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DEAR READER:

The first time I drove a car on Interstate 5, I was 20 years old and on my way to tour Western Washington University. I made the trip from Olympia to Bellingham in a borrowed Toyota truck. In Seattle, the traffic terrified me. Soon, my fingers were cramped from clenching the steering wheel. In Everett, I missed the signs warning me my lane was exiting. I spent 20 minutes trying to find the freeway again.

In Bellingham, I stepped out of the truck with relief. I never wanted to see I-5 again. Now, nearly four years later, I can drive I-5 more calmly. Experience has taught me to put on some music and accept the gridlock.

I-5 stretches 1,376 miles along the West (east from the Canada to Mexico, the only interstate that touches both borders. The interstate system got its start because of concerns about national security. During World War II, Dwight D. Eisenhower noted that the German Autobahn system moved people quickly and safely across the country. When he became president in 1953, Eisenhower approved funding for an interstate system. That system reached Bellingham 45 years ago when I-5 cut its way through the city. Today, more than 46,000 miles of interstate cross the United States.

Each day, hundreds of thousands of people drive on the 276 miles of I-5 in Washington. In Bellingham, I-5 drivers make about 56,000 trips each day. Commuters head to work, vacationers start their trips, truckers haul food and other products and students drive to classes.

I-5 touches nearly every aspect of our lives, yet it rests in the back of our minds - like the constant sound of tires on the road. But I-5 shaped the western half of Washington. Where are all the large cities and densest populations? Along the interstate. How do we get our food, clothes and building materials? Truckers drive them here. Who keeps small businesses near the freeway alive? Drivers on I-5.

For this issue of the Planet Magazine, we wanted to take a closer look at the concrete strip running through our state. We talked to people who live with the constant whir of tires. We spent time with farmers who have found they can make more money by selling their land near I-5 than farming it. We talked to residents who remember what their neighborhood was like before I-5.

We also looked at the alternatives to I-5. Light rail in Seattle will give commuters another option. Some people prefer an older method of travel and ride traditional trains. We spent time at some of the natural areas that are left near the freeway and learned how I-5 affects them.

The more we looked at the freeway, the more we learned about the impact it has. I no longer drive I-5 in a panic and after working on this issue I no longer drive in a daze. I notice things I never noticed before: truckers, the plants in the median, the rivers.

I hope the next time you drive I-5 our stories help you look at it differently, too.

Jessi Loerch

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SOUND OF SPEED  
by Derek Jackman
Neighbors of I-5 deal with the constant barrage of freeway noise. Some methods exist for reducing the noise, but for many people, it's a matter of adapting to the sound.

TIES TO THE PAST  
by David Stone
The railroads facilitated development in the West and established many transportation corridors. For most people, the automobile made train travel obsolete. Some, however, still prefer the rails, and without their freight capabilities, gridlock would increase dramatically.

CRASH COURSE  
by Ian Alexander
Car accidents capture the immediate attention of the public and media. Sometimes, though, their human, environmental and economic effects continue long after the wreckage is cleared.

LIGHTEN THE LOAD  
by Laurie Ballew
The 14 miles of light rail planned for Seattle to Tukwila offer an alternative to I-5. But some say the rail won't reduce congestion and construction disrupts neighborhoods.

LIFE AT 60  
by Andrea Jasinek
No store or gas station can operate without the constant supply of goods that truckers deliver. These drivers work late nights and early mornings to ensure shelves stay stocked. Meanwhile, state patrol troopers watch the roads, looking for safety violations.

ISOLATED  
by Emily Johnson
Transportation workers closely maintain medians to keep the area safe for humans and wildlife. As an isolated habitat, the medians are an unique man-made landscape that few see up close.

SELL YOUR SOIL  
by Marianne Warren
If farmland is next to I-5 in Skagit Valley its value can triple. But land has to be rezoned for development first. Some see development as a return on an investment, others see it as destruction of rural heritage.

REFUGE  
by Lucas Henning
I-5, the southern border for the Nisqually Wildlife Refuge, heavily affects the refuge. High visitation increases the impact on the natural world, but the high number of visitors also gives refuge staff and volunteers a chance to educate more people.

DIVIDING LINE  
by Sean Monahan
I-5 divided neighborhoods throughout its corridor. Some think bisecting these areas has contributed to a decreased sense of community. Despite these changes, others still feel a close connection to their neighborhoods.

RUNNING OFF ROADS  
by Brianne Holte
Each time it rains, water pours off the surface of I-5, bringing silt and contaminants with it. In Bellingham, a new retention pond should help reduce the effects of runoff on Whatcom Creek.

CHANGING TIDES  
by Ben Arnold
Humans have changed the Snohomish River estuary to control the tidal water. In the process, they removed vital, productive natural areas. Now, efforts are beginning to restore some of this land along I-5 north of Everett.

OUT THE WINDOW  
by Jen Rittenhouse
Where people go, trash inevitably follows. The Adopt-a-Highway program seeks to keep Washington's highways clean by encouraging volunteers to pick up after the less courteous.

HOME FRIED FUEL  
by Katie Scaife
Our nation is dependent on petroleum based fuels. While biodiesel cannot meet the U.S.'s demand, it might provide enough fuel to change the way we look at gas stations.

THE AIR WE BREATHE  
by Aaron Managhan
Cars drive millions of miles on I-5 every year. Along with all this traffic inevitably comes exhaust. What is in the air we breathe along I-5?

The Planet Magazine is published three times yearly and is dedicated to environmental advocacy and awareness through responsible journalism. The magazine is written, designed and edited by students through Huxley College of the Environment.
SOUND OF SPEED

by Derek Jackman
photos by Nicole Mills

Bryn Kruse, standing on her second-story deck, enjoys a cup of hot tea while the sounds of I-5 roar over the concrete sound barrier in her backyard.
Oblivious to the torrent of chaotic noise from beyond the yard's edge, two black dogs fight over the dilapidated remains of what was once a fluorescent green tennis ball. Just past the dogs, the lawn ends abruptly at a chain link fence. Beyond the fence, 25 feet down a concrete retaining wall, cars, trucks, motorcycles and vans on I-5 streak past Bellingham's Roosevelt neighborhood at 60 mph.

"The dogs were going crazy when we first moved in," said Lee Kittel, referring to the dogs' reaction to the noise, "but they seem to have gotten used to it."

The yard's rusty fence, overgrown with blackberries and grasses, stands adjacent to several small maple trees, leaves yellowing in the autumn sunlight. This fence is the only barrier between the roaring bustle of the freeway and Kittel's home.

"You can definitely hear the freeway in here," Kittel said, standing in her living room. "Sometimes, when you're dead asleep at 1 in the morning, truckers will use their engine brakes. It kind of sucks, it sounds like they're right outside your window."

"It was hot," Kittel said. "We wanted to have our windows open, but it was loud; it was a hassle. I grew up way out in the county, so I'm not really used to hearing noises all the time. But it seems constant enough that I'm able to kind of tune it out."

From a distance, the sound of rubber on concrete is not an unpleasant one for some.

"It's soothing now," said Andy Kruse, a resident of Mountlake Terrace, Wash. "I don't really hear it unless I think about it. It's too quiet — almost eerie when I'm not around the freeway."

Close up, the sounds of screaming engines and compression braking dominate the airwaves, but from a distance or through an insulated wall or window, these intermittent eruptions of mechanical sounds all but disappear.

"Andy's mom said she thought the traffic sounded like the ocean," said Bryn Kruse, Andy's wife. "She said it was kind of relaxing."

The Kruses live on the second story of a duplex. Surrounded by pine and madrona trees, their house towers over the top of a concrete barrier designed to keep noise confined to the freeway. From the green patio chairs situated around a circular glass table outside the master bedroom's sliding glass door, the view of the Olympic Mountain Range is nearly as clear as the view of the interstate. All major lanes of traffic are in plain sight from the Kruses' deck, and the sound proceeds unobstructed to the second floor.

According to the Washington State Department of Transportation, noise walls in Washington are occasionally constructed to a height of 20 feet, but are usually built to an average of between 12 feet and 15 feet — not a sufficient height to significantly reduce noise in a second-floor home. The Kruses' home stands high enough that sound from the freeway is not reduced.

"When you come up the stairs, that's the point when you cross the sound barrier. I never talk on the phone out here," Andy said while the whoosh and growl of cars and trucks in the background provided the explanation for him.

Down in the yard below, a swing set stands unused on the lower
level of the terraced landscape. Toys are strewn about, haphazardly discarded by the children living downstairs. Orange pine needles and large brown cones litter the ground. The gray concrete of the sound barrier sits stiff and cold at the back of the yard. A few small alder trees grow against the wall. The rough, grooved surface of the wall shows mildew and dirt stains from years of weathering.

“It’s pretty ugly,” Andy said. “It’s just a big cement wall.”

Kittel said she thinks the barriers strip the character of surrounding towns and homes.

In addition to the aesthetic problems of concrete noise barriers, high construction costs prevent them from being used in many cases. According to WSDOT, it costs an average of $22.10 per square foot to construct a barrier. This translates into an approximate cost of $1.75 million for a 15-foot high wall spanning one mile.

The noise barriers, however, are usually the most practical solution, according to an April 2000 study by the Federal Highway Administration and the U.S. Department of Transportation. But there are other options. The study found that earth berms are the most effective method of mitigation. Earth berms are large mounds of soil, rock and other natural materials, usually covered in bark and landscaped with flowers and plants. Berms, however, require a great deal of space and materials, more than the concrete walls. Lowering speed limits and planting dense vegetation can also alleviate some of the highway noise. But, according to the FHWA study, speed limits would have to drop by nearly 20 mph to produce a noticeable change in decibel levels, and vegetation would have to be 61 meters thick to achieve a similar reduction.

Another possible step to mitigate noise involves insulating the house itself.

“We’ve got double-paned windows and pretty good sound insulation,” Bryn said. “The only time it gets too loud is in the summer when we’ve opened the windows.”

But for those residents without good sound deadening insulation or double-paned windows in place already, upgrading their home can be costly.

On December 28, 2000, the FHWA proposed a bill that would provide federal funding to residents living in homes where traffic noise was a significant problem. The Department of Urban Housing and Development and the U.S. Environmental Protection Agency supported the proposal. FHWA canceled the proposal in March 2002 citing unacceptable labor and cost burdens as the main reasons for its demise.

The Kruses are lucky. Their landlord outfitted their home with double-paned windows before they moved in. Inside the living room, the sound from I-5 is a whisper and in their bedroom, the noise is barely noticeable. Despite the interior sound relief and their adaptation to living with the freeway 24 hours a day, the Kruses are still forced to make several lifestyle changes.

“At night we’ll go outside to watch the sunset over the Olympics,” Bryn said. “But after a minute of listening to all the noise I say ‘Okay, let’s watch it from inside.’”

The influence of nature, however, is still present in the Kruses’ home. Audible above the passing traffic, several small birds sing from the high branches of a tree over the deck. The majestic Olympics are visible beyond the wall and the gray void of I-5. A small squirrel scrambles atop the wall and leaps into the safe confines of another pine in the yard.

“During the recent storms, we went to sit outside and listen to the rain fall,” Bryn said, “We could actually hear the rain over the freeway. It was so refreshing.”

Back inside, Bryn draws up the blinds and curls up in the corner of the plush, green leather loveseat in the living room. After a moment she gets up and makes her way down the hall into the bedroom.

“It’s white noise for the most part,” she said, while giving a final demonstration of how effective the sliding glass door to the balcony is in blocking out the sound, “except when a big truck or police siren goes by. Or when a big Harley guns it down the on-ramp.”

Later, in the midst of preparing a cup of tea and cutting a slice of lemon poppy seed bread in the kitchen, Bryn looks out through the small window over the sink. She is just opening her mouth to speak when a deep, grumbling motorcycle interrupts her train of thought.

“See” she said, “That is exactly what I’m talking about.”

Senior Derek Jackman studies environmental education at Huxley College of the Environment. This is his first published piece.
"We’re moving," 5-year-old Kale Kunicki said, pressing his nose to the window overlooking the still morning waters of Bellingham Bay, as the train pulled away from the platform.

The 10:20 a.m. train to Seattle slowly moved north a few hundred yards carrying the family of four. The conductor explained the train was switching to the side track to let another train pass. Kale’s father, Dave Kunicki, reminded Kale of the way he operates his own train set at home. Soon the train stopped, switched directions and sped up, sashaying down the tracks on its way to Seattle, the final destination of Kale’s first real train ride.

"Kale is a train nut," Kunicki said. "He’s been asking us if we can go on a ride on a real train."

Kunicki said he regularly travels south to Seattle from Vancouver for business but typically drives, and never considered the train as an alternative to driving the Interstate 5 corridor.

"It’s something you don’t realize until you get on the train — how pleasant the ride is," he said.

Kunicki’s perception is similar to many people’s: They do not consider trains as an alternative to I-5.

"A whole generation or two have never ridden the train, they don’t think of it as an alternative to the automobile," said Carlos Schwantes, author of "Railroad Signatures Across the Pacific Northwest."

The railroads had a strong influence on the way we travel and live in the Northwest today, Schwantes said. The railroads spatially engineered the Northwest by creating transportation corridors.

A whole generation or two have never ridden the train, they don’t think of it as an alternative to the automobile.

Carlos Schwantes, author of "Railroad Signatures Across the Pacific Northwest."
"Many of the corridors we use today were promoted by the railroad lines," Schwantes said.

In the early days of road building, railroad companies assisted and helped pay for many roads before they were state sponsored, he said. This led to many major roadways paralleling important rail lines, as is the case with I-5.

"The irony was that the railroads didn't see it coming," Schwantes said. "Railroads never expected competing corridors. People do not always see the consequences of technology."

By the late 1920s the construction of roads and the increasing popularity of cars started to hurt the railroads, he said.

"It was a snowballing effect," Schwantes said. "As people got more cars, they wanted more roads. When they had the roads, they wanted more cars."

Since the 1920s passenger train use has diminished consistently, Schwantes said.

Today an average of 1,365 people get on or off the train in Seattle each day, according to the Washington State Department of Transportation. Approximately 200,000 vehicles drive on I-5 daily in Seattle, according to the WSDOT 2002 Annual Report.

Kunicki, as well as others, have said one of the largest obstructions to people using the trains is the attitude surrounding cars.

"I think North Americans have had this freedom thing," Kunicki said. "I'll get in my car and do what I want — drive on the highways and roads and be on our own — and that is our mentality."

Despite describing the train trip from Bellingham to Seattle as "picturesque," he said the choice would have to be made for him, in the form of laws or a physical disability, before he would quit using his car.

"I am a guy who loves to get into my car, my truck and go," he said.

Other passengers on the train that day said they had enough with the roads and now ride the trains almost exclusively.

Jeromey Campbell, 33, and his brother Cody, were traveling on the Bellingham to Seattle train, playing cribbage. Campbell said he hates driving and chooses the train for a variety of reasons.

"You avoid traffic, you don't have to drive, it's less expensive than gas, it's faster than driving and you can play cards the whole time," he said.

Campbell said the train is his preferred way to travel.

Better views, as seen on this trip between Seattle and Bellingham, are one advantage of riding trains as opposed to driving on I-5.

"Whenever an opportunity arrives is when I ride it," he said. "I truly hate driving. The only time I drive is if I really have to."

Campbell said he used to frequently drive the I-5 corridor while traveling from Oak Harbor to Bellingham.

"It's an okay trip," he said. "It's just not a joy. It's not something I like to do so I try not to."

The amount and cost of gas for his car is also a factor, Campbell said.

"I have a V-8, my girlfriend has a V-8, my grandparents have a V-8, everyone has got stupid big trucks," he said. "It just costs way too much."

Others enjoy the trains for the amenities and services they provide over other transportation options.

Lauriano Rubio, 32, was riding the train with crewmates from the Alaskan fishing boat he worked on and was going home because the season was over. This was his first trip on a train, though he has ridden the bus several times to get different places.

"The bus is kinda more boring," Rubio said. "I just like this ride better; you can drink beer and relax."

Rubio's crew mate Mike Vierra agreed.

"When you are on a train 16 hours, sooner or later you are going to want to pass-out," he said.

Vierra said the train has other benefits including being quieter and faster than most bus routes. The train also has room to stretch out and walk around.

For Rubio the decision seemed cut and dry.

"I like this better because it has beer," he said.

Michael Clarke, 54, is the lead service attendant on the route to Seattle. He serves food and beverages in the dining car. He said that the reason people don't choose the train more often is primarily historical.

"When you go back 150 years everybody had their own horses," Clarke said. "They went everywhere, place to place, on their horses. Now they have cars. The train thing never caught on, not like it did in Europe."

Clarke moved to the United States from England in 1982. He said while growing up he got used to riding the trains to and from London to go to school. When he moved to the States, however, he didn't see a similar system.

"Here, when I came over, I was not really aware there was any sort of regular train system until I started working for Amtrak,"
Clarke said, "Everybody drives in cars; you don't see anything advertised about trains."

To get more people to ride the trains, an attitude change is necessary and that change is going to be slow, Clarke said.

"It is such a rich county, and everything is so inexpensive compared to other countries," he said. "I don't think they realize yet that there has to be some conservation. ... People like their cars, they like their SUV's, they like the freedom of going wherever they want, when they want. It's something they have been doing for 50 years; it's not something that is going to change overnight."

The case for freight is markedly different.

Many people perceive the railroads as obsolete, but the contrary is actually true, said Gus Melonas, Washington director of public affairs for Burlington Northern Santa Fe Railroads.

"Customers are looking for various alternatives and we are working to meet that demand," Melonas said.

BNSF operates a mainline railroad that parallels I-5 from Portland to Seattle and a branch-line that runs along I-5 from Seattle to Bellingham. Three commuter trains and 50 freight trains run daily between Seattle and Portland.

Melonas said freight movements are increasing, moving everything from food and lumber to passengers and chemicals. To meet current demands for transportation and to compete with trucks, BNSF has been improving tracks and safety, he said.

Rail freight service also helps keep down the number of trucks on the highways.

Without rail service, more than a million trucks would be added to some sections of interstate and travelers would sit through more than 3 million additional hours of delay on the roads, according to the 2001 Benefits of Rail Freight Study, released by the Washington State Department of Transportation.

Current trends suggest that from 1997 to 2020 container shipments through Puget Sound ports will increase 131 percent, according to the study.

While the future of rail freight is set, people disagree on the future of passenger rail service. Some say the shift is inevitable. Others say it is impossible.

"I would say the car has run its course in the United States," said Alfred Runte, historian and a member of the Washington Association of Rail Passengers, a rail advocacy group.

Runte said no matter how many lanes crisscross the land, traffic is always going to be a problem and at some point the switch to trains will be inevitable.

"America is just going to have to grow up and expect scarcity and public transportation," Runte said. "We are suffering from a frontier hangover."

Scarcity of land and materials is going to drive people to the trains because of the costs involved, he said. At some point it is going to cost billions to create more freeways and much less to fund reliable train service. It will then be a simple choice for cities and states. This will lead to developments similar to those in Europe, such as quicker trains and more frequent and reliable service, he said.

Schwantes disagrees with Runte's predictions.

"I hate to say this because I love riding the trains, but it is not convenient in our modern lifestyle," he said.

Gridlock and gas prices will push people toward the trains, Schwantes said, but the Northwest will never have a European system because people live too far apart. If everyone living west of the Mississippi were moved to live within the borders of Arizona then the population density would be roughly equivalent to England's — where commuting by train is popular and effective, he said.

"I see the addition of passenger trains in areas of high population density, but I don't see the comeback of the long distance passenger train," Schwantes said.

America is just going to have to grow up and expect scarcity and public transportation. We are suffering from a frontier hangover.

Alfred Runte, historian and member of the Washington Association of Rail Passengers.

Runte said, however, it is just a matter of time before passenger trains will become a necessary alternative.

"Is it going to happen in the next five years? No," Runte said. "Is it going to happen in the next 25 years? Yes."

Senior David Stone studies environmental journalism at Huxley College of the Environment. He has previously been published in the Planet Magazine and the Western Front.
LATE ONE NIGHT IN FEBRUARY 2000, Andy Swinburnson, 25, almost died in a four-car collision while driving north from Portland, Ore.

“It just happened so quick it was freaky,” Swinburnson said.

Passing an RV north of Mount Vernon, Swinburnson drifted too far to the left, hit the rumble strip and ricocheted off the guardrail. Swerving back into his lane he overcorrected and lost control. Shearing off the end of the RV in the right lane he bounced back into the left lane and slid across the grass median into the southbound lane. He came to a stop when he hit a southbound car, sending it off the road in a shower of sparks.

“When I started going across the median, I saw lights coming the other way,” Swinburnson said. “I just thought I was going to die.”

He was not hurt, only numb from the car’s airbags. His only thought was to get off of the road.

“I was standing in the southbound lane and a semitruck was coming,” Swinburnson said.

He ran to the side of the road just as the truck driver slammed on his brakes and plowed through his car. The semi never stopped. No one was hurt in the accident, but damages totaled nearly $30,000.

Accidents claim lives, cause emotional stress and trauma, cost millions of dollars and threaten ground water. Every year drivers are forced to spend hours on I-5, waiting for the wreckage to be cleared and for traffic to get back up to speed as people slow down to ogle the damage.

Doug Pierce, head of environment and operations management at the Washington State Department of Transportation, said car accidents are a drain on Washington’s resources.

“It happens four to six times a year where there’s a major accident on the interstate that closes it,” Pierce said. “The loss of commerce, loss of health, people missing work … is huge, costing millions of dollars.”

Washington State Trooper Lance Ramsay said during his eight years of work in Seattle he found impatient drivers cause the most accidents.

“Down in Seattle everyone follows too close,” Ramsay said, “but you’ll find that anywhere; you’ll see that in Bellingham, you’ll see that in Marysville.”
Ramsay also said road construction is a main cause for road rage and driver impatience. He said congestion resulting from construction provokes drivers to drive in irresponsible ways, such as on the shoulder of the highway.

"Drivers just have to realize, 'I'm going to sit in it' or take another route," Ramsay said.

Bellingham Police Traffic Officer Lewis Leake said training is a huge factor in preparing for accident responses. Leake said training and experience has helped him control his emotions when responding to an accident.

"After 25 years of knowing what's involved, I go out there knowing what I've got to do," Leake said.

He also said he constantly preps himself mentally when he responds to an accident.

"When conducting an investigation you have to focus on collecting evidence and analyzing the collision," Leake said. "You have to keep your emotions at bay."

Along with cleaning up spills on the highway, officials must clear the cars involved off the roadway.

Pierce said in 2002 the Washington state government spent $1 million to buy more highway incident response trucks to speed accident response on the freeways.

Pierce said the WSDOT and state patrol try to remove disabled vehicles off the road as quickly as possible.

"If it's an expensive or a cheap car, we'll just shove it off to the side of the road," Pierce said. "Mobility and keeping the people moving, that's the important thing."

After an accident, many cars are left twisted heaps of metal. Teams clear the cars from accident scenes and take the cars to junkyards to be stripped and recycled.

Don Johnson, manager of Gundie's Auto and Truck Wrecking in Bellingham, said Gundie's has 2,500 cars in its yard. He said the cars usually stay no more than one year on the lot while they are stripped of all reusable and recyclable parts, which Gundie's sells to insurance companies and auto body shops.

"For instance, if the car has rear damage, we sell the front clip, the tires and any other undamaged parts," Johnson said.

After the car is stripped of all reusable parts, the body is crushed and shipped to Tacoma.

"We have a crusher and we send (the crushed cars) to General Metals in Tacoma and they shred it and the metal is recycled and sold," Johnson said.

Despite the damage and trauma they cause, accidents might have one positive result.

"I hate driving through that specific spot; I always get in the right lane," Swinburnson said. "It's amazing how little you have to do on the road to get in a real bad accident; I didn't realize that."

Swinburnson said he views his driving abilities and cars differently after his accident.

"I respect it (a car) a lot more," Swinburnson said. "I don't worry about being a couple minutes late somewhere."

Senior Ian Alexander studies journalism at Western. He has previously been published in the Western Front.

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**ACCIDENT RATES:**

Between 1993 and 2001 about 350 people died in car accidents on I-5 in Washington. During that same time period, 27 people died in traffic accidents or from injuries sustained in accidents on I-5 in Whatcom County. King, Pierce and Snohomish counties had the most fatalities at 85, 55 and 53 respectively.

LIGHTEN THE LOAD

Constance Miller steps onto her front porch and sees a block of vacant houses: windows patched with plywood, dry lawns, No Trespassing signs posted over doorbells. She sips her morning coffee to the hammer and bang of construction.

“We’ve been lied to. We were told we wouldn’t see it, wouldn’t hear it. Well, hell, now it’s in my front yard,” said Miller, a Beacon Hill resident who lives across from a light rail station building site.

In 1996, voters in Pierce, King and Snohomish counties approved a 10-year regional transit plan that included light rail — an electrical train system that can operate at ground level, on elevated tracks or underground. Even though the project promises a more convenient commute for some, unexpected cost increases and unwanted neighborhood impacts have brought criticism from others.

On Oct. 23, 2003, the Federal Transit Administration issued the $500 million grant that Sound Transit, the agency working on the Link Light Rail project, had been waiting for to begin major construction.

The original plan for a 21-mile route from Seattle’s University District to Sea-Tac International Airport proved to be unattainable and the route was shortened to the 14-mile “Central Link” from downtown Seattle to Tukwila. The original price for this section was $1.7 billion and construction was supposed to be completed in 2006. But because of difficulties with property acquisition and construction complications, the current projection cost is $2.44 billion and completion is planned for 2009. Along with the shortening and cost overruns, the ST board itself has changed.

“(The Board) was totally revamped,” said Lee Summerstein, a spokesperson for ST. “It now has a highly engaged activist board and is probably the most scrutinized agency in the state.”

The result is a better agency and better project, Summerstein said. “As with any public project,” said Scott Rutherford, chair of the Civil and Environmental Engineering Department at the University of Washington, “there are a lot of winners, and they don’t win very much. … The people who benefit don’t benefit enough to be passionate about it. Then, there are a few losers, and they lose a lot.”

While light rail will benefit commuters, it will not be a cure-all for the region’s traffic problems, said Richard Borkowski from People for Modern Transit. The most commonly voiced concern is that despite its expense, light rail will not relieve congestion.

Proponents of light rail, such as Borkowski, however, argue that congestion relief is not the goal of light rail.

Rather, the benefit of light rail is that it offers a reliable and affordable alternative to Interstate 5’s congestion. Borkowski gave the following comparison: “(It) is like putting a pipe in a river. Both the pipe and the river carry water, but the water in the pipe flows independently from the river, which is analogous to light rail operating on its separate right-of-way. The water in the pipe will always be free-flowing, while the water in the river is subject to log jams and other congestion.

“The purpose of the pipe is not to reduce the volume of the river any more than the purpose of light rail is to empty the freeway of cars,” Borkowski said.

If the river could be emptied it would fill again, just as cars would fill I-5, he said.

The crux of transportation projects is the inevitable disruption on some communities. Colleen Brown voted for the rail in 1996, happy something was finally being done about the region’s transportation problems — the fourth worst in the country, according to ST. Two years later, in an elevator, a coworker informed Brown that her house was on the proposed rail route.

Since then, Brown has been an active member of Save Our Valley, a group that wants the rail routed through a tunnel instead of running on street level through the Rainier Valley neighborhood. A group that wants the rail routed through a tunnel instead of running on street level through the Rainier Valley neighborhood. A

Even if the light rail serves primarily only those who live six to eight blocks away, it would be worth it.

Alan Bernahl, Seattle resident

rainier valley is a Cambodian, Nigerian, African-American, Egyptian, white-American and Irish families all live on Brown’s street. Also, the majority of Rainier Valley’s population is low-income and public transit-dependent, according to ST.

Because land is relatively inexpensive in Rainier Valley, Brown said it was most cost-efficient for ST not to tunnel, but to build street level.

“We were a sacrificial lamb,” Brown said. “[ST] was balancing their budget on the backs of people too busy and too poor to oppose them.”

Businesses along Martin Luther King Way will be condemned to business owner Du Luong said. “They told me they were looking for property. They said they’d offer me a loan, but they haven’t followed through. And they still want me to move.”

To mitigate the effects of light rail, ST has created the $50 million Rainier Valley Community Development Fund. Through the fund,

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businesses might be eligible to receive aid to relocate. According to ST, the money will also be used to increase transit ridership, develop transit-oriented communities and promote economic enhancement.

Transportation projects do cause displacement. Hundreds of farmlands and homes were plowed through to construct I-5, which is now one of the most heavily used freeways in the country, Rutherford said.

Alan Bernahl, a West Seattle resident for 27 years, has seen traffic progressively worsen.

"I don't know that (light rail) is 100 percent the right thing to do, but I do believe we have to do something," Bernahl said.

One population that will benefit from light rail is the University of Washington campus. Rutherford said UW wants to increase its enrollment by 8,000 students every ten years. Because of limited parking, however, the only way to expand is via efficient public transit. ST and UW officials are planning the best way to connect the rail to the university.

Residents such as Bernahl, who lives near a proposed route, will also benefit. He is eager to reduce his commute. Even if light rail serves primarily those who live six to eight blocks away, it would be worth it, he said. It currently takes him 25 to 30 minutes to get downtown. With light rail, the trip would be 10 to 12 minutes, and he would not have to worry about parking.

If the ridership for Link Light Rail corresponds to the recent counts for another of ST's projects, the Sounder commuter train, then ST will probably meet or exceed its projection of serving 24,500 people by 2020.

Offering service between Tacoma and Seattle, the Sounder operates only on weekdays during peak travel times. The train whistles by his workplace each evening and Borkowski says the Sounder is always full, and ridership has surpassed ST's expected numbers.

Because of increased expenses, the initial segment of Link Light Rail will be different from what voters approved in 1996. Yet, it will still have the potential to help commuters weary of Seattle's traffic.

Unfortunately, public projects often go hand-in-hand with stepping on someone's toes.

For 23 years, Janet Ko's family has owned the South China Restaurant near Rainier Valley. Miller, who lives down the road, said South China has been a neighborhood place to meet for dinner and a beer for years.

"You know, what can you do?" Ko said. "We can't sit here and cry over it. We've got to just hurry and set up another place."

Meanwhile, Miller will continue to drink her morning coffee and watch her street transform.

"It's very disruptive, but that's the nature of progress, I guess," she said.
While some employees dread their daily commute, Paul Geiger lives for his. He rises before the sun and is out the door by 2 a.m., about to embark on another 530-mile roundtrip from Portland, Ore., to Bellingham. Geiger is a trucker.

Geiger, a 33-year veteran of the industry, views life as it whizzes past him at 60 mph. For 14 hours each day, he endures the vibrations of a too-small seat, stopping only when necessary for a jolt of caffeine or something to munch on. Still, life is good, Geiger said. "I've always liked the open road, and this has just been a good living for my family," said Geiger, who makes $72,000 per year. "I've just got to get a good night's sleep beforehand."

Not much can shock Geiger, who's traveled approximately 676,000 miles on Interstate 5 in the last five years. During this time, he's worked only the Portland-to-Bellingham route, and he's seen "My first thought was, 'I hope no cars are underneath it,' and secondly, 'Was anyone hurt?'"

In her three years as a trooper, Spangler said she has responded to 30 to 50 semitruck crashes.

According to the Federal Motor Carrier Safety Administration, the accident rate among trucks weighing more than 10,000 pounds has declined by more than half since 1980. That year, the FMCSA recorded 5.5 fatalities per 100 million miles traveled. In 2001, 2.4 fatalities were recorded per 100 million miles traveled. Out of 7.9 million registered trucks nationwide, 4,431 large trucks were involved in fatal crashes in 2001, according to the FMCSA.

Spangler said one of the more spectacular crashes she remembers happened in Issaquah. An 80,000-pound tanker hauling diesel fuel crashed, caught on fire and scorched the asphalt.

Most (companies) pay by the mile, so if truckers want to make money, they gotta drive.

Mike Southards, safety director for the Washington Trucking Association

Andrea Jasinek

Mike Southards, safety director for the Washington Trucking Association

Ecology spokesman Larry Altose said crashes like these are environmental concerns because of the threat they pose to ground and surface water. Because trucks have the capacity to haul thousands of gallons, a single spill can devastate an area and the cleanup can take weeks, he said.

"A scene that you might see on TV of the broken truck being hauled away and the road being re-opened is very early in the process for us," Altose said. "Lots of these fuel crashes in the news involve testing the soil and possibly excavation."

The nature of the spill dictates Ecology's level of involvement and how long it will monitor water and soil quality. The process, he said, is never a cheap one.

"The truck's owners are looking at costs of tens of thousands of dollars," Altose said, adding that the cost depends on how damaging the spill is, what is spilled and what the private contractors, who clean up the site, decide to charge.

It's important to realize, however, that consumers' insatiable desire for fuel can stress the industry, he said.

"The demands we place on transporting these fuels is a factor in crashes," Altose said. "I'm not saying that consumers are responsible, but they have a share in what the industries transport and how much."
Preventing crashes is a primary concern for safety regulators, said Mike Southards, a 10-year trucking veteran and current safety director for the Washington Trucking Association.

One of the three most common safety regulations, Southards said, is drug and alcohol testing. Other common regulations require truckers to carry up-to-date medical cards and limit their hours of service — a trucker cannot drive for more than 10 consecutive hours per day or after being on duty for 15 hours, Southards said.

But in a profession where distance pays, Southards said some truckers might fib on their logbooks, though it is not a common practice. “Hopefully, there wouldn’t be a reason to work more hours than allowed, but most (companies) pay by the mile, so if truckers want to make money, they gotta drive,” Southards said.

Geiger, a Roadway Express employee, said working more hours than allowed is more likely to happen when truckers work for themselves or for companies that aren’t union-represented. “Money is the root of a lot of problems,” Geiger said. “(Roadway Express) pays me really good, but some of these guys who own their own rig are under more pressure. ... I’ve seen (truckers) so broke that they’re trying to sell dang near everything.”

State Patrol Sgt. Scott McCoy heads the commercial vehicle division for Whatcom County. His crew of seven troopers is trained to recognize and control excess, whether it’s excess of weight, speed or hours worked. McCoy’s team is not restricted to probable cause and can pull over any commercial vehicle. “My guys ... can pull over a truck for the sole purpose of doing an inspection,” McCoy said.

On a typical day, State Patrol Trooper Alice Collins said she contacts eight or nine truck drivers for moving violations, hours-of-service or weight violations, and oversize-load checks. Her patrol area extends throughout Whatcom, Skagit and northern Snohomish counties.

Oct. 24 was a slower-than-typical day, she said. Between 1:58 p.m. and 3:43 p.m., Collins made only three stops. After waiting for five minutes at her preferred “fishing hole” just south of Exit 252, Collins clocked a 5-axle, 80,000-pound semi speeding down the hill. “OK, we got one at 70,” she said, hurriedly slamming the door of her state patrol SUV, which is filled with weighing instruments, a laptop and even a printer.

After a five-minute conversation with the speedy driver, Collins decided not to issue him a citation since he was not going more than 10 mph faster than the speed limit.

Collins made her last stop of the day at 3:43 p.m. A dump truck hauling dirt caught her attention. “I just want to check and make sure he’s not overweight,” she said. The truck actually was 600 pounds overweight, not enough to warrant a ticket, Collins decided.

Regulations on trucks’ weight exist to protect road surfaces, Collins said.

Even though the thousands of trucks traveling I-5 cause damage to the road, they are there to meet consumer demands, Geiger said. “Without us, the country don’t move,” he said. “Whatever you eat, wear — even your house — at some point, a trucker hauled it.”

Geiger said he hauls “everything from tires to bananas.” If consumers realized how dependent they are on the trucking industry, maybe they could curb their road rage against trucks, he said.

Without us, the country don’t move, 
Whatever you eat, wear — even your house — at some point, a trucker hauled it.

Paul Geiger, truck driver

He said he doesn’t mind all the rules and regulations — what irks him the most, he said, is lack of freeway courtesy. “Just use your damn blinker,” he said.

Senior Andrea Jasinek studies journalism at Western. She has previously been published in the Western Front and the Tri-City Herald.
The average commuter sees Jim McDonald's workplace at 60 mph. Usually, only people forced to the side of the road by vehicle trouble have time for a better look. The medians, land trapped between I-5's lanes, are where McDonald works.

South of Bellingham, in a median near Lake Samish, McDonald, regional maintenance superintendent for the Washington State Department of Transportation, turns on his flashing yellow light and pulls his WSDOT vehicle into an area known as the Barnes Creek turnaround. Wearing his bright orange safety vest, he steps out into a small clearing of mowed grass.

The plants and animals in the median live in a human controlled environment between the concrete and unending traffic. I-5's construction isolated the median from surrounding habitat. WSDOT manages everything in the medians to keep roads safe and minimize impact on nearby environments.

McDonald said plants help stabilize slopes and filter and retain stormwater. WSDOT prefers to have certain native plants in medians. Those plants help WSDOT meet their goal of having self-sustaining, low-maintenance vegetation. Native plants are easier to manage than nonnative plants because they don't spread out of control.

WSDOT prefers native plants, said Sandy Stephens, WSDOT operations and maintenance water quality policy manager, but not all native plants are suitable because of safety concerns.

"Alders are a very dangerous tree because when they get to a certain size they have a tendency of freezing and cracking," Stephens said, "and they will fall onto the highway system and can present a safety hazard to the traveling public."

Stephens said more desirable plants are smaller and low-growing.

"Salal is an excellent example," said Vikki Jackson, former president of the local chapter of the Washington Native Plant Society. "They don't get to a very large size but they provide a lot of shading."

McDonald said WSDOT tries to minimize impacts on neighboring habitats and the animals that live there. At the same time, they try to discourage animals from using the medians.

"We don't encourage deer to use the right of way but there's not much of a good way to prevent that," McDonald said.

Anytime wildlife lives near the freeway, the animals will find their way into the right of ways sometimes, he said.

Keeping the visual corridor clear by mowing roadside vegetation is important so people and animals can see each other, McDonald said.

Red-tailed hawks are one species that has adjusted to I-5, Jackson said.

"Red-tailed hawks have found a particular niche and have flourished along the I-5 corridor feeding on the voles that live in the grasses on the side of the road," she said.

Stephens said WSDOT also controls aquatic habitats. Green reflective posts mark areas along the freeway that hired wetland biologists identified as important for fish habitats. These "fish stakes," as McDonald calls them, are posted along the freeway as part of WSDOT's sensitive area identification program.

"(The posts) provide guidance to our maintenance crews so that they know when to apply (practices)
that will eliminate and reduce impacts on streams and wetlands and water bodies," Stephens said.

Another important part of vegetation management, McDonald said, is preventing infestations of noxious weeds. Any plant dangerous to people, animals or native plants is considered a noxious weed, said Ray Fann, 26-year member of the Washington State Noxious Weed Control Board and 1980 founder of the Whatcom County NWCB.

Fann became interested in weeds after discovering that a noxious weed called tansy ragwort had been killing his cows. The plant with a yellow, daisy-like flower contains toxins that can shut down a horse's or cow's liver the same way alcohol affects a human's liver, Fann said.

"I would say 90 percent of weed problems begin on highway right of ways," Fann said.

A common way for weeds to be spread is the transportation of agricultural materials like hay, said Laurel Shiner, Whatcom County Noxious Weed Board coordinator since 1989. Materials, including seeds, might blow off of trucks.

Another common way for weeds to spread is by getting picked up on vehicle undercarriages or on radiator grills, as well as seeds getting blown up and down the I-5 corridor from car movement.

"Weeds don't move from place to place by themselves," Shiner said, "people move weeds, whether they know they're doing it or not."

Knapweed, a green-grey, thistle-like plant with pink or lavender flowers, is a common weed along I-5, Shiner said.

Knapweed is probably one of our most notorious hitchhikers. They're a high priority along the I-5 corridor. Some of the knapweeds grow at the approximate height of most radiator grills. I think it's some sort of weird evolution thing.

"Knapweed is probably one of our most notorious hitchhikers," she said. "They're a high priority along the I-5 corridor. Some of the knapweeds grow at the approximate height of most radiator grills. I think it's some sort of weird evolution thing."

According to Washington state law, it's the responsibility of the landowner to control noxious weeds. The law also gives local weed boards the authority to enforce weed control.

"Anybody that owns property in this county and has a noxious weed on it is destined to hear from us, whether they want to or not," Shiner said.

Shiner said the local weed board works closely with the WSDOT.

"About once a year someone from the local (weed) board comes to help us with weed identification," McDonald said. "They tell us about new laws, new regulations."

McDonald said WSDOT primarily uses two methods to control weeds: mechanical, involving cutting and mowing, and chemical, mainly the spraying of herbicides.

Shiner said herbicides are usually the last option considered for controlling weed populations.

"Herbicides can be a very useful tool when they're used well," Shiner said. "If you're going to do vegetation management you have to look at the target plant. You have to learn all its idiosyncrasies before you can really approach it well. Herbicides can certainly be a useful part of that. They are not the only tool, though."

Shiner said many times in travel corridors, herbicides could be the best option.

"(In travel corridors) it's economically wise to use herbicides on the right target plants at the right time of the year, so you're not using too much and that you're doing what you're out there to do, and not wasting time," she said.

McDonald said the maintenance crew is trained and certified to apply herbicides using the proper methods.

For McDonald and his maintenance crew, managing vegetation is a big issue, but he said it's interesting work. Working in the medi-ans provides him with a close-up view on an area looked at every day but rarely noticed.

After finishing his tour of the Barnes Creek turnaround, McDonald pulls carefully back in to the rush of semi trucks and commuters. Without missing a beat, his eyes are again surveying the roadside for anything amiss in the medians.

Senior Emily Johnson studies environmental education at Huxley College of the Environment. This is her first published piece.
A blanket of gray clouds hangs over Skagit Valley. As winter approaches, the farmers are harvesting the fall crops. Boxes of sweet smelling raspberries, enormous blackberries, blueberries, red, gold and yellow tomatoes, and other vegetables line the Sakuma Brothers market stand. This weekend farmers invite customers to tour their farms and taste local specialty products during the two-day Festival of Family Farms.

While Interstate 5 brings customers to the stand, it also threatens the farms' future. With easy access to I-5, the valley’s population has grown rapidly, forcing policy makers to determine where and how Mount Vernon and Burlington will grow and at what cost to farmland.

“For farming to survive in the valley with the land use issues, we need to educate the public,” said Richard Sakuma, manager of farm operations for Sakuma Brothers Farms. “The times now are different for farming, people are interested to know what we’re doing and that’s why we think we need to help educate everyone on what we do.”

Farms line I-5 in Skagit County, along with large bright signs with recognizable names such as Wall-Mart, Auto World and Costco. Just as familiar are signs on the adjacent farmland announcing the sale of land for development.

“If farmers are making money they’ll continue to farm,” said Ken Dahlstedt, a farmer and county commissioner for Skagit County. “If they’re not making money then they’ll try to do anything they can to get their land converted to some other higher value use.”

Many farmers in Skagit Valley have spent their entire lives working the land for the reward of...
gnarled and toughened hands and a lifestyle they enjoy. Some farmers are ready to retire and hope to live from the investment they’ve made in their land.

"The only thing you have is what you’ve saved through the years and your land," said Skagit Valley farmer Bill White. "The reason we purchased the land in the first place was that it would be a nice place to live and because we thought in time it was going to be a valuable piece of commercial property."

Ever since a stroke forced Bill into retirement nine years ago, Lois and Bill White have been renting out their 80 acres to other farmers to pay property taxes.

"I farmed that land three years myself," Dahlstedt said. "I barely could pay him enough money to pay for the taxes. I'm hoping someone else will rent it because I won't rent it again."

The Whites believe their property is ideal for development and have applied to have the land annexed into the city of Burlington. Several developers have already made offers to buy the Whites' land if it is rezoned.

Unfortunately for the Whites, the city of Burlington will not consider the annexation until a recently appointed task force makes plans for the city’s future. While the wait for a decision angers the Whites, Bob Rose, executive director of Skagitonians to Preserve Farmland, sees the delay as a positive move.

"Once you jump to the west side of Burlington there's no logical stopping point for development," Rose said. "Certainly if you're adjacent to the freeway you're going to get freeway type development, but after that, who knows where it unravels to."

Margaret Fleck, Burlington's planning director, said planners should have routed I-5 through the hills to the east of the cities. That route would have put the road out of the floodplain and away from farmland, but the city of Mount Vernon pushed to have I-5 directed through the city to help promote downtown commerce.

"It was a political decision to run I-5 through agriculture lands," Fleck said. "That's what caused the tension in the first place."

Commercial development did take place but not just in downtown Mount Vernon. Shopping centers like the Cascade Mall and Prime Outlets have stretched development up the I-5 corridor. Now,
Mount Vernon and Burlington no longer have a clear separation. “We had cucumbers growing right where the malls are,” said Jean Youngquist, a Skagit Valley farmer.

Sakuma remembers when the construction of I-5 divided their farmland. His family used to farm the land that now lies under the Auto World.

To curb sprawl, the state instituted the Growth Management Act in 1990. The GMA requires counties and cities to develop and follow a comprehensive development plan. It must include urban growth areas, land pre-designated for city expansion.

In accordance with the GMA, Skagit County set the urban growth boundaries for Burlington in 1994. Since then, rapid growth in the city has raised questions about whether the current UGAs are large enough.

The Whites argue that annexing their property is the next logical move. From their living room window they can see the lights of a business park 900 yards away on the other side of I-5. With an already existing off-ramp and overpass, their property has convenient access to I-5 and Burlington.

“Legislatures say it would be so nice if everyone would locate in this nice little box,” Dahlstedt said. “Unless you have financial incentives or credits to make that happen, people will still be driven by the economics of their decisions.”

A New York-based development firm devised the Sakuma Market Center, which will be built on farmland previously owned by farmers Steve Sakuma and John Bouslog. The land is designated commercial and is within Burlington’s city limits. Pumpkins currently grow on the land.

Richard Sakuma said after the land was annexed, developers approached Sakuma Brothers with an interest in buying it. They used the money from the sale to pay off debt.
The Market Center is not the only project approved by the city. A new Bob's Burgers and Brew is set to open by spring 2004 along I-5. Developers JJMD Inc. received zoning approval for a hotel on land adjacent to the restaurant, just off I-5 near the Cook Road exit. Dahlstedt said the Burlington-Edison School District is looking to acquire agricultural land to build a school.

He said the city is in a kind of Catch-22. Taxpayers don't want to pay for higher priced land within the city and the city doesn't want to annex additional agricultural land. Agricultural land is less expensive, but some people don't want to see the conversion of farmland.

For cities to annex agricultural land, they must prove they have a need for the land because of growth or economic needs. Fleek said Burlington could never justify annexing the Whites' land.

Instead, the city is now focusing on planning the future of Burlington. Graduate students in the landscape and architecture program at University of Washington are working with the Burlington task force to develop a city plan.

"Burlington is really looking forward in a progressive way in how to become a more livable city," Rose said. Few valleys along I-5 offer extensive open spaces for wildlife and farming. The Puyallup, Duwamish, and Kent valleys lost much of their farmland during growth before the GMA.

"The I-5 corridor from Vancouver to Olympia is basically urbanized," Rose said. "Except for this section in the Nisqually Delta."

Skagit Valley established a strong farming community after its first successful barley crop in 1863. Even today, the fertile soil, coupled with the knowledge and skill of Skagit farmers, still produces large quantities of quality crops.

"When you eat Häagen Dazs ice cream you're eating Skagit Valley strawberries because of the color, texture, consistency and the flavor," Rose said.

He said Skagit Valley produce lines shelves in markets throughout the West Coast, the nation and in some cases the world. Yoplait uses Skagit blueberries in their yogurt. QFC grocery stores sell red potatoes from Skagit growers, and grocery stores as far south as West Hollywood carry Skagit produce.

"It's not a pick-up truck load kind of farming here," Rose said. "It's semitruck farming. People really have to seek out and achieve regional, national and international markets for their products."

The successful farmers in the valley are maintaining and finding their niche in markets by growing superior produce and doing the packaging and marketing as well, Rose said.

"We're pretty well complete in our facility to handle anything from barreled juice products to individually frozen berries," Sakuma said. "We can bring in our fruit from the fields and custom pack and be able to provide that product to our buyers."

Sakuma Brothers Farms is building a $6 million processing plant where they can freeze and package their berries for shipment. They are developing their own product line and sell their fresh fruit under the Sakuma Brothers label.

"I think we need to be doing creative things," Dahlstedt said. "Whatever we can do to provide positive incentives (for farming)."

The Festival of Family Farms was an effort to bring attention to local farms and the potential of their products. With 14 participating farms, visitors had a chance to see for themselves the valuable role agriculture plays in their community.

"Going to the farm is exciting and interesting," Youngquist said. "It's education and reaching out to the community, to make them aware of what's going on, on the farm."

The success of farmers is dependent upon access to markets and the demand for Skagit produce, Rose said. 1-5 acts as a corridor for movement. Since its construction, the accessibility 1-5 provides has influenced where growth occurs.

"Burlington was a sleepy little town until the I-5 corridor," Fleek said. When I-5 came through Skagit Valley it brought changes. I-5 makes development along its corridor, near its exits, and at its interchanges easy. Farmers use the interstate to move Skagit Valley produce and farm products.

"Is there a future for farming here in the Skagit Valley?" Rose said. "We believe strongly that there is."

This fall farmers will ship truckloads of red potatoes, strawberries and cabbage out of Skagit Valley on I-5. The balance found between the demand for development and the demand for the products of Skagit Valley farms will determine their future.

"Let's get together and figure this out," Sakuma said. "If people want farming then we need to help it survive."

Senior Marianne Warren studies environmental education at Huxley College of the Environment. This is her first published piece.
As fall gives way to winter's chill, commuters begin traveling south on the Pacific Flyway. Along this aerial version of Interstate 5, migratory birds leave their summer homes in Canada and Alaska for warmer southern climates. Just as I-5 drivers stop for snacks and a rest from the road, so do the traveling birds.

The Nisqually National Wildlife Refuge, tucked between Olympia and Tacoma, is one such rest stop along the Pacific Flyway. At the Nisqually River delta a diverse landscape of estuaries, marshes and riparian wetlands form a haven for wildlife to thrive and a place for visitors to take a break from everyday life and witness the beauty of the natural world.

With I-5 at its southern border, the Nisqually refuge receives both burdens and benefits from being next to the freeway. I-5 provides easy access for a large number of visitors, which allows the refuge's staff to educate more people. But the freeway also brings overcrowding, noise and hydrological problems to the refuge. It also presents a barrier to animals.

Last year the refuge had 140,000 visitors. A $3 entrance fee for each group brings in roughly $45,000 each year, said Jean Takekawa, refuge manager. Along with profits from the bookstore and special events, these funds go toward improving facilities at the 3,000-acre refuge.
“At most refuges you get the feeling that it is entirely for the wildlife,” said refuge visitor Bent Blichfeldt during a walk on the trails with his wife. “Here at Nisqually it’s just as much for the people.”

As the most highly visited refuge in the state, Nisqually staff and volunteers emphasize the importance of educating their guests. From avid bird-watchers equipped with high-magnification spotting scopes to curious elementary school field-trippers, visitors from all around the world come to see and learn about the wildlife. Each year, nearly 5,000 students visit the refuge on field trips. In the environmental education center, group learning stations and refuge exhibits become classrooms. The refuge staff works hard to educate guests about the refuge, the life within it and the importance of its protection and conservation.

“A lot of visitors come to me and ask what animals they can see today,” said Outdoor Recreation Coordinator Sheila McCartan. “As the seasons change, so do the locations of animals and it’s fun to be able to point guests in the direction of where we know wildlife has been seen recently.”

A walk-through exhibit welcomes guests to the visitor center with walls of information, from refuge history to tidbits on some of the 170 species of birds in the area. Volunteers at the information desk sit attentively, ready to answer questions. Beside them, a new display details the invasive-plant removal project currently underway.

Beyond the refuge office, gravel trails and boardwalks wind through the protected wetlands. Telescopes, observation platforms and informative signs line the trail. Orange maple leaves pile up on the boardwalk and crunch under people’s feet. As visitors watch, red-winged blackbirds swoop through the marshes. Higher up, a massive cloud of starlings shifts, as the birds maneuver in sync. Beyond the boardwalk, a five-mile trail runs through open fields, shady woodlands, tidal mudflats and frog-filled marshes.

An observation tower overlooks the tidal landscape just two miles from the trailhead. The platform gives guests a prime vantage point for viewing the estuary at the river’s delta. Closely gathered mallards float and feed on the calm waters while, hidden below them, young salmon have their first taste of saltwater as they enter Puget Sound.

According to officials at the refuge, nearly 75 percent of Puget Sound estuaries are gone. Most have been dredged or filled in.

“The estuaries here are the most important thing to preserve,” Audubon Society volunteer Fran Wood said, while guiding a bird-watching walk through the refuge. “We can’t continue to replace habitat with development.”

Abundant wildlife draws people to the refuge and its proximity to I-5 further increases the number of visitors. Yet because of the refuge’s location overcrowding often occurs.

“One of the most unique things about our refuge is its accessibility to the public,” Takekawa said. “Sometimes on spring and summer weekends our 100-car parking lot will overflow.”

One downside to a nearby freeway and such high visitation is the potential for disturbing the wildlife, Takekawa said. The presence of people can affect where the animals breed, feed and nest in relation to trails. The busier the refuge is the farther animals will be from trails, she said.

“Providing protection to the wildlife and habitat is our primary objective,” Takekawa said. “But we try to maintain a balance.
between that and giving access to the public.”

Refuge management and the Washington State Department of Transportation are working together to find alternative ways to visit the refuge when it is crowded. A park-and-ride with a shuttle is one option. Another is an expansion of the parking lot. With funding from WSDOT, the refuge management hopes to provide a solution over the rivers, created a bottleneck effect,” she said. The water could only pass under I-5 in a few places with bridges, she said.

The Nisqually Bar and Grill is one of the nearest businesses to the interstate between Nisqually River and McAllister Creek. Owner Chuck Boyde recalls the rapidness of the flood.

Birdwatching is a popular activity for visitors to the refuge.

by spring.

“The number of visitors has been self-regulating because many people know not to come on busy days,” Takekawa said. “Once people reach the trails, the congestion quickly spreads out. But we continue to monitor.”

Many visitors refuse to visit the refuge when the parking lots are full. Not because they don’t like people, but because more people means less wildlife. Birdwatching becomes difficult as screaming children and vocal visitors keep birds greater distances from the trails.

Even if visitors decide to come back on a quieter day, they will still have to deal with the noise of I-5. Its continuous vibration permeates the area. The resonance of cars, trucks and an occasional blaring Harley reaches the observation tower, nearly two miles from the corridor. Yet not all visitors notice the sound.

“I don’t notice the sound at all, I just tune it out from the background,” birdwatcher Glen Peterson said. “But I live closer to the freeway than this, so I guess I’m just used to it.”

Some guests have other ways to suppress the noise.

“The noise bothers me a lot, but there is something about this place and its solitude that is stronger and more compelling than any noise,” visitor Sally Benson said. “There are very few places where man-made noises seem to recede.”

In addition to the noise, I-5 poses a threat to the animals in and around the refuge by acting as a barrier. Although birds can fly over the interstate, many animals often struggle to get past such obstacles.

“Road kill is not uncommon in areas where animals need to cross roads,” Bailey said. “At the refuge, two bridges are the only way for animals to get past the freeway without having to cross a roadway. They have to find a way to get across or they’ll become isolated.”

As well as a barrier to animals, I-5 is a barrier to flood waters. In February 1996, a combination of heavy rains and rapid glacier melt on Mount Rainer filled the basin and created a “man-made flood,” Takekawa said.

“When it flooded, the freeway structure, which runs east and west

“Road kill is not uncommon in areas where animals need to cross roads,” Bailey said. “At the refuge, two bridges are the only way for animals to get past the freeway without having to cross a roadway. They have to find a way to get across or they’ll become isolated.”

As well as a barrier to animals, I-5 is a barrier to flood waters. In February 1996, a combination of heavy rains and rapid glacier melt on Mount Rainer filled the basin and created a “man-made flood,” Takekawa said.

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“When it flooded, the freeway structure, which runs east and west
Irene Baker associates Interstate 5 with a failed business and a neighborhood split apart. Baker, 79, a lifelong resident of Bellingham’s York neighborhood, remembers a working class area where neighbors knew each other. After the construction of I-5, things began to change.

I-5’s construction has irrevocably altered neighborhoods. The opening of the freeway in Bellingham on December 5, 1960, changed the character of the York neighborhood and influenced how it grew.

“It’s basically changed the whole complexion of the neighborhood,” Baker said.

Baker and her family ran a neighborhood grocery store, Chetwoods, from 1931 to 1974, when the store was forced to close because of a decline in business. Because the freeway divided the neighborhood, customers were physically separated from the store.

Baker remembers preparing and refrigerating orders for customers who did not have refrigerators of their own. The store served as a gathering place for the neighborhood, where kids could buy candy and adults could visit and catch up with friends, she said.

I-5 was only a few houses from the grocery store. After the split, it was inconvenient for many of their customers to patronize their store and it eventually had to close.

“It sliced right through and the neighborhood has been divided into separate areas,” Baker said.

Doug Starcher, 45, a member of the York Neighborhood Advisory, did not live in the neighborhood when I-5 came through but has seen its effects. Living four blocks from I-5, he said the noise and increased traffic are constant reminders of the interstate’s presence in the York neighborhood.

The land where the Lakeway Golf course once stood is now a Fred Meyer. Homes that once held families on Lincoln and Gladstone streets were either torn down or relocated to make room for I-5. Baker said she believes the neighborhood has deteriorated. Now full of rental houses, the neighborhood has the image of not being a desirable place for families to live, she said.

“You don’t have a neighborhood,” Baker said. “You have a place with a lot of people living (here).”

She said absentee landlords who do not worry about keeping the houses in good condition is a concern in the area. She said this trend has led to fewer family homes and more student rentals.

Baker said the York neighborhood used to be like a small town for her, composed primarily of Swedish immigrants along with a large number of Greek families living on Humboldt Street.

Baker said one business that has helped maintain the friendly atmosphere in the York neighborhood is Nelson’s Market, the neighborhood’s remaining grocery store.

Jon Ostby, the owner of Nelson’s, has lived in the York neighborhood for 27 years and owned Nelson’s for 20. Along with nostalgic advertisements for beer and soda, Nelson’s holds accounts for neighborhood customers on index cards. Half of the grocery store is filled with tables and chairs used for neighborhood meetings and watching baseball games on the television.

Ostby said he feels that I-5 and its proximity to the neighborhood is an asset to the community. He enjoys the convenience of having an on-ramp to I-5 a few blocks away and thinks the neighborhood prospers because of it.

For four decades the York neighborhood has had to adapt to I-5. Baker said she believes that Jon Ostby and Nelson’s have helped the neighborhood retain a sense of community.

Despite the effects of I-5, Baker has no plans to move. Living in the York neighborhood allows her to watch her grandchildren grow up in the same neighborhood she did. She enjoys her community of family and friends in the York neighborhood.

“It’s just home,” she said.

Senior Sean Monahan studies public relations at Western. He has previously been published in the Western Front.
Whatcom County residents fish along the north side of Whatcom Creek hoping to catch salmon during the spawning season. Doug Davids, a Bellingham resident, is intent on the task at hand. Sporting a tattered blue baseball cap, he changes his lure. Davids said he fishes at Whatcom Creek whenever possible. "Every day if I can," he said. "It's just something to get out and do."

In order for fishermen to enjoy the yearly salmon runs, Whatcom Creek needs clean water. Runoff from Interstate 5 and other roads, however, can destroy spawning beds and decrease water quality. The Washington State Department of Transportation is taking steps to ensure this will not happen by building a storm water retention pond on I-5 in Bellingham, said Robyn Boyd, a WSDOT transportation engineer.

Currently, certain parts of I-5 in Bellingham have a grassy median to filter runoff. Catch basins retain runoff for a short amount of time before releasing it into Whatcom Creek, Boyd said. The new retention pond will allow runoff to settle, removing pollutants from the water before releasing it into the creek. An existing pipe transports water from the catch basins to Whatcom Creek. WSDOT will use this pipe to transport water from the new pond to the creek. The retention pond will also feature a bioswale, an area

MEN WITH FISHING POLES IN HAND lean side-by-side against a blue fence — the only thing separating them from a surging Whatcom Creek. Across the way, people stand in the creek, waiting for a bite. One man shouts as another fisherman hooks a fish, but to their disappointment, it gets away.

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where plants are grown for the specific purpose of filtering water. “(Retention ponds) help a lot,” Boyd said. “We’re kind of anxious to get one in the area and see how that bioswale is going to work with the plants.”

Retention ponds are the main way to treat storm water runoff on highways, said Sandra Manning, policy lead for Transportation Permitting for the Department of Ecology. After sediments settle to the bottom, the clean water that is left can be released. Manning said this method is the best way to reduce silt in runoff.

The retention pond will be located on the east side of King Street between Lakeway Drive and Meador Street, just off of I-5. The pond will be about 10 feet deep and concrete lined, much like a swimming pool. The pond is roughly triangular in shape, and 300 feet on its longest side. Construction is scheduled to begin in July and will take six months.

This pond is an important step in recognizing and addressing the problem storm water runoff can cause to waterways, Boyd said.

He said water quality is important to WSDOT. The agency intends to install many retention ponds along I-5.

He said WSDOT is working to make more space available for retention ponds by purchasing land, as well as working with cities to set aside areas for ponds.

“Along the freeway, there’s not a whole lot of area to put retention ponds,” Boyd said.

Ponds are only required when new pavement is added to the freeway. WSDOT is currently planning to install nine retention ponds along the Guide-Meridian in Bellingham and six ponds along State Route 543 in Blaine.

Earl Steele, Whatcom Creek Hatchery manager and Fisheries Technology instructor for Bellingham Technical College, said retention ponds can only help water quality improve. He said retention ponds are necessary to maintain healthy streams and prevent roadway pollutants from entering the water.

According to the Environmental Protection Agency, potential runoff from roads includes: sediments, including materials worn away from the roads and tires; nutrients that can lead to excessive plant growth; heavy metals such as lead, zinc and iron; and hydrocarbons such as gas and oil. When it rains these pollutants make their way into streams and other bodies of water through runoff.

Polluted storm water runoff can destroy habitat for plants and animals, as well as reduce the quality of recreational waters. Impervious surfaces, such as I-5, create a high volume of runoff, said Mike Sato, director of People for Puget Sound’s North Sound Office.

“Any impervious surface with autos has a whole bunch of pollutants that come off,” he said.

When looking at pollution from runoff, silt is one of the most concerning pollutants, Manning said.

She said silt in runoff can fill salmon spawning grounds and clog the fish’s gills. Heavy storm water runoff can also scour the gravel spawning beds.

“Habitat is one of the primary things we look for (when evaluating water quality),” she said. “Salmon need gravel to spawn. Silty materials can choke eggs.”

Manning said Ecology’s job is to establish standards for the volume and rate of runoff allowed and the treatments required for the runoff. Enforcement of those standards is then up to Ecology.

“We are the agency with the authority to govern water quality,” Manning said.

Ecology’s standards for silt are measured using turbidity. Turbidity indicates how much silt is in water by measuring the amount of light able to pass through the water. A higher level of turbidity means more sediment, said Steve Hood, Ecology water quality engineer. Turbidity cannot exceed 5 percent or 10 percent over the natural levels, he said.

WSDOT faces fines if they don’t meet Ecology’s standards. Hood said those fines vary greatly depending upon the violation’s severity and many other factors.

Independent of Ecology’s supervision, WSDOT is building the new retention pond to protect the Whatcom Creek watershed and meet Ecology’s standards.

These steps ensure that waterways like Whatcom Creek will have large fish runs for many years, Manning said.

Steele said the condition of Whatcom Creek is improving.

“We have fish that are coming back and spawning,” he said. “We’ve already made the turnaround.”

Whatcom Creek Hatchery sees nearly 300 recreational visitors, including fishermen such as Davids, on the weekends, Steele said. Davids said he will keep fishing at Whatcom Creek as long as it contains fish, but he worries about the habitat being destroyed. He said he would be willing to donate money if it kept the stream viable.

“I want to keep this going,” he said.

Senior Briane Holte studies journalism at Western. She has previously been published in The Western Front.
Biologist John Soden explains how the flow of the tides can restore a meadow overgrown with invasive plant species back to a tidal marshland.

**With arms spread wide**, John Soden explained the dichotomy of restored marshland habitat compared to dry diked lands, overrun by reed grass and devoid of tidal currents, within the Snohomish River estuary.

Soden, a biologist for Jones and Stokes, an environmental consulting firm based out of Bellevue, Wash., pointed his hands toward mudflats exposed by the low tide and said, "Productive estuarine habitat," then to the left, toward the diked lands, "Not productive estuarine habitat."

During the past 150 years, people have changed the Snohomish River estuary from tidal marshlands into agricultural and pastureland. Population growth in Everett and Marysville, two cities that border the estuary, spurred construction of several industrial and municipal developments and two wastewater treatment facilities. Interstate 5 cuts a path directly through the lower estuary. But now, Everett, Marysville and Snohomish County are returning the damaged estuarine lands to a more natural state — the state they existed in prior to white settlement, prior to industrial use, prior to wastewater treatment facilities and prior to 1-5.

Like many cities in the Puget Sound, Everett lies next to an estuary. The Snohomish River winds its way to Everett and I-5, twisting 25 miles west from the confluence of the Skykomish and Snoqualmie rivers. It abruptly turns north just east of Everett, diverging into one main stem and several smaller channels called sloughs. The freeway and numerous dikes influence the flow of water in the estuary.

"The first non-Indians arrived and established the first settlement in the area in 1853," said Andrew Hass, senior habitat specialist for Snohomish County Surface Water. "Farmers began to clear this marsh and build dikes beginning in about the 1860s. Currently, there's around 44 miles of dikes down here along the main stem of the Snohomish River."

The dikes changed the habitat around the waterways and destroyed tidal marshlands and trees. Settlers built barriers to keep out the tidal currents within the estuary, removing the water from the marshland. Hass said diking eliminated all but one sixth of the tidal sloughs that were originally in the estuary.

Partially due to the loss of tidal marshland, in the late 1990s the government placed Chinook salmon and bull trout char — two fish species that use the estuary as a rearing ground — on the endangered species list.

The Endangered Species Act is a driving force behind any work within the estuary, especially habitat restoration, Soden said.

Currently, Snohomish County and Everett are working to restore lost channels and tidal marshlands by breaching many of the dikes within the estuary.

In 1993 on Spencer Island, Snohomish County breached dikes and allowed water to reclaim much
The Everett water treatment facility is directly next to I-5 and within the Snohomish River estuary.

of the tidal marshland there, Hass said. The tides themselves also reclaimed some of the original tidal habitat, breaching the dikes naturally.

"We’ve documented extensive use by salmon as well as bull trout char using this habitat for foraging, as well as over-wintering," Haas said.

Everett and the Army Corps of Engineers are working toward breaching dikes as well, on the east side of Smith Island next to the wastewater treatment facility.

"When it comes to most of the work now in the lower estuary, reclamation of historic tidelands is the number one activity," Soden said. "In terms of number of acres, you get the biggest bang for your buck when you breach dikes. You can get access to a large number of acres pretty simply."

One success story lies at the outskirts of Marysville’s wastewater treatment facility, at the northern reach of Ebey Slough. Thirteen and a half acres of previously diked land are now restored tidal habitat.

"Just about every year, for the past five years, we’ve seen an increase in use by both (fish) species," Soden said.

At low tide, the area resembles a flooded beach, with braided streams running to the water. Old ramshackle boats sit off kilter and huge logs brought in by the tide sit on the mudflats.

Most of the dike still stands, however. Marysville breached only a small section of the dike about 10 years ago, being careful to let in only the amount of water needed to restore the tidal marshlands, Soden said.

Diking is not the only cause of damage within the estuary. Industrial use along the river, specifically by paper-pulp mills, had devastating effects.

"In particular, the concern with the various mills was related to water quality, which was actually identified at its worst through the 1940s and 70s, because of timber, pulp and paper mill work," said Donald Haring, author of the 2002 Washington State Conservation Commission report on the Snohomish River watershed.

According to the report, pulp mills discharged untreated toxic effluent such as sulfites and organic solids into Possession Sound and estuary waters. In 1949, researchers collected 53 water samples along the Snohomish River. All of the samples had a level of dissolved oxygen lower than five milligrams per liter, the report found. A level of eight mg/L is necessary for fish rearing.

As late as 1971, about 2.5 million pounds of organic solids were discharged into the sound per day, and around 400,000 pounds a day into the estuary.

"Water quality was a huge issue in the 1950s, 60s and 70s," Soden said. "Then about 10 years ago it was wetlands, wetlands, wetlands. Now, it’s estuaries."

Historically, human civilization has depended on estuarine environments.

"The cradle of civilization, the fertile crescent, was an estuary," said John Rybczyk, assistant professor at Huxley College of the Environment and a specialist in wetland ecology. "They’re flat, fertile and near the sea — perfect for settlement."

Humans need water to survive, and in order to use it, it makes sense humans would settle around or near it, Rybczyk said.

"If you want to have a functioning estuary the most critical thing is to have free exchange of water, both tidal and freshwater flowing in and out, and subsidizing that area," he said. "But the first thing humans do is build dikes in order to reclaim the land for development."

Smith Island, the largest island in the Snohomish estuary, is littered with dikes. Union Slough and the main stem of the Snohomish River create the island’s boundaries and wrap around it before flowing into Possession Sound.

Once or twice a week, tugboats make their way through Union Slough, slowly bringing log rafts to Buse Timber and Sales Inc.

Buse stands as it has on Smith Island since 1957 — immense piles of cut blond lumber at one end of the plant, and at the other, row upon row of freshly harvested stacked timber, waiting for the saw. Over the years, Buse’s production output and facility within the estuary has grown, but its location has not changed.

Buse uses roughly 80 million board feet of timber a year, or 18,000 truckloads, mill General Manager Ron Smith said. This comes out to approximately 350,000 board feet, or 50 truckloads of timber a day.

"(The timber) comes anywhere from southwestern British Columbia to the Olympic Peninsula, south as far as Mount Rainier," Smith said. "It probably arrives about 70 percent by log truck and the remaining 30 percent by water."

Buse depends on log rafts, but their environmental effects are contentious.

Soden, the biologist, said log rafts have significantly declined in the estuary along with the decrease in timber harvest during recent years. But log rafts in the estuary have affected the fish habitat, shading large expanses of water and allowing seals to venture farther into the estuary than they normally would, feasting on fish as they go, he said.

"We have never had any indication from anyone that log rafts
have been a problem here,” Smith said in response to this. “If there is, nobody has told us.”

Yet, Haring said ridding the estuary of log rafts is one of the most important actions for habitat restoration because the problems they cause in the estuary, while minor, would be the easiest to solve.

“You don’t have to go through other substantial restoration activity,” Haring said. “Removing log rafts has benefits, and it has the least cost.”

The accumulation of organic materials, primarily bark, from log rafts can reduce the water quality, he said. As the organic material decomposes, it creates anoxic (absence of oxygen) conditions in the water.

Smith said Buse has a contract with the Washington State Department of Natural Resources to take care of bark and other environmental hazards related to log rafts.

“It’s not a big deal for those who don’t need (the log rafts),” Smith said. “If you’re a grocery store operator and don’t need rafts, then it’s not a big deal. But if your livelihood depends on it, then it’s not as easy to say just get rid of them.”

Thirty years ago, the most important concern within the estuary was not habitat restoration, but water quality.

When Congress passed the Federal Water Pollution Control Act Amendments of 1972, which set the standards for water quality regulations, Everett had already had a treatment facility for 12 years.

“Everett was ahead of the game,” said Charles Johnstone, operations supervisor at Everett’s Water Pollution Control Facility.

Johnstone, an employee at the facility since 1985, said many people see the wastewater treatment facility and say, “Oh, there’s this terrible sewage.”

“Some people who may not be well-informed of environmental issues may view treatment plants as polluters,” he said. “A treatment plant is here to protect water quality. We are what we like to call the last line of defense in water quality.”

The facility employs three kinds of treatment. Preliminary treatment, where the facility removes physical matter like hair, paper and grit by screening the water; primary treatment, where the solid organic matter in the water settles, solidifies and is removed; and secondary treatment, where microorganisms consume most of the remaining organic matter that is too small to settle.

“What it really boils down to is we’re trying to make a happy little environment for microorganisms, because they essentially make the water clean,” Johnstone said.

Robert Waddle, operations superintendent for the City of Everett Public Works, said the plant usually removes between 85 percent and 90 percent of the waste.

“We don’t remove 100 percent of the effluent,” he said. “But when that residual organic matter hits the estuary, that process doesn’t stop.”

The treatment process continues naturally, he said.

Rybczyk said wastewater treatment facilities are basically engineered and controlled versions of estuaries — their processes are the same.

“Estuaries have a tremendous capacity to absorb and treat pulses of material, nutrients and energy,” he said. “That’s why they’re so good to have. They’re probably the most resilient of the types of ecosystems we have.”

Six years after the city built the wastewater treatment facility, I-5 plowed through Everett and into the Snohomish River estuary. Construction began on the section in 1966 and finished around 1969. During construction, the freeway displaced whatever tidal marshland was left in its path and also paved over several smaller slough channels.

The fact that Everett and the Snohomish River estuary are so close to each other makes for a unique environment, Haas said. Some people look at Everett and the estuary and see an amazing place — a contrast of a natural area and an urban environment.

Haas, who moved here 10 years ago from the Midwest, cannot imagine anywhere better.

“It’s one of the great places in the country, I think,” he said. “I came from the Midwest and didn’t look back after I moved out here, I was drawn out here by the mountains and the ocean and it’s close to a great city. It has everything.”

Although development and sparse industrial use presently surround the estuary, it still has some semblance of its natural beauty.

The number of restored acres of land has increased dramatically since the early 1990s, fish use within the estuary is on the rise. At the Marysville restoration site, natural tideland vegetation has replaced invasive species, and expanses of water have replaced crowded throngs of invasive reed grass.

The estuary is, however, still on the road to recovery.

Soden, out near Marysville’s restoration site, points out residential developments less than a mile away, to the east.

“It’d be great for fish to breach dikes all the way up to the houses, but if you were a home owner, would you want the tide coming up to your doorstep?” he asked. “Probably not.”

Residents are probably more comfortable with the tide where it is, flowing through the sloughs, over the mudflats and filtering through the cattails.

Senior Ben Arnold studies environmental journalism at Huxley College of the Environment. He has previously been published in the Western Front.
CRUISING INTERSTATE 5 in his pale yellow 1980 Volkswagen Vanagon, Western senior Ken McAllister admits to littering a time or two.

"I have littered in the past," McAllister said. "I don’t anymore, though. Well, I might if I’m in Seattle. It doesn’t make a difference though, it’s filthy down there."

McAllister said he is an avid outdoorsman and a student of nature so he doesn’t litter when he is fishing or out in the woods. Yet, he said he has favorite towns in which he enjoys littering.

McAllister said he and his friends make a sport out of littering in these areas.

“One time I was driving down the road, just a little north of Seattle, finishing a chocolate milkshake from a local drive through,” McAllister said. “It’s drive-by littering at its finest. When we came up on a road sign we threw the cup and when you hit the sign you are the ultimate litterer.”

Left-over food containers are among the litter scattered along the sides of I-5. To deal with the litter, the Washington State Department of Transportation organized Adopt-a-Highway, a volunteer program in which individuals or groups commit to cleaning up litter along two-mile stretches of highway twice a year. In return for the service, WSDOT places a sign along the highway with the group’s name and provides the volunteers with training and safety equipment.

According to the Washington State Department of Ecology, combined cleanup efforts in 2001 picked up 2,405,100 pounds of litter along 5,861 miles of roadway in Whatcom, Skagit, Island, San Juan, Snohomish, King and Kitsap counties.

WSDOT contributes the majority of litter cleanup success to its Adopt-a-Highway Program. Statewide, 14,050 groups participate in the program, which began in 1990.

Fairhaven Bike and Mountain Sports adopted a two-mile stretch of Chuckanut Drive eight miles from I-5. Employee Kris Borgias, who lives near the stretch of road in Skagit County, said the group has participated in the program for about five years.

Cleaning up the side of the road isn’t an easy job, Borgias said.

“Ditches make it hard,” Borgias said. “When I do it I get kind of obsessive and get down in the ditches. A lot of stuff you don’t see until you get down there.”

Ray Willard, Washington state Adopt-a-Highway program manager and coordinator, receives reports from the groups about their cleanup activity.

“Something that has really become a problem and is increasing in numbers are what we call ‘trucker bottles,’” Willard said. “It’s really gross, but if a trucker has to go to the bathroom and doesn’t want to stop they will go in a bottle and just throw it out the window.”

Washington State Patrol is also working to prevent litter by enforcing stricter litter laws on the state highways. As of July 27, 2003, littering an amount greater than a cubic foot is considered a misdemeanor and can cost the litterer up to $1,000 and 90 days in jail. Littering burning material, such as cigarette butts, can cost up to $1,025.

Last year Ecology, Adopt-a-Highway and the Department of Corrections cleanup efforts collected 60,000 pounds of cigarette butts, Willard said.

Litter cleanup efforts are not cheap, Willard said.

“It costs $1.25 million per year statewide,” Willard said. “This includes all litter control costs.”

McAllister said he is aware of the costs of litter control.

“It gives people something to do,” McAllister said. “I used to enjoy litter because it gave me something to do. I worked for public works for six months. We used to go on trash duty. It was basically milking the government clock.”

Borgias said he felt involving the immediate community gave the program a face to put with the cleanup effort, hopefully making future litterers more conscious of the work.

While he respects the beauty of the outdoors, McAllister said he doesn’t see beauty in overpopulated places where environmental damage has occurred for years.

“There are two different kinds of worlds: urbanization and places that haven’t been desecrated by the effects and drudgeries of urban sprawl,” McAllister said. “I like to think of myself as an environmentalist, I really do. I am a spokesman for the environmentalist cause. I like to promote the preservation of natural environments that haven’t already been raped and pillaged by the evil hand of man.”

Borgias said he is familiar with that kind of thinking, but is more in favor of torching Hummers as a social statement than littering.

“It’s whether you have any respect for the human race whether you buy into that or not,” Borgias said. “I can’t see littering in a city. Those folks may be ignorant and stewing in their own juices as they ruin the environment, but why make it worse?”

Senior Jen Rittenhouse studies public relations at Western. She has previously been published in the Western Front.
HOME FRIED FUEL

by Katie Scaife
photos by Anya Traisman

Bruce Barbour’s newly-invented machine (right) produces 115 gallons of biodiesel in two to four hours. The other machine produces 25 gallons in 24 to 48 hours.
THE FAST-FOOD AROMA of greasy burgers and fries lingers in Bruce Barbour's garage. Inside, vats of used restaurant grease fill the shelves, awaiting Barbour's attention. Three giant plastic tubs stacked on top of each other line one wall from the floor to the ceiling. Tubes and funnels weave them together. This is not a burger joint. It is not a mad scientist's laboratory. This is where Barbour makes fuel for his cars.

"I do it for the joy of making my own fuel, filling my tank, waving at the gas stations," Barbour said, chuckling as he ran his fingers across his beard. "We call them milk stations now."

The power of petroleum moves nearly all Interstate 5's traffic. With current power struggles revolving around the world's oil reserves and concerns about how carbon dioxide emissions are affecting the world's climate, some citizens are taking action by producing a purified form of cooking oil, known as biodiesel, for their vehicles. While current biodiesel production cannot match the country's thirst for petroleum, producers hope it might lead to a shift in the United States' dependence on petroleum-based fuels.

Barbour began making his own biodiesel in 1999 when a gasoline pipeline ruptured and exploded in Whatcom Creek, Bellingham, and killed three boys. One was a friend of Barbour's son.

At the time, Barbour was working as an environmental scientist for the Washington State Department of Ecology. His work included studying Whatcom Creek for factors that would make salmon survival difficult — such as metals, pesticides and toxins — in an effort to eliminate them. The explosion disrupted habitat in the waterway and Barbour said he found himself negotiating a long-term restoration plan with Equillon, the company that managed Olympic Pipeline Co.

"One day," Barbour said, "after a particularly frustrating round of negotiations, I went to a gas station and filled the tank on my Honda wagon. The smell of the gasoline brought tears to my eyes as I realized how hypocritical it was for me to support the system that led to this tragedy."

"I stopped driving cars. That didn't work long; I have kids."

Producing your own fuel is a powerful experience. Making fuel locally empowers everyone except the large oil companies.

For the next three months, Barbour tinkered in his garage, trying to find an efficient way to purify used vegetable oil, he said. Now the garage is his laboratory, his toy.

"I'm in here all the time," Barbour said, after he dragged a few living room chairs into the middle of the garage. Unfinished wood walls enclosed the room. Pitchers of yellowish-brown muck sat on a work bench.

Barbour works about one hour every two weeks to produce 25 gallons of biodiesel: enough to fuel his Suburban, Datsun pickup, Mercedes and one boat, he said.

Barbour said he spends about 45 cents for every gallon he produces. According to the Environmental Protection Agency, purchasing pure biodiesel can cost anywhere from $1.95 to $3 per gallon.

Barbour picks up used vegetable oil from local restaurants.

"It is a relatively simple process and can easily be made in a Coke bottle," Barbour said.

He said the process of purifying the oil, called cracking, is not complicated. He learned in less than three months with recipes posted on the Internet by activist groups and research universities.

Michael Seal founded the Vehicle Research Institute at Western Washington University in 1972. Since then, his team of students and engineers have designed award-winning vehicles with power sources ranging from propane to solar. A number of the VRI's hybrids — vehicles that are powered by a combination of fuel and electricity — use biodiesel fuel.

When carbon dioxide accumulates in the atmosphere, Seal said, it traps the earth's heat and can cause global temperatures to rise.

Petroleum diesel releases three tons of carbon dioxide into the atmosphere for every ton burnt, according to the British Association for Bio Fuels and Oils. Burning biodiesel also releases carbon dioxide, but the overall lifecycle emissions — from production to burning — are 78 percent lower than the overall carbon dioxide emissions from petroleum diesel, according to a study by the U.S. Department of Energy and U.S. Department of Agriculture.

Biodiesel is made from cooking oil, which initially comes from plants, said Wayne Elson, an environmental protection specialist for the EPA. Unlike petroleum diesel, which releases carbon removed from the atmosphere millions of years ago, the carbon released from burning biodiesel comes from plants that removed the carbon from the atmosphere while growing. This means that the carbon dioxide released when biodiesel is burned is offset by the carbon dioxide uptake during plant growth, burning biodiesel effectively "recycles" carbon dioxide.

In Washington state, more than 75 percent of anthropogenic (human caused) carbon dioxide emissions come from petroleum use, primarily for transportation, according to the Washington State Department of Community, Trade and Economic Development.

In King County, vehicles traveled an estimated 5,266,660 miles on interstate highways in 2002, according to the Washington State Department of Transportation. An average passenger car emits 0.916 pounds of carbon dioxide per mile, according to the EPA's Average Emissions Estimates. Using these numbers, traffic in King County could produce more than four million pounds of carbon dioxide in one year.

The production and use of pure biodiesel compared to petroleum...
diesel can reduce carbon monoxide emissions by 48 percent, partic­ulate matter by 47 percent, total unburned hydrocarbons by 67 per­cent, and sulfate by 100 percent, according to a report by the National Biodiesel Board. The same report found that emissions of nitrogen oxides might increase by 10 percent. Jenna Higgins, infor­mation coordinator for the National Biodiesel Board, explained why nitrogen oxides emissions increase.

“The best scientific evidence has to do with the way biodiesel comb­usts,” Higgins said. “Biodiesel combusts more completely than petro­leum diesel. That changes the timing of combustion within the engine, which can change nitrogen oxides emissions.”

Higgins stressed that the new cleaner diesel technology mandat­ed by the EPA for 2007 will drastically reduce biodiesel nitrogen oxides emissions.

An advantage of biodiesel fuel, Elson said, is that individuals can make it on a small scale in their homes and use it to power Diesel engines without modifications.

“Any Diesel engine will run on biodiesel,” Seal said, “but there isn’t enough. There isn’t going to be enough.”

Seal said using restaurant waste to fuel cars is a wonderful way to dispose of it. But to fuel all of America’s cars on biodiesel, he said, would involve growing crops in order to make enough oil; this would consume energy and increase the price of biodiesel.

“It somehow seems wrong to be burning fuel (from crops) when even in America there are people who are hungry,” Seal said.

But right now, Barbour said, biodiesel isn’t fueling as many cars as possible. Restaurants currently pay a waste disposal fee just to get rid of their used oil.

“It’s not a question of whether there is enough,” Barbour said. “It’s a question of using what we have.”

Barbour said more than six gallons of waste vegetable oil are pro­duced annually per capita in the United States. If this oil were con­verted to biodiesel it would make five and a half gallons of fuel per person. Barbour estimates the Seattle area produces enough waste vegetable oil to satisfy the fuel needs of 40,000 families.

“We have to shift our priorities,” Barbour said. “The petroleum industry has a stranglehold on fuel flow.”

Although Seal doesn’t share Barbour’s enthusiasm for biodiesel, he said the United States needs to learn how to function without dependence on foreign oil.

“There is a strong resistance in the White House to alternative fuel,” Seal said. “They see a God-given mandate to control the world’s oil.”

Seal said he fears that as the world’s population grows, and car dependence increases, the United States will find itself in competi­tion with countries like China and India for oil control.

“We know we will run out,” Seal said. “We just don’t know when.”

For the time being, Seal said Americans should focus on consum­ing less when it comes to gas.

“We don’t really need a sport utility to go to the grocery store to pick up milk,” he said.

Some countries and organizations are adopting programs that discourage heavy consumption of petroleum fuel. Austria began using biodiesel fuel in trucks, tractors and boats in 1988. Bellingham’s waste disposal company, Sanitary Service Company, has been using a mix of 20 percent biodiesel and 80 percent diesel in two trucks for about a year, said Rodd Pemble of SSC, Inc.

“As far as advantages,” Pemble said, “the drivers have mainly noted the reduced air pollution: less soot. SSC has been willing to pay more for biodiesel in this pilot program because we believe it’s important to support pollution prevention for the benefit of the community.”

Barbour said the process of making biodiesel is so easy and inex­pensive that individuals can make it on a small scale.

“Producing your own fuel is a powerful experience,” Barbour said. “Making fuel locally empowers everyone except the large oil companies. My wife and I have not been to a gas station in four years. That is, except to buy milk.”

Though it is unrealistic to think the United States might be able to satisfy its energy needs with biodiesel, Barbour said, the fuel can be used as a transitional resource.

“Make it, use it, talk about it,” Barbour said. “I believe in the power of the individual to affect his or her community and that community to affect the region, and if it really works, ultimately the rest of the world.”

Senior Katie Scalf studies environmental journalism at Huxley College of the Environment. She has previously been published in the Planet Magazine.

To make biodiesel:

Bruce Barbour uses a recipe that originated at the University of Idaho. First he makes a mini-batch to test his measurements. For a mini-batch he heats one liter of waste vegetable oil to 120 degrees and uses a titration of two milliliters of the oil to determine how much methanol and lye he needs.

Then he mixes the methanol and lye in a blender for two minutes, and adds the heated oil. He blends this mixture for 15 minutes and lets it settle for an hour. When it separates into two layers — biodiesel on the top, which looks like apple cider and glycerine, which looks like molasses — he knows he has made biodiesel. Using the same ratios he makes a large batch, and allows the mixture to settle overnight.
Air pollution health effects:

- **Particulate matter 2.5 and 10:** Microscopic particles too small to be filtered by the body. Causes wheezing and lung irritation. People with asthma are especially at risk. Can also include toxic air pollutants like the carcinogens benzene and formaldehyde. The smaller particulate matter is also associated with heart disease and premature death.

Sulfur dioxide: Emitted from Diesel engines. Constricts air passages. Mostly a problem for young children and people with asthma.

- **Nitrogen oxides:** Produced during gasoline and diesel combustion. Contributes to the formation of ground level ozone. On their own, nitrogen oxides can affect the respiratory system and constrict air passages.

Carbon monoxide: Colorless odorless gas emitted in exhaust. Interferes with blood's capacity to carry oxygen to the brain, heart and other tissues. Can cause headaches, fatigue, reduced reflexes and death. Most intensely affects children and people with heart disease.

Ozone: A major component of smog. Produced when emissions of hydrocarbons and nitrous oxides react in sunlight. Ozone can damage lungs and breathing passages and cause coughing and chest pain. Even healthy people are sensitive.

Hydrocarbons: Product of gasoline and diesel combustion. Contributes to ground level ozone.

Environmental effects:

- **Particulate matter:** Main source of haze, reduced visibility
- **Sulfur dioxide:** A major precursor of acid rain, which has acidified soils, lakes and streams.
- **Nitrogen oxides:** Another contributor to acid rain and smog.
- **Carbon dioxide:** A greenhouse gas released when fossil fuels are burned. Contributes to global warming.

**Ground level ozone:** Can damage plants and animals. Contributes to smog.

Sources: Washington State Department of Ecology air quality reports, Doug Brown, Ecology air quality supervisor

Bellingham and Seattle air pollution comparison:

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<thead>
<tr>
<th></th>
<th>Bellingham</th>
<th>Seattle</th>
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<tr>
<td>Particulate matter 10</td>
<td>0.073 ppm</td>
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<tr>
<td>Sulfur dioxide</td>
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<td>Nitrogen dioxide</td>
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<tr>
<td>Carbon monoxide</td>
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<tr>
<td>Ozone</td>
<td>0.067 ppm</td>
<td>0.059 ppm</td>
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**Sources:** Northwest Air Pollution Authority, State Dept. of Ecology

**Vehicle emissions:**

- **Motorcycles, cars, SUVs:** Particulate matter 10. Carbon monoxide, nitrogen oxides, hydrocarbons.
- **Diesel trucks:** Particulate matter 2.5 and 10. Carbon monoxide, sulfur dioxide nitrogen oxides, hydrocarbons.

Source: Environmental Protection Agency