Climate, Cows, and Cars

A not-too-serious exploration of the effects that Western lifestyle choices have on our health and our world

Special Thanks

Andy Singer
BikePortland
Dan Piraro
Eric Jaffe
Dr. Leon James & Dr. Diane Nahl
The Intergovernment Panel on Climate Change
Jeff Speck
Dr. Melanie Joy
Dr. Michael Greger
StreetFilms
Todd Litman
The United Nations Climate Panel
VeganStreet
Dr. Will Tuttle
And
All of YOU

By Mitch

Table of Contents

Prelude 05
- Denial 06
- What IS Climate Change? 07

Benefits 09
- Looking Great 09
- Social Connections 10
- Efficiency 11

Greenhouse Gases 15
- Carbon Dioxide 15
- Methane 16
- Nitrous Oxide 16
- Combined Impact 17
- Embodied Energy 17
- Summary 19
- Meat the Alternatives 20

Air Pollutants 24
- Carbon Monoxide 24
- Benzene 25
- Hydrogen Sulfide 25
- Ozone 25
- Nitrogen Dioxide 26
- Particulate Matter 26
- Comparison to Second Hand Smoke 27
- Driving on Fumes 28

Some Good News 32

Water. 36
- Fishing 36
- Water Pollution 37
- Water Consumption 39

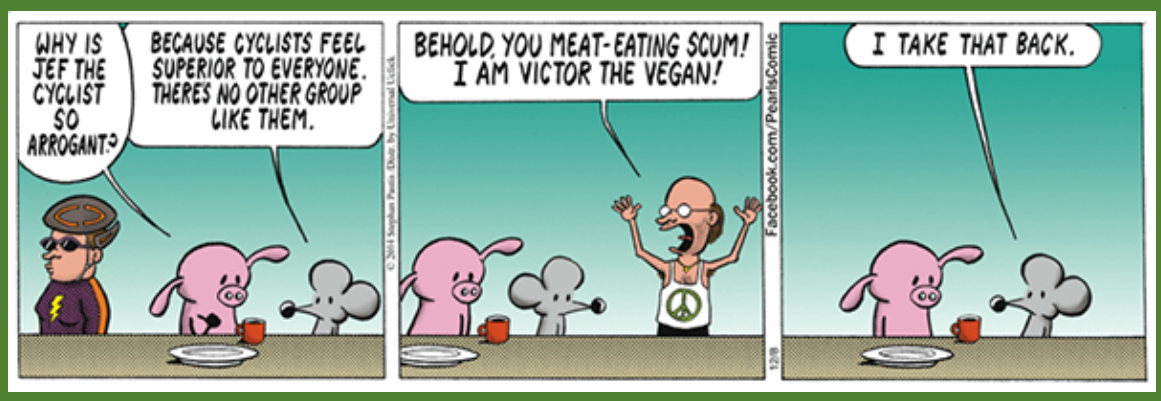
Back to the Land 42
- Outa' Space 43

Cost... 45
- 'Free' Parking 46
- 'Accidents' 46
- Not Seeing the Forest for the Street 47
- The High Cost of a Poor Diet 47

Physical Health 51
Heart disease 51
Cancer 52
Other Diseases 52
CARnage 53
Other Hazards 54
Emotional Health 57
Noise Pollution 58
Active Learning 58
Loving Dogs and Eating Pigs 59
Broccoli Slaughterhouse 60
What is Solastalgia? 61
Desperately Seeking Space 62
Political Conflict 65
Conclusion 68

Prelude

Which lifestyle choice does more to combat Climate Change, a carfree lifestyle, or a vegan lifestyle?



© Stephan Pastis

Like you I've often asked that eternal question: How can I become even more of a holier then though, pain in the butt eco-maniac? I was already car-free (and will remind you immediately), composted my food waste, and wore sweaters in the house during winter.

But then it occurred to me – going vegan was the solution!
But I wondered though.....was this going to *actually* help the planet more then boycotting **ExxonMobil?**
At first it didn't seem possible. Throughout my life the cars and roads and factories had always been labelled as the largest environmental threat to our future. The question was so intriguing that it led to a year of intense research into the many ways in which these choices shape our lives.

What I discovered, was that the question was far more complex then I could have imagined.

(Spoiler alert: they both have a really big impact on the climate.) I welcome you to join me in this exploration so that you too, can make choices that will ease your conscience and allow you to live a healthier, happier life.

> “Every revolutionary idea evokes three stages of reaction:
> ‘It’s impossible.’
> ‘It’s possible, but it’s not worth doing.’
> ‘I said it was a good idea all along.’

The original question of which decision has a higher impact was originally raised in 2006 when the UN commissioned a report, titled **‘Livestock’s Long Shadow.’** The report stated that the raising of domestic animals for food was the larger contributor to greenhouse gas emissions. But they didn’t simply claim that livestock were more damaging then driving, the UN report claimed that the animal products industry was more destructive then *all the world’s transportation combined.*

The first thing that I found was that shortly after the UN’s report was published, Dr. Frank Mitloehner **challenged their findings.** Dr. Mitloehner pointed out errors in the data which made me think that the folks at the UN could be mistaken. Like Dr. Mitloehner, I was sceptical of what sounded like outlandish claims. However without funding, a giant laboratory, or a scientific degree I needed a large pool of resources to draw from in order to know for certain.

Thanks to the magic of the internet, there are in fact….millions of documents & scientific studies to help understand this complex issue. But don’t worry, I’ve done all the research and calculations for you.

Denial

The dinosaurs didn’t believe in climate change either.

Despite all the research on our current climate situation, there are plenty of people in the United States who believe that Climate Change either isn’t happening, or isn’t caused by people. A PEW research poll confirms that **nearly half of U.S. residents believe this** (and not all of them work in Congress). If you put yourself in the shoes of an oil company CEO (not so easy I admit) and ponder the danger that such knowledge poses for them, it’s possible to understand their motivation. This is why support for climate

change denial comes from the **Koch Brothers**, **oil companies**, and the coal industry. (**link**) (**link**) On the other hand, the case for human-caused climate change is supported by **97% of the scientific community**. While our current era of superstorms makes denial increasingly difficult, many people are not aware that some companies **knew** about the threat of climate change in the mid 1980s. Some climate scientists even warned Lyndon Johnson about this 50 years ago! (**link**)

The Oil Industry is Certainly Willing to 'Win Ugly'

What IS Climate Change?

But what exactly IS Climate Change? Throughout the world, people are becoming more concerned about it, yet most people seem to be either dis-empowered, or confused about how to make a difference (hint, recycling isn't the answer). To put it simply, Climate Change is a general increase in world temperatures due to heat-trapping gases (the aptly-named 'Greenhouse Effect'). The term 'Global Warming' is less accurate because what scientists predict is not for warming across the globe (as a recent U.S. politician, who **brought a snowball into the Senate,** demonstrated).

> "It's much easier to come up with a compelling story if you can make up whatever you want, then if you have to stick to the truth."
>
> **Derek Muller**

The increasingly radical fluctuations in weather patterns which have caused drought, heat waves, and more intense flooding would be better described as 'Global Weirding,' or 'Climate Chaos.' Higher global temperatures mean more energy, that energy gets released in the form of more powerful superstorms which cause enormous damage to populations all over the world. (**link**) Humans (especially the well-off) are able to stay afloat more easily then poor populations and wildlife which is why individual choices are progressing faster than national policy.

Prelude - citations

1. Wikipedia - Environmental record for ExxonMobil
2. LEAD (Livestock, Environment, and Development) (2006). 'Livestock's Long Shadow,' produced through the Food and Agriculture Organization of the United Nations
3. Pitesky, M. E., Stackhouse K. R., Mitloehner F. M. (2009). "Clearing the Air: Livestock's Contribution to Climate Change" originally published in '**Advances in Agronomy**'
4. Views on climate change by key demographics - Pew Research Centre
5. Jane Mayer, "Koch Pledge Tied to Congressional Climate Inaction" The New Yorker 06/30/2013
6. David Adam, "Oil Firms Fund Climate Change 'Denial'" - The Guardian 01/27/2005
7. Brian Merchant, "How the World's Biggest PR Firm Helps Promote Climate Change Denial" - Motherboard 08/05/2014
8. Steve Hanley, "InfluenceMap.org Tracks Fossil Fuel Lobbying Efforts" Gas2.org 04/11/2016
9. NASA 'Statement on Climate Change from 18 scientific associations'
10. 'Neela Banarjee, "**Oil Industry Group's Own Report Shows Early Knowledge of Climate Impacts**" Inside Climate News 02/05/2016
11. Dana Nuccitelli "Scientists Warned the US President About Global Warming 50 Years ago Today" The Guardian 11/05/2015
12. Eric Lipton "Hard-Nosed Advice from Veteran Lobbyist: 'Win Ugly or Lose Pretty'" The New York Times 10/30/2014
13. Steve Mirsky "Climate Skeptic Senator Burned after Snowball Stunt" Scientific American 03/02/2015
14. Derek Muller "Climate Change is Boring"
15. "Warmer Oceans Could Produce More Powerful Superstorms" Phys.org 01/19/2016

Image Credits

1. Cover image created by the author
2. 'Vegan vs. Cyclist' Pearls Before Swine created by Stephan Pastis
3. 'Which Lifestyle Choice more Impactful' image by Veganstreet.com
4. Image of Dr. Mitloehner from U.C. Davis
5. Screenshot from 'Climate Change Debate' Last Week Tonight John Oliver
6. 'Swan through Window' source unknown
7. 'Weird Weather Map' source unknown

Benefits

There are a huge number of advantages that come with both a **vegan diet** and a **car-free lifestyle.** Both choices help us to enjoy longer, more stress-free lives while reducing our impact on the land. A vegan lifestyle improves energy levels, nutrition, heart health, and our immune system. In fact there are so many advantages that they would easily overwhelm this essay. You can save time by just watching **'Forks Over Knives'** for a quick overview. Or, **here** are just five things that would happen if everyone ditched meat & Dairy.

This is an excerpt from a video by Emily of Bite Size Vegan fame. See the full video **here**

Eating plant-based also prevents the 'dulling of the senses' caused by overloading the taste buds. People who switch to plant-based meals find that flavours are richer, more varied, and more delicious as the taste-buds heal. (**WPD81**)

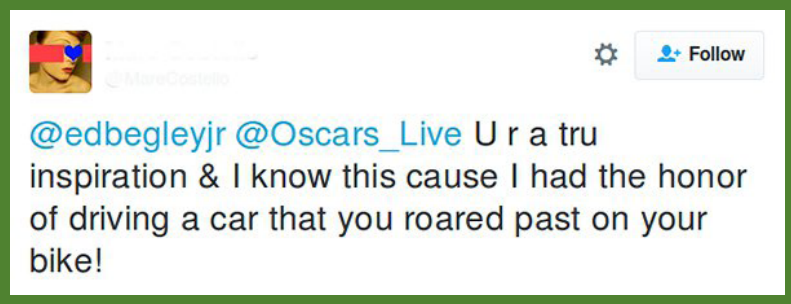
And while Emily's video on the right is used mainly to give you a smile, it does feel in my own opinion, that eating vegan really has the potential to improve our lives in a huge number of ways. (**link**)

Do vegans have a spam folder?

Looking Great

What has always impressed me is the youthful shine that shows on the faces of people who eat healthy and stay active. I'll never forget a trip that I took years ago with a young couple, climbing through a small mountain area. I felt a bit of struggle trying to keep up with these young 20 year olds and felt my own age as we climbed the hills. It was only a year later when I ran into one of them again that I found that he was in fact 30 years old. Since then I've noticed that vegan eaters and active cyclists look, so much younger then other people of the same age. (**link**) (**WC198**)

Compared to a plant-based diet however, the health benefits of living car-free are less well known (**not as many Netflix movies about it**). Clearly the increased exercise of walking, bicycling or even using public transit (which involves walking) will improve our lives. (**link**)



The exercise boosts ones mood, improves connection with neighbourhoods, and provides many other benefits.

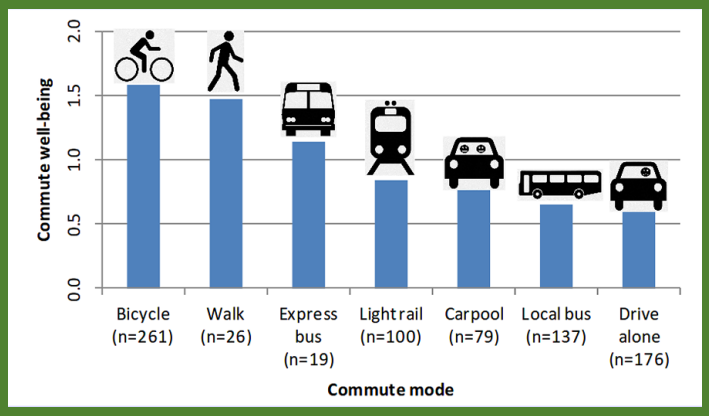
(I cover this in more detail **below***.)*

Social Connections

> “Cities are books that you read with your feet.”
>
> **Quintin Cabrera**

But there’s more to it then that. As just one example, every 10 minutes commuting without a car results in 10% more social connections. (**link**) These social connections provide enormous benefit to our well-being. They fight depression, **improve democracy**, and increase sharing. (**link**) (**link**) Seeing the street as a place rather then a through-way, helps foster a greater sense of community and connection within our neighbourhoods. (**link**) (**link**) When people travel by foot or by cycle, we get to enjoy spur-of-the moment conversations, we might ask someone on a date, or see a rainbow. I’ve had a beautiful wealth of experiences that I often realize would be impossible were I traveling alone within an enclosed vehicle.

> “When you ride a bicycle, you’re part of a neighbourhood.
> When you’re in a car, your just passing through.”

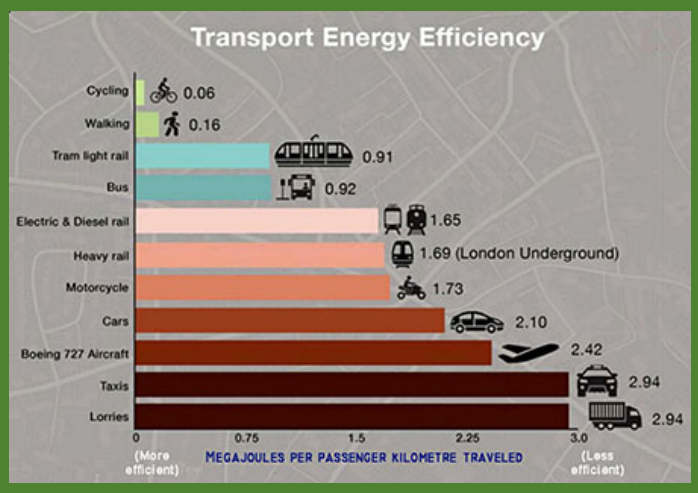


Commute Well-Being study by Oliver Smith PhD. Portland State University

This improved connection to our neighbourhood plays a big part in our overall happiness not only while we're traveling, but after we reach our destination too. (**link**) The fresh air, the relaxed pace and the freedom from traffic all play a large part in lowering stress levels. There's sound research to support this. (**link**)

According to Dr. Oliver Smith at Portland State University, bike commuters were found to have the highest "happiness quotient" of all transportation modes. (**link**) Smith surveyed over 800 commuters using various modes about their level of satisfaction.

Efficiency



Data: Sustainable Transport and Public Policy, **David Banister**, Univ. of Oxford

Another huge advantage to both lifestyles is efficiency. Both in terms of space (see below) and energy needed. It might not suprise you to learn that automobiles are the least efficient machines that we have for moving us around. A car has an efficiency of **roughly 20%** from oil well to passenger kilometer (or mile). On top of that, less then 1% of the energy used by a car is actually needed to carry a person. (**link**) By contrast, a human on a bicycle has an efficiency estimated between **700** and **1000** miles per gallon. With a bicycle, our food is our fuel, which means that we can eat (within reason) anything that we want.

Cycling Promotion Fund - Australia

The scenery is always nicer on bikeable roads. How many times have you seen a landscape photograph of a parking lot?

> “Pedestrian and bicycle traffic use fewer resources and affect the environment less then any other form of transport.”
>
> **Jan Gehl - ‘Cities for People’**

On top of the efficiency of space and fuel, bikes and walking also cause less damage to the road itself. I’m sure you can think back to the many times you were inconvenienced by having to wait for, or detour around a road resurfacing project. Well these are more then just inconvenient. They cost A LOT of money. Resurfacing an arterial road costs roughly $1 million per mile. (**link**)

Compared to cars and trucks, a bicycle causes an infinitely small amount of damage. Using an ‘average’ 4000lb car as the baseline you can see the huge difference.

Vehicle Type	Average Weight (lbs)	Comparative Damage
Hummer H2	8,600	21.37
Average Car	4,000	1.0
‘Smart Car’	1,800	0.0410
300lb Man on a Bicycle	350	0.00006

source

The efficiency of a vegan diet is mainly linked to the huge reduction in the amount of land and food used when raising animals to adulthood. Whether an animal is eating grass or corn, the amount of food needed to raise a cow vastly outweighs (no pun intended) the yield. In the United States, cattle will eat over 8.5 metric tonnes of food per year. Since they're killed after 18 months, that's about 13 tonnes of food needed per animal. And the return that a rancher gets is about 254 kilograms (560 lbs) of saleable meat. With a vegan diet on the other hand, the food goes directly to people where it gets turned into human energy. This means that more people can be fed on the same amount of grain, oats, rice, or potatoes.

I'm not vegan because I love animals...
I'm vegan because I REALLY hate plants.

But since the main focus of this essay is on climate change, we will first take a look at the issues around Greenhouse Gases (GHGs).
According to the original UN report, the three gases which have the greatest impact on climate change are:

- - Carbon Dioxide
- - Methane
- - Nitrogen Dioxide

All three of these elements have a huge influence on our planet. You can see a detailed breakdown of each of the three GHGs, and their impact here.

Benefits - citations

1. Heather McClees, “5 Health Perks of Going Vegan” One Green Planet 03/11/2015
2. Orion Kriegman, “No Car, No Problem: The Benefits of Car-Free Living” Alternet 04/12/2010
3. Fulkerson L., Wendel B., Corry J., Boon A. “Forks Over Knives” Documentary Film
4. Mimi Bekhechi, “Five Things That Would Happen if Everyone Stopped Eating Meat and Dairy” FerocesMente
5. Dr. William Tuttle, **“The World Peace Diet”** pg.81
6. Health Sutra “Top 10 Benefits of a Vegan Diet”
7. Jeff Speck, **“Walkable City”** Farrar, Straus and Giroux 2012 Pg.198
8. Chris Bruntlett, ModaCity Communications and Marketing firm for Vancouver, B.C.
9. Lloyd Alter, “Study: Cycling Keeps you Young” Treehugger 01/06/2015
10. Nick Paumgarten, “There and Back Again” The New Yorker 04/16/2007
11. Tom Sandborn, “Isolation Bad for Democracy” Vancouver Courier 10/04/2012
12. Yvette Tendick, “Biking, a Gateway Drug to Social Awareness” StrongTowns 02/15/2016
13. Julie Croteau, “Social Ties are Good for Your Health” BeWell@Stanford Stanford Univ.
14. “Streets as Places: How Transportation Can Create a Sense of Community” Project for Public Spaces
15. Peter Walker, “Cities with Physically Active Residents More Productive as Well as Healthier” The Guardian 06/08/2015
16. Morris E. A., Guerra E., “Mood and Mode: Does How We Travel Affect How We Feel?” Momentum Magazine 03/29/2016
17. Transportation Journal 01/2015 summarized in Phys.org
18. Hilary Angus, “Pedaling Towards Happiness: 7 Mental Health Benefits of Riding Bikes”
19. Dr. Oliver Smith, “Commute Well-Being Among Bicycle, Car, and Transit Commuters in Portland, Oregon” based on data from ‘Transportation Research’ Part F. pg.167-175
20. Chu S., Majumdar A., “Opportunities and Challenges for a Sustainable Energy Future” Nature 08/16/2012
21. Amory B. Lovins, “DoD’s Strategic Energy Opportunities: More Fight, Less Fuel, Lower Cost, Safer World” Presentation to the U.S. Dept. of Defence Rocky Mountain Institute 2009
22. Wikipedia “Energy Efficiency in Transportation”
23. “Is there a way to compare a human being to an engine in terms of efficiency” 5 December 2000. HowStuffWorks.com. 10 March 2016
24. Cost figures provided by Florida Dept. of Transportation 06/2014
25. Meg Dunn, “Which Road Users Make the Greatest Demands on our Tax Dollars” Pedal Fort Collins 05/06/2016
26. Cassidy E. S., West P. C., Gerber J. S., Foley J. A., “Redefining Agricultural Yields: from Tonnes to People Nourished per Hectare” Environmental Research Letters Vol.8 Num.3 08/01/2013

Image Credits

1. Screenshot of 'The Dangers of Vegan Health Claims | Matt Ruscigno Returns' Bite Sized Vegan created by Emily Barwick
2. Screenshot of 'Vegans are WEAK!!!' created by GaiaisiMusic
3. 'Street Community Potluck' source unknown
4. 'Commute Happiness Chart' by Dr. Oliver Smith
5. 'Step It Up' U.S. Surgeon General and the Center for Disease Control
6. 'Transportation Energy Efficiency' Dr. David Banister University of Oxford
7. 'Cyclist in a Landscape' photo by the author
8. '70% US Grain fed to Farm Animals' image created by VeganStreet.com
9. 'Earth is the Only Planet with Chocolate' source unknown

Greenhouse Gases

Warning! There's lots of data here, and the numbers are astronomical. After all, we're talking about the entire planet's atmosphere. So this should help give you a sense of the numbers:

1 Gigaton = 1,000,000,000 metric tonnes

The estimated weight of Mt. Everest = 3,400,000,000 metric tonnes

Carbon Dioxide

Carbon Dioxide (CO^2) has become the ruler by which all greenhouse gases are compared. It's mainly produced by the world's transportation systems, which send up roughly 6.8 gigatons of Carbon Dioxide (that's 2 Mt Everests) *every year*. (**link**) Carbon Dioxide is released through burning coal, oil, wood, and through deforestation. Similarly, the raising of livestock contributes to this figure mainly in the clearing of forests to graze animals, and in the use of fuels for transporting animals, feed, and supplies. (**link**)

In terms of cost, I invite you to consider that each ton of CO^2 added to our atmosphere causes an estimated **$220 in economic damage** (I will let you, dear reader, examine the cost of almost 7 gigatons).

> "You can't spell 'carbon,' without CAR."
>
> **Jeff Speck**

Methane

While released in smaller amounts, methane is all the more troublesome since it has **72 times** the impact on the climate. For transportation, methane is released mainly in oil drilling, through 'flaring' or through pipeline leaks. (**link**) About 14% of the world's methane is released this way.

Grazing animals, on the other hand produce most of the world's methane. The combination of 'cow burps' with animal waste lagoons and animal feed results in roughly 15 gigatons of CO^2 equivalent per year. (**link**)

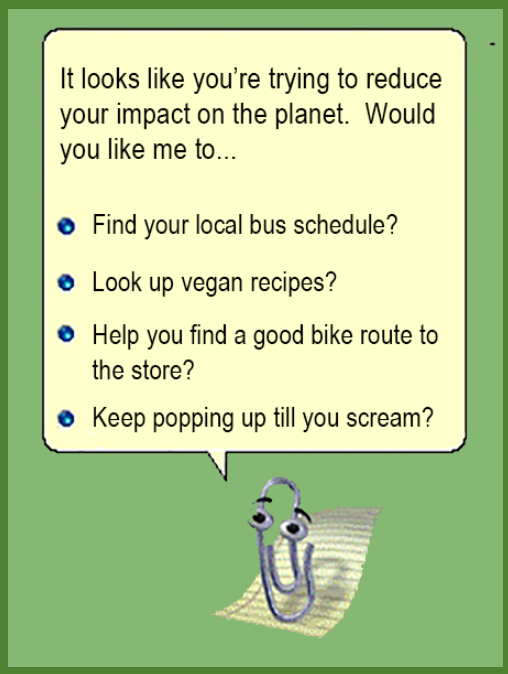
That said, I want to make an important additional point. By comparison, rice production (the main plant-based source) contributes about 2.7 gigatons CO^2 equivalent per year. (**link**) I include this to point out that there are plant-based sources which have a big impact as well. According to Dr. Masanobu Fukuoka, a well-known permaculture farmer in Japan, rice farming can be done **less impactfully** by reducing the amount of time that rice fields are flooded.

Nitrous Oxide

The third climate changing gas is Nitrous oxide. This potent gas is 300 times as damaging as CO^2. So even though it is released in comparably small amounts, it still packs a big punch. Nitrous oxide is mainly produced by agriculture, with livestock contributing 1.5 megatons of CO^2 equivalent each year. (**link**) By comparison Nitrous oxide emissions from transportation are almost nil.

Combined Impact

Even with the wealth of information available though, the issue is not as clearcut as it seemed. The world's transportation vehicles do produce almost 7 gigatons of CO^2. But there's more to the story then that.



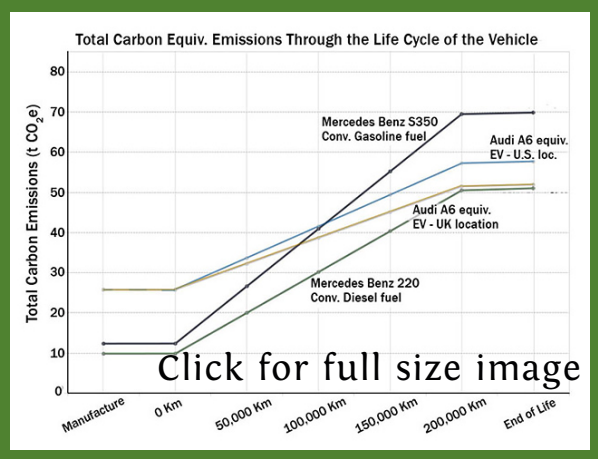
The key element, which Dr. Mitloehner had said was missing from the UN study, was something called **'embodied energy.'** This is the amount of energy that goes into something before it arrives on a store shelf. The UN study did include the embodied energy for livestock (land use change), but did not include the embodied energy needed to bring a car and it's fuel to the customer. That's why, in my research I looked into the whole process, to offer an 'apples-to-apples' comparison. It's difficult to make comparisons between a living being like a cow and an automobile, but bear with me.

"If global warming by itself isn't enough to scare you, then just imagine.....Bill O'Reilly in a thong."

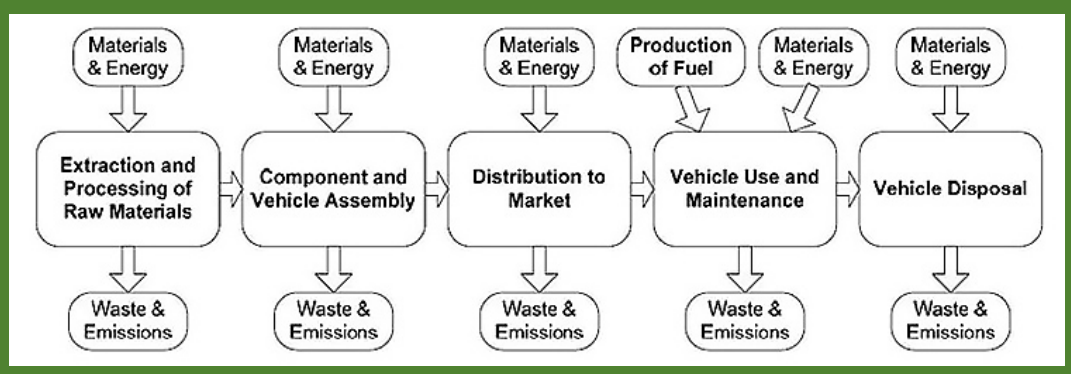
Embodied Energy

So going beyond tailpipes and cow burps, where is the rest of the damage coming from?

Well the embodied energy for transportation includes a long industrial process. Vehicles don't operate in a vacuum [no cars in outer space]. The materials have to be mined from the ground, manufactured, and then delivered. Estimates for the pollution created vary widely. From as low as **6.3 tons** per vehicle to as much as 30% of a car's total emissions. (**link**)

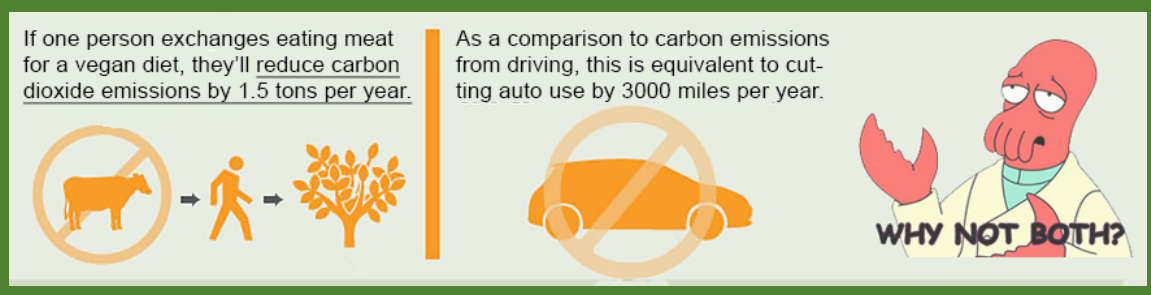


Strømman et. al.
Norwegian Univ. of Science and Technology

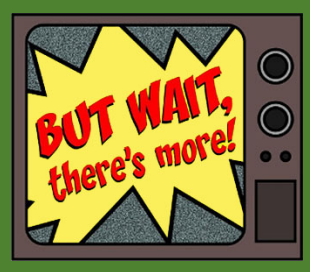


On top of the embodied energy to manufacture vehicles there is also a great deal of embodied energy needed to pump, process, and deliver the fuel. According to **this UK report,** the embodied energy for fuel is roughly equal for that of vehicle manufacture. They estimate that the embodied energy for both manufacture and fuel at 10% of the vehicle's lifetime impact. This amounts to roughly 158 million tons of CO_2 worldwide. Of course the impact depends largely on the source (offshore, tar sands, or oil shale) and distance that the oil has to be transported.

Lastly we will look at the Greenhouse Gases released for roads. According to **this Canadian study,** the average carbon emissions for roads comes out to 11 metric Tonnes per sq. km. over a 50 year period. Translating that into a world total gives us almost 35 million tonnes of greenhouse gas released per year around the world.



Though the climate emissions from cars and their infrastructure is enormous, the data nevertheless was showing that the world's domestic animals produce *more climate changing gases then all of the world's transportation*. But wait, there's even more to this story.



Dr. David Steele of **EarthSave Canada** wrote an **eloquent piece**, describing other factors not included in the UN study. In this case the most significant being the Carbon Dioxide exhaled by the millions of cows daily (just like we do). His conservative analysis estimates that 3.2% of world emissions can be attributed to the breathing of livestock. He also suggests an additional 2% increase due to the gas exhaled by farmed fish, which I agree is important. Adding the sum total, we get an additional 3 gigatons of CO_2 equivalent.

When a cow laughs really hard, what comes out of her nose?

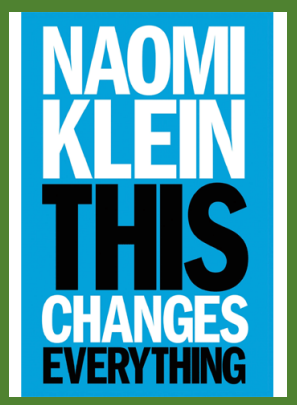
Summary

Based on all of this information, I was forced to change my beliefs and accept that in the strict sense of climate change, a plant-based lifestyle *does* have a greater positive effect on climate change then a car-free lifestyle. In fact animal agriculture creates more climate-changing gases then all of the world's transportation combined, mainly from **cattle.** Even when air travel is considered, the total is only 9 gigatons for all sources. Meanwhile, the shear number of livestock throughout the world creates over 22 gigatons. (**link**)

© Brian Fray

Total world GHG produced				
Gigatons Co2-eq	Animals raised 4 food	Rice Farming	Embodied Energy	Transportation
			(cars -inc. road building)	(includes air & shipping)
CO2	7.18158		1.47200	7.17622
Methane	15.13600	2.76179	0.37840	
Nitrous Oxide	0.00151		0.00007	0.00002
Total	**22.319**	**2.762**	**1.850**	**7.176**

[I further believe that if we had more detailed information on omnivores who eat mainly poultry (the least impactful domestic animal) or people eating a vegan diet which is high in rice then the comparison would become even more interesting.]



After all of this analysis, does this mean people who eat a vegan diet but drive are now off the hook? Does this mean that I'm going to run out and get a drivers license? Of course not. As I will be repeating throughout this essay, the climate crisis is affecting much more then just the Earth's temperature and we are going to have to use every tool available in order to reduce the harm of human lifestyles. Changing our relationship with the climate is going to become more and more challenging the longer we delay. At the risk of sounding too negative, it cannot be ignored that humanity has already passed the point where mild shifts can save us. As Naomi Klein states, "there are no non-radical options left before us." (**link**) We're not just looking at a changing climate, we're looking at a changing .....everything.

> “There is a vast territory between what we’re trying to leave behind, and where we want to go - and we don’t have any maps for that territory.”
>
> **Charles Eisenstein**

Meat the Alternatives

If you will indulge me, I hope to expand the scope of this essay to include other sources of impact beyond climate change. For those of you who are already vegan, you may regularly enjoy the recent plethora of ‘fake meat’ products such as Tofurkey. Unfortunately, these require so much in terms of water and energy to create, that they cause a ***noticeable* reduction** in the environmental gains of a vegan diet. There are even some fake meat products which are produced using the neurotoxin **hexane.**

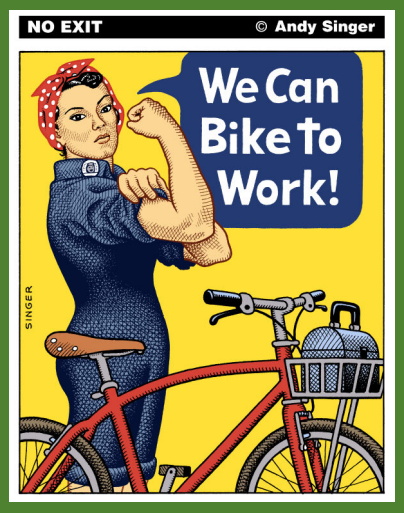
Additionally, unhealthy vegan foods such as white rice and bleached flour can actually increase the risk from diseases such as diabetes. (**link**)

People may decide to change their diet for any number of reasons. However if you decide to go vegan for the health benefits, then please make informed purchases. There are a great number of processed vegan products which offer a smaller health benefit then might be expected.

© Ferdi Rizkiyanto

If you are transitioning to a lower meat or dairy menu and having trouble, then these foods are a great way to help you eat lower on the food chain. On the other hand, if you already feel comfortable with animal-free food, then bulk veggies and grains are the best way to go. The added plastic packaging in prepared foods puts a big strain on our climate, so much in fact that **Rob Greenfeild** suggests that the strain on our ecology can be larger then from eating animals. The most compassionate food choice always comes from using whole foods in their natural forms. (**link**) I welcome you to explore the many resources that can help you to ditch plastic and eat naturally. (**link**)

> “Happiness is when what you think, what you do, and what you say are in harmony.”
>
> **Mahatma Ghandi**



© Andy Singer

For some of you, this will be convincing enough to help you make changes to your lifestyle. Others may feel that this is all too overwhelming. Both of these reactions are perfectly okay.

For those in the latter crowd, I welcome you to take small steps. Go to a **tree planting event**, participate in ‘**meatless Mondays**,’ or ride a bike to the store. Every step that we collectively take to reduce climate changing emissions is unquestionably helpful for the well-being of humans, animals, and our planetary ecosystems.

What I hope to impress on you with this essay, is that personal choices based on a single area of impact are merely one chapter in a larger and more beautiful novel. If you take in the full breadth of issues affecting the world and consider how interconnected everything is, that will help you develop a broader and richer level of awareness. You might already be a passionate activist, protester, or social justice advocate. You may believe that where you are right now is good enough. But that’s not the end of the story. While most of us think about being earth-friendly in single-issue terms; being vegan, political campaigning, ditching plastic, etc. The truth is that there are many choices that we make every day, and all of them have an impact either positive or not.

As you read on, I will share with you other issues surrounding both livestock and motorized transport beyond their effects on climate-change alone. The effects of both decisions are wide-ranging and often less obvious then we would expect. This is why I support you in continuously pushing yourself to live more in line with our host planet. I hope that you will use this essay as a source of inspiration to follow in such a path. Support **cruelty-free products**, lower your heat and wear sweaters, or ride a bike to the store for small items. Every step is a higher evolution for our own health, the animals, and our collective planet.

Greenhouse Gases - citations

1. "Reducing Transport Greenhouse Gas Emissions trends and data" produced for the International Transport Forum 2010 by the Organization for Economic Cooperation and Development Pg.6

2. Vermeulen S. J., Campbell B. M., Ingram J. S I., "Climate Change and Food Systems" Annual Review of Environmental Resources 11/21/2012

3. Moore F. C., Diaz D. B., "Temperature impacts on economic growth warrant stringent mitigation policy" Nature Climate Change pg.127-131 01/28/2015

4. Intergovernment Panel on Climate Change "Direct Global Warming Potentials" Ch.2.10.2 Climate Change 2007

5. "Oil and Gas Systems Methane: Reducing Emissions, Advancing Recovery and Use" Global Methane Initiative Sept. 2011

6. "Global Methane Emissions and Mitigation Opportunities" Global Methane Initiative

7. Kay Sumfleth "Overview of Rice Production Methods, Agriculture Production, and Methane Emissions Estimates"

8. Masanobu Fukuoka "Rice and Orchard Techniques" video

9. Reay D., Hogan C. M., "Nitrous Oxide" The Encyclopedia of Earth 10/24/2006

10. Wiki2 "Embodied Energy" definition

11. "UK: Electric and Hybrid Cars are CO2-Heavy in Production" JustAuto.com 06/08/2011

12. Patterson J., Alexander M., Gurr A., "**Preparing for a Life Cycle CO_2 Measure**" Ricardo Consultants, RD.11/124801.4 05/20/2011 pg. 46

13. Gregory Launay, "Lifey-Cycle Assessment in the Automotive Industry" GNESG.com 08/25/2012

14. Dr. Ben Lane, "**Life Cycle Assessment of Vehicle Fuels and Technologies**" prepared for the London Borough of Camden, March 2006 pg.67

15. Tim Smith, "A Life Cycle Perspective on Concrete and Asphalt Roadways: Embodied Primary Energy and Global Warming Potential" Cement Association of Canada, pg.7 09/15/2006

16. Dr. David Steele, "A Sympathetic but Skeptical Look at Goodland and Anhang's 'Livestock and Climate Change'" 10/26/2009

17. Damian Carrington, "Giving up Beef will Reduce Carbon Footprint More than Cars, Says Expert" The Guardian 07/21/2014

18. Oishimaya Sen Nag, "Will You Stop Eating Meat to Save the Environment?" Youth Ki Awaaz 10/06/2015

19. Michael Winship, "Naomi Klein: 'There are No Non-Radical Options Left Before Us" Alternet 02/03/2016

20. Caroline Scott-Thomas, "How Eco-Friendly are Meat Analogues" Foodnavigator.com 11/26/2012

21. Diane Vukovic, "The Best and Worst Vegan Processed Foods" PlenteousVeg.com 11/12/2013

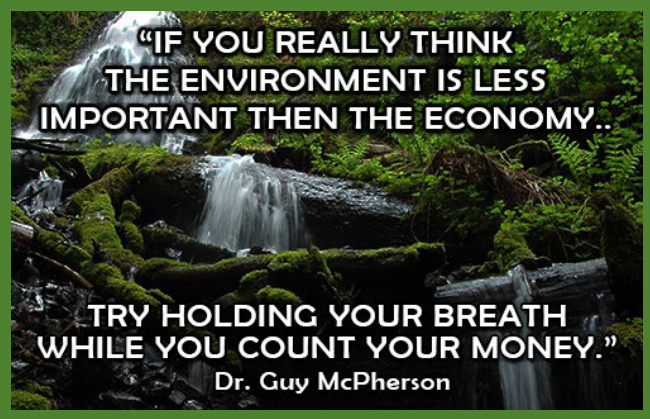
22. Sun Q., Spiegelman D., Van Dam R. M., Holmes M. D., Malik V. S., Willett W. C., Hu F. B., "White Rice, Brown Rice, and Risk of Type 2 Diabetes in US Men and Women" Arch Intern Med 06/14/2010

23. Rob Greenfield, "An Argument Against Veganism...From a Vegan" RobGreenfield.tv 07/23/2015
24. "Adverse Health Effects of Plastic" EcologyCenter.org
25. Kate Good, "10 Life Hacks to Help You Cut Plastic Out of the Picture" OneGreenPlanet.org

Image Credits

1. 'Climate Irony' by Assaad Razzouk
2. 'Bestie Cow Fart' source unknown
3. 'Climate Change your Fault' source unknown
4. 'Clippy' image created by the author
5. Hawkins T. R., Singh B, Majeau-Bettez G., Strømman H., "**Comparative Environmental Life Cycle Assessment of Conventional and Electric Vehicles**" Journal of Industrial Ecology V.17 pg.53-64 02/2013
6. 'Steps in the Life Cycle of a Car' Gregory Launay
7. 'Simon Cat Hungry' source unknown
8. 'Expansive Road in Perspective' source unknown
9. 'Why Not Both?' partial image from CulinarySchools.org edited by the author
10. 'Wait There's More' source unknown
11. 'Vegan Viking' produced by Brian Frey used with permission
12. 'GHG graph' produced by the author
13. 'This Changes Everything' image from the book of the same title by Naomi Klein
14. 'Unhealthy Vegan' created by 416vegan
15. 'Plastic Under the Waves' by Ferdi Rizkiyanto
16. 'We Can Bike to Work' by Andy Singer
17. 'Roll Over Urban' source unknown

Air Pollutants



Both unhealthy diet choices and motor vehicles are responsible for an enormous number of health problems in the western world (**link**). Looking beyond the climate, we see a variety of impacts from other gases, which cause health problems for all of us. Like climate-changing gases, these cause harm throughout the various populations of our planet. The larger source of pollution, not surprisingly, is from autos and other combustion vehicles. **One study** found that 50,000 U.S. deaths can be attributed to roadway pollution, while **another** estimates over 200,000. I'll touch on just a few of the specific gases below, but you can see a larger list **here.**

Carbon Monoxide

This colourless and odourless gas is a product of burning fossil fuels and interrupts our lungs' ability to deliver oxygen throughout the body. The two areas where people are most in danger are poorly vented rooms with combustion appliances, and vehicles with blocked exhaust. (**link**) While it's rare for someone to be killed accidentally, lower levels can cause serious harm over time. (**link**) London has recently been making headlines in the study of urban pollution due to it's position as one of the most polluted cities in Europe. This is partly caused by the fact that 2/3 of the autos are emitting illegal levels of carbon dioxide. (**link**)

"The most common source of carbon monoxide exposure is motor vehicle exhaust. 77% of the nationwide CO emissions are from transportation sources."

Centre for Environmental Mgmt. & Control

Benzene

Not many people are aware of Benzene which is a short-lived toxic gas found in car exhaust and 2nd hand smoke. (**link**) It's a well-established carcinogen and even in small amounts it can irritate the skin and eyes. Samples show that it's found at higher levels inside of a car then in samples taken elsewhere in a neighbourhood. (**link**) In fact, the highest levels are found at gas stations and refineries. Thankfully, the U.S. EPA has finally taken steps to tighten restrictions on the levels allowed into the air. (**link**)

Hydrogen Sulfide

Hydrogen Sulfide is caused by the continuously increasing population of livestock being bred by ranchers. It's mainly produced when animal waste is concentrated in giant **waste lagoons** as a result of factory farming. Hydrogen sulfide is harmful, even at low levels, and causes damage to the nervous system and respiratory system. The gas is mainly concentrated at the source, however elevated levels have been found among the homes of people living downwind from factory farms. (**link**)

> "Factory farm workers routinely inhale hazardous levels of particulate matter as well as ammonia and hydrogen sulfide gases. Individually, each of these components is capable of causing severe health complications; however, it is their collective effect that is most harmful…."
>
> ***The Food Empowerment Project***

Ozone

If you grew up in a dense city (like I did) you learned early about smog alerts. **Ozone**, which is one component of smog, is considered the most widespread air pollutant in urban environments. It's created by traffic, power plants, and industry. Breathing high amounts causes a wide range of health problems. (**link**) According to the American Lung Association, nearly half of the U.S. population (147 million people) lives in counties with unhealthy air quality. (**link**) The U.S. EPA estimates that reducing ground level ozone by 10 parts-per-billion could prevent 1700-5000 premature deaths per year as well as reducing childhood asthma. (**link**)

Image from SpaceBalls by Mel Brooks

Nitrogen Dioxide

It's easy to confuse Nitrogen Dioxide with Nitrous oxide. However 'nitro' (sometimes called 'laughing gas) is only a mild toxin and unlikely to be deadly. Nitrogen Dioxide, on the other hand, causes severe harm to the lungs. (**link**)

Caused mainly by burning gasoline, this colourless gas is more dangerous than anything found in cigarettes. It can also bond with other elements in the air to form particulate matter (see below). What makes this element so scary is that the numbers for how much pollution is being produced by the world's cars is wildly understated. (**link**) The recent news around Volkswagen's pollution rigging has only shined a spotlight on a **long existing scandal.** Throughout Northern Europe, residents are waking up to the severe dangers which are caused by auto exhaust. (**link**)

> "These days you can't see pollution, you can't smell it or taste it, so you'd be forgiven for thinking there was no pollution – but there certainly is.."
>
> **Duncan Mounsor - Enviro Technology Services**

Particulate Matter

Particulate matter (PM) is microscopic pollution produced by not only road exhaust, but also by industry, and factory farms. As the amount of small particles in the air rises, even from low levels, there is a direct link to damage to the lungs, heart and circulatory system. Many people exposed run an increased risk of cardiovascular harm and lung cancer. For others, symptoms for existing diseases like bronchitis and asthma become dangerously severe. People living in areas with high concentrations of particulate matter are believed to have a greatly reduced life expectancy. (**link**)

© Chris Madden

Children endure the highest risk because their lungs are still developing, which contributes to a host of breathing problems later in life. City residents who live closer to high traffic areas are found to have poor concentration, and less reliable memory recall then people living in cleaner air. (**link**) This may be connected to studies showing that people who breathe in more of this pollution tend to have brains that 'age faster.' (**link**) (**link**) The risk from these pollutants has caused France to enact **tough laws** limiting the number of cars entering Paris in order to reduce the damage from pollution.

> “[children who grow up breathing polluted air] scored more poorly on intelligence tests and were more prone to depression, anxiety and attention problems….children born to mothers living within 1,000 feet of a major road or freeway in Los Angeles, San Francisco or Sacramento were twice as likely to have autism, independent of gender, ethnicity and education level.”
>
> *Epidemiologist **Heather Volk** at USC’s Keck School of Medicine)*

Comparison to Second Hand Smoke

© Andy Singer

According to the **Center for Disease Control,** “All cigarettes are harmful, and all exposure to tobacco smoke causes damage within the body. There is no safe level of exposure to tobacco smoke.” However most of the same chemicals from second-hand smoke are also given off by autos and agriculture. According to **The National Cancer Institute,** there are at least 69 cancer-causing gases in cigarette smoke including several listed specifically on their website. As you can see from the table below, eight of the 12 chemicals listed are also found either in car exhaust or near livestock farms. This ties in perfectly with **research** proving that car companies have been using the same deceptive tactics to retain customers as cigarette companies have. The good news is that reducing or eliminating animal products from our diet can help our bodies **reverse** the negative effects caused by pollution.

Chemical	Where it’s found	Level of danger	Source
Arsenic	agricultural pesticide	medium	link
Benzene	auto exhaust	large	link
Butadiene	auto exhaust	large	link
Cadmium	animal feed	medium	link
	oil refineries/exhaust	medium	link
Ethyl oxide	auto exhaust/antifreeze	small	link
Vinyl Chloride	auto upholstery	small	link
Benoapyrene	charbroiled meat	medium	link
Tuluene	gasoline	large	link

Other pollutants known to contribute to cancer in humans include:

- Bis (2-ethylhexyl)phthalate
- Acetaldehyde
- Carbon tetrachloride
- Ethylene dichloride
- Hexachlorobenzene
- Hydrazine
- Methylene chloride
- Naphthalene
- O-tuluidine

Driving on Fumes

I have heard many people actually use pollution to justify the use of their automobile as protection from both the noise and the smell of roadways in the belief that the car's shell will keep them safe. While there are some limited benefits (such as being able to escape a polluted area quickly), more often then not the environment inside of a car is actually more harmful. Data from several studies point out that the high concentration of pollutants, especially when starting an engine and idling does extensive harm to the body. (**link**) (**link**)

In one **New Zealand study,** it was found that drivers are exposed to 60% more Carbon Monoxide then cyclists. Meanwhile definitive research has shown that the physical exercise from traveling by bicycle far outweighs the danger from inhaled pollution (read more **here**). As this and **other studies** show, the more people choose active transportation, the less pollution will be thrown into the air, and the **better we can all breathe.**

> "When people view highways as rivers of toxic air.... rather than as simply regional polluters, resistance to road projects and demand for protection from existing highways will dramatically increase."
>
> ***Bill Adams***

I included this section for you, dear reader, to point out that there are more issues facing us then just greenhouse gases. Are the effects of greenhouse gases less harmful or more harmful then the pollution in our cities? To those who suffer the effects of these pollutants, they are *both* hugely important. What I encourage you to take away from this essay, is that making choices which cause less impact benefits everyone. Not just you yourself, but your children, your parents, your friends, your spouse...everyone wins with less pollution and healthier lifestyle choices. This is what makes me feel great about enjoying both a car-free lifestyle *and* a vegan diet.

Air Pollution - citations

1. Chelsea Harvey, "Scientists say Air Pollution Causes More than 3 Million Deaths Each Year Around the World" The Washington Post 09/16/2015

2. Bill Adams, "What is a Safe Distance to Live or Work Near High Auto Emission Roads?" San Diego UrbDeZine 05/28/2015

3. Caiazzo F., Ashok A., Waitz I. A., Yim S. H. L., Barrett S. R. H., "Air Pollution and Early Deaths in the United States. Part 1: Quantifying the Impact of Major Sectors in 2005" Atmospheric Environment V.79 Nov. 2013 Pg.198-208

4. 'Criteria Air Pollutant Descriptions' Scorecard by GoodGuide

5. 'Public Health Statement for Carbon Monoxide' Agency for Toxic Substances & Disease Registry CAS# 630-08-0 June 2012

6. Jon LeSage, "Traffic Pollution Exposure Linked to Autism in Young Children" AutoBlog 11/28/2012

7. Susanna Rustin, "Car Fumes are Killing Us. So Why Isn't Anyone telling Us Not to Drive?" The Guardian 02/04/2016

8. Ucheje O., Agbazue V. E., "Health Implication of Vehicular Emissions to Traffic Wardens and Road Side Business Operators in Port Harcourt City" Scholars Research Library 2014 pg.68

9. ibid. pg.2

10. "Air Quality Guidelines for Europe" World Health Organization - European Regional Office No. 91 2nd Edition 2000 pg.62

11. "Community and Environmental Groups Herald Improvements in New Oil Refinery Pollution Standards" EarthJustice 09/29/2015

12. Wikipedia - Hydrogen Sulfide

13. Doss H. J., McLeod W., Person H. L., "Beware of Manure Pit Hazards" National Agriculture Safety Database - Michigan State Univ. Extension

14. Wing S., Horton R. A., Rose K. M., "Air Pollution from Industrial Swine Operators and Blood Pressure of Neighboring Residents" Environmental Health Perspectives quoted in Guidry V. T. Hessler W., "Pig Farm Pollution Linked to higher Blood Pressure" Environmental Health News

15. "Factory Farm Workers" Food Empowerment Project

16. "Area Designations for 1997 and 2008 Ground Level Ozone Standards" U.S. EPA factsheet

17. "Ground Level Ozone" Ministry of the Environment and Climate Change factsheet

18. Jeff Spross, "Half the Country Lives with Unsafe Air Pollution, American Lung Association Finds" Climate Progress 04/30/2014

19. Wikipedia - Air Pollution mortality

20. "Nitrogen Dioxidee - Health" U.S. EPA factsheet

21. Franco et. al. "Real-World Exhaust Emissions from Modern Diesel Cars" International Council on Clean Transportation 10/11/2014

22. "Mind the Gap 2015: Closing the Chasm Between Test and Real-World Car CO2 Emissions" Transport & Environment 09/28/2015

23. Damian Carrington, "The Truth About London's Air Pollution" The Guardian 02/05/2016

24. "Particulate Matter - Little Things can Cause Big Problems" Hamilton County Environmental Services

25. Dockery et. al. "An Association Between Air Pollution and Mortality in Six U.S. Cities" New England Journal of Medicine PMID: 8179653 12/09/1993

26. Robert L. Holtz, "The Hidden Toll of Traffic Jams" The Wall Street Journal 11/08/2011

27. Aaron Reuben, "Does Air Pollution Cause Dementia?" Mother Jones July/August 2015

28. Samantha Michaels, "Study: Air Pollution May Make Your Brain Age Faster" Mother Jones 06/24/2015

29. John Lichfield, "French Government Launches New Law Allowing it to Ban Half the Private Cars in Paris" The Independent 03/22/2015

30. Ellin Kavanagh, "Study Points to Environmental Factors of Autism" USCNews - University of Southern California 12/17/2010

31. "Highlights: Scientific Review of Findings Regarding Cancer" Center for Disease Control

32. "Secondhand Smoke and Cancer" Cancer.gov factsheet

33. Douglas M. J., Watkins S. J., Gorman D. R., Higgins, M., "Are Cars the New Tobacco?" Journal of Public Health Oxford University 2011 Vol.33, No.2 Pg.160-169

34. Betty Hallock, "So Here's the Bad News About Meat and Cheese" LA Times 03/05/2014

35. Robert Preidt, "Pollution Exposure Peaks at Stop Lights, Study Finds" HealthDay.com 02/12/2015

36. Rojas-Rueda et. al. "The Health Risks and Benefits of Cycling in Urban Environments Compared with Car Use: Health Impact Assessment Study" British Medical Journal BMJ 2011;343:d5306

37. Kingham S., Pattinson W., Shrestha K., "Determination of Personal Exposure to Traffic Pollution While Travelling by Different Modes" New Zealand Transport Agency Research Report 457 2011 p.21

38. Hartog et. al., "Do the Health Benefits of Cycling Outweigh the Risks?" Environmental Health Perspectives 08/2010 118(8): 1109-1116

39. Børrestad et. al., "Experiences from a Randomised, Controlled Trial on Cycling to School: Does Cycling Increase Cardiorespiratory Fitness?" Scandinavian Journal of Public Health 05/2012 V.40 #40

40. Jonathan Maus, "Study: Separated Bikeways Mean Better Air Quality for Bikers, Walkers" BikePortland 10/28/2010

41. Paul Koberstein, "The Air We Breathe: Dangerous Contaminants Found Hovering Over the City" Portland Tribune 03/01/2016

42. Bill Adams, "The Little Known Pollutant That Could Finally Reprioritize Transportation Projects" Planetizen 02/04/2016

Image Credits

1. ‘Try Holding your Breath While you Count Your Money’ source unknown
2. ‘Bane Pollution’ produced by the author
3. ‘No Bullsh*t’ produced by the author
4. ‘Perri-Air’ screenshot from SpaceBalls by Mel Brooks
5. ‘Breathing Tree’ Chris Madden pending permission
6. ‘Fart Pollution’ created by Andy Singer used with permission
7. ‘Meat is the New Tobacco’ produced by Physicians for Responsible Medicine edited by the author
8. ‘Gas Mask Driver’ stock photo

Some Good News

There is good news in all of this gloom and doom. The key here is to understand that *knowledge is power.* It's not that we see different things then those who are unaware of these issues.... But once we understand the reality of these issues on a deep level, we simply see the same things differently.

> "It's not that we see different things, it's that we begin to see the same things.... differently."
>
> ***Dr. Melanie Joy***

We begin to understand that the decisions to choose 'the easy way' or follow mainstream society run counter to our true feelings of compassion, respect, and connection with our living world. The idea of treating the natural world as a 'resource to be exploited' no longer feels conscientious. This isn't a feeling that most people understand on the surface, but it exists within each of us on a deeper level, and it reduces our sense of self-respect.

Photo by Jonathan Maus of Bikeportland

The power of the human mind is now demonstrating to us that we can use our great talents for the benefit of all, rather then just for the sake of making a buck. But instead of sharing news about hybrid cars, nuclear power, or other forms of greenwashing....I'm going to share with you the REAL solutions which have the greatest potential to help us live in harmony. (psst, and they're either cheap or free).

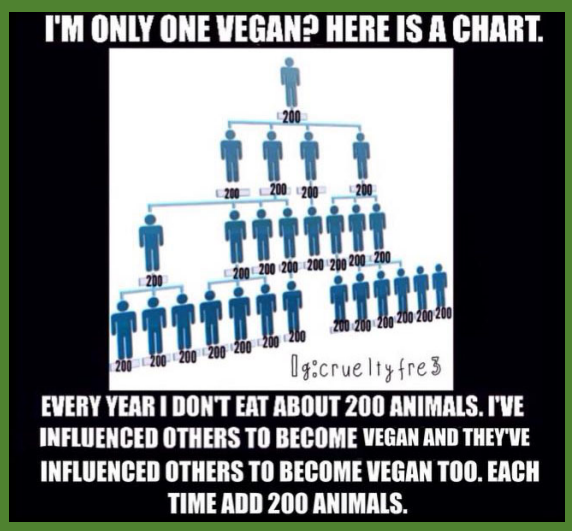
I've been amazed at the level of genius which has been showing up on the internet in recent times. People young and old, from all over the world, are coming up with awesome solutions to our current shared global crisis.

- **William Kamkwamba** was a 15 year old boy from Malawi who became famous for building a wind turbine from scrap parts to provide electricity to his village.
- In 1979, **Jadav Payeng** started growing bamboo on a parched island near Bangalore. He devoted 30 years to the project and has now built a dense forest covering over 550 hectares (1300 acres). Of course most of us aren't going to spend that much time, but groups like **Friends of Trees** can help you find ways to plant trees around the neighbourhood.
- **Food not Bombs** is an international group of people who take food that would otherwise be
- discarded, and turn it into meals that they serve to the public for free.
- Lauren Singer decided in 2011 to cut out the wasteful production of trash from her life. Since then she's not contributed a single piece of trash. Read more about her story **here.**
- A lot of smart people have figured out how to build their own solar panel for super cheap. **Here** is an instructables on how.
- Want to heat your house for free? No I'm not selling anything. But there is a thing, called passive solar heat. It's actually super easy to make a solar heater out of soda cans. You can look up 'pop can solar heater' on youtube, but here's the **quickest way** that I've found.
- Composting is a great way to turn food waste into healthy soil. If you don't have a yard or a lot of space, a worm bin is an easy way to do compost right under the kitchen sink. **This woman** shows you how.

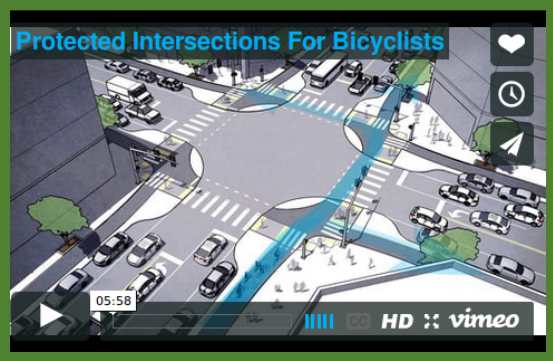
Notice, these ideas don't involve spending a week's paycheck at the store.

If you think food has to have meat in it to taste good, just remember this. Weed, tobacco, beer, and whiskey are all made from plants.

Beyond taking steps like this in our own life, we can share the understanding and be a positive influence for change with other people. Popular films like **'Forks over Knives'** and **'Cowspiracy'** (which is on Netflix) are wonderful tools to help us raise awareness for animal-free diets. Influential public figures like **sports heroes, politicians, actors and actresses** are embracing veganism and using their positions to be positive role-models. As the picture here shows, each one of us that makes a change causes friends, coworkers, and family to re-think their own choices and consider the benefits of compassionate lives.



When I was younger, most people viewed cycling as just a **'weekend warrior'** fringe. Advertisements reinforce this by promoting 'Lance Armstrong' stereotypes. But now brilliant people all over the world are showing how to move human-powered transportation into the realm of everyday trips. Not only just for lightweight errands, but even larger grocery trips and urban adventures.



Protected Intersections For Bicyclists
by **Nick Falbo.**

- Clarence Eckerson Jr. & **Streetfilms** have created a huge library of videos showing the value of great cycling spaces
- Ciclovias or Sunday Parkways, inspired by former mayor **Enrique Penalosa,** have helped people experience how wonderfully peaceful and quiet carfree spaces can be. Partly due to this, Paris recently pushed the **whole city center** to go carfree for one day.
- Hundreds of brilliant people are making bikes that don't just carry people, but **groceries, pets, furniture,** or even a **bicycle powered mobile building**


Metrofiets

Good News - credits

Image Credits

1. ‘Nothing is Impossible’ photo of Emily Finch by Jonathan Maus edited by the author
2. ‘Vegan Chart’ Elizabeth earthling @crueltyfreeland
3. ‘Protected Intersection’ screenshot of video by Nick Falbo
4. ‘Cargo Bike Wedding’ MetroFiets

Water

Beyond just human health. Our lifestyle choices can cause damage to another major shared resource. The oceans and waterways of the world that we depend on. Having safe water systems is an important element not only for our own health, but for all of the plants and animals.

Fishing

The 20th century has seen enormous technological advances in food production and harvesting which have resulted in ever larger numbers of animals being raised, hunted, and fished. Overfishing for example is at a crisis point with 70% of the world's fish species either fully exploited or depleted. (link) (link) (link)

The sad truth is that not only is an ocean food source destructive to the populations of animals being consumed, it's also sadly devastating to thousands of other species. For example the populations of predatory fish which depend on the smaller fish being caught in nets, or predatory fish who's food is taken onto fishing boats, end up struggling for food themselves. Ironically, for large commercial fishermen only 1/5 of the animals caught are actually sold, with the rest discarded as 'bykill. (link)

On top of the actively used nets, there are thousands of nets which escape from fisherman only to continue killing fish on the ocean floor. The Suzuki foundation offers programs to encourage volunteer divers to remove these escaped nets before they can harm marine life.

I talk to people about the need to stop eating seafood, and what's the response I get? - abalone!

For many people the suggested solution is aquaculture (fish farms). These days, the United States imports 60% of it's fish and shellfish. Aquaculture is regularly advertised as the answer to both of the above problems. However raising fish in concentrated areas causes overloading of the ecosystem. This means that there is too much of a demand on the resources like oxygen that the fish need. When overloading happens, the area becomes "spent." What was once thriving habitat for native species becomes unlivable. In Brazil, for example, so many areas have been overloaded that some operations have had to shut down. You can read more about the issue here.

© Alex Hallatt

Water Pollution

Water pollution as well is a major issue with both fossil fuels and animal agriculture. Given that 1% of the trillions of gallons of water on the planet is fresh and available to us, the effects are all the more frightening.

When people think of ocean pollution, they think of major oil spills like the Exxon Valdez or the BP explosion. This is only the surface of a much deeper issue however. The fact is that pollution of our waterways occurs in many different forms every day. The enormous profits secured by the world's major petroleum company's has given them the financial resources to finance brilliant PR departments. These employees are highly skilled at downplaying the effects or even outright blocking oil spills from the news. Thankfully the internet provides us with the tools to discover information which would never be broadcast on nightly news.

For example, the big news oil spills like the Exxon Valdez spill (estimated at 11-38 million gallons) don't even make the list of the 10 largest oil spills in modern history. Within a year or two, the media attention on these devastating events becomes lost in the background.

So should our efforts be spent on reigning in the power of the big oil companies and pushing for

more effective cleanup? Of course that would be a worthy cause. However what will undoubtedly surprise you is that these large oil spills make up less then 10 percent of the oil that humans leak into our oceans and waterways (**link**).

The largest source of pollution is that little black stain on most people's driveways. Oil which sits on pavement or in the storage tanks of gas stations will inevitably get washed into the nearest waterway by rain.

Every year oily road runoff from a city of 5 million could add up to as much pollution as one large tanker spill. (**link**) (**link**).

Given that a single litre of motor oil can pollute 1 million litres (1 gallon can pollute 1 million gallons) of water, (**link**) it's all the more important to use as little of the substance as possible.

It's not just petroleum that gets transported from our roads to our waterways. Car tires flake off bits of debris throughout their lifetime. These include toxic chemicals like styrene-butadiene which leaches into the oceans. (**link**)

On the other side of the equation, the enormous amount of animal waste produced [mainly] by factory farms and the fertilizers used for growing cattle feed result in gigantic **algae blooms** along river deltas. The 'red tide' that results has been linked with severe birth defects in humans (**link**) and with low oxygen-levels in the water. Tyson foods, one of the largest meat product producers releases **more toxic pollution** into North American waterways then even companies like ExxonMobil.

Water Consumption

The last point that I would like to share with you here is water consumption. The ever more frequent droughts around the world are threatening the lives and safety of thousands of people. Yet at the same time millions of gallons of water are used in oil exploration and for animal agriculture. This makes it difficult for small farmers to keep growing the food that we need to stay alive.

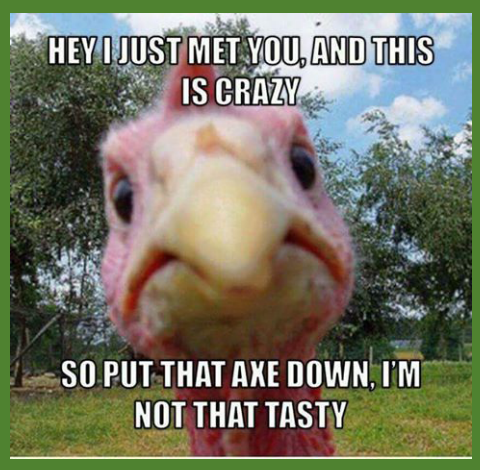
In the U.S. roughly **2 billion gallons** of water per year are used to raise domestic animals for food.

The original UN report states that water use for animal agriculture "includes slaughtering, meat and milk processing, and leather tanning, all of which have a very high water usage and a high wastewater generation." *The estimated water consumption for animal products is roughly 1/3 of all global water used to produce food.* (**link**)

Fossil fuels on the other hand, use water mainly for drilling and fracking. It's impossible to tell how much is used, because the companies simply **refuse to tell us.**

> "True story: My buddy & I were in our boat, fishing, when a flock of geese flew off the pond right at us. I yelled, "Duck!" He sat upright and said, "No, those are geese." And got hit in the head by one."

So despite the massive amount of damage that oil pollution does to waterways, I believe it can be conclusively argued that raising animals for food causes more damage to the drinkable water supply. (**link**) If all of this sounds like ...um...a lot to digest, the LA Times produced a very **clever infographic** to help clear things up.



Water - citations

1. "Overfishing: A Threat to Marine Biodiversity" 10 Stories the World Should Hear More About UN News Center

2. "Overfishing" factsheet Young People's Trust for the Environment

3. Robert Krulwich, "Big Fish Stories Getting Littler" RadioLab 02/05/2014

4. Michael Wines, "Fish Nets Found to Kill Large Numbers of Birds" New York Times 06/12/2013

5. "Learning to Catch with Care" Monterey Bay Aquarium Seafood Watch

6. Peter Mieras, "Volunteers Help Find Old Fishing Nets" Suzuki Foundation

7. Jeff Matthews, "Ahousaht First Nation Warriors Win B.C. Salmon Farm Standoff" The Huffington Post 09/24/2015

8. Susan Krashinsky, "Oil Companies Seek to Rebrand with Friendly Campaigns" The Globe and Mail 07/16/2015

9. Marybeth Holleman, "After 25 Years, Exxon Valdez Oil Spill Hasn't Ended" CNN 03/25/2014

10. "10 Largest Oil Spills in History" The Telegraph 10/07/2011 quoted from Popular Mechanics

11. John Farrington, Judy McDowell, "Mixing Oil and Water" Oceanus Magazine Vol.43 No.1 11/2004

12. "Oil Pollution" excerpt from "Ocean Planet" a 1995 Smithsonian Institution exhibit

13. Christine Dell'Amore, Christina Nunez, "3 Surprising Sources of Oil Pollution in the Ocean" National Geographic 03/25/2014

14. Clean Water Education Partnership - factsheet

15. Bob Hirshon, "Road Rubber" Science Update

16. David Biello, "Fertilizer Runoff Overwhelms Streams and Rivers--Creating Vast 'Dead Zones'" Scientific American 03/14/2008

17. "Pollution from Giant Livestock Farms Threatens Public Health" Natural Resources Defense Council - factsheet

18. Natasha Geiling, "This Meat Company Dumps More Pollution into Waterways Each Year Than ExxonMobil" ThinkProgress 02/08/2016

19. "Livestock Water Use" U.S. Geological Survey - factsheet

20. Gerbens-Leenes P.W. et. al., "The Water Footprint of Poultry, Pork and Beef: A Comparative Study in Different Countries and Production Systems" Water Resources and Industry 03-04/2013

21. Mike Gaworecki, "California Oilfield Operators Refuse to Report Water Usage, In Violation of the Law" Desmog 08/21/2015

22. Jeff Burnside, "Nitrates, Fecal Coliform from Dairies Linked to Tainted Shellfish, Tap Water" KomoNews 11/20/2014

23. Kyle Kim, "From Steak to Mangoes, Here are Some Water-Hogging Foods" LATimes 04/08/2015

Image Credits

1. ‘Weaponize Dolphins’ source unknown
2. ‘Whale Rescue’ screenshot from Michael Fishbach’s encounter with a whale entangled in fishing nets
3. ‘Fish Farm Pollution’ created by Alex Hallatt, used with permission
4. ‘Batman Iceberg’ source unknown
5. ‘BP Billboard’ created by the author
6. ‘Skipping Through Oil Puddles’ photo of Joel Rebik Eagleton
7. ‘Can Vegetarians Eat Animal Crackers’ source unknown
8. ‘Water Use for Beef’ image by VeganStreet.com
9. ‘I Just Met You, This is Crazy’ source unknown

Back to the Land

Land consumption is another troubling issue, since it removes space that would otherwise be left as untouched wildlife. The damage is more pronounced for 'free range' livestock then conventional because the latter are housed in more 'efficient' [crowded] conditions.

In the U.S. 788 million acres of land are used for grazing livestock. Additionally about **200 million acres** are used for animal feed. In South America, 70% of formerly native forests are being clearcut in order to provide grazing land for cattle. Trees are felled at an incredible rate to satisfy the growing market for animal meat.

> "Imagine if trees gave off wifi signals, we would be planting so many trees...and we'd probably save the planet. Too bad they only produce the oxygen that we breathe."

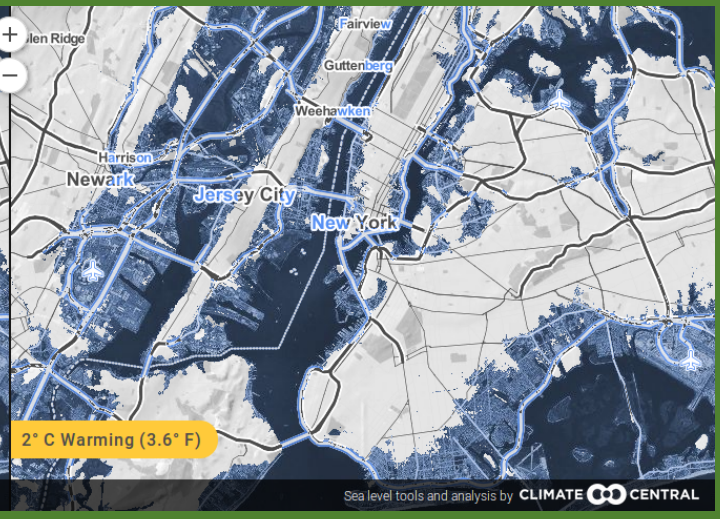
Transportation as well has a similarly massive impact on the health of our land. In the United States, 158,000 square km. (61,000 sq. mi.) of land is devoted to roads and parking lots. This results in paved areas consuming between 30% and 60% of the total land surface in North American cities. (**link**) However the cumulative effects of what is called the **'road-effect zone'** are much greater. Noise and pollution spread quite far from the road, as far as 1 1/2 miles farther. Harvard researcher Richard Forman estimates that 1/5 of all land in the U.S. is ecologically impacted by roads. This impact includes human health, animal migration, and water movement. (**link**)

This high demand for space means that other users get squeezed out. With such large swaths of land being negatively affected, it's easy to see why so many environmental groups are pushing for more **'roadless areas.'**

Outa' Space

But why is it, that we devote so much physical space to transportation? The reason is partly due to the size of the cars themselves and partly the result of travel speed. A traveling car creates a large space around it (mainly in front) that would be dangerous for anyone else to use. This space can be 1000 sq. ft. for a car traveling in town to several thousand square feet for a car on the highway. (**link**) This means that the average car, traveling at highway speed can consume as much space as a small house! (**link**)

Of course, if our climate crisis continues with business as usual, there will be less land available for either highways *OR* livestock.



Back to the Land - citations

1. George Wuerthner, "The Truth About Land Use in the United States" WesternWatersheds.org Vol.9 No.2 Summer 2002

2. Dr. Jean-Paul Rodrigue, "Transportation and the Urban Form" The Geography of Transport Systems - excerpt

3. Forman R. T. T. (2000), "Estimate of the Area Affected Ecologically by the Road System in the United States" Conservation Biology 14: 31-35. doi: 10.1046/j.1523-1739.2000.99299.x

4. Raymond Watts, "Roadless Space" The Encyclopedia of Earth 05/20/2014

5. "Roadless Area Conservation" Center for Biological Diversity - factsheet

6. Todd Litman, "The Selfish Automobile" Planetizen 10/25/2010

7. Todd Litman, "Evaluating Active Transport Benefits and Costs" Victoria Transport Policy Inst. 12/10/2015 pg.33 Table 9

Image Credits

1. 'Livestock Consume 30% of Earth's Landmass' image by Culinary Schools

2. "Pave Paradise' created by the author

3. screenshot from 'Your Way on the Highway' by the Sightline Institute

4. 'Highway Space Consumed' created by the author

5. 'New York Underwater' screenshot from Climate Central

Cost

Whether the country that you live in is more wealthy or less, the choice to follow a typical western lifestyle bears a large number of hidden costs which are rarely understood by the average person.

Beyond just dangers from dirty air, both animal agriculture and driving cause an enormous financial drain. In this chapter we'll look at the main areas where these costs show up starting with the 'real' cost of driving.

- Car payments, fuel, and repairs
- Insurance
- Congestion
- Cost of crashes
- Building and repairing roads and bridges
- Land use

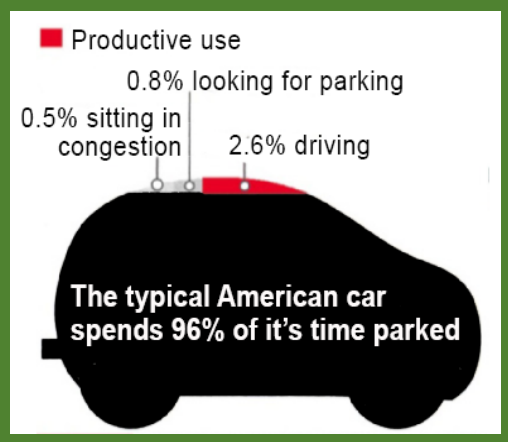
Sadly, the cost of owning, maintaining a car, insurance, gas, and others are a burden that's upsetting to everyone. In the U.S. the dollar cost of traveling by car is usually tagged at 50 cents per mile. But what many people don't know, is that the costs are much more then this in real terms.

	Average Car	Electric Car	van/pickup	carpool pass.	bus	Bicycle	Walk
Ownership-operation	$0.466	$0.614	$0.627	$0.004	$6.930	$0.092	$0.053
Travel Time	$0.288	$0.288	$0.288	$0.225	$0.438	$0.438	$1.250
parking	$0.230	$0.230	$0.230	$0.000	$0.000	$0.013	$0.000
crashes	$0.138	$0.138	$0.138	$0.083	$0.268	$0.086	$0.086
land use	$0.117	$0.117	$0.117	$0.000	$0.034	$0.002	$0.002
health benefits	$0.000	$0.000	$0.000	$0.000	$0.000	-$0.190	-$0.480
pollution	$0.131	$0.055	$0.188	$0.002	$0.397	$0.001	$0.000
other	$0.102	$0.066	$0.116	$0.001	$0.356	$0.003	$0.002
Totals	***$1.472***	***$1.508***	***$1.704***	***$0.315***	***$8.423***	***$0.445***	***$0.913***

Cost of travel per mile - derived from data by **VTPI**

Most drivers don't realize that the dollar cost of commuting is only a small part of the picture. The personal cost of owning a car dwarfs all other choices even before looking at tax subsidies. On top of the regular cost of maintenance, congestion puts an additional burden. A **report by AAA** estimates the national cost of sitting in traffic at nearly $1 trillion overall or $800 per year per person. Even the **Wall Street Journal** has begun to address the high cost of auto-centric cities as a losing venture.

'Free' Parking

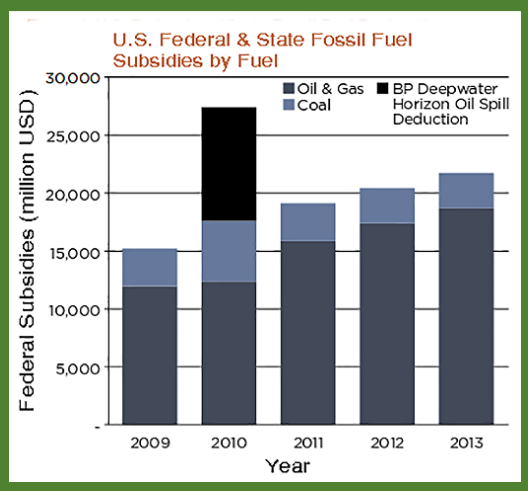


Among the many hidden costs of driving is the cost of storing the vehicle when it's not being used. According to researcher Donald Shoup, the cost of parking spaces ranges from $4000 for a curbside spot to $40,000 per space in a parking structure. He further wages that the total cost of parking in the U.S. exceeds the value of all the country's vehicles and perhaps the roads as well. (**link**) Think about it this way, when you go to the store, there is no cost for parking. Yet the store owners had to pay for that lot to be built, and the land cannot be used for anything else. The cost of that parking is slipped in to every item that we buy. This despite the 40,000 square km (15,400 sq. mi.) of land devoted to parking. (**link**)

'Accidents'

All of this is dwarfed by the gigantic cost of fixing the damage from car crashes (often labelled **'accidents'**). According to the Federal Highway Administration, a single fatal car crash carries a $6,000,000 price tag. AAA estimates that car crashes in the U.S. weighed in at $300 billion for 2009. (**link**) It's interesting to realize that when people ride bicycles or walk, there is almost no need for additional traffic signs, signals and other safety features. This adds to the dramatic cost savings for non-motorized travel.

> *"Have you noticed that anyone driving slower then you is an idiot, while anyone driving faster is a maniac?"*



In 2008 the United States spent $181 billion to build and maintain roadways. (**link**) But looking even further, there is a vast amount of wealth given to petroleum companies in the form of tax breaks. Here is a list of what the oil companies get just in the United States alone. (**link**) Worldwide, these costs average $5,300,000,000,000 or $10 per minute for every human being on the planet. (**link**)

At every level - personal, state and national, the cost of roadway maintenance, expansion, enforcement, replacement of damaged infrastructure, and safety upgrades are a huge expenditure. (**link**) Most drivers in the U.S. have no idea how this could be since they assume drivers are paying more to use the roads then they get back in services. (**link**) Unfortunately for them, the opposite is true. The U.S. is the one country where drivers pay a whole lot LESS. This means less city funds are available for schools, libraries, parks, and other public needs. (**link**)

Not Seeing the Forest for the Street

"Car drivers don't window-shop."

So with all of these well documented costs and consequences, why do we continue to see parking lots and roadway expansion? That is a highly complex question which I will touch on superficially. The simplest overarching answer is to consider that politicians and planners, the people who have the most influence on society's transport choices rarely walk or ride a bike. These public servants are heavily influenced by business owners which have a surprising disconnect regarding which people create the most profit. A group of **12 studies** from around the world prove that contrary to the beliefs of merchants, the group which spends the most at local businesses are people who travelled by bicycle. According to **this study** for Travel Oregon, bicycle tourists contributed $400 million to their state's economy.

It's easy to see how the enormous savings from bicycle travel would end up being spent on local businesses rather then on fuel and auto repairs.

The High Cost of a Poor Diet

I have not found studies focusing specifically on the cost of a western diet, and so I share with you the cost of the most common diseases *associated* with a western diet - heart disease, osteoporosis, and cancer. It is my personal belief that a number of other diseases are caused or worsened by a eating animal products. There's more on that in the next section, but the financial impact is less definitive then for the 'big three.'

Heart disease in the U.S. costs $444 billion and *accounts for 1/6 of all spending on medical care* (**link**). A single heart bypass procedure can cost $100,000 (USD)

Cancer risk is more evenly spread around the globe and affects western and non-western countries alike. The best estimate for cost is a 2008 study showing $895 billion lost worldwide due to cancer. (**link**)

Osteoporosis, which is closely tied to the **nutrition imbalances** of dairy can actually have a higher economic impact then most cancers. For the regions where information is available, I found that the cost of osteoporosis on us directly or to society is **€37 billion** in Europe and **$22 billion** in the U.S. Heart disease, *does* most heavily affect smokers and/or people who eat meat, and osteoporosis is closely linked to diet as well. Cancer, on the other hand, is linked not only to diet but to pollution, toxic elements like asbestos, and aluminium.

© Dan Piraro

I cover more on this in the next section.

> *"It is no coincidence that the same diet that helps prevent or cure diabetes also causes effortless weight loss, lowers cholesterol and triglycerides, cleans out the arteries, and returns the body to excellent function. But no matter how much research appears saying the same thing over and over again, the tide is unlikely to change because of the economic incentives for the medical establishment of continued illness and profitable treatments."*
>
> *Dr. John McDougall*

On top of these enormous costs, the cost of our increasingly destructive weather due to climate change has been, thus far, overlooked. As I mentioned previously, each ton of CO^2 equivalent causes $220 in economic damage. This affects the cost of living, the cost of goods, and even the cost of repairing the damage. (**link**) (**link**)

So if you think that 'hippy food' is too expensive, or that cities shouldn't spend tax dollars on bike lanes, consider how much worse off we would be if *nobody* was taking action.

Cost - citations

1. Todd Litman, "Transportation Cost Analysis Spreadsheet" Victoria Transport Policy Institute 2007 edited by the author

2. Michael Green, "AAA Study Finds Costs Associated with Traffic Crashes are More than Three Times Greater than Congestion Costs" AAA Newsroom 11/03/2011

3. Laura Kusisto, "The Cost of Sprawl: More Than $1 Trillion Per Year, New Report Says" Wall Street Journal 03/19/2015

4. Donald Shoup, "The High Cost of Free Parking" introduction

5. Chester M., Horvath A., Madanat S., "Parking Infrastructure: Energy, Emissions, and Automobile Life-Cycle Environmental Accounting" Environmental Research Letters Vol.5. No.3 07/29/2010

6. Lorraine Sommerfeld, "Why there's no such thing as a car 'accident'" Driving.ca 04/04/2016

7. Cambridge Systematics, Inc. "Crashes vs. Congestion - What's the Cost to Society" prepared for AAA Nov. 2011 pg.ES2

8. U.S. Dept. of Transportation – Federal Highway Administration Office of Highway Policy Information - factsheet March 2010

9. Makhijani et. al. "Cashing in On All of the Above: U.S. Fossil Fuel Production Subsidies Under Obama" Oil Change International July 2014 pg.17

10. Damian Carrington "Fossil Fuels Subsidised by $10m a Minute, Says IMF" The Guardian 05/18/2015

11. Gössling S., Choi A. S., "Transport Transitions in Copenhagen: Comparing the Cost of Cars and Bicycles" Ecological Economics Vol.113 May 2015 pg.106-113

12. Eric Jaffe, "Debunking the Myth That Only Drivers Pay for Roads" CityLab 05/13/2015

13. David Thompson, "Suburban Sprawl: Exposing Hidden Costs, Identifying Innovations" Sustainable Prosperity Oct. 2013 pg.5

14. Eric Jaffe "The Complete Business Case for Converting Street Parking Into Bike Lanes" CityLab 03/13/2015

15. Jonathan Maus, "'Scenic Bikeways' Help Power Oregon Bike Tourism to $400 Million Annual Impact" BikePortland 05/09/2013

16. R. Morgan Griffin, "Heart Disease: What are the Medical Costs?" WebMD 2011

17. "The Global Economic Cost of Cancer" LiveStrong & The American Cancer Society

18. "Health Concerns About Dairy Products" Physicians Committee for Responsible Medicine

19. International Osteoporosis Foundation - factsheet

20. Blume S. W., Curtis J.R., "Medical Costs of Osteoporosis in the Elderly Medicare Population" Osteoporosis International 1835-44 doi: 10.1007/s00198-010-1419-7 06/22/2011

21. Laura Seaman, "Stanford researchers' calculations reveal higher-than-expected global economic cost of climate change" Stanford News 10/21/2015

22. Mike Shreiner, "Climate Change is Nature's Tax on Everything" Huffington Post 02/29/2016

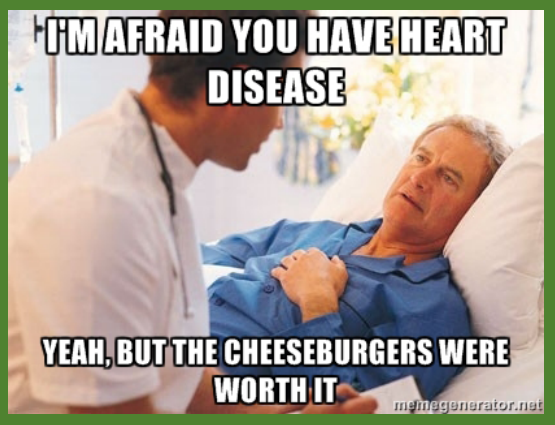
Image Credits

1. ‘Money Car’ stock image edited by the author
2. “Missed Your Turn’ source unknown
3. ‘Waste in Fuel, Cars, and Roads’ Heck and Rogers “Resource Revolution: How to Capture the Biggest Business Opportunity in a Century” 2014
4. ‘Sure We Can’ source unknown
5. ‘Subsidies Graph’ Makhijani et. al. “Cashing in On All of the Above: U.S. Fossil Fuel Production Subsidies Under Obama” Oil Change International July 2014 pg.7

‘Cost to Society - image produced by Discourse Media with data by George Poulos

6. ‘Heart Attack pays for Vacation’ created by Dan Piraro used with permission

Physical Health



While the cost of medical expenses in western countries creates a huge burden, those costs pale in comparison to the ultimate cost - life itself. Knowing that these deadly diseases are completely preventable makes the situation all the more sorrowful. Despite the perception that the diseases common to western culture are 'genetic' the question you should ask yourself is...why do they seem concentrated not in people with similar genetics, but similar lifestyles? Hundreds of scientific studies around the world link unhealthy lifestyle choices like consumption of animal products with disease. (**link**) (**link**) (**link**) Yet strangely, doctors and medical experts rarely tell us about healthy nutrition. This is because, like carfree lifestyles, there is less profit in *preventing* sickness. We've all heard commercials telling us to 'ask your doctor if 'X' drug is right for you.' How many of us though, have heard a commercial applauding the medical benefits of lentils? Sadly, the medical doctors and experts that we trust to learn about health, actually have **next to zero** required coursework in nutritional health. It's therefore up to us to understand this relationship, with the help of people like Dr. Michael Greger.

> "A doctor a day keeps the apple away."

Heart disease

As I mentioned in the previous section, a huge number of the most harmful diseases are linked with animal products. According to the World Health Organization, roughly 17 million people around the world are killed each year by heart disease. (**link**) This makes it the leading cause of death in developing countries for middle-age and older adults. Despite enormous time and effort into studying the disease, most professionals ignore the connection to lifestyle and assume that these diseases are genetic. The simplest rebuttal to this is to look at studies of groups who have immigrated from areas with healthy diets and adopted western lifestyles. These people consistently experience degraded health and energy levels as their diet becomes filled with sugar, meat, and cholesterol. This is described as 'dietary acculturation.' (**link**)

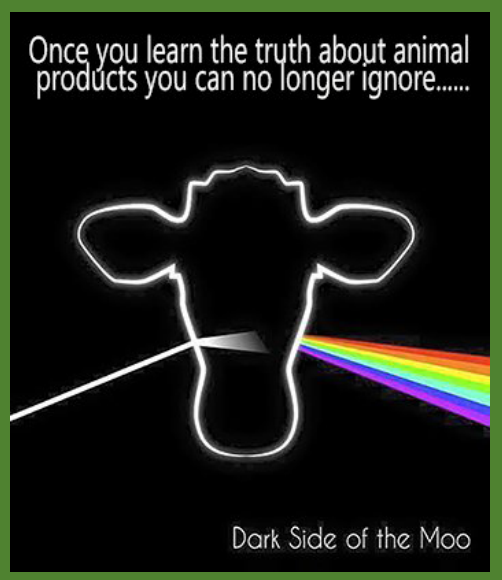
Cancer

The second disease most connected with lifestyle choices is cancer. There is by now a very clear link between many types of cancer and a person's diet. (**link**) According to the **World Cancer Research Fund**, "about a third of the most common cancers can be prevented through diet, maintaining a healthy weight and regular physical activity." The evidence links lifestyle and diet with prostate, breast, stomach and colon, colorectal, and pancreatic cancer. (**link**)
On the other hand, it's important to remember that the single most deadly form of cancer is lung cancer which is caused by industrial pollution, cigarettes, and the burning of fossil fuels. (**link**)

To add another layer, several studies have linked traffic noise and stress with **heart attacks,** and **circulatory disease.** There is a very large body of evidence linking the pollution from traffic-filled roads with cancer in both **children** and **adults.** This brings up one of the main reasons for this site. While some of you might eat a vegan diet, and others might be car-light or (hopefully) car-free, only a very small number are both. I hope that this information will help you to see the value in both choices.

> "Nothing will benefit human health and increase chances for survival of life on Earth as much as the evolution to a vegetarian diet."
>
> ***Albert Einstein***

Other Diseases

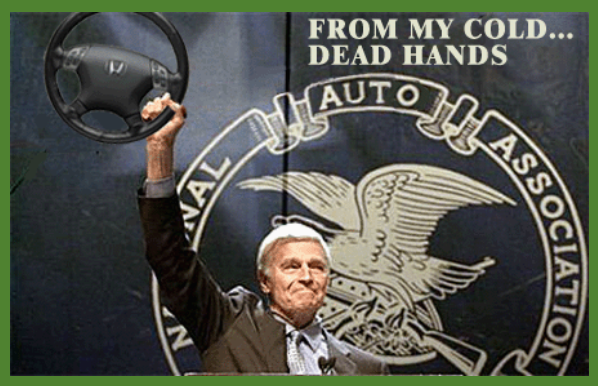


Beyond the most common lifestyle diseases, there are also a host of other diseases such as **Stroke, Multiple Sclerosis, Diabetes, Arthritis,** Parkinsons Disease, and **Alzheimer's Disease** which have different amounts of evidence connecting them with diet. Vegetarians too, should be wary of the data coming in on animal products. Many of the same health problems can be caused (to a lesser degree) by eggs and dairy. **Osteoporosis** and poor bone health are linked to higher consumption of milk (which I covered in the previous section). Meanwhile, activist Emily Barwick created an **in-depth video** describing the horrific health consequences of the egg industry. Additionally, **this article** offers an unbiased view on how dairy affects our health.

There's some disagreement in the research as to whether animal products are the main cause or just a contributing factor. This depends on which disease, how much meat is consumed relative to whole grains, and the amount of exercise a person gets. What IS clear, is that ever increasing numbers of health professionals are speaking out about the benefits of a meat-free diet as part of a longer and more healthy life

Reckless driving is illegal.....but wreck-less driving is good

CARnage



In addition to the damage caused by diet, car transportation takes it's toll as well. Worldwide roughly 1 million people are killed in car crashes per year, and in the United States roughly **35,000 people are killed,** making it the highest cause of death for people aged 35 and under (by contrast firearms killed 33,600). The World Health Organization states that internationally, **"tens of millions of people are injured or disabled on the roads each year."** It's with blatant irony therefore, that I hear people regularly speak of the fear they have with traveling outside of a car. This belief is partly due to a number of issues including social pressure, poor awareness, and a heavily biased transportation system.

So why is it that so few people take steps to reduce this horrific CARnage? Well the answer to that is quite simple - it's always the other person's fault.

As humans we tend to see ourselves as more skilled then the average person without any outside proof. One study found that 673 out of 909 motorists believed that they were better than the average driver. (**link**)

But obviously we can't *ALL* be better then average. So what allows people to have such a contradictory view? Well the answer turns out to be pretty comlex. You can read the **full study** or the more abridged article **here**.

To put it briefly, there's no universal definition for a 'good driver.' Some think that being able to balance a phone conversation with traffic makes them 'good' while others might conveniently forget their own speeding only to focus on someone else's.

Ironically, of the people who I've spoken with, the minority who are most aware of the huge responsibility to be careful are those who regularly travel by bicycle. In my own experience, the vulnerability of traveling without a reinforced steel safety cage teaches us to be more attentive and avoid **distractions.**

In addition, **this study** from the university of Copenhagen found that the physical activity associated with bicycle transportation reduces a person's chance of death by 40%.

Other Hazards

Beyond the direct health costs involved in driving every day, are the enormous costs borne by the people who obtain the resources in the first place. Conditions at oil rigs in the Midwest of the U.S. have recently exposed a long-running human-rights disaster there. The blatant disregard for safety and ecological risk is nothing new, as activists abroad have long known. (**link**) (**link**) What *IS* new, is that westerners are starting to see **pictures** and **video** of the atrocities. Exploitation is no longer limited to Nigeria and Columbia, it's happening everywhere.

In the vegan community I hear a strong outcry not only against animal agriculture, but to the **many other ways** in which animal are harmed. Every year scientists kill an estimated 100 million lab animals for **'research'** and **hunters** kill 200 million game animals. However even I was surprised to learn that drivers kill nearly 400 million animals per year on the road. (**link**)

So, while it's clear that the meat industry is the highest cause of *intentional* harm to animals, America's motorists are the largest cause of purposeless harm.

Physical Health - citations

1. Chiuve et. al., "Primary Prevention of Stroke by Healthy Lifestyle" Circulation 08/26/2008 118(9):947-54. doi: 10.1161/CirculationHA.108.781062

2. Yusuf et. al, "Effect of Potentially modifiable risk Factor Associated with Myocardial Infarction in 52 Countries (the INTERHEART Study): Case-Control Study" Lancet 09/11/2004 17;364(9438):937-52

3. Ornish et. al., "Intensive Lifestyle Changes for Reversal of Coronary Heart Disease" LIfestyle Heart Trial - Journal of the American Medical Assoc. 12/16/1998 Vol.280 No.23

4. Dr. Pauline W. Chen, "Teaching Doctors about Nutrition and Diet" New York Times 09/16/2010

5. "International Cardiovascular Disease Statistics" American Heart Association - factsheet

6. Lesser I A., Gasevic D., Lear S. A., "The Association Between Acculturation and Dietary Patterns of South Asian Immigrants" PLoS One 2014 9(2): e88495

7. Boivin et. al. "Antiproliferative and Antiodxidant Activities of Common Vegetables: A Comparative Study" Food Chemistry 01/15/2009 Vol.112 Issue 2 pg.374-380

8. "Link Between Lifestyle & Cancer Risk" World Cancer Research Fund Int. - factsheet

9. Charles Bankhead, "Diet and Cancer: Less Red Meat, More Fruit" MedPage Today 06/10/2014

10. "Worldwide Cancer Mortality Statistics" Cancer Research UK - factsheet

11. "Can Noisy Traffic Trigger a Heart Attack?" National Health Services UK 06/25/2012

12. Kim Painter, "Your Health: Air Pollution Affects Brain, Heart, Blood Vessels" USA Today 08/09/2010

13. Justin Caba, "Living Near Traffic Pollution Increases Risk of Cancer in Children" Medical Daily 04/10/2013

14. Lewis Macdonald, "Traffic Pollution Raises Risk of Cancer, Study Says" Eltis 10/27/2014

15. Michael Greger M.D. "Preventing Strokes with Diet" NutritionFacts.org Vol.11 12/20/2012

16. "The Dairy Connection" Overcoming Multiple Sclorosis - factsheet

17. Hope Warshaw RDN, "Should You Go Vegetarian? The Benefits of a Plant-Based Diet for People with Diabetes" DiabeticLivingOnline.com 2014

18. "Foods and Arthritis" Physicians Committee for Responsible Medicine - factsheet

19. Kovacic J.C., Fuster V., "Atherosclerotic Risk Factors, Vascular Cognitive Impairment, and Alzheimers Disease" Mt. Sinai Journal of Medicine Nov-Dec 2012 PMID: 23239205

20. Abby Phillip, "Study: Milk May Not be Very Good for Bones or The Body" The Washington Post 10/31/2014

21. Emily Barwick, "The Great Egg Conspiracy: Lies, Corruption, & Kevin Bacon" Bite Sized Vegan

22. David Katz, "Is Dairy Healthy or Not?" U.S. News & World Report 11/30/2012

23. "Car Crash Fatality Statistics" Statistic Brain Research Inst. - factsheet

24. "Road Traffic Injuries" World Health Organization - factsheet

25. Williams AF, "Views of US Drivers about Driving Safety" Journal of Safety Research 2003;34(5):491-4

26. M. Roy and M. Liersch, "I Am a Better Driver Than You Think: Examining Self-Enhancement for Driving Ability" Journal of Applied Psychology 08/01/2013 43(8): 10.1111/jasp.12117

27. "When It Comes To Driving, Most People Think Their Skills are Above Average" Association for Psychological Science 08/28/2014

28. David Booth, "New Study Shows that Hands-free Technology in the Car isn't the Great Solution to Distracted Driving We all Thought it'd Be" Driving.ca 11/07/2014

29. "What's Your Driving Personality? Survey Says Americans Identify With Their Cars" Road & Travel Magazine summarizing "You Are What You Drive" survey by RoperASW for Allstate Insurance

30. Anderson et. al., "All-Cause Mortality Associated With Physical Activity During Leisure Time, Work, Sports, and Cycling to Work" Arch Internal Medicine Vol.160 06/12/2000

31. Remember Saro-Wiwa

32. Meg White, "In 'Crude' Exploitation of Ecuador's Amazon, Chevron-Texaco Leaves a Toxic, Deadly Legacy" Buzz

33. Caroline Cox, "Study Documents Air Pollution Risks from Fracking" Center for Environmental Health

34. "Do Sheep Need to Be Shorn?" VeganPeace - factsheet

35. "Questions and Answers About Biomedical Research" Humane Society 09/16/2013

36. "Hunting" Orange County People for Animals - factsheet

37. Mark Matthew Braunstein, "Driving Animals to Their Graves" Culture Change

Image Credits

1. 'The Cheeseburgers Were Worth It' created by the author
2. "Vegan is Good for Your Heart' created by VeganStreet.com
3. 'Eat Bacon and Eggs Instead of Veggies?' created by the author
4. 'Dark Side of the Moo' source unknown
5. 'Company Interested Only in the Results' screenshot from "The Daily Show" John Oliver
6. 'Nature's Little Speedbumps' DribbleGlass.com

Emotional Health

Mental trauma is another sadly unexpected result of western lifestyles. Not surprisingly, emotional stress is closely linked with the damaging lifestyle choices which we will examine below.

These days, driving drunk is almost scarier then walking sober.

"A Gallup-Healthways Well-Being Index, which surveyed Americans about daily commutes and their effects, discovered a virtual horror show. They found that the longer the commute, the higher the levels of one's obesity, cholesterol, pain, fatigue and anxiety." (**link**) In addition, the stress from long commute times has been tied to road rage, substance abuse, and even **higher divorce rates.**

> "Driving is emotionally challenging because unexpected things happen constantly..... The rules of engagement on the road are harsh and competitive, even hostile. Most drivers find these conditions emotionally challenging and experience difficulty coping. Therefore, most people routinely drive in an emotionally impaired state."
>
> ***Dr. Leon James & Dr. Diane Nahl***

Some researchers are even looking at the dependency cars in the same light as other addictive habits. The consulting firm **Steer Davies Gleave** is using a method called 'Motivational Interviewing' to help people re-examine transportation choices (**link**) Meanwhile, **Chris Bruntlett** brilliantly examines how drivers' reaction to the consequences of their choice mimics that of smokers.

On a similar note, journalist Kathy Freston writes here about helping people let go of their addiction to animal products and to replace harmful habits with more healthy ones. According to Dr. Neal Barnard, 'our taste cells turn over about every three weeks....in less then a month we forget the attraction to animal products." (WPD80)

Noise Pollution

> "Music of commute:
> Sonata for horn and brakes
> eat your heart out Brahms"
>
> ***Erin Roll***

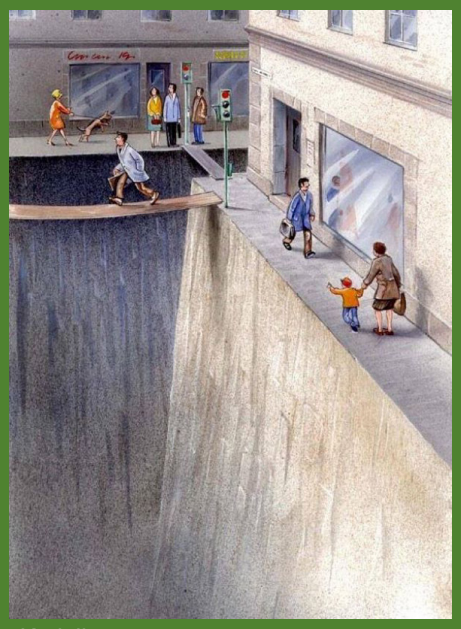
Noise pollution is a highly overlooked stressor that harms both human and non-human health. (link) (link) Ironically it was the noise and pollution of the inner cities that caused people to flee and to createsuburbs in the first place. A report by the World Health Organization says that noise pollution from roadways are second only to air pollution in it's harm to human health. As a result, most of us try to tune out city noise with headphones or other devices causing people to lose connection with their surroundings.

Imagine if your daily commute sounded like this Amsterdam street?

Active Learning

Aside from noise, car travel and pollution have a striking effect on the developing minds of children. One study found that children who are driven to school have a more difficult time understanding their neighbourhood and have a poor sense of direction. Another found that children who walk or cycle to school have better concentration and advance more in school. (link) (link)

One example of the emotional conflict that I personally see every day, is the obvious culture of fear that exists between sidewalks. Most of us every day see pedestrians jogging or running across the street (even if there are no cars nearby). This is considered a normal, everyday occurrence.



Karl Jirg

What most drivers fail to notice (as they speed past) is that the person tends to go back to walking once they reach the bike lane or sidewalk. There is a very clear sense that the road does not belong to people, but to cars. **This wasn't always the case** though. Before the 1920s, people saw nothing unusual in walking in or across the street wherever it was convenient. Business interests at the time had a **well-documented** role in demonizing the use of the road by non-drivers.

> "Personal choice should not involve victims."
>
> *Mary Mallozzi*

Loving Dogs and Eating Pigs

The emotional effects connected to a meat-based diet are more subconscious. As children growing up, our natural tendency is to care for animals and to develop emotional bonds with human as well as non-human creatures. Because of this, people in western society are subjected to hundreds of messages to convince us that it's only acceptable to experience these emotions with dogs and cats but not for dozens of other creatures. **Dr. Melanie Joy** expresses these points with great success in her **book** and the TED talk which I've linked to here.

Speaking of vegans looking much younger, Dr. Joy claims to be 47

Other wonderful sources are John Robbins, author of **'Diet for a New World,'** and Dr. Will Tuttle author of **'The World Peace Diet.'**

Riane Eisler further explains that the culture we live in is built around domination of animals and 'resources.' It requires a deadening of 'soft emotions' like compassion which would interfere with acts such as confinement and branding. (**WPD20**)

What you might find surprisingly missing from this site (and if you're vegan already, then you've surely noticed), are the horrific images of mutilated cows and pigs, or baby chicks being ground up. My belief is that you can find that if you want to. But many people have learned the hard way, that shock images tend to create barriers rather then break them down. I ask you simply to consider this:

Cook as if your food could look you in the eye

"If it's not good enough for your eyes, why is it good enough for your stomach?"

Emily, **Bite Sized Vegan**

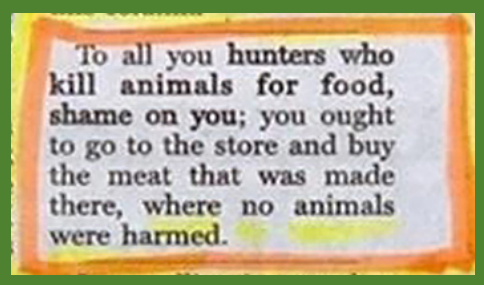
Compassionate people (and I think that all of us have a sense of compassion) will fall back on the defence that using animal products which are 'free range,' **'cage free,'** or 'grass fed' have no harmful consequences and that makes such products a 'humane' alternative. Unfortunately, my research tells a different story. The ranchers who market these alternative food sources may try their best, but the impacts have many of the same harmful consequences as factory farms.

One Green Planet describes the most important ones (some of which are also touched on below). You can read a more detailed description of cattle's effects on the wild-lands **here.**

> "Animals are beings to be respected rather then commodities to be exploited."
>
> ***Dr. Will Tuttle***

Broccoli Slaughterhouse

One area that most people are not aware of, is the effects on the workers at factory farms. (**link**) The suffering from meat consumption is heavily concentrated on those who are actually slaughtering the animals. Concentrated is a very appropriate term as the distancing of us all from the slaughterhouse causes a very small number of people to experience the terror experienced by millions of animals.



As humans, we are uncomfortable with seeing images of animal slaughter and that is a good sign. It shows that "we are not predators. Predators don't empathize with their prey." It shows that we are compassionate beings. Think about it this way, which would you feel more comfortable taking a child to, a broccoli harvest, or a slaughterhouse. If you feel horrified by images of a slaughterhouse but not from images

of people picking from fruit trees, then this is a powerful clue into what your body naturally wants.

However this essay touches you, I ask only that you take a moment each day to consider the billions of conscious animals which are killed for the sake of the human diet, and think about whether you want to support that in your life.

> “It will come as no surprise that the consequences of such emotional dissonance [in slaughterhouse workers] includes domestic violence, social withdrawal, drug and alcohol abuse, and severe anxiety. As slaughterhouse workers are increasingly being treated for post-traumatic stress disorder, researchers are finally starting to systematically explore the results of killing sentient animals for a living.”
>
> ***Occupy for Animals***

Part and parcel with the stress of killing regularly are the ‘accidents’ which are way too common in slaughterhouses. According to the Bureau of Labor Statistics, meatpacking is the nation’s most dangerous job. (**link**) In 1999, more than one-quarter of U.S. meatpacking workers suffered a job-related injury or illness. The meatpacking industry not only has the highest injury rate, but also has by far the highest rate of serious injury - more than five times the national average, as measured in lost workdays. If you accept the official figures, about 40,000 meatpacking workers are injured on the job every year (the industry regularly minimizes these figures). (**link**)

What is Solastalgia?

Lastly, the issue of our current climate catastrophe itself is causing many people to feel hopeless, depressed, and apathetic. (**link**). The emotional pain which people feel is only recently becoming connected with lifestyle choices and climate. The effects of unstable weather, scarce resources, and other effects of climate change are weighing more heavily on our collective sense of security and hope. Researchers **Helen Berry** and James Williams have spent years researching depression and anxiety in Australia where climate fears have been felt

© Mike Lynch

since the term ‘ozone hole’ first entered the public’s eye. (link) Through the work of Dr. Berry and other researchers, the awareness of depression and solastalgia stemming from a more hostile climate are finally becoming more fully understood.

> “Those battling pre-traumatic stress have accepted the truth about climate change, but rather than turning to a coping mechanism like denial, they have soldiered on, and they have paid for it with grief, sadness, and worry.”
>
> Dr. Lise Van Susteren

Desperately Seeking Space

One of the more obscure results of the western lifestyle is the disappearance of wild areas. Once again, both animal agriculture and automobiles contribute to this state of affairs. As covered above, the vast swaths of land used for the sake of western lifestyle choices means that very little is left to provide for the health of wild animals and the emotional health of people. The critical link between our emotional health and access to natural areas has been well proven by dozens of studies. (link) (link)

I remember clearly as a teenager living in Los Angeles and struggling to get out to a natural area. I would ride my bike for most of the day (as much as 50 miles out) and still not end up leaving the ‘developed’ part of the city. Suburbia consumed nearly every square mile of land beyond the city center.

Emotional Health - citations

1. Chris Taylor, "Your Commute is Costing You More Than You Realize" Reuters 05/27/2014
2. "Divorce Study Shows That Couples With Longer Commutes are More Likely to Divorce" Huffington Post 08/13/2013
3. James L., Nahl D., "Aggressive Driving is Emotionally Impaired Driving" Dr. Driving
4. "Breaking the Driving Addiction" Steer Davies Gleave 06/10/2010
5. Eric Jaffe, "A Therapy Created to Treat Addiction is Being Used to Reduce Car Reliance" CityLab 06/23/2014
6. Chris Bruntlett, "Driving is the New Smoking" Hush Magazine 09/10/2013
7. Kathy Freston, "How to Kick Your Meat Addiction" Huffington Post 08/04/2011
8. Dr. William Tuttle, 'World Peace Diet' pg.80
9. "Noise Pollution" EverthingConnects.org - factsheet
10. Christopher Intagliata, "Road Noise Takes a Toll on Migrating Birds" Scientific American 09/01/2015
11. "Scientists Find Noise Pollution Affects Both Animal and Plant Life" Indian Country Today Media Network 03/21/2012
12. "Traffic Noise Health Impacts Second Only to Air Pollution, New WHO Report Says" Transport and Environment 03/30/2011
13. Ian Sample, "Noise Pollution is Making us Oblivious to the Sound of Nature, says Researcher" The Guardian 02/16/2015
14. Sarah Goodyear, "Kids Who Get Driven Everywhere Don't Know Where They're Going" CityLab 05/07/2012
15. Anna Hodgekiss, "On Your Bike! Children Driven to School are Slower Learners Than Those Who Walk or Cycle" The Daily Mail 11/26/2012
16. Sarah Goodyear, "The Link Between Kids Who Walk or Bike to School and Concentration" CityLab 02/05/2013
17. Joseph Stromberg, "The Forgotten History of How Automakers Invented the Crime of Jaywalking" Vox.com 11/04/2015
18. Dr. Will Tuttle, "The World Peace Diet" pg.20
19. Gregory Barber, "Are Cage-Free Eggs All They're Cracked Up to Be?" MotherJones 02/10/2016
20. Patti Nyman, "Grazing Cattle: The New 'Invasive Species'" One Green Planet 09/04/2014
21. "The Waste of the West - The Ecological Consequences of Public Lands Livestock Grazing" NPLGC - factsheet August 2003
22. Lindsay Patton, "The Human Victims of Factory Farming" One Green Planet 02/13/2015
23. "Killing for a Living" Occupy for Animals (warning, graphic images)
24. Eric Schlosser, "The Chain Never Stops" MotherJones July/August 2001

25. "Psychology & Global Climate Change - Addressing a MultiFaceted Phenomenon and Set of Challenges" The American Psychological Association pg.52--60

26. Helen Berry, "Pearl in the Oyster: Climate Change as a Mental Health Opportunity" Australasian Psychiatry Vol.1 No.6 453-456 Dec. 2009

27. Joanne Silberner, "What is Climate Change Doing to Our Mental Health?" Grist.org 07/28/2014

28. Wikipedia - Solastalgia

29. Jeremy Deaton, "This is Your Brain on Climate Change" ThinkProgress.org 09/16/2015

30. Green Cities: Good Health - factsheet

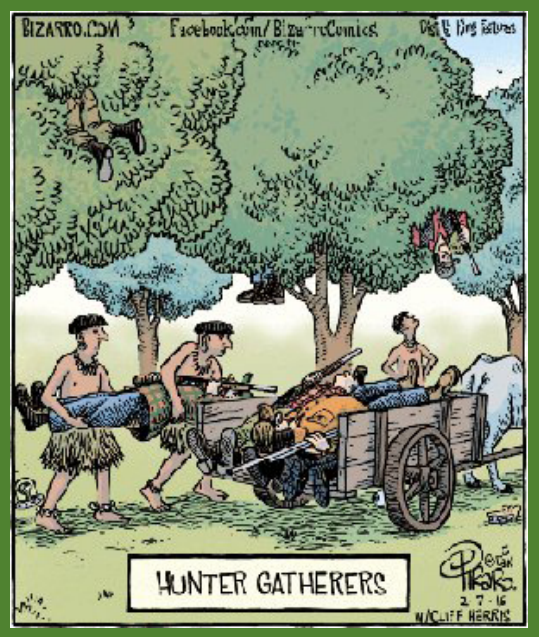
31. "The Importance of Wilderness to Spiritual and Mental Health" Wilderness - factsheet

Image Credits

1. Screenshot from 'MotorMania' by Walt Disney
2. 'Except for Anger' source unknown
3. 'Addicted to Driving' created by the author
4. 'Four Seasons in the U.S.' created by the author
5. 'Highway Sound Wall' source unknown
6. 'Historic Street' photo care of shorpy.com
7. 'Untitled' scary streetscape by Karl Jirg
8. Screenshot of Dr. Melanie Joy by the author
9. 'Google Eyed Breakfast' source unknown
10. 'Store Bought Meat -no Harm' source unknown
11. 'Laughterhouse' created by the author
12. 'Environmental Rehab' created by Mike Lynch
13. 'Four-Lane Landscape' photo by the author

Political Conflict

The last subject that we will explore is war. This is a controversial subject because every nation promotes a unique version of history designed to frame their beneficence. I will do my best to offer you, dear reader, thorough research on views which contrast with established historical beliefs.



© Dan Piraro

According to **Dr. Will Tuttle,** the entire origins of western culture were rooted in the control and domination of animals. Historical documents such as the Old Testament and the epic of **Gilgamesh** document the transition from nomadic tribes to herding cultures. As humans became more attached to the control of animals, the relationship changed from one of honouring and worshipping life - to one of seeing animals as possessions and a form of currency. This culture became more powerful through domination of other humans and eventually came to conquer all nearby cultures in Europe and the Mediterranean. (**link**)

This greed for wealth caused an evolution toward the domination of land and eventually to domination of elements consumed by humans (termed 'resources'). The resource wars eventually came to encompass not just elements used for sustenance but to precious metals and finally to fuel sources.

Nearly everyone in the world clearly understands that the recent wars between the United States and Iraq were fought in order to protect the oil supply (if you don't see the connection, then **this source** from the White House itself should provide credible evidence).

What is less well known is that for over a century, the most destructive wars that we've ever seen have been tied to oil. At the turn of the 20th century, both Britain and Germany were converting their navy from **coal to oil** fuel. Both nations were vying for control of the Iraq oil fields as a rich source of fuel (sound familiar?). Britain through the Anglo-Persian oil company (now BP) and Germany through the Berlin-Baghdad railway. It was this competition and the alliances linked to the power struggle which helped set off the first 'great war.' (**link**) In the years leading to the second World War, Hitler spent vast resources supporting Germany's **artificial oil program** since the country had no natural oil fields (Britain had put a halt to Germany's railway). It was only with the assurance of a reliable fuel source that Hitler felt confident enough to launch the first Blitzkrieg.

Meanwhile Japan decided to attack Hawaii only after the U.S. imposed an **embargo** on it's oil supply. After the attack, Japan immediately moved to control Vietnam and the Indonesian oil fields. (**link**) Unknown to most people, oil was also the cause for the only direct control of U.S. soil by Japan during the war. (**link**) After the war's conclusion, the U.S. and Britain orchestrated an overthrow of the Iranian government in order to prevent Iran's Prime Minister from reducing access to their oil supply. (**link**)

Then came Vietnam. Interestingly, there is information that Standard Oil found vast fields of petroleum off the Vietnamese coast, however the technology at the time required explosive charges to locate the fields (the same technology used by archaeologists today) which the government would not agree to. This caused the company to support a conflict. During the war, it was easy enough to use Navy ships to fire the charges. The research on this is admittedly less credible and so I encourage you to explore for yourself (research "White Horse Oil Field" "Operation Linebacker" and "Vietnam War")

In 1984 the Iran/Iraq war expanded to include shipping of oil in the Persian Gulf. This threatened western supply lines and the U.S. got involved in an embarrassing political situation. (**link**)

In the modern age, less powerful countries all over the world have suffered huge political upheavals due to this almost ubiquitous addiction to fossil fuels. (**link**). U.S. forces fighting in Afghanistan have lost one person, killed or wounded, for every 24 fuel convoys it runs. During the U.S. war in Afghanistan, hundreds and hundreds of these convoys were needed to truck fuel – to run air-conditioners and power diesel generators – to remote bases all over Afghanistan. (**link**) Since the 1890s, the political leadership of the entire Middle East region has been dictated by Britain and later the United States because of these countries' reliance on oil for heating, industry, and transportation.

If you think, dear reader, that these oil conflicts are merely a product of American-European resource grabs then I welcome you to read on here. The whole region of southeast Asia has recently been in an uproar near the Senkaku and Huangyan island chains. The conflict of course was only sparked after the **discovery of oil in the region.**

There is no question that battles over the really essential resources are being fought throughout the world. (**link**) However they often fall under the radar because there aren't expensive jet fighters and missiles involved. The huge disparities around both water and food distribution favour the countries with enough money and fuel to maintain military control. The enormous populations which are denied basic needs because of the resources given to animals inevitability causes even more world conflict.

Political Conflict - citations

1. Dr. Will Tuttle, "The World Peace Diet" Lantern Books 2005 pg.18-19
2. "The Epic of Gilgamesh" Tablet 1 SparkNotes.com
3. Riane Eisler, "The Chalice and the Blade" SibyllineOrder
4. former President George W. Bush, "Executive Order Protecting the Development Fund for Iraq and Certain Other Property in Which Iraq Has an Interest" The White House 05/22/2003
5. Jeff Reed, "Britain Vs. Germany, coal Vs. Oil & The Coming of the Great War" OIlPro.com
6. Joseph V. Micallef, "THe Berlin to Baghdad Railway and World War 1" Huffington Post 05/14/2015
7. Anthony N. Stranges, "Germany's Synthetic Fuel Industry 1927-1945" Energeia Vol.12 No.5 2001
8. Wikipedia - "Events Leading to the Attack on Pearl Harbor"
9. Daniel Yergin, "The Prize: Epic Quest for OIl, Money, and Power" PBS excerpt
10. "Forgotten History - Japanese Invasion of Alaska" Ep.5
11. Wikipedia "Iranian coup d'état"
12. "Tanker War 1984-1988" HistoryOfWar.com
13. W. Corbett Dabbs, "Oil Production and Environmental Damage" abstract Research Paper No.15 December 1996
14. Thomas L. Friedman, "The U.S.S. Prius" New York Times op-ed 12/18/2010
15. Dolores M. Bernal, "Wars and Conflicts Over Natural Resources Already Taking Place" News Junkie Post 07/16/2012
16. Ninja (translated by Marianna Olinger), "A Sea of People Fighting for Water in Sao Paulo" Ninja. Oximity.com 02/27/2015

Image Credits

1. 'Hunter Gatherers' created by Dan Piraro, used with permission
2. 'No Oil Tank, No Regrets' source unknown
3. 'Vietnam oil fields' source unknown

Conclusion

From all of these sources, it's my conclusion that a **both** a vegan lifestyle and a carfree one are essential for us to improve the health of the planet. The decision to boycott oil and the automobile has a larger effect on our health and quality of life in cities. People can choose (to some degree) whether they live near an animal slaughtering plant or not and so most people aren't regularly exposed to the pollution and carnage caused by raising and slaughtering animals. However there are very few places in the western world where the spectre of highway pollution (toxic gases, smog, or noise) aren't felt. The health of children, the level of stress in adults, and the ability of seniors to get around are all impacted by the dependence on high-speed gas powered transportation. Meanwhile the impact of an animal-based diet mainly affects the non-human beings that we share the earth with.

There's two ways that you, dear reader, can respond to this essay. One is to say 'Aw hell, everything that I do is bad for the planet. I'm just gonna get drunk.' But the other is to realize that wherever you are at, there is always an opportunity to do more. Simply deciding that you're vegan and that's enough or simply accepting that you're car-free and that's enough, is to ignore the vast potential that we all have to enjoy a happier relationship with the world. There are people who protest oil pipelines, or who grow all their own food, or build houses out of recycled materials. Anything that you can do to reduce your impact is great, and

..... you can always do more.

Thank you for taking the time to read this.