

Chapter 16

Buying and Owning a Vehicle

16.1 Buying a Vehicle

16.2 Insuring a Vehicle

16.3 Environmental Concerns

16.1

Buying a Vehicle

Having your own vehicle gives you a lot of freedom and mobility. *It also carries a lot of responsibilities.* If you are under the age of 18, you will likely share the responsibilities with your parents. You also will likely share the additional expenses for maintenance, repairs, insurance, and fuel.

Do You Need a Vehicle?

Are your driving needs great enough to justify owning a vehicle? Are there alternatives to buying a vehicle? The answers to these questions will help you decide whether your needs justify the expense of owning a vehicle.

Can You Afford to Own a Vehicle?

The cost of owning a vehicle can be more than you expect. Following are some of the major expenses associated with vehicle ownership:

- **Purchase Price** The purchase price is the amount a person is charged and willing to pay for the vehicle. Consider what you can afford before selecting a specific type of vehicle. Shop around and compare prices of different makes and models of vehicles. Newspaper ads and the Internet are good ways to compare prices.
- **Depreciation** A vehicle's value drops steadily over time, whether you use the vehicle a lot or very little. This decrease is called **depreciation**.
- **Financing** If you are able to purchase a vehicle by paying cash, you eliminate having to pay interest on a loan. Most people, however, obtain a loan when they purchase a vehicle. Make sure you shop around for the best loan rates available. Banks, credit unions, sav-

ings and loan associations, and car dealerships are often good sources.

- **Other Costs** Operating costs include fuel, oil, tires, repairs, and replacement parts. Licensing, registration, insurance, taxes, and loan interest also are costs to be considered. Costs also may include parking and toll fees.

Vehicle expenses can increase from year to year. Your annual operating costs will depend on how much you drive, where you drive, and your fuel economy. The more you drive, the greater the costs.

Arrange a loan with a bank or other financial institution before you go car shopping.

What Kind of Vehicle Should You Buy?

If you decide you absolutely need and can afford a vehicle, what type will you get? Examine your needs, wants, and budget. Ask yourself these questions:

- What will I use the vehicle for?
- Do I need certain passenger and cargo capacities? Will I need to tow anything?
- How many miles will I drive each year?
- Will I use the vehicle more for short trips or long trips?
- How long will I expect to keep the vehicle?

You need to consider many factors when determining what type of vehicle to buy. Consider all factors carefully before you go out and look at any vehicles.

Vehicle Size

Size is an important factor in buying a vehicle. What size vehicle will serve your needs? Consider these points:

- A smaller, lighter vehicle usually gets better gas mileage but does not offer as much protection in a collision as a larger, heavier vehicle.
- Smaller vehicles are easier to maneuver than larger vehicles, especially when parking.
- A larger vehicle provides a more comfortable ride but is usually more costly to operate than a smaller vehicle.
- A larger vehicle has a greater capacity for passengers and parcels than a smaller vehicle.

Engine Size and Types

Smaller engines usually are more fuel efficient than larger engines. However, a larger engine may be more feasible in a fully-equipped vehicle. Vehicles with larger engines typically cost more to maintain and repair.

Transmission

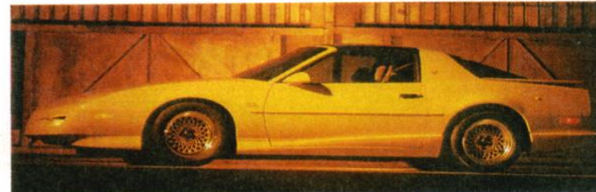
Most vehicles today are equipped with automatic transmissions that include automatic overdrive. This makes the vehicles nearly as fuel efficient as stickshift vehicles. Although the costs of repairs for an automatic transmission are usually higher, stickshifts may require repairs more often.

Optional Equipment

Decide what optional equipment you want, but be aware that options add to the cost of the vehicle. Technological advancements have resulted in “smarter” vehicles with options designed for safety, comfort, and information.



Fuel efficient . . .



or sporty but expensive.



More room for passengers . . .



and more cargo capacity.

Leasing a Vehicle

An alternative to purchasing a vehicle is **leasing**. In some ways, leasing is similar to owning a vehicle. You are responsible for monthly payments, fuel, and all the other types of operating costs you would incur if purchasing a vehicle.

The main difference is that after your lease contract expires, you do not own the vehicle. At the end of your lease, you must choose one of the following three options:


1. Return the vehicle and lease another vehicle.
2. Purchase the vehicle at a cost determined at the start of your lease.
3. Return the vehicle with no obligations to either lease another vehicle or purchase the vehicle you returned.

Lease payments are based on the difference of the value of the vehicle at the start of the lease, and the value at the end of the lease, plus interest. In contrast, when you take out a loan to purchase a vehicle, your monthly payments cover the entire cost of the vehicle over the term of the loan, plus loan interest.

Leasing is not for everyone. Most lease agreements limit how many miles you can put on the vehicle. Extra miles are likely to cost you an additional charge. Normal wear is considered, but any wear considered excessive will result in an extra charge. Make sure you understand all the terms of the contract before you sign a lease agreement.

Many people get an ugly surprise when they turn in their leased vehicle

Purchase New Car for \$12,899



LEASE FOR
\$121 per month
For 36 months*

PURCHASE with loan for
\$158 per month
For 36 months**

*\$1525 down payment plus tax, title, license and \$45 Doc. fee
12,000 miles/year—fee of 15¢ per mile over

**\$1399 down plus tax, title, license and \$45 Doc. fee
8.5% APR financing option

Compare the costs of leasing a vehicle to purchasing using a loan.

Buying a Used Vehicle

You may decide to purchase a used vehicle if you cannot afford a new vehicle. Used vehicles can be purchased from a used-car dealer, a new-car dealer, or a private owner.

Buying a vehicle from a private owner may cost less. However, you need to consider the following:

- A private owner will seldom repair the vehicle or provide you with a **warranty**. A warranty is a written guarantee that the seller will make certain repairs for a stated period of time.
- In nearly all cases, a private sale is final.
- Used-car dealers usually have a large selection of vehicles available. Many used vehicles purchased from car dealerships carry a warranty.

Be aware that warranties do not cover everything. **Read the warranty carefully and know what is covered before you buy.**

Used car warranties are not actually warranties. They are mechanical breakdown insurance policies commonly called service contracts or extended warranties



'06 PONTIAC SOLSTICE ROADSTER
 2.4L 4Cyl. 5-Speed Manual CD Chrome Wheels - 2,500 Miles
Sale Price
\$23,375
 Stock# R11638



06 Chevrolet Impala LTZ\$19,865
 3.9L V6 6Disc-MP3 P.Seats Htd.Leather Remote-Start Sunroof Alloys XM-Radio 12K LaserBlue R11573



06 Pontiac Grand Prix\$13,850
 3.8L V6 CD P.Seat Full Power Remote-Start Alloys 27K Sport Red R11416



02 Chevrolet Monte Carlo LS\$10,570
 3.4L V6 CD Full Power Keyless-Entry Sunroof 55K White R23524A



02 Oldsmobile Aurora\$10,475
 3.5L V6 CA/CD P.Seats Leather Full Power Keyless-Entry Alloys 59K Dark Red 52742B



05 Chrysler Pacifica Touring AWD\$18,870
 3.5L V6 CD P.Seats Leather KE Chrome Wheels 3rd-Row Seat 29K Silver R23488



03 Mercury Mountaineer AWD\$15,880
 4.6L V8 CD P.Seats Htd.Leather KE Moon Alloys Tow Pkg. Running Boards 1-Owner 57K Blue 52995A



05 Chevrolet Colorado\$17,590
 Ext. LS Z71 4x4 3.5L 5Cyl. MP3-CD AC Tilt Cruise Tube Steps 18K Blue 53888A



04 Chevrolet Silverado 1500.....\$20,675
 Ext. LS Z71 5.3L V8 CD P.Seat Full Power KE Alloys Tow Pkg. Running Boards 1-Owner 42K White 53334A



02 Ford F150 Ext. Lariat 2WD\$15,220
 5.4L V8 CD P.Seat Leather Full Power KE Tow Pkg. Running Boards 35K Red 50745B

RATES AS LOW AS 3.9% FOR 60 MONTHS ON SELECT GM CERTIFIED USED VEHICLES**

Choosing a Used Vehicle

Selecting a good used vehicle takes time. When you find a vehicle you like, check it out.

- Besides looking good, make sure the vehicle is in good mechanical condition.
- Determine whether it was ever involved in a collision, or needs repairs.
- When possible, talk to the previous owner about the condition of the vehicle and previous maintenance service that was done on the vehicle.

Enter the vehicle to check

- seats for comfort and condition
- lights and accessories
- mileage (odometer)
- pedals and steering wheel

Check the trunk to find

- evidence of damage
- spare tire
- tire jack

Open the hood to check

- signs of collision damage
- hoses and radiator for leaks
- condition of belts
- coolant level
- battery and cables

When a car dealer is willing to put his/her picture in their ad, he/she is likely to stand behind the sale.

Outside and Inside Checks

Walk around the vehicle to inspect it. Be sure to check

- doors and locks
- vehicle appearance
- fluid leaks
- evidence of collision damage

*"There is strength in numbers,
our inventory proves it."*

XARL
Chevrolet

**AN AMERICAN
REVOLUTION**

Carl Moyer, Owner

The advertisement features a portrait of Carl Moyer, the owner, on the right side. The background is a dark green color. The text is arranged in a structured layout, with the quote at the top, the XARL logo in the center, and the Chevrolet logo below it. The slogan 'AN AMERICAN REVOLUTION' is at the bottom left, and the owner's name is at the bottom right.

Is this a good price?

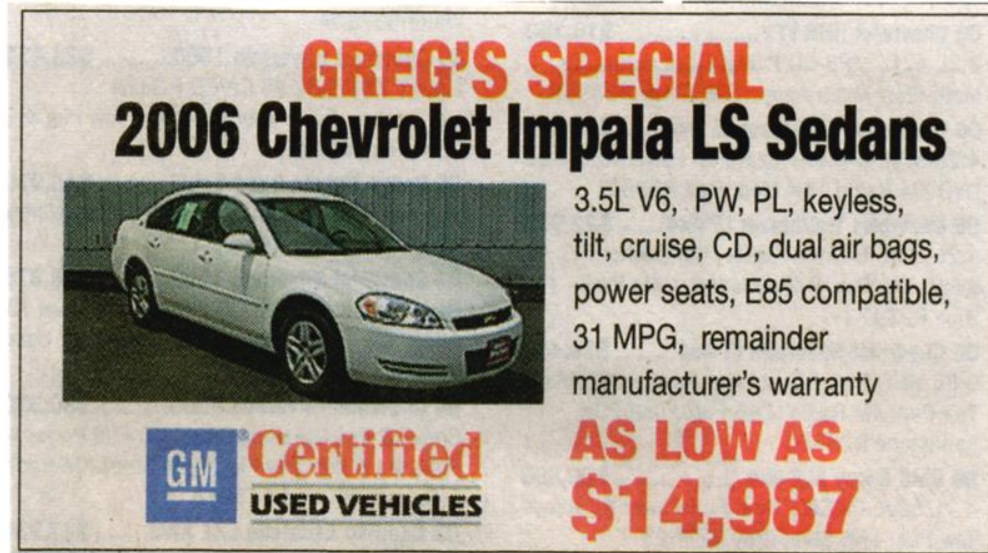
How Much Should You Pay?

Publications like the *NADA Guide* (National Auto Dealers Association Guide) provide what are referred to as suggested **blue-book prices** for used vehicles. A blue-book price is the average market value for that model and age of vehicle. The value of a vehicle depends a great deal on the vehicle's condition. You can also use the Internet to compare prices of different makes and models of vehicles.


Two internet sources to find the price of a vehicle are:

edmunds.com

Kelly Blue Book at kbb.com



GREG'S SPECIAL
2006 Chevrolet Impala LS Sedans



3.5L V6, PW, PL, keyless, tilt, cruise, CD, dual air bags, power seats, E85 compatible, 31 MPG, remainder manufacturer's warranty

AS LOW AS \$14,987

GM Certified USED VEHICLES

SHOPPING ON THE INTERNET More people use the Internet or special CD-ROM software each year when shopping for vehicles. This technology helps you review and compare vehicles and prices, apply for loans, and even purchase vehicles. Prices are often not negotiable and can be hundreds to thousands of dollars less than you would pay at a dealership.

Test Drive Always take a vehicle you intend to purchase for a test drive. If the owner refuses to let you test drive the vehicle, look for another vehicle.

When you take a test drive, drive in areas and on roads with which you are familiar. Keep the following questions in mind as you test drive a vehicle:

- What do you hear and feel?
- Are the brakes in good condition?
- Is the steering firm?
- How is the suspension?
- Does the vehicle hesitate when you quickly accelerate?
- Is the vehicle comfortable?

Make these checks during the test drive:

- Turn the ignition switch on and check to see that all warning lights, signals, and headlights work.
- Start the engine. It should start easily. Warning lights should go out in a few seconds.

- Drive at low speeds and test the brakes several times. The vehicle should stop smoothly and straight.
 - Make a number of right and left turns. There should not be any play in the wheel, and it should steer easily.
 - Accelerate moderately. The vehicle should accelerate smoothly from 0–40 mph without hesitation.
 - Test the brakes at various speeds. They should not grab or pull to one side. If equipped with antilock brakes, brake hard to ensure that the system works.
 - Drive on a rough road at 25 mph, and turn off the radio. The vehicle should not rattle or feel unstable.
 - Check oil pressure gauges and warning lights for low pressure, overheating, or any other malfunctions indicated by warning lights.
-

Have the Vehicle Inspected You have inspected the vehicle yourself—both inside and outside. Before you commit to buying it, you should have a trained technician also inspect it. It's an investment of time and money that may save you a lot in the long run.

Talk with the technician about possible needed maintenance or repairs. Obtain estimates on related costs for the repairs or maintenance. Problems with the transmission, brakes, gears, clutch, radiator, and exhaust system can be costly.



Carefully inspect the vehicle inside and out. Then have it inspected by a professional mechanic or technician.

#1 GM CERTIFIED DEALER IN THE NATION!

>>PRE-OWNED CARS

06 Buick LaCrosse CXS \$17,785
3.6L V6 CD P.Seat Leather Full Power KE Al-
loys XM-Radio 23K Blue R11622

>>PRE-OWNED SUVS

07 Chevrolet Suburban LT3 4x4 \$42,880
5.3L V8 MP3-CD Htd.Leather Remote-Start
Park Assist Moon Tow Pkg. DVD XM-Radio (E85
Flex-Fuel) 724 Silver R23552

>>PRE-OWNED VANS

05 Chevrolet Express 1500 LS..... \$16,870
8-Passenger 4.3L V6 CA/CD P.Seat Full Power
Keyless-Entry Alloys Tow Pkg. Rear-Air 21K
Sport Red R23518

In the car business there is an old joke that goes: We'll sell you the owner's manual. When you can pass a test based on the manual, we'll give you the car."

Before You Close the Deal

If the seller is going to make repairs, have the repairs written into the sales agreement. Make sure the vehicle includes an owner's manual and receipts of service repairs.

After you purchase the vehicle, read the owner's manual. The owner's manual is a valuable resource for learning about features of your new vehicle and the proper care and maintenance needs of the vehicle.

Cost of a Vehicle Loan

Monthly Payments (5 years)

Amount Borrowed

Interest Rate Charged

	10%	12%	14%	16%	18%
\$2,000	\$42.49	\$44.49	\$46.54	\$48.64	\$50.79
\$4,000	\$84.99	\$88.98	\$93.07	\$97.27	\$101.57
\$6,000	\$127.48	\$133.47	\$139.61	\$145.91	\$152.36
\$8,000	\$169.98	\$177.96	\$186.15	\$194.54	\$203.15
\$10,000	\$212.47	\$222.44	\$232.68	\$243.18	\$253.93

Total Cost of Vehicle Loan

Total Amount Paid

Amount Borrowed

(Loan Amount Plus Interest on Loan)

\$2,000	\$2,549.65	\$2,669.33	\$2,792.19	\$2,918.17	\$3,047.21
\$4,000	\$5,099.29	\$5,338.67	\$5,584.38	\$5,836.33	\$6,094.42
\$6,000	\$7,648.94	\$8,008.00	\$8,376.57	\$8,754.50	\$9,141.63
\$8,000	\$10,198.58	\$10,677.33	\$11,168.76	\$11,672.67	\$12,188.85
\$10,000	\$12,748.23	\$13,346.67	\$13,960.95	\$14,590.83	\$15,236.06

Insuring a Vehicle

If you are involved in a collision, you may find that the largest expense of owning a vehicle is paying for damages you cause. Every state has a **financial responsibility law**. This law requires you to prove that you can pay for damages you cause that result in death, injury, or property damage.

What does your state say about financial responsibility? What type of penalties can be invoked for not complying with the financial responsibility laws in your state?

What Is Vehicle Insurance?

Insuring your vehicle is financial responsibility. You buy insurance from a company by paying a **premium**, a specified amount of money for coverage over a specified period of time, to the company. A policy is a written contract between you—the insured—and the insurance company. A policy includes the terms and conditions of insurance coverage.

INSURANCE Even though financial responsibility laws exist, a significant number of drivers do not have insurance. Without insurance people risk losing their life savings and can be forced to liquidate assets to cover required payments. Always comply with your state's financial responsibility laws.

Kinds of Insurance

There are many different types of insurance. Refer to the chart for a summary of various types of insurance and what each type covers.

Liability Insurance

Every state requires individuals to carry **liability insurance**. It is the most important insurance to have. Liability insurance protects the driver who caused the collision. It provides compensation for a harm or wrong to a third party for which the insured is legally obligated to pay. Liability insurance covers others when you are at fault.

Bodily-Injury Insurance One type of liability insurance, **bodily-injury insurance**, covers the driver who is at fault against claims. (*Claims are formal requests for payments related to injuries to other people.*) Most states require drivers to hold a specified minimum level of liability insurance.

You should carry higher than minimum levels of **bodily-injury liability insurance**. The amounts of today's court settlements can be quite high.

Another type of liability insurance, **property-damage insurance**, protects the driver who is at fault against claims for damages to another person's property, up to specified limits. Make sure your level of coverage is adequate.

Medical Payment Insurance

This insurance pays medical and funeral expenses for bodily injuries sustained by occupants in an insured vehicle. It pays expenses up to stated amounts. This coverage does not depend on who was at fault in the accident.

No-Fault Insurance

Because of the backlog and long delays in litigation cases coming to a trial, some states have **no-fault insurance**. In such states, people involved in collisions recover losses and expenses associated with the collision directly from their own insurance company—regardless of who is at fault. However, coverage is limited as specified in the insurance policy. Details in how no-fault insurance is handled differs significantly from one state to another.

Collision Insurance

Collision insurance covers you if you are at fault in a collision, or not able to collect from the person who is at fault. Your collision insurance provides coverage to pay the costs of repair or replacement of your vehicle, less the **deductible** you have selected. A deductible is the amount you agree to pay towards the repair or replacement of the vehicle. Your insurance company agrees to cover the balance up to specified maximum limits. Know what the limit is with the company you choose.

You can select your deductible level. The higher the deductible you select, the greater the amount you are required to pay out of your pocket. However, the higher deductible you select, the lower your premium will be.

Comprehensive Insurance

What if your vehicle is damaged for some reason other than a collision? Your policy's **comprehensive insurance** can pay for replacement or repair of your vehicle. You also can select a deductible amount for comprehensive insurance. As with a collision deductible, the higher deductible you select, the more you agree to pay, and the lower your premium will be. Most insurance companies will only

pay up to the estimated current value of the vehicle.

Damage caused by severe wind, hail, vandalism, or similar situations are typically included under comprehensive insurance. Most companies have restrictions on what causes qualify for comprehensive coverage. Check your policy to see what restrictions apply.

Uninsured and Underinsured Motorist Insurance

Uninsured motorist insurance protects you if you are struck by another vehicle whose driver has no insurance. Your company covers the costs of your repairs and injuries to you and your passengers, up to a specified amount. Most states require insurance companies to provide this type of insurance.

If you have **underinsured motorist insurance** your insurance company will pay any costs that exceed what the other person's insurance company will pay as a result of a collision. Most states now require that companies offer this type of insurance to their customers.

INDIANOLA RECORD 1/24/07

Mom sues driver in fatal crash

By **SARA SLEYSER**
Record-Herald Staff Writer

The mother of a 6-year-old boy killed in a traffic accident in front of the Indianola Public Library this summer has filed a civil suit against the driver of the vehicle that hit her son.

Kim Dillon of Indianola is suing Oscar Calvin Johnson claiming he failed to keep a proper lookout, failed to slow or stop his vehicle after seeing small children near the roadway and driving too fast for the conditions, according to papers filed in Warren County District Court.



Countryman

"The trial will bring out the truth about liability and fault," said Rob Garver, the attorney who represents Dillon and the estate of Lucas Countryman, the boy killed in the collision. "I believe there's some negligence there and some fault. We have a dead boy. It's a tragic thing."

A police investigation of the Aug. 15 incident determined that speed was not a factor in the accident and that Johnson, 24, was not at fault. No charges were filed.

Lovingrest LLC, a Warren County pet cemetery company, was also named in the suit because Johnson was driving a company van at the time.

Garver will ask for a monetary judgment during the trial, but an amount has not been determined.

"The mother hasn't even brought up money," Garver said. "I'm not concerned with that at this time."

Andrew Hall, a Des Moines attorney representing Johnson, did not return repeated messages left by the Record-Herald.

Even if you are not charged with a crime, as a driver you can still be sued for your actions.

The owner, if different than the driver, can be sued too.

4 charged with giving driver booze before crash

Shanda Munn was underage when she struck and killed Kelly Laughery.

By **TOM BARTON**
REGISTER STAFF WRITER

Des Moines Register
January 23, 2007

A substance abuse expert at Iowa State University said felony charges against four people who allegedly gave alcohol to a student whose car later struck and killed a pedestrian should serve as a caution to others.

“No one intends to have something like this happen, but they still result in such severe consequences,” said Sara Kellogg, ISU’s substance abuse and violence prevention coordinator.

“It’s something everyone, including students, needs to think about before getting into those situations.”

Authorities last week charged one current and three former ISU students who they say



George



Tonelli



Galante



Campbell

See **CHARGES**, Page 6B

4 gave young driver booze, police say

CHARGES, from Page 1B

provided alcohol to Shanda Munn, 21.

Munn was sentenced last fall to up to 10 years in prison for vehicular homicide in the death of Kelly Laughery, 20, of Orient.

Laughery, a sophomore pre-business major, was killed as she walked to her sorority about 4:30 a.m. on Dec. 3, 2005.

Charged are:

- Jody Robert George, 25, of Ames.
- Nicholas Anthony Tonelli, 24, of Dexter.
- Anthony Louis Galante, 28, of Williamsburg.
- Kelly Ann Campbell, 24, of Colo.

Munn, who was underage at the time of the fatal incident, admitted she had been at an off-campus party in west Ames hosted by the four students. She testified that she had six to eight drinks before she drove home.

Munn surrendered to campus police Feb. 11 after authorities searched a garage in Nevada and matched debris from the scene with Munn's car.

Laughery's parents have filed a wrongful-death lawsuit against Munn and the four students they say are also responsible for their daughter's death. A September court date is set in the lawsuit.

Story County Attorney Stephen Holmes said he hopes a keg registration ordinance passed in August 2005 will help prevent a similar situation.

"We haven't had to use it yet, ... and that, I would assume, says it's having a positive effect," he said. "We're looking to prevent tragedy."

Some ISU students remain skeptical, however, of the impact the four arrests will have on alcohol abuse and underage drinking.

"Tragedies occur on every campus, and no matter how much you want there to be a decrease over the long run, it's not going to happen," said Katherine Lundberg, 21, a junior who studies English. "It's not something that crosses their minds. They're just looking for a good time."

A 2003 Iowa State survey of 2,500 students shows 73 percent drank alcohol and 41 percent reported having five or more drinks in one sitting at least once in two weeks.

The study also showed that students underestimated the number of students who have used alcohol in the past 30 days, which was 80 percent.

"I think it's too early to tell if students' behavior has been affected by this, but I hope students realize that providing alcohol to those under or over 21 has far-reaching effects not only on themselves, but on others," said Andy Alt, the school's assistant director for judicial affairs. "I hope students realize it's irresponsible to provide underage drinkers with alcohol."

Reporter Tom Barton can be reached at (515) 284-8065 or tbarton@dmreg.com

Malone family sues driver in fatal crash

Parents of 13-year-old girl who died Dec. 9 say driver did not have headlights on

By **SHAWNA DRISH**
Record-Herald Staff Writer

The family of 13-year-old car crash victim Cortney Malone has sued the car's 16-year-old driver for wrongful death and negligence leading to their daughter's death.

The suit alleges Lancer Wood was driving without the vehicle lights on and he failed to maintain control of the vehicle which led to the fatal crash on Dec. 9.



Malone

The lawsuit names Wood, of Indianola, who was driving the 1999 Dodge Stratus and Daniel K. Wood of Des Moines, the vehicle's registered owner.

On Dec. 9, Malone, of Indianola, was killed in a car crash south of Indianola.

According to police, Lancer Wood was driving without headlights at approximately 12:57 a.m., lost control of the car, crossed the roadway and entered the ditch. The car struck two trees before it came to rest.

A breath test revealed Lancer Wood had a blood alcohol level of .079 percent, though alcohol is not mentioned in the lawsuit.

"We believe the facts of the case establish negligence without the addition of alcohol," said Max Burkey, an attorney representing the Malone family.

No criminal charges have been filed by the county attorney's office, but former Warren County Attorney Gary Kendell said he was confident charges would be filed when the investigation was completed, however, he took no action on the case in his final month in office.

Burkey said the Malone family has no criticisms of the county attorney's office handling of the case.

"The Malones are not in the criminal law business and they aren't in the revenge business," Burkey said. "They are confident the county attorney will fulfill the duties of his office."

Current county attorney Bryan Tingle, who took office last week, has not returned phone calls and could not be reached Monday.

Robert Rehkemper, the attorney for the Wood family, declined to comment Monday.

This is every parent's nightmare on both sides of this tragedy.

It is likely that at some point in the future a person or persons will be charged with providing the alcohol to the driver.

If the person(s) are identified, they will likely be named as defendants in the suit.

Wood faces new lawsuits from fatal crash

By **SHAWNA DRISH**
Record-Herald Staff Writer

Two more families have filed civil lawsuits against Lancer Wood, the 16-year-old driver in the Dec. 9 crash that killed 13-year-old Courtney Malone.

The families of two other teenagers who were in the car that night have filed separate lawsuits seeking punitive and compensatory damages. Malone's family filed a civil lawsuit in December.

Shawn and Stacey Lenguadora and Christine Lapour, the parents of Rebecca Lenguadora, 14, and Katelyn Lapour, 13, claim Wood acted negligently, recklessly and "with complete disregard for the rights and safety of his passengers," according to court documents.

Rebecca Lenguadora, Katelyn Lapour, Malone and Bobbi Johnson, 15, were all passengers in a car driven by Wood on Dec. 9.

According to police reports, Wood had a blood alcohol level of .079 and was driving with his lights off just before 1 a.m. when the car veered out of control and struck two trees. The crash killed Malone and injured Lenguadora and Lapour.

The lawsuits also name Daniel Wood, the boy's father, as a defendant. Daniel Wood owns the car involved in the crash.

Matthew Hainfield, defense attorney for the civil cases against Lancer and Daniel Wood, said a trial date wasn't set yet but he expects it to be during the summer 2008.

Warren County Attorney Bryan Tingle filed vehicular homicide charges against Lancer Wood in January and is petitioning to try him as an adult.

If tried and convicted as an adult, Wood could face up to 10 years in prison for the Class C felony charge. If he is tried and convicted as a juvenile, the charge will be a delinquent act and the disposition will be determined by what is considered to be in Wood's best interests.

The waiver hearing to determine which court Wood will be tried in was originally scheduled for last week but has been postponed until May 9 to allow for more preparation time. Tingle said he is confident a decision will come out of the May 9 hearing.

John Breitbach, the Cedar Rapids-based attorney for Lapour and Lenguadora, did not return phone calls for this story.

In addition to the deceased passenger's family, the surviving passengers are suing the driver and his father also

<u>Case ID</u>	<u>Title</u>	<u>Name</u>	<u>DOB</u>	<u>Role</u>
05771 LACL106229	PROPERTY & CASUALTY INS CO VS DANIEL K WOOD ETAL	WOOD, LANCER AUSTIN		DEFENDANT
05911 LACV029718	ESTATE OF CORTNEY MALONE ETAL VS LANCER & DANIEL WOOD	WOOD, LANCER AUSTIN	05/07/1990	DEFENDANT
05911 LACV029787	CHRISTINE & KATELYN LAPOUR VS LANCER & DANIEL WOOD	WOOD, LANCER AUSTIN	05/07/1990	DEFENDANT
05911 LACV029788	SHAWN, STACEY & REBECCA LENGUADORA VS LANCER & DANIEL WOOD	WOOD, LANCER AUSTIN	05/07/1990	DEFENDANT
05911INST122192	INDIANOLA vs. WOOD, LANCER AUSTIN	WOOD, LANCER AUSTIN	05/07/1990	DEFENDANT

CN=John Q Public,O=JUDICIAL

[Logon](#)

[Register](#)

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Lancer Wood's problems are far from over. Note that he is being sued by the parents of all three of his passengers plus an insurance company. He also has problems with the city of Indianola.

If Lancer Wood's father, Daniel, also named in the suits because he is owner of the car, does not have sufficient insurance to cover the damages that will be awarded by three jury trials, the families will look to Mr. Wood's personal assets to make up the difference.

Car Insurance

Kind of Insurance	Coverage	Claim Includes	Minimum Amount	Notes
Bodily-injury liability	Pays claim against owner if someone is killed or injured and owner is at fault.	Hospital and doctor bills Legal fees Court costs Loss of wages	States normally specify minimum: \$10,000–\$30,000 for one person; \$20,000–\$100,000 for several persons.	Required in many states. Needed by all car owners. Minimum coverage required is generally too low.
Property-damage liability	Pays claim against owner if property of others is damaged and owner is at fault.	Other car and possessions in car. Damage to house, telephone pole, and traffic light.	States normally specify minimum: \$5,000–\$25,000	Required in many states. Needed by all car owners.
Uninsured-motorist* and underinsured-motorist	Pays for injuries to you and your passengers in case of hit-and-run collision, uninsured or underinsured motorist.	Hospital and doctor bills Legal fees Court costs Loss of wages (Does not cover property damage.)	Usually same as bodily-injury liability.	Required in many states. Needed by all car owners.
Collision	Pays cost of repairing or replacing owner's car when owner is at fault or when owner cannot collect from person at fault.	Repair or replacement of any car driven by owner or with owner's permission.	Insures for depreciated value of car. Owner decides on \$100 to \$500 (or more) deductible to reduce cost of premium.	Important for new or expensive car. Drop after 7–10 years of ownership or when value of car no longer justifies cost of coverages.
Comprehensive	Pays cost of repairing or replacing owner's car.	Fire Theft Flood Wind Earthquake Storm Riots Vandalism	Insures for depreciated value of car, usually with \$100 to \$500 (or more) deductible to reduce cost of premium.	Important for new or expensive car. Drop after 7 to 10 years of ownership.
Medical-payments	Pays medical costs for you and your passengers injured in any collision, regardless of fault.	Pays all immediate medical costs (generally in addition to other medical insurance).	Insures for \$500 to \$5,000 per person.	This insurance does not require a legal process to determine fault, while bodily-injury coverage usually does.
Towing	Pays cost of towing or minor repair to disabled car.	Dead battery Out of gas Flat tire Accident (regardless of cause or fault).	Usually pays amount validated by towing company.	Good to have. Not needed if owner belongs to automobile club with towing service.

*Note that uninsured-motorist insurance covers collision-related injuries only, not property damage. Some states now allow insurance companies to offer uninsured-motorist property damage insurance.

Insurance Rates

A number of factors determine what you pay for insurance. Data on different factors are reviewed and statistics developed. Rates are then established based on the statistics. Factors upon which statistics are based and rates determined include:

- **Driving Record** Drivers with a certain number of convictions for moving violations and collisions pay higher premiums.

Insurance companies consider them greater risks to insure.

- **Age** Younger drivers have a proportionally higher number of collisions; thus, they have higher premiums. Older, more experienced drivers have fewer moving violations and are involved in comparatively fewer collisions. A principal driver is a person who will drive a certain vehicle most often. A person under the age of 25 listed as the principal driver of a vehicle could pay as much as four times more than an older driver.

- **Miles Driven** The more miles a vehicle is driven on a regular basis (usually annual), the greater the premium. This is because the vehicle is more exposed to the possibility of a collision.
- **Driver Gender** Male drivers tend to pay higher premiums. Historically, statistics have shown they drive more, have more collisions, and their crashes tend to be more severe than those involving young female drivers. However, the gap based on gender has narrowed.
- **Marital Status** Married drivers statistically have fewer collisions than unmarried drivers.
- **Type of Vehicle** Sports cars, some vans, and sport utility vehicles are very popular. They

also tend to be stolen or vandalized more often and cost more to repair. Many larger vans, trucks, and sport utility vehicles tend to cause greater damage to vehicles they strike. Some insurance companies may charge higher rates to people who drive such vehicles.

- **Where the Driver Lives and Drives** Traffic density in urban areas increases the potential for collisions. Therefore, drivers who live in rural areas tend to pay less for insurance than those who live in larger metropolitan areas.
- **Driver's Claim Record** Higher and more frequent claims, especially for comprehensive and collision coverage, usually result in higher premiums.

Reduced Premiums

Most insurance companies reward low-risk drivers with reduced premiums. Premiums are often reduced for drivers who have

- maintained good grades in school, and in some cases, have successfully completed an approved driver education program
- had no claims or convictions for three years
- multiple vehicles insured under the same policy
- vehicles with certain safety features like airbags and anti-theft devices

Assigned-Risk Insurance

Some companies cancel an insurance policy if the driver or other insured drivers on the policy have been convicted of a drug- or alcohol-related violation. A driver who has several collisions or traffic convictions can be the cause for a company canceling a family's policy.

Drivers who have had their insurance canceled due to a poor driving record may not be eligible to obtain coverage at standard rates. Often times the only coverage these drivers can obtain is **assigned-risk insurance**. Assigned-risk insurance provides bodily injury and property damage liability coverage to high-risk drivers for a much higher premium. Assigned-risk drivers must drive violation-free several years before they can qualify for standard insurance.

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Financial Responsibility

Any suspension as a result of moving convictions or revocation for OWI and implied consent (Chapter 321J) requires compliance with Iowa's financial responsibility law. This requirement is normally met by filing proof of at least \$55,000 insurance coverage. Otherwise, you must post security of \$55,000 by certified check, cashier's check, money order, or surety bond. This filing must be maintained for two years.

From Iowa DOT website
www.dot.state.ia.us/mvd/ods

After Suspension or Revocation

Future proof of financial responsibility is required from the first day of your suspension or revocation for a conviction, unsatisfied judgment, or violation of the OWI law, and lasts for two years. Failing to show or maintain future proof suspends your license and registrations.

Methods of Proof

When you receive your suspension or revocation notice, file future proof in one of these methods:

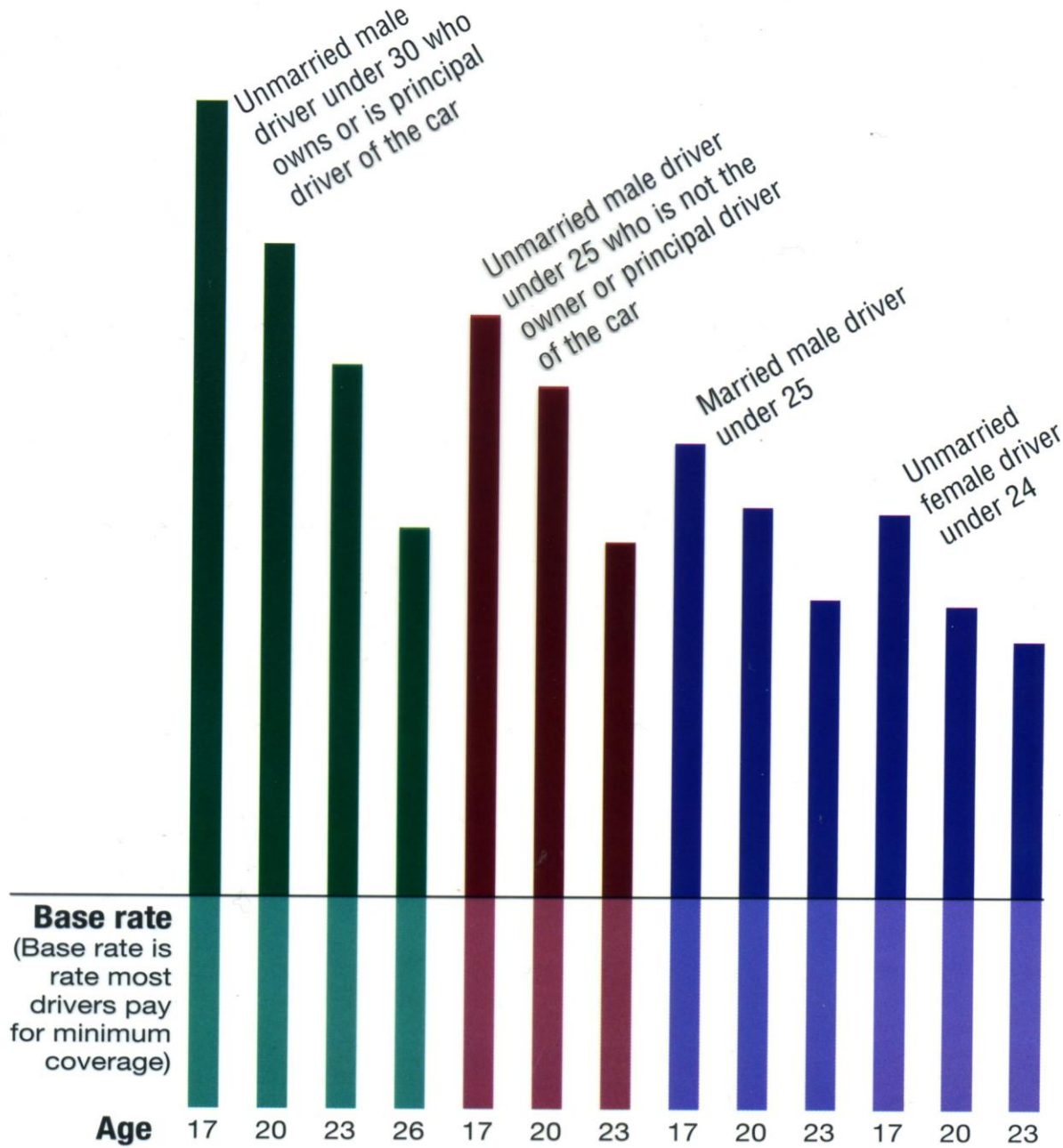
Have your Iowa Authorized insurance company file Form SR-22 (Certificate of Automobile Liability Insurance) with the Office of Driver Services.

or

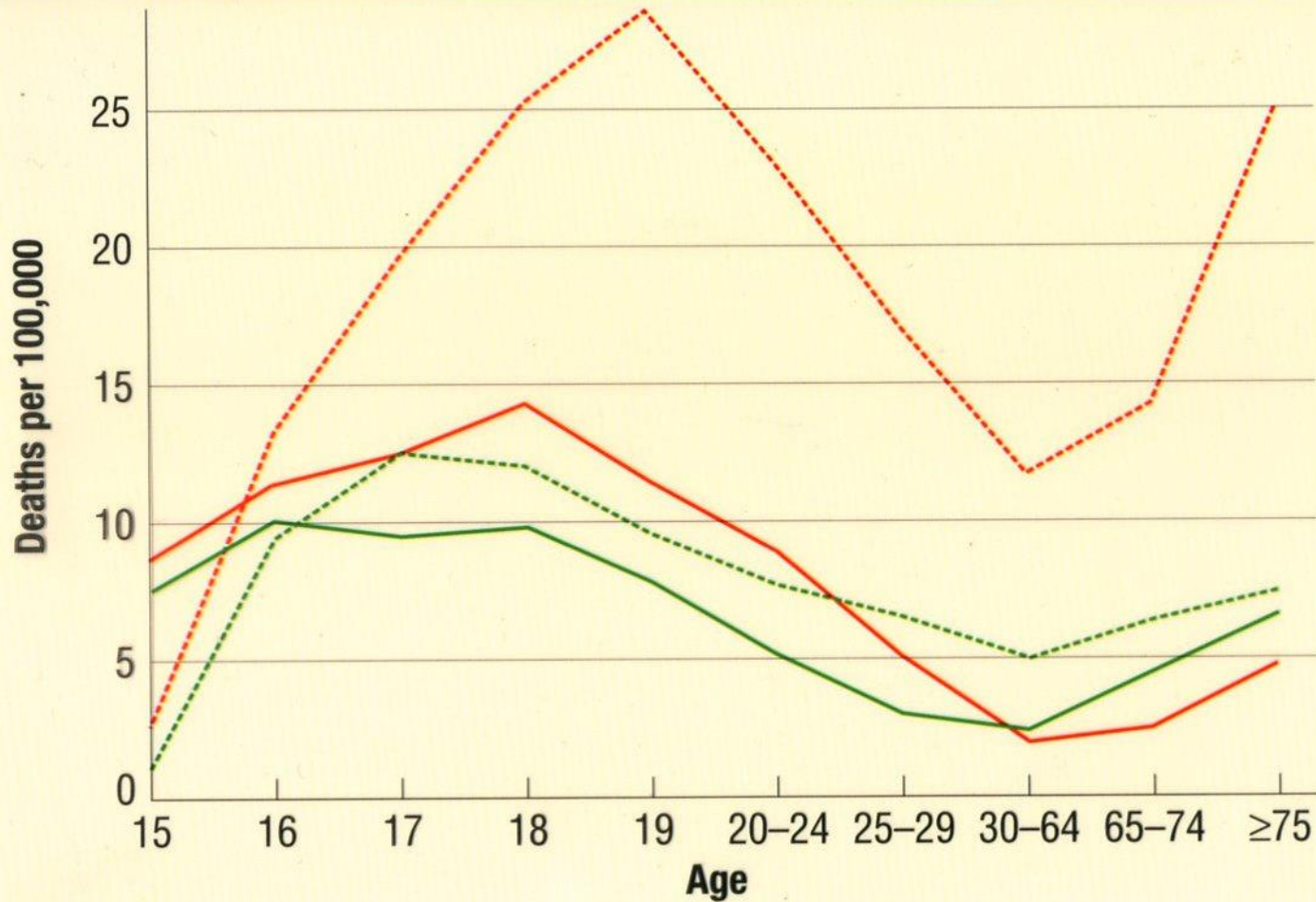
File a surety bond, cash, or securities equal to \$55,000.

From Iowa DOT website
www.dot.state.ia.us/mvd/ods

Insurance Rates Lower As Driver Ages



Death in Passenger Vehicles per 100,000 People, 1999



Male drivers Female drivers
Male passengers ——— Female passengers ———

Iowa claims lowest auto insurance rates

An annual survey by state insurance regulators shows that in 2003-04 Iowa motorists again paid the smallest annual premium in the country to insure their vehicles. Cost is highest in the heavily populated states in the Northeast.

RATES, RANKED BY COST

1 IOWA	\$686
2 Wisconsin	\$706
3 North Carolina	\$717
4 Idaho	\$719
5 North Dakota	\$731
U.S. AVERAGE	\$960
47 Rhode Island	\$1,199
48 Massachusetts	\$1,205
49 New York	\$1,324
50 District of Columbia	\$1,347
51 New Jersey	\$1,386

Source: National Association of Insurance Commissioners

THE REGISTER

Owning and driving a vehicle place many responsibilities on you. One is being aware of how vehicles affect our environment. Drivers must act responsibly to minimize the harm they may cause to the environment.

How Do Vehicles Affect the Environment?

All vehicle owners have a responsibility for ensuring that they do not harm the environment. This includes using more environmentally friendly products, and properly disposing vehicle parts, fluids, and components.

Almost every motor vehicle that uses gasoline or diesel fuel creates engine exhaust. Some exhaust gases contribute to air pollution.

Exhaust Gases

Over the years, improvements in the engineering of vehicles have resulted in smaller amounts of harmful exhaust emissions. Today's vehicles also get better gas mileage. However, each year drivers in the United States drive more vehicles more miles.

Carbon Dioxide Carbon dioxide (CO_2) is one of several gases in vehicle exhaust. Large amounts of this gas produce a "greenhouse effect," which warms the earth. Some scientists fear that too much warming will change the earth's climate.

Regularly maintaining your vehicle can help reduce the number of pollutants your vehicle emits. The less fuel your vehicle burns, the lower the levels of pollutants in its exhaust.

A number of states have implemented auto emissions inspection programs. These programs require owners to have their vehicle's emission levels periodically inspected. A vehicle must pass the inspection before its license can be renewed.

CFCs Until quite recently, most air conditioners contained freon gas, a chlorinated fluorocarbon (abbreviated CFCs). Though effective in cooling air, when freon is released into the atmosphere, it breaks down the atmosphere's ozone layer.

The ozone layer shields the earth from the sun's ultraviolet rays, a known cause of skin cancer. If the earth's ozone layer continues to be reduced, it is likely rates of skin cancer will rise.

All new vehicles use an alternative refrigerant in their air conditioning systems. Auto repair shops that service older vehicles whose air conditioners require freon are required to utilize refrigerant recovery systems. These systems capture any freon that escapes while the shop recharges a vehicle's air conditioning system.



Refrigerant recovery systems are used on older vehicles to keep CFCs from escaping into the atmosphere.

R-12 is the old style refrigerant commonly called Freon, although the name Freon is owned by DuPont. Production of R-12 ceased on December 31, 1995. R-12 was replaced by R-134a by auto makers beginning about 1993. It is a violation of Federal Law to allow R-12 to escape into the atmosphere. Every shop that repairs automotive A/C systems must have refrigerant recovery equipment similar to the equipment shown in the photo and every technician who works on A/C systems must be certified by and registered with the Environmental Protection Agency (EPA).

Sometimes, air conditioning repairs can be more expensive than a car owner can afford.

A driver may have to become creative to enjoy the comfort of an air conditioned car



Disposal of Vehicle Parts and Fluids

Vehicle batteries, oil filters, and fluids—oil, gasoline, transmission fluid, brake fluid, and antifreeze—contain hazardous substances. Never dump or dispose of these items in the garbage or down a drain. Collect these items and take them to the nearest hazardous waste collection center, or other appropriate collection location. Contact your local health department. They will probably know of appropriate drop-off locations for your hazardous wastes.

Other solid materials like tires, exhaust pipes, and mufflers also need to be disposed of properly. Piles of older tires placed out in the open are not only eyesores, they can become breeding grounds for insects and rodents that carry dangerous diseases.

Many vehicle parts can be recycled. Old tires now are being used to make floor mats and other rubber products. Glass and tires can be recycled into road-paving materials. Various plastics are being used to make other commonly used plastic products.

In Iowa you
can go to
iowadnr.com

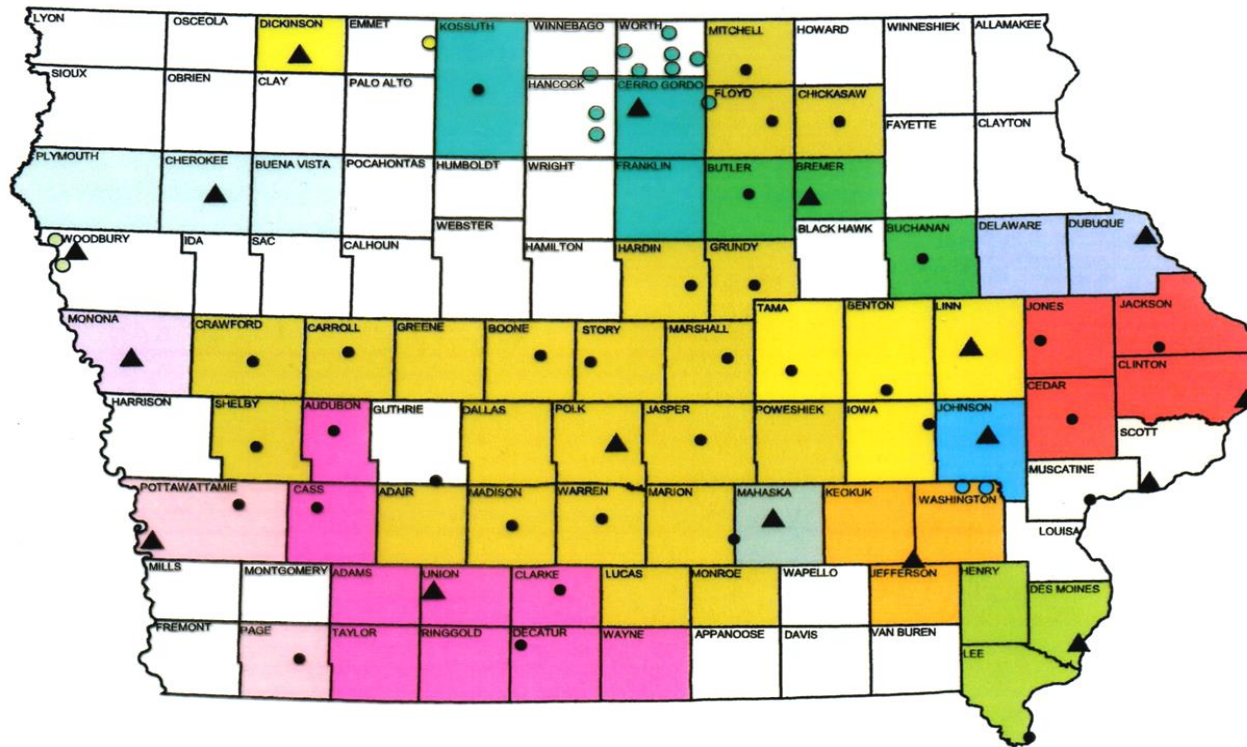
There is “core charge” added to every battery purchase to ensure that old batteries are returned to the seller.

A used oil filter can hold nearly one quart of oil. NEVER put a used oil filter or an old battery in a the garbage or trash. Be a smart driver. Do your part to keep these things out of landfills

Iowa has a tire disposal fee charged per tire at the time of tire purchase

HHM Regional Collection Centers

Regional Collection Centers (RCC) are permanent collection facilities designed to assist the public and small businesses with proper management of hazardous materials.



▲ Regional Collection Center Facilities

● RCC Satellites

RCC Service Areas

- | | |
|------------------------------|------------------------------------|
| ■ Dickinson Co. RCC | ■ Dubuque Co. RCC |
| ● Served City | ■ CR/Linn Co. SWA RCC |
| ■ Iowa City RCC | ■ Waste Commission of Scott County |
| ● Served City | ■ PCB SWA RCC |
| ■ Landfill of North Iowa | ■ Metro Waste Authority RCC |
| ● Served City | ■ Monona Co. RCC |
| ■ Council Bluffs RCC | ■ Mahaska Co. RCC |
| ■ Clinton Co. SWA RCC | ■ SEMCO RCC |
| ■ Haz Chem RCC | ■ Bremer Co. RCC |
| ■ Prairie Solid Waste Agency | ■ Unserviced Counties |

▲ Sioux City HHM Collection Center Service Area

<i>County</i>	<i>City</i>	<i>Buisness</i>	<i>Street</i>	<i>Phone</i>	<i>Oil</i>	<i>Oil Fee</i>	<i>Oil Filters</i>	<i>Oil Filter Fee</i>	<i>Antifreeze</i>	<i>Antifreeze fee</i>	<i>Lead-acid Batteries</i>	<i>Battery fee</i>
<i>Tama</i>	Clutier	Mark's One Stop Service	314 4th Street	319-479-276	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Dysart	Dysart Tire & Service	707 Highway 21	319-476-397	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Gladbrook	Goos Implement LTD	1333 Highway 96	641-473-240	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Gladbrook	Deselm's Motor Company	423 Johnston Street	641-473-263	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Tama	Bennett's Salvage	2369 360th Street	641-484-361	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Tama	Mid-Iowa Auto Repair	1408 East Fifth Street	641-484-282	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Toledo	D's Auto & Truck Inc.	206 North County Road	641-484-414	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Traer	Kaufman Tire Company	1788 Highway 63 South	319-478-802	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Traer	A.W.E. Auto Service	206 North Main Street	319-478-846	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Traer	Lone Pine Service	908 South Main Street	319-478-214	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Recycling information can be found at lowadnr.com

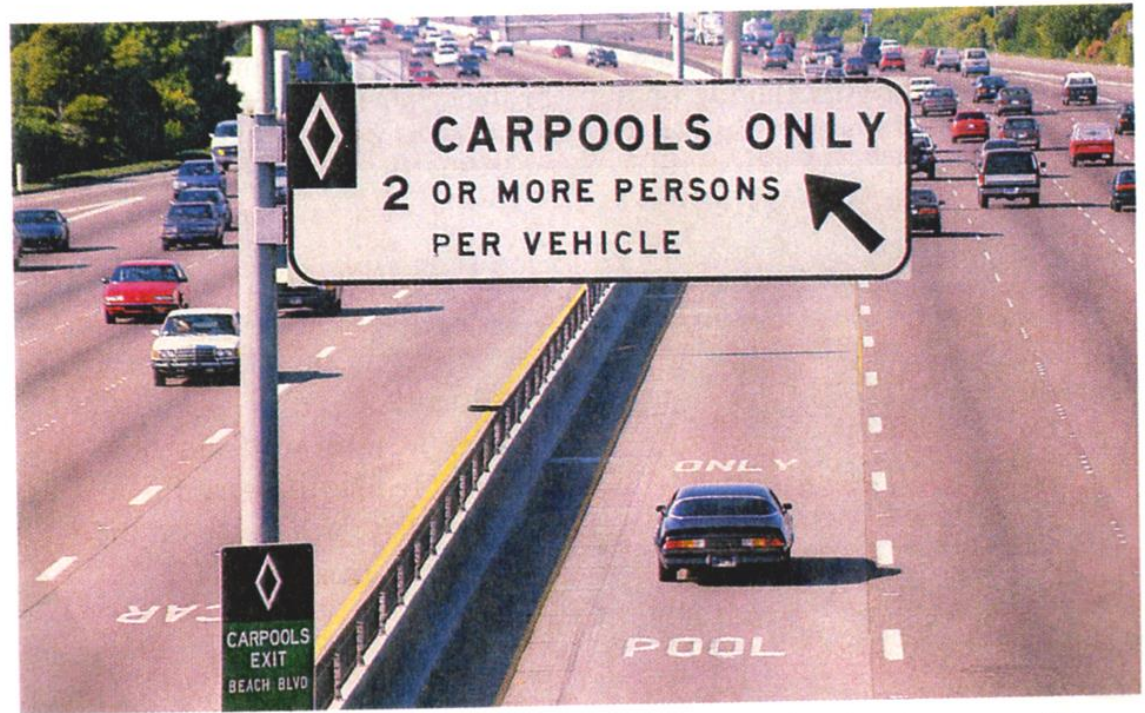
How Can Drivers Help the Environment?

Each person can utilize transportation and still help the environment. As technology increases, more and more alternatives are available.

Mass Transportation

Several forms of **mass transportation** (also called mass transit) are available throughout the United States. Mass transportation involves moving large numbers of people together from place to place.

Mass transportation is safe, efficient, and environmentally responsible. It includes small buses, city and suburban buses, and rail trams. It also includes urban mass transit systems common to some of our larger cities. Some rapid transit systems are already in place. Others are being developed. Using mass transit reduces the cost per passenger mile and decreases exhaust emissions.



Car or van pooling reduces the number of vehicles on the road, exhaust, and conserves the amount of gasoline consumed.

Car and Van Pools

Other environmentally responsible systems include **car pooling** or **van pooling**. These are systems where several individuals share transportation to one or more destinations. As an incentive to car or van pooling, some highways have special lanes for use only by vehicles containing a certain number of passengers.

Many companies and government agencies provide vans and vehicles for use in a car or van pool. These systems help reduce the number of vehicles on the road, save fuel consumption, reduce overall amounts of exhaust, and decrease the amount of space needed for parking.

Iowa has RideShare

WHAT ARE SOME WAYS YOU CAN CONSERVE FUEL?

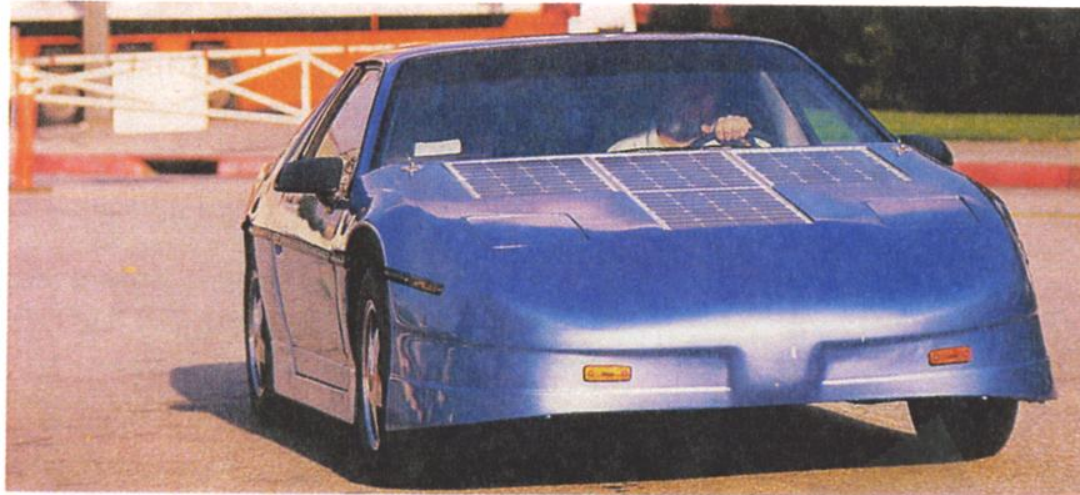
- BUY A SMALL, FUEL EFFICIENT VEHICLE
- AVOID “JACK RABBIT” STARTS
- REMOVE ITEMS FROM THE TRUNK THAT ARE NOT NEEDED TO SAVE WEIGHT
- DRIVE SLOWER (AT 55 MPH A VEHICLE USES LESS FUEL THAN AT 75 MPH)
- MAINTAIN A STEADY SPEED – USE CRUISE CONTROL WHENEVER IT IS SAFE TO DO SO
- MAINTAIN RECOMMENDED TIRE PRESSURE
- FOLLOW A REGULAR MAINTENANCE SCHEDULE
- DO NOT ALLOW YOUR VEHICLE TO WARM UP EXCESSIVELY IN COLD WEATHER
- COMBINE YOUR TRIPS
- AVOID SHORT TRIPS AND STOP AND GO DRIVING AS MUCH AS POSSIBLE

Alternative-Fueled Vehicles

Although many alternative-fueled vehicles are still in early stages of development, this is another option drivers have in reducing the harmful effects of driving on the environment. Many government agencies have fleet vehicles that use cleaner burning fuels like propane gas or gasoline with an ethanol blend.

Battery-powered vehicles are being tested in several cities. Some of these vehicles run on batteries that store electricity. When the batteries are low, you simply plug in and recharge. As technologies improve, these vehicles may one day be mass produced.

A **solar-powered vehicle** captures light from the sun and transforms it into electrical power. Though not yet available on the mass market, it will only be a matter of time before you will see solar-powered vehicles on roadways.



Solar-powered vehicles require no gasoline because they harness from the sun the energy they need to operate.

Are solar and battery powered cars practical?

How long have battery powered cars been around?

What is an alternative to a battery powered or solar powered car?

The state of California passed a law called ZEV in the 1990s.....



Thomas Edison with electric car, 1913. The car is a 1914 model Detroit Electric



This electric car would be plugged in when not being driven and the power company could draw on the car's batteries to add electricity to the nation's electric grid when needed.

This is called Vehicle to Grid Technology or V2G

Utility companies would pay car owners for the power they draw off the car's batteries

A Light Bulb Goes On

Willett Kempton sees your car—and the electric grid—as a solution to America's energy problem, not the source of it | By Joann Muller

LAWMAKERS IN WASHINGTON want to solve America's pollution and energy problems by imposing higher fuel economy standards on automobiles. Willett Kempton has a more exotic approach: turn cars into rolling power stations that can provide clean energy when utilities need it most.

Kempton, a wiry, 59-year-old renewable energy professor at the University of Delaware with round, wire-rimmed glasses and a shock of white hair, is the nation's foremost proponent of what's known as vehicle-to-grid technology. For ten years he's been trying to convince utilities and automakers that electric cars could draw power at night, when power is cheaper, and then discharge some of that juice back into

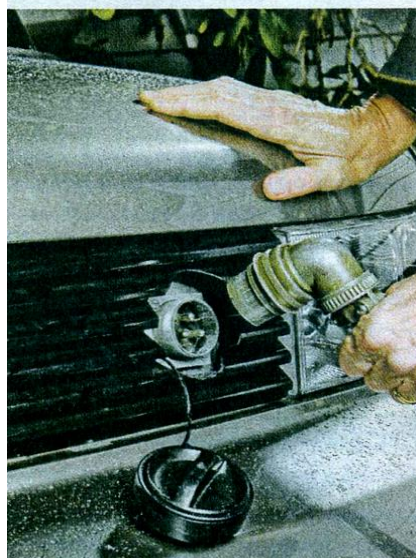
the grid during the day to balance supply and demand for electricity. Kempton's theory is beginning to win applause from some car and utility folks, but daunting technical and economic obstacles make it a tough sell.

Kempton argues his idea doesn't have to wait for cheaper batteries, the main stumbling block to production of electric vehicles. He's got a way, he says, for owners of electric cars to recoup the cost of even very expensive batteries, the ones with price tags in the \$20,000 range. It involves using cars to supply a reserve of electric power that can smooth out minute-to-minute shortages in the transmission grid.

Kempton parks a plug-in Toyota Scion in his garage that can discharge 19

kilowatts of power from its battery. The average house uses 1.5 kilowatts. "When I run it backwards at full power," says Kempton, "I'm running my whole block," or he would be if the system were up and operating.

The Kempton plan is just one of several proposed schemes for interconnecting the country's transportation and electric networks. Another, proposed by former software executive Shai Agassi, entails electric filling stations at which car owners would make a quick swap of a depleted battery for a charged battery.



Electric Vs. Gas

How power sources differ in two areas.

1.1 tons of greenhouse gases, from coal generation, attributed to an electric car per year.

6.3 tons of greenhouse gases from gasoline-powered cars.

\$270 annual utility bill for an electric car.

\$1,538 annual fuel cost for a gas-powered compact car.

Source: Penco Holdings.



Two-way: A 220-volt plug (left) and an electronic controller in Kempton's converted Scion (battery is in rear of car) let electricity flow in or out; he monitors the system on a custom dashboard display.



Note that this V2G car reduces carbon emissions by about 6 times and costs about 1/6 to operate compared to a gasoline powered car

LYNN HICKS, Executive Business Editor,
515-284-8290/e-mail: lhicks@dmreg.com

Supply of hybrid Prius now zooms with demand



JUSTIN HAYWORTH/REGISTER PHOTOS

Deeya McClurkin, left, checks a Toyota Prius on Monday with help from Bill Klomstad of Toyota of Des Moines. The automaker quietly launched its first incentives on the gas-electric hybrid at the end of January.

Toyota will use ads, incentives to drive its car, once seen as niche product, into mainstream

Hybrid sales by the numbers

107,000

Toyota Priuses sold in the United States in 2006

175,000

Expected Prius sales in the United States in 2007

170,000

Total Toyota hybrid sales in 2006

250,000

Expected total Toyota hybrid sales in 2007

600

Priuses sold in Iowa in 2005

700

Priuses sold in Iowa in 2006

2,670

Priuses sold in the six-state Toyota region that includes Iowa in 2006

4,700

Expected Prius sales in the six-state Toyota region that includes Iowa in 2007

Hybrid vehicles appear to be a good alternative. They have range, power and economy. They still pollute, but less.

Some hybrid auto makers are:

Toyota

Honda

Volkswagen

Ford

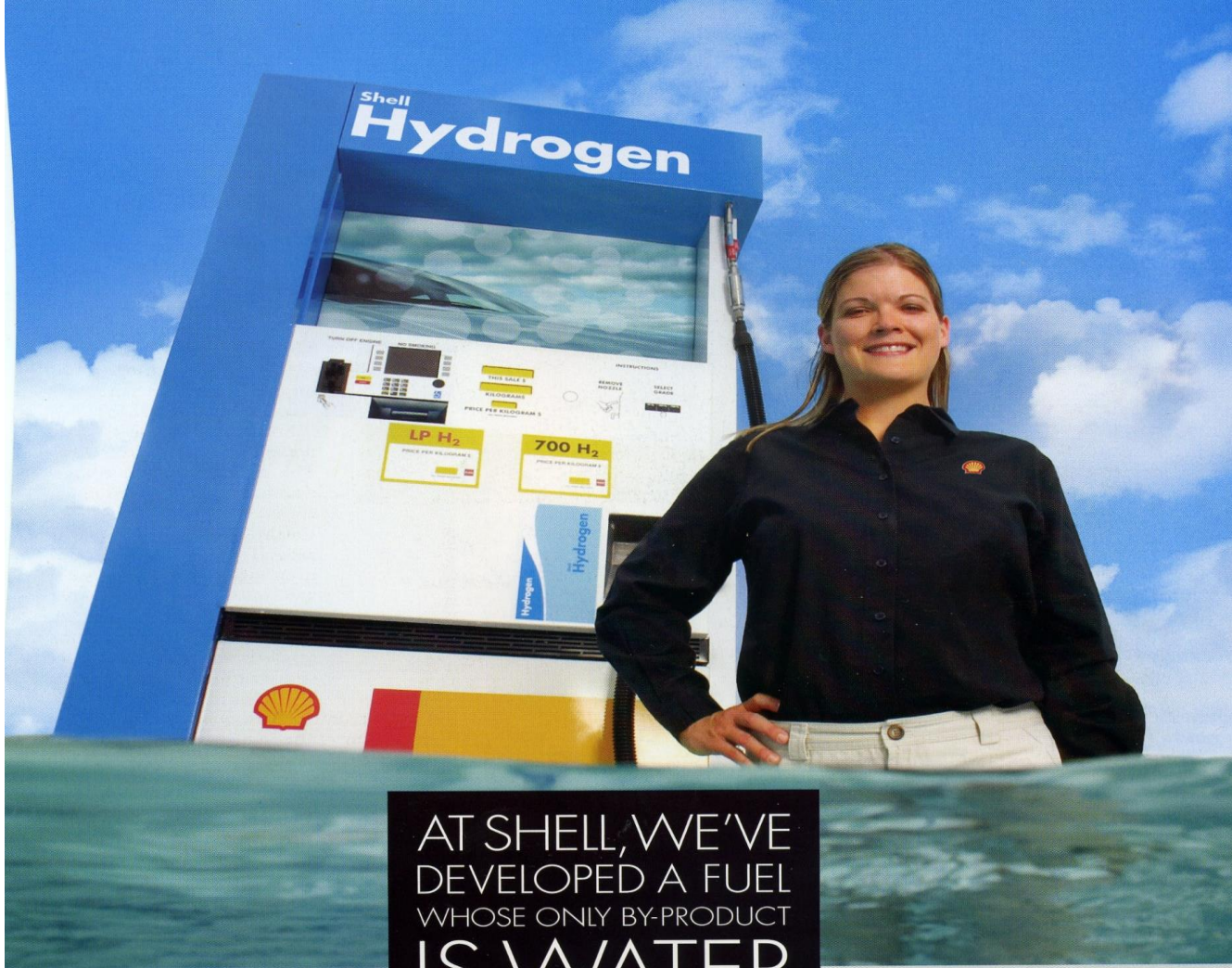
General Motors

Based on the price of a Toyota hybrid, it takes about 8 years for a purchaser of a hybrid to recover the extra cost paid.

WHAT ARE SOME OTHER ALTERNATIVE FUELS ?

- HYDROGEN FUELED VEHICLES
- E-85 FUEL (85 PERCENT ETHANOL)

WHAT ARE SOME DRAWBACKS TO HYDROGEN AND E-85?



AT SHELL, WE'VE
DEVELOPED A FUEL
WHOSE ONLY BY-PRODUCT
IS WATER.
HOW REFRESHING.

The promise of hydrogen is exciting, but commercial viability is a long-term prospect. At Shell there's progress toward the promise, thanks to a commitment to make the hydrogen economy a reality.

Key to this progress are strategic relationships with leading companies like General Motors and people like Kristin Andrichik, Business Development Advisor with Shell Hydrogen (U.S.). Kristin works to capitalize on Shell leadership in fueling technologies and GM's expertise in vehicle technology to

determine the best path toward the commercialization.

The centerpiece of this union is the nation's first hydrogen refueling dispenser at a retail site, which supports a fleet of GM hydrogen fuel cell vehicles.

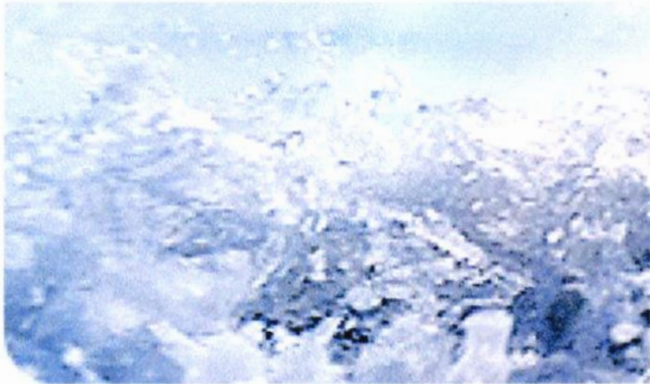
Ultimately, commercialization will depend on individuals choosing hydrogen. And through the efforts of Kristin and others like her, Shell is ready to meet those needs.

Visit www.shell.com/newenergies for details on this and other Shell activities.

"Shell Hydrogen" refers to a global business of the Royal Dutch/Shell Group and consists of separate companies set up to pursue and develop business opportunities related to hydrogen and fuel cells.



Welcome to Shell Hydrogen



Shell Hydrogen develops business opportunities in hydrogen and fuel cell technology

What's new?



Purchasing zero emissions hydrogen-powered buses

05/10/2006

Six cities and regions in Europe and Canada are joining forces with the aim of buying environmentally friendly zero-emissions hydrogen-powered buses.



Industry Outlines Steps for a European Hydrogen Infrastructure

29/09/2006

Shell Hydrogen and Total France, along with several vehicle manufacturers announce their joint approach to advance hydrogen as a fuel for road transport in Europe.

Hydrogen



Hydrogen bus in Iceland

Introducing hydrogen

Hydrogen is the simplest and most abundant element in the universe, with the potential to be the principal building block of a sustainable energy system in future.

Hydrogen goes hand-in-hand with fuel cells, a technology which generates electricity through an electrochemical reaction – just like a battery – cleanly and quietly.

But unlike a battery, a fuel cell will continue to generate power as long as it has a continuous supply of fuel. When powered with hydrogen, fuel cells generate electricity – with only water and heat as by-products.

Today, companies around the world are developing fuel-cell technology to power everything from laptop computers to homes and automobiles.

Hydrogen is the key to unlocking this world of pollution-free power. Though some of these products – such as fuel cells for computers – may be marketed this decade, most people expect fuel-cell vehicles to be at least a decade away from commercialisation.

Where does hydrogen come from?

Hydrogen isn't found naturally on earth in its pure state. It is usually chemically combined with other atoms to form compounds, such as water (H₂O).

Unbinding the hydrogen content requires energy, such as an electrical current, to split water into oxygen and hydrogen (electrolysis).

Hydrogen can also be extracted from hydrocarbons such as natural gas or propane by applying heat (reforming). Natural gas reforming is the primary means of producing the hydrogen used in today's industrial processes.

Benefits of a "hydrogen economy"

Hydrogen is rightfully considered an energy carrier instead of an energy source. Energy carriers allow a direct source of energy, such as the sun or wind, to be stored and then transported to where it's needed.

The phrase "hydrogen economy" envisions an energy infrastructure built on hydrogen as an energy carrier, fuelling cars and homes powered by fuel cells.



Auto gas (LPG)

Liquefied Petroleum Gas



Introducing auto gas (LPG)

Auto gas is now the most commonly-used alternative fuel in the world. There are currently nine million vehicles on roads using the fuel, ranging from cars, to vans, trucks and buses.

Governments everywhere have recognised the environmental benefits of auto gas and offer a range of incentives to ensure drivers save on every litre. Typically, auto gas only costs motorists half the price of petrol.

Between 1997 and 2002, global demand for auto gas rose by 60 per cent. Shell is one of the leading suppliers and provides a quality fuel to 24 countries around the world.

Auto gas is a safe fuel with a long history of use in many countries. Shell has been refuelling auto gas vehicles for almost 50 years. Today's vehicles are fitted with many safety features including tanks designed to resist heavy impact and heat, beyond the level which traditionally-fuelled vehicles can withstand.

Where does auto gas come from?

Auto gas is the generic term for Liquefied Petroleum Gas (LPG) used for powering vehicles. It is blended from a mixture of two gases – propane and butane – extracted from either natural gas or crude oil.

Auto gas has the unique property of being a gas at normal atmospheric pressure which can be stored easily as a liquid under light compression.

By combining the cleaner emissions of a gas fuel, with the practicality of traditional liquid fuels, auto gas is an affordable, clean energy source for the road.

Auto gas vehicles

Most auto gas vehicles are bi-fuelled, meaning they have both LPG and petrol tanks. Drivers can switch between fuels while driving at the touch of a button, without any noticeable difference.

Auto gas vehicles can be bought new from some vehicle manufacturers or kits can be incorporated into existing petrol vehicles.

Typically, refuelling equipment is installed at existing service stations, meaning the refuelling experience is almost unchanged for drivers. Although there are costs associated with installing new tanks and dispensers, systems are well established and very cost-effective.

Recent technological developments such as liquid injection systems and mono-fuelled factory-fitted vehicles are improving performance and emissions even further.



Field of sunflowers in France

Introducing bio-fuels

The term bio-fuels describes fuel components produced from biomass, such as plants, straw or waste paper.

Bio-fuels can be used either "pure", or as a blend with standard automotive fuels. Derived from renewable sources, they result in lower carbon dioxide emissions. However, these reductions are highly dependent on the production process.

There are two main bio-components for fuels – ethanol and bio-esters.

Ethanol

Where does ethanol come from?

Ethanol is made by the fermentation of sugars produced by plants, such as sugar cane and sugar beet. As fermentation occurs in the aqueous solution, ethanol is separated from the water by distillation.

Ethanol in gasoline

To meet existing gasoline specifications, ethanol can only be blended up to 10 per cent in the US, and five per cent in Europe. To use ethanol at higher concentrations – such as up to 25 per cent

in Brazil – the tank and fuel-injection equipment requires modification.

In bespoke vehicles, ethanol can be used at concentrations of up to 85 per cent, and is available in the US and Sweden. The only difference for the driver is a 30 per cent increase in fuel consumption.

Fuel-ethanol is used in large quantities in Brazil, where it is produced from sugar cane, and in the US, where it is made from corn.

Sugar cane may replace more than 10 per cent of all gasoline used in tropical regions, where it is grown, but corn and cereals are less productive and more expensive – and in competition with the food industry.

Greater potential exists in new technologies which convert the cellulose contained in plant residues, such as straw and stems, into sugars.

One of the most advanced companies in this field is IOGEN. And Shell has now formed a partnership with this Canadian-based company to bring the technology to the benefit of consumers.



CNG station in Delhi, India

Introducing CNG

Compressed Natural Gas (CNG), as a vehicle fuel, has a long history dating back to the 1920s. With the oil shocks of 1974 and 1979 and the possibility of future fuel shortages, there has been much interest in Natural Gas Vehicles (NGV) and AutoGas (LPG).

And as awareness surrounding urban and global pollution has grown, interest in CNG has increased even further.

Worldwide, there are just under 2.7 million NGVs, representing 0.3 per cent of the world's vehicle population, with more than 4,000 natural gas refilling stations.

Given the long history of NGVs, this low figure comes as a surprise. The limited NGV market success is in contrast to a general perception, that readily available natural gas can be low cost as well as a clean fuel.

Where does CNG come from?

Like crude oil, natural gas occurs underground, although it is not always associated with crude oil deposits.

A substantial proportion of the world's gas reserves are located in areas remote from places of demand. Therefore, natural gas needs to be transported either in gas pipelines or liquefied, then carried by ship and gasified in the countries of demand.

Around two-thirds of global gas reserves are concentrated in the Middle East and Russia.

Converting to NGV

The analysis of several cases where markets have made a rapid change from liquid fuel to natural gas can be divided into two groups. Those which aim to promote the use of indigenous natural gas and others that are driven by the need to rapidly improve emissions from local transport.

- The first group includes the majority of NGVs in Argentina, Pakistan, India and Egypt. NGV drivers have a high annual mileage; are cost conscious; and mainly operate in densely populated areas (eg, taxi drivers). The gas consumed is typically low-cost indigenous gas, with regulated prices. The cost of converting a gasoline vehicle to bi-fuel is US\$900 to US\$4,000. There is a reduction of 10 per cent in engine power, 20 per cent to 50 per cent in boot space, and a reduction in the distance covered.
- The second group includes NGVs in the US, Germany and Japan. NGVs are rarely used by private motorists. CNG is mainly used by bus and corporate car fleets. The use of CNG as a transport fuel is expensive, and often compensated by subsidies. Filling up is usually carried out at special corporate filling stations.

Gas-to-Liquids fuel

GTL trials using a London bus



Introducing Gas-to-Liquids (GTL) fuel

Gas-to-Liquids (GTL) fuel is an ultra-clean alternative fuel, made from natural gas, which can be used in conventional diesel engines.

It is a colourless, odourless liquid, with the easy handling features of diesel fuel, and can be used as a stand-alone fuel, or blended with diesel.

GTL fuel delivers a superior environmental performance with significantly lower local emissions than ultra-low sulphur (50ppm) diesel. It is also cost-effective, and can be used in existing infrastructures and vehicles without modification.

All these characteristics make GTL fuel a promising alternative option in the medium term. Longer term, its compatibility with many future technologies makes GTL fuel a potential bridge to fuels and vehicles with even greater benefits.

GTL fuel will be available in commercial-scale quantities before the end of the decade.

With trials taking place across the globe alongside many different automotive partners, Shell has gathered considerable evidence on the performance and efficiency of GTL fuel.

Where does GTL come from?

GTL fuel is produced from natural gas by chemical transformation. It is non-toxic, biodegradable, and does not contain nitrogen or sulphur.

"Shell has been at the forefront of GTL technology for many years. With the world's only commercial GTL plant of its type operating in Malaysia, the company has unrivalled experience in the development and manufacture of GTL products."



Roger Davies
Global Marketing Manager
Shell GTL Transportation Fuels

As GTL is a synthetic fuel, engine manufacturers are able to develop new improved engine technologies with better performance and lower emissions.

GTL conversion is an umbrella term for a group of technologies which can create liquid fuels from a variety of feedstocks. The basic technology was developed in Germany in the 1920s, and is known as the Fischer-Tropsch process – named after its inventors.

It uses catalytic reactions to synthesise complex hydrocarbons from more basic organic chemicals.

Water-in-diesel emulsions



Sample of water-in-diesel emulsion as compared with diesel

Introducing emulsions

It has been known for almost a century that injecting water into the combustion chamber of a diesel engine can reduce the formation of pollutants, such as soot and Nitrogen Oxides (NOx). But it isn't easy modifying existing engines, and this approach has never been widely adopted as a means of controlling exhaust emissions from vehicles.

However, if water was combined with diesel fuel, it could be injected into the combustion chamber with the fuel, and no engine modifications would be needed. Oil and water do not normally mix, but it is possible to form an emulsion by using a surfactant to disperse droplets of water in diesel fuel.

Such "microemulsions" look extraordinary, having a dense white appearance, like milk. Although emulsions look very different from diesel, they can be used in most diesel engines, bringing immediate reductions in pollutant emissions.

Whereas it might take many years to replace all the vehicles in a fleet with newer and cleaner technologies, switching from diesel to emulsion reduces particulate and NOx emissions in all engines, whether old or new.

Water-in-diesel emulsions have been in use in bus fleets in France and Italy since the mid-1990s. Shell recently launched its own emulsion fuel, Aquadiesel, which is used in a number of bus fleets and underground mines in Australia.

How are emulsions made?

Large amounts of water can be incorporated into diesel fuel, and the more water, the larger the reduction in smoke and NOx emissions. Engine power is reduced slightly, because the water displaces some fuel, but around 13 to 15 per cent water gives a good compromise between performance and emissions reduction. Distilled or de-ionised water must be used to avoid mineral deposits forming in the engine.

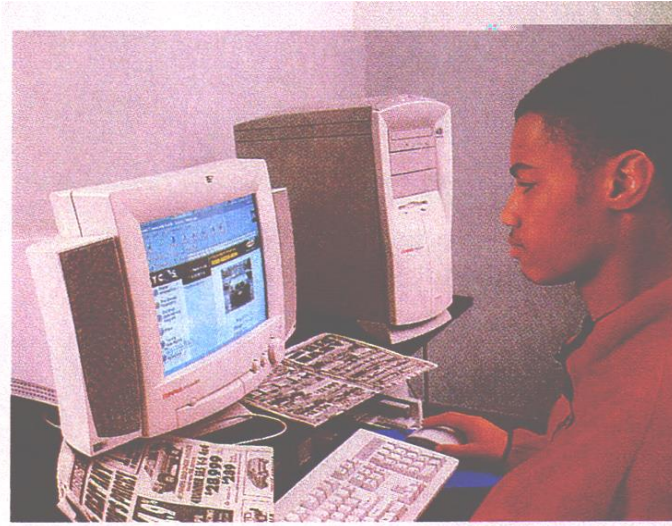
Diesel typically makes up about 85 per cent of the emulsion. Water is mixed into the diesel and broken into microscopic droplets by mechanical shearing or ultra-sound, in a process similar to the manufacture of mayonnaise.

The droplets must be very small – less than one micron – in order to pass through fuel filters and the very tight clearances in fuel-injection equipment.

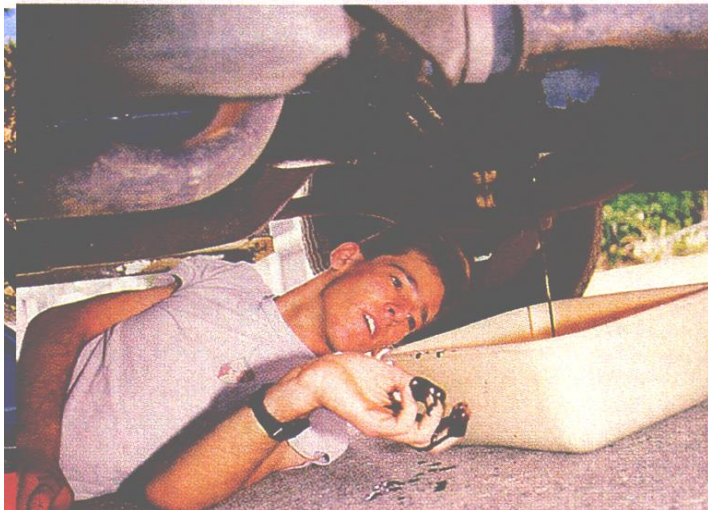
Decision Making



1. You have a part-time job. What are the arguments for and against buying a vehicle?



2. You know the type of vehicle you want. You have found vehicles at a private seller, a used-car dealer, and a new-car dealer. How would you decide which vehicle to buy?



3. How should this person properly dispose of used oil?



4. Your vehicle has been vandalized. What should you do? What type of insurance will cover the repairs?