

National Center of Clinical Testing in Optometry (NCCTO)

An Analysis of Best-Location Issues

Introduction

Several Excel spreadsheets, charts, and maps were developed that show multiple factors relevant to selecting an appropriate city in which to locate the NBEO One-Site Clinical Skills Examination Testing Facility. Following are descriptions of these items, brief discussion of the information contained within them, a summary of the conclusions that can be drawn from analysis of that information, and the spreadsheets, charts, and maps themselves. The basic facts include the existence of 22 schools or colleges of optometry, as shown in **Figure 1**, including 3 of international location. Six of these institutions are situated within the western half of the US; 16 are east of the US midline. In 2010, the 4th-year student population in those 6 western schools/colleges consisted of 422 candidates while 1286 students attended optometry learning institutions in the eastern half of the country. The school-specific student enrollments are shown in **Figure 2**.

Facility Location Considerations

Figure 3 shows the top 50 MSAs (Metropolitan Statistical Areas) in the United States, based on data from the 2009 Census. Populations within these 50 most-inhabited metropolitan areas range from 1,123,804 to 19,069,796. This initial listing of the 50 largest MSAs was evaluated for two main criteria.

First, all cities that are home to, or in close proximity to, an optometry school or college (shown in RED) were identified and eliminated as a potential host for the One-Site CSE Testing Facility. Longstanding NBEO Board of Director policy prohibits the establishment of an NBEO facility within or close to the same city as an existing optometry college. Five of the schools/colleges are not mentioned in **Figure 3**. Both the Michigan College of Optometry (Big Rapids, MI) and the Northeastern State University College of Optometry (Tahlequah, OK) exist in somewhat remote settings and therefore are not proximal to MSAs. The Inter-American University of Puerto Rico School of Optometry and the Schools of Optometry at the Universities of Waterloo and Montreal (both of the latter are only POTENTIAL NBEO participants at this point) are located beyond US borders.

Second, all cities that are positioned relatively close to a large air traffic hub (**Figure 4**) were identified (shown in BLUE). The existence of excellent air connections between all 22 optometry schools/colleges and the One-Site CSE facility is of paramount importance in determining the location of this facility.

Figure 3's **YELLOW highlights** reveal the 14 remaining MSAs that are NOT proximal to an optometry school or college, but ARE within a relatively short distance from an air traffic hub, and therefore, good air travel connections. These areas represent the MOST APPROPRIATE locales in which to situate the NBEQ One-Site CSE Testing Facility and are summarized in **Figure 5**. These 14 cities that meet the three basic requirements (large city, large airport hub, and lack of proximity to an optometry school or college) made the first objective, issue-related cut and are ranked by population size, from highest MSA population to smallest, in **Figure 5**. Indianapolis was excluded from the potential list of CSE cities because the Indiana University School of Optometry's eye care center (IECC) is located in the Indianapolis MSA.

These 14 cities are then compared in two different proximity studies. **Figure 6** demonstrates how driving mileage was determined for the trip between, for example, the prospective CSE city of Charlotte and the school at UCB. **Figure 7** shows the number of miles between a candidate city (in this example, Charlotte) and each of the schools. It also displays the *Student Miles*, which were calculated by multiplying the number of 4th-year students at each school by that school's number of miles to each city. Total mileage (from the city to all schools) and total student miles to schools (from the city to all schools x all students) are tallied at the bottom of each city's chart. This critically relevant *Student Miles* value reflects both distances between schools and potential CSE sites and 4th-year optometry student distribution. **Figure 8** summarizes the *Total Miles to Schools* from all of the schools/colleges of optometry to each of the 14 cities on the list of potential CSE sites. **Figure 9** shows the *Student Miles to Schools* from all of the schools/colleges of optometry to each of the 14 cities for all students.

In both proximity study charts (**Figures 8 - 9**), the cities that are the closest to all of the schools and colleges, collectively, with and without consideration of the 4th-year student population, are at the top of the list, while the cities most distant from all the schools and colleges, with and without consideration of the 4th-year students, are at the bottom. Since relative proximity to the collective candidate population is a primary factor in choosing the placement of the One-Site CSE Testing Facility, all but the top five remaining MSAs were deleted from consideration based upon the proximity study shown in the ultimately significant **Figure 9**. Surviving the second objective, issue-based cut are the Metropolitan Statistical Areas of Atlanta, Charlotte, Dallas, Detroit, and Washington D.C./Baltimore.

Candidate Travel Costs Considerations

Several spreadsheets were produced that display the costs of the necessary travel to and from the proposed One-Site CSE Testing Facility to be located in one of the five remaining MSAs. **Figure 10** shows all of the schools/colleges and the nearest large airports that candidates likely will use. Though Oakland International Airport may be slightly closer to UCB, it was presumed that the majority of UCB candidates will utilize the San Francisco International Airport because there are more flights out of San Francisco. In

addition, airfares to and from the Indianapolis International Airport were included for the IU candidates since the local Bloomington Airport offers very limited service.

Figure 11 exhibits the least expensive roundtrip airfare for afternoon flights from each of the schools to and from the 5 cities being considered to host CSE testing. Either non-stop or one-stop flights were deemed acceptable. This airfare study was performed and completed on Monday, May 10, 2010. It was important that the entire search be executed on the same day so the fares could be accurately compared. The search included a 2-day booking and a 4-week booking. The lowest costs were sought in each category for afternoon flights to and from the 14 potential CSE cities on May 12-13, 2010 (2-day booking), and afternoon flights to and from these same cities on June 9-10 (4-week scheduling). Lower prices are available to those candidates who are willing to fly at less desirable times of the day.

Figure 12 displays the availability of non-stop flights to candidates, through their apparent primary airport, to each of the 5 cities being studied, on the date of study. Airfare for non-stop flights typically is higher than one-stop flights. The lowest non-stop or one-stop fares for the afternoon flights are shown in **Figure 11**.

Consumer satisfaction with large airports is shown in **Figure 13**. Travelers to and from Detroit, Charlotte, and Dallas appear to be very satisfied; Atlanta, Reagan, and Dulles Airports are not mentioned on the list of accommodating airports.

Figure 14 displays a comparison of taxi fares for the 5 MSAs being considered as One-Site locations. This spreadsheet shows the cost of fares from the airport to the most likely facility setting within each potential city. Central business district (CBD) sites were assumed in Charlotte, Dallas, and Detroit; the most likely testing site in Atlanta would be in the Midtown area; in Washington D.C., the most probable facility placement would be in the vicinity of the National Institutes of Health.

Hotel cost comparisons are summarized in **Figure 15**. The standard booking parameters used in our analysis included a reservation made 30 days in advance for a one-night stay in the middle of the week. The study was conducted on May 5, 2010 for an overnight stay on June 8, 2010. The hotel chains chosen for use in the study represent a better lodging quality; overnight stays can be arranged in all 5 cities at far less expense.

Along another tangent, directly related to candidate CSE costs, **Figure 16** displays the relative cost of office space in the 5 cities of interest. Criteria considered include the total office space available as compared to the overall office space vacancy rate as compared to the most desirable vacancy rate within the area most likely to host the One-Site CSE Testing Facility. The suggested rental rate/square foot is shown for the most desirable locations within each city. Office space rental rates are significant to candidates only in that they affect the overall cost of doing business; an exorbitant rent potentially would translate to a higher-than-otherwise increase in the CSE registration fee. Washington D.C.'s steep rental rates would appear to restrict its selection as a sensible CSE setting.

Quality-of-Living/Visiting Issues for Candidates and Staff

Quality-of-living issues are of paramount importance to the staff of any organization; quality-of-visiting aspects of a city certainly will be of interest to NBEO candidates who travel to a different city to take their CSE. Would candidates prefer to visit an MSA in which there is a lot of crime, or a city in which they feel relatively safe? Would they rather have a short ride to the facility from the airport, or a long one? Will candidates want to sit for an hour or two in severely snarled traffic as they commute to and from the CSE site and the airport, or would a less time-consuming cab ride be a better option? If they drive in for their exams, will they want to maneuver their way through many miles of congestion and complex routes, or would they favor a more direct route?

Figure 17 exhibits the number of violent crimes per 100,000 people for the 5 remaining MSA cities on the list of potential One-Site CSE Testing Facilities. This analysis parameter throws sizeable shadows on the appropriateness of the cities of Atlanta and Detroit.

Traffic congestion is summarized in **Figure 18** as it shows the extra travel time for peak-period travel during the year divided by the number of travelers who begin a trip during the prime periods of 6:00 to 9:00 a.m. and 4:00 to 7:00 p.m. It is apparent that Washington D.C. and Atlanta travelers spend considerable time sitting in traffic.

Another heavy contributor to traffic congestion is rapid MSA growth without a commensurate increase in the number of roads that service the influx of more cars on the roads. Rates by which urban driving demand is growing faster than roadway growth are shown in **Figure 19**.

Figure 20 discusses the “hardest cities to navigate” and the “toughest cities to escape for holiday weekends” and provides a list of the worst offenders. Of the 5 cities still on the list of possibilities, only Charlotte escapes these unattractive labels.

The data from **Figures 17 - 20** apply to NBEO staff members as well as to CSE candidates, actually to a much greater degree, since staff members either enjoy the positive characteristics of a city or cope with its negative traits, day in and day out. Although this is not an issue that concerns ASCO in regard to choosing a city in which to place the CSE Testing Facility, the topic is germane to the overall quality of NBEO examinations of all types, as produced by the NBEO’s very stable, efficient, competent staff.

Related primarily to staff considerations rather than candidate issues, **Figure 21** offers a cost-of-living study in which relative price levels for consumer goods and services were measured in the 5 cities, as of May, 2010. Washington D.C. was the only city clearly out of line with the other cities that are in contention to host the CSE facility. This parameter does intersect with candidates’ interests; the more the NBEO has to pay to attract and retain quality staff, the sooner and higher CSE fees (and other NBEO fees) will have to rise.

Conclusion

An analysis was undertaken to determine in which city the new NBEO One-Site Clinical Skills Examination Testing Facility should be located. Factors considered most significant included proximity to the greatest number of optometry students, distance from the nearest airline hub, lack of proximity to any optometry schools/colleges, costs of air travel and hotels, and general ease of travel. From a list of 50 of the largest Metropolitan Statistical Areas, 14 cities were chosen for further evaluation, based objectively on their close proximity to a major airlines hub and their lack of close proximity to a school or college of optometry.

Following the identification of the 14 cities most appropriate to host the CSE site, the issue of convenience to the maximum number of students was investigated. **Figure 9** revealed which cities BEST met this qualification. From this critically-relevant, objective data, the list of 5 semi-finalist cities emerged and consisted of Atlanta, Charlotte, Dallas, Detroit, and Washington D.C./Baltimore.

Further assessments were carried out involving travel costs and quality-of-living/visiting parameters. From these objective data, it became clear that Washington D.C. would be an illogical city in which to seat the One-Site facility; not only did the NBEO recently forsake this city for Charlotte, many of the data show that the Washington D.C. area is, indeed, a very expensive place to visit, live, and do business. It is also a very crowded city to visit or in which to live, based on the analyses of traffic considerations. This MSA of Washington D.C./Baltimore, Maryland justifiably can be cut from the semi-finalist list due to cost factors and congested highways that would render a difficult, unpleasant trip for CSE candidates who might choose to drive to the CSE site.

Detroit also objectively can be eliminated from the list of potential CSE host cities. Detroit is the city closest to the AVERAGE optometry student in the United State, Puerto Rico, and Canada; but the glow from this positive feature is dimmed by the facts that the cost of living in Detroit is relatively high, and it dramatically heads the list in violent crime. In addition, Detroit's weather could severely compromise CSE scheduling in the winter months; airport and intra-city road closures are not uncommon and would affect both candidates and staff members.

From the data presented, there is no clear indication of which of the remaining 3 contending cities is the BEST choice to host the One-Site Clinical Skills Exam Testing Facility. Atlanta, Charlotte, and Dallas all show some unquestionably strong positive features but the study also reveals objective shortfalls for each city. Atlanta is slightly closer to the average optometry student than Charlotte; Dallas is quite a bit further from the average student. Dallas takes first place in low hotel costs; Charlotte enjoys the lowest violent crime rate among the potential One-Site cities. Atlanta's 4-week airfare is \$9 cheaper than Charlotte's; Charlotte's taxi fare is \$7 less than Atlanta's. Charlotte's roads are far easier to navigate than roads in Atlanta or Dallas, and Charlotte more successfully has kept pace with new road production as its population has increased, unlike Atlanta or Dallas. Dallas offers the most expensive 2-day airfare booking, but can boast the cheapest 4-week reservation.

No compelling reason exists to locate the One-Site Clinical Skills Examination Testing Facility in a Metropolitan Statistical Area other than Charlotte, North Carolina. Charlotte is located nearly as centrally as is possible to the greatest number of optometry students. It offers excellent airport connections (see **Figure 22**) and lodging, both at competitive prices. The uptown area, which currently is home to the NBEO, is modern, pretty, and relatively safe. It affords residents and visitors a host of restaurants, a vibrant night life, attractive places to walk, and a variety of tourist attractions. The latter may well encourage candidates to bring their significant others and transform the CSE experience into a mini-vacation. Alternatively, candidates may choose to fly into Charlotte for an afternoon exam, take their exam, and fly out the same evening, thus avoiding the cost of an overnight hotel. This is possible due to the short distance between the uptown area and the Charlotte Douglas International Airport, the relatively minimal traffic congestion, and the 632 daily flights in and out of Charlotte (see **Figure 23**).

Since the NBEO currently is headquartered in Charlotte, the Board of Directors is unable to justify the costs of locating the new testing facility in another city. Aside from administrative, purely budgetary issues, the NBEO staff has weathered the relocation of the office to Charlotte from Bethesda, Maryland; it survived the Examination Restructure; and it coped with the massive changeover in IT systems from the aging ATMIS to the state-of-the-art OEDIS. It would be counterproductive, difficult, expensive, and illogical to risk losing any of the current staff's talents and experience due to an unfounded, unnecessary relocation of any facet of the NBEO facility. To establish a CSE facility in another city would require staff redundancy, which would result in higher costs to administer the CSE exam, and thus would force a steeper rise in candidate registration fees, perhaps sooner than would otherwise be necessary.

Due to a lack of conclusive evidence to support any divergent conclusion, it is the studied opinion of the Board of Directors of the National Board of Examiners in Optometry that the NBEO One-Site Clinical Skills Exam Testing Facility be established in Charlotte, North Carolina. ASCO's support would be greatly appreciated as we endeavor to establish a more comprehensive, truly standardized Clinical Skills Examination that will separate the competent candidates from the incompetent as we all strive toward the same noteworthy goal, which is to protect the public.

Figure 1

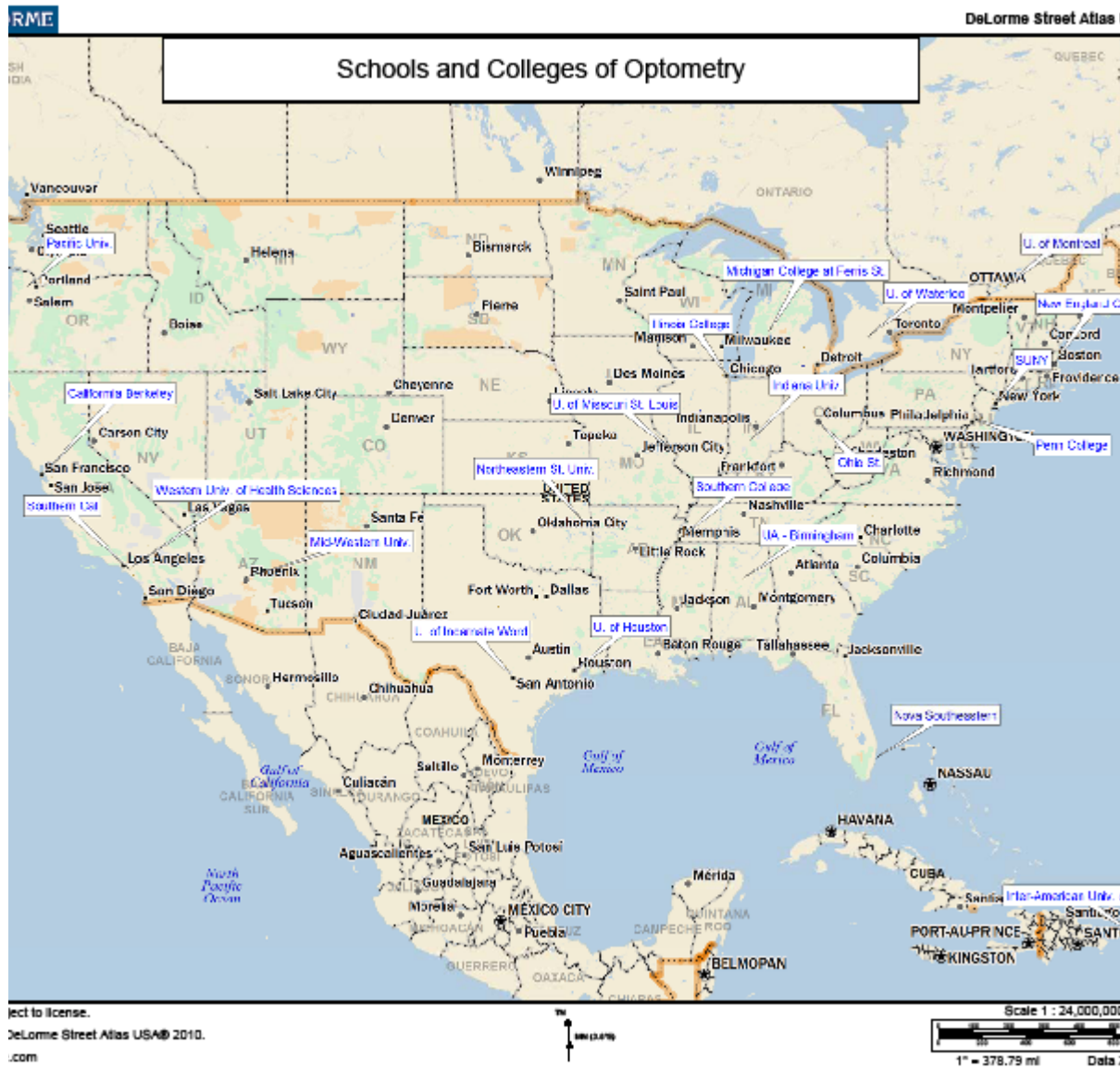


Figure 2

Estimated Optometry Student Enrollment for 2010

School/College	Location	Number of Students	Eastern	Western
University of California/Berkeley School of Optometry	Berkeley, CA	60		60
Michigan College of Optometry at Ferris State University	Big Rapids, MI	38	38	
University of Alabama at Birmingham School of Optometry	Birmingham, AL	43	43	
Indiana University School of Optometry	Bloomington, IN	70	70	
New England College of Optometry	Boston, MA	118	118	
Illinois College of Optometry	Chicago, IL	150	150	
The Ohio State University College of Optometry	Columbus, OH	61	61	
Pacific University College of Optometry	Portland, OR	87		87
Southern California College of Optometry	Fullerton, CA	95		95
University of Houston College of Optometry	Houston, TX	105	105	
Southern College of Optometry	Memphis, TN	119	119	
State University of New York State College of Optometry	New York, NY	72	72	
Nova Southeastern University College of Optometry	Ft. Lauderdale, FL	106	106	
Pennsylvania College of Optometry	Philadelphia, PA	154	154	
Inter American University of Puerto Rico School of Optometry	San Juan, PR *	47	47	
University of Missouri St. Louis College of Optometry	St. Louis, MO	43	43	
Northeastern State University College of Optometry	Tahlequah, OK	26	26	
University of Waterloo School of Optometry	Toronto, ON	92	92	
University of Montreal School of Optometry	Montreal, QC	42	42	
Western University of Health Sciences College of Optometry	Pomona, CA	60		60
Mid-Western University College of Optometry	Phoenix, AZ	60		60
University of the Incarnate Word School of Optometry	San Antonio, TX	60		60
Total		1708	1286	422

**Figure 3: All Metropolitan and Micropolitan Areas
(2009 Census Bureau Estimates)**

Source: US Census Bureau

Metropolitan or micropolitan area	Population (2009)	Rank (2009)	MSAs with large air traffic hub	MSA's With Optometry School
New York-Northern New Jersey-Long Island, NY-NJ-PA	19,069,796	1	Airport	SUNY State College of Optometry
Los Angeles-Long Beach-Santa Ana, CA	12,874,797	2	Airport	Sou. Cal. College of Optometry in Fullerton Western Univ. of Health Sciences College of Optometry in Pomona
Chicago-Naperville-Joliet, IL-IN-WI	9,580,567	3	Airport	Illinois College of Optometry
Dallas-Fort Worth-Arlington, TX	6,447,615	4	Airport	
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5,968,252	5	Airport	Pennsylvania College of Optometry
Houston-Sugar Land-Baytown, TX	5,867,489	6	Airport	U. of Houston College of Optometry
Miami-Fort Lauderdale-Pompano Beach, FL	5,547,051	7	Airport	Nova Southeastern Univ. College of Optometry
Washington-Arlington-Alexandria, DC-VA-MD-WV	5,476,241	8	Airport	
Atlanta-Sandy Springs-Marietta, GA	5,475,213	9	Airport	
Boston-Cambridge-Quincy, MA-NH	4,588,680	10	Airport	New England College of Optometry
Detroit-Warren-Livonia, MI	4,403,437	11	Airport	
Phoenix-Mesa-Scottsdale, AZ	4,364,094	12	Airport	Mid-Western Univ. College of Optometry
San Francisco-Oakland-Fremont, CA	4,317,853	13	Airport	U. of Cal./ Berkeley School of Optometry
Riverside-San Bernardino-Ontario, CA	4,143,113	14		Western Univ. of Health Sciences College of Optometry in Pomona
Seattle-Tacoma-Bellevue, WA	3,407,848	15	Airport	
Minneapolis-St. Paul-Bloomington, MN-WI	3,269,814	16	Airport	
San Diego-Carlsbad-San Marcos, CA	3,053,793	17	Airport	
St. Louis, MO-IL	2,828,990	18		Univ. of Missouri St. Louis College of Optometry
Tampa-St. Petersburg-Clearwater, FL	2,747,272	19	Airport	
Baltimore-Towson, MD	2,690,886	20	Airport	
Denver-Aurora-Broomfield, CO	2,552,195	21	Airport	
Pittsburgh, PA	2,354,957	22		
Portland-Vancouver-Beaverton, OR-WA	2,241,841	23	Airport	Pacific U. College of Optometry
Cincinnati-Middletown, OH-KY-IN	2,171,896	24		
Sacramento--Arden-Arcade--Roseville, CA	2,127,355	25		
Cleveland-Elyria-Mentor, OH	2,091,286	26		
Orlando-Kissimmee, FL	2,082,421	27	Airport	
San Antonio, TX	2,072,128	28		Univ. of the Incarnate Word School of Optometry
Kansas City, MO-KS	2,067,585	29		
Las Vegas-Paradise, NV	1,902,834	30	Airport	
San Jose-Sunnyvale-Santa Clara, CA	1,839,700	31		U. of Cal./ Berkeley School of Optometry
Columbus, OH	1,801,848	32		The Ohio State Univ. College of Optometry
Charlotte-Gastonia-Concord, NC-SC	1,745,524	33	Airport	
Indianapolis-Carmel, IN	1,743,658	34		Indiana University School of Optometry -Bloomington (50 Miles from Indianapolis)
Austin-Round Rock, TX	1,705,075	35		
Virginia Beach-Norfolk-Newport News, VA-NC	1,674,498	36		
Providence-New Bedford-Fall River, RI-MA	1,600,642	37		
Nashville-Davidson--Murfreesboro--Franklin, TN	1,582,264	38		
Milwaukee-Waukesha-West Allis, WI	1,559,667	39		
Jacksonville, FL	1,328,144	40		
Memphis, TN-MS-AR	1,304,926	41		Southern College of Optometry
Louisville/Jefferson County, KY-IN	1,258,577	42		
Richmond, VA	1,238,187	43		
Oklahoma City, OK	1,227,278	44		
Hartford-West Hartford-East Hartford, CT	1,195,998	45		
New Orleans-Metairie-Kenner, LA	1,189,981	46		
Birmingham-Hoover, AL	1,131,070	47		U. of Alabama at Birmingham School of Optometry
Salt Lake City, UT	1,130,293	48	Airport	
Raleigh-Cary, NC	1,125,827	49		
Buffalo-Niagara Falls, NY	1,123,804	50		

= City with large hub and without Optometry School

Figure 5:
Top Metropolitan Statistical Areas
with Large Airlines Hub
and
Without School of Optometry

1	Dallas-Fort Worth-Arlington, TX
2	Washington-Arlington-Alexandria, DC-VA-MD-WV
3	Atlanta-Sandy Springs-Marietta, GA
4	Detroit-Warren-Livonia, MI
5	Seattle-Tacoma-Bellevue, WA
6	Minneapolis-St. Paul-Bloomington, MN-WI
7	San Diego-Carlsbad-San Marcos, CA
8	Tampa-St. Petersburg-Clearwater, FL
9	Baltimore-Towson, MD
10	Denver-Aurora-Broomfield, CO
11	Orlando-Kissimmee, FL
12	Las Vegas-Paradise, NV
13	Charlotte-Gastonia-Concord, NC-SC
14	Salt Lake City, UT

Figure 6



Figure 7

Study of Proximity of Schools and Colleges of Optometry to Potential One-Site Testing Cities

Potential City: Charlotte

School/College	Location	Miles	Students	Student Miles
University of California/Berkeley School of Optometry	Berkeley, CA	2,712	60	162,720
Michigan College of Optometry at Ferris State University	Big Rapids, MI	808	38	30,704
University of Alabama at Birmingham School of Optometry	Birmingham, AL	390	43	16,770
Indiana University School of Optometry	Bloomington, IN	576	70	40,320
New England College of Optometry	Boston, MA	861	118	101,598
Illinois College of Optometry	Chicago, IL	755	150	113,250
The Ohio State University College of Optometry	Columbus, OH	426	61	25,986
Pacific University College of Optometry	Portland, OR	2,760	87	240,120
Southern California College of Optometry	Fullerton, CA	2,404	95	228,380
University of Houston College of Optometry	Houston, TX	1,036	105	108,780
Southern College of Optometry	Memphis, TN	620	119	73,780
State University of New York State College of Optometry	New York, NY	645	72	46,440
Nova Southeastern University College of Optometry	Ft. Lauderdale, FL	711	106	75,366
Pennsylvania College of Optometry	Philadelphia, PA	540	154	83,160
Inter American University of Puerto Rico School of Optometry	San Juan, PR *	1,489	47	69,983
University of Missouri St. Louis College of Optometry	St. Louis, MO	713	43	30,659
Northeastern State University College of Optometry	Tahlequah, OK	975	26	25,350
University of Waterloo School of Optometry	Toronto, ON	756	42	31,752
University of Montreal School of Optometry	Montreal, QC	980	42	41,160
Western University of Health Sciences College of Optometry	Pomona, CA	2,385	60	143,100
Mid-Western University College of Optometry	Phoenix, AZ	2,091	60	125,460
University of the Incarnate Word School of Optometry	San Antonio, TX	1,231	60	73,860

TOTALS	25,864		1,888,698
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* = Straight Line Miles

Figure 8

Cities and Schools/Colleges Proximity Study		
Ranked by Total Miles to Schools		
Rank	City	Total Miles to Schools *
1	Detroit	24,184
2	Atlanta	24,651
3	Dallas	25,805
4	Charlotte	25,864
5	Washington, DC	26,831
6	Baltimore	26,873
7	Minneapolis	27,711
8	Denver	29,644
9	Orlando	30,554
10	Tampa	31,256
11	Salt Lake City	35,994
12	Las Vegas	37,441
13	San Diego	40,766
14	Seattle	49,088
* Total number of miles from all schools to city being studied		

Figure 9

Cities, Schools/Colleges, and Students Proximity Study			
Ranked by Student Miles to Schools *			
Rank	City	Total Miles to Schools	Student Miles to Schools
1	Detroit	24,184	1,798,473
2	Atlanta	24,651	1,814,775
3	Charlotte	25,864	1,888,698
4	Washington, DC	26,831	1,928,576
5	Baltimore	26,873	1,931,256
6	Dallas	25,805	1,967,859
7	Minneapolis	27,711	2,077,804
8	Orlando	30,554	2,238,496
9	Denver	29,644	2,270,429
10	Tampa	31,256	2,292,863
11	Salt Lake City	35,994	2,748,950
12	Las Vegas	37,441	2,888,892
13	San Diego	40,766	3,139,779
14	Seattle	49,088	3,733,460
* Students per school multiplied by miles from that school to city being studied			

Figure 10

Optometry Schools/Colleges and their Nearest Large Airports				
School/College	Location	Nearest Large Airport	City	Airport Abbreviation
University of California/Berkeley School of Optometry	Berkeley, CA	San Francisco International	San Francisco	SFO
Michigan College of Optometry at Ferris State University	Big Rapids, MI	Gerald R. Ford International	Grand Rapids	GRR
University of Alabama at Birmingham School of Optometry	Birmingham, AL	Birmingham-Shuttlesworth International	Birmingham	BHM
Indiana University School of Optometry	Bloomington, IN	Indianapolis International	Indianapolis	IND
New England College of Optometry	Boston, MA	Logan International	Boston	BOS
Illinois College of Optometry	Chicago, IL	Chicago O'Hare	Chicago	ORD
The Ohio State University College of Optometry	Columbus, OH	Columbus International	Columbus	CMH
Pacific University College of Optometry	Portland, OR	Portland International	Portland	PDX
Southern California College of Optometry	Fullerton, CA	Los Angeles International	Los Angeles	LAX
University of Houston College of Optometry	Houston, TX	George Bush Intercontinental	Houston	IAH
Southern College of Optometry	Memphis, TN	Memphis International	Memphis	MEM
State University of New York State College of Optometry	New York, NY	New York La Guardia	New York	LGA
Nova Southeastern University College of Optometry	Ft. Lauderdale, FL	Miami International	Miami	MIA
Pennsylvania College of Optometry	Philadelphia, PA	Philadelphia International	Philadelphia	PHL
Inter American University of Puerto Rico School of Optometry	San Juan, PR	Luis Munoz Marin International	San Juan	SJU
University of Missouri St. Louis College of Optometry	St. Louis, MO	Lambert International	St. Louis	STL
Northeastern State University College of Optometry	Tahlequah, OK	Tulsa International	Tulsa	TUL
University of Waterloo School of Optometry	Toronto, ON	Toronto Pearson International	Toronto	YTO
University of Montreal School of Optometry	Montreal, QC	Montreal Trudeau International	Montreal	YMQ
Western University of Health Sciences College of Optometry	Pomona, CA	Los Angeles International	Los Angeles	LAX
Mid-Western University College of Optometry	Phoenix, AZ	Phoenix Sky Harbor International	Phoenix	PHX
University of the Incarnate Word School of Optometry	San Antonio, TX	San Antonio International	San Antonio	SAT

Figure 11

Summary of Lowest Afternoon-Flight Airfares from Schools' Primary Airport to All Cities in Study

School/College	Location	Primary Airport	Atlanta 2 Day *	Atlanta 4 Week **	Charlotte 2 Day *	Charlotte 4 Week **	Dallas 2 Day *	Dallas 4 Week **	Detroit 2 Day *	Detroit 4 Week **	Wash. Dulles 2 Day *	Wash. Dulles 4 Week **	Wash. Reagan 2 Day *	Wash. Reagan 4 Week *	Students
University of California/Berkeley College of Optometry	Berkeley, CA	SFO	\$ 728.00	\$ 437.00	\$ 502.00	\$ 364.00	\$ 605.00	\$ 394.00	\$ 577.00	\$ 321.00	\$ 568.00	\$ 395.00	\$ 453.00	\$ 281.00	60
Michigan College of Optometry at Ferris State University	Big Rapids, MI	GRR	\$ 752.00	\$ 382.00	\$ 662.00	\$ 325.00	\$ 770.00	\$ 319.00	\$ 481.00	\$ 501.00	\$ 855.00	\$ 748.00	\$ 853.00	\$ 454.00	38
University of Alabama at Birmingham School of Optometry	Birmingham, AL	BHM	\$ 693.00	\$ 443.00	\$ 544.00	\$ 234.00	\$ 519.00	\$ 417.00	\$ 540.00	\$ 430.00	\$ 330.00	\$ 328.00	\$ 330.00	\$ 318.00	43
Indiana University School of Optometry	Bloomington, IN	IND	\$ 351.00	\$ 251.00	\$ 476.00	\$ 230.00	\$ 469.00	\$ 341.00	\$ 559.00	\$ 426.00	\$ 546.00	\$ 350.00	\$ 481.00	\$ 296.00	70
New England College of Optometry	Boston, MA	BOS	\$ 570.00	\$ 318.00	\$ 368.00	\$ 173.00	\$ 630.00	\$ 313.00	\$ 824.00	\$ 430.00	\$ 289.00	\$ 129.00	\$ 596.00	\$ 311.00	118
Illinois College of Optometry	Chicago, IL	ORD	\$ 414.00	\$ 285.00	\$ 820.00	\$ 339.00	\$ 685.00	\$ 437.00	\$ 315.00	\$ 199.00	\$ 329.00	\$ 267.00	\$ 331.00	\$ 267.00	150
The Ohio State University College of Optometry	Columbus, OH	CMH	\$ 405.00	\$ 270.00	\$ 305.00	\$ 268.00	\$ 455.00	\$ 381.00	\$ 693.00	\$ 405.00	\$ 852.00	\$ 471.00	\$ 756.00	\$ 471.00	61
Pacific University College of Optometry	Portland, OR	PDX	\$ 754.00	\$ 483.00	\$ 354.00	\$ 400.00	\$ 629.00	\$ 361.00	\$ 676.00	\$ 416.00	\$ 891.00	\$ 576.00	\$ 675.00	\$ 438.00	87
Southern California College of Optometry	Fullerton, CA	LAX	\$ 448.00	\$ 335.00	\$ 309.00	\$ 379.00	\$ 553.00	\$ 319.00	\$ 531.00	\$ 303.00	\$ 618.00	\$ 363.00	\$ 261.00	\$ 344.00	95
University of Houston College of Optometry	Houston, TX	IAH	\$ 570.00	\$ 434.00	\$ 1,021.00	\$ 604.00	\$ 276.00	\$ 152.00	\$ 647.00	\$ 497.00	\$ 860.00	\$ 513.00	\$ 538.00	\$ 442.00	105
Southern College of Optometry	Memphis, TN	MEM	\$ 511.00	\$ 227.00	\$ 881.00	\$ 437.00	\$ 774.00	\$ 403.00	\$ 573.00	\$ 428.00	\$ 544.00	\$ 482.00	\$ 514.00	\$ 462.00	119
State University of New York State College of Optometry	New York, NY	LGA	\$ 566.00	\$ 309.00	\$ 378.00	\$ 178.00	\$ 478.00	\$ 281.00	\$ 455.00	\$ 205.00	\$ 288.00	\$ 193.00	\$ 296.00	\$ 201.00	72
Nova Southeastern University College of Optometry	Ft. Lauderdale, FL	MIA	\$ 309.00	\$ 149.00	\$ 540.00	\$ 359.00	\$ 499.00	\$ 385.00	\$ 530.00	\$ 378.00	\$ 435.00	\$ 292.00	\$ 413.00	\$ 274.00	106
Pennsylvania College of Optometry	Philadelphia, PA	PHL	\$ 720.00	\$ 295.00	\$ 434.00	\$ 259.00	\$ 593.00	\$ 433.00	\$ 787.00	\$ 511.00	\$ 828.00	\$ 268.00	\$ 920.00	\$ 241.00	154
Inter American University of Puerto Rico School of Optometry	San Juan, PR *	SJU	\$ 283.00	\$ 284.00	\$ 300.00	\$ 317.00	\$ 674.00	\$ 368.00	\$ 316.00	\$ 288.00	\$ 256.00	\$ 293.00	\$ 249.00	\$ 314.00	47
University of Missouri St. Louis College of Optometry	St. Louis, MO	STL	\$ 534.00	\$ 255.00	\$ 530.00	\$ 290.00	\$ 610.00	\$ 231.00	\$ 389.00	\$ 244.00	\$ 500.00	\$ 430.00	\$ 499.00	\$ 286.00	43
Northeastern State University College of Optometry	Tahlequah, OK	TUL	\$ 870.00	\$ 523.00	\$ 1,193.00	\$ 467.00	\$ 286.00	\$ 198.00	\$ 716.00	\$ 346.00	\$ 459.00	\$ 289.00	\$ 459.00	\$ 285.00	26
University of Waterloo School of Optometry	Toronto, ON	YTO	\$ 1,035.00	\$ 426.00	\$ 1,524.00	\$ 562.00	\$ 1,718.00	\$ 636.00	\$ 1,292.00	\$ 513.00	\$ 815.00	\$ 471.00	\$ 815.00	\$ 488.00	42
University of Montreal School of Optometry	Montreal, QC	YMQ	\$ 1,130.00	\$ 608.00	\$ 1,467.00	\$ 577.00	\$ 1,767.00	\$ 422.00	\$ 1,004.00	\$ 573.00	\$ 927.00	\$ 590.00	\$ 817.00	\$ 568.00	42
Western University of Health Sciences College of Optometry	Pomona, CA	LAX	\$ 448.00	\$ 335.00	\$ 309.00	\$ 379.00	\$ 553.00	\$ 319.00	\$ 531.00	\$ 303.00	\$ 618.00	\$ 363.00	\$ 261.00	\$ 344.00	60
Mid-Western University College of Optometry	Phoenix, AR	PHX	\$ 479.00	\$ 330.00	\$ 309.00	\$ 308.00	\$ 617.00	\$ 367.00	\$ 424.00	\$ 322.00	\$ 819.00	\$ 480.00	\$ 727.00	\$ 468.00	60
University of the Incarnate Word School of Optometry	San Antonio, TX	SAT	\$ 329.00	\$ 311.00	\$ 336.00	\$ 374.00	\$ 301.00	\$ 171.00	\$ 534.00	\$ 460.00	\$ 648.00	\$ 510.00	\$ 648.00	\$ 487.00	60
		Average Fare	\$ 586.32	\$ 349.55	\$ 616.45	\$355.59	\$ 657.32	\$347.64	\$ 608.82	\$386.32	\$603.41	\$400.05	\$540.55	\$365.45	

* = Fare if booked May 10 for May 12-13 Travel
 ** = Fare if booked May 10 for June 9-10 Travel

Source: Kayak.com

Rank	Airport	2 Day	Rank	Airport	4 Week
1	Reagan	\$ 540.55	1	Dallas	\$ 347.64
2	Atlanta	\$ 586.32	2	Atlanta	\$ 349.55
3	Dulles	\$ 603.41	3	Charlotte	\$ 355.59
4	Detroit	\$ 608.82	4	Reagan	\$ 365.45
5	Charlotte	\$ 616.45	5	Detroit	\$ 386.32
6	Dallas	\$ 657.32	6	Dulles	\$ 400.05

Figure 12

Non-Stop Flight Availability

1 = a NON-STOP flight is available; X = no NON-STOP flight is available

School/College	Location	Primary Airport	Atlanta 2 Day *	Atlanta 4 Week **	Charlotte 2 Day *	Charlotte 4 Week **	Dallas 2 Day *	Dallas 4 Week **	Detroit 2 Day *	Detroit 4 Week **	Wash. Dulles 2 Day *	Wash. Dulles 4 Week **	Wash. Reagan 2 Day *	Wash. Reagan 4 Week *	Students
University of California/Berkeley School of Optometry	Berkeley, CA	SFO	1	1	1	1	1	1	1	1	1	1	X	X	60
Michigan College of Optometry at Ferris State University	Big Rapids, MI	GRR	X	X	X	X	X	X	1	1	X	X			38
University of Alabama at Birmingham School of Optometry	Birmingham, AL	BHM	1	1	1	1	X	X	X	X	X	X	X	X	43
Indiana University School of Optometry	Bloomington, IN	IND	1	1	1	1	1	1	1	1	1	1	X	1	70
New England College of Optometry	Boston, MA	BOS	1	1	1	1	1	1	1	1	1	1	1	1	118
Illinois College of Optometry	Chicago, IL	ORD	1	1	1	1	1	1	1	1	1	1	1	1	150
The Ohio State University College of Optometry	Columbus, OH	CMH	1	1	1	1	1	1	1	1	1	1	1	1	61
Pacific University College of Optometry	Portland, OR	PDX	1	1	X	X	1	1	1	1	1	1	X	X	87
Southern California College of Optometry	Fullerton, CA	LAX	1	1	1	1	1	1	1	1	1	1	1	1	95
University of Houston College of Optometry	Houston, TX	IAH	1	1	1	1	1	1	1	1	1	1	1	1	105
Southern College of Optometry	Memphis, TN	MEM	1	1	1	1	1	1	1	1	X	X	1	1	119
State University of New York State College of Optometry	New York, NY	LGA	1	1	1	1	1	1	1	1	1	1	1	1	72
Nova Southeastern University College of Optometry	Ft. Lauderdale, FL	MIA	1	1	1	1	1	1	1	1	1	1	1	1	106
Pennsylvania College of Optometry	Philadelphia, PA	PHL	1	1	1	1	1	1	1	1	1	1	1	1	154
Inter American University of Puerto Rico School of Optometry	San Juan, PR *	SJU	1	1	1	1	1	1	X	X	1	1	X	X	47
University of Missouri St. Louis College of Optometry	St. Louis, MO	STL	1	1	1	1	1	1	1	1	1	1	1	1	43
Northeastern State University College of Optometry	Tahlequah, OK	TUL	1	1	X	X	1	1	1	1	X	X	X	X	26
University of Waterloo School of Optometry	Toronto, ON	YTO	1	1	1	1	1	1	1	1	1	1	1	1	42
University of Montreal School of Optometry	Montreal, QC	YMQ	1	1	X	X	1	1	1	1	1	1	1	1	42
Western University of Health Sciences College of Optometry	Pomona, CA	LAX	1	1	1	1	1	1	1	1	1	1	1	1	60
Mid-Western University College of Optometry	Phoenix, AR	PHX	1	1	1	1	1	1	1	1	1	1	X	X	60
University of the Incarnate Word School of Optometry	San Antonio, TX	SAT	1	1	1	1	1	1	1	1	1	1	X	X	60
Totals			21	21	18	18	20	20	20	20	18	18	13	14	

* = Fare if booked May 10 for May 12-13 Travel

** = Fare if booked May 10 for June 9-10 Travel

Source: Kayak.com

Figure 13

AIRPORT SATISFACTION

Large Airport Ranking (30 million passengers or more per year)

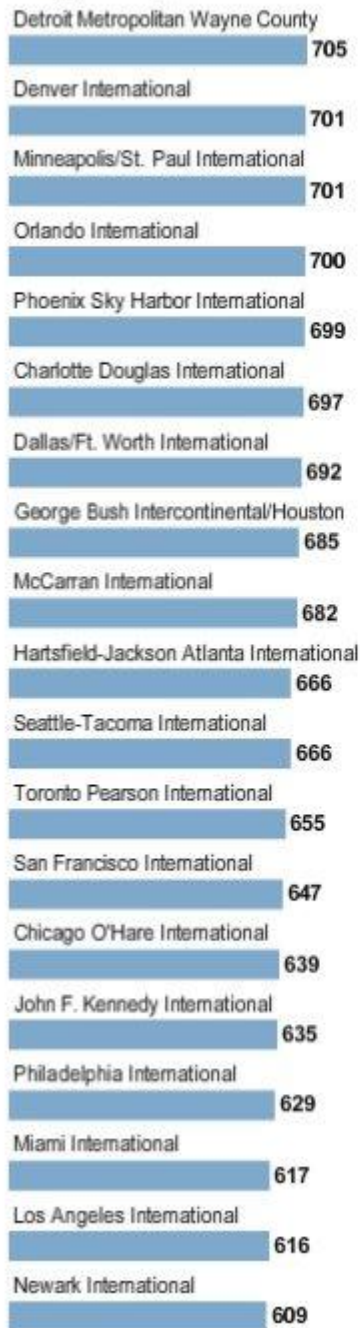


Figure 14

Taxi Fare From Airport to Likely Office Location

Rank	City	Trip	Rate	Notes
1	Charlotte	Airport to Central Business District	\$ 25.00	Flat Rate Fee
2	Washington	Reagan to National Institutes of Health Area	\$ 29.50	Approximate Fee
3	Atlanta	Airport to Mid-Town	\$ 32.00	Flat Rate Fee
4	Dallas	Airport to Central Business District	\$ 40.00	Flat Rate Fee
5	Detroit	Airport to Central Business District	\$ 52.00	Flat Rate Fee
6	Washington	Dulles to National Institutes of Health Area	\$ 61.00	Flat Rate Fee

Source: Each Airport's website - Ground Transportation Page

Figure 15

Hotel Cost Comparison

Comparison of downtown hotel costs, booked 30 days in advance, for one-night stay, mid-week

Rank	City	Average Cost	Hampton Inn	Hampton Inn & Suites	Holiday Inn Express
1	Dallas	\$ 98.05	\$ 92.65	\$ 93.49	\$ 108.00
2	Detroit	\$ 111.47	\$ 112.00	\$ 122.40	\$ 100.00
3	Charlotte	\$ 115.32	\$ 126.65	\$ 130.90	\$ 88.40
4	Atlanta	\$ 126.27	\$ 118.15	\$ 143.65	\$ 117.00
5	Washington	\$ 219.88	\$ 211.65	\$ 229.00	\$ 219.00

Source: Company websites for Hampton Hotels and Holiday Inn Hotels.
 Study conducted May 5, 2010 for stay on June 8, 2010.

Figure 16

Office Space Study for 5 Cities

Atlanta

Total Office Space	133,401,822
Overall Vacancy Rate	23.2%
Most Desired Area (MDA)	Buckhead
MDA Vacancy Rate	30.7%
MDA Avg. Asking Rent/SF	\$ 24.95

Charlotte

Total Office Space	37,457,350
Overall Vacancy Rate	17.4%
Most Desired Area (MDA)	CBD
MDA Vacancy Rate	8.8%
MDA Avg. Asking Rent/SF	\$ 25.07

Dallas

Total Office Space	204,724,000
Overall Vacancy Rate	21.9%
Most Desired Area (MDA)	Ft. Worth CBD
MDA Vacancy Rate	15.1%
MDA Avg. Asking Rent/SF	\$ 22.68

Detroit

Total Office Space	73,232,867
Overall Vacancy Rate	29.6%
Most Desired Area (MDA)	Birmingham
MDA Vacancy Rate	24.7%
MDA Avg. Asking Rent/SF	\$ 22.98

Washington

Total Office Space	122,832,520
Overall Vacancy Rate	12.0%
Most Desired Area (MDA)	East End
MDA Vacancy Rate	10.1%
MDA Avg. Asking Rent/SF	\$ 60.11

Source: CB Richard Ellis, Inc. MarketView Office Reports - 1st Quarter 2010

Figure 17

Violent Crime Incidents

2007 Violent Crime Offenses per 100,000 Population

Rank (Least to Most)	City	Number of Crimes
1	Charlotte	986.4
2	Dallas	1,069.2
3	Washington	1,347.0
4	Atlanta	1,623.8
5	Detroit	2,289.0

Source: U. S. Dept. of Justice and FBI

Figure 18

NBEO - Traffic Congestion Study

Annual Delay per Traveler: Extra travel time for peak-period travel during the year divided by the number of travelers who begin a trip during the peak period (6 to 9 a.m. and 4 to 7 p.m.)

Rank (Best to Worst)	City	Annual Delay per Traveler in Hours
1	Charlotte	40
2	Detroit	52
3	Dallas	53
4	Atlanta	57
5	Washington	62

Source: 2009 Urban Mobility Report by the Texas Transportation Institute of the Texas A&M University System

Figure 19

Traffic Congestion Study

Urban Area Demand and Roadway Growth Trends: The rate by which urban area demand is growing faster than roadway growth

Rank	City	Rate
T-1	Charlotte	15% to 35% Faster
T-1	Detroit	15% to 35% Faster
T-3	Dallas	More than 35% Faster
T-3	Atlanta	More than 35% Faster
T-3	Washington	More than 35% Faster

Source: 2009 Urban Mobility Report by The Texas Transportation Institute of The Texas A&M University System

Figure 20

Hardest cities to navigate: The complete list

January 19, 2009 14:27PM

As hard as it is for some Portland drivers to believe, we probably don't live in one of America's hardest cities to navigate.

As I mentioned in today's [Oregonian column](#), [MapQuest](#) actually conducts an annual poll to try to determine that. Portland has never appeared on the 10-worst list. Nor has it shown up as one of the 10 "easiest cities to escape for holiday weekends." The top spot on that list goes to Cleveland. (Cleveland?) Even stranger, our neighbor to the north, Seattle, appears on both the bad list and the good list. Anyway, since my column picked on Houston, supposedly the hardest city to navigate, I figured it would be only fair to post MapQuest's complete 2008 best and worst navigation lists.

The poll done by [ICR](#) of Media, Pa., for MapQuest, questioned people online last May. The rankings are based on a national sampling of 1,023 adults with online access. ICR also conducted 3,000 phone interviews in the top 20 cities.

Toughest Cities to Navigate

1. Houston
2. Washington D.C.
3. Los Angeles
4. Atlanta
5. Boston
6. Dallas
7. Phoenix
8. Orlando
9. Seattle
10. Miami

Toughest Cities to Escape for Holiday Weekends

1. Los Angeles
2. Philadelphia
3. New York
4. Washington D.C.
5. Atlanta
6. Houston
7. Detroit
8. San Francisco/Oakland
9. Dallas
10. Phoenix

-- Joseph Rose; josephrose@news.oregonian.com

Figure 21

Cost of Living Study

The ACCRA *Cost of Living Index* measures relative price levels for consumer goods and services in participating areas. The average for all participating places in each quarter equals 100, and each participant's index is read as a percentage of the average for all participating places.

Rank	City	Composite Index	Grocery Items	Housing	Utilities	Transportation	Health Care	Misc.
1	Dallas	90.8	95.9	71.9	105.4	97.9	103.4	97.1
2	Charlotte	93.5	96.1	79.9	89.7	99.4	111.1	101.6
3	Atlanta	96.2	98.4	91.0	88.9	96.6	100.9	101.7
4	Detroit	103.6	91.7	99.6	132.4	102.9	96.8	100.9
5	Washington	137.9	109.5	219.1	98.9	109.2	103.4	103.3

Source: ACCRA Cost of Living Index - May 2010
 Produced by The Council For Community And Economic Research

Figure 22

US Airways' connectivity a sweet spot in business recruitment

Last Thursday, US Airways launched its first nonstop flight from Charlotte to Rome. This comes on the heels of their new nonstop service to Rio de Janeiro; Paris; Los Cabos, Mexico; and Ottawa, Ontario; as well as recent increased domestic departures to key U.S. destinations, such as Dallas, Miami, Minneapolis-St. Paul, Orlando and Washington, D.C.

The impact of US Airways' Charlotte hub on our regional economy cannot be overstated. All other things being equal, companies would rather set up operations in a city with direct flights, or at least convenient connections, to their home offices, customers and vendors. And being able to fly nonstop to Denver to ski or to Puerto Vallarta to sun is a plus. US Airways' 584 daily Charlotte flights to 132 nonstop destinations make the Queen City its largest hub – and the fourth largest hub of any airline in the county.

Comparing city populations and boarding originations, Charlotte's emergence as such a large hub appears to be a head scratcher. Less than a quarter of the people boarding US Airways' European flights in Charlotte start or end their travels at the city's airport. For those other 75 percent who relax in the white rockers, eat at the new airport sushi bar or grab a cold Carolina-crafted beer, this Charlotte "visit" encourages them to come back and stay a while. By putting Charlotte's name above boarding gates and on flight monitors throughout the world, by funneling these passengers through Charlotte to hundreds of points beyond, US Airways increases the city's name recognition and provides a taste of how our region does business.

The tourists are coming...and coming

Last week had to have been the trifecta of tourism. Within five days, the NASCAR Hall of Fame opened with home-grown racing legends such as Richard Petty and Junior Johnson; the NRA brought 70,000 people to town, including Sarah Palin and Glenn Beck; and UltraSwim came to the city – for the 26th time – featuring Olympian Michael Phelps and other top U.S. swimmers. Add this weekend's NASCAR Sprint All-Star Race and the Coca-Cola 600 on May 30, and we're looking at literally hundreds of millions of dollars flowing into our regional economy.

Ronnie L. Bryant, CEcD, FM, HLM
President & CEO
Charlotte Regional Partnership