	415	410	405	400	395	380
Rank	84	84	84	84	84	84
Commuters (1000s)	214	215	213	210	206	198
Daily Vehicle-Miles of Travel (1000s)						
Freeway	5,931	4,792	4,685	4,777	4,740	4,600
Arterial Streets	2,359	1,766	1,765	1,665	1,700	1,860
Cost Components						
Value of Time (\$/hour)	17.67	17.39	17.14	16.79	16.28	16.01
Commercial Cost (\$/hour)	44.82	41.23	39.66	44.62	42.50	41.83
Gasoline (\$/gallon)	3.20	3.44	3.49	3.32	2.70	2.24
Diesel (\$/gallon)	3.58	3.89	3.89	3.64	2.93	2.53
System Performance	2014	2013	2012	2011	2010	2009
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	2,546	2,483	2,471	2,464	2,480	2,414
Rank	94	94	95	95	94	94
Fuel per Peak Auto Commuter (gallons)	8	7	7	7	7	7
Rank	99	98	98	98	99	97
Annual Delay						
Total Delay (1000s of person-hours)	6,956	6,664	6,513	6,435	6,414	6,186
Rank	91	91	92	91	90	89
Delay per Auto Commuter (pers-hrs)	22	21	21	20	20	21
Rank	97	98	98	98	98	96
Travel Time Index	1.11	1.11	1.11	1.11	1.12	1.11
Rank	97	96	94	93	89	92
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	145	137	132	129	123	116
Rank	91	91	92	92	91	90
Cost per Auto Commuter (\$)	449	437	432	441	449	443
Rank	98	97	97	96	95	95
Truck Congestion						
Annual Person-Hours of Delay (000)	292	280	274	270	269	260
Rank	93	93	93	93	92	91
Annual Gallons of Wasted Fuel (000)	497	485	483	482	485	471
Rank	93	93	94	94	93	93
Annual Congestion Cost (\$ million)	14	13	12	13	12	11
Rank	92	92	93	93	92	92
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to All Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to Truck Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--

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Mobility Data for Winston-Salem NC

Inventory Measures	2008	2007	2006	2005	2004	2003
Urban Area Information						
Population (1000s)	375	370	360	350	340	335
Rank	84	85	85	86	87	87
Commuters (1000s)	194	191	185	178	172	169
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,440	4,685	4,545	4,565	4,335	4,280
Arterial Streets	1,945	1,845	1,855	1,835	1,815	1,750
Cost Components						
Value of Time (\$/hour)	16.07	15.47	15.06	14.58	14.10	13.73
Commercial Cost (\$/hour)	40.77	39.30	37.88	36.51	35.19	33.92
Gasoline (\$/gallon)	3.42	2.95	2.62	2.27	1.89	1.46
Diesel (\$/gallon)	4.11	3.33	2.80	2.44	1.90	1.47
System Performance	2008	2007	2006	2005	2004	2003
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	2,512	2,557	2,523	2,341	2,119	1,945
Rank	93	93	93	93	94	94
Fuel per Peak Auto Commuter (gallons)	7	8	8	8	7	6
Rank	98	97	98	97	96	97
Annual Delay						
Total Delay (1000s of person-hours)	6,131	6,241	6,156	5,711	5,171	4,748
Rank	90	88	88	89	91	92
Delay per Auto Commuter (pers-hrs)	21	22	22	21	20	18
Rank	96	94	94	95	95	95
Travel Time Index	1.11	1.11	1.12	1.12	1.11	1.10
Rank	96	95	88	86	91	91
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	119	115	110	98	85	75
Rank	92	90	89	90	92	93
Cost per Auto Commuter (\$)	435	460	467	447	417	395
Rank	95	95	95	94	95	95
Truck Congestion						
Annual Person-Hours of Delay (000)	258	262	259	240	217	199
Rank	91	88	88	91	92	92
Annual Gallons of Wasted Fuel (000)	491	499	493	457	415	380
Rank	92	93	91	92	93	92
Annual Congestion Cost (\$ million)	12	11	11	9	8	7
Rank	90	89	88	91	91	91
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to All Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to Truck Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--

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Mobility Data for Winston-Salem NC

Inventory Measures	2002	2001	2000	1999	1998	1997
Urban Area Information						
Population (1000s)	325	320	310	305	295	290
Rank	87	87	88	88	88	87
Commuters (1000s)	161	156	149	144	138	133
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,130	4,100	4,005	3,900	3,800	3,765
Arterial Streets	1,660	1,570	1,545	1,480	1,400	1,335
Cost Components						
Value of Time (\$/hour)	13.43	13.22	12.85	12.43	12.17	11.98
Commercial Cost (\$/hour)	32.69	31.51	30.38	29.28	28.89	28.50
Gasoline (\$/gallon)	1.33	1.43	1.46	1.05	1.02	1.14
Diesel (\$/gallon)	1.32	1.47	1.44	1.06	1.12	1.20
System Performance	2002	2001	2000	1999	1998	1997
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	1,813	1,738	1,652	1,483	1,362	1,196
Rank	94	94	94	94	94	94
Fuel per Peak Auto Commuter (gallons)	5	5	6	4	5	5
Rank	97	96	94	97	93	92
Annual Delay						
Total Delay (1000s of person-hours)	4,426	4,241	4,032	3,619	3,324	2,919
Rank	93	91	90	93	92	93
Delay per Auto Commuter (pers-hrs)	18	17	17	16	15	14
Rank	95	95	95	95	95	95
Travel Time Index	1.10	1.10	1.10	1.09	1.09	1.08
Rank	91	87	85	86	83	87
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	68	64	60	51	46	40
Rank	93	93	91	93	92	93
Cost per Auto Commuter (\$)	378	366	357	328	312	275
Rank	94	94	94	94	94	95
Truck Congestion						
Annual Person-Hours of Delay (000)	186	178	169	152	140	123
Rank	93	92	91	92	92	93
Annual Gallons of Wasted Fuel (000)	355	339	323	290	266	233
Rank	92	92	91	91	92	93
Annual Congestion Cost (\$ million)	6	6	5	4	4	4
Rank	92	89	91	92	91	87
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to All Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to Truck Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--

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Mobility Data for Winston-Salem NC

Inventory Measures	1996	1995	1994	1993	1992	1991
Urban Area Information						
Population (1000s)	280	270	260	250	240	230
Rank	88	89	89	89	90	90
Commuters (1000s)	127	120	114	108	102	96
Daily Vehicle-Miles of Travel (1000s)						
Freeway	3,600	3,500	3,330	3,100	2,950	2,800
Arterial Streets	1,270	1,265	1,240	1,250	1,460	1,440
Cost Components						
Value of Time (\$/hour)	11.71	11.37	11.06	10.78	10.47	10.17
Commercial Cost (\$/hour)	28.12	27.75	27.38	27.02	26.66	26.30
Gasoline (\$/gallon)	1.21	1.13	1.02	1.07	1.08	1.12
Diesel (\$/gallon)	1.28	1.19	1.08	1.13	1.15	1.21
System Performance	1996	1995	1994	1993	1992	1991
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	1,031	883	778	659	613	581
Rank	94	94	95	95	95	95
Fuel per Peak Auto Commuter (gallons)	4	3	2	2	2	2
Rank	92	94	96	96	95	94
Annual Delay						
Total Delay (1000s of person-hours)	2,516	2,154	1,898	1,609	1,496	1,419
Rank	94	94	94	94	95	94
Delay per Auto Commuter (pers-hrs)	12	11	10	9	9	9
Rank	96	96	96	97	97	96
Travel Time Index	1.07	1.06	1.06	1.05	1.05	1.05
Rank	90	93	91	93	92	92
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	34	28	24	20	18	17
Rank	94	94	94	94	95	94
Cost per Auto Commuter (\$)	248	220	195	174	159	165
Rank	95	96	97	97	97	97
Truck Congestion						
Annual Person-Hours of Delay (000)	106	90	80	68	63	60
Rank	93	93	93	93	94	93
Annual Gallons of Wasted Fuel (000)	201	173	152	129	120	114
Rank	94	94	94	94	94	94
Annual Congestion Cost (\$ million)	3	3	2	2	2	2
Rank	92	89	93	93	90	88
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to All Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to Truck Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--

* Note: Zeroes in the table reflect values less than 0.5.

Mobility Data for Winston-Salem NC

Inventory Measures	1990	1989	1988	1987	1986	1985
Urban Area Information						
Population (1000s)	220	210	200	190	185	180
Rank	90	90	92	93	93	94
Commuters (1000s)	91	86	81	77	74	71
Daily Vehicle-Miles of Travel (1000s)						
Freeway	2,700	2,585	2,505	2,400	2,335	2,290
Arterial Streets	1,410	1,400	1,380	1,360	1,345	1,320
Cost Components						
Value of Time (\$/hour)	9.75	9.25	8.83	8.48	8.18	8.03
Commercial Cost (\$/hour)	25.95	25.60	25.26	24.93	24.60	24.27
Gasoline (\$/gallon)	1.08	1.08	1.00	1.00	0.98	1.28
Diesel (\$/gallon)	1.07	0.98	0.91	0.91	0.89	1.16
System Performance	1990	1989	1988	1987	1986	1985
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	542	501	464	438	416	392
Rank	94	94	93	93	92	92
Fuel per Peak Auto Commuter (gallons)	2	1	1	1	1	1
Rank	93	97	94	93	91	90
Annual Delay						
Total Delay (1000s of person-hours)	1,321	1,222	1,133	1,070	1,016	956
Rank	93	94	94	93	91	91
Delay per Auto Commuter (pers-hrs)	9	9	8	8	8	8
Rank	94	92	92	92	90	90
Travel Time Index	1.05	1.05	1.05	1.05	1.05	1.05
Rank	89	86	83	79	74	64
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	15	13	12	11	10	9
Rank	93	94	93	93	91	91
Cost per Auto Commuter (\$)	154	157	149	148	151	135
Rank	97	96	96	95	95	95
Truck Congestion						
Annual Person-Hours of Delay (000)	55	51	48	45	43	40
Rank	92	93	93	92	90	90
Annual Gallons of Wasted Fuel (000)	106	98	91	86	81	76
Rank	94	93	93	93	91	91
Annual Congestion Cost (\$ million)	1	1	1	1	1	1
Rank	92	90	89	86	86	86
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to All Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Due to Truck Travel (tons)	--	--	--	--	--	--
Rank	--	--	--	--	--	--

* Note: Zeroes in the table reflect values less than 0.5.

Mobility Data for Winston-Salem NC

Inventory Measures	1984	1983	1982
Urban Area Information			
Population (1000s)	175	170	170
Rank	94	94	92
Commuters (1000s)	69	67	66
Daily Vehicle-Miles of Travel (1000s)			
Freeway	2,125	2,000	1,970
Arterial Streets	1,300	1,280	1,250
Cost Components			
Value of Time (\$/hour)	7.75	7.43	7.20
Commercial Cost (\$/hour)	23.94	23.63	23.31
Gasoline (\$/gallon)	1.29	1.32	1.38
Diesel (\$/gallon)	1.17	1.20	1.26
System Performance	1984	1983	1982
Congested Travel (% of peak VMT)	--	--	--
Congested System (% of lane-miles)	--	--	--
Congested Time (number of "Rush Hours")	--	--	--
Annual Excess Fuel Consumed			
Total Fuel (1000 gallons)	352	322	280
Rank	92	92	91
Fuel per Peak Auto Commuter (gallons)	1	1	1
Rank	87	86	82
Annual Delay			
Total Delay (1000s of person-hours)	860	787	684
Rank	92	91	91
Delay per Auto Commuter (pers-hrs)	7	7	6
Rank	90	85	90
Travel Time Index	1.04	1.04	1.03
Rank	75	68	76
Commuter Stress Index	--	--	--
Rank	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--
Rank	--	--	--
Congestion Cost			
Total Cost (\$ millions)	8	7	6
Rank	91	91	90
Cost per Auto Commuter (\$)	126	123	113
Rank	93	92	91
Truck Congestion			
Annual Person-Hours of Delay (000)	36	33	29
Rank	91	90	90
Annual Gallons of Wasted Fuel (000)	68	63	55
Rank	91	91	88
Annual Congestion Cost (\$ million)	1	1	1
Rank	82	79	78
Annual Greenhouse Gases (CO2) Produced			
Excess Due to Congestion (tons)	--	--	--
Rank	--	--	--
Due to All Travel (tons)	--	--	--
Rank	--	--	--
Truck Annual Greenhouse Gases (CO2) Produced			
Excess Due to Truck Congestion (tons)	--	--	--
Rank	--	--	--
Due to Truck Travel (tons)	--	--	--
Rank	--	--	--

* Note: Zeroes in the table reflect values less than 0.5.