# TRANSITION STREETS

Name:

Group name:

Version April 2019

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# Transition Streets
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**To contact Transition U.S.** visit us online at www.transitionstreets.org and www.transitionus.org, email info@transitionus.org, or call 1-707-824-1554. Write to Transition U.S., PO Box 917, Sebastopol, CA 95473.

# 1. Getting started

TRANSITION STREETS

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# Transition Streets
# 1.1 INTRODUCTION

Introduction

**Welcome to Transition Streets!**

You are starting a journey to a lifestyle that's healthier for you, your family, the neighborhood and the planet. It will also save you money, keeping hard earned dollars in your pocket.

This workbook offers credible, expert advice with links back to source material used in each of its sections. There is also room in each chapter for you to make note of local resources. The workbook is designed to support you and the people you live with as you make simple, practical changes to your home and habits. Each chapter includes an opportunity for you to choose actions you will take – and when.

The support of your fellow group members, and people in other Transition Streets teams, will help keep you motivated and make the experience pleasurable as well as effective.

TRANSITION UNITED STATES

Transition Town TOTNES

Background information

Transition Streets was originally developed by Transition Town Totnes, UK, and was adapted for the U.S. by Transition U.S. and a team of topic experts:

- Jon Freise, energy futurist, and Tim Wulling, electrical engineer (energy)
- Matthew Freiberg, environmental consultant, and Linda Currie, sustainable living consultant (water)
- Diana Donlon, founder of Soil Centric (food)
- Devi Peri, education specialist at Marin Recycling (waste)
- Sandra Hamlat, sustainability policy director, East Bay Regional Park (transportation)

The 2019 version, updated and edited by Leslie MacKenzie of Transition Twin Cities, included input from Tim Wulling (energy), Dr. Michael Russelle (food), Pat Thompson (transportation), Linda Currie, Christina Bertea and Anne Sawyer (water), and Peter Foster (waste).

Transition Streets is available at no cost to Transition Initiatives (with a suggested donation of $20/download), or at a cost of $20 per download to the general public to help cover the cost of the workbook and ongoing project support. Financial support for Transition Streets came from the Transition Streets crowdfunding campaign and generous supporters. Thank you!

For more information, visit www.transitionstreets.org.

# Transition Streets
## 1.2 HOW IT WORKS

How it works

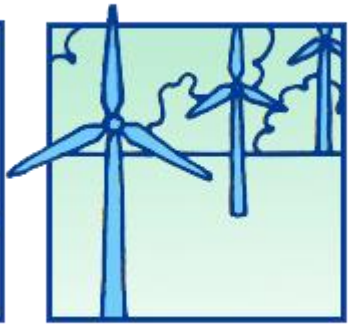
The Transition Streets program covers seven group sessions. The first session is an overview of the work, and the final session wraps up your activities. The other five chapters cover the areas of everyday life where we can most easily make a change: home energy, water, food, waste and transportation.

Usually groups meet every 2-4 weeks for 2 hours. People take turns hosting in their homes or at a church, library or community center. Group members take turns facilitating or leading sessions so that it is truly a group effort. Ideally, the host of a session is not also the facilitator/session leader.

At each of the five topic sessions, the group can follow the meeting outline suggested in the Facilitator's Guide. You can download the guide from www.transitionstreets.org.

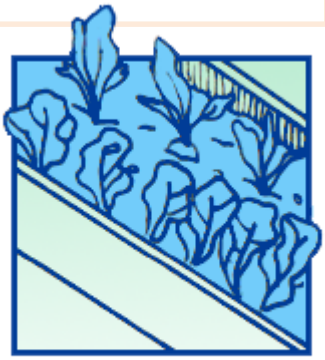
It's a good idea to nominate a timekeeper to keep you on track. There's always more to say about these topics! It's also useful to have a note-taker at each session and to keep a record of decisions. At the end of the session be sure to establish the meeting time and place for the next session. Be sure to select the leader/facilitator for the next session.

**1. Getting Started**



**2. Energy**

**3. Water**



**4. Food**

**5. Waste**

**6. Transportation**

**7. What's Next?**

# Transition Streets
## 1.3 THE FIRST SESSION

The first session

During your first session, we suggest you take a look at the rest of this workbook to familiarize yourself with the sections. In this first session, your goal is to work through the following:

- Agree to a group schedule for the rest of the sessions
- Share contact information
- Agree on guidelines to help your group work well together
- Think about your main objectives
- Complete the initial evaluation form
- Find out about other support available
- Review the agenda for future sessions

**A quick note on the cost and carbon-saving estimates**

Each action has a set of boxes at the top of the page that give an indication of the potential costs, cost-savings, level of effort and CO2 savings. These should be seen as an approximation only, useful for comparing different actions.

Quotes for potential cost savings for an action are based on average prices at the time this book was prepared. These can vary widely by location and over just a few months, so please see these as indicative rather than precise.

Some actions, particularly related to food and transportation, are difficult to estimate due to the wide range of factors involved. However, where we can, we have tried to convert actions into both CO2 and financial savings.

Notes:

# Transition Streets
# 1.4 AGREE TO A GROUP SCHEDULE

Important information

Things to decide up front (and record on the schedule below):

1. How often will your group meet?
2. Where will you meet?
3. Who will be the coordinator for each meeting? The coordinator will run the meeting and, ideally, contact everyone before the next session to confirm attendance. It's also useful to share contact details, which can be recorded on the next page.
4. Who will be the timekeeper? The note-taker?

You can go over these again at each meeting so everyone remembers their role.

| Date | Time | Coordinator | Venue |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |

Transition Streets

# 1.5 SHARE GROUP CONTACT DETAILS

| Name | Phone | Email | Address |
|---|---|---|---|
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Notes:

# Transition Streets
# 1.6 YOUR GROUP AGREEMENTS

Suggested group agreements

It is important to agree on some guidelines for how your group will work so it will be a more satisfactory experience for everyone.

These agreements are in place to support the unity and stability of the group, and to create an atmosphere of mutual support and trust. It is important that all group members collectively agree to these at your first session. You may want to revisit them from time to time, or when necessary. .

The following agreements are suggested to help ensure the overall success of your group, but feel free to edit, adapt, or add to them as your group sees fit.

**Commitment**: We commit to attend all the sessions, when possible and to let the other group members know when we cannot. Someone else can attend in our place if we cannot come, but it is important that they/this person knows what's been discussed previously. We also commit to have read the relevant workbook section before each session and to seriously consider taking some actions each time.

**Confidentiality**: We agree to respect the privacy of any personal information shared at the meetings and we agree not to discuss this information outside the group in a way that would mean a person could be identified.

**Punctuality**: We agree to arrive on time for each session and to start promptly so that everyone can benefit from the full two hours.

**Respect**: We will strive to ensure that time is shared equally between team members in terms of speaking and listening, and that differences of opinion are allowed and respected. Our abilities to change will vary, based on a variety of factors such as income or time, age or disability.

**Support**: When possible, we will offer practical and emotional support to any team member who is experiencing difficulty in attending the sessions (or achieving the actions).

Notes:

# Transition Streets
# 1.7 SUGGESTED AGENDA

## Agenda

This suggested agenda can be used at the next 5 sessions. Adjust it as needed for your group (for example, spend more time on 'The Bigger Picture' discussion topics and less on discussing the actions).

For the next session, try the proposed timing below and see how it works for your group. Given that you cannot start your action plan until after that session, the first agenda item is not needed for this first session. You will probably use this time talking about the actions.

| Section | Timing (2 hours total) |
|---|---|
| Introductions (and initial evaluation at first session) | 10 minutes |
| Review actions and progress from previous session | 10 minutes |
| Discuss the facts and actions for this session | 60 minutes |
| Write your personal action plan | 10 minutes |
| The Bigger Picture discussion | 20 minutes |
| Re-confirm next meeting (at last session, do final evaluation) | 5 minutes |

## Pre-Evaluation

When you've completed the workbook, you'll want to see the results of all your hard work. Be sure to complete the "before" section of the evaluation form included in the Facilitator Guide so you can add up the number of actions you have completed and see the results.

You'll complete an "after" section of the evaluation form when you complete the workbook, but make a copy to keep on hand because the changes you make will lead to even greater cost, carbon and water savings over time.

# Transition Streets
# 1.8 MORE SUPPORT

## Website

For additional support, please visit www.transitionstreets.org

You can also visit www.transitionstreets.org.uk to learn about Transition Streets in the UK, including general information about the program, stories from existing groups, and some frequently asked questions and answers.

## More info

This workbook has been written to help save money in the home, as well as to reduce our impact, as a community, on our natural resources and environment. The program is a local community response to the challenges of rising energy prices, climate change, and economic uncertainty.

## Effective groups workshop

There is an optional workshop offered to participants in Transition Streets groups. The **Effective Groups** workshop seeks to create and sustain healthy groups by giving you the skills to work together more effectively. This can be useful for any group you belong to. It covers the topics of group development, group dynamics, conflict resolution, leadership, decision making, running good meetings and facilitation skills.

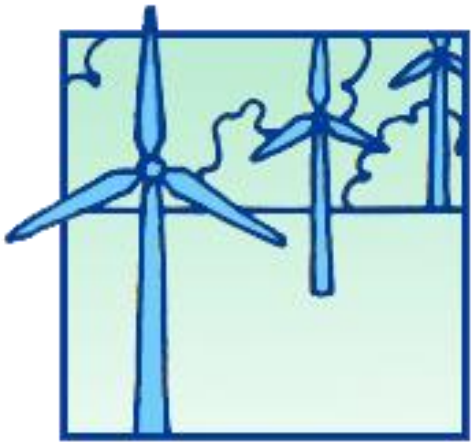

**Effective Groups** is available as a free introductory teleseminar recording, or as a two-day in-person workshop with a certified trainer.

Teleseminar recording: http://bit.ly/effectivegroups

To learn more about the Effective Groups course and how to schedule a workshop for your group, visit http://www.transitionus.org/effective-groups or contact info@transitionus.org

# 2. Energy

TRANSITION STREETS



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# Transition Streets
## 2.1 ENERGY

The Practical Action Plan

The facts

As you may have experienced, energy prices usually go up rather than down. So using less electricity, gas, or oil in your home will save you money. We can waste a lot of energy without even realizing it, but significant savings are often possible. Each action in this section of the workbook has a “Potential Savings” section that will give you an idea of the money you could save.

But it’s not just your wallet that will benefit. Using less energy will also reduce the amount of $CO_2$ emitted from fossil fuels as they are burned, either in your home’s furnace/boiler and water heater, or in a power station that generates your electricity. We all need to work on reducing our $CO_2$ emissions if we want to minimize the impacts of climate change that we are already seeing in communities across the globe. Every action we take to reduce our carbon footprint will have positive impact on you and on our planet.

Sharing information and resources, and taking carbon-cutting action with friends, neighbors, and local government will not only make our transition to a more energy-efficient future easier, it will also build stronger, more resilient communities and neighborhoods.

The Practical Action Plan

So what can you do about energy?

Each of the following actions has the potential to reduce the amount of energy your household uses. Some will cost you little or nothing; some will cost you money up front, and some of that cost can be offset by utility rebates, tax rebates, or a reduction in your energy bill.

- **Know how much energy you use** (2.3)
- **Electronics and appliances** (2.7)
- **Reduce your standby power load** (2.10)
- **See the light** (2.12)
- **Keeping it cool** (2.14)
- **Control your heat** (2.16)
- **Insulating water heater and pipes** (2.18)
- **Weather-stripping** (2.21)
- **Air sealing** (2.22)
- **Attic insulation** (2.24)
- **Wall insulation** (2.26)
- **Other energy saving options** (2.28)

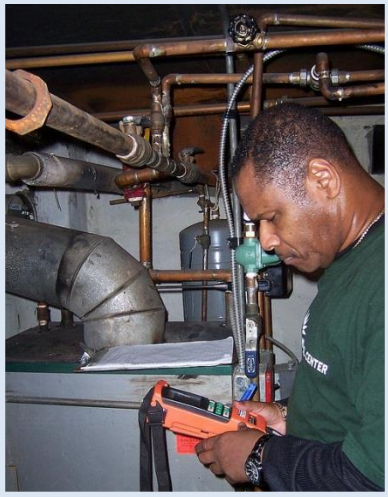


**Photo from flickr by Community Environmental Center. Licensed under Creative Commons**

In your group, have a brief discussion about each of these actions and then decide which ones you want to tackle and when. Record your personal action plan on page 2.31.

The actions listed above are the basic, but most cost-effective things you can do in your home. Section 2.28 includes several other actions you may wish to consider once you've done the basics.

For all sections the following estimates are used for…

Costs / savings (dollar savings imply related $CO_2$ savings):

| | | |
|---|---|---|
| Low | / | Less than $25 |
| Medium | / | Less than $150 |
| High | / | More than $150 |

Effort (estimates based on a 3-bedroom home):

| | |
|---|---|
| Low | Less than 2-3 hours |
| Medium | About a day |
| High | A day + |

# Transition Streets
# 2.3 KNOW HOW MUCH ENERGY YOU USE

The Practical Action Plan

**Cost: low** | **$ Savings: med** | **Effort: low** | **$CO_2$ saved: med**

## Challenge

Many people know how much money they are paying the utility company, but few people know how much energy they actually use. Frequent price changes confuse the picture, as your bill could go up even though you are using less.

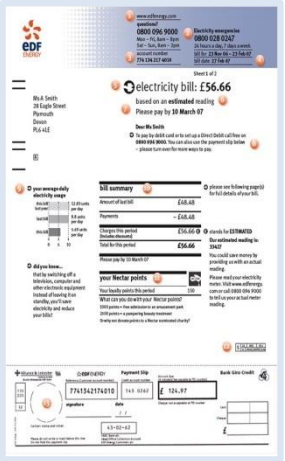
What takes more energy: heating or air conditioning? If we don't know how much energy we use, it is difficult to plan how to use less or to measure the effects of our conservation and efficiency efforts.

When you look beyond the dollars on your electricity and gas bills, you will encounter "kWh" (kilowatt-hour), which measures electric energy, and "therm" or "cu ft" (cubic foot) which measure natural gas energy. Understanding these terms is a key part of saving energy.

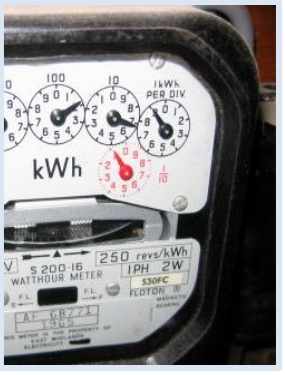
## Solution

The first step in lowering energy use is learning how much we use.

**1. Read your monthly electric and natural gas bills.** Look for how many kWh of electricity and how many therm or cu ft of natural gas were used in the month. Use this info to make month-to-month and year-to-year comparisons. You can also read your own electric and gas meter(s). Keep a record (see next page).




**2. Use an electricity monitor.** You can use a plug-in monitor to measure the energy use of one appliance at a time. You can borrow a monitor (in some communities the public library loans them), or you can buy one. You can also buy a whole-house monitor that attaches to your electric meter. Other whole-house monitors clip onto the wires from your electric meter, but if these wires are in a conduit or in a cable, you should have an electrician clip onto wires inside the fuse box or circuit breaker panel where dangerous voltages exist (see section 2.5).




**3. Compare your energy bills with your neighbors'** and share ideas for saving energy.

# Transition Streets
# 2.4 KNOW HOW MUCH ENERGY YOU USE

The Practical Action Plan

## Savings and benefits

Studies have shown that people who monitor their energy use typically see reductions of 5-10% per year ($70-$140), just by being aware of when things are on and how much each device uses.[1]

**Save $70-$140 on your electricity costs per year.**

Notes:

## Next steps, hints & tips

**How to read your gas and electric meters**

- If it's not clear how to read your meter(s), call your utility company or check their website.
- Read numbers from left to right.[2]
- Record your meter readings at the same time each day, week or month.
- Subtract the previous reading from the new one to see how many kWh, therm, or cu ft you have used (see 2.6).
- Compare it to previous periods. Consider why it may have changed. Your bill may provide a hint by telling you if temperatures were higher or lower during this period.
- Complete this online Home Energy Saver for your home: http://hes.lbl.gov/consumer to get a personalized report of potential savings. Be sure to note your "Session #" so you can return to your report.

**I can't read my meters.** Your utility bill includes your energy usage per month so you can track a month's usage on your bill. Your utility company may also provide your past usage online.

**I'm a renter.** If your energy bill is included in your rent, ask your landlord if you can see the bill from the utility company. They might be motivated to share this by the potential for energy savings, and might even want to implement some of these changes themselves. Be aware, however, that this is only possible if energy for individual units are tracked separately (with separate meters).

# 2.5 KNOW HOW MUCH ENERGY YOU USE

The Practical Action Plan

## Electricity monitors

You can buy an electricity monitor, or your library or local Transition group may have a plug-in monitor you can use. You may want to buy a monitor as a group and use it for a week each, in turn. This gives you time to find out how much each appliance, lamp and electronic device uses, and your typical daily use. Then, when you don't have the monitor, you can simply read your electric meter to see your consumption every week, or check your electric bill every month.

When you first use your electricity monitor, you'll probably wander around the house turning things on and off, and marveling at the information at your fingertips!

**Some whole house electricity monitors**:[3]

- PowerCost Monitor (about $110)
- Efergy Smart Meter (about $115)
- The Energy Detective ($300)
- Sense Energy Monitor for phone and computerized tracking ($300)

**Plug-in electricity monitor**

- Kill a Watt® (about $25)

**How do I use a plug-in monitor?** Plug the monitor into a wall outlet and plug your device into the monitor. Write down how much power each device uses when switched on and switched off. You will be able to see which devices are using energy when they are off. This is called "standby" power.

Do this for each device in your house that uses electricity. With up-to-the-minute information, you will have a much better idea of which devices are using the most energy (and generating the most $CO_2$ emissions).

**Efergy is an example of a home energy monitor.**

Transition Streets

# 2.6 KNOW HOW MUCH ENERGY YOU USE

The Practical Action Plan

## Sample meter reading record

| Date | Electricity Meter Reading | Usage |
|---|---|---|
| 8/01/2018 | 1037 | n/a |
| 8/08/2018 | 1097 | 60 |
| 8/15/2018 | 1199 | 102 |
| 8/22/2018 | 1287 | 88 |

Know how much energy you use

**Understand how to measure energy use**

Kilowatts (kW) measure electric *power* – the rate at which we use energy. Kilowatt-hours (kWh) measure electrical *energy* consumed.

Power is akin to speed, and energy is akin to distance—as we all know, the faster you go, the more quickly you cover a given distance. Similarly, the more power you use, the faster you consume a given amount of energy. So, if you use electricity at a rate of 1kW, you will have consumed 1kWh of energy after one hour. Your electricity meter measures kWh. (For older electric meters each digit on the smallest dial is one kWh.)

Standby: Approximately every 40W of electric power a device uses in standby mode (left on 24 hours a day) consumes 1kWh a day, which costs about $40-60 a year. Many houses typically use 200W on standby, or about $200-$300 a year.

Gas meters measure the volume of gas. They either measure in 100 cubic feet per step of the meter (normally called a CCF or therm), or 1,000 cubic feet. Call your gas company and ask what kind of meter you have.

To compare gas to electric usage you can convert:

100 cubic feet (one therm) = 29.3 kWh

1,000 cubic feet = 293 kWh

# Transition Streets on a Budget
## 2.7 KNOW HOW MUCH ENERGY YOU LOSE

The Practical Action Plan

**Cost: free-$500** | **$ Savings: med** | **Effort: low** | **$CO_2$ saved: med**

## Challenge

How is your home losing heating and cooling energy? Is it drafty windows? Cracks under the doors? Is heat escaping through the roof? Are sunny southern and western windows pouring in summer heat so you've got to crank up the air conditioning? When you know your problem areas, you can create a plan to fix them. That's where an **energy audit** can come in handy.

## Solutions

An audit can cost anywhere from nothing up to $500, depending on how complete the audit is and whether your utility company or local government is underwriting some or all of the cost. The most thorough energy audits will include a blower door test, an infrared camera scan of walls, ceilings and floors, and a furnace efficiency measure.

**What can you learn from an energy audit?**[4]

- Where air is leaking from your home so you can do weather-stripping and air sealing
- Where your home has hot and cold spots that can be fixed with added insulation, or storm windows or window plastic
- How efficient your furnace and AC units are and whether they are the right size for your needs

### Benefits

The biggest benefit of an energy audit is that it helps you create a plan of action for improvements to your home. You can then look for rebates, tax credits, low-interest loans and grants to help you achieve your goal.

On average, people who follow the recommendations given by their energy audit save 5-30% off their energy bills.

### Next steps, hints & tips

Call your utility company and ask about energy audit services. They may offer rebates or discount. You can also check with your local government energy office.

Before the auditor comes, pull together a year's worth of utility bills. Also, make a list of your home's problems – cold and hot spots, condensation, etc.

# Transition Streets
# 2.8 ELECTRONICS AND APPLIANCES

The Practical Action Plan

| Cost: low | $ Savings: med | Effort: low | $CO_2$ saved: med |
|---|---|---|---|

## Challenge

Modern homes are filled with appliances and electronics: fridges and freezers (often two), dishwashers and ranges, coffee makers, microwaves, printers, scanners, game systems, sound systems… the list is long. Each and every one of these appliances and electronics uses energy, often when it's not even in use!

Sadly, much of the energy efficiency gains we've seen in recent years has been cancelled out by more usage of ever more electronics and appliances.[5] A whopping 90% of homes have at least one desktop computer, laptop, tablet or smartphone; 79% have more than one. Many large homes have two refrigerators.[6]

## Solution

When trying to reduce our energy consumption for appliances and electronics, we've got several effective options that range from free to moderately costly:

- Use devices less; and use non-electric options when that makes sense
- Turn them off (and even unplug them) when not in use
- Ensure appliances are performing optimally
- Use the most energy-efficient model

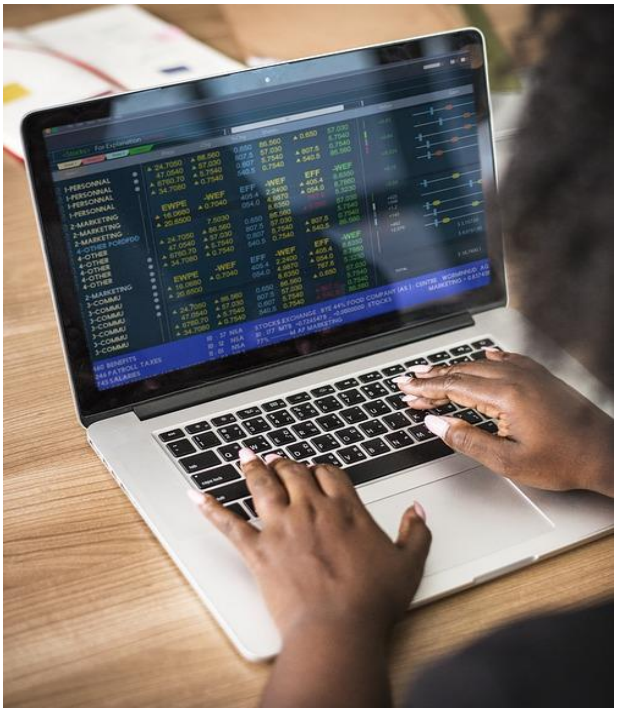
**Yes, but ... my computer has a screen saver. Isn't that saving energy?** Very likely, no, you are not saving energy. In fact, it may take more energy to use a screen saver. Your computer's power-down feature may not work if you have a screen saver activated.

# Transition Streets
# 2.9 ELECTRONICS

## Savings and benefits

ENERGY STAR® office products use about half the electricity of standard equipment, and as little as one quarter for some products. ENERGY STAR® computers use 30%-65% less energy than computers without this designation, and ENERGY STAR® monitors use 1 watt or less when off.[7]

**Saves $50 off an average electricity bill per year.**



## Next steps, hints & tips

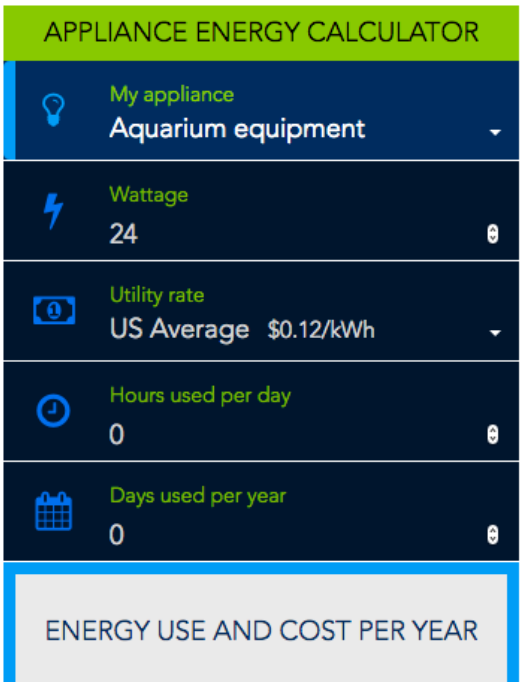
- As a general rule, turn off the monitor if you‘re going to be away from your PC for more than 20 minutes.
- Turn off the computer and monitor if you're not going to use it for more than 2 hours.
- Use a power strip to turn off your monitor, printers and other accessories every night. Some power strips also provide surge protection.
- Use rechargeable batteries. Studies have shown they are more cost effective than disposable batteries.
- If you currently use a desktop computer, consider a laptop computer the next time you buy. Laptops use much less energy.
- ENERGY STAR® monitors consume two watts or less in sleep mode and 1 watt or less when off. Follow the instructions for your particular model so your monitor automatically goes into sleep mode.
- An ENERGY STAR® TV uses 3 watts or less of power when switched off, as compared to a conventional TV, which use up to 12 watts. Replacing an old, inefficient TV saves you both money and a big carbon footprint. [8]

# Transition Streets
# 2.10 APPLIANCES

## Savings and benefits

Your savings will vary depending upon which appliances you are using and their energy efficiency. See below for a resource to estimate the efficiency of your current appliances.

**Could save $100s off an electricity bill over the life of an appliance.**




Get an energy estimate at https://www.energy.gov/energysaver/save-electricity-and-fuel/appliances-and-electronics/estimating-appliance-and-home

## Next steps, hints & tips

- Keep your range-top burners and reflectors clean. Vacuum the coils on your refrigerator. Clean the lint trap on your dryer. Proper maintenance improves performance.
- Making a small meal? Use a toaster oven to save one-third to one-half the energy.
- Better yet, learn to solar cook and use the energy of the sun.
- Switching from hot to warm water when washing clothes can cut the energy use of that load in half.
- Save money on drying clothes with an old-fashioned clothes line or drying rack. The sun and wind do the work for free with much less wear and tear on the fabric.
- When it's time to replace an appliance, always take a look at the ENERGY STAR® options. They can save you hundreds of dollars over the life of your appliance.
- Most appliances have an EnergyGuide label, which tells you about how much it will cost to operate that appliance for a year and how it compares to the most versus the least energy efficient model.[9]

Transition Streets

# 2.11 REDUCE YOUR STANDBY POWER LOAD

The Practical Action Plan

| Cost: low | $ Savings: med | Effort: low | $CO_2$ saved: med |
|---|---|---|---|

## Challenge

Leaving lights, TVs, computers and radios on when no one is in the room is an waste of money and energy. But even when we switch things off some devices go into standby mode, which can still consume a lot of energy. Even phone chargers, if left plugged in, will use a little energy, whether or not you're charging your phone.

An individual device uses relatively little standby power, but a study of California homes by the National Resource Defense Fund found that the average home had 65 devices constantly drawing power. That amounted to 23% of residential electricity use and cost an average of $165 a year.[10] Consumer electronics are responsible for half of that standby load.

An electric toothbrush, a phone charger, a DVD player, a microwave, a printer, a game console, a digital radio – if you have a lot of equipment on standby, turning them off can add up to significant savings over a year.


## Solution

Turn things off when you leave the room for more than a few minutes. Turn them off at the plug when not in use.

You can buy a "smart power strip" for as little as $25, which cuts power to all connected devices with the press of a single button. Some strips can be remote controlled.

If you need to leave lights on at night, such as an outside light, use an energy-efficient bulb.

**Yes, but ... I can't turn off my TV's set-top box.** Boxes set to record programs must be left idling around the clock, costing you up to $25 per year. Integrated digital TV sets, or more expensive models, generally use less energy on standby.

Transition Streets

# 2.12 REDUCE YOUR STANDBY POWER LOAD

The Practical Action Plan

## Savings and benefits

In a typical home, turning devices off, rather than using standby power, can save $100 off your annual electricity bill.[10]

**Saves $100 off an average electricity bill per year. Costs nothing!**

Notes:


## Next steps, hints & tips

- You can use an energy monitor to see exactly how much power each item is using when on and when in standby mode (see page 2.5).
- Buy a smart power strip to turn multiple devices off at the same time when not in use.
- Talk to everyone in your home about turning devices off. Try a friendly competition to help motivate them.
- Keep a scoreboard on the fridge for every time someone finds a light or TV on when no one is in the room.
- Motivate your kids with a share of the savings!
- Try using electricity-powered devices less often: dry clothes in the sun not the dryer, turn lights off in the daytime, only wash full loads, etc.

# Transition Streets
# 2.13 SEE THE LIGHT

The Practical Action Plan

| Cost: med | $ Savings: med | Effort: low | $CO_2$ saved: med |
|---|---|---|---|

## Challenge

A majority of the light bulbs in U.S. homes today (71%) are *STILL* inefficient incandescent bulbs, which cost much more to operate and use 90% of their energy to create heat, not light![11] Changing out your inefficient light bulbs for energy-efficient LED bulbs is the easiest, and possibly the cheapest thing you can do to see immediate savings.

## Solution

The average American home uses 50 light bulbs. Replacing incandescent bulbs in those fixtures with the most energy efficient LED light bulb will immediately save you money, and that savings continues over the lifetime of that bulb. Just take a look at the cost savings in the table below.

And what will that savings cost you? The most commonly used LED replacements for 40 and 60 watt incandescent bulbs can be purchased for $1-$2. Many local utility companies offer rebates or have partnerships with local retailers to offer LED bulbs at a discount to help you make the switch. Check your utility company website for deals.

It's worth buying reputable brands, such as Philips or GE, rather than discounted brands, which may burn out faster. Bulbs come in "warm" and "cool." A big DIY store like Home Depot or Lowes will usually have bulbs on display so you can see what the light looks like.

LED or CFL—which should you choose? CFLs are a big step up from incandescent bulbs and most homes in America have some, but if you are purchasing new bulbs, go with LEDs, which are more efficient and last two to three times longer. That saves you even more money.


IMAGE SOURCE: ENERGYSTAR.GOV

# Transition Streets
# 2.14 SEE THE LIGHT

The Practical Action Plan

## Savings and benefits

Replacing one incandescent bulb with one LED bulb can save you $6 a year in a light that's on 2-1/2 hours a day. An average home has 30 incandescent bulbs. If all were replaced, this could save up to $180 a year.[11]

**Switching out an incandescent with an LED can save up to $6 per light bulb per year.**

## Recycling bulbs

CFL bulbs contain trace amounts of mercury (less than 1/100th the amount of a mercury thermometer). If a CFL bulb breaks, refer to EPA guidelines for safe disposal: http://www2.epa.gov/cfl/cleaning-broken-cfl#instructions).

LEDs and CFLs are recyclable. Research local CFL recycling sites and share that information with your group members.

## Next steps, hints & tips

- Go through your house, room by room, looking at each light fixture. Starting with the brightest bulbs, and those used the most, consider replacing incandescent and halogen bulbs with an LED.
- **A caution about halogen bulb replacement in low-voltage track lighting**: Many people are tempted to simply put an LED bulb into a halogen fixture. There are electrical limits on how many LEDs you can use. Learn more at places like Lightbulbs Direct. [11]
- When a bulb goes out, see if you can live (safely) without replacing it at all.
- Most hardware stores and home improvement stores carry a range of efficient bulbs. You may need to go to a lighting specialty store to find a special bulb. Or you can look online.
- Be sure to check your utility company's website. They may have an online store, too.

**Yes, but ... I have dimmer switches.** You can buy dimmable energy-saving light bulbs. There are even candle-shaped bulbs to fit into chandelier light fixtures.

# Transition Streets
# 2.15 KEEPING YOUR COOL

The Practical Action Plan

| Cost: low | $ Savings: med | Effort: low | $CO_2$ saved: med |
|---|---|---|---|

## Challenge

The share of homes in the United States with air conditioners – central air, window units or portable units – reached 87% in 2015.[6] It should not be a surprise, then, to learn that 5% of all electricity produced in the U.S. is used for air conditioning.

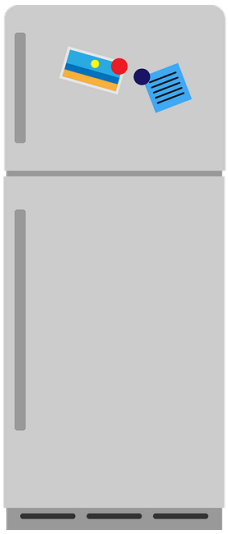
Very few people adjust the temperature settings on their AC unit so they are wasting that cool air when away from home. Air conditioners become less efficient as they age. If your AC unit is 10-12 years old, you could save 20-40% of your cooling costs by buying a newer, more efficient model.[13]

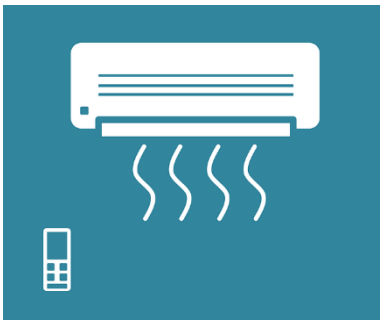
Your air conditioner isn't the only cooling cost in your home. Almost every American house has at least one refrigerator: 30% of American households have a 2nd refrigerator or freezer.[7] These are often older models that are very inefficient.

ENERGY STAR® refrigerators use 15% less energy and models with top-mounted freezers use 10%-25% less energy than side-by-side or bottom-mount units.[14]

## Solution

You can reduce your cooling costs in a wide variety of ways: by using the most efficient appliance properly sized for your needs, by making lifestyle changes, by landscaping to discourage summer heat from entering, and by weather-stripping to discourage cool air from leaving your living space.





**Yes, but ... I need the air conditioning to help with my allergies**. It's true that air conditioning also provides a filtering function for people who suffer from seasonal allergies. In that case, look for the most energy-efficient air conditioner you can find and consider a HEPA air filter. [14]

Transition Streets
2.16 KEEPING YOUR COOL

The Practical Action Plan

## Savings and benefits

By properly recycling your old refrigerator and replacing it with an ENERGY STAR® refrigerator, you can save more than $270 over the next 5 years. Check with your local electrical utility company about rebates for ENERGY STAR® appliances, and check with your city or township about disposal of old refrigerators. Some utility companies are offering incentives for households that get rid of an old, second refrigerator or freezer.[16]

An ENERGY STAR® central air conditioner uses 8% less energy than a new conventional unit.

**Save more than $100 a year with an energy-efficient refrigerator and air conditioner.**

Notes:

## Next steps, hints & tips

- Test the seal on your refrigerator door. Put a dollar bill against the door frame and close the door. You should feel tension when you pull on the dollar bill.
- Clean the coils behind or under your refrigerator to ensure it is running most efficiently.
- Consider getting rid of a second refrigerator.
- When you come home and turn on the AC, don't set the thermostat at a colder setting than normal. It won't cool your home any faster and it could wind up costing you money.[17]
- In the summer, keep your house warmer when you are away, and turn the thermostat down to no lower than 78°F only when you are at home and need cooling.

- Set your thermostat as high as comfortably possible and control for humidity with a dehumidifier.
- Use landscaping to save on home cooling (and heating). Trees, shrubs and vines can all provide cooling shade, when properly places.[18]

# Transition Streets
# 2.17 CONTROL YOUR HEAT

The Practical Action Plan

| Cost: low-med | $ Savings: med | Effort: low | $CO_2$ saved: med |
|---|---|---|---|

## Challenge

Space heating and water heating account for 63% of the energy used in the typical American home.[19] Changing the settings on furnaces, boilers and water heaters just a little can have a big impact. However, many of us don't know how to effectively change heating settings. Mastering them can make a big difference to our wallets.

## Solution

A programmable thermostat can help you save as much as 10% off your heating bill if you turn down the heat at night or when you aren't home.[20] Surprisingly few homeowners manually reset their thermostat or use a programmable thermostat to automatically adjust the heat. They are passing up easy savings.

Take a little time to learn how to change the heat settings on your furnace/boiler and water heater. Refer to the instruction manuals that came with them. If you don't have any manuals, copies can usually be downloaded from the manufacturer's website. (See 2.30 for a Heating Controls summary.)


Image above from http://greengroundswell.com/7-ways-to-stay-warm-indoors-in-the-winter-and-be-green/2012/12/03/

**Yes, but ... I like being cozy at home.** You can achieve the same effect by wearing more clothes, like thermal underwear.[21] You could also try weather-stripping, air sealing, and adding insulation to your home to keep the heat inside.

Transition Streets

# 2.18 CONTROL YOUR HEAT

The Practical Action Plan

## Savings and benefits

For every degree you turn your thermostat down, just at night, you can save about 1% of your total heating bill. If you use a programmable thermostat, it could save you 10% of your heating bill.[20]

When replacing a furnace, boiler or water heater look for ENERGY STAR® models. An ENERGY STAR® furnace can save you up to $75 a year in northern states and up to $25 in southern states[22]; a water heater from $5 to $25 a year.[23]

**Save up to $150 a year with programmed thermostat and ENERGY STAR® furnace/boiler and water heater.**

Notes:

## Next steps, hints & tips

- You can upgrade to a programmable thermostat for $25 to $150, depending on features.
- Try setting your thermostat so most rooms in your house are 65°F (depending on the location of your thermostat, you may need to set it above 65°F to warm other parts of the house adequately).
- Set the heating to come on 20 minutes before you get up or get home from work, and to go off 15 minutes before you leave home or go to bed.
- Setting the night-time temperature slightly lower (60 to 67°F) can promote better sleep, but too cold makes for poor sleep.[24] For infants and toddlers, the recommended temp is 65 to 70°F.
- Heat the rooms you use most, rather than the whole house. Close vents or radiator valves. Use space heaters.
- If you have old radiators, consider installing TRVs (thermostatic radiator valves) to control the heat output of a single radiator.[25]
- Turn down the heating temperature when on vacation or away for the weekend.
- Keep curtains and furniture away from vents and radiators to let heat circulate.

Transition Streets

# 2.19 INSULATING WATER HEATER AND PIPES

The Practical Action Plan

| Cost: med | $ Savings: med | Effort: med | $CO_2$ saved: med |
|---|---|---|---|

## Challenge

Many home hot water heater tanks are not sufficiently insulated. This means that heat is continually being lost, and your water heater has to work harder to keep the stored water at the desired temperature.

Heat is also lost from pipes that carry hot water around your house.

## Solution

Both tank insulation and pipe insulation will keep your water hotter for longer by reducing the amount of heat that escapes. This reduces your fuel bill and saves you money. Both tank insulation and pipe insulation are cheap and easy to fit, so this is a do-it-yourself option even if you're renting. You can find them at stores like Home Depot, Lowes, or online.

In many cases, you can reduce your hot water heater setting to 120°F (factory setting is usually 140°F). This reduces the risk of scalding, saves energy, and reduces corrosion and mineral build-up in your pipes. You may not want to do this if your dishwasher does not have a booster heater, or if someone in your household has a suppressed immune system or chronic respiratory disease.[25] Visit http://www.energy.gov/energysaver/projects/savings-project-lower-water-heating-temperature to learn more about health and safety risks.

**Yes, but ... I can't access most of my hot water pipes.** If you can afford it, get professional help. Otherwise, just do the ones that you can easily reach.

Transition Streets

# 2.20 INSULATING WATER HEATER AND PIPES

The Practical Action Plan

## Savings and benefits

Insulating your water tank could reduce standby heat losses by 25% to 45% and save you about 4% to 9% on water heating costs.[27] A hot water heater jacket costs about $25 and pays for itself in a year.

Insulation for hot water pipes will cost about $10 to $15 and save you around $10 - $15 a year.[28]

**Water tank and pipe insulation cost about $40 will typically pay for themselves in the first year.**

## Next steps, hints & tips

- If your tank is new, it's likely that it's already insulated.
- If you have an older tank, check to see if it is warm to the touch. If so, it needs an insulating jacket.
- Measure and write down the tank size (diameter, height, gallons).
- Fit an insulating jacket (3 inches or 75mm thick) around your hot water tank.
- Feel your water pipes and consider insulating those that are hot. Buy foam tubes and fit to pipes.
- Insulation should be at least 8 inches away from a gas flue. If pipes are within 8 inches, use unfaced fiberglass and secure with wire.
- For DIY guides, see: http://www.energy.gov/energysaver

Notes:

Transition Streets

# 2.21 WEATHER-STRIPPING

The Practical Action Plan

| Cost: med | $ Savings: med | Effort: med | $CO_2$ saved: med |
|---|---|---|---|

## Challenge

If you can feel cold air coming in around the windows and doors in your home, it means warm air is escaping. Sitting in a draft doesn't just give you a chill. In a typical home small air leaks add up to the equivalent of having one window open every day.[29]

**Save up to 15% off your heating and cooling costs per year by weather-stripping, sealing air leaks and insulating your attic.**[28]

## Solution

A drafty window or door is quickly and cheaply remedied by a visit to the hardware store. Weather-stripping seals gaps around windows, doors, attic hatches and other movable parts of your home, and decreases the amount of cold air leaking in. Once it's snug, you'll start saving cash, and CO2, as well as feeling more warm and comfortable.

There are several types of materials available from DIY stores, including brushes, foams and sealants, strips, and shaped rubber or plastic. Check the quality of the products. Metal, silicone and rubber are the longest lasting, while vinyl and foam are the shortest lived.

**Yes, but ... doesn't my house still need to breathe?** Once the drafts are plugged, it's important that the house is still ventilated. You might need to add a ventilation fan in kitchens and bathrooms if condensation becomes a problem.

## Next steps, hints & tips

- Find out where the drafts are coming from: older windows, door frames and attic hatches are all easy to check and remedy. On a windy day, hold a stick of lit incense or a match near these openings and watch the smoke for signs of drafts.
- Measure external doors and windows and buy seals from the hardware store. Seals are usually made from self-adhesive foam, rubber, or brush material.
- Get a brush-style draft stopper for your mail slot or seal it up and use an external mailbox.
- Seal unused chimneys with a solid plug or a chimney balloon. Remember to take them out again should you decide to use your chimney.
- In winter, draw the curtains at dusk to minimize cold radiating from the windows. Charity shops often have cheap curtains. Curtains wearing thin? Sew a layer of heavy lining material inside them or pay someone to do it for you.
- Windows still drafty, but can't afford new ones? Cover them in a clear plastic film that tightens over the pane when heated with a hairdryer. This is easy to do and doesn’t damage window trim.
- Low-e storm windows are an affordable alternative to window replacement, creating another layer of dead air between the outside and inside. The low-e coating keeps heat in and hot sun out.[30]
- Research and share local resources related to weather-stripping refunds, grants and classes.
- See http://energy.gov/energysaver for tips on weather-stripping doors, windows and more.

Notes:

# Transition Streets
# 2.23 AIR SEALING

The Practical Action Plan

| Cost: high | $ Savings: high | Effort: med | $CO_2$ saved: high |
|---|---|---|---|

## Challenge

Often the largest air leaks are hidden in the attic and basement, which makes them harder to find. Large holes around chimneys, plumbing pipes, or over kitchen cabinets can let heated air rise into the attic and pull cold air in through leaks into the basement.

## Solution

Air leaks can be found and sealed, resulting in a much more comfortable home and lower energy bills. A good air sealing job in the attic and basement stops air from circulating, reducing cold drafts. Air sealing stops air from blowing through existing insulation, making the insulation much more effective.

You can hire a professional to do air sealing (low effort, higher cost) or find and seal those leaks yourself (higher effort, medium cost) with the help of DIY guides. Try searching "air sealing" at: http://energy.gov/energysaver/energy-saver


**Save up to 15% off heating/cooling costs per year by weather-stripping, air-sealing and insulating.**[29]

**Yes, but ... Is my furnace or water heater getting enough air?** Most houses leak plenty of air. After air sealing, an energy auditor can conduct a combustion safety test to ensure your gas furnace and gas water heater are getting enough air and not leading carbon monoxide into your home.

**Disclaimer:** Do not try any major DIY project without guidance. It could lead to unnecessary costs or irreparable damage to one's home. Home energy retrofits like air sealing and wall insulation are most feasible as part of a larger remodeling project.

The Practical Action Plan

## Next steps, hints & tips

- A professional energy audit can help you find air leaks in your attic or basement.
- If you hire professional help, make sure they do a blower door test with infrared camera to look for air leaks before and after they finish air sealing. There should be a dramatic reduction in the air leakage rate. They can also make sure your furnace and water heater are getting enough air. For more information on professional home energy audits, visit: https://www.energy.gov/energysaver/home-energy-audits/professional-home-energy-audits
- Your utility company may offer rebates or incentives for home energy audits. Check their website.
- Sewer vent pipes and plumbing running from the basement to the attic are common locations for air leaks. Holes drilled for electrical wires are a path for air to move through walls and from the basement to the attic.
- Check that all recessed light fixtures under unheated spaces are caulked and sealed. Where a fixture protrudes into an attic, it should be boxed in to avoid contact with insulation.
- Common locations for air leaks are rim joists of basement walls and the top of walls where they meet an unheated attic.
- For detailed instructions on finding and closing air leaks, see "A Do-It-Yourself Guide to Sealing and Insulating with ENERGY STAR®." It is excellent for its pictures and tips, plus helpful advice on when to bring in professional help. Available at http://www.energystar.gov/ia/partners/publications/pubdocs/DIY_Guide_May_2008.pdf?8de2-b8ac
- For a more technical guide, see "Attic Air Sealing Guide and Details," which has excellent diagrams and instructions: https://buildingscience.com/documents/guides-and-manuals/gm-attic-air-sealing-guide/view
- If you live in a cold climate, see "Home Envelope Guide" for DIY help with air sealing and insulation: https://structuretech1.com/wp-content/uploads/2014/10/Building-Envelope-Guide.pdf
- Research and share local resources related to grants, classes, and recommended contractors for air sealing and other energy-efficiency upgrades.

# Transition Streets
# 2.25 ATTIC INSULATION

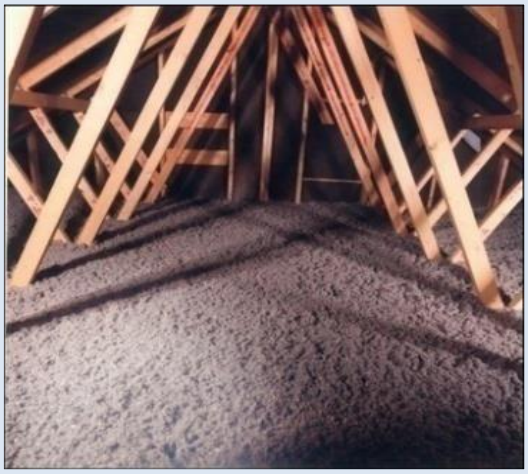
The Practical Action Plan

| Cost: high | $ Savings: high | Effort: med | $CO_2$ saved: high |
|---|---|---|---|

## Challenge

Attic insulation keeps your house warmer in winter and cooler in the summer. In an uninsulated home, a quarter to a half of your heat is lost through the roof.

Insulating your attic is a simple and effective way to reduce your heating bills and you can even do it yourself. Already have insulation? Current insulation recommendations may be higher than when your home was built or insulated. Many older homes can save quite a bit by adding more. (Be sure you've done your air sealing first to protect your insulation from moisture.)



## Solution

Insulation acts as a blanket, preventing heat from rising from the house below. It also keeps summer heat in the attic from entering the home. Insulating material can simply be laid over the floor of the attic, between and over the joists, if they are visible. If there is flooring in the attic, it may be blown in under the floor boards.

Attic insulation can be a DIY task (high effort, medium cost) or can be done by a professional with medium effort on your part but at a higher cost. Your utility company or local or state government may have rebates and incentives available to help you pay for insulation. Research and share information on local resources for attic insulation.

**Yes, but ... I don't know which materials to use**. Each type of insulation material has its own strengths and weaknesses. Their suitability will depend on the nature of your attic space, but all of them are better than not insulating at all. Learn more: http://energy.gov/energysaver/articles/insulation-materials

# Transition Streets
# 2.26 ATTIC INSULATION

## Your savings

Even if you already have some attic insulation, the DOE estimates weather-stripping, air sealing, and insulating your attic can save up to 15% off your heating and cooling costs (or 11% of your total energy bill) in both warm and cold climates.[32]

**Save up to 15% off heating/cooling costs per year by weather-stripping, air-sealing and insulating.**[28]

Notes:

## Next steps, hints & tips

- Always perform attic air sealing before adding insulation, because insulation will not stop air leaks, and air leaks can ruin insulation.
- Check your existing insulation level. How does it compare to the ENERGY STAR® suggested insulation level for your area?[32]
- Do not insulate if you have old knob and tube wiring.
- Decide whether you want to install it yourself or get a professional to do it. Consider which material you prefer.
- Check with your utility or insulation contractors for financial incentives and rebates.
- Always wear protective masks, eyewear, and clothing when handling insulation.
- Remember to protect recessed lights on the the top floor ceiling. See the DIY guide below for necessary steps.
- Read this “Attic Insulation Project” DIY guide for detailed instructions and advice to see if you want to do it yourself. [33]

# Transition Streets
# 2.27 WALL INSULATION

The Practical Action Plan

| Cost: high | $ Savings: high | Effort: med | $CO_2$ saved: high |
|---|---|---|---|

## Challenge

In most houses in the U.S., the external walls are stud walls with a cavity between studs. If the cavity is empty, your home has uninsulated walls, and a considerable slice of your energy bills will be spent heating (or cooling) the air outside. In fact, about a third of all the heat lost in an uninsulated home is lost through the walls.

## Solution

Wall insulation is a fantastic way to make your home feel more comfortable and significantly reduce home heating costs.

Filling the wall cavity between the studs and the inside and outside finished surfaces with an insulating material significantly decreases the amount of heat that escapes through the walls. It will help keep the temperature in your home even, prevent condensation on the walls and ceilings (which can lead to mold), and reduce the amount of heat building up inside your home during summer hot spells.

Insulation can be installed during remodeling, or from the outside through holes drilled in the wall. It's a simple process for a professional installer and is normally completed without damage or mess to your house or garden. Be sure to choose a reputable installer who offers a long-term guarantee.

**Yes, but ... why invest in wall insulation when I'm going to sell my house in the next few years?** Wall insulation will increase your home's efficiency, potentially adding value to your home.

# Transition Streets
# 2.28 WALL INSULATION

The Practical Action Plan

## Savings and benefits

Wall insulation can significantly cut both heating and cooling bills. Savings vary with climate and local energy costs, but the Department of Energy found that adding insulation can pay for itself in 3½ to 12 years.

**Insulation pays for itself in 3½ to 12 years – saving you money every year after that.**

Notes:

## Next steps, hints & tips

- Most houses have a wall cavity that can be insulated. Drilling a small hole in an interior wall can help you see if the wall already has insulation.
- Many utilities or local and state governments offer rebates, grants, loans, and other incentives for adding wall and ceiling insulation.
- Research and share information on local resources for wall insulation.
- Dense pack cellulose/foam helps restrict air movement and creates a more airtight house. It can even be blown into wall cavities with older, damaged fiberglass batts.
- See “A Consumer’s Guide to Home Energy Upgrades” for advice on choosing air sealing and insulation options. https://www.energy.gov/articles/living-comfortably-consumer-s-guide-home-energy-upgrades

# Transition Streets
# 2.29 OTHER ENERGY SAVING OPTIONS

## Overview and where to go for more information

You may want to explore these actions **once you've done the basics** outlined in this workbook. These projects tend to take more effort and/or more investment and have a longer payback period. However, they can further reduce your energy use and your carbon footprint.

**Buy new, high-efficiency heating and cooling equipment**

Heating and cooling accounts for more than 50% of a home's energy use. New high-efficiency equipment will significantly cut your home's $CO_2$ emissions and could save as much as $200 a year, depending on what climate you live in. In a cold climate, consider a high-efficiency condensing furnace or boiler and improved heating controls. A heat recovery ventilator can recover 90% of the heat of the air it exhausts outside while bringing in fresh air. In a hot climate, you could reduce your cooling energy by 20% to 40% with a new high-efficiency central air conditioner. See:

http://energy.gov/energysaver/articles/furnaces-and-boilers

http://energy.gov/energysaver/articles/air-conditioning

**Replace your windows**

Windows account for 30% of a typical home's heat loss. New windows with double panes and a low-e coating (low-emissivity) cut drafts and heat loss in cold climates and cut undesirable heat gain in warm climates. Triple pane windows are now a popular way to replace windows, and may be worth considering. For more information and advice, see http://energy.gov/energysaver/articles/energy-efficient-windows

**Recapture heat**

It takes energy to heat water and air, and once used, that energy disappears as hot water goes down the drain and warm air cools or escapes from our homes. But there are heat recovery technologies that are geared for home use. A heat exchanger is one such technology. New systems can recovery up to 90% of the heat from the air to recirculate back into the home.[34]

A hot-water heat recovery system like Ecodrain [https://ecodrain.com/en/] is another technology for new buildings or remodeling projects. This technology pulls the heat from water after it goes down the drain.

# Transition Streets
# 2.30 OTHER ENERGY SAVING OPTIONS

## Overview and where to go for more information

**Plan carefully for basement wall insulation**
In climate zone 3 and colder, basement wall insulation increases comfort and saves energy. But solve any water intrusion problems – whether from rain or melting snow – before insulating. Then use only rigid or sprayed foam that is not damaged by water. Don't use fiberglass batt or cellulose in a basement. For more information and advice, see: http://www.greenbuildingadvisor.com/blogs/dept/musings/how-insulate-basement-wall

**Switch to a renewable/green energy provider**
Many utilities offer a renewable energy option. This might cost a little more each month, but as more people sign up the utility has to increase its renewable sources.

If you can, switch to a renewable energy supplier to reduce demand for fossil fuel and to create demand for renewable technologies. This supports new jobs in the the green energy industry, which is so critical to dealing with climate change.

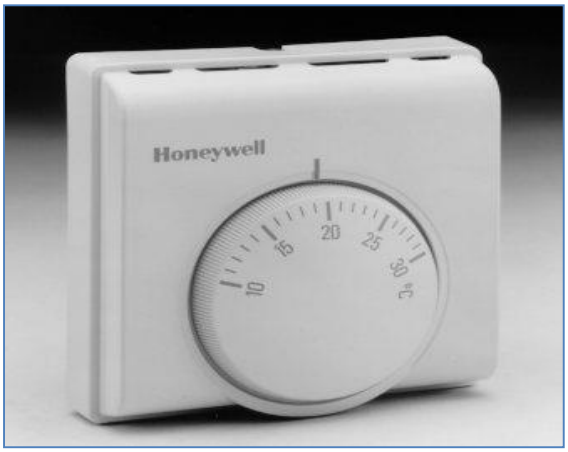
**Install your own renewable energy**
Renewable energy systems are effective alternatives to fossil fuels and will help you meet your own energy requirements as well as reduce your home's $CO_2$ emissions.

In an unshaded spot on your lot or your house, you could install a solar PV array to generate electricity, a solar thermal system to heat water, or a solar hot air system for space heating. A creek on your property might provide hydroelectric power. A large open area with few obstructions could provide an opportunity for a wind turbine. However, these systems can be expensive. For more information, see http://energy.gov/energysaver/articles/planning-home-renewable-energy-systems

**Look for rebates**
You can find information on each states' incentives and policies that support renewables and energy efficiency at http://www.dsireusa.org

# Transition Streets
# 2.31 HEATING CONTROLS

## Overview




**What is a room thermostat?**

This constantly measures the air temperature of a space to control when your furnace, boiler or AC unit turns on. You can set it for whatever temperature suits you best. When the temperature falls below (or above) that setting, the thermostat switches on the heating or cooling. Once the room reaches the set temperature, the thermostat switches the heating or cooling unit off. Thermostats are usually located in halls, stairs or landing areas.

**What is a programmable thermostat?**

A programmable thermostat lets you choose the times you want your home to be heated or cooled and the temperature you want it to reach. In other words, it allows you to heat/cool to different temperatures at appropriate times of the day and week. By heating/cooling your home only when necessary, you can save energy and money.

**What are thermostatic radiator valves (TRVs)?**

TRVs sense the air temperature around them and regulate the flow of hot water to keep a set temperature in a specific room served by a radiator. They can save money and energy by allowing different temperatures in some rooms than in others, turning off heating in rooms that are not used.

# Transition Streets
# 2.32 YOUR ENERGY ACTION PLAN

The Practical Action Plan

Reminder

**Possible actions**

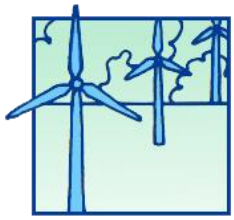
- Know how much energy you are using (2.3)
- Electronics & appliances (2.7)
- Reduce your standby power load (2.10)
- See the light (2.12)
- Keeping your cool (2.14)
- Control your heat (2.16)
- Insulating water heater and pipes (2.87)
- Weather-stripping (2.21)
- Air sealing (2.22)
- Attic insulation (2.24)
- Wall insulation (2.26)
- Other energy use options (2.28)

**What other ideas does your group have that aren't covered above? Add them below if you think they are relevant for you.**

| My actions | Previously done | When I'll do this | Notes |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Group actions

How can you help each other in your group? List group actions here (with named person and due date).



# Transition Streets
# 2.33 ENERGY: THE BIG PICTURE

## Questions for discussion

There are many different actions that you can take to save energy. Taken together, all these actions play a significant part in saving you money, as well as reducing your energy consumption — which means fewer fossil fuel power stations being built to supply us with energy, be they coal, nuclear, oil or gas-fueled.

- What are the real reasons for us continuing to use energy unsustainably?
- How can we share this information about energy conservation with others in our lives and make a bigger change in our communities?
- When does it make sense to buy an energy efficient appliance if you already have a functioning older model? (After all, it takes energy to make new products and to dispose of old ones.)

Notes:

Transition Streets
2.34 LOCAL RESOURCES

## Where to go for local information

Add your own information about local resources, grants, contractors, etc. for each of the energy-saving actions below.

**Electric meter and electricity monitor:**

**Gas meter:**

**Light bulb samples:**

**CFL recycling:**

**Refrigeration:**

**Energy audit:**

**Weather-stripping:**

**Air sealing:**

**Attic insulation:**

**Renewable energy resources, programs, & incentives:**

# Transition Streets
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# 3. Water

TRANSITION STREETS

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# Transition Streets
# 3.1 WATER OVERVIEW

The Practical Action Plan

The facts

Water is essential to all of life on our planet. It covers about 70% of the Earth's surface and yet less than 1% of that is fresh water available for human use. This small fraction must be shared by over 7 billion people globally for domestic, agricultural, industrial and environmental use.

In the U.S., the average person uses about 88 gallons of water every day,[1] or an average of 350 gallons per household.[2] That's a drop from a high of 112 gallons per person in 1982.[3] That decline was partly the result of federal policies that improved the efficiency of water-using appliances.

While our water use is declining, it remains much higher than in other wealthy nations, and is nearly twice the global average. In the U.K., the average person uses 37 gallons a day; in Germany, 32 gallons a day.[4]

Right now, aquifers and waterways across the nation are under pressure from droughts, damaging floods, industrial contamination, agricultural run-off and other forms of pollution.[5] Drought has hit the Western states particularly hard. In 2018, California experienced the most destructive wildfires on record. In 2017 and again in 2018, Montana's Glacier National Park burned out of control.

## Indoor Household Water Use


Source: Water Research Foundation Residential End Uses of Water, Version 2, 2016.

The federal government's recently released National Climate Assessment (2018)[6] warned that human health, life and economies are endangered as reliable clean water for agriculture, urban areas, industry and ecosystems is jeopardized.

If we do not take action now, it will mean increased water stress in the future.

The good news is that through awareness, we can make decisions about how to conserve this precious resource. By doing so, we can create more resilient and sustainable communities.

# 3.2 WATER OVERVIEW

The facts

In the U.S. approximately 30% of domestic water is used outdoors. In drier areas that number can be closer to 60 or even 70%. The remainder of residential water use is inside our homes.[1] You can easily reduce water waste by making small behavioral changes and by choosing more water-efficient appliances.

Each of the actions in this chapter can significantly reduce the amount of water that your household uses. Some of these actions will cost you nothing, and some will cost a little bit of money but this can be offset by the reduction in your water and power bills.

The actions listed below are the basic and most cost-effective things you can do in your home. In your group, have a brief chat about the actions, and then decide which ones you want to tackle and when. Record your own action plan in section 3.22.

- **Know how much water you use** (3.3)
- **Feeling flushed** (3.7)
- **Drips and leaks** (3.10)
- **Showers & baths** (3.12)
- **Washing and drying clothes** (3.14)
- **The kitchen sink** (3.16)
- **Outdoors** (3.18)
- **Harvesting rainwater** (3.20)
- **Greywater** (3.21)

**Municipal or well water?** In 2015, 283 million Americans got their water from public suppliers and 42.5 million used self-supplied sources, like wells, mostly supplied by fresh groundwater. While the cost of water may not be a big motivating factor for water savings among well users, droughts and declining aquifers will have a big impact on their water access over time. Saving water is vitally important for everyone.

Notes

Transition Streets

# 3.3 KNOW HOW MUCH WATER YOU USE

The Practical Action Plan

| Cost: none | $ Savings: low | Effort: low | $CO_2$ saved: low |
|---|---|---|---|

## Challenge

Managing water starts with measuring your use of it. An easy way to understand individual water use is to look at your water bill—not just the amount due, but how much water you used.[2] Your water bill may provide a gauge for your water use over time, but it doesn't give you information about your immediate water consumption. And your monthly bill won't alert you if you have a leak, which can account for up to 12% of your indoor water use.[1]


## Solution

Read your own water meter regularly (see 3.4). Just being more aware of how much water you use can have a positive impact on reducing the amount of water your household wastes. It also shows you the actual savings from all your efforts after doing the actions in this section.

Generally, in warm states your water meter will be located outside near the curb in front of your home in a concrete box labelled "water" or with your water provider's logo. In colder states, your water meter will be located inside your home in the basement or lower level. If you can't find your meter, call your water provider and ask.

Since centipedes and spiders may have taken up residence in the dark box around your meter, take care when removing the lid.

**Yes but … how can I keep track of my water if I'm not at home?** Consider installing a water monitor or leak detector to get meaningful, immediate feedback about water usage. If you live in an older home, have old appliances, or are away from home for months at a time, these monitors could quickly alert you to unusual water use (such as leaks) so you can act to prevent damage to your home. See reference 7 for examples.

# Transition Streets
# 3.4 ADVICE ON READING YOUR METER

There are two common types of water meters, the **straight-reading meter** which resembles the mileage indicator on an automobile odometer, and the **round-reading meter** which has several separate dials.

For the **straight-reading meter**, the reading is taken from the figures shown under the words “cubic feet.” The meter reads 008171, which is the total number of cubic feet of water recorded since the meter was installed (one cubic foot of water = 7.48 gallons). The large hand is used only for testing purposes and leak detection. Newer meters also have a small triangle that is usually red or blue, which spins when water is used. They are sensitive and can even detect small water drops that are leaking.

The **round-reading meter** has several small dials in a circle and is a little more difficult to read. The dials are marked off in ten divisions and are read much like a clock, except that the hand on every other dial turns counterclockwise. To check the readings, start with the “100,000” dial, and the readings are 8, 0, 6, 3, and 2 or 80,632 cubic feet.

Call your local water utility if you have any difficulties in reading the figures on your meter.

Note: If you live in an older property you may have a different type of meter.

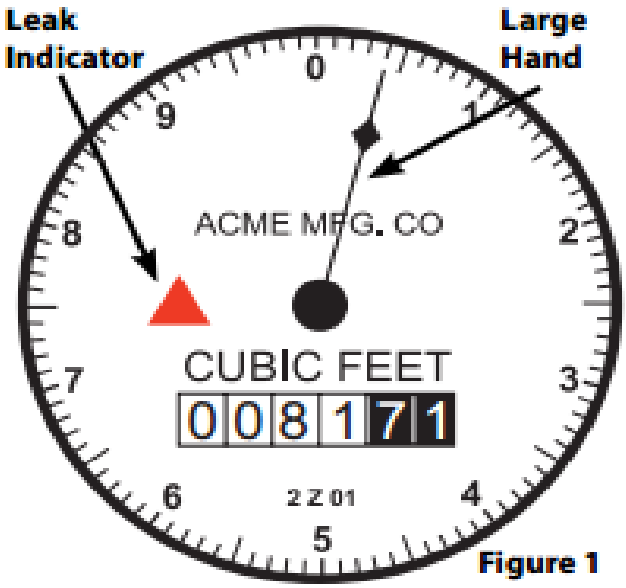


Figure 1

**STRAIGHT-READING METER**

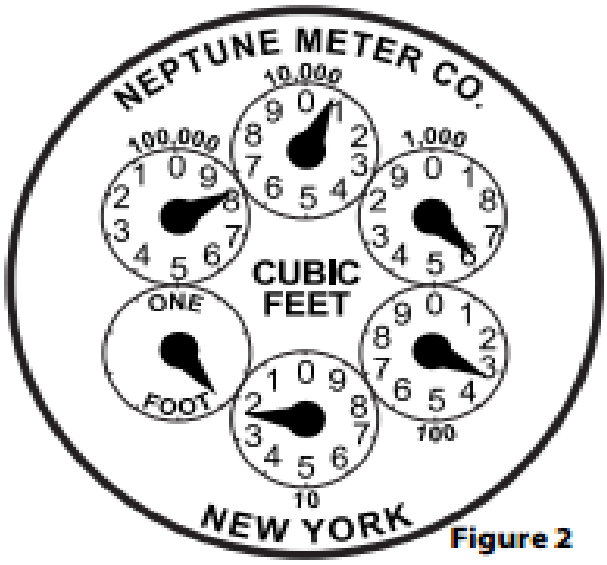


Figure 2

**ROUND-READING METER**

**One cubic foot of water = 7.48 gallons**

Transition Streets

# 3.5 KNOW HOW MUCH WATER YOU USE

The Practical Action Plan

## Sample log of water meter readings

| Date | Water Meter Reading (cu. ft.) | Usage (cu. ft.) | Gallons/day |
|---|---|---|---|
| 6/01/2019 | 20,035 | n/a | n/a |
| 6/08/2019 | 20,130 | 95 | 102 |
| 6/15/2019 | 20,221 | 91 | 97 |
| 6/21/2019 | 20,307 | 86 | 64 |

## Next steps, hints & tips

- ❑ Estimate your average daily consumption (see 3.6).
- ❑ Check your water meter weekly during this time when you are making changes to reduce your water use (see the sample water meter readings log provided above). Record your meter readings in the log below.
- ❑ To calculate the daily use per person in your household: 1. Divide the usage by the number of days. 2. Multiply by 7.48 gallons per cu. ft. 3. Divide by the number of people in your household. How does your household compare to the national average of 88 gallons (10.9 cubic feet) per person/day, or 350 gallons per household/day? [1,2] Set a goal for reducing your consumption based on your usage.
- ❑ Keep the log visible. Stick it on the fridge so everyone in your household can see it. Are you seeing progress in your weekly usage? Consider rewarding everyone for their efforts by sharing some of the savings.
- ❑ Learn more about your bill at: https://www.epa.gov/watersense/understanding-your-water-bill
- ❑ For up-to-the minute water usage reports, consider a water monitor.[7]

## Your water meter readings log

| Date | Water Meter Reading (cu. ft.) | Usage (cu. ft.) | Gallons/day |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

# Transition Streets
# 3.6 QUICK USAGE ESTIMATER

## Water conservation tips

| Appliance | Normal Use | Conservation Use |
|---|---|---|
| **Shower** (5 minutes) | Conventional showerhead<br>25-35 gallons | Water-saving showerhead<br>10 gallons |
| **Tub bath** | Full water level<br>36-45 gallons | Minimal water level<br>10-12 gallons |
| **Toilet flushing** | Conventional<br>3.5-7 gallons/flush | Ultra low-flow toilet<br>0.8-1.1 gallons/flush |
| **Brushing teeth** | Tap running<br>5 gallons | Wet brush, rinse briefly<br>¼ gallon or less |
| **Shaving** | Tap running<br>20 gallons | Water in basin<br>1 gallon |
| **Washing hands** | Tap running<br>2 gallons | Water in basin<br>1 gallon |
| **Dishwashing**<br>(by hand) | Tap running<br>25 gallons | Wash & rinse in tub/sink<br>5 gallons |
| **Dishwasher**<br>(automatic) | Older model<br>9-14 gallons/cycle | Efficient model<br>2-3.5 gallons/cycle |
| **Washing machine**<br>(full load) | Top loading - older<br>20-56 gallons/load | Front loading - high efficiency<br>12-14 gallons/load |
| **Leaks** | All faucets, shower, toilet etc.<br>27 gallons/day average | Check all faucets and your water meter |
| **Toilet leak** | Slow leak<br>15 gallons/day | Use dye tablets to drop into tank, check bowl for dye |
| | Flapper valve leak<br>1,000-2,000 gallons/day | Check your water meter or bill for dramatic increase in water use |
| **Outdoor watering** | Average hose or sprinkler system<br>10 gallons/minute or<br>300 gallons/30 minutes | Water deeply, infrequently and only when plants need it |

This chart compares conventional versus more efficient appliances and conservation habits. The numbers provided are estimates and don't account for variation in appliances and usage. Consider tracking your own *actual* usage, or using one of these online calculators:

- WECalc (Home-Water-Energy) Calculator: wecalc.org/
- WaterSense Calculator: https://www.epa.gov/watersense/watersense-calculator
- Water Footprint Calculator: www.watercalculator.org

# Transition Streets
# 3.7 FEELING FLUSHED

The Practical Action Plan

**Cost: none-med** | **$ Savings: med** | **Effort: low-med** | **$CO_2$ saved: low-med**

## Challenge

Toilets are the main source of water use in homes today. About 25% of all the clean, drinkable water we use is flushed down a toilet.[1]

Older, inefficient toilets use as much as 7 gallons of water in one flush.[8]

## Solution

New "WaterSense®" toilets use as little as 0.8 gallons per flush (gpf), which could save the average family 20 to 60% in water use.[8] Learn more a: https://www.epa.gov/watersense/residential-toilets

If your toilet was made before 1994 and you don't want to replace it, consider installing a water displacement device such as a toilet dam or an early closing toilet flapper. These devices reduce the amount of water used per flush by displacing space in the water chamber above the toilet, or by reducing the amount of water released by closing the plunger faster than a traditional buoyant flapper.

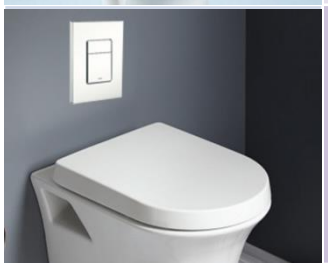
Note that these devices are only suitable for toilets rated at 3.5 gallons per flush and higher. Performance can vary between toilet types. Learn more about these devices at the Alliance for Water Efficiency: http://www.allianceforwaterefficiency.org/Toilet_Retrofit_Devices.aspx

**Yes, but ... our toilet doesn't flush well. Won't this make it worse?** A displacement device can cause problems if water pressure is too low to properly flush. If you have to flush twice, or if you have clogs, a WaterSense® toilet may be a better option for you.

Transition Streets

# 3.8 FEELING FLUSHED

The Practical Action Plan

| Type of Toilet | Year | Flush | Water Used Per Flush |
|---|---|---|---|
|  | 1950s – 1980s | Single | 5.0-7.0 gallons |
|  | 1980 –1994 | Single | 3.5-4.5 gallons |
|  | 1994 – present (standard) | Single | 1.6 gallons |
|   | 1994 – present (high efficiency) | Single | 1.28 gallons |
|  | Present | Single<br>Dual | 0.8 gallons<br>1.1 gallons (avg) |

Note: Check your toilet tank for a stamp or date to determine gallons per flush (gpf). You can also visit the manufacturer's website to find more information. Also see the Alliance for Water Efficiency: http://www.allianceforwaterefficiency.org

# Transition Streets
# 3.9 FEELING FLUSHED

## Your savings

By replacing an older toilet with a WaterSense® or low-flow toilet, the average family can reduce their water use by approximately 13,000 gallons a year, saving more than $110 per year.[8]

Save $110 on your water bill, and 13,000 gallons of water a year!

Notes:

## Next steps, hints & tips

- ❑ Learn more about WaterSense® products, see www.epa.gov/watersense/products/toilets.html
- ❑ Many water providers offer rebates for upgrading to more efficient toilet models.
- ❑ Use the table on the previous page to identify what type of toilet you have and what type of water displacement device you could use. Before you install a water displacement device, be alert to any problems you are currently encountering that could be made worse with less water.
- ❑ If a displacement device is the right choice for your needs, you can make your own from a large plastic bottle filled with water.
- ❑ Flush less often. If it's yellow, let it mellow; if it's brown, flush it down.[9]
- ❑ Check that the water level in your tank is set to the mark about one inch below the overflow. If it is just below the overflow, it will flush about ¼ gallon more than the designed amount.
- ❑ Avoid using your toilet as a waste basket. It will reduce maintenance costs for your local waste water provider and potential plumbing problems in your own home.

# Transition Streets
# 3.10 DRIPS AND LEAKS

The Practical Action Plan

**Cost: none-low** | **$ Savings: med** | **Effort: low** | **$CO_2$ saved: low-med**

## Challenge

A dripping or leaking faucet is not just annoying, it can add up to staggering water losses and wasted money. For the average household, leaks can account for nearly 10,000 gallons of lost water every year, adding 12% to your water bill.[1] In 10% of homes, leaks are so bad they are wasting 90 gallons or more per day.[10]

| Faucet or leak drip rate | Gallons lost / day | Gallons lost / year |
|---|---|---|
| 1 drop per second | 3.65 gal / day | 1,300 gal / year |
| Drops breaking to a stream | 22.5 gal / day | 8,200 gal / year |
| 1/8 inch stream | 400 gal / day | 146,000 gal / year |
| ¼ inch stream | 1441 gal / day | 526,000 gal / year |

## Solution

Check regularly for drips and leaks from faucets, water heaters, washers, showers, tubs and ice-making refrigerators. Common causes of leaks are worn toilet flappers, worn out washers, and old plumbing valves.

Reading your meter regularly can help you determine if you have drips or leaks. The cost to repair most of these problems is minimal and often not hard to repair yourself.

If you live in a cold climate, your plumbing could be at risk of freezing and bursting if it is outdoors or if your home is without heat for a period of time. Make sure your external water pipes and faucets are turned off and drained before freezing weather hits. Have someone check on your home if you are away during the colder months.

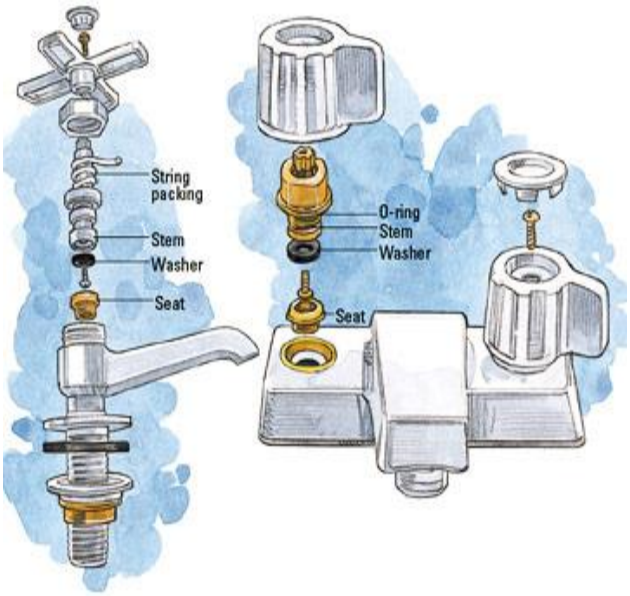
A water monitor – whether a whole house monitor, or a monitor on the floor near a washer or water heater – can alert you to leaks (see reference 7).

**Yes, but ... I changed the washer and it's still dripping.** A dripping tap usually means that the washer needs renewing, but it can also be caused by a damaged valve seating. If the drip is from a mixer nozzle, then change both tap washers.

# Transition Streets
# 3.11 DRIPS AND LEAKS

## Your savings

Your savings will vary, depending upon how serious the leak is and how easy the fix is. A washer costs mere cents, whereas replacing a valve on old plumbing could cost several hundred dollars. Consider replacing old faucets with a WaterSense® faucet or accessory, which can reduce flow rates about 30%.[11]




Notes:

## Next steps, hints & tips

- ❑ Check your pipes for visible leaks around gaskets or pipe fittings.
- ❑ Check your water meter before and after a two-hour period when no water is being used. If the meter changes at all, you probably have a leak (also see section 3.4).
- ❑ See the EPA's "Checking for Leaks" website for tips and videos: https://www.epa.gov/watersense/fix-leak-week
- ❑ For more info on bathroom sink faucets and accessories, visit http://www.epa.gov/watersense/products/bathroom_sink_faucets.html
- ❑ Use dye tablets to check if your toilet tank has a leak into the bowl. Flappers are often under $5.
- ❑ Call your local water provider to ask about free leak detection kits and water reduction devices, like faucet aerators and low-flow showerheads.
- ❑ If you're not into DIY, hire a local plumber or handyman. Do not try any major plumbing project without consulting a professional.
- ❑ In the yard, check your sprinkler heads and hoses for leaks. A leak as small as the tip of a ballpoint pen can waste as much as 6,300 gallons of water per month.[12]

# Transition Streets
# 3.12 SHOWERS AND BATHS

The Practical Action Plan

| Cost: none-med | $ Savings: med | Effort: low | $CO_2$ saved: low-med |
|---|---|---|---|

## Challenge

Baths and showers make up more than 20% of the average American's water use.[1] A single bath can use 20-45 gallons of water. Taking a shower can use half that amount of water, depending on how long you shower. (The average shower duration is just over 8 minutes.) The trend toward multi-head showers, however, significantly increases water use.[13]

## Solution

Baths and showers represent one of the greatest opportunities for indoor water conservation.

Many modern showerheads are designed to reduce the water flow rate while maintaining good pressure. Older showerheads use as much as 5 gallons per minute, whereas new, low-flow showerheads use 2 gallons or less per minute.


WaterSense® showerheads can save the average family 2,900 gallons of water – and the fuel to heat it – per year. Simply replacing your showerhead with a more efficient model could reduce your water consumption by more than half. [14] Reuse your shower greywater and save even more.

Behavior changes, like taking showers rather than baths and cutting back the amount of time you spend in the shower, will save both water and money.[15]

**Yes, but ... I really do *need* to shower every day.** If you do need an all-over shower, consider using a timer to reduce the time you spend in the shower.

# Transition Streets
# 3.13 SHOWERS AND BATHS

The Practical Action Plan

**Savings**

Replacing a standard showerhead with a low-flow WaterSense®-rated showerhead could save 2,900 gallons of water a year, and $70 off your bills. Electric water heater? You could save more than 370 kWh of electricity, enough to power a house for 13 days![14]

Save $70 or more a year in water and electricity costs.

## Next steps, hints & tips

- ❑ Consider installing a low-flow showerhead, which limits water flow to 2 gallons or less per minute. Check your water or energy company for rebates on low-flow showerheads, and for free products.
- ❑ For more info on WaterSense® showerheads visit: http://www.epa.gov/WaterSense/products/showerheads.html
- ❑ Limit your time in the shower to 5 minutes or less. It's easy to do if you take a "navy shower," turning the water off when soaping up or shaving and back on when it's time to rinse off.
- ❑ Get a shower timer to help limit your (and your teenager's) time. Some timers can tell you how much water you are using, and alert you when you've used the maximum recommended amount. See www.aliexpress.com/popular/waterproof-shower-timer.html
- ❑ Save the cold water that comes out of the tap before the hot water arrives. Keep a bucket in the shower to catch cold water and use it to flush the toilet or water plants. If you do take a bath, you can use that bath water to flush your toilet as well. You can also consider installing a greywater system to reuse bath water.
- ❑ Water heaters are one of the most inefficient home appliance. Consider an ENERGY STAR certified electric heat pump water heater (HPWH) for your next water heater instead of a gas or standard electric model. An average family can save $330 a year and $3500 in electricity costs over the lifetime of the HPWH. See https://www.energystar.gov/products/water_heaters/heat_pump_water_heaters

**Yes, but ... How about brushing my teeth?** Assuming you do this for 2 minutes twice a day, you can save an additional 200 gallons of water a month if you turn off the faucet while you brush your teeth.[16]

# Transition Streets
# 3.14 WASHING AND DRYING CLOTHES

The Practical Action Plan

| Cost: none-high | $ Savings: low-med | Effort: low | $CO_2$ saved: low-medium |
|---|---|---|---|

## Challenge

Washing clothes accounts for about 17% of the water we use in our homes[1] and considerable energy for both washing and drying. Washing machines vary tremendously in how much water they use per wash. Older top loading models can use between 20-56 gallons per load, compared to modern high efficiency (HE) models, which average closer to 14 gallons per load.[17]

## Solution

Each of these simple steps can have as big an impact on your energy bill and water use as buying a more efficient – and expensive – washing machine.

- Wear clothes longer between washes so you wash less often
- Reduce the temperature of your water
- Wash more clothes per load
- Hang your clothes to dry

But you should know that you can save big if you go with ENERGY STAR® washers and dryers. Clothes washers that have earned the ENERGY STAR® rating use 33% less water and approximately 25% less energy than standard models.[17] Clothes dryers that have earned the ENERGY STAR® rating use approximately 20% less energy than standard models.

No matter what your price range, you'll find that new machines and front-loading machines give you more cleaning options, use less water and energy, are gentler on your clothes, and save you money over time.

Want to see exactly what your laundry is costing you? Visit Mr. Electricity: https://michaelbluejay.com/electricity/laundry.html

# Transition Streets
# 3.15 WASHING AND DRYING CLOTHES

The Practical Action Plan

**Savings**

An ENERGY STAR® washer can save you about $35 a year on your utility bill, compared to a standard model, and more than 2,000 gallons of water![17] Save another $150, or more, simply by switching from hot to cold water wash.[18] Hang up your clothes to dry and use 100% renewable power.

Save up to $185 a year in water and electricity costs.

## Next steps, hints & tips

- ❑ Water heating consumes about 90% of the energy it takes to operate a clothes washer. Wash in cold water. It will usually do a good job of cleaning.
- ❑ Washers use about the same amount of energy regardless of the size of the load, so run full loads whenever possible. If your washer has a half-load feature, use it when you have only a few items to wash.
- ❑ Try reducing the amount of laundry you do. Wear your clothes more than once and hang towels up to dry after showering so you can use them again.
- ❑ If you're purchasing a new machine, choose a model with a capacity that is appropriate for your situation. If you live alone, consider a small, apartment-sized model.[16]
- ❑ If it fits in your budget, choosing an ENERGY STAR® machine can save you money and water. Check your local water provider or utility company for rebates.
- ❑ Familiarize yourself with your washing machine's cycle options. Some settings provide the same cleaning power but with less water and energy.
- ❑ Avoid pre-washing. Most modern washing machines and washing powders are so effective that you don't have to pre-wash.
- ❑ Be sure to use "High-Efficiency"(HE) detergents with modern front loading machines. They are specifically designed to keep dirt suspended in lower volumes of water. Regular detergents will reduce the machine's performance.[17]
- ❑ Learn more about different types of washing machines at: http://www.allianceforwaterefficiency.org/Residential_Clothes_Washer_Introduction.aspx
- ❑ Consider setting up a greywater system from your washing machine, especially if you have an older machine. See page 3.21.

# Transition Streets
# 3.16 THE KITCHEN SINK

The Practical Action Plan

| Cost: none-med | $ Savings: low-med | Effort: low | $CO_2$ saved: low |
|---|---|---|---|

## Challenge

When it comes to wasting water in the kitchen, the dishwasher isn't the culprit, it's probably you. The way you use your kitchen faucet, the type of aerator and how you hand wash your dishes makes a big impact on your water use. Hand washing one load of dishes can use 20 gallons of water or more.[19] Many people rinse their dishes before putting them in a dishwasher, an unnecessary waste of time and water when dishwashers don't require it.

## Solution

When washing up, don't let the faucet run; use a tub or plug your sink.

The aerator (a screw-on tip of the faucet nozzle) restricts the maximum flow rate of water from the faucet. New kitchen faucets usually have a 2.2 gallon per minute aerator, but you can purchase one with a flow rate of 1 gallon per minute and save even more.[20]

A common misconception is that dishwashers use more water. In fact, dishwashers can be water savers. In the 1980s, dishwashers used as much as 14 gallons per cycle, but modern models can use as little as 2 gallons—often a lot less than washing up by hand. A new ENERGY STAR® dishwasher will save, on average, 3,870 gallons of water over its lifetime.[21] Refer to the rankings of dishwashers at: www.energystar.gov/products

**Yes, but ... sometimes I have to wait for ages for hot water to arrive at the tap, which wastes lots of cold water down the sink**. Collect all that cold water in a watering jug that you leave by the sink, then use it on the garden or your houseplants.

# Transition Streets
# 3.17 THE KITCHEN SINK

The Practical Action Plan

Savings

Handwashing your dishes costs $430 more in energy and water than using an ENERGY STAR® rated dishwasher over its lifetime. These dishwashers also use less than half as much energy (for water heating) as washing dishes by hand, and save more than 5,000 gallons of water each year.[22] When washing dishes by hand, see best practices below and save over 14,600 gallons of water per year.

Save up to $400 in energy and water costs and 5,000 gallons of water over the lifetime of your dishwasher.

## Next steps, hints & tips

- ❑ Consider installing a more water-efficient faucet, or a faucet aerator with a flow rate of 2.2 gallons per minute or less. Aerators are cheap, quick fixes that you can install yourself. An aerator could save over 3,000 gallons of water per year.[20]
- ❑ Shut off the faucet when possible. When washing up by hand, use a tub or plug your sink. You'll save 20 gallons of water or more each time.[19] If you do two loads of dishes per day, that saves over 14,600 gallons of water per year.
- ❑ Make sure your faucet doesn't drip or leak (see 3.10).
- ❑ Consider composting your food waste or setting up a worm bin instead of using the garbage disposal in your sink. Such units require lots of water to operate properly.
- ❑ Plan ahead to avoid having to thaw frozen foods under running water.
- ❑ Keep a jug of water in the fridge so that you don't have to run the tap for ages while waiting for cold water to flow.
- ❑ When using your dishwasher, make sure to use a full load every time. Two half loads still use more water and energy than one full load.
- ❑ Become familiar with your dishwasher's cycle options for lower temperature/ duration cycles. Check your user manual or see the manufacturer's website.
- ❑ Most modern dishwashers are so effective that you don't have to pre-rinse.
- ❑ Consider purchasing an ENERGY STAR® certified dishwasher: https://www.energystar.gov/products/appliances/dishwashers

# Transition Streets
# 3.18 OUTDOORS

The Practical Action Plan

| Cost: low-med | $ Savings: med-high | Effort: low-high | $CO_2$ saved: low-high |
|---|---|---|---|

## Challenge

About 30% of the water used by the average American households is devoted to outdoor landscaping. In dry areas, that could be as high as 60%-70%.[1]

The typical suburban lawn consumes 10,000 gallons of water, above and beyond rainwater, each year[23] and requires lots of fertilizer and maintenance. Inefficient watering is one culprit. Your garden hose uses as much as 23 gallons of water per minute; sprinklers can use as much as 1020 gallons of water per hour.[24] Is that water actually going where needed? Or is it watering pavement or evaporating into the air?

## Solutions

Maybe it's time to rethink the American lawn. Landscaping that fits your region's climate is easier to care for and uses less of our precious fresh water.

Improving the efficiency of our outdoor water use will not only save water, it will often improve the health of our plants. It's a simple change to water the right part of the plant during the right time of day, and it will make a big difference. By using water-efficient gardening practices like mulching, drip irrigation and swales, you can have a beautiful, living garden even in times of drought.[25]

Try to avoid using tap water to water the vegetable garden. Instead, store and use rainwater (see 3.20), which is better for your plants. Consider reusing water (greywater) on your landscape (see 3.21).

**Yes, but ... I'm concerned about the chemicals in soap that might be in greywater.** If you set up a system to use greywater, you will need to be careful that the soaps you use in your home do not contain sodium or boron, and are not anti-bacterial.[26] (See 3.21 for links to learn about products that can be damaging to plants and soil.)

# Transition Streets
# 3.19 OUTDOORS

The Practical Action Plan

Savings

The varying cost of water in municipalities across the nation – and the amount of water needed by different types of landscapes – makes it impossible to put a dollar value on outdoor water savings. But the savings in water itself is huge – 30 to 70%. That impacts human, animal and plant life in your area.

## Next steps, hints & tips

- When planning your landscaping, select plants that are native, require less water and are appropriate for your local climate. For example, drought-resistant trees and plants can save 30 to 60 gallons of water per 1,000 square feet each time you water them.[12] For more information on plants that are native to your area, check your local nursery or Native Plant Society.[27]
- Make good decisions about watering your plants.
    - Use a watering can for watering potted plants and small raised beds. That way you know exactly how much water your plants are getting. Don't over water. That can lead to root rot.
    - Give your plants' roots a good soaking once or twice a week in dry weather. That's better than lightly watering them every day. Water should be directed underneath the foliage. There should be enough to wet the top few inches of soil, where most plants' roots are located.
    - Use drip irrigation instead of sprinklers. If you really must use a sprinkler, use it early in the morning or late in the evening, so less water evaporates.
    - Put a nozzle on your hose. That will reduce water output while increasing pressure.
- Mulching soil around your plants can cut water loss by as much as 20%.[28]
- Rather than washing your car with a running hose, try using a bucket and sponge. (Ideally, fill the bucket from the rain barrel.)

# Transition Streets
# 3.20 HARVESTING RAINWATER

## Overview and where to go for more information

**Rainwater harvesting**

Rainwater harvesting can reduce stormwater runoff while saving water for later use. A 1,000-square-foot roof can collect about 600 gallons of water during a 1-inch rainfall. This free water can be used during dry periods.

Rainwater is ideal for ornamental landscaping, and depending on the quality of your rainwater collection method, may also be suitable for edible gardens. (Learn more about water quality considerations of roofing materials.[29]) When managed properly, rainwater harvesting can also help reduce stormwater runoff from your property.

Rainwater collection system designs range from large underground tanks storing thousands of gallons, to interconnected above-ground, gravity-fed storage containers holding hundreds of gallons, to a single 50-gallon rain barrel filled from your downspout.

When done properly, rainwater does not need any treatment and requires only modest maintenance. If you live in a cold climate, you will need to winterize your rain barrel system so it doesn't freeze and crack.[30]

For those in dry states, see Brad Lancaster's series on rainwater harvesting and drought resilient landscaping at: www.harvestingrainwater.com

A home use, 350-gallon blue barrel interconnected rainwater collection system

Some states have laws regarding rainwater capture. This website outlines laws by state: http://www.ncsl.org/research/environment-and-natural-resources/rainwater-harvesting.aspx

# Transition Streets
# 3.21 GREYWATER

## Overview and where to go for more information

**Greywater reuse systems**

Greywater is previously used household water from all sources *other than toilets and diaper-washing* (which is called blackwater). Capturing waste water and using it for a purpose that does not require a high level of purity, like flushing toilets and watering non-edible plants, can be safe and save huge amounts of water. For example:

- Water-saving toilet tank covers (lid sinks) enable clean water to be used for hand-washing *before* that water enters the tank to be used for flushing.
- You can also use shower, bath, washing machine and dehumidifier water to flush toilets. (A 5-gallon bucket of water poured into the toilet bowl will flush waste with sufficient force.)

In some communities, greywater capture is legal and encouraged. In other areas it is heavily regulated or there are no codes at all. See the Greywater Action website for information on the laws in your state as well as plumbing codes, system designs and best maintenance practices (https://greywateraction.org/greywater-codes-and-policy/).


**A few considerations**

- Kitchen sink greywater is higher in organic matter, oils, grease ar fats than other types of greywater. It requires special care (learn more at: https://www.storey.com/article/kitchen-greywater-water-conservation/) It can contain pathogens, like *listeria,* so it is advisable not to use it on edible plants.
- Water from dehumidifiers can contain mold, algae and lead.[31] Do not put it on plants.
- Greywater that originated from cleaning may contain soap, shampoo, bleach, dye and high levels of sodium or boron. These can be damaging to soil organisms, making it unsuitable for landscape use. Just because a product says it is biodegradable, that does not always mean it is healthy for plants. Learn more at the link above, and also at: https://greywateraction.org/greywater-faq/ and https://www.thisoldhouse.com/ideas/plant-friendly-soaps-are-safe-greywater-irrigation

Transition Streets

# 3.22 YOUR WATER ACTION PLAN

The Practical Action Plan

Reminder

Possible actions:

- Know how much water you are using (3.3)
- Feeling flushed (3.7)
- Drips and leaks (3.10)
- Showers and baths (3.12)
- Washing and drying clothes (3.14)
- The kitchen sink (3.16)
- Outdoors (3.18)
- Harvesting rainwater (3.20)
- Greywater (3.21)

**What other ideas does your team have that aren't covered above? Add them below if you think they are relevant for you...**

| My actions | Already done | When I'll do this | Notes |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Group actions

How will you help each other out in your team? Can one member who has already tackled an action help others? List team actions here (with named person and due date):

Transition Streets
3.23 LOCAL RESOURCES

## Local resources

Add your own information about local resources, grants, contractors, etc. for each of the water-saving actions below.

**Local water utility resources:**

**Rebates/incentive programs:**

**Sustainable landscape planning info/contractors/classes:**

**Drought tolerant and native plants nurseries:**

**Soil, compost and mulch resources:**

**Water-wise irrigation supplies:**

**Rainwater harvesting and catchment:**

**Greywater reuse systems and installation:**

**Plumbers specializing in water conservation and reuse:**

**Water meters/monitors:**

# 3.24 THE BIG PICTURE: WATER & CONSUMER CULTURE

Questions for discussion

You've undoubtedly heard of a "carbon footprint," the measure of how much carbon a person (or a product) is responsible for creating. We can also talk about a person or a product's "water footprint."[32] That can be measured for a single process (growing rice), for a product (a pair of jeans), or for a person.

Nobody will have a water footprint of zero because we all drink water and it takes water to make just about everything we buy. But as some of the biggest shoppers on the planet, the average American's water footprint is oversized.

Two-thirds of our water footprint is embedded in our food. For example, a pound of fresh tomatoes has about 14 gallons of embedded water; apples about 83 gallons; tofu about 240 gallons; pork about 570 gallons; and a pound of beef about 1,800 gallons (depending on how they were grown).[32]

Purchasing consumer goods adds another 583 gallons of water per day to our footprint.[32]

Add all this up and the average American's water consumption jumps from 88 to around 2,000 gallons a day, nearly twice that of citizens in most other industrialized nations.

**What do you know about your own water footprint?** Take a look at the chart on page 3.25. How many of these items have you purchased in the last year? Use this calculator: https://www.watercalculator.org/

We can think about saving water using the same five R's we considered when reducing other types of waste (see section 5 in this workbook) – **REFUSE**, **REDUCE, REUSE, RECYCLE/REPURPOSE/REPAIR** and **RETURN TO EARTH**. For example, we can:

- Refuse bottled water when offered
- Reduce the water we waste by shutting off the faucet when brushing our teeth
- Reuse dehumidifier water to flush the toilet
- Recycle shower water for plant irrigation (with appropriate products)
- Set up a water-saving hügelkultur mound for growing strawberries on top of rotting wood and other organic matter

# Transition Streets
# 3.25 REDUCING YOUR WATER FOOTPRINT

Water footprints

Use this water footprint chart to consider the water usage embedded in the production of food and other products we consume regularly. These numbers are based on estimated global averages for industrial production. Ecological farming practices like permaculture, holistic land management, and dry farming can significantly reduce the water footprint of certain foods.

| Item | Water Footprint |
|---|---|
| **T-shirt (cotton)** | 659 gallons |
| **Jeans (cotton)** | 2,108 gallons |
| **Smart phone** | 3,190 gallons |
| **Leather shoes** | 3,626 gallons |
| **Car** | 13,700-22,000 gallons |
| **1 gallon of gasoline** | 3-6 gallons of water |
| **Steak – beef** (6 ounces) | 674 gallons |
| **Hamburger** (including bun, lettuce, tomato) | 660 gallons |
| **Egg** | 52 gallons |
| **Soda** (17 ounces) | 46 gallons |
| **Coffee** (1 cup) | 34 gallons |
| **Wine** (1 glass) | 34 gallons |
| **Salad** (includes, lettuce, tomato, cucumber) | 21 gallons |

Information on chart from: https://www.watercalculator.org/water-use/#stuff

By the year 2030, experts predict that global demand for water will outstrip supply by 40 percent.[32] Every region in our country could be impacted by water scarcity due to depleted or contaminated aquifers (from fracking), industrial and agriculture run-off (algae blooms), and human-caused pollution.

- What are the most important water use issues in your area? How well are regulations protecting your water resources?
- What's the connection between individual/household behaviors and bigger water use issues? What changes can you make to reduce your own water footprint? What about on a larger scale?

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- https://smartdesignworldwide.com/ideas/water-watcher-monitor-residential-use/ and
- https://streamlabswater.com/;

examples of leak detectors include:

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- https://getnotion.com/pages/water-leak-detector?gclid=Cj0KCQiAjZLhBRCAARIsAFHWpbEfj_6BcGvVNWv54ZdNbcjc2pT71YDr9p6U7rkiLnC6RFl4e883f3AaAjzUEALw_wcB

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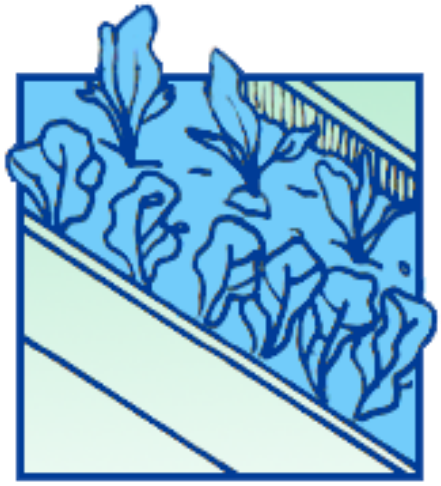
# 4. Food

TRANSITION STREETS



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# Transition Streets
# 4.1 FOOD

The Practical Action Plan

The facts

A strong local food system is essential if our communities are to be more self-reliant, less fossil fuel-dependent, and less exposed to weather and price fluctuations. In times of global shortage and local supply disruption, it's important that we be able to feed ourselves sufficient nutritious food at a reasonable cost.

In the past, communities had more self-reliant food systems. Every region of the country grew its own types of grains, fruits, vegetables, and meat. Family farms, small and mid-sized food processing businesses and distribution businesses were part of a local network rooted in community.

That's not the kind of food system we have today in most places. Our food is grown by big agribusinesses and shipped to us by truck, ship or plane from far away. Food processing has even moved overseas! (In 2017, the U.S. began shipping chickens in China to be processed and then sent back to us.)[1]

A strong local food system is essential if we want our communities to be less dependent on fossil fuels and less exposed to extreme weather and price changes. In times of food shortages – or food recalls, which seem to be increasing in the U.S. – we need to be able to feed ourselves.

By re-investing in local food systems, we can create and support local jobs and vibrant local economies. When we grow our own produce, we can eat a fresh, nutritious food, often within hours of it being picked, with no processing or excessive packaging. Added bonus, we have a smaller carbon footprint.

Each of the actions below helps us reach our goals of having a better food system, stronger community and a smaller carbon footprint. In your group, talk about each item and decide which ones you want to tackle, and when. Record your action plan at section 4.15.




The Practical Action Plan

## What can you do about it?

Each of the actions below can give you tasty, fresh food for less money, fewer $CO_2$ emissions, and fewer negative environmental and social impacts, often while helping to build a stronger local food system.

In your group, have a brief discussion about each item and then decide which ones *you* want to tackle and when. Record your action plan at section 4.19.

- **Buy local, seasonal foods** (4.3)
- **Reduce food waste** (4.9)
- **Try organic** (4.11)
- **Grow your own** (4.13)
- **Eating lower on the food chain** (4.15)

**Food prices:** While food costs have been rising for American households, and now account for 9.9% of disposable income, [2] the average U.S. citizen still spends a smaller percentage of their total budget on food than citizens in any of the other 83 countries tracked by the U.S. Department of Agriculture.[3]

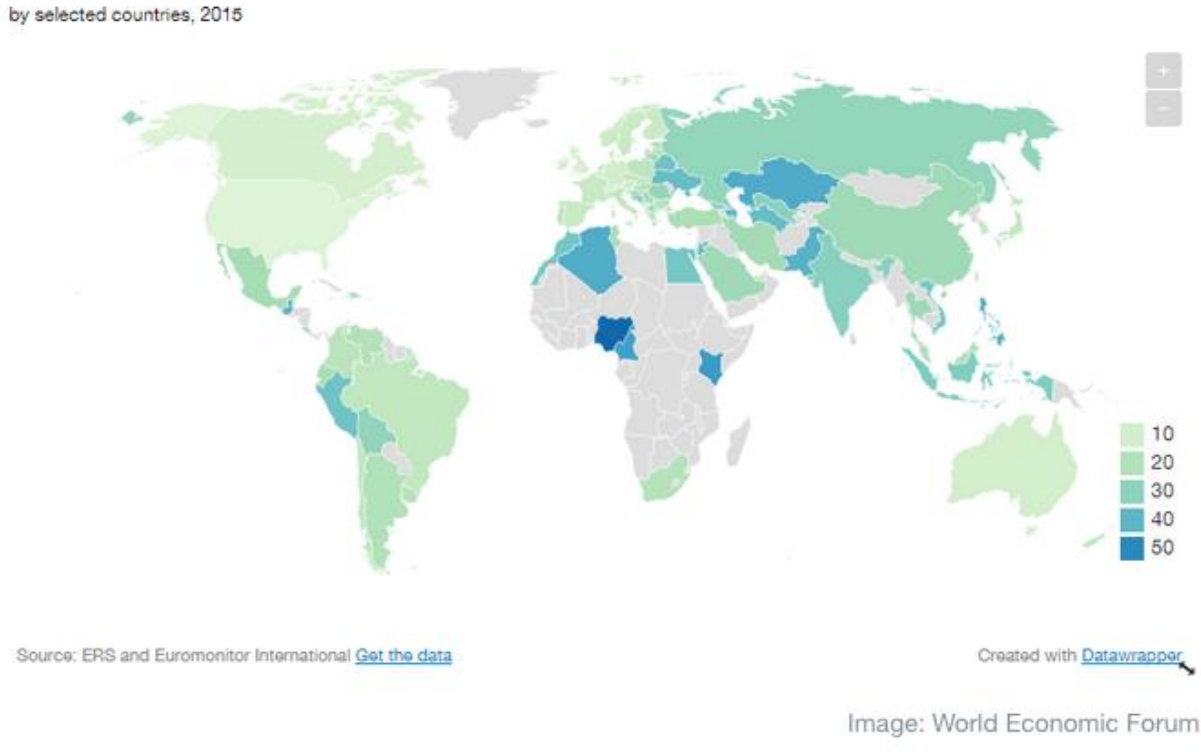



Image: World Economic Forum

# Transition Streets
# 4.3 BUY LOCAL, SEASONAL FOODS

The Practical Action Plan

| Cost: varies | $ Savings: low | Effort: medium | $CO_2$ saved: med-high |
|---|---|---|---|

## Challenge

In the U.S., on average, food travels 1,500 miles from farm to consumer. Your much-loved lettuce and grapes may have flown more than 2,000 miles to reach you.[4] All those "food miles" add up to $CO_2$ in the atmosphere.

Equally problematic, our industrial food system has contributed to the loss of heirloom seed varieties, family farms, local slaughterhouses, local processing plants, local food distribution systems, and small shops. It's hard to compete when only a few companies control the market.


## Solution

Fortunately, this trend is beginning to reverse as people see that buying local strengthens our economy, and the health of families and communities.

Local food is not just about food miles, it's also about food that is produced and distributed in ways that contribute positively to people in your state or region. Local food systems help communities to thrive by:

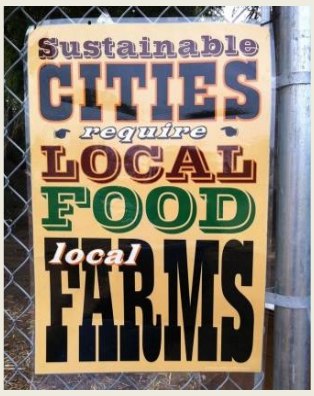
- Providing jobs and supporting business networks
- Distributing food directly in their area
- Creating positive social connections
- Providing healthy, fresh, seasonal food for the community

**Yes, but, ... some food can't be produced locally**. Very rarely can a local region be completely self-sufficient. Trade, if carried out in a fair way, has many positive impacts, including education and improved quality of life. If you are going to buy food that can't be produced locally, do some research to see if you can find products that are produced fairly and sustainably.

The Practical Action Plan

## Supporting local food systems

**Find Your Local Farmers Market (or start one)**. When the U.S. Department of Agriculture (USDA) began publishing its National Directory of Farmers' Markets in 1994, there were 1,755 farmers' markets. By 2018 that number had grown to 8,740[5] and some communities are served by spring and winter markets as well. Check out the Directory of Farmers Markets to find one near you: https://www.ams.usda.gov/local-food-directories/farmersmarkets




**"Pick your own"** options for blueberries, apples, corn, etc. are popular in many regions of the country.

**Join a CSA:** Another popular way for consumers to access fresh, local, seasonal foods is by joining a community-supported agriculture (CSA) program: a partnership between a buyer and a local farmer that guarantees a market for their crop. In 2015, the number of CSA farms in the U.S. numbered almost 7,400.[6] Most are located near urban areas in the New England, Mid-Atlantic, and Great Lakes regions, with growing numbers on the West Coast.


Many CSAs sell only organic produce, but not all – so it's important to ask how the produce was grown. CSA produce generally varies from week to week, depending on what is ready to harvest. Most farms sell only homegrown produce, while some source additional products from other local producers. Many CSAs ask for a list of up to three vegetables you don't like so they can swap those out for something you would want.

CSA boxes are competitively priced and may be cheaper than organic supermarket produce. Some CSAs will deliver to your door, while others deliver to a central location for pickup. Local Harvest (http://www.localharvest.org/csa/) is a great resource to explore what kind of CSA works for you and your family.

Share information about local farmers markets, farm stands, farm tours, and CSAs with your group members.

# Transition Streets
# 4.5 BUY LOCAL, SEASONAL FOODS

The Practical Action Plan

## Savings and benefits

Eating local food from a nearby farm is more likely to be healthy, fresh, and in season – when food tastes best!

Quality is likely to be higher than what you'd get at a big box store.

Local food can be cheaper.

Community Supported Agriculture (CSA) subscriptions save you time on shopping, and your CSA box may even be delivered to you!

You get the joy of connecting with local farmers or market employees, and knowing you're contributing to growing a vibrant local food system.

## Next steps, hints & tips

- Find out if your community has a Local Food Guide.
- Check which foods are in season and how to use them: http://www.eatwellguide.org/
- Do some of your weekly shopping at a local butcher, fish or cheese shop.
- Support local, independent food markets. Ask them to stock local produce.
- Buy direct from a farm stand, CSA or farmers market.
- Try local wine, cider, beer and juice.
- Ask for local, organic food at your school, hospital and workplace.
- Choose restaurants that source their ingredients locally and seasonally (farm-to-table restaurants).
- Visit a local organic farm and learn more about food production (a perfect outing for the entire family).
- Agro-tourism is another way to support a small, local farms. Vacation on the farm this year.

Notes:

# Transition Streets
# 4.6 REDUCE FOOD WASTE

The Practical Action Plan

| Cost: none | $ Savings: low-med | Effort: low | $CO_2$ saved: low-med |
|---|---|---|---|

## Challenge

Food waste is not only a waste problem, it's a moral issue and a major contributor to climate change. The numbers may shock you. In 2017, when 40 million Americans were "food insecure," [7] the U.S. threw away between 30 and 40% of the food it grew or imported. About a third of that was lost in the field and on the farm, about 8% was lost while it waited to be sold, and a whopping 39% of it was lost when it came into our homes or in restaurants.[8]

Food waste is the single largest component (22%) of municipal solid waste reaching landfills and incinerators.[9] Food waste in landfills produces methane, a greenhouse gas 28 to 36 times more potent than $CO_2$.[10]

Wasting food also wastes the energy, water and nutrients used to grow, ship and store it. That waste costs the average U.S. family up to $2,200.[11]

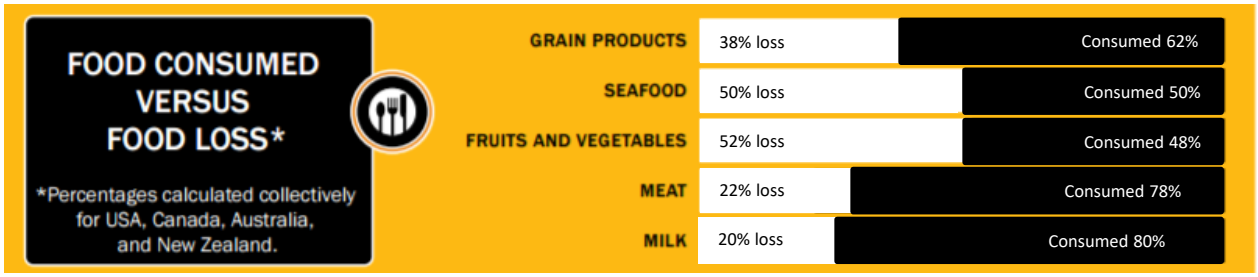



Chart from Food & Agriculture Organization, 2011

## Solutions

How can we reduce all this waste? Better planning when shopping, improving knowledge of food storage, building confidence around cooking, understanding the difference in food date labels, and paying attention to what's in the fridge. See 4.7 for more tips on minimizing food waste.

Some food waste is unavoidable, but composting is a much better alternative than throwing it in the trash. You can start composting at home, or if you live in a community that offers municipal composting, call to get a bin. See section 5.14 for more information on composting.

**Yes, but, ... I don't like leftovers or finding bad food in my fridge.** The easiest way to avoid food waste is to cook – or buy – just the right amount. Practice measuring out food portions so you know what is exactly right for you.

Transition Streets
4.7 REDUCE FOOD WASTE

The Practical Action Plan

## Next steps, hints & tips

- We often waste carbs: rice, pasta, potatoes and bread. Measure portions. (If you are unsure what a portion size is, see this WebMD portion guide: https://img.webmd.com/dtmcms/live/webmd/consumer_assets/site_images/media/pdf/diet/portion-control-guide.pdf
- Use your freezer. Keep bread in the freezer and take out half a loaf at a time. Too much soup or risotto? Freeze it for a lazy day.
- Plan your meals for a week and write your shopping list accordingly. You will save time and spend less.
- Be careful with “buy one, get one free” offers. Will you eat it before it spoils?
- Set a goal for a “no waste” fridge. Have a ”potluck” lunch of dinner leftovers.
- Keep an eye on aging produce and eat it in time or prepare it for storage by canning or freezing.
- Is your fridge set to the right temp? This handy tool is from the U.K. so you’ll have to convert temps but it offers info for many makes of refrigerators. (https://www.lovefoodhatewaste.com/article/chill-fridge-out) (To get degrees F, multiply degrees C by 1.8 and then add 32. For example, 3 degrees C is 38 degrees F.)
- Learn to love your leftovers. Make (and freeze) stock from vegetable trimmings and chicken carcasses. Add one fresh ingredient to leftovers and repurpose them into a tasty stir-fry. Turn old bread into croutons, savory or sweet bread pudding, or soak in water and feed to your chickens. Find more leftover ideas at www.lovefoodhatewaste.com or on sites like Pinterest.
- For more great tips and ideas for reducing food waste, visit: http://foodshift.net/

Notes:

# Transition Streets
## 4.8 TRY ORGANIC

The Practical Action Plan

| Cost: med | $ Savings: none-low | Effort: low | $CO_2$ saved: low-med |
|---|---|---|---|

Food for thought

There are a lot of benefits associated with eating organically grown food.

- Organic methods produce 40% fewer greenhouse gas emissions than conventional agriculture with uses synthetic fertilizers and pesticides.[12]
- Organic agriculture builds healthy soil, which stores more carbon. "A study by the Rodale Institute projects that … if all U.S. cropland—434 million acres—were converted to organic farming, we could reduce nearly 25 percent of our total greenhouse gas emissions."[12]
- Organic growing promotes biodiversity, not only of plants but also pollinators, birds and other creatures.

Many people buy organic food because they believe it reduces their exposure to herbicides and pesticides. It's true that toxic substances can't always be washed off foods. The Environmental Working Group publishes a shoppers guide to pesticides on produce: https://www.ewg.org/foodscores

Others believe that organic produce is more nutritious (though this is a hotly contested field of research).

- A study in the *British Journal of Nutrition* found that organic growing methods boosted nutrients in some foods. For example, organically raised animals that forage on grass had meat and milk with 50% more omega-3 fatty acids.[14]
- Another study found that organic produce had substantially higher concentrations of antioxidants and flavonols that protect cells from damage and reduce inflammation.[14]

And there is ongoing research into the health benefits of organic food. For example, a recent French study followed 70,000 adults for five years and found that the most frequent consumers of organic food had 25% fewer cancers, with a particularly steep drop in lymphomas and post-menopausal breast cancer.[13]

**Do some research on your own.** The Environmental Working Group provides a food score that rates food on nutrition, safety and processing: https://www.ewg.org/foodscores/content/user-guide. The Center for Food Safety also shares information about the benefits of organic agriculture: https://www.centerforfoodsafety.org/issues/306/organic-and-beyond

# Transition Streets
# 4.9 TRY ORGANIC

The Practical Action Plan

## Challenge

**"Yes, but ... organic food is much more expensive."** It is true that organic food usually costs more. It's also true that conventionally grown food costs all of us more than we realize. Here's why.

The true cost of growing any kind of food includes the cost of seeds/plants/animals, machinery and tools, fertilizers or feed, worker labor, harvest and processing, transportation and storage, and the interest the farmer pays for bank loans.

Organically grown food generally requires more intensive management and more workers to ensure timely weed control and a harvest that meets strict regulations. Organic farming is more complicated because multiple crops are needed to maintain crop rotations, in contrast to simpler rotations or monocrops on conventional farms.

Organic farmers may also need to pay to clean up past pesticide contamination at their site.[15] Certification is expensive, as is the conversion of land from conventional farming to organic. And yet organic production practices yield important ecosystem services.

Consumers are paying the true cost for their organic food.

On the other hand, conventionally grown food includes hidden costs due to the use of chemicals that can damage the health of farmworkers, people who live near big farms, consumers and the environment. We pay these costs with higher insurance premiums and with tax dollars for environmental cleanup.

## Hints & tips for paying less for your organic food

- Buy food in bulk with friends.
- You may be able to get organic (or nearly organic) food cheaper as part of a CSA (see 4.4). You may be able to exchange work for a share or a reduced price.
- Grow your own food organically.
- When shopping at a farmer's market, talk directly with farmers about their farming practices. It can take years to get organic certification, but in the meantime they may already be using organic growing methods.

# Transition Streets
# 4.10 GROW YOUR OWN

The Practical Action Plan

| Cost: low | $ Savings: med | Effort: low-med | $CO_2$ saved: low-med |
|---|---|---|---|

## Challenge

2018 was a year of unprecedented food recalls due to contamination (see https://www.foodsafetynews.com/food-recalls/ for the latest news.) Lettuce, beef, turkey, canned corn, breakfast cereal … the list of foods that made people ill was long.

But contamination isn't the only concern. Extreme weather events caused by climate change–droughts and floods, wildfires and extreme heat–are affecting food supplies here and elsewhere. Rising food costs will be felt by everyone, especially the poor.

## Solution

By growing and preserving some of our own food, we become more resilient as families and as communities. Home and community gardens alone can't solve our food supply problems, but they can be one part of the needed solutions.

Only have a balcony to grow on? No problem. You can grow in patio pots, window boxes, and hanging baskets. No outdoor space? Try growing nutritious and easy microgreens or sprouts on a sunny countertop. If you have a yard, add food into your landscape. Think big! Vegetables can be beautiful mixed in with a flower bed (think purple runner beans and fire-engine-red peppers). Add berry and nut bushes, grape vines and fruit trees. The sky's the limit!

**Yes, but…. I have no outdoor space at all.** Join a community garden or a yard-sharing program where landowners share yard space with landless gardeners in exchange for produce. For tips on urban gardening, see: https://www.nal.usda.gov/afsic/urban-agriculture

Image on right from permies.com

# Transition Streets
# 4.11 GROW YOUR OWN

## Savings and benefits

While growing your own fruit and vegetables is satisfying, there are some vegetables that are especially cost-effective to grow:[16]

- No need to worry about a recall of your home-grown lettuce.
- Tomatoes always taste best when sun-ripened and fresh.
- Bell peppers can be costly at the store.
- Swiss chard is a delicate green.
- Broccoli can be harvested more than once.
- Asparagus takes two years to grow, but you can harvest for the next 20.

## Next steps, hints & tips

- Try growing traditional family foods or heirloom vegetables.
- Try growing organically. Take a local or online organic gardening course. Your local extension service or Master Gardeners may offer free classes.
- Consider gardening with a partner or another family.
- Join or start a “crop swap” or “produce exchange,” where fellow gardeners exchange what they have too much of (zucchini?) for things they want more of (cauliflower?). This can include items like fresh eggs or honey. Learn more about swaps: http://cropandswap.blogspot.com/p/what-ithe-crop-swap.html

**Yes, but ... it’s a lot of work!** It takes some effort, but gardening can be fun, beautiful, and a great way to relieve stress and stay fit. Take a look at Toby Hemenway’s permaculture book *Gaia’s Garden* for inspiration.

Notes:

Transition Streets

# 4.12 EATING LOWER ON THE FOOD CHAIN

The Practical Action Plan

| Cost: none | $ Savings: low-med | Effort: low | $CO_2$ saved: low-med |
|---|---|---|---|

Challenge

Americans are big meat eaters, with the third highest rate of consumption per capita in the world. That contributes to our oversized carbon footprint. In the U.S. 42% of agricultural greenhouse gas emissions come from animals.[17]

That's a high price to pay for what turns out to be a low caloric "return on investment" for industrially-produced meat. For example, for every 100 calories of energy put into producing conventional beef, you get only 6 calories of energy back to eat. Apples, on the other hand, yield 110 calories for the equivalent energy input.[18]

There *are* big differences in environmental impact depending on how animals are raised. Those raised in concentrated animal feed operations (CAFOs, or "factory farms") are not only an environmental nightmare, but can also be a health hazard. Many factory farms pollute the air, contaminate surface and groundwater, and overwhelm the ability of ecosystems to absorb waste.

Animals housed in close quarters are routinely given antibiotics both to accelerate their growth and to keep them from succumbing to disease. Widespread use of antibiotics on farms increases antibiotic resistance in bacteria.[19]

Half of all the corn grown in the U.S. and most of the soybean crop are fed directly to livestock, even though this is not their natural diet and can cause liver abscesses, digestive distress and excessive gas.[17] It would be much more efficient–and humane–to let chickens and sheep, goats and cattle graze as nature intended. It would also be better for the land itself. Carbon storage is often higher in land used for pasture than those used for annual crops.[20]

Photo from www.flickr.com (creative commons)

Photo from a Wisconsin family farm

# Transition Streets
# 4.13 EATING LOWER ON THE FOOD CHAIN

The Practical Action Plan

| Cost: none | $ Savings: low-med | Effort: low | $CO_2$ saved: low-med |
|---|---|---|---|

## Solution

Eating lower on the food chain – a primarily plant-based diet -- can help reduce our carbon footprint, especially if we consume food grown locally and sustainably. But a vegetarian diet is not without environmental impacts. For example, industrially produced soy-based meat substitutes can have a significant carbon footprint.[18]

If and when we do eat animal products, we can reduce our impact by buying high quality products produced in an ethical and sustainable manner. For example, were the animals raised on small-scale, diversified farms, provided with space and appropriate food? The meat, eggs or milk from those animals will have a lower carbon footprint than that from animals raised in confinement. Since high quality, grass-fed meat and free-range chickens are more expensive, you may eat less of it. That can have health benefits.

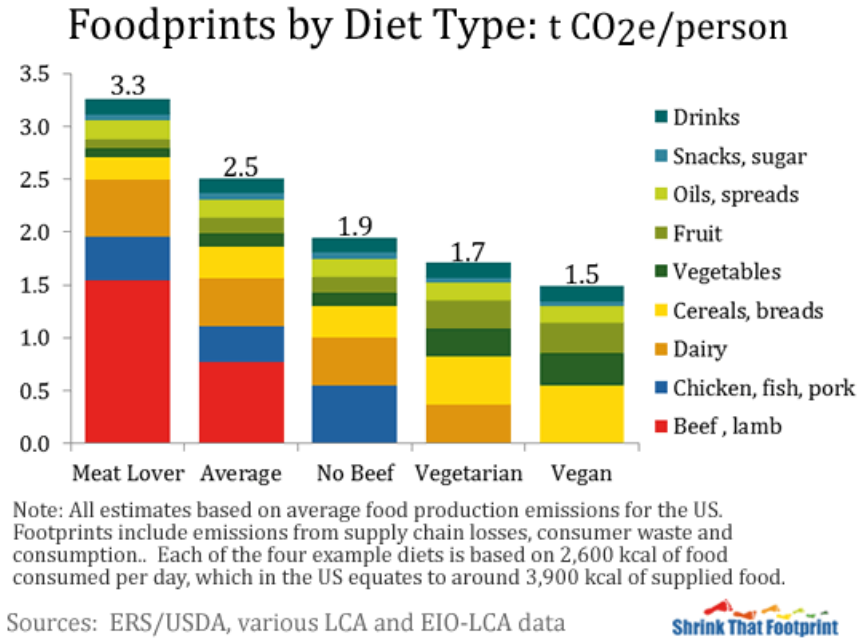



Chart above from shrinkthatfootprint.com

**Yes, but .... I'm already a vegetarian.** Try reducing your impact by going organic with your produce, dairy products and eggs. Buy from local producers. Consider the impact of your meat substitute or protein source.

# Transition Streets
# 4.14 EATING LOWER ON THE FOOD CHAIN

The Practical Action Plan

## Savings and benefits

You'll start saving money on your weekly grocery bill when you buy less meat.

You may improve your health and lower your long-term healthcare costs because a diet with less meat generally has more fiber from fruits and vegetables, as well as less saturated fat.

Evidence suggests that eating a diet rich in vegetables and fruits can increase longevity. This dietary pattern helps to reduce the risk of chronic diseases such as cardiovascular disease and some cancers.

Notes:

## Next steps, hints & tips

- Change the way you see meat.
  - Move it from the middle to the side of the plate and put vegetables, grains, beans and salads in the center.
  - Use it as a flavouring rather than the main course. In many cuisines, meat is used as a condiment.
- Consider ordering meat directly from a producer you know and trust.
- Eat local, pasture-raised meat. Not only is this meat more climate-friendly, it is from a source you can trust.
- You don't have to give up all meat. Try one meat-free day per week. Check out the site "Meatless Monday" for more information, inspiration and recipes: www.meatlessmonday.com
- Choose the vegetarian or vegan option when you go out for dinner.



Transition Streets

# 4.15 YOUR FOOD ACTION PLAN

The Practical Action Plan

Reminder

**Possible actions:**

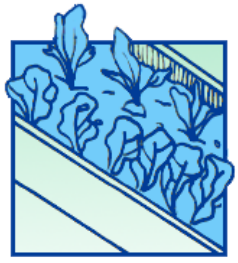
- Buy local, seasonal foods (4.3)
- Minimize food waste (4.6)
- Try Organic (4.8)
- Grow your own (4.10)
- Eat lower on the food chain (4.12)

**What other ideas does your group have that aren't covered above? Add them below if you think they are relevant for you.**

| My actions | Already done | When I'll do this | Notes |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Group actions

How can you help each other out in your group? List team actions here (with named person and due date):



Transition Streets
4.16 LOCAL RESOURCES

## Local resources for food and gardening

Add your own information about local food resources, farms, markets, gardening programs, and more.

**CSAs:**

**Farmers markets:**

**Farm stands:**

**Pick-your-own:**

**Farm tours:**

**Gardening resources:**

**Gleaning and crop swaps:**

# Transition Streets
## 4.17 THE BIG PICTURE: FOOD

Questions for discussion

We saw in the first action that buying local, seasonal, organic food from independent shops has environmental benefits and helps our local economies thrive. However, many of us shop at major supermarkets and membership clubs.

- What benefits do these large chains offer us? What are the downsides?
- How important is a strong, local food system to our town and our community?
- How might “eating low on the food chain” factor into your eating habits?
- How can we share the economic and health benefits of eating fresh, local, and organic food with our family, friends, and neighbors?

Notes:

# Transition Streets
# 4.18 REFERENCES

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# 5. Waste

TRANSITION STREETS

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# Transition Streets
## 5.1 WASTE

The Practical Action Plan

The facts

In 2015, U.S. homes, schools, businesses and hospitals produced 262.4 million tons of municipal solid waste (MSW), also known as garbage. Individually, each of us produced an average of almost 4.5 lbs of waste per day. To put that in perspective, the U.S. produced 88.1 million tons of MSW in 1960, and each American was responsible for just 2.68 lbs a day.[1]

Back in 1960, there was no such thing as recycling. We've come a long way since then, achieving a combined recycling and composting rate of 34.7%, but that rate has stayed basically the same since 2010.[2]

Municipal waste does not include industrial waste, which comprises the majority of our nation's waste stream, but as consumers, we're not off the hook. We contribute to the problem of industrial waste by our consumption of manufactured goods—i.e., all the stuff we buy.

Why should we be concerned about reducing waste?

- **Save resources**—Many discarded products contain resources that are becoming scarce, like precious metals. Using them again saves digging up even more.
- **Save energy**—Making new goods takes energy; better to keep the old ones in use as long as possible.
- **Save money**—Get more use out of things you already own, rather than throwing them away and buying new.
- **Reduce climate change**—Rotting, buried garbage often produces methane, a greenhouse gas 28 to 36 times more potent than carbon dioxide.

**What options do we have for dealing with this waste?**

In order of preference, they are:

1. **Refuse**—Do you really need it?
2. **Reduce**—Do you need as much of it?
3. **Reuse/repair/repurpose**—Can it be fixed, or used by others?
4. **Recycle**—Can it be broken down and used again?
5. **Return to earth (rot)**—Can it be composted?
6. **Landfill and incineration**—The last resort.

The Practical Action Plan

The facts

Each of these actions will help you reduce the amount of waste you produce. In your group, chat about each item and then decide which ones you want to tackle and when. Record your action plan on page 5.16.

- **Understand your own waste.** Let's take a look at what's going out the door each week so we can plan how to reduce it. (5.3)
- **The Story of Stuff.** Learn more about the impacts of our excessive consumption, how it contributes to waste, and what we can do about it. (5.4)
- **Refuse.** Just because it's free, that doesn't mean you need it. (5.5)
- **Reduce.** Enough is just the right amount. (5.6)
- **Reuse, recycle, repurpose, repair.** Before you even think of throwing something away, consider how it could be used again. (5.10 and 5.12)
- **Return to earth: Make your own compost.** This is a great activity for anyone who loves to grow things and is ready to take care of their own compostable waste. (5.14)

As you begin this journey, you may want to get inspiration from others who've tackled waste reduction with great success. For example, Bea Johnson and her family have shared their waste reduction practices at the **Zero Waste Family blog** and website: https://zerowastehome.com/blog/

Notes:

# Transition Streets
# 5.3 UNDERSTAND YOUR WASTE

The Practical Action Plan

## Challenge

Every week, most of us make a trip to the garbage can and recycling bin. We drop in a bag or two (or more) of carefully separated (or not separated) waste and resolve to do better next week. But do we? Would we even know?

Anytime you want to make a change, it helps to know where you are starting from. What kind of "waste" are you actually producing?

- In the U.S., paper and paperboard products make up about 26% of the waste stream. We hear a lot about the "paperless office," but our lives are filled with paper.
- Yard waste is 13.3% of the waste stream.
- More worrisome is the 13.1% of waste in the form of plastics, an amount that continues to grow year after year.
- Finally, about 2% of our waste is consumer electronics.[2]

## Solution

Our first step is going to be cataloging our waste for a week (or a month) so we know what we've got, and then we can decide what to do. Open up the bags and separate it into a few categories.

These are ideas; you may want to pick additional categories:

- **Recyclables**
  - Paper
  - Glass
  - Metal (cans, usually)
  - Some plastic
- **Compostables**
  - Food-contaminated paper
  - Food
- **Non-Recyclables**
  - Electronics
  - Non-recyclable plastics
  - Food packaging (the hardest waste of all to avoid)
  - Misc. trash

If you want to measure your success from week to week, consider weighing and recording your trash and recycling each week.

# Transition Streets
# 5.4 THE STORY OF STUFF

**Watch "The Story of Stuff" video on DVD or online at http://bit.ly/story_of_stuff**

What about all this stuff?


At the heart of our country's waste problem is an obsession with "stuff."

> *"We are using and throwing away too much stuff, more than our share … The U.S. has 5% of the world's population but consumes 30% of the world's resources and creates 30% of the world's waste."* -*The Story of Stuff*

Learn about the real impact of consumption by watching "The Story of Stuff," a fast-paced 20-minute video that looks at the underside of our consumption habits. It's available free online (see link above). After watching the video, choose one or two questions to discuss from the accompanying Discussion Guide: https://www.nwf.org/~/media/PDFs/Eco-schools/annie_leonard_discussion_guide.ashx

Has anyone in your group lived in or traveled in another nation? Did you notice differences in the cultural role of consumption? Differences in the prevalence of advertisements?

Annie Leonard, the producer of "The Story of Stuff," said: "The American economy's ultimate purpose is to create more consumer goods."[3] Do you think that's true? Can that change? Should it?

Leonard said: "… many environmental and social change efforts have come to reflect the centrality of shopping in our culture, suggesting that change can be made … through alterations in our individual consumption patterns. These efforts—buy Fair Trade or organic, use a reusable bag, screw in a CFL lightbulb—are a great place to start, but they are a terrible place to stop."

- Do you think change through mindful shopping is an overall good thing, or a problem?
- How could we move beyond "voting with our dollars"?

# Transition Streets
## 5.5 REFUSE

The Practical Action Plan

| Cost: none | $ Savings: low-high | Effort: low | $CO_2$ saved: med-high |
|---|---|---|---|

Solution

You've probably heard of the 3 Rs: Reduce, Reuse, Recycle. But how about the 5 Rs? **Refuse, Reduce, Reuse (repurpose, repair), Recycle and Return to earth (rot)**.

If we really want to make a difference in waste, we'll have the biggest impact when we change our consumption habits. Refusing what we do not need (even if it's something we've been offered for free – like that T-shirt, sticker or water bottle!) is a first step.

**Reduce Temptation**

- Stop looking at catalogs. Get off the junk mail list by registering at http://www.dmachoice.org
- Reduce your exposure to ads whenever possible.
- Break the habit of shopping as entertainment.

**Understand *Needs* Versus *Wants***

"You can never get enough of what you don't need,
because what you don't need won't satisfy you." — Dallin H. Oaks

Make a list of the things you've bought in the last month (especially those things you didn't plan to buy). Why did you buy it? Was it a real need or a want?

Now think about the things you use every day that bring you pleasure. Take a moment to feel grateful and satisfied.

**Understand Stress Buying**

People in the U.S. have less leisure time now than any time since the feudal period. All that work adds up to a lot of stress, and many people turn to shopping for relaxation. What are some ways we could change our work-life balance to find more satisfaction?

Notes:

# Transition Streets
## 5.6 REDUCE

The Practical Action Plan

| Cost: none | $ Savings: low-high | Effort: low-med | $CO_2$ saved: med-high |
|---|---|---|---|

## Challenge

When we talk about **REDUCE**, we could mean two things: reducing how much we use and reducing how much we waste. These can be interrelated. Pay particular attention to three harmful types of waste: food waste, plastic waste and clothing waste.

In Paul Hawken's book *Drawdown*,[4] reducing **food waste** is identified as #3 of 100 solutions for reducing global warming. That's because food waste is responsible for adding 70.5 gigatons of $CO_2$ into the atmosphere. A shocking 30% of all the food we grow never gets eaten (see 4.6). When food goes into the bin, so does the energy, water, fertilizer and human-power used to grow it.

**Plastic waste** is another huge challenge. It's everywhere – in the furthest reaches of the arctic, inside sea animals, even in the salt we eat![5] Buying – and using – less plastic is a worthy, and sometimes seemingly impossible goal. Try it anyway.

The price of **clothing** has been decreasing for decades, but so has its quality. That's because clothing retailers have learned that the key to higher profitability is "fast fashion" – fashion trends that last a month and clothing that quickly comes apart at the seams.


The movie "The True Cost" documents the impact fast fashion is having on our environment, on garment workers, and on countries where donated clothing get dumped. You can get the movie as a digital download here: https://truecostmovie.com/watch/the-true-cost ($10).

## Solution

Wondering where to start with reducing the glut of clothing in your closet? Try a minimalist approach. It frees up space AND time you don't have to spend trying to figure out what to wear every morning. Before you buy your next sweater or pair of shoes, learn more about the true cost of fast fashion.

# Transition Streets
# 5.7 REDUCE

The Practical Action Plan

Solutions

**What can you do?**

- Trying to reduce how much plastic packaging you bring home from the grocery store? Bring empty jars, reusable containers and bags to fill at the bulk bins. Try the smartphone app ZeroWasteHome to identify stores in your area that sell items in bulk.
- Before you go-big at the warehouse club with a 5 lb. bag of salad, think about how much your family can really eat before it goes bad. Buying in bulk only works if you can properly store the food or promptly eat it.
- Understand the “best by,” “sell by” and “use by” dates on food.[6] Most Americans misunderstand these dates and throw away perfectly good food.
- If food does go bad, compost it (see 5.10) or start a worm bin.
- Look for products with little or no packaging. Choose products with recyclable packaging over non-recyclable plastic packaging.
- For items you don’t use often (for example, tools, lawn mowers, equipment), see if you can borrow or rent rather than buy them.
- Rather than throwing away clothes and shoes, look for places where you can get things repaired: a local tailor or a shoe repair shop. You can also learn how to mend from watching videos online or from old books.
- Learn how to properly and promptly clean clothes to prevent stains. You can find videos online.

Notes:

# Transition Streets
# 5.8 REDUCE FOOD PACKAGING

The Practical Action Plan

| Cost: none | $ Savings: none-low | Effort: low | $CO_2$ saved: low-med |
|---|---|---|---|

## Challenge

According to the Environmental Protection Agency (EPA), food and food packaging accounts for almost 45% of the material in landfills in the U.S.[7] Food packaging is a significant portion of trash discarded by the public.

In addition to producing unnecessary waste, packaged, pre-chopped vegetables go bad faster and often cost more.


## Solution

Reduce the amount of food and packaging you throw away by planning ahead, buying fresh ingredients, growing your own food, and wasting less (see hints and tips on the following page).

Packaging we can't avoid can sometimes be disposed of through reuse or recycling rather than sending it to a landfill.


**EPA Food Recovery Challenge:** To reduce the amount of food and packaging that reaches landfills, the EPA started the Food Recovery Challenge. Visit http://www.epa.gov/foodrecoverychallenge/ for resources, including an assessment tool for tracking food and packaging waste.

# Transition Streets
# 5.9 REDUCE FOOD PACKAGING

The Practical Action Plan

## Next steps, hints & tips

- Buy fruit and vegetables loose or in paper bags from local shops.
- Purchase dry goods (nuts, rice, etc.) from the bulk section. Start to think of shopping as “refilling.” Bring your own containers (jars, bags, etc.) to refill.
- Take bags with you to the store (keep them in a place where you’ll be sure to remember them, like a bike basket or the trunk of your car).
- Take along your own reusable container or “doggie bag” for leftovers when you eat out.
- Choose larger sizes rather than individually packaged portions – but only if you will eat the food or promptly prepare it for storage.
- Your local co-op, high-end grocery store, or specialty shop may have products like oil, vinegar, syrup, shampoo, soap and cleaning products in large containers for refilling containers you bring from home.
- Look for biodegradable and recyclable packaging, such as cardboard.
- Look for milk in reusable glass bottles.
- Ask the store managers what they're doing to reduce packaging and encourage them to step up their efforts.
- Many towns, cities, and even the state of California are banning single-use plastic bags. Join them by saying “no” to plastic at the checkout counter.
- Start a neighborhood bulk-buying club to save money and packaging. Here’s a great resource to get started: http://www.smallfootprintfamily.com/how-to-start-a-food-buying-club.
- Make a list of all the food products your group members make from scratch instead of buying (salad dressing, yogurt, bread, butter, hummus, etc.). Share recipes!

Notes:

# Transition Streets
# 5.10 REUSE

The Practical Action Plan

| Cost: none | $ Savings: low-med | Effort: low | $CO_2$ saved: low-med |
|---|---|---|---|

## The reuse economy

Reuse businesses are a vital part of the local economy in many states, and bring a variety of benefits to the community.

- Reuse businesses tend to be small and locally owned, providing local jobs.
- During tough financial times, reuse businesses increase economic resilience.
- Reusing materials reduces the demand on natural resources.
- Upcycling and repairing products reduces the energy used to create new products and keeps old products out of the landfill.


## Solutions

**What you can do**

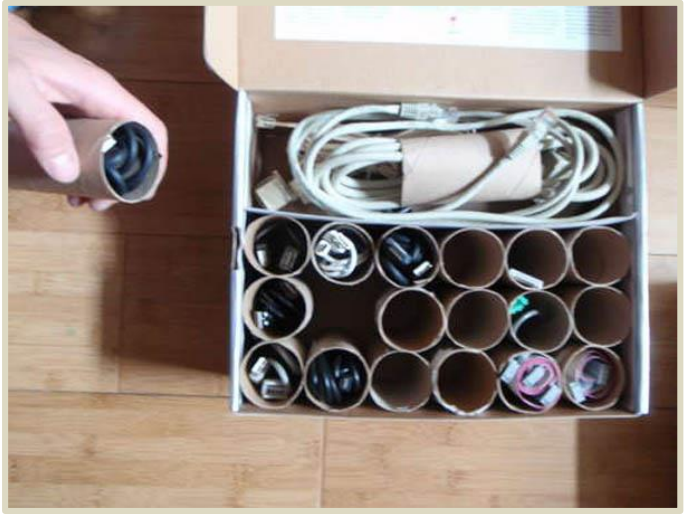
- If something is broken, repair it instead of throwing it away and buying new.
- Consider organizing a neighborhood Repair Café to create a culture of reuse: https://repaircafe.org/
- When you need something, look first at consignment shops, thrift stores, and online at websites like Freecycle, Craigslist, Ebay, NextDoor, and Buy-Swap-Sell groups on Facebook.
- Sell your used things online, or donate rather than throwing away. You would be surprised at the things people want!
- Give old magazines to a neighbor, doctor's office, school or a Little Free Library.
- Rather than disposables, get durable and reusable cups, drink cartons, napkins, plates and cutlery. You can even find foldable items you can take with you on the go in a purse, laptop bag, or glove compartment.
- Use rechargeable batteries instead of disposable ones. They pay for themselves.
- Buy things that are made from recycled materials and are recyclable.

# Transition Streets
# 5.11 REUSE

## Creative reuse

The internet is full of ideas for creative reuse of household objects you might otherwise throw in the trash. Here are a few ideas to get you started:

- Pinterest: https://www.**pinterest**.com/
- 30 Creative Ways to Repurpose and Reuse Old Stuff: http://www.boredpanda.com/creative-reuse-upcycling-repurposing-ideas/
- 50 Creative Ways to Repurpose, Reuse, and Recycle Old Things: http://twistedsifter.com/2012/06/creative-ways-to-repurpose-reuse-and-upcycle-old-things/




Upcycling Ideas: used tires as a playground (Pinterest), toilet paper tubes to organize cables & cords, old credit cards become guitar picks (Twisted Sifter)

# Transition Streets
# 5.12 RECYCLE

The Practical Action Plan

| Cost: none | $ Savings: none-low | Effort: low | $CO_2$ saved: low-med |
|---|---|---|---|

Challenge

Recycling conserves important raw materials, energy and natural habitats, and also reduces greenhouse gas emissions. Because recycling keeps valuable resources in circulation, it helps keep down the cost of goods you buy.

The precise benefits depend on the material you're recycling. For example, recycling aluminium saves 95% of the energy of making it from scratch, while recycling glass saves around 25%. That said, glass can be recycled again and again without losing its strength or purity, unlike other materials.


In the U.S., we recycle and compost 34.7% of municipal solid waste, (not including backyard composting).[2] Some cities do much better than that. San Francisco boasts a recycling/composting rate of 80%, with a goal of zero waste to landfill by 2020.[8] Unfortunately, many municipalities have little to no local infrastructure for collection of recyclable materials.

We have the technology to recycle (and upcycle) much more than we do, from empty aerosol cans to batteries to bicycles. Some things are still beyond the reach of most municipal recycling programs and require extra effort on our part.

**Yes, but... doesn't most of what we recycle just end up in a landfill somewhere?** If you pay attention to your local recycling guidelines and are careful to place only the correct items in your recycle bin, they will be recycled. Although the greatest environmental benefit occurs when recycling is done locally, even if it's recycled in another country there can be significant carbon savings compared to using raw materials.

Transition Streets
5.13 RECYCLE

## Next steps, hints & tips

- Make space next to your bin for recycling containers so it's as simple to recycle as it is to throw away. You can use cardboard boxes, bags, or stacking plastic containers.
- Try putting a sign on your trash can that reminds you to reuse and recycle.
- Look at a local recycling guide or map of recycling drop-off centers to find out what is available in your area. Share that information with your group.
- With glass jars, just rinse and recycle them. Don't worry about removing labels. Metal lids can be recycled too.
- Bathroom products are often forgotten. Rinse out empty bottles while you're in the shower. Even cardboard toilet paper tubes can be recycled or composted.
- With neighbors, organize shared trips to recycling sites for hazardous waste.
- Check the website of your city or county to find out what can be recycled locally and check www.earth911.com to see where to send the stuff that can't. Some examples:
  - Used mobile phones can be sent free of charge to several charities.
  - Old eyeglasses can be donated to Lions Club International for reuse.
  - Used printer cartridges can sometimes be taken back to stores that sell them or shipped back to the manufacturer.

## Hazardous waste

Chemicals in hazardous waste can be released into the environment to contaminate our air, water, and possibly the food we eat. Throwing hazardous waste in the garbage is also hazardous to your garbage handlers.

In some states things like batteries, paint, motor oil, electronics and other toxic wastes are banned from the landfill. These materials must be taken to special collection sites.


Transition Streets

# 5.14 RETURN TO EARTH: COMPOST

The Practical Action Plan

**Cost: none** | **$ Savings: low** | **Effort: low** | **$CO_2$ saved: low**

## Why compost?

When we throw food in the trash, we waste money, take up space in landfills, and create methane gas (see 4.6). Turning that food into compost not only avoids those emissions, it actually improves soil so that it can do an even better job of carbon sequestration (keeping carbon in the ground).

In some U.S. communities, food scraps and food-soiled papers are collected curbside. In other communities, there are volunteer-run public compost sites.

If these options aren't available to you and you grow anything at all, then with very little effort you could soon be making your own homemade compost — a climate-friendly alternative to store-bought, peat-based versions.

The first benefit of composting that you'll notice is a flourishing garden or window box. Compost improves the nutrient levels of your garden's soil, reduces the need for other fertilizers, increases water retention and reduces erosion.

| Do compost | Don't compost |
|---|---|
| Fruit and vegetable waste and peelings | Meat, fish or dairy—attracts vermin and flies (unless you're using a Bokashi system) |
| Tea bags and coffee grounds | Hard objects like fruit pits |
| Crushed egg shells | Invasive weeds |
| Grass cuttings, leaves | Pesticide-treated plants or yard waste, including leaves from treated trees |
| Shredded paper, soft cardboard, and soiled paper napkins (unbleached) | Glossy paper or shiny cards—because of the chemicals used in the printing process |
| Human and animal hair | Sawdust from pressure-treated plywood/lumber |
| Vacuum dust (only from woollen carpets) | Non-biodegradable materials such as plastic, glass, or metal |
| Manure & bedding from animals that eat ONLY plants | Cat or dog excrement—contains pathogens that won't be killed in the decomposition process |

# Transition Streets
# 5.15 MAKE YOUR OWN COMPOST

The Practical Action Plan

## Getting started

You can make a traditional compost heap or use a worm bin. There are many types of compost bins on the market, although perfectly satisfactory ones can be constructed from scrap timber, trash barrels, bricks, or wire mesh. Instructions for making compost or worm bins are widely available.

A worm bin is a container housing a colony of red wiggler worms, ideal for composting. Worm bins can be kept indoors (in a basement, under the sink, or in a closet) or outside in warm climates. They produce worm castings (compost) and a liquid that forms a concentrated plant food ("compost tea"). There are a variety of worm bins available for sale, complete with "worm starter kits," or you can make your own. Not all compostable materials are good worm food, so do a little research on vermiculture before you get started.

Photo at right: Transition founder Rob Hopkins visits a community compost site run by Kompost Kids in Milwaukee, WI.

**Yes, but ... I only have pots and window boxes, not a garden.** You don't need to have your own garden to want to properly process food waste. Once the composting stage is over, you can add the worm castings and compost tea to a window box or give it to a neighbor who gardens.

**I have absolutely no space for a compost or worm bin**. Find a neighbor who is an avid gardener or composter and ask if you can bring your organic waste to them once or twice a week to add to their compost bin.

***Additional Resources:*** For composting tips and instructions to make your own composters or worm bins see:
http://www.treehugger.com/lawn-garden/4-diy-compost-bins-you-can-build-one-day-video.html
http://www.wikihow.com/Make-a-Worm-Compost-System
http://www.recyclenow.com/reduce/home-composting/making-compost

Transition Streets

# 5.16 YOUR WASTE ACTION PLAN

The Practical Action Plan

Reminder

**Suggested actions:**

- Understand your waste (5.3)
- Learn about "Stuff" (5.4)
- Refuse (5.5)
- Reduce (5.6)
- Reduce food packaging (5.8)
- Reuse (5.10)
- Recycle (5.12)
- Return to earth: compost (5.14)

**What other ideas does your group have that aren't covered above? Add them below if you think they are relevant for you.**

| My actions | Already done | When I'll do this | Notes |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Group actions

How can you help each other out in your group? List team actions here (with named person and due date):

Transition Streets
5.17 LOCAL RESOURCES

## Where to go for local information

Add your own information about local resources, grants, contractors, etc. for each of the energy-saving actions below.

**Recycling services:**

**Recycling guidelines (which items are accepted):**

**Hazardous waste guidelines & recycling options:**

**Where to recycle electronics:**

**Where to recycle batteries:**

**Local resources for upcycling and creative reuse:**

Transition Streets

# 5.18 THE BIG PICTURE: WASTE

Questions for discussion

Waste is a factor in almost every part of our daily lives. At some point along your waste-reduction journey, you will find your actions at odds with consumer culture and you'll make choices that are unpopular or confusing to people close to you. Don't let that undermine your commitment.

It helps to have a community of like-minded folk you can connect with, who will understand and support you in your commitments. Plan now how you will get support and encouragement.

- Find a supportive Facebook group, like the Non-Consumer Advocate, or a local Zero Waste group. You may find your community's solid waste department or local recycling company is active on Facebook.
- Consider hosting a book group to read one of the popular decluttering books, or a movie night to watch "The Minimalist" movie. Then keep the momentum going by challenging each other to take an action.
- Look for a Minimalist group in your area on Meetup, or a frugal living group on Craigslist.

Waste reduction is more challenging than you think in a throw-away culture. Give yourself the skills and support you need to succeed.

Notes:

# Transition Streets
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Additional resources

**Documentary films about garbage and reducing waste**

- **REUSE: Because You Can't Recycle the Planet** *http://www.reusedocumentary.com/*
- **No Impact Man** *https://colinbeavan.com/search-no-impact/*
- **DIVE! Living Off America's Waste** *http://www.divethefilm.com/default.aspx*
- **Trashed: No Place for Waste** *http://www.trashedfilm.com/*
- **Garbage Warrior** *http://www.garbagewarrior.com/*
- **Waste Land** *http://www.wastelandmovie.com/*
- **Addicted to Plastic** *http://watchdocumentaries.com/addicted-to-plastic/*
- **The Story of Stuff** website carries several relevant videos, including *The Story of Microfibers, The Story of Electronics, The Story of Bottled Water,* and in 2019, *The Story of Plastic.* You may also want to watch *The Story of Change* for inspiration on actions to create change. They also offer a curriculum for students, grades 9-12, entitled "Buy, Use, Toss?"

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# 6. Transportation

TRANSITION STREETS

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The Practical Action Plan

The facts

Since transportation accounts for 28% of greenhouse gas emissions in the U.S., our decisions about how we get from A to B can have far-reaching effects.[1]

The majority of the world's vehicles are powered by oil. Planes, trains and cars all contribute to the growing concentration of greenhouse gases and pollution. Even trains and cars powered by electricity indirectly rely on fossil fuels being burned in power stations. But how do these modes of transportation compare and which is the worst?

Let's look at the variation in $CO_2$ per passenger mile between different methods of transportation. You'll see that cars use significantly more $CO_2$ per passenger mile than public transit.[2]

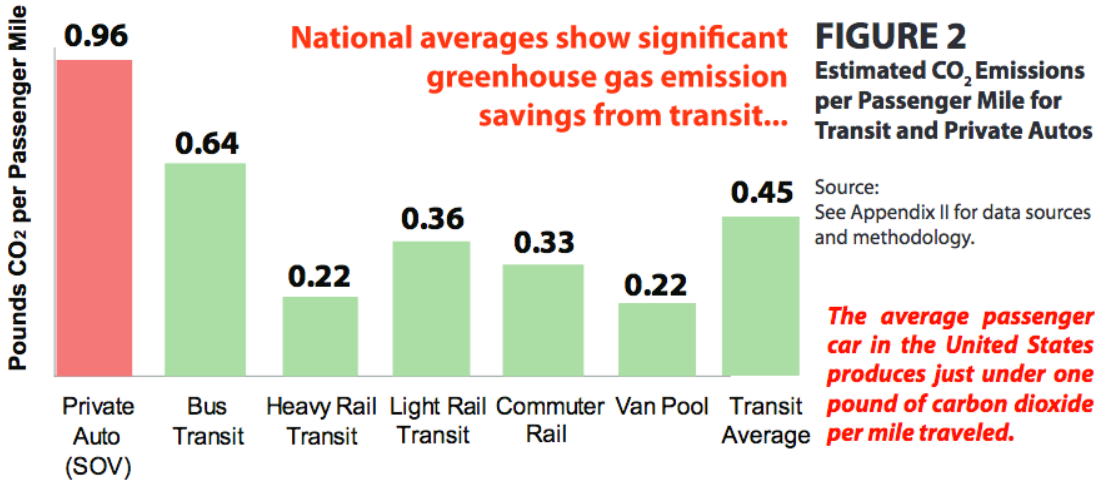



**FIGURE 2**
**Estimated $CO_2$ Emissions per Passenger Mile for Transit and Private Autos**

Source:
See Appendix II for data sources and methodology.

***The average passenger car in the United States produces just under one pound of carbon dioxide per mile traveled.***

While cars get us around in comfort and convenience, they are costly in a variety of ways: vehicle accidents are a primary source of injury and death, they are expensive to operate and repair, traffic congestion and parking add to daily stress, and car-focused urban planning leads to communities more comfortable for cars than people.

We now know that pollution from car exhaust has significant health impacts, from increased asthma attacks in children to dementia, impaired lung function and COPD in adults.[3] Research points to the role of particulate matter in car exhaust as a factor in the worldwide increase in Type 2 diabetes. In 2016, an estimated 8.2 million lives were lost globally to pollution-linked diabetes.[4]

The Practical Action Plan

The facts

There are many good reasons to cut back on our use of personal vehicles: saving money, improving health, less stress, more peace and quiet, and reducing carbon in the atmosphere.

The EPA's Green Vehicle Guide asks us to imagine: "What if we kept our cars parked for trips less than one mile?" What if we walked or rode a bike? The savings would be tremendous. In 2009, car trips under one mile accounted for 10 billion miles.[5]

And what about the daily commute? According to the U.S. Department of Energy, most one-way car trips (59.4%) are less than 6 miles.[6] It may be both time- and cost-effective to consider carpooling, busing or taking a train for those miles.

It can be very useful to complete a travel diary to help you understand your travel habits and needs, especially your regular trips (see a sample on page 6.19). Armed with information, you can identify which actions mentioned below may be most appropriate for you.

Some actions will cost little or nothing; others may have a cost that is offset by savings. In your group, talk about each item and then decide which ones you want to tackle and when. Record your own action plan.

- **Walk this way** (6.3)
- **Get on your bike** (6.4)
- **Take buses and trains** (6.6)
- **Try car sharing** (6.8)
- **Try carpooling** (6.9)
- **Fuel-efficient driving** (6.11)
- **To fly or not to fly?** (6.13)
- **Vacation locally** (6.15)


**Photo from Transition Culver City, CA Bike Parade**

# Transition Streets
# 6.3 WALK THIS WAY

The Practical Action Plan

**Cost: none** | **$ Savings: varied** | **Effort: varied** | **$CO_2$ saved: varied**

## Challenge

Walking is the greenest and one of the healthiest forms of transportation, but Americans don't do nearly enough of it. In 1969, 89% of children walked to school; by 2007-2008 that figure was 14%. Recent surveys by the National Center for Safe Routes to School show a promising rise in biking and walking.[7]

## Savings and benefits

- Walking is free! You'll save money on gas, parking, insurance, and repairs. That could add up to many thousands of dollars a year!
- Walking releases endorphins, the body's happiness hormone. People who walk 8 minutes or more a day report better mental health.[8]
- Walking has many health benefits. It strengthens your heart, reduces your blood pressure, increases bone density, and even reduces the risk of developing chronic diseases like Type 2 diabetes. [8]
- More pedestrians in an area reduces crime because there are more "eyes on the street." That benefits everyone! [8]

## Next steps, hints & tips

- For short trips, walking is the easiest way to cut back on car use.
- If you start to use mass transit, you may find that you automatically do more walking to get to and from transit stops.
- Join a group. Healthy walking programs are often organized by employers, healthcare organizations and municipalities.
- Join or organize a "walking school bus" for your children's school.
- Comfortable walking shoes and rain gear are essential. Wheeled shopping carts help with the shopping load.
- Consider getting a pedometer to measure your progress.

**Yes, but ... It's raining and cold.** Follow the lead of outdoor enthusiasts who say: "There's no such thing as bad weather—just poor clothing choices." Get some good rain gear, waterproof shoes or boots, a windproof jacket, and a sunhat. You may even be able to find it used. Consider bringing a backpack to store your gear upon arrival at your destination.

**Yes, but ... I don't have time.** As you begin to walk more, you will learn how much time it takes to get from A to B.

# Transition Streets
# 6.4 GET ON YOUR BIKE

The Practical Action Plan

**Cost: low-med** | **$ Savings: varied** | **Effort: varied** | **$CO_2$ saved: varied**

## Challenge

Good news! The number of trips made by bicycle in the U.S. more than doubled between 2001 and 2009. In Bicycle Friendly Communities (BFCs), the rate of bicycle commuting increased 105% (versus 31% in non-bike-friendly cities). [10]

There is real momentum to the trend of bicycle use not only for leisure, but also as a primary mode of transportation. But there is plenty of work to be done to make biking a safe and accessible option in many cities and townships across our nation.




## Savings and benefits

- Depending on distance and traffic, you may be able to arrive at your destination faster by cycling than by driving.
- You can save thousands of dollars on gas, car maintenance and parking costs, and hundreds on bus or train fare.
- It's relatively inexpensive. After your initial investment, it costs around $100 a year or less to maintain a bike. (And you may be able to find a decent bike used.)
- Bicycling is an aerobic workout with multiple health benefits. It builds muscles and bones, burns fat and improves cardiovascular health and balance.[9] Plus, it's fun!

**Yes, but ... what about safety?** As our roadways become more multi-use, we have to learn new skills and teach more awareness to drivers of motor vehicles. Look into local bike safety programs and groups that are promoting safe multi-use transportation infrastructure, like Complete Streets.[10] Learn and teach cycling skills with programs like the League of American Bicyclists Cycling Coaches: https://bikeleague.org/content/league-cycling-coaches

Transition Streets
6.5 GET ON YOUR BIKE

The Practical Action Plan

## Tips for safe, enjoyable cycling

- You can buy a perfectly serviceable bike from a local bike shop, thrift store, or Craigslist.
- You can do most (or all) of your own bike maintenance. See http://bicyclehabitat.com/how-to/a-simple-bike-maintenance-chart-pg366.htm
- If you have physical limitations, are a bit out of shape, will be climbing a lot of hills along your route, or want to take longer trips, consider an electric bike (or converting your bike to electric by adding an electric wheel). Be sure to try a few before you buy. Different models provide different levels of assistance.
- Balance issues? Consider riding a trike – it's more stylish than you think!
- If you will be traveling with your bike by plane or train, consider a folding bike.
- Be ready to ride. Keep your bike maintained, accessible and loaded with a lock, lights, helmet and rain gear.
- Transform your bike with panniers (side saddles), baskets and a rack to accommodate shopping trips.
- Work out your regular travel routes and try them on your bike, especially ones that are within a five mile radius of where you live.
- Try biking on alternate days, or practice "car-free" Mondays.
- Plan ahead. Leave enough time to get there in a leisurely fashion.
- If parking your bike in the city, check out where you can securely store your bike. Some cities have bike lockers for rent.
- Find a safe bike route to school for your children. Check Safe Routes to School (https://www.saferoutespartnership.org/). Cycling to school, either on a tandem bike or independently of your child, or with them in a trailer or bike seat, is a great way for kids to learn road safety and get some exercise.
- Join your local cycling group and gain confidence. Or "buddy up" with someone who does the same route as you do.

**Schwinn Meridian model adult trike**

# Transition Streets
# 6.6 TAKE BUSES AND TRAINS

The Practical Action Plan

**Cost: varied** | **$ Savings: varied** | **Effort: varied** | **$CO_2$ saved: varied**

## Challenge

The average gasoline-powered vehicle on the road today gets 22 miles per gallon and emits 404 grams of $CO_2$ per mile. Over the course of a year of average driving, that adds up to 4.6 metric tons of carbon dioxide.[11] Multiply that by the 85% of Americans who travel to work by car and you can see that we've got a real problem.

City buses, long-distance buses and trains consume a lot of energy, but when you divide that energy (and greenhouse gas production) by the number of passengers, these vehicles are usually a far more climate-friendly option. From a carbon perspective, motor coaches and trains are among the lowest emission choices you can make, especially on shorter (less than 500-mile) trips.

## Savings and benefits

- If you can get by using only public transportation (supplemented with occasional carpooling and car-sharing), you could sell your car and see a huge cash savings. (See what the Kelly Blue Book says about ownership and operating costs for your particular vehicle: https://www.kbb.com/new-cars/total-cost-of-ownership/)
- Some states and employers offer financial incentives or tax breaks for commuting by public transportation.
- Taking a bus saves money on parking, as well as time if the bus has a reserved lane or right of way in heavy traffic.

# Transition Streets
# 6.7 TAKE BUSES AND TRAINS

## Next steps, hints & tips

- If you've never taken a bus before, ask an experienced friend to take a trip with you.
- Plan your most common trips in advance. You can use the transit provider's website or Google maps. Using Google, click on Directions, and choose the bus or train icon.
- When on the bus, pick up a paper bus/train schedule for the routes you normally take and keep one at home and one with you.
- Or, add a phone app to your smartphone for local transit providers so you can check on schedules and routes.
- See if your employer offers incentives for taking the bus to work.
- Buy Amtrak Multi-Ride Tickets and become a Guest Rewards member (http://www.amtrak.com/home).
- Try Megabus (http://usmegabus.com/) and Greyhound.
- When on vacation, try to use local mass transit to see the city as the locals see it. You'll save a lot of money on car rentals.

## Local resources

Complete this section with local resources (helpful websites, recommended train and bus routes, public transit incentive programs, etc.)

Notes:

# Transition Streets
# 6.8 TRY CAR-SHARING

The Practical Action Plan

**Cost: medium** | **$ Savings: med-high** | **Effort: low** | **$CO_2$ saved: med-high**

## Challenge

Are you hostage to the costs of a car you hardly use? AAA estimates that the true cost of owning and operating a new vehicle in 2017 was $8,469 annually – and that's a new car, before the repair costs start adding up![11] But can you really get rid of a car completely? What could you use instead where a car is the only option?

## Solution

A "pay-as-you-go" car-sharing service could be the answer, providing you flexibility while also saving you money. Car-sharing services like Zipcar (https://www.zipcar.com), Car2Go (https://www.car2go.com/US/en/) and Hour Car (https://hourcar.org/) are membership organizations that exist in dozens of major cities. For very low fees, you can book the use of a car online or from your cell phone, and pay for the time and miles you use. Infrequent drivers save money and generally cut their mileage by about two-thirds.

You could set up a car-share agreement with roommates or close neighbors. The book, *The Sharing Solution*, by Janelle Orsi and Emily Doskow,[12] offers guidelines on how to set up sharing contracts.

## Savings and benefits

Car-sharing members save an average of $500 each month compared to folks who own and operate their own cars—and you won't have all the hassle of cleaning, insuring and maintaining a vehicle.

Each car-sharing vehicle replaces 6-10 vehicles on the road and in parking lots. Car-share members tend to combine trips, leading to significant carbon savings. They also tend to replace short trips with walking, cycling and public transportation.

**Yes, but ... will I really save money? I need to use my car a lot.** Car-sharing services are less valuable for frequent drivers. As a guide, if you drive five or more times a week, it may not be the right choice for you. You could consider carpooling.

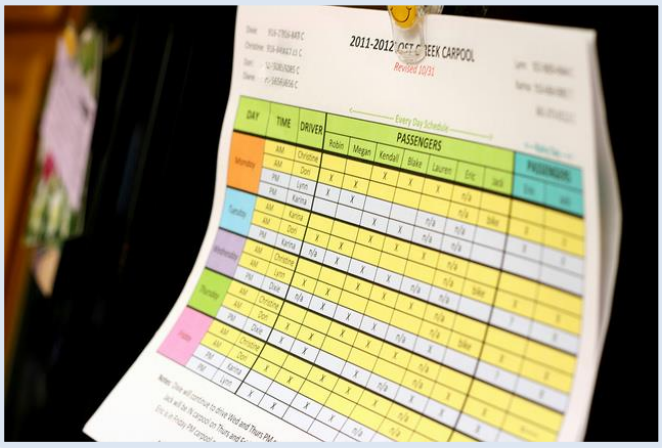
# Transition Streets
# 6.9 TRY CARPOOLING

The Practical Action Plan

| Cost: low | $ Savings: med-high | Effort: low-med | $CO_2$ saved: med-high |
|---|---|---|---|

## Challenge

Currently 76% of Americans drive to work alone, putting 115 million cars on the road and resulting in traffic congestion, stressful commutes and high levels of carbon emissions. Only 9% of Americans carpool, and 77% of carpoolers travel with just one other person.[13] Think of all those unused seats!


## Solution

Give carpooling a try! By having more than one person using a vehicle, carpooling reduces each person's travel costs as well as the environmental cost of driving. In 2014, carpoolers saved $1.1 billion and 85 million gallons of gas, while eliminating 56,000 miles of traffic. If everyone carpooled once a week, traffic congestion could decrease by an additional 20%.[14]

According to Wikipedia, most carpools in the U.S. involve family members, but it could be friends going to a movie together, fellow students getting to school together, or coworkers going to work. You can start carpooling just by asking someone for a ride, or you could use an online carpooling website or app, like:

- Waze (https://www.waze.com/carpool)
- CarpoolWorld (https://www.carpoolworld.com/)
- Rideshare (https://www.shareyourride.net)
- Your local mass transit company may also offer carpool assistance

# Transition Streets
# 6.10 TRY CARPOOLING

The Practical Action Plan

## Savings and benefits

- Save money on parking and gas, compared to driving alone.
- Make new friends you wouldn't have met otherwise.
- Use the carpool lane and avoid the worst of rush hour traffic.
- Your employer may provide commuter benefits for carpooling and other alternative transportation. Your employer may even assist with carpooling matches.
- Reduce stress from being behind the wheel all the time; share the responsibility of driving.

## Next steps, hints & tips

- Use social media, such as Facebook and online community boards such as Craigslist, to find ride-shares.
- Check to see whether your local public transit authority offers help with ridesharing or has a guaranteed ride home service for people who use car- or van-pools.
- The book, *The Sharing Solution* (Nolo Press) also has a chapter on carpooling, with issues to consider before you start sharing, and a sample written agreement.

**Advice on personal safety** (which applies to anyone who shares a car with a stranger): Everyone is responsible for their own safety. Avoid exchanging home addresses with your traveling companion before you meet them. Arrange to meet in a public place. You are under no obligation to go ahead with any carpooling arrangement. If you have any doubts about your traveling companion, for any reason, you should avoid traveling with them.

Notes:

# Transition Streets
# 6.11 FUEL-EFFICIENT DRIVING

The Practical Action Plan

| Cost: none | $ Savings: low | Effort: low | $CO_2$ saved: med |
|---|---|---|---|

## Challenge

Every vehicle has a sweet spot where speed and fuel economy meet. That's the most efficient speed to drive. For most vehicles that's about 50 mph. Each 5 mph over 50 is like paying an additional $0.22 per gallon.[15] Aggressive driving – with quick accelerations and sudden starts and stops – lowers gas mileage by as much as 33% at highway speeds, and by 5% around town.

## Solution

Changing *how* you drive could save more energy than changing *what* you drive. Fuel-efficient driving has a significant impact on our fuel use and, therefore, our emissions.

Sensible driving is also safer for you and for others, saving lives as well as money. [15]


**Yes, but ... If I close the windows and switch off the air conditioning in July, I'll cook.**
If you're overheating on the freeway, it's more fuel efficient to use AC than opening the window or sunroof. At lower speeds, opening windows is more efficient.

Notes:

Transition Streets
6.12 FUEL-EFFICIENT DRIVING

The Practical Action Plan

## Tips for better fuel efficiency

- Get your car serviced regularly so it's operating at peak performance levels.
- Stay at or within the speed limit.
- Keep your tires inflated to the correct pressure. Under-inflated tires create more resistance when your car is moving, so your engine has to work harder.
- Improve aerodynamics and reduce drag by leaving the roof rack at home and closing the windows and sunroof.
- Be gentle with your right foot: rapid acceleration takes a toll on your fuel economy.
- Anticipate road conditions and drive smoothly, avoiding sharp acceleration and repeated braking.
- Don't idle! This is a hold-over behavior from older cars. Idling uses more fuel in ten seconds than turning the engine off and on. Drive away immediately when starting from cold.
- Check your revs. Move up a gear before 2,500 rpm in a gas-fueled car and 2,000 rpm in a diesel.
- Don't carry around unnecessary weight. Empty your trunk.
- Use air conditioning sparingly as it significantly increases fuel consumption.
- Plan your trips to avoid congestion, road work, and getting lost by using a wayfinding app such as Waze.
- Combine trips.
- Avoid short trips. A cold engine uses fuel almost twice as quickly as a hot one (conveniently, these journeys are the easiest to walk or cycle).
- If you're stuck in a traffic jam, switch the engine off if you expect to be there for more than a minute or two.

# Transition Streets
# 6.13 TO FLY OR NOT TO FLY

The Practical Action Plan

**Cost: varied** | **$ Savings: varied** | **Effort: varied** | **$CO_2$ saved: high**

Challenge

In the U.S., more than 80% of Americans say they have flown.[16] Flying accounts for 13% of transportation-related carbon emissions and 2% all global carbon emissions.[17] That's a lot of $CO_2$ and it's expected to get worse as a growing global middle class begins to fly more frequently.

The question everyone wants answered is this: "How does air travel stack up against car travel?" Well, there are a few things to consider.

- The amount of fuel required to get a plane off the ground is great; the amount to keep a plane in the air is much less, so a longer flight is more fuel-efficient than a shorter one.
- Airplane emissions include black carbon, nitrous oxide, sulfur oxide, black soot and water vapor. All of these increase the greenhouse effect. So the impact of flying on our climate is a factor of 6 to 47 times higher than that of car travel.[17]

But the research doesn't point to one straightforward, simple answer. There is some evidence of benefits in which airplanes increase the ozone layer, which blocks some sunlight and reduces methane.[18]

Michael Sivak, a researcher at the University of Michigan Transportation Research Institute, looked at "energy intensity" (BTU per passenger mile) for different types of transportation. Most car trips involve only one person and most vehicles get only 22 miles per gallon. That puts the energy intensity for most car trips at 4,200 BTUs per passenger mile. That's high!

U.S. airplanes, on the other hand, are flying with 86% of the seats occupied[19], so the energy a plane uses is divided across a large number of passengers. That cuts the energy intensity of flying to around 2,033 BTU.

**The moral of the story? Whenever possible, don't drive alone! Don't take short plane trips. And avoid flying when it's not essential – it's still damaging.**

# Transition Streets
# 6.14 TO FLY OR NOT TO FLY

The Practical Action Plan

## Solution

Unlike driving to work, flying is usually a luxury, not a necessity. There are many trips we can avoid and if we do need to travel, there may be alternatives.

- If a work commitment requires your presence, see if you can use teleconferencing technology. Increasingly, organizations are hosting webinars and teleconferences in place of in-person conferences.
- Consider a "staycation," seeing the sights and events in your own community (see section 6.15).
- Plan your vacation in the U.S. so you can take a train, a ferry, or a bus.
- See www.seat61.com for info about how to get to any destination in the world without flying.

Considering carbon offsets to cover the damage of your flight? Do your research. An investigation into carbon offset schemes by the *Guardian* newspaper in the U.K. found some to be "unreliable."[20]

## Savings and benefits

- On a train, the journey becomes a greater part of the experience. You go slower and watch the scenery and culture change.
- A no-fly lifestyle means no airport lines, no security checks, no lengthy delays, no tiny seats, no bad airplane food and no jet lag.
- When you stop flying, it means less noise pollution for the millions living under the flight path and massive carbon savings. You are doing your part to fight climate change.

Notes:

# Transition Streets
# 6.15 VACATION LOCALLY

The Practical Action Plan

| Cost: varied | $ Savings: varied | Effort: low | $CO_2$ saved: med-high |
|---|---|---|---|

## Challenge

In 2017, 41 million international visitors came to the U.S. to see the sights, according to *USA Today*. And millions of Americans hopped on a plane and left the country to vacation abroad, leaving contrails and carbon behind to impact the climate. Isn't it time we take a vacation from damaging climate impacts?



## Solution

Top vacation destinations in the U.S. include the Grand Canyon, Yellowstone, Mt. Rushmore, San Francisco, New York City, Disneyland and Disney World, Hollywood, Yosemite, Washington, DC, Niagara Falls, Las Vegas … the list is long! There are great spots to visit in every state, so try planning your next vacation closer to home. Here are a few ideas to get you started:

1. Go camping at a national park or see a monument (www.nps.gov)
2. Visit an iconic city such as New York, Los Angeles, or Chicago
3. Stay on a farm with Farm Stays US (www.farmstayus.com)
4. Stay on a houseboat (https://www.houseboating.org/)
5. Plan a bike touring trip with friends. Try bike camping with a small trailer
6. Visit a local spa or retreat center
7. Volunteer with an organization you care about

**Yes, but…it's cheaper to vacation abroad.** That depends on where you are going, and whether you are counting the cost of carbon and damage to the climate. If you want your vacation to be less carbon-intensive, you'll find plenty of fun options right here.

Transition Streets
6.16 VACATION LOCALLY

## Local tourism resources

Use this section to list ideas and resources for vacationing in your part of the country.

Notes:

Transition Streets

# 6.17 YOUR TRANSPORTATION ACTION PLAN

The Practical Action Plan

**Reminder**

Possible actions:

- Walk this way (6.3)
- Ride your bike (6.4)
- Take buses and trains (6.6)
- Try car-sharing (6.8)
- Try carpooling (6.9)
- Fuel-efficient driving (6.11)
- To fly or not to fly? (6.13)
- Vacation locally (6.15)

**What other ideas does your group have that aren't covered above? Add them below if you think they are relevant for you.**

| My actions | Already done | When I'll do this | Notes |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Group actions**

How can you help each other out in your group? List team actions here (with named person and due date).

Transition Streets
6.18 LOCAL RESOURCES

## Where to go for local information

Add your own information about local resources to help you with transportation options.

**Local transit services to your preferred destinations:**

- **Is there a transit service app?**

**Regional transit services that will take you to the places you go to occasionally:**

**Carpool service (through employer or transit provider or other):**

**Local car sharing service:**

**Local bike sharing service:**

**Good local bike shop for classes and maintenance:**

**Where can you buy clothing and accessories for walking and biking in bad weather:**

# Transition Streets on a Budget
## 6.2 YOUR TRAVEL DIARY

Diary

Use the form below to record your travel over the next couple of weeks. This information should help you understand more about the kinds of trips you make (especially the regular ones) and why.

| Date | Miles | From | To | Reason | How I got there |
|---|---|---|---|---|---|
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Transition Streets

# 6.20 THE BIG PICTURE: TRANSPORTATION

## Questions for discussion

It seems that giving up our cars is one of the hardest things to do. Obviously, this is influenced by the cost and availability of suitable public transportation options. Given that this may take some time to change,

- What sort of changes would you need to make in your life to significantly cut your dependence on your car?
- What would your friends and family think?
- Given what we've learned about air travel, when do you think it is appropriate or responsible to fly?

Notes:

# Transition Streets
# 6.21 REFERENCE INFO

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# 7. What's next

TRANSITION STREETS

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# Transition Streets
# 7.1 WHAT'S NEXT?

You're done!

Congratulations!

You have now completed the Transition Streets program. This session is all about evaluating and celebrating your achievements, and deciding whether your group wishes to continue working together.

There are a number of optional workshops and activities that you may want to try, or you may already have formed your own plans about the next steps for your group: for example, going through the sessions again and picking up some new actions, exploring some of the advanced options presented at the end of some of the chapters, or sharing skills with each other (canning, composting, gardening, etc.).

If you decide to continue (and we sincerely hope you do), then it's probably helpful for you to agree on the purpose of the group moving forward, how often you will meet, and so on.

It may be useful to plan another seven sessions and then have another evaluation, rather than agreeing to an indefinite program.

You may wish to get more involved in other community activities that reduce our fossil fuel dependence and build resilient communities, such as the Transition Movement. More information is provided later in this section.

The following pages cover:

- Final evaluation (7.2)
- About Transition (7.3)
- Next steps (7.5)
- Celebrate!


**Photo of Transition Culver City Bike Parade, courtesy of Transition Culver City, CA**

# Transition Streets
# 7.2 FINAL EVALUATION

## How did you do?

Please complete the “after” section of the evaluation form that you started at the beginning of your very first session. We hope you will clearly see your progress as you add up the number of actions you have completed and which are still in progress (some of which might already have been underway before you started Transition Streets).

Also, please complete the feedback section at the end of the evaluation form to let us know what you liked and what you didn’t like about the program. We are keeping track of the overall impact of the program and will use the evaluation forms to continue improving and providing support for Transition Streets.

Please collect all the completed evaluation forms and send them to the Transition US office at PO Box 917, Sebastopol, CA 95473. Thank you!

Transition Streets Evaluation Form

| | PLEASE COMPLETE THE BLUE COLUMNS AT THE START OF THE PROGRAM (first session): | | | | | AND THE GREEN ONES AT THE END OF THE PROGRAM (last session): | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | What do you hope to gain from being part of Transition Streets (please list up to 3 things): | | | | | Did you meet your objectives (e.g. all, most, some, none): | | | |
| | **In this section, please rate the following statements:** | **Strongly agree** | **Somewhat agree** | **Somewhat disagree** | **Strongly disagree** | **Strongly agree** | **Somewhat agree** | **Somewhat disagree** | **Strongly disagree** |
| 2. | I feel positive about the future. | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 3. | I feel that a strong sense of community is important in these uncertain times. | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 4. | I feel connected to, and a part of, my local community. | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |

## Your stories

Would you like to write a success story about your group? Would you be willing to supply a quote about your experiences of doing the project? We put these on the Transition US website and use them to inform others about the benefits of Transition Streets. If you are willing to share, please call or email us with your story or quote.

Transition Streets
7.3 ABOUT TRANSITION

# About Transition

Transition US is a national hub for the international Transition Movement, a grassroots network of communities around the world who are taking action to make the transition away from oil dependence and vulnerability toward local self-reliance and environmental sustainability.

Inspired by the first Transition Town in Totnes, UK, the Transition Movement has spread to more than 50 countries. In the US, more than 164 official Transition Towns have formed and new groups start all the time.

We believe that, if properly designed and planned for, our communities can use fewer resources and become more resilient in the face of ecological and economic instability, while maintaining and even enhancing our quality of life.

We are living at a pivotal moment in history when we need to explore new (and old) ways to strengthen our communities while taking responsibility for our impact on the planet. While the task is serious, our approach is fun and welcoming. Whether you are a doer or a thinker, a farmer or a banker, a mom or a dad, a senior or a youngster, there are plenty of ways you can be involved.

Every Transition Initiative is unique. Groups often choose to undertake projects that involve local food, local business, renewable energy, housing, education, transportation, health and well-being, emotional support, and more. See 7.4 for additional resources and information on how to get involved in Transition.

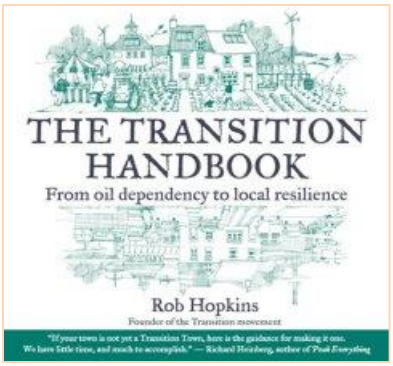
# Transition Streets
# 7.4 ABOUT TRANSITION

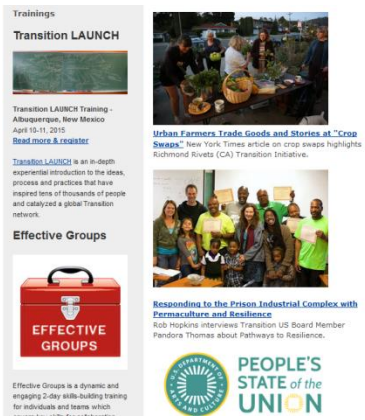
Would you like to be a part of one of the most exciting movements in modern times, at one of the most important moments in history? Would you like to continue to be a part of a process that strengthens and builds a friendly, vibrant community and enhances our quality of life? Give Transition a try!

## Learn more

To learn more about Transition:

- Visit the Transition US and Transition Network websites (www.transitionus.org and www.transitionnetwork.org).
- Pick up *The Transition Handbook, The Essential Guide to Doing Transition,* or *The Power of Just Doing Stuff*, books by Transition founder Rob Hopkins.*
- Watch "In Transition 2.0," a documentary film featuring stories of Transition groups around the world (DVD and free download available at www.transitionus.org).
- Sign up for the Transition US newsletter (at www.transitionus.org), to receive stories and resources from local Transition Initiatives across the US straight to your inbox.




## Get involved

To get involved in Transition:

- Find out if there is already a local Transition group in your area: visit www.transitionus.org/initiatives-map, or email: info@transitionus.org
- If there's not already a local group, consider starting one. You can sign up as a "mulling" group (email info@transitionus.org for more info). You can also host a Transition LAUNCH training to jump-start Transition in your area (learn more at http://transitionus.org/training/transition-launch).

**The Transition Handbook* and *The Essential Guide* are available in hard copy by searching online, or you can download free (edited) pdf versions at http://www.transitionus.org/transition-handbook.

# Transition Streets
# 7.5 YOUR NEXT STEPS

## Where to now?

Think about and discuss where you will go from here, either on your own or with some or all of your group. Will you:

- Continue to complete the basic actions?
- Come up with new actions?
- Get more involved with Transition or other local community groups?
- Engage your local government around sustainability issues?
- Develop an emergency preparedness plan for your neighborhood?
- Tell your friends about Transition Streets?
- Start a Transition Initiative in your community?

For additional resources and inspiration, check out the *Guide to Building Thriving, Resilient Communities* at: www.resilience.org/communities-guide

## Mentor

Would you like to become a Transition Streets mentor? Now you know what it's all about, you could help another group to get started and to get the most from the program. This is a great way to give back to your local community. Please contact us to find out more.

## Celebrate!

### And now – celebrate what you've already achieved with your group!

Celebration is an important part of Transition. Our task is great, and we will always have more to do and more to learn. It's important to take the time to celebrate accomplishments along the way! Regardless of what you decide to do next, your participation in Transition Streets—the actions you've taken, the bigger-picture context you've gained, and the time you've spent getting to know your neighbors—is well worth celebrating.

TRANSITION STREETS

# The end

## (of the beginning of your journey, we hope!)

Thanks for your participation, we hope you've enjoyed it!

TRANSITION UNITED STATES

Transition Streets has been adapted from its original UK version and the 2019 version has been updated for a U.S. audience. It is managed by Transition US, with many thanks to all of our supporters and expert contributors, as well as to Transition Town Totnes for developing the original curriculum.

**www.transitionus.org**