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Common Current

Major US City Post-Oil Preparedness Ranking

Which Cities and Metro Areas are Best or Least Prepared for Price Volatility, Supply Shocks and Climate Change Regulations?

November 10, 2008

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1. Executive Summary

For the first time in history, the United States experienced in 2008 oil prices well in excess of $100 a barrel[1], with retail gas prices reaching near $5 a gallon in parts of the nation.[2] Oil supply and demand, the desire for foreign oil independence, natural and man-made disasters, and pending climate change regulations all suggest a new paradigm in metropolitan design, mobility, economics and social behavior.

The effects of these recent changes in oil and gas prices and supply are now being realized through a variety of related data points and findings. Nationally, public transit ridership has increased more than 5% from 2007 to 2008[3], while telecommuting rates, and alternative forms of mobility including biking and walking have likewise recorded significant year-to-year increases.

High gas prices have resulted in sweeping economic impacts. Real estate values in low-density, completely car-dependent exurban development—also known as sprawl—have plummeted in comparison to real estate values in central urban or higher-density suburban real estate served by public transit and walkable amenities, which have been holding their relative value.[4,5]

According to a July 2008 *Business Week* study, many U.S. central urban areas have maintained real estate values while real estate values have declined significantly the further out one travels from the central city:

> "Annual (real estate) price changes in most of the largest metro areas, including New York, Los Angeles, Chicago, Miami, San Francisco, Seattle, Baltimore, Washington D.C. and Philadelphia, followed a similar pattern: Values were most stable within a 10-mile radius of the center of the city, but generally worsened with each successive radius ring as far as 50 miles from the center of the city." [6]

In terms of this study of city preparedness for post-oil, seven of these nine metros referenced in the *Business Week* analysis ranked in the top ten cities in this study (the other two—Los Angeles and Miami ranked in the top 20), having relatively strong public transit, higher rates of mixed real estate uses, realistic opportunities for commuting on foot or by bicycle, and demonstrating relatively low or moderate development sprawl.

"Sprawl has become the biggest risk factor in real estate," according to Jeffrey Norquist, President of the Congress for New Urbanism, in reference to the US housing foreclosure crisis of 2008.[7]

Chicago's Center for Neighborhood Technology, in conjunction with the Center for Transit-Oriented Development and the Brookings Institution, has modeled the impact of gas price increases on household expenses across 52 US metropolitan areas. Most metro area households had annual gasoline costs below $1,600 in 2000; by 2008 most of these 52 metro areas, with the exception of downtown areas well served by transit, walking and bicycling such as New York, San Francisco and Boston (where central city gas expenses remained below $1,600 annually), had average gas costs ranging from $2,400 to $3,800 and higher.[8]

Oil availability or refined gas supply constraints have also impacted urban mobility. A single gas pipeline from the Gulf Coast, for instance, supplies many inland urban markets throughout the Southeast United States. The gas supply disruptions that occurred throughout Southeast U.S. cities including Atlanta, Nashville and Charlotte in the weeks following Hurricane Ike[9] demonstrated the fragility of the concentrated US oil processing and gas supply system.

At the global level, the growing use of oil in developing nations, particularly in China and India, has put a strain on the ability of global oil suppliers to meet demand. Shell Oil has forecast that, "by 2015, growth in the production of easily accessible oil and gas will not match the projected rate of demand growth."[10] The rapidly growing use of oil and coal in developing nations comes at the steep price, placing significant additional burdens of greenhouse gas emissions into the earth's troposphere and stratosphere. According to Shell Oil, "remaining within desirable levels of CO2 concentration in the atmosphere will become increasingly difficult."[11]

This study assumes the hypothesis that certain U.S. cities and metro areas are currently better prepared for oil price volatility--or potential oil supply disruptions--than others. Furthermore, cities or regions that have existing significant alternatives to reliance on oil for transportation (and alternatives to oil for building heating and electricity generation) will prove more economically resilient if oil prices remain above $50 or $75 a barrel. These metro areas will gain even more competitive advantage with any combination of higher-priced oil and ambitious global climate change regulations that are now being enacted or proposed.

An example of how climate change-related legislation will facilitate the growth of post-oil cities can be illustrated by California's Senate Bill 375 (SB 375), signed into law on September 30, 2008.[12] SB 375 legislation requires that the state's regions and their metro areas develop quantifiable "sustainable community strategies" to reduce potential greenhouse gases resulting from new development and associated transportation impacts, as measured by vehicle miles traveled. In effect, SB 375 requires development of housing closer to transportation in order to reduce fossil fuel use and thus better achieve the greenhouse gas reduction goals of the state's 2006 Global Warming Climate Solutions

Act (AB 32).[13] SB 375 incentivizes denser, transit-oriented development with mixed real estate uses while providing disincentives for auto-dependent exurban or suburban sprawl. For communities that plan sprawled development, the new law reduces federal transportation funding and imposes more stringent and lengthy environmental review processes.

In terms of social behavior, using public transit and carpooling, or using alternative forms of mobility such as walking, biking, or telecommuting all help offset the need for exclusively relying on personal automotive transport, thus reducing fuel needs and greenhouse gas emissions. These city and metro mobility and communications factors for this study were measured using public data available through the US Bureau of the Census and other research institutes.

Clearly, the way in which cities and metro areas are planned and developed also has a measurable impact on fuel use, household transportation expenses as well as the degree of dependence on auto transport. Ranking data on the comparative sprawl rate of metro areas was included to determine such vulnerabilities.

Finally, the use of heating oil or use of oil to generate electricity in metro areas was analyzed to determine vulnerability to oil prices and supply shocks for non-transport related oil uses. It should be noted that in the United States, the use of heating oil or the use of oil to generate electricity is not used in most cities or metro areas, thus this ranking data was factored into the overall score but was not published as a separate category. Only Boston and New York City use significant amounts of heating oil for buildings, though that amount is under 25% for Boston and under 10% for New York City of all heating energy used and is decreasing as a percentage of the whole; only Honolulu uses a significant amount of oil to generate electricity (as of 2006, almost 80% of the city's electricity came from burning oil.[14])

2. Study Methodology

"Major US City Post-Oil Preparedness" examines how the largest 50 cities (by population) will fare with volatile oil prices, oil or gas supply shocks and global climate change regulations. The study examines key data variables across public secondary and primary research sources. Common Current is a private consulting firm working with government, business and non-governmental organization clients globally in the area of public-private partnerships, research and planning.

The study was researched September through November 2008. For author's biography, see "Biography" (Section 5, p.15).

Data sources and weighting used were as follows:

Double Weighting (x2)

- City resident public transit use; telecommuting; and bike-or-walk-to-work rates data are from US Bureau of the Census 2007 American Community Survey: http://factfinder.census.gov/home/saff/main.html?_lang=en

- Overall per capita metro transit use data is from "2008 Public Transportation Factbook," the American Public Transit Association and from the 2007 Texas Transportation Institute/ Texas A&M University system: http://tti.tamu.edu/

Single Weighting (x1)

- Metro sprawl data is from Smart Growth America 2002 study, "Measuring Sprawl and Its Impact": http://www.smartgrowthamerica.org/
  (*Note:* five metro areas that were unranked in "Measuring Sprawl and its Impact": Charlotte, NC; Louisville, KY; Nashville, TN; Virginia Beach, VA and San Antonio were also not ranked in this category for this study—overall scores took this omission into account)
- Heating oil use data came from primary research conducted in 2007 and oil use data for electricity generation in Honolulu came from *How Green is Your City? The SustainLane US City Rankings* (New Society Publishers, 2007): http://www.amazon.com/Green-Your-City-SustainLane-Rankings/dp/0865715955/ref=sr_1_1/103-7631200-1144617?ie=UTF8&s=books&qid=1184343530&sr=1-1

Half Weighting (x.5)

- Carpooling ranking data, from the 2007 US Census American Community Survey, was the least weighted.

3. Overall Ranking

The cities with highest overall ranking in "Major US Cities Preparedness for an Oil Crisis" are as follows:

1. San Francisco
2. New York
3. Washington, DC
4. Seattle
5. Oakland
6. Chicago
7. Portland, OR
8. Philadelphia
9. Baltimore
10. Boston

Ranking highest are cities with strong public transit system ridership, well-organized and relatively dense city centers, a high degree of mixed real estate uses (retail, office, residential), and medium-to-high city population density. Honolulu was significantly

reduced in the overall ranking by its use of oil for electricity, Boston was somewhat reduced and New York was slightly reduced in the ranking on a proportional basis because of their use of oil for heating.

The highest-scoring cities had strong public transit commute-to-work rates by residents and high overall transit ridership within their metro area.

US cities have experienced high growth in rates of telecommuting to work from 2006 to 2007, most likely a direct impact from rising fuel prices. Oakland had the highest telecommuting rate, at 7.6% in 2007, while six US cities—San Francisco, San Diego, Portland, OR; Atlanta; Virginia Beach and Denver--had more than 5% of their total workforce being primarily home based. In 2006 only two cities were above 5% in telecommuting.

Sprawl, which is defined by factors including low density, low mixed real-estate uses, poor street connectivity and lack of city centeredness, was relatively low in the overall highest-ranking metro areas, with the exception of Washington, DC (ranked #39); Oakland (ranked #30) and Seattle, which ranked #28 of the metro areas studied in terms of sprawl.

All the top ten cities overall were older seaport cities or were a Great Lakes port city (Chicago), while the lowest ten ranking cities had only one seaport city, Jacksonville.

The cities ranked the lowest overall were the following:

41. Louisville, KY
42. Omaha, NE
43. El Paso, TX
44. Nashville, TN
45. Memphis, TN (tie)
45. Fort Worth, TX (tie)
47. Tulsa, OK
48. Indianapolis, IN
49. Jacksonville, FL
50. Oklahoma City, OK

All ten of the lowest-ranking cities in this study were based in the South or Midwest. With the exception of Indianapolis and Omaha, eight of the bottom ten cities lie within what has been called the nation’s Sunbelt. The region experienced tremendous population growth during the 1960s through the 1990s with development that can often be characterized as urban or exurban sprawl.

Of the ten overall lowest-ranking cities, only Nashville and Omaha ranked in the top half of the largest 50 cities for telecommuting rates. Nashville ranked #9 of the largest 50 in telecommuting rates and Omaha ranked #15, according to 2007 US Bureau of Census American Community Survey data.

Other overall city rankings in the study were as follows:

11	Minneapolis
12	Denver
13	Los Angeles
14	Atlanta
15	Long Beach
16	San Diego
17	New Orleans
18	Miami
19	Honolulu
19	Milwaukee
21	Cleveland
22	Sacramento
23	Austin
24	Las Vegas
24	Mesa, AZ
26	Houston
27	Phoenix
28	Tucson
29	Detroit
30	San Jose
31	Albuquerque
32	Dallas
33	San Antonio
34	Arlington, TX
35	Columbus, OH
36	Charlotte, NC
37	Colorado Springs
38	Fresno
39	Kansas City, MO
40	Virginia Beach

4. Ranking by Data Category

4.1. Carpooling

Rank	City	Carpool%
1	Mesa	17
2	Sacramento	15.8
3	Honolulu	14.8
3	Phoenix	14.8
5	Houston	14.4
6	Dallas	14.1

6	New Orleans	14.1
8	Austin	13.2
8	Oklahoma City	13.2
10	Tulsa	12.9
11	Fresno	12.6
12	Detroit	12.1
13	Charlotte	11.6
13	Memphis	11.6
15	Fort Worth	11.5
16	San Antonio	11.4
17	Arlington, TX	11.3
17	Baltimore	11.3
19	Albuquerque	11.2
19	Tucson	11.2
21	Milwaukee	11
22	Colorado Springs	10.9
23	Jacksonville	10.7
23	Long Beach	10.7
25	Los Angeles	10.6
26	El Paso	10.5
27	Chicago	10.4
28	Indianapolis	10.2
28	Omaha	10.2
30	San Jose	10.1
30	Seattle	10.1
32	Kansas City	10
32	Minneapolis	10
32	Oakland	10
35	Philadelphia	9.9
36	San Diego	9.8
37	Louisville	9.7
38	Denver	9.6
38	Las Vegas	9.6
40	Miami	9.5
41	Nashville	8.9
41	Virginia Beach, VA	8.9
43	Cleveland	8.4
44	Portland, OR	7.9
45	Columbus	7.8
46	Atlanta	7.2
47	San Francisco	7.1
48	Boston	6.8
48	Washington, DC	6.8
50	New York	5.5

4.2. City Telecommuting Rate

Rank	City	Telecomm%
1	Oakland	7.6
2	San Francisco	6.8
3	San Diego	6.6
4	Portland, OR	6.4
5	Atlanta	5.8
6	Virginia Beach, VA	5.3
7	Denver	5.1
8	Washington, DC	5
9	Minneapolis	4.8
9	Nashville	4.8
9	Seattle	4.8
12	Los Angeles	4.7
13	Arlington, TX	4.6
13	Austin	4.6
15	Omaha	4.3
15	Phoenix	4.3
17	Charlotte	4.1
17	Colorado Springs	4.1
19	Honolulu	4
20	Albuquerque	3.9
20	Tucson	3.9
22	New York	3.8
23	Chicago	3.7
24	Long Beach	3.6
24	Mesa	3.6
26	Dallas	3.5
26	Sacramento	3.5
28	Columbus	3.4
28	Fresno	3.4
30	Houston	3.3
30	Oklahoma City	3.3
30	San Jose	3.3
30	Tulsa	3.3
34	Fort Worth	3.1
35	Indianapolis	2.9
35	New Orleans	2.9
37	Philadelphia	2.8
38	Boston	2.7
38	Detroit	2.7
40	Baltimore	2.6
40	Las Vegas	2.6
42	Jacksonville	2.5
42	Kansas City	2.5
42	Milwaukee	2.5
45	Cleveland	2.4
46	El Paso	2.3
46	Miami	2.3

48	San Antonio	2.2
49	Louisville	2
50	Memphis	1.8

4.3. City Resident Public Transit Commute Use

Rank	City	Public Transit Use %
1	New York	54.6
2	Washington, DC	36.4
3	Boston	34
4	San Francisco	33
5	Chicago	26.7
6	Philadelphia	25.3
7	Baltimore	19.4
8	Seattle	18.6
9	Oakland	15.8
10	Cleveland	13.6
11	Minneapolis	13.4
12	Miami	12.7
13	Atlanta	11.7
14	Los Angeles	11.3
15	Portland, OR	11.2
16	Honolulu	11.1
17	Detroit	8.5
17	Milwaukee	8.5
19	Denver	7.7
20	Long Beach	6.9
21	New Orleans	6.3
22	Las Vegas	5
23	Austin	4.9
23	Houston	4.9
25	San Diego	4.5
26	Dallas	4.2
27	Louisville	4
27	Phoenix	4
29	Kansas City	3.8
29	San Jose	3.8
31	Charlotte	3.3
31	San Antonio	3.3
33	Tucson	3.2
34	Columbus	3.1
35	Sacramento	2.8
36	Memphis	2.6
37	Mesa	2.5
38	Fresno	2.4

39	El Paso	2.3
39	Nashville	2.3
41	Albuquerque	2.2
42	Colorado Springs	1.5
42	Indianapolis	1.5
44	Jacksonville	1.4
45	Omaha	1.3
46	Fort Worth	1.1
47	Tulsa	0.8
47	Virginia Beach, VA	0.8
49	Oklahoma City	0.7
50	Arlington, TX	0.2

4.4. City Resident Walk/ Bike Commute Rate

Rank	City	Walk%	Bike%	Walk and Bike%
1	Boston	13.3	1	14.3
2	Washington, DC	11.1	1.7	12.8
3	San Francisco	9.7	2.5	12.2
4	New York	10.3	0.7	11
5	Seattle	8.3	2.3	10.6
6	Minneapolis	6.4	3.8	10.2
7	Philadelphia	7.9	1	8.9
8	New Orleans	6.9	1.6	8.5
9	Portland, OR	4.4	3.9	8.3
10	Honolulu	6.8	1.1	7.9
11	Baltimore	7	0.3	7.3
12	Oakland	5.2	1.4	6.6
13	Chicago	5.4	1.1	6.5
14	Tucson	4	2	6
15	Denver	4.3	1.6	5.9
16	Milwaukee	4.6	0.7	5.3
17	Sacramento	3.4	1.8	5.2
18	Atlanta	3.8	0.7	4.5
18	Long Beach	3.6	0.9	4.5
20	Cleveland	3.8	0.5	4.3
20	Los Angeles	3.7	0.6	4.3
22	Miami	4.1	0.1	4.2
23	San Diego	2.6	0.9	3.5
24	Columbus	2.7	0.7	3.4
25	Mesa	1.9	1.4	3.3
26	Albuquerque	2.4	0.8	3.2
27	Detroit	2.7	0.3	3
28	Arlington, TX	2	0.9	2.9

28	Austin	2	0.9	2.9
28	Colorado Springs	2.5	0.4	2.9
31	Fresno	2	0.7	2.7
31	Las Vegas	2.1	0.6	2.7
31	San Jose	2	0.7	2.7
31	Louisville	2.4	0.3	2.7
35	Houston	2.2	0.3	2.5
35	Kansas City	2.2	0.3	2.5
35	Tulsa	2.4	0.1	2.5
38	Memphis	2.1	0.3	2.4
38	Omaha	2.1	0.3	2.4
40	El Paso	2.2	0.1	2.3
40	San Antonio	2.2	0.1	2.3
40	Phoenix	1.8	0.5	2.3
43	Virginia Beach, VA	2	0.2	2.2
44	Indianapolis	1.7	0.2	1.9
45	Charlotte	1.8	0	1.8
46	Jacksonville	1.3	0.3	1.6
46	Dallas	1.4	0.2	1.6
48	Fort Worth	1.2	0.2	1.4
48	Nashville	1.2	0.2	1.4
50	Oklahoma City	1	0.1	1.1

4.5. Metro Area Overall Per Capita Public Transit Ridership

Rank	Metro Area
1	New York City
2	San Francisco
2	Oakland, CA
4	Washington, DC
5	Chicago
6	Boston
7	Seattle
8	Baltimore
9	Philadelphia
10	Portland, OR
11	Los Angeles
11	Long Beach, CA
13	Atlanta
14	Denver
15	San Diego
16	Las Vegas
17	Miami
18	Minneapolis
19	Cleveland
20	Houston
21	San Antonio

22	Fort Worth
22	Arlington, TX
22	Dallas
25	Milwaukee
26	Sacramento
27	San Jose
28	Mesa
28	Phoenix
30	Virginia Beach
31	Detroit
32	Columbus
33	Kansas City, MO
34	Indianapolis
35	New Orleans
36	Austin
37	Charlotte
38	Jacksonville
39	Memphis
40	Tucson
41	El Paso
42	Albuquerque
43	Indianapolis
44	Nashville
45	Louisville, KY
46	Fresno
47	Colorado Springs
48	Tulsa
49	Omaha
50	Oklahoma City

4.6. Metro Area Sprawl

1= least sprawled, 46 = most sprawled, N/A = data not available

Rank	City
1	New York
2	San Francisco
3	Honolulu
4	Omaha
5	Boston
6	Portland
7	Miami
8	New Orleans
9	Denver

10	Albuquerque
11	Colorado Springs
12	Chicago
13	Milwaukee
14	El Paso
15	Baltimore
16	Philadelphia
17	Phoenix
18	Mesa
19	Fresno
20	Austin
21	San Jose
22	Tucson
23	Las Vegas
24	Sacramento
25	San Antonio
26	San Diego
27	Los Angeles
27	Long Beach
29	Seattle
30	Tulsa
31	Oakland
32	Minneapolis
33	Indianapolis
34	Houston
35	Memphis
36	Cleveland
37	Kansas City, MO
38	Jacksonville
39	Columbus, OH
40	Washington, DC
41	Oklahoma City
42	Detroit
43	Dallas
43	Fort Worth
43	Arlington, TX
46	Atlanta
N/A	Nashville
N/A	Virginia Beach
N/A	Louisville
N/A	Charlotte

5. Author Biography

Warren Karlenzig, Common Current (www.commoncurrent.com) founder and president, has worked with the federal government, the State of California, major cities, and the world's largest corporations developing policy, strategy and critical operational capacities for 20 years. Current and recent clients include the US Department of State; The Packard Foundation; the counties of Riverside and San Bernardino, California; a major mixed-use real estate development corporation; an educational sustainability non-profit; and a product design corporation.

Karlenzig has appeared in media including *The Wall Street Journal*, CNN, CNBC, *Forbes*, *The New York Times* and *The Washington Post*.

The former Chief Strategy Officer of SustainLane, he planned, designed and directed both the SustainLane US City Rankings and the SustainLane Government knowledge base for sustainability best practices in state and local governments. He also led consulting engagements with the State of California focused on green city performance metrics for a pilot program that rolled out in 2008.

Previously, as Lead Strategist for Dimension Data/ Proxicom, Karlenzig led strategy engagements for clients including General Electric and Chevron. His areas of expertise included planning portals, complex information and data systems, and communications. He has been a consultant with clients including the White House Office of Science and Technology, for which he helped plan an eco-industrial park; the US EPA Futures Group and the US Dept. of Energy. He authored *A Blueprint for Greening Affordable Housing*, the first substantial work on the subject (Global Green USA, 1999) and he co-authored San Francisco's influential Sustainability Plan, which was adopted by the city in 1997. The section he co-authored ("Economy and Economic Development") was directly cited in San Francisco's 1999 and 2003 municipal green building ordinances.

How Green is Your City?, which Karlenzig authored, was published in 2007 by New Society Publishers. He contributed a chapter in *Growing Greener Cities: Urban Sustainability in the 21st Century* (Penn Press, 2008). He has an MFA from Naropa University and a Bachelor of Science degree from University of Illinois at Urbana-Champaign.

6. Notes

1. The price of oil rose to its highest level ever (on an inflation-adjusted basis or otherwise) when it reached $147.50 a barrel in intraday trading on July 11, 2008. Source: “Oil Rebounds after falling to 8-month low,” The Associated Press, October 7, 2008 http://www.msnbc.msn.com/id/12400801/

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3. “Public Transit Ridership Surges in Second Quarter.” News release, American Public Transportation Association, Sept. 9, 2008. Ridership rates increased more than 5.2% between second quarter 2007 and second quarter 2008.

4. "Gas Prices Apply Brakes to Suburban Migration," Eric Weiss, *Washington Post*, Tuesday, Aug. 5, 2008, p. A1. http://www.washingtonpost.com/wp-dyn/content/article/2008/08/04/AR2008080402415_pf.html

5. "Where Home Prices Are Holding Up," Jeff D. Opdyke, *The Wall Street Journal*, May 20, 2008. http://online.wsj.com/public/article/SB121122333682304367-qs8pV9CgzRT82Fxu2OLcVZCHblM_20080619.html?mod=tff_main_tff_top

6. "The Unraveling of the Suburban Fringe," Prashant Gopal, *Business Week*, July 12, 2008. http://www.businessweek.com/lifestyle/content/jul2008/bw20080711_257959.htm?chan=autos_real+estate+--+lifestyle+subindex+page_real+estate+news

7. John Norquist, October 3, 2008 Presentation at "Sustainable Communities 2008," San Francisco, CA.

8. "Housing + Transportation Affordability Index," Chicago Center for Neighborhood Technology, Center for Transit-Oriented Development and The Brookings Institution. Available as an interactive mapping tool at http://htaindex.cnt.org/

9. "Georgia's Gas Shortage Exposed Fragile System," Alan Judd, (*Atlanta Journal-Constitution*, Sunday, October 5, 2008) http://www.ajc.com/services/content/metro/stories/2008/10/05/gasblame_1005.html?cxtype=rss&cxsvc=7&cxcat=13

10. "Shell Energy Scenarios to 2050," Royal Dutch Shell Oil, March 2008. http://www.shell.com/home/content/aboutshell/our_strategy/shell_global_scenarios/dir_global_scenarios_07112006.html

11. Royal Dutch Shell. *Ibid.*

12. "Better Planning, Fewer Emissions," California League of Conservation Voters website, viewed 10/10/08: http://www.ecovote.org/vmt/ Complete SB 375 bill and state analysis: http://info.sen.ca.gov/cgi-bin/postquery?bill_number=sb_375&sess=CUR&house=B&site=sen

13. "The California Global Warming Solutions Act of 2006" (AB 32) calls for an 80% reduction of greenhouse gases in California from 1990 levels by 2050. http://info.sen.ca.gov/cgi-bin/postquery?bill_number=sb_375&sess=CUR&house=B&site=sen

14. Karlenzig, Warren, *How Green Is Your City? The SustainLane US City Rankings*, New Society Publishers, Gabriola Island, British Columbia, 2007: p. 70.