

Salve Regina University

## Digital Commons @ Salve Regina

---

BIO140 Carbon Footprint Project

Student Work on Display

---

2009

### The Costs of Transportation at McKillop Library

Elizabeth Giambusso

*Salve Regina University*, [elizabeth.giambusso@salve.edu](mailto:elizabeth.giambusso@salve.edu)

Timothy Hanrahan

*Salve Regina University*, [timothy.hanrahan@salve.edu](mailto:timothy.hanrahan@salve.edu)

Raine Raab

*Salve Regina University*, [raine.raab@salve.edu](mailto:raine.raab@salve.edu)

Follow this and additional works at: [https://digitalcommons.salve.edu/bio\\_proj](https://digitalcommons.salve.edu/bio_proj)



Part of the [Biology Commons](#), and the [Ecology and Evolutionary Biology Commons](#)

---

#### Recommended Citation

Giambusso, Elizabeth; Hanrahan, Timothy; and Raab, Raine, "The Costs of Transportation at McKillop Library" (2009). *BIO140 Carbon Footprint Project*. 4.

[https://digitalcommons.salve.edu/bio\\_proj/4](https://digitalcommons.salve.edu/bio_proj/4)

This Article is brought to you for free and open access by the Student Work on Display at Digital Commons @ Salve Regina. It has been accepted for inclusion in BIO140 Carbon Footprint Project by an authorized administrator of Digital Commons @ Salve Regina. For more information, please contact [digitalcommons@salve.edu](mailto:digitalcommons@salve.edu).

## **The Costs of Transportation at McKillop Library**

Elizabeth Giambusso, Timothy Hanrahan, Raine Raab

### **Abstract:**

Much like other libraries and institutions across the United States, Salve Regina faces its share of efficiency problems. In turn, these problems add to the many environmental issues we face today. These are mostly paper waste, recycling, or lack thereof, and the amount of energy needed to heat buildings. Notwithstanding the excessive consumption and waste, our group focused on transportation. The main goal of this project was to measure the current transportation costs and explore ways to cut carbon emissions. By sending a questionnaire through email, the staff responded with the type of vehicle they drive and their commuting distance. Most of the staff lives in state but the issue of commuting still has a large impact on the environment. Each gallon of burned gasoline products produces 19.4 pounds of carbon dioxide (EPA). Using the staff's statistics, we found that 15,180 pounds of carbon dioxide is released by the staff weekly just by driving to work. Also, only a handful walk or bike to work and nobody takes public transportation. In conclusion, we found that the library can greatly reduce their carbon emissions by driving less, driving more fuel efficient vehicles, and utilizing public transportation. The most beneficial recommendation we have is to use public transportation. We understand that people enjoy driving their cars for a variety of reasons but environmentally, this would make an enormous difference. Maybe the library director could come up with some incentives to get staff members to take the bus instead of driving, for example, a free lunch at Miley cafeteria.

### **Introduction:**

Carbon dioxide is a colorless, odorless, incombustible gas. There are many sources of carbon dioxide in the Earth's atmosphere, but human activities are the primary causes of carbon emissions. Human activities greatly impact carbon dioxide with our extensive burning of fossil fuels and operation of motor vehicles. Cunningham and Cunningham says, "Carbon dioxide is by far the most important cause of anthropogenic climate change...Human activities release more than 33 billion tons of carbon dioxide every year, on average..." (207). Increasing carbon dioxide emissions cause about 50-60% of the global warming problem we face today (Lenntech).

**Methods:**

“More than 94 million commuters, 73% of all commuters, work within their county of residence, but that leaves more than 34 million who are exported each day from their home county to work” (Pisarski 1). Although these figures come from 1996, it is inevitable that these numbers have gone up since then. In order to find out the library staff’s car type and commuting information, we asked Maria Bernier, head archivist of the library, to help us gather email addresses. Of the current 39 members on the staff, 25 responded to an email questionnaire. The questions were: what type of car do you drive (year, make, and model) and how far is your daily commute.

We also focused on how to reduce carbon dioxide emissions through the utilization of existing public transportation. First, we obtained a list of where the library staff lives in order to determine alternative transportation routes to increase vehicle efficiency and reduce carbon dioxide emissions. The analysis also evaluated costs and benefits. With the data and implementation of the methods, the library staff will have a good idea as to where RIPTA services are in their area.

**Results:**

Two staff members live in walking distance of the university and when weather permits, they usually bike (A-1). This means that the 23 remaining staff members drive to work five days

Commute	Vehicle Type	CITY MPG	HWY MPG	Carbon Footprint per Week
52.49 miles	2003 Chrysler PT Cruiser	City: 21 MPG	Highway: 28 MPG	415.62 lbs CO2
6.29 miles	2004 Volkswagen Touareg	City: 14.5 MPG	Highway: 19 MPG	36.42 lbs CO2
15.42 miles	2003 Toyota Highlander	City: 20 MPG	Highway: 24.5 MPG	134.44 lbs CO2
16.37 miles	2004 Chevrolet Aveo	City: 27 MPG	Highway: 35 MPG	256.11 lbs CO2

32.98 miles	2002 Toyota Corolla	City: 32 MPG	Highway: 41 MPG	175.29 lbs CO2
2.36 miles	2000 Volkswagen Passat	City: 20.5 MPG	Highway: 27.5 MPG	19.07 lbs CO2
21.05 miles	2008 Toyota Prius	City: 48 MPG	Highway: 45 MPG	87.61 lbs CO2
4.1 miles	2005 Volkswagen Jetta	City: 22.5 MPG	Highway: 30 MPG	30.3 lbs CO2
7.27 miles	2003 Ford Escape	City: 20.5 MPG	Highway: 25.5 MPG	61.32 lbs CO2
16.71 miles	1999 Hyundai Sonata	City: 20.5 MPG	Highway: 29.5 MPG	129.66 lbs CO2
13 miles	2006 Volkswagen Jetta	City: 23 MPG	Highway: 31 MPG	97 lbs CO2
43.52 miles	2007 Saturn Ion	City: 26 MPG	Highway: 35 MPG	276.81 lbs CO2
10.9 miles	1999 Plymouth Minivan	City: 19 MPG	Highway: 25 MPG	96.11 lbs CO2
26.5 miles	2007 Toyota Corolla	City: 32 MPG	Highway: 41 MPG	144.41 lbs CO2
18.1 miles	2001 Ford Focus	City: 26 MPG	Highway: 33.5 MPG	118.03 lbs CO2
26.7 miles	2002 Buick Century	City: 20 MPG	Highway: 29 MPG	211.42 lbs CO2
3.5 miles	2006 Toyota RAV4	City: 22.5 MPG	Highway: 29 MPG	24.46 lbs CO2
32.1 miles	2001 Nissan Sentra	City: 25.5 MPG	Highway: 33 MPG	212.9 lbs CO2
45.29	2006 Toyota Tacoma	City: 18 MPG	Highway: 23.5 MPG	423.43 lbs CO2
10.74 miles	2006 Honda Accord	City: 23 MPG	Highway: 31.5 MPG	76.46 lbs CO2

15.1 miles	2000 Honda Civic	City: 31 MPG	Highway: 38.5 MPG	84.29 lbs CO2
1.74 miles	Bike			
2 miles	Bike			
3.3 miles	2004 Honda Accord	City: 23 MPG	Highway: 32 MPG	23.07 lbs CO2
<b>TOTAL</b>				<b>1.56 tons CO2 per week</b>

a week. Using the information given, we calculated each car's average city and highway miles per gallon (Car's Direct). The average commute is 18.02 miles, which is a little below the average city miles per gallon for their cars. This means, every day the commute to and from work is 36.04, which is a little above the average highway miles per gallon for their cars (A-1). After getting the average, we multiplied that number by 19.4 lbs of CO2 per gallon. Using this information, we are able to calculate the exact amount of pounds of carbon dioxide each of their cars put into the atmosphere on their daily commute to work each day. After calculating each car's CO2 emission, we simply multiplied by 5 to get the weekly total, and then multiplied by 4 to get the monthly total. Therefore, Salve Regina library staff release 1.56 tons CO2 per week just to get to work and back home.

RIPTA offers transportation to and from Salve Regina University. According to the RIPTA website ([www.ripta.com](http://www.ripta.com)), on weekdays the bus will usually arrive at 7:41 AM at Ochre Court. Buses will arrive every twenty minutes after the first inbound bus, according to the schedule. Furthermore, buses departing Salve Regina on the weekdays start at 7:51 AM.

Transport via RIPTA on Aquidneck Island

According to the data, seven staff members live on Aquidneck Island: one in Newport, four in Middletown, and three in Portsmouth. The Newport Gateway Visitor's Center on America's Cup Ave in Newport is the only park and ride on Aquidneck Island. According to RIPTA, the most direct route for the resident in Newport is the 67 line which is the same line that stops at Ochre Court. For the four staff members living in Middletown, the most convenient route is the 60 line (interchanging to the 67 line is necessary) The 60 line runs the length of route 114

(another bus on the same line runs the length of RT-138 also with both arriving at the same destination) is also the recommended travel line for those living in Portsmouth. Moreover, the 60 line is the only bus line that runs for the remaining staff members living in the east bay area.

#### Transport via RIPTA in Washington County

For the staff members living in Washington County except for Westerly, the 14 line can be taken from Narragansett at the Stop & Shop near route 1A and in North Kingstown at the park and ride next to the Hess Station on Route 1A. Additionally, the same line stops in Jamestown on Route 138 before the Newport Bridge. In Westerly the 204 Flex line will go Narragansett, interchanging with the 14 line.

#### Transport via RIPTA in other areas of RI and MA

The remaining staff members live in the west bay area and inland: one in Coventry, one in Cranston, one in Johnston, one in North Scituate, and one in Warwick. There are no park and rides located in Coventry; however there is one located in Warwick at the corner of RT-117 and I-95 near Apponaug. Furthermore, there is one park and ride in Cranston behind the post office at Garden City in Cranston which provides service on the 13 line to Kennedy Plaza in Providence (interchanging to the 60 line is necessary). In Johnston, there is no park and ride; however, the most accessible line for the staff member who lives there is the 28 line which interchanges at Kennedy Plaza. There is one park and ride located in North Scituate on the corner of RT-6 and RT-102 at the Chopmist Fire Station. This park and ride provides service on the 10 line which interchanges at Kennedy Plaza.

#### **Discussion:**

“In keeping with the traditions of the Sisters of Mercy, and recognizing that all people are stewards of God’s creation, the University encourages students to work for a world that is harmonious, just and merciful” (Salve Regina’s Mission Statement). Not only students, but staff members as well must work for a common goal. This goal is to protect our environment. As previously stated, carbon dioxide emissions are a major cause to the global warming problem today. The Campus Environmental Sustainability Program says that “Salve will support the concepts of sustainability in its curriculum, research, and related activities, preparing all members of the community to contribute to an environmentally sound and socially just society.” It is our job as members of the Salve Community to strive to reach this goal.

“Aside from the overriding need to stabilize atmospheric CO2 levels, there are several other compelling reasons for countries everywhere to restructure their transport systems, including the need to prepare for falling oil production, to alleviate traffic congestion, and to reduce air pollution” (Brown). He says that our current transport system is not likely to be viable over the long term. The issue of transportation is a continuing problem; with three cars to every four people, we need to recognize the issue and act before we either run out of oil or destroy our planet with carbon emissions.

Few can argue that mass transit in the United States needs improvement. Compared to Europe, the United States lags far behind in terms of availability and utilization of mass transit. There are many factors why Europe's public transportation system is superior, namely the smaller geographic area, higher population density, and higher fuel prices. Also, the suburban sprawl developed in the last 50 years has made mass transit impractical, but not entirely defunct (Burchell, Mukherji 16-21). Nevertheless, mass transit is an important component for achieving energy independence and combating global climate change. According to scholars, “the choice for public transportation is attractive from a collective long-term perspective because public transportation produces fewer waste materials that threaten the quality of our environment relative to cars” (Van Vugt, Meerteens, Van Lange 260). Notwithstanding the state of mass transit in the United States, the Rhode Island Public Transportation Authority (RIPTA) provides efficient service available to the public.

Another aspect of transportation cost to the library is the HELIN system. This system allows students access to thousands of books all over Rhode Island. The HELIN service at Salve is subcontracted out to a local Newport woman who drives her own Dodge Caravan. The carbon cost of this system can be reduced if this woman converts to a Ford Escape and decreases the trips she makes to Salve (Appendix F).

### **Recommendations:**

“Transportation vehicles are the single largest contributors to CO2 and other greenhouse emissions. The type of car and the fuel efficiency of your car can have a big impact on global warming (Rideshare).” Not only is commuting extremely expensive, it is also a hassle and has severe environmental impacts. On a global scale, commuting contributes to air pollution, global warming, and traffic congestion. It is obvious the effects of commuting to the environment. What is not so obvious is that the power is in our hands. There are many ways the library staff can lower its carbon output. Some of these methods are walking, biking, taking public transportation,

telecommuting, or carpooling. The map shows the locations of the staff members. Those who live further away could pick up someone living closer as a way to save money and the environment (A-2).

Nevertheless, riding public transportation may not be the most convenient method; however, it is more socially conscious and environmentally friendly. Furthermore, utilizing mass transit may be more expensive for many Rhode Islanders insofar as they will potentially spend less money on gas per month (depending on fuel economy). Hopefully in coming years more incentives for riding RIPTA will be available, such as tax breaks and low cost monthly and annual bus passes. Notwithstanding, RIPTA still may be a good choice for some. Riding the bus can take longer than driving, but more time can be spent while on the bus dedicated to other tasks (such as reading or watching a video on an I-pod). For the staff's convenience, we have, to the best of our ability, plotted their homes along RIPTA routes (A-3). In the end, RIPTA services can be improved, but they are still efficient and available to Rhode Islanders.

There are a small percentage of faculty members who have a commute of over 30 miles one way. For them, the commute is extremely tiring. John Lewis brings up a very interesting point of the option of telecommuting. Specifically, the basic requirements for his job are a phone and an internet connection. He and many others could very possibly do their job from home as well. "The option to telecommute even just one day a week would be not only good for the environment but also good for me as an employee" (Lewis). Given the technology today, this is a great solution. Skype is an application that allows users to make telephone calls over the internet free of charge. Additional features include instant messaging, file transfer, and video conferencing (Skype.com). Having this as an option for faculty would make life much easier and more environmentally efficient.



## Works Cited

- "12 Things YOU Can Do to Reduce Global Warming Pollution from Transportation." 2009. Transportation Choice Coalition. 10 Apr. 2009  
<<http://www.transportationchoices.org/Top12ThingsYOUCanDo.asp>>.
- Brown, Lester R. Plan B 3.0: Mobilizing to Save Civilization. Earth Policy Institute, 2008
- Burchell, R.W., Mukherji, S "Costs of sprawl 2000." TR News , no. 229, pp. 16-21. Nov.-  
Dec.2004  
  
<<http://md1.csa.com/partners/viewrecord.php?requester=gs&collection=TRD&recid=200404350118CE&q=Benefits+of+Mass+transit&uid=1294269&setcookie=yes>>
- Car Research. 2009. Car's Direct. 10 Apr. 2009 <<http://www.carsdirect.com/research/model-year?make=SA&modelid=2389&year=2007>>.
- Cunningham, William P., and Mary Ann Cunningham. Principles of Environmental Science.  
New York: McGraw-Hill Companies Inc., 2009.
- Eco Aid. 2008. 10 Apr. 2009 <<http://www.ecoaidnow.com/Learn.aspx>>.
- Lewis, John. "Library Project." E-mail to the author. 5 Mar. 2009.
- Pisarski, Alan. "Commuting In America III." Commuting Facts. 16 Oct. 1996. 17 Apr. 2009  
<<http://onlinepubs.trb.org/onlinepubs/nchrp/CIAIIIfacts.pdf>>.
- Rice, Doyle. "Study looks at transportation's effects on global warming." Weather & Climate Science. 8 Jan. 2008. USA Today. 10 Apr. 2009  
<[http://www.usatoday.com/weather/climate/globalwarming/2008-01-08-transportation-co2\\_N.htm](http://www.usatoday.com/weather/climate/globalwarming/2008-01-08-transportation-co2_N.htm)>.
- Rhode Island Public Transportation Authority. "Rhode Island System Map." 17 APR 2009.  
<http://www.ripta.com/content1306.html>
- Skype. 2009. 17 Apr. 2009 <<http://skype.com/useskype/>>.
- Van Vugt, Mark, Ree Meerteens, Paul Van Lange. "Car Versus Public Transportation? The Role of Social Value Orientations in Real-Life Social Dilemma." Journal of Applied Social Psychology 25 MAR. 1995 <<http://www.kent.ac.uk/psychology/departement/people/van-vugtm/personal/publications/JASP1995Pdf.pdf>>