

**COUNTY OF SAN MATEO**

**INTERDEPARTMENTAL CORRESPONDENCE**

**DATE:** March 18, 2010

**TO:** Jim Porter, Director of Public Works

**FROM:** Tom Huening, Controller

**SUBJECT: Follow-up Audit Report – Vehicle and Equipment Services of the  
Department of Public Works: Compact Vehicle Analysis**

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Attached is the follow-up report on the audit of the Vehicle and Equipment Services of the Department of Public Works dated March 17, 2004. This report addresses one of the audit recommendations to upgrade the compact class to hybrid vehicles.

We appreciate the proactive effort by your management and staff in addressing the concerns raised in our audit and the opportunity to work with them in improving processes that provide management increased assurance regarding the achievement of the County's and the program's financial and operational goals and objectives.

cc: Robert Radcliffe, Manager, Vehicle and Equipment Services  
David Boesch, County Manager/Clerk of the Board of Supervisors (6)  
Charlene Kresevich, Superior Court (Civil Grand Jury)

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# **VEHICLE AND EQUIPMENT SERVICES**

## **COMPACT VEHICLE ANALYSIS HYBRID v NON-HYBRID**

**January 2010**



**Controller's Office  
Audit Division**

**Vehicle and Equipment Services  
Compact Vehicle Analysis – Hybrid v Non-hybrid**

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**Vehicle and Equipment Services**  
**Compact Vehicle Analysis – Hybrid v Non-hybrid**

**Executive Summary**

The Audit Division performed an operational review of the Vehicle and Equipment Services of the Department of Public Works and issued a report in March 2004 that included several recommendations. A follow-up audit report on the status of the recommendations was issued in August 2005. In August 2009, the Civil Grand Jury requested these reports as part of its review, in response to which the Audit Division performed a quick follow-up review so as to provide current information on the recommendations. The major issue arising from the follow-up review was the long-term cost implications of replacing conventional compact vehicles in the fleet by hybrids that have continually become more expensive over time, while the ownership costs of the conventional or non-hybrid compact vehicles being replaced have decreased significantly over time. This report discusses our analysis on this issue. The scope of the analysis focuses only on compact vehicles since there are a large number of fleet vehicles in this class, and hybrids are not as readily available for other vehicle classes.

<b>Compact Vehicles Fleet</b>				
Description	Type <sup>1</sup>	Current Fleet		FY03-04
		Meets New Policy	Count	Count
Honda Civic	H	Y	65	0
Toyota Prius	H	Y	52	5
Total Hybrids			117	5
Other	C	N	55	139
			172	144

<sup>1</sup>Type: H - Hybrid; C – Conventional

As shown on the adjacent table on compact vehicles fleet, at the time of our operational review in 2004, virtually all of the compact vehicles fleet comprised of non-hybrid or conventional vehicles. In our 2004 review, the analysis showed that a hybrid (2003 Toyota Prius) was less expensive to operate and maintain than a conventional vehicle (2003 Ford Focus). At the time of that review, the maintenance, fuel, and resale advantages of a hybrid offset its higher initial purchase cost giving it an overall ownership cost advantage of \$1,830 over a similar conventional vehicle.

<b>7-Year Ownership Cost</b>			
	Current	2004	Change
Toyota Prius Hybrid	\$28,431	\$26,954	\$ 1,477
Ford Focus	23,939	28,784	(4,845)
Hybrid Cost Over/(Under)	\$4,492	(\$1,830)	\$ 6,322
<b>Likely cost savings: \$231,000 to \$297,000</b> <i>- replacing 50 non-hybrids due for replacement by selected non-hybrids instead hybrids</i>			

An update to this analysis comparing the same vehicle models shows that the cost advantage is no longer applicable. It now shows a lower cost of ownership of about \$4,500 for a Ford Focus compared to a Toyota Prius Hybrid. While the ownership cost of the Prius has increased by about \$1,500, the ownership cost of the Focus has actually decreased by about \$4,800. The decrease in the ownership cost of the Focus is mainly due to

a significant decrease in maintenance cost of the newer model. We included several conventional compacts in addition to the Ford Focus in our analysis and noted that, on average, the 7-year ownership cost of the selected conventional compacts is about \$5,600 less than that of the hybrids in the current fleet.

The current County policy, effective since September 9, 2008, requires purchase of hybrid or other fuel-efficient vehicles with a minimum of 30 combined street and highway miles per gallon whenever possible. Exceptions are allowed only in special cases and the requesting department has to adequately justify buying a non-hybrid.

For the purposes of this comparative analysis we considered the following factors - compliance with current policy, ownership life cycle cost, miles per gallon, reliability, and emissions. During our review we noted correspondence indicating that buying American may also be an issue. We noted that




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historically public agencies have considered or adopted policies with requirements to purchase from American auto companies.

The table below summarizes the data for the current hybrids in the fleet and two compacts selected from our sample, one American and the other foreign-made that best meet the criteria mentioned above.

**Summary of findings**

<b>Summary - Comparing Compact Vehicles' Data: Current Hybrids and Selected Alternatives</b>										
Vehicle	Made in	Com- bined MPG <sup>1</sup>	Meets Policy (Y/N)	Relia- bility <sup>2</sup>	7-Year Ownership Data					
					Emissions		Owner- -ship Net Cost	Cost savings		
					Green- house Gases (in tons)	Smog (in grams)		Per Unit	Total (50 Units) <sup>3</sup>	
Current Hybrids in Fleet <sup>4</sup>    <b>Alternatives</b>  2010 Toyota Yaris    2010 Ford Focus  	Japan	46	Y	4.5 <sup>5</sup>	6.2	1,688	28,564	-	-	
2010 Toyota Yaris	Japan	31	Y	3.5 <sup>5</sup>	13.7	7,044	22,624	5,940	297,000	
2010 Ford Focus	US	28	N	3.5	16.1	1,688	23,939	4,625	231,250	

<sup>1</sup>Combined Street/Highway Mileage

<sup>2</sup>JD Power predicted reliability score out of a maximum score of 5.

<sup>3</sup>There are 50 conventional compacts in the fleet that will be replaced in the near future.

<sup>4</sup>The data for Current Hybrids in Fleet is based on the average for 2010 Toyota Prius & 2010 Honda Civic Hybrids.

<sup>5</sup> Per media reports on February 9, 2010, Toyota would recall its 2010 Prius hybrid model to fix a glitch in the braking system. At the time of writing this report, the Yaris was not affected by the recent recalls made by Toyota.

As depicted in the table, the current hybrids get impressive miles per gallon, with high reliability rating and very low emissions. However, the net ownership cost of the hybrids is significantly higher than that of non-hybrids. The reliability rating for one of the current hybrids included in our review, Toyota Prius, may be adversely affected since at the time of writing this report media reports stated that Toyota would recall the 2010 model to fix a glitch in the braking system.

The non-hybrid compact in our sample that meets the current policy requirement on miles per gallon and has the highest potential cost savings is the 2010 Toyota Yaris. Based on current estimates, the cost savings from replacing non-hybrids in the fleet by Yaris would be about \$5,940 per unit or \$297,000 for all the 50 non-hybrids in the fleet that are due for replacement in the near future. Yaris does have significantly higher emissions of greenhouse gases and smog when compared to the hybrids. The cost to the County of lowered emissions from hybrids is considered later in the report.

Of the American-made compacts, the 2010 Ford Focus best meets the selection criteria used in our analysis though it achieves only 28 miles per gallon (mpg) that is lower than the 30 mpg required by the current policy. When compared to Yaris, Focus has the same reliability rating but higher

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greenhouse gas emissions. The Focus compares very favorably with respect to smog emission, which is very low and same as the hybrids. The ownership cost of the Focus is about \$4,625 lower than the hybrids but about \$1,315 higher than Yaris. Based on current estimates the total cost savings from replacing a non-hybrid in the fleet by a Focus would be about \$231,000 if the savings rate is applied to all 50 non-hybrids in the fleet that are due for replacement in the near future.

***Recommendation 1:***

Since the lifecycle ownership costs of vehicles are affected by various factors that change over time, we recommend that the Department of Public Works perform an appropriate comparative analysis on a regular basis to ensure that vehicles purchased not only meet policy but also maximize cost savings. Department personnel who manage the County fleet should use their knowledge and expertise to include in the analysis vehicle models suitable for the fleet and cost estimates that replicate actual experience.

***Recommendation 2:***

In view of the County's structural deficit and taking in to account government's general preference towards buying from American auto companies, we recommend that the Department of Public Works and County management take immediate appropriate actions to effect a policy change that includes preference for American cars in addition to cost and environmental factors. Based on our analysis Ford Focus would meet the requirements of such a policy.

## **Vehicle and Equipment Services**

### **Compact Vehicle Analysis – Hybrid v Non-hybrid**

#### **Background Information**

Vehicle and Equipment Services is part of the Road Services Division of the Department of Public Works. The Road Services Division consists of three sections, Road Maintenance (Bayside and Coastside), Road Operations and Vehicle and Equipment Services.

Vehicle and Equipment Services (VES) is responsible for the purchase, maintenance, repair and replacement of road equipment and motor vehicles. There were 684 vehicles in the fleet as of January 2010. VES also manages lease agreement with user departments; services and repairs generators and pumps; and provides project management services. VES has 25 full-time employees that comprise of a Vehicle and Equipment Manager, two Auto Mechanic Supervisors, a Lead Equipment Mechanic, a Management Analyst, and a number of mechanics, service and utility workers, and support staff. Core work activities include preventive maintenance, scheduled and unscheduled repairs, regulatory inspections, parts fabrication and modification, heavy equipment training for users, installation of new equipment and parts management.

VES is not funded by the General Fund and therefore has no net county cost. Its operations are fully funded by revenue from other departments receiving services from the unit.

#### **Purpose and Scope**

The Audit Division follows up on recommendations made in prior audits to ascertain the progress made towards their implementation and where necessary, assist departments in the implementation process.

This follow-up was performed in response to the Civil Grand Jury's request for information on prior Vehicle and Equipment Services audits. As noted in the executive summary the major issue in this follow-up review is the long-term cost implications of replacing conventional compact vehicles in the fleet by hybrids that have continually become more expensive over time while the ownership costs of the conventional or non-hybrids being replaced have decreased significantly overtime. The scope of the review focuses only on compact vehicles since there are a large number of fleet vehicles in this class, and hybrids are not as readily available for other vehicle classes.

We reviewed the ownership life cycle cost, miles per gallon, reliability, and emissions data for compacts available in the market and selected those that showed significant cost savings when compared to the hybrids currently in the fleet. We included compact hybrids that are currently not in the fleet in our review but excluded them from further analysis since their ownership costs were higher than those of the hybrids in the fleet.

We included the 2010 model of six non-hybrid compacts - three American and three foreign brands in our sample, for comparative analysis:

#### Current hybrids in the fleet-

Preferred vehicles in the current fleet - foreign brands:

- Honda Civic
- Toyota Prius

#### Non-hybrids selected for comparative analysis -

Previously preferred vehicle - American:

- Ford Focus

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Other American brands:

- Chevrolet Aveo
- Chevrolet Cobalt

Foreign brands:

- Honda Fit
- Nissan Versa
- Toyota Yaris

### **Current Policy**

The Board of Supervisors Resolution No. 069650, approved on September 9, 2008, directs Public Works to purchase hybrid or other fuel-efficient vehicles with a minimum 30 miles per gallon whenever possible. Other fuel-efficient vehicles are defined as Ultra Low Emissions Vehicle (ULEV), Partial Zero Emissions Vehicle (PZEV) or Zero Emissions Vehicle (ZEV). Purchase of non-hybrids or other fuel-efficient vehicles are only allowed if justified by the requesting department or if no hybrid models exist for the type of vehicle requested. In determining the types of vehicles to purchase, the department evaluates fuel efficiency, the need of the users, types of vehicles available, whether hybrids are available and purchase price.

### **Ownership or Life-cycle Costs**

We used 7-year ownership costs of vehicles in our analysis since the replacement criteria for a County compact vehicle is 7 years (or 100,000 miles). Each vehicle analyzed is the base model with a minimum of the following features: 4-doors, automatic transmission, power steering, anti-lock brakes, air-conditioner, airbag and audio system. The cost data came from Edmunds.com's "True Cost to Own" feature, which estimates purchase price, rebates, taxes & fees, fuel, maintenance, repairs and salvage value. The costs were adjusted for regional areas based on zip code (94063 was used).

Since Edmunds.com provided five-year estimates based on 15,000 miles per year, years six and seven data were projections that followed historical growth patterns. Fuel costs were adjusted downwards to 10,000 miles a year to better reflect the County's compact fleet usage. Insurance was excluded from ownership cost as the County self-insures its vehicles and assigns the same fixed amount regardless of make, model, or vehicle type. To get the net present value, a discount rate of 3% was used in the analysis.

### **American and Foreign Vehicle Selection**

During the review we noted correspondence that discussed an email from a former Assemblyman to the Board of Supervisors contending the need to change the vehicle purchasing policy to buy only American cars, specifically GM, Ford, or Chrysler. We also came across a recent letter from the former Assemblyman in the local media (see Appendix 2) where he mentioned that historically, public agencies had explicit or implicit requirements to purchase from American auto companies. He also contended that buying foreign-make cars have their profits flow overseas, contributing to the balance of trade deficit. We have included the 'American v foreign' issue in our cost analysis.

The tables on the next page summarize the pertinent data relating to the selected vehicles.



## Vehicle and Equipment Services Compact Vehicle Analysis – Hybrid v Non-hybrid

**Table 1: Summary – ‘Made in’, Reliability and 7-Yr Emissions & Cost Data**

Vehicle	Made in	Com-bined MPG <sup>1</sup>	Meets Policy (Y/N)	Relia-bility <sup>2</sup>	7-Year Ownership Data				
					Emissions		Owner-ship Net Cost	Est'd Cost savings	
					Greenhse Gases	Smog		Per Unit	Total (50 Units) <sup>3</sup>
					(tons)	(grams)			
Current Hybrids in Fleet Alternatives	Japan	46	Y	4.5	6.2	1687	\$28,564	\$ -	\$ -
2010 Honda Fit	Japan	31	Y	4.0	16.1	7042	23,020	5,544	277,200
2010 Nissan Versa	Mexico	28	N	2.5	16.1	7042	22,039	6,525	326,250
2010 Toyota Yaris	Japan	31	Y	3.5	13.7	7042	22,624	5,940	297,000
2010 Chevrolet Aveo	Mexico	30	Y	2.0	18.6	6195	26,406	2,158	107,900
2010 Chevrolet Cobalt	US	30	Y	3.5	18.6	9016	24,624	3,940	197,000
2010 Ford Focus	US	28	N	3.5	16.1	1687	23,939	4,625	231,250

<sup>1</sup>Combined Street/Highway Mileage  
<sup>2</sup>JD Power predicted reliability score out of a maximum score of 5.  
<sup>3</sup>There are 50 conventional compacts in the fleet that will be replaced in the near future.

**Table 2: Summary - Emissions & Cost Data**

Vehicle	Com-bined MPG <sup>1</sup>	Meets Policy <sup>2</sup> (Y/N)	7-Year Ownership Data <sup>3</sup>			Alternat-ives' Cost Under/ (over)	Increase in Emissions		Cost of Reduction in Emissions utilizing Current Hybrids <sup>4</sup>	
			Grnhse Gases	Smog	Cost		Grnhse Gases	Smog	Grnhse Gas (per ton)	Smog (per gram)
			(tons)	(grams)			(tons)	(grams)		
Current Hybrids in Fleet Alternatives	46	Y	6.2	1,687	\$28,564	\$0	-	-	-	-
2010 Honda Fit	31	Y	16.1	7,042	23,020	5,544	9.9	5,355	\$558.12	\$1.04
2010 Nissan Versa	28	N	16.1	7,042	22,039	6,525	9.9	5,355	656.87	1.22
2010 Toyota Yaris	31	Y	13.7	7,042	22,624	5,940	7.5	5,355	797.31	1.11
2010 Chevrolet Aveo	30	Y	18.6	6,195	26,406	2,158	12.4	4,508	173.80	0.48
2010 Chevrolet Cobalt	30	Y	18.6	9,016	24,624	3,940	12.4	7,329	317.31	0.54
2010 Ford Focus	28	N	16.1	1,687	23,939	4,625	9.9	-	465.60	-
<b>Estimated current market price of one Carbon Credit</b>									<b>\$ 12.25 per ton</b>	

<sup>1</sup>Combined Street/Highway Mileage  
<sup>2</sup>Minimum 30 MPG per BOS Resolution No. 069650, approved 9/9/08  
<sup>3</sup>Emissions data is from the California Air Resources Board; The ownership cost data is from Edmunds.com  
<sup>4</sup>Toyota Prius & Honda Civic hybrids preferred under the current policy have lower emissions but higher costs. We divided the increase in emissions by the incremental cost to determine the per unit cost of benefit (lower emissions). The estimated current 'market value' of one carbon credit (\$12.25 per ton) is provided for comparison.

Overall, Nissan Versa has the highest cost savings potential, at \$6,500 per unit. However, it does not meet the miles-per-gallon (mpg) criteria per current policy and has a significantly lower reliability rating and higher greenhouse gases emissions than the compact with overall second highest cost savings potential or \$5,940 per unit, Toyota Yaris. The Yaris also meets the mpg criteria. The Yaris is made in Japan.

Of the American-made compacts in the sample, Ford Focus has the highest cost savings potential. Ford Focus does not meet the mpg criteria per current policy but otherwise beats or equals other American

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brand compacts in reliability and low emissions factors. In fact, the Focus’s smog emissions are same as a hybrid and the lowest of all the non-hybrids or alternatives we reviewed.

We selected the 2010 Ford Focus and 2010 Toyota Yaris for further analysis. This selection was made after comparing ownership cost, mpg, safety, consumer satisfaction and reliability of each vehicle with other vehicles within its group. See Appendices 3 and 4. Appendix 3 provides additional information on the comparison of Ford Focus with other American compacts and includes additional comparative data on safety, consumer satisfaction and reliability ratings. Appendix 4 provides similar information on foreign compacts.

The remainder of the report provides additional comparative data on Toyota Yaris and Ford Focus.

Below is a summary of the comparative data on Toyota Yaris and Ford Focus. These issues are discussed after the summary.

<b><u>Summary: Comparative Data - Toyota Yaris and Ford Focus</u></b>			
	<b>2010 Ford Focus</b>	<b>2010 Toyota Yaris</b>	<b>Advantage</b>
American v Foreign	American	Foreign	2010 Ford Focus
Cost (Seven-Year Ownership)	\$23,939	\$22,624	2010 Toyota Yaris
Miles per Gallon	28 mpg	31 mpg	2010 Toyota Yaris
Board Resolution 069650	Does Not Qualify	Qualifies	2010 Toyota Yaris
Safety (Frontal/Side)	Good/Acceptable	Good/Good	2010 Toyota Yaris
Consumer Satisfaction Rating	9.1 out of 10	9.4 out of 10	2010 Toyota Yaris
Reliability (Quality/ Performance & Design/Reliability)	3.5 / 3/ 3.5	3.5 / 2.5 / 3.5	2010 Ford Focus
Emissions (Seven-Year Ownership)			
- Greenhouse Gases	16.1 tons	13.7 tons	2010 Toyota Yaris
- Smog	1,687 grams	7,042 grams	2010 Ford Focus

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**7-Year Ownership Cost Comparison**

Based on the analysis below, the 2010 Ford Focus costs \$1,315 more than the 2010 Toyota Yaris over a seven-year ownership cost per vehicle. The data for this analysis is based on information from edmunds.com.

<b>Net Present Value of 7-Year Cost of Ownership Totals</b>			
	<u>2010 Ford Focus</u>	<u>2010 Toyota Yaris</u>	<u>Variance</u>
Purchase	\$ 16,813	\$ 14,819	\$ 1,994
Taxes & Fees	\$ 506	\$ 462	\$ 44
Fuel	\$ 6,712	\$ 6,060	\$ 652
Maintenance	\$ 2,419	\$ 4,233	\$ (1,814)
Repairs	\$ 2,108	\$ 1,842	\$ 266
Salvage	\$ (4,620)	\$ (4,792)	\$ 172
<b>Net Present Value</b>	<b>\$ 23,939</b>	<b>\$ 22,624</b>	<b>\$ 1,315</b>

Additional details are in Appendices 3 and 4

The main driver of the cost is purchase price, where the Yaris has a \$1,994 advantage. The Yaris has a cost advantage in every category except for maintenance cost.

**Miles Per Gallon**

The miles per gallon rating on the Yaris is higher with 31 combined street and highway mpg (vs. 28 for the Focus). Unlike the Focus, the Yaris complies with the current board resolution of purchasing vehicles with a minimum mpg of 30.

**Safety**

The Insurance Institute for Highway Safety (IIHS) designed a vehicle rating system with “Good” (highest rating), “Acceptable,” “Marginal,” and “Poor” (lowest rating). The National Highway Traffic Safety Administration (NHTSA) rating system ranges from one to five stars (with five stars as best).

Overall Toyota Yaris has the best rating among the foreign brands reviewed and Ford Focus has the best rating among the American brands reviewed. See Appendices 3 and 4.

When compared to each other, under the IIHS rating system the Focus test results are “Good” for frontal impact and “Acceptable” for side impact. The Yaris was rated “Good” for both frontal and side impacts. Under the NHTSA rating system Focus and Yaris both received the same number of stars for passenger (4 stars), side impact front (5 stars), and rollover (4 stars) ratings. The differences were in side impact rear rating where the Focus is rated higher (4 stars compared to 3 for Yaris) and in driver safety rating where the Yaris is rated higher (5 stars compared to 4 for Focus).

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**Consumer Satisfaction Rating**

While both vehicles have a high consumer satisfaction rating, the Yaris is rated higher at 9.4 (out of 10) versus 9.1 for the Focus. The consumer satisfaction rating is the overall score based on eight categories: performance, comfort, fuel economy, fun-to-drive, interior design, exterior design, build quality and reliability.

**Quality, Performance/Design, and Reliability**

<b>Car Rating Scores</b>		
	<b>2010 Ford Focus</b>	<b>2010 Toyota Yaris</b>
<b>Overall Initial Quality</b>	3.5	3.5
<b>Overall Performance &amp; Design</b>	3	2.5
<b>Predicted Reliability</b>	3.5	3.5

5 - among the best, 4 – better than most, 3 – does not really stand out, 2 - the rest  
(source: JD Power)

The Yaris and the Focus have identical Initial Quality and Predicted Reliability scores. The Initial Quality looks at owner-reported problems in the first 90 days of new-vehicle ownership. This score is based on problems that have caused a complete breakdown or malfunction, or where controls or features may work as designed, but are difficult to use or understand. The Predicted Reliability is derived from historical trending for a vehicle and/or manufacturer in Initial Quality and Vehicle Dependability Studies. Predicted Reliability is a forecast of how reliable a newer vehicle might be over time.

The Focus has a slightly higher performance and design score. This measures owner satisfaction with vehicle performance, style, features and instrument panel, and comfort.

**Environmental Impact**

Improving the overall fuel efficiency of the fleet (measured in miles per gallon) and reducing the County’s carbon footprint are performance measures for the Vehicle and Equipment Services (VES) Division. There are generally two types of emissions from cars that impact the environment, greenhouse gases and smog. Greenhouse gases emissions are deemed to impact climate change and smog is a type of air pollution that is deemed harmful to human health.

To improve overall fuel efficiency and reduce emissions VES has replaced older vehicles with hybrids. As discussed above, while hybrids have better fuel efficiency and emit less greenhouse gases and smog, the cost of ownership has risen over the years due to increase in purchase price. The ownership costs of the newer conventional Ford Focus models being replaced, on the other hand, has decreased significantly mostly due to lower maintenance costs.

The table below summarizes the emissions and cost data. It indicates that replacing non-hybrids in the fleet (mostly Ford Focuses) by hybrids have significantly reduced greenhouse gases emissions. Our analysis based on 2010 models of the two vehicle types (current fleet hybrids and Ford Focus) shows a reduction of 9.9 tons per vehicle over a 7-year ownership life cycle. The reduction in greenhouse gases emissions comes at a cost, through the utilization of higher cost hybrids. Based on the data it will cost the

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County \$4,625 to prevent 9.9 tons of greenhouse gases emissions or \$466 per ton. We also compared the smog emissions from hybrids and the Focus. As was noted previously in the report, the smog emission from the non-hybrid Focus is very low and is the same as the hybrids.

In comparison to Ford Focus, Toyota Yaris has lower greenhouse gases emissions but significantly higher smog emissions. While the Yaris meets the current policy on combined mpg, the current hybrids in the fleet still achieve significantly better mpg and reduced emissions. However, since the hybrids cost significantly more than Yaris, the additional cost of reduction in emissions from using current hybrids instead of the Yaris will be about \$800 per ton for greenhouse gases and \$1.11 per gram for smog.

To put the additional per unit cost of emissions into perspective, we compared them to ‘carbon credits’. See below.

<b>Summary - Emissions &amp; Cost Data</b>										
Vehicle	Com- bined MPG <sup>1</sup>	Meets Policy <sup>2</sup> (Y/N)	7-Year Ownership Data <sup>3</sup>			Alternat- ives' Cost Under/ (over)	Increase in Emissions		Cost of Reduction in Emissions utilizing Current Hybrids <sup>4</sup>	
			Green- house Gases (tons)	Smog (grams)	Cost		Grnhse Gases (tons)	Smog (grams)	Grnhse Gas (per ton)	Smog (per gram)
Current Hybrids in Fleet <b>Alternatives</b>	46	Y	6.2	1,687	\$28,564	\$0	-	-	-	-
2010 Toyota Yaris	31	Y	13.7	7,042	22,624	5,940	7.5	5,355	797.31	1.11
2010 Ford Focus	28	N	16.1	1,687	23,939	4,625	9.9	-	465.60	-
<b>Estimated current market price of one Carbon Credit</b>									<b>\$ 12.25 per ton</b>	
<sup>1</sup> Combined Street/Highway Mileage <sup>2</sup> Minimum 30 MPG per BOS Resolution No. 069650, approved 9/9/08 <sup>3</sup> Emissions data is from the California Air Resources Board; The ownership cost data is from Edmunds.com <sup>4</sup> Toyota Prius & Honda Civic hybrids preferred under the current policy have lower emissions but higher costs. We divided increase in emissions by the incremental cost to determine the per unit cost of benefit (lower emissions). The estimated current market value of one carbon credit (\$12.25 per ton) is provided for comparison.										

### Greenhouse Gas and Carbon Credits

Carbon credits can be used to monetize and put the cost of reduced greenhouse gas emissions into perspective.

#### Carbon Credits

Carbon credits are a key component of national and international attempts to mitigate the growth in concentrations of greenhouse gases. One credit is equal to one ton of carbon dioxide. Greenhouse gas emissions are capped and then markets are used to allocate the emissions among the group of regulated sources. The idea is to allow market mechanisms to drive industrial and commercial processes in the direction of low emissions or less "carbon intensive" approaches than are used when there is no cost to emitting carbon dioxide and other greenhouse gases into the atmosphere.

There are two distinct types of Carbon Credits that provide financial support of projects that reduce the emission of greenhouse gases in the short-term or long-term. Carbon Offset Credits (COC's) and Carbon Reduction Credits (CRC's). Carbon Offset Credits consist of clean forms of energy production, wind, solar, hydro and biofuels. Carbon Reduction Credits consists of the collection and storage of Carbon from our atmosphere through biosequestration (reforestation, forestation), ocean and soil collection and storage efforts.

## **Vehicle and Equipment Services**

### **Compact Vehicle Analysis – Hybrid v Non-hybrid**

Based on the average of a few reputable carbon credit providers, the current market price of one carbon credit is approximately \$12.25 per ton. This is a fraction of the cost of reducing emissions utilizing current hybrids, which compute to \$466 per ton when compared to the non-hybrid Ford Focus or \$797 per ton when compared to the non-hybrid Toyota Yaris.

#### **Assumptions and Disclosures**

Seven-year ownership costs were used in this analysis as this is the replacement criteria for County compact vehicles (or 100,000 miles). See Appendix 5-8 for the cash flow analysis of the vehicles reviewed. The cost data came from Edmunds.com's "True Cost to Own" feature (see Appendix 1 for an example), which was adjusted for regional areas based on the 94063 zip code. Since Edmunds only provided five-year estimates based on 15,000 miles per year, year six and seven data were projections from historical growth patterns. Only fuel costs were adjusted down to 10,000 miles a year to better reflect the County's compact fleet usage. Adjusting other categories such as maintenance and repair was not feasible with too many unknown variables. Insurance was disregarded from ownership cost as the County self-insures its vehicles with the same fixed amount for each vehicle. A discount rate of 3% was used in the analysis. The cost data was gathered in January and February 2010 and will change over time. Since the information was limited to data from Edmunds.com, a complete thoroughness cannot be assured since the data could not be confirmed with actuals.

The safety ratings came from the Insurance Institute for Highway Safety (IIHS) and National Highway Traffic Safety Administration (NHTSA) while the automobile ratings, from JD Power and Associates. The Greenhouse Gas Emissions, Smog Scores, Smog Emissions and Emission Certification Standards came from the California Air Resources Board ([www.arb.ca.gov/](http://www.arb.ca.gov/)). Carbon credit estimates from EcobusinessLinks ([www.ecobusinesslinks.com/carbon\\_offset\\_wind\\_credits\\_carbon\\_reduction.htm](http://www.ecobusinesslinks.com/carbon_offset_wind_credits_carbon_reduction.htm)).

Appendix 1 - Edmunds.com True Cost to Own Feature Page

2010 Toyota Prius True Cost to Own ratings at Edmunds - Microsoft Internet Explorer


Address: http://www.edmunds.com/new/2010/toyota/prius/101161780/cto.html

Welcome, Guest | SIGN IN | JOIN | Connect with Facebook | Edmunds.com | Inside Line | CarSpa

edmunds.com where smart car buyers start

HOME NEW CARS CERTIFIED CARS USED CARS CAR REVIEWS TIPS & ADVICE CAR LOANS AUTO

Toyota Prius 2010



### 2010 Toyota Prius True Cost to Own

**Style:** II 4dr Hatchback (1.8L 4cyl gas/electric hybrid CVT) | [Show All Styles](#)

**MSRP:** From \$22,400 | [Price with Options](#) | [View Inventory](#) <sup>NEW</sup>

[Photos](#) [Videos](#)

Sponsored Links: [Build & Price a 2009 Toyota Prius](#)

[Pricing](#) [Reviews & Specs](#) [Photos & Videos](#) [Inventory](#) [Quick](#)

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**Buyer Resources**

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- [Incentives & Rebates](#)
- [Price with Options](#)
- [Get A Free Price Quote](#)
- [Estimated Payments](#)
- [Dealer Inventory](#)
- [Resale Values](#)
- True Cost to Own**

**Premier Dealers**

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**Vehicle Details**

[Summary](#)

[Available Features](#)

[Standard Warranty](#)

[Safety](#)

[Colors](#)

[Specs](#)

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[Get Additional True Cost to Own Information](#)

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[Find a Local Toyota Dealer](#) [Auto Loans as low as 4.99% APR](#)  
[Free Insurance Quote](#)

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**Summary**

True Cost to Own <sup>®</sup> *	\$38,727 <a href="#">view details</a>
Total Cash Price	\$25,415 <a href="#">view details</a>
Average Cost per Mile <sup>†</sup>	\$0.52 <a href="#">compare popular models</a>

**True Cost to Own<sup>®</sup> Ratings<sup>\*\*</sup>**

[operating cost rating](#)      [depreciation cost rating](#)

0 ———— 10      0 ———— 10

\* This is a 5-year estimate (based on 15,000 miles per year).  
\*\* Ratings are based on a comparison of this vehicle to all new vehicles. Rating scale is 0 to 10 where 10 is best.

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Based on regional costs for Zip Code:  [Change](#)

**True Cost to Own<sup>®</sup>**

	Year 1	Year 2	Year 3	Year 4	Year 5	5-yr Total
<a href="#">Depreciation</a>	\$3,780	\$2,336	\$2,054	\$1,822	\$1,634	\$11,626
<a href="#">Taxes &amp; Fees</a>	\$2,265	\$156	\$141	\$127	\$116	\$2,805
<a href="#">Fuel</a>	\$768	\$791	\$815	\$839	\$864	\$4,077
<a href="#">Maintenance</a>	\$533	\$834	\$745	\$1,086	\$1,880	\$5,078
<a href="#">Repairs</a>	\$0	\$0	\$111	\$269	\$393	\$773
<a href="#">Tax Credit</a>	\$0	\$0	\$0	\$0	\$0	\$0
<a href="#">Financing</a>	\$1,566	\$1,265	\$940	\$591	\$214	\$4,576
<a href="#">Get Pre-Approved Financing--Apply for a Car Loan</a>						
<a href="#">Insurance</a>	\$1,826	\$1,890	\$1,956	\$2,025	\$2,095	\$9,792
<a href="#">Compare Insurance Rates</a>						
<b>Yearly Totals</b>	<b>\$10,738</b>	<b>\$7,272</b>	<b>\$6,762</b>	<b>\$6,759</b>	<b>\$7,196</b>	<b>\$38,727</b>

## Appendix 2 – Letter to the Editor from Gene Mullin

# THE DAILY JOURNAL

San Mateo County's homepage

**December 1, 2009**

### **Another reason to buy American**

Editor,

I note that Toyota has recently issued a recall for over four million of its various models, including the exceedingly popular Prius, the best selling hybrid in the United States. While I have no particular concern about a foreign company's car being the auto of choice for many of our environmentally and economically conscious residents, I do draw the line about our tax dollars being spent by public agencies to purchase these cars.

Historically, public agencies had explicit or implicit requirements that American auto companies, specifically the Big Three of GM, Ford or Chrysler, would be the choice for vehicles. That was certainly the standard for the over 60,000 autos purchased by the state of California, and for all the cities, counties and school districts throughout the state. However, a change began when the Legislature not only encouraged the leasing of Priuses by its members, but provided an incentive to the office budgets of the members who chose these cars. I protested that change, and while the incentive was eventually discontinued, the new leasing standard is still in place.

I've recently noticed that San Mateo County and several Peninsula cities are also buying foreign-made cars which, while perhaps manufactured in the United States have their profits flow overseas, contributing significantly to the balance of trade deficit, a major part of our economic woes. I'm personally offended by tax supported agencies unilaterally changing the policy of only buying cars manufactured by U.S. companies, all of which provide hybrids or other alternatively powered cars.

Protests to these agencies have not been productive. Hopefully the next round of automobile purchases will result in a return to the common-sense practice of helping our American auto manufacturing industry return to stability and to preserve the types of jobs which helped create the middle class in our country.

Gene Mullin

South San Francisco

*The letter writer is a former state assemblyman representing the 19th District.*



## Appendix 3 - American Compact Vehicle Matrix

	2010 Ford Focus	2010 Chevrolet Aveo	2010 Chevrolet Cobalt
<b><u>FEATURES</u></b>			
4-door	Yes	Yes	Yes
Automatic	Yes	Yes	Yes
Power Steering	Yes	Yes	Yes
A/C	Yes	Yes	Yes
Audio System	Yes	Yes	Yes
Anti-Lock Brakes	Yes	Yes (\$403 extra added to cost)	Yes (\$365 extra added to cost)
Where Built?	United States	Mexico	United States
<b><u>COST</u></b>			
	<b><u>1st</u></b>	<b><u>3rd</u></b>	<b><u>2nd</u></b>
Price	\$15,125	\$16,096	\$15,223
Tax & Fees	\$1,688	\$1,598	\$1,706
Total Cash Price	\$16,813	\$17,694	\$16,929
7-Year Cost of Ownership	\$23,939	\$26,406	\$24,624
<b><u>MPG</u></b>			
MPG	<b><u>3rd</u></b> 28	<b><u>1st - tie</u></b> 30	<b><u>1st - tie</u></b> 30
<b><u>SAFETY</u></b>			
Airbag (Depowered, Head, Side, Pass)	Yes	Yes (No head airbag)	Yes (No side airbag)
Traction & Stability Control	Yes	No	Traction - Optional Stability - N/A
<b><u>NHTSA Ratings (Out of 5 Stars)</u></b>			
Passenger	4 stars	4 stars	5 stars
Driver	4 stars	5 stars	4 stars
Side Impact Front	5 stars	4 stars	3 stars
Side Impact Rear	4 stars	3 stars	5 stars
Rollover Rating	4 stars	4 stars	4 stars
<b><u>IIHS Ratings (Good (best), Acceptable, Marginal, Poor (worst))</u></b>			
Frontal Offset	G	A	G
Side Impact	A	M	A
<b><u>CUSTOMER SATISFACTION</u></b>			
Customer Satisfaction	<b><u>1st</u></b> 9.1	<b><u>3rd</u></b> 6.3	<b><u>2nd</u></b> 8.5 (2009 Review)
<b><u>RELIABILITY</u></b>			
	<b><u>1st</u></b>	<b><u>3rd</u></b>	<b><u>2nd</u></b>
<b><u>JD Power (5-among the best, 4-better than most, 3-does not really stand out, 2-the rest)</u></b>			
Overall Initial Quality	3.5	2	3.5
Overall Performance & Design	3	2	2
Predicted Reliability	3.5	2	3.5
Total	10	6	9
<b><u>CATEGORY</u></b>			
COST	1st	3rd	2nd
MPG	3rd	1st - tie	1st - tie
SAFETY	1st	3rd	2nd
CUSTOMER SATISFACTION	1st	3rd	2nd
RELIABILITY	1st	3rd	2nd

## Appendix 4 - Foreign Compact Vehicle Matrix

	2010 Nissan Versa	2010 Toyota Yaris	2010 Honda Fit
<b><u>FEATURES</u></b>			
4-door	Yes	Yes	Yes
Automatic	Yes	Yes	Yes
Power Steering	Yes	Yes	Yes
A/C	Yes	Yes	Yes
Audio System	Yes	Yes	Yes
Anti-Lock Brakes	Yes (\$236 extra added to cost)	Yes	Yes
Where Built?	Mexico	Japan	Japan

	<b><u>1st</u></b>	<b><u>2nd</u></b>	<b><u>3rd</u></b>
<b><u>COST</u></b>			
Price	\$12,828	\$13,427	\$15,834
Tax & Fees	\$1,275	\$1,392	\$1,564
Total Cash Price	\$14,103	\$14,819	\$17,398
7-Year Cost of Ownership	\$22,039	\$22,624	\$23,020

	<b><u>3rd</u></b>	<b><u>1st - tie</u></b>	<b><u>1st - tie</u></b>
<b><u>MPG</u></b>			
MPG	28	31	31

	<b><u>3rd</u></b>	<b><u>1st</u></b>	<b><u>2nd</u></b>
<b><u>SAFETY</u></b>			
Airbag (Depowered, Head, Side, Pass)	Yes	Yes	Yes
Traction & Stability Control	No	Yes	No

<b><u>NHTSA Ratings (Out of 5 Stars)</u></b>			
Passenger	4 stars	4 stars	5 stars
Driver	4 stars	5 stars	5 stars
Side Impact Front	4 stars	5 stars	5 stars
Side Impact Rear	4 stars	3 stars	4 stars
Rollover Rating	4 stars	4 stars	4 stars

<b><u>IIHS Ratings (Good (best), Acceptable, Marginal, Poor (worst))</u></b>			
Frontal Offset	G	G	G
Side Impact	G	G	G

	<b><u>3rd</u></b>	<b><u>1st - tie</u></b>	<b><u>1st - tie</u></b>
<b><u>CUSTOMER SATISFACTION</u></b>			
Customer Satisfaction	8.9	9.4	9.4

	<b><u>3rd</u></b>	<b><u>2nd</u></b>	<b><u>1st</u></b>
<b><u>RELIABILITY</u></b>			
<b><u>JD Power (5-among the best, 4-better than most, 3-does not really stand out, 2-the rest)</u></b>			
Overall Initial Quality	2	3.5	3.5
Overall Performance & Design	2	2.5	2.5
Predicted Reliability	2.5	3.5	4
Total	6.5	9.5	10

<b><u>CATEGORY</u></b>	<b>2010 Nissan Versa</b>	<b>2010 Toyota Yaris</b>	<b>2010 Honda Fit</b>
<b>COST</b>	1st	2nd	3rd
<b>MPG</b>	3rd	1st - tie	1st - tie
<b>SAFETY</b>	3rd	1st	2nd
<b>CUSTOMER SATISFACTION</b>	3rd	1st - tie	1st - tie
<b>RELIABILITY</b>	3rd	2nd	1st

**San Mateo County Department of Public Works Fleet Maintenance Division**  
**Operational Review**  
**March 17, 2004**

**Appendix 5**

**Cash Flow Analysis - Hybrid versus Conventional**

Discount 4%	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
<b>Purchase Toyota Prius (Hybrid)</b>	21,837							
Insurance		830	859	889	920	952	985	1,019
Taxes		257	230	206	185	167	152	140
Fuel		649	668	688	709	730	752	774
Maintenance		27	137	410	828	1,572	498	498
Repairs		0	0	37	238	357	476	595
Salvage								-6,524
Annual Cash Flow	21,837	1,763	1,894	2,230	2,880	3,778	2,863	-3,498
Discounted Cash Flow	21,837	1,699	1,759	1,996	2,484	3,140	2,293	-2,700
Net Present Value	32,507							
<b>Purchase Ford Focus LX (Gas)</b>	16,470							
Insurance		819	848	878	909	941	974	1,008
Taxes		161	144	128	113	100	89	80
Fuel		889	916	943	971	1,000	1,030	1,061
Maintenance		762	1,011	905	1,460	1,835	1,000	1,000
Repairs		0	0	38	241	361	481	601
Salvage								-3,235
Annual Cash Flow	16,470	2,631	2,919	2,892	3,694	4,237	3,574	515
Discounted Cash Flow	16,470	2,535	2,711	2,588	3,186	3,521	2,862	397
Net Present Value	34,271							
<b>Discounted Cash Flow Increment</b>	<b>-5,367</b>	<b>836</b>	<b>952</b>	<b>592</b>	<b>702</b>	<b>381</b>	<b>570</b>	<b>3,097</b>
<b>Net Present Value Increment</b>	<b>1,764</b>							

Source: edmunds.com

2/2010 Note: Since the County insures its own vehicles, insurance should be excluded from the cost of ownership.

Net Present Value Increment 1,830 (excluding insurance)

## Appendix 6 - Hybrids

<u>Make and Model</u>	<u>Combined MPG</u>	<u>True Cost to Own (7 years)</u>
2010 Toyota Prius Hybrid	50 mpg	\$ 28,431
2010 Honda Civic Hybrid	42 mpg	\$ 28,697
2010 Hybrid Average	46 mpg	\$ 28,564

Discount Rate	Year	Year	Year	Year	Year	Year	Year	Year
3%	0	1	2	3	4	5	6	7
<b>2010 Toyota Prius Hybrid</b>								
Purchase	\$ 25,415							
Taxes & Fees		\$ -	\$ 156	\$ 141	\$ 127	\$ 116	\$ 105	\$ 95
Fuel		\$ 515	\$ 530	\$ 546	\$ 562	\$ 579	\$ 596	\$ 614
Maintenance		\$ 533	\$ 834	\$ 745	\$ 1,086	\$ 1,880	\$ 850	\$ 850
Repairs		\$ -	\$ -	\$ 111	\$ 269	\$ 393	\$ 574	\$ 839
Salvage								\$ (11,009)
Annual Cash Flow	\$ 25,415	\$ 1,048	\$ 1,520	\$ 1,543	\$ 2,044	\$ 2,968	\$ 2,125	\$ (8,611)
<b>Net Present Value</b>	<b>\$ 28,431</b>							

<b>2010 Honda Civic Hybrid</b>								
Purchase	\$ 26,343							
Taxes & Fees		\$ -	\$ 156	\$ 139	\$ 124	\$ 111	\$ 99	\$ 88
Fuel		\$ 620	\$ 639	\$ 658	\$ 677	\$ 697	\$ 718	\$ 740
Maintenance		\$ 176	\$ 466	\$ 300	\$ 1,148	\$ 1,081	\$ 531	\$ 531
Repairs		\$ -	\$ -	\$ 111	\$ 269	\$ 393	\$ 574	\$ 839
Salvage								\$ (9,899)
Annual Cash Flow	\$ 26,343	\$ 796	\$ 1,261	\$ 1,208	\$ 2,218	\$ 2,282	\$ 1,922	\$ (7,701)
<b>Net Present Value</b>	<b>\$ 28,697</b>							

## Salvage

2010 Toyota Prius Hybrid			2010 Honda Civic Hybrid		
Cost		\$	Cost		\$
		25,415			26,343
Depreciation	YOY Factor		Depreciation	YOY Factor	
\$ 3,780			\$ 4,666		
\$ 2,336	62%		\$ 2,588	55%	
\$ 2,054	88%		\$ 2,277	88%	
\$ 1,822	89%		\$ 2,018	89%	
\$ 1,634	90%		\$ 1,811	90%	
\$ 1,465	90%		\$ 1,625	90%	
\$ 1,314	90%		\$ 1,459	90%	
\$ 14,406			\$ 16,444		
\$ 11,009	Salvage		\$ 9,899	Salvage	

Source: Edmunds.com

## Appendix 7 - American Conventional Compact Vehicles

<u>Make and Model</u>	<u>Combined MPG</u>	<u>True Cost to Own (7 years)</u>
2010 Ford Focus	28 mpg	\$ 23,939
2010 Chevrolet Cobalt	30 mpg	\$ 24,624
2010 Chevrolet Aveo	30 mpg	\$ 26,406

### 2010 Ford Focus

<u>Discount</u> 3%	<u>Year</u> 0	<u>Year</u> 1	<u>Year</u> 2	<u>Year</u> 3	<u>Year</u> 4	<u>Year</u> 5	<u>Year</u> 6	<u>Year</u> 7
Purchase	\$ 16,813							
Taxes & Fees		\$ -	\$ 119	\$ 108	\$ 99	\$ 90	\$ 82	\$ 75
Fuel		\$ 988	\$ 1,017	\$ 1,048	\$ 1,079	\$ 1,112	\$ 1,145	\$ 1,179
Maintenance		\$ 69	\$ 268	\$ 279	\$ 574	\$ 883	\$ 347	\$ 347
Repairs		\$ -	\$ -	\$ 128	\$ 307	\$ 449	\$ 657	\$ 960
Salvage								\$ (5,682)
Annual Cash Flow	\$ 16,813	\$ 1,057	\$ 1,404	\$ 1,563	\$ 2,059	\$ 2,534	\$ 2,231	\$ (3,120)
<b>Net Present Value</b>	<b>\$ 23,939</b>							

### 2010 Chevrolet Cobalt

<u>Discount</u> 3%	<u>Year</u> 0	<u>Year</u> 1	<u>Year</u> 2	<u>Year</u> 3	<u>Year</u> 4	<u>Year</u> 5	<u>Year</u> 6	<u>Year</u> 7
Purchase	\$ 16,929							
Taxes & Fees		\$ -	\$ 116	\$ 105	\$ 96	\$ 87	\$ 79	\$ 72
Fuel		\$ 921	\$ 949	\$ 977	\$ 1,006	\$ 1,036	\$ 1,067	\$ 1,099
Maintenance		\$ 154	\$ 225	\$ 578	\$ 416	\$ 1,443	\$ 471	\$ 471
Repairs		\$ -	\$ -	\$ 122	\$ 291	\$ 425	\$ 621	\$ 907
Salvage								\$ (5,326)
Annual Cash Flow	\$ 16,929	\$ 1,075	\$ 1,290	\$ 1,782	\$ 1,809	\$ 2,991	\$ 2,239	\$ (2,777)
<b>Net Present Value</b>	<b>\$ 24,624</b>							

### 2010 Chevrolet Aveo

<u>Discount</u> 3%	<u>Year</u> 0	<u>Year</u> 1	<u>Year</u> 2	<u>Year</u> 3	<u>Year</u> 4	<u>Year</u> 5	<u>Year</u> 6	<u>Year</u> 7
Purchase	\$ 17,694							
Taxes & Fees		\$ -	\$ 103	\$ 92	\$ 83	\$ 74	\$ 66	\$ 59
Fuel		\$ 921	\$ 949	\$ 977	\$ 1,006	\$ 1,036	\$ 1,067	\$ 1,099
Maintenance		\$ 65	\$ 230	\$ 890	\$ 375	\$ 2,092	\$ 611	\$ 611
Repairs		\$ -	\$ -	\$ 122	\$ 291	\$ 425	\$ 621	\$ 907
Salvage								\$ (5,171)
Annual Cash Flow	\$ 17,694	\$ 986	\$ 1,282	\$ 2,081	\$ 1,755	\$ 3,627	\$ 2,366	\$ (2,494)
<b>Net Present Value</b>	<b>\$ 26,406</b>							

## Salvage

#### 2010 Ford Focus

<u>Depreciation</u>	<u>YOY Factor</u>
\$ 3,386	
\$ 1,701	50%
\$ 1,498	88%
\$ 1,327	89%
\$ 1,191	90%
\$ 1,069	90%
\$ 959	90%
<u>\$ 11,131</u>	
\$ 5,682	Salvage

#### 2010 Chevrolet Cobalt

<u>Depreciation</u>	<u>YOY Factor</u>
\$ 4,098	
\$ 1,649	40%
\$ 1,451	88%
\$ 1,286	89%
\$ 1,154	90%
\$ 1,036	90%
\$ 929	90%
<u>\$ 11,603</u>	
\$ 5,326	Salvage

#### 2010 Chevrolet Aveo

<u>Depreciation</u>	<u>YOY Factor</u>
\$ 4,902	
\$ 1,675	34%
\$ 1,474	88%
\$ 1,307	89%
\$ 1,172	90%
\$ 1,051	90%
\$ 942	90%
<u>\$ 12,523</u>	
\$ 5,171	Salvage

## Appendix 8 - Foreign Conventional Compact Vehicles

Make and Model	Combined MPG	True Cost to Own (7 years)	Savings vs. Hybrid
2010 Toyota Yaris	31 mpg	\$ 22,624	\$ 5,940
2010 Honda Fit	31 mpg	\$ 23,020	\$ 5,544
2010 Nissan Versa	28 mpg	\$ 22,039	\$ 6,525
Conventional Avg. (incl American Compacts)	29.7 mpg	\$ 23,775	\$ 4,789

The savings of replacing an estimated 50 compact vehicles in  
 with the 2010 Toyota Yaris \$297,000  
 with the 2010 Honda Fit \$277,200  
 with the 2010 Nissan Versa \$326,250

### 2010 Toyota Yaris

Discount 3%	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Purchase	\$ 14,819							
Taxes & Fees		\$ -	\$ 109	\$ 99	\$ 90	\$ 82	\$ 75	\$ 68
Fuel		\$ 892	\$ 919	\$ 946	\$ 974	\$ 1,004	\$ 1,034	\$ 1,065
Maintenance		\$ 222	\$ 522	\$ 730	\$ 626	\$ 1,511	\$ 604	\$ 604
Repairs		\$ -	\$ -	\$ 111	\$ 269	\$ 393	\$ 574	\$ 839
Salvage								\$ (5,893)
Annual Cash Flow	\$ 14,819	\$ 1,114	\$ 1,550	\$ 1,886	\$ 1,959	\$ 2,990	\$ 2,287	\$ (3,317)
<b>Net Present Value</b>	<b>\$ 22,624</b>							

### 2010 Honda Fit

Discount 3%	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Purchase	\$ 17,398							
Taxes & Fees		\$ -	\$ 115	\$ 105	\$ 95	\$ 87	\$ 79	\$ 72
Fuel		\$ 892	\$ 919	\$ 946	\$ 974	\$ 1,004	\$ 1,034	\$ 1,065
Maintenance		\$ 55	\$ 192	\$ 484	\$ 297	\$ 1,724	\$ 461	\$ 461
Repairs		\$ -	\$ -	\$ 111	\$ 269	\$ 393	\$ 574	\$ 839
Salvage								\$ (7,328)
Annual Cash Flow	\$ 17,398	\$ 947	\$ 1,226	\$ 1,646	\$ 1,635	\$ 3,208	\$ 2,148	\$ (4,891)
<b>Net Present Value</b>	<b>\$ 23,020</b>							

### 2010 Nissan Versa

Discount 3%	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Purchase	\$ 14,103							
Taxes & Fees		\$ -	\$ 95	\$ 86	\$ 78	\$ 71	\$ 64	\$ 58
Fuel		\$ 988	\$ 1,017	\$ 1,048	\$ 1,079	\$ 1,112	\$ 1,145	\$ 1,179
Maintenance		\$ 73	\$ 284	\$ 457	\$ 358	\$ 1,319	\$ 417	\$ 417
Repairs		\$ -	\$ -	\$ 111	\$ 269	\$ 393	\$ 574	\$ 839
Salvage								\$ (4,821)
Annual Cash Flow	\$ 14,103	\$ 1,061	\$ 1,396	\$ 1,702	\$ 1,784	\$ 2,895	\$ 2,200	\$ (2,327)
<b>Net Present Value</b>	<b>\$ 22,039</b>							

## Salvage

2010 Toyota Yaris			2010 Honda Fit			2010 Nissan Versa		
	\$	14,819	Purchase	\$	17,398	Purchase	\$	14,103
Depreciation	YOY Factor		Depreciation	YOY Factor		Depreciation	YOY Factor	
\$	1,883		\$	2,721		\$	2,934	
\$	1,548	82%	\$	1,616	59%	\$	1,395	48%
\$	1,361	88%	\$	1,421	88%	\$	1,227	88%
\$	1,207	89%	\$	1,260	89%	\$	1,087	89%
\$	1,083	90%	\$	1,130	90%	\$	976	90%
\$	972	90%	\$	1,013	90%	\$	876	90%
\$	872	90%	\$	909	90%	\$	787	90%
\$	8,926		\$	10,070		\$	9,282	
\$	5,893	Salvage	\$	7,328	Salvage	\$	4,821	Salvage