

These tables were contributed by Jean-Michel Guldmann for inclusion at <http://www.csiss.org/best-practices> to supplement his chapter "Spatial Interaction Models of International Telecommunication Flows" in M.F. Goodchild and D.G. Janelle (editors), *Spatially Integrated Social Science* (Oxford University Press 2004).

Guldmann Supplemental Table 1: Originating and Terminating Links and Flows

<u>Country</u>	Number of Originating Links	Total Originating Flow (minutes)	Number of Terminating Links	Total Terminating Flow (minutes)
AFRICA/CENTRAL AFRICA				
Burundi	69	2427126	14	915286
Central African Republic	70	2312291	16	815589
Chad	75	1623937	14	493621
Rwanda	0	0	12	1004842
Zaire	0	0	15	6168610
AFRICA/EASTERN AFRICA				
Djibouti	40	4022876	22	1564015
Ethiopia	0	0	19	20034937
Kenya	74	22481282	16	25266706
Seychelles	15	1314672	16	754256
Somalia	0	0	10	363460
Tanzania	0	0	10	5431113
Uganda	68	4212132	10	3883633
AFRICA/NORTHERN AFRICA				
Algeria	49	80262165	30	89308439
Egypt	174	98614734	35	327563941
Libya	0	0	28	16554854
Mauritania	0	0	24	1710644
Morocco	29	119518011	31	212834531
Sudan	36	8899272	20	21471201
Tunisia	24	32023652	31	101679214
AFRICA/SOUTHERN AFRICA				
Angola	0	0	18	7827793
Botswana	74	29399438	14	16861820
Comoros	0	0	14	96953
Lesotho	0	0	10	9632656
Madagascar	0	0	16	675267
Malawi	11	103160	11	4574669
Mauritius	29	17980000	13	1310302
Mayotte	0	0	1	1
Mozambique	0	0	14	18379430
Namibia	1	45799510	13	37868907
Reunion	0	0	11	2518578
South Africa	20	249370000	27	230054193
Swaziland	0	0	13	14030458
Zambia	23	3357849	14	7686007
Zimbabwe	68	21543735	6	3390362
AFRICA/WESTERN AFRICA				
Benin	69	5906247	15	2846035
Burkina Faso	0	0	15	1840863
Cameroon	36	6866967	16	9887226
Cape Verde	0	0	14	6177380
Congo	0	0	16	1103789
Cote D'Ivoire	0	0	18	16351817
Equatorial Guinea	0	0	8	224887
Gabon	0	0	18	3261483
Gambia	0	0	14	8415128
Ghana	0	0	15	25033237
Guinea	35	3491188	13	2698657
Guinea-Bissau	0	0	15	2610931
Liberia	0	0	15	4466398
Mali	68	6917628	15	3296902
Niger	0	0	16	1161688
Nigeria	0	0	16	57804277
Sao Tome & Principe	62	505915	14	18782064
Senegal	0	0	21	23682835
Sierra Leone	0	0	13	5709703
Togo	70	8289483	15	5556235

Gulmann Supplemental Table 1: Originating and Terminating Links and Flows (continued)

Country	Number of Originating Links	Total Originating Flow (minutes)	Number of Terminating Links	Total Terminating Flow (minutes)
AMERICA/CARIBBEAN				
Antigua and Barbuda	0	0	12	10974146
Aruba	0	0	11	12202404
Bahamas	0	0	11	57623979
Barbados	0	0	12	32284362
Cuba	0	0	15	111693188
Dominica	0	0	11	7022809
Dominican Republic	0	0	16	437507437
Grenada	0	0	12	12525470
Guadeloupe	0	0	13	6306739
Haiti	45	10667924	11	73431687
Jamaica	0	0	14	216959805
Martinique	0	0	12	362189
Netherlands Antilles	0	0	14	80105127
Puerto Rico	0	0	12	4014764
Saint Kitts and Nevis	0	0	11	7194679
Saint Lucia	0	0	12	9922757
St. Vincent & Grenadines	0	0	12	10248807
Trinidad and Tobago	47	54273904	12	87528612
Virgin Islands (U.S.)	0	0	12	13912441
AMERICA/CENTRAL SOUTH AMERICA				
Bolivia	0	0	14	38760456
Paraguay	0	0	13	27286367
AMERICA/EASTERN SOUTH AMERICA				
Brazil	62	288375868	20	385333867
AMERICA/MIDDLE AMERICA				
Belize	45	5349857	10	14417308
Costa Rica	0	0	15	70264480
El Salvador	0	0	13	140806713
Guatemala	0	0	13	123377420
Honduras	38	33225616	11	80229802
Mexico	20	927700000	18	1975663397
Nicaragua	0	0	12	43974520
Panama	0	0	13	76117412
AMERICA/NORTH AMERICA				
Bermuda	0	0	12	32404187
United States	194	15602904646	98	6209362630
AMERICA/NORTHERN NORTH AMERICA				
Canada	20	2638100000	82	3597770659
Greenland	0	0	7	5239140
AMERICA/NORTHERN SOUTH AMERICA				
Columbia	15	115900000	16	311066447
Guiana	0	0	11	1314864
Guyana	0	0	13	74365390
Suriname	48	5291560	11	18450232
Venezuela	52	124308289	18	164610292
AMERICA/SOUTHERN SOUTH AMERICA				
Argentina	51	153669520	20	277892541
Chile	21	113755665	16	167740385
Uruguay	52	49439414	13	63560931
AMERICA/WESTERN SOUTH AMERICA				
Equador	63	36620404	15	149549213
Peru	0	0	17	150059218
ASIA/CENTRAL ASIA				
Kazakhstan	0	0	7	23157504
Kyrgyzstan	0	0	6	2643732
Tajikistan	37	20211417	4	551045
Turkmenistan	0	0	6	2024185
Uzbekistan	0	0	7	7845013

Gulmann Supplemental Table 1: Originating and Terminating Links and Flows (continued)

Country	Number of Originating Links	Total Originating Flow (minutes)	Number of Terminating Links	Total Terminating Flow (minutes)
ASIA/EASTERN ASIA				
China	48	1237363573	29	1508181313
DPR Korea	0	0	11	2456932
Hong Kong	20	1614892100	54	1517362286
Japan	0	0	82	1222187904
Korea (Rep. Of)	15	475000000	42	444532008
Macau	47	107322657	14	82785203
Taiwan, China	50	570393671	26	581603157
ASIA/MIDDLE EAST				
Bahrain	38	86115000	17	50988016
Cyprus	37	108340673	25	40591906
Iran (Islamic Rep. Of)	55	168784483	19	94699401
Iraq	0	0	10	16228383
Israel	22	217200000	20	288294843
Jordan	18	42798659	20	106644815
Kuwait	33	117906598	18	111858643
Lebanon	0	0	30	83006436
Oman	0	0	16	39581848
Qatar	43	73734418	16	36337523
Saudi Arabia	43	484979904	38	308215520
Syria	24	61343008	18	87016767
United Arab Emirates	46	483323038	21	170606712
Yemen	41	21345565	14	43216976
ASIA/NORTHERN ASIA				
Mongolia	32	1640164	8	1635776
Russia	20	176100000	32	386300379
ASIA/SOUTHEASTERN ASIA				
Brunei Darussalam	35	16231393	13	11646955
Cambodia	0	0	12	5413878
Indonesia	20	192100000	22	220725759
Lao P.D.R.	0	0	11	1336875
Malaysia	20	343700000	20	359899748
Myanmar	0	0	11	7328894
Papua New Guinea	0	0	12	1687690
Philippines	12	161000000	30	508086996
Singapore	16	693000000	25	495009791
Thailand	34	202784701	23	223079827
Viet Nam	0	0	17	113753265
ASIA/SOUTHERN ASIA				
Afghanistan	0	0	2	796
Bangladesh	0	0	18	54818806
Bhutan	0	0	11	75485
India	20	282600000	48	678898720
Maldives	42	2430701	11	197280
Nepal	0	0	14	4287336
Pakistan	0	0	24	306842991
Sri Lanka	0	0	20	30770381
ASIA/SOUTHWESTERN ASIA				
Armenia	0	0	6	9428599
Azerbaijan	0	0	6	6566190
Georgia	0	0	6	2574759
Turkey	46	353720567	35	607572001
EUROPE/CENTRAL EUROPE				
Austria	0	0	41	810220498
Czech Republic	20	163900000	7	104400000
Germany	97	5114019310	97	3996375842
Hungary	36	223249640	27	156404016
Liechtenstein	0	0	1	408465
Poland	19	345230000	32	568561216
Slovak Republic	0	0	2	6700000
Switzerland	21	1575300000	73	1265660447

Gulmann Supplemental Table 1: Originating and Terminating Links and Flows (continued)

Country	Number of Originating Links	Total Originating Flow (minutes)	Number of Terminating Links	Total Terminating Flow (minutes)
<i>EUROPE/EASTERN EUROPE</i>				
Belarus	31	12368850	9	30191575
Estonia	46	52155185	8	27966492
Latvia	36	41726667	7	16998322
Lithuania	47	45987904	7	16484199
Moldova	46	66648573	7	11357447
Ukraine	0	0	17	120011558
<i>EUROPE/NORTHERN EUROPE</i>				
Denmark	20	478300000	56	496043976
Faroe Islands	0	0	2	9000234
Finland	20	290600000	27	253254973
Iceland	0	0	22	16274236
Norway	20	373000000	31	352331527
Sweden	20	780400000	63	716572633
<i>EUROPE/SOUTHEASTERN EUROPE</i>				
Albania	39	22503823	19	1538279
Bosnia and Herzogovina	0	0	2	50300000
Bulgaria	0	0	24	59233778
Croatia	42	202943290	18	219498517
Romania	33	77418800	21	156231710
Slovenia	38	98481756	14	66865951
T.F.Y.R. Macedonia	0	0	4	27500000
Yugoslavia	36	205417766	24	208114271
<i>EUROPE/SOUTHERN EUROPE</i>				
Greece	46	437714936	54	460686203
Italy	47	1770724969	80	1931190552
Malta	29	24329484	19	10816705
<i>EUROPE/SOUTHWESTERN EUROPE</i>				
Andorra	0	0	2	447264
Gibraltar	0	0	4	770201
Portugal	57	289477352	53	495008306
Spain	44	993011276	68	1044596707
<i>EUROPE/WESTERN EUROPE</i>				
Belgium	20	1025100000	62	1101559351
France	21	2263700000	93	2795744010
Ireland	13	388000000	28	537873150
Luxembourg	20	223100000	25	126523020
Netherlands	25	1320559000	74	1363589230
United Kingdom	20	3211500000	95	3877539225
<i>OCEANIA</i>				
American Samoa	0	0	10	6117951
Australia	10	673000000	65	758794603
Fiji	43	14532249	12	10005383
French Polynesia	0	0	10	10255514
Guam	0	0	12	28792576
Kiribati	0	0	9	238055
Marshall Islands	0	0	1	1289573
Micronesia (Fed. States)	38	1358146	5	2176976
New Caledonia	41	8194303	10	1020156
New Zealand	20	236000000	19	205765402
Solomon Islands	0	0	11	361121
Tonga	0	0	11	3866683
Vanuatu	0	0	11	584963
Western Samoa	0	0	9	6793020

Guldmann Supplemental Table 2: Trade, Cultural, and Political Group Memberships

ACCT:	Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Rep., Chad, Comoros, Congo, Cote d'Ivoire, Djibouti, Dominica, Egypt, Equatorial Guinea, France, French Polynesia, Gabon, Guadeloupe, Guiana, Guinea, Guinea-Bissau, Haiti, Lao P.D.R., Lebanon, Luxembourg, Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova, Morocco, New Caledonia, Niger, Reunion, Romania, Rwanda, Saint Lucia, Sao Tome and Principe, Senegal, Seychelles, Switzerland, Togo, Tunisia, Vanuatu, Vietnam
ADEC:	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Korea (Rep. of), Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Taiwan, United Kingdom, United States
<u>ANDEAN:</u>	<u>Bolivia, Colombia, Ecuador, Panama, Peru, Venezuela</u>
APEC:	Australia, Brunei, Canada, Chili, China, Hong Kong, Indonesia, Japan, Korea (Rep. of), Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Taiwan, Thailand, United States, Vietnam
ASEAN:	Brunei, Indonesia, Lao P.D.R., Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
CACM:	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama
CAEU:	Egypt, Iraq, Jordan, Kuwait, Libya, Mauritania, Somalia, Sudan, Syria, United Arab Emirates, Yemen
CBSS:	Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, Norway, Poland, Russia, Sweden
CHWTH:	Antigua and Barbuda, Australia, Bahamas, Bangladesh, Barbados, Belize, Botswana, Brunei, Cameroon, Canada, Cyprus, Dominica, Fiji, Gambia, Ghana, Grenada, Guyana, India, Jamaica, Kenya, Kiribati, Lesotho, Malawi, Malaysia, Maldives, Malta, Mauritius, Mozambique, Namibia, New Zealand, Nigeria, Pakistan, Papua New Guinea, Saint Kitts and Nevis, Saint Lucia, Seychelles, Sierra Leone, Solomon

Islands, South Africa, Sri Lanka, St. Vincent and the Grenadines, Swaziland,
Tanzania, Tonga, Trinidad and Tobago, Uganda, United Kingdom, Vanuatu,
Western Samoa, Zambia, Zimbabwe

ECWAS: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo

EFTA: Iceland, Liechtenstein, Norway, Switzerland

EU: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom

FSU: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

FZ: Benin, Burkina Faso, Cameroon, Central African Rep., Chad, Comoros, Congo, Cote d'Ivoire, Equatorial Guinea, France, French Polynesia, Gabon, Guadeloupe, Guinea-Bissau, Mali, Martinique, Mayotte, New Caledonia, Niger, Reunion, Senegal, Togo

LAIA: Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela

MERCOSUR: Argentina, Brazil, Chile, Paraguay, Uruguay

NAFTA: Canada, Mexico, United States

OPEC: Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, Venezuela

Note: The number of originating and terminating links and flows for each country are provided on the books web page, at <http://www.csiss.org/best-practices>.