

Clogged Cities – sclerotic infrastructure

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Introduction

- Focus on understanding the urban metabolism(s) of fat, oils and grease (FOG) through the “sewer fat crisis” in US and UK.
- Trace the efforts by cities, utilities, regulators, communities and corporates to systematically tame and reshape the metabolism of FOG.
- A view from an (amateur) “urban technologist” concerned with understanding the urban political ecology of resource flows.

Why is this important?

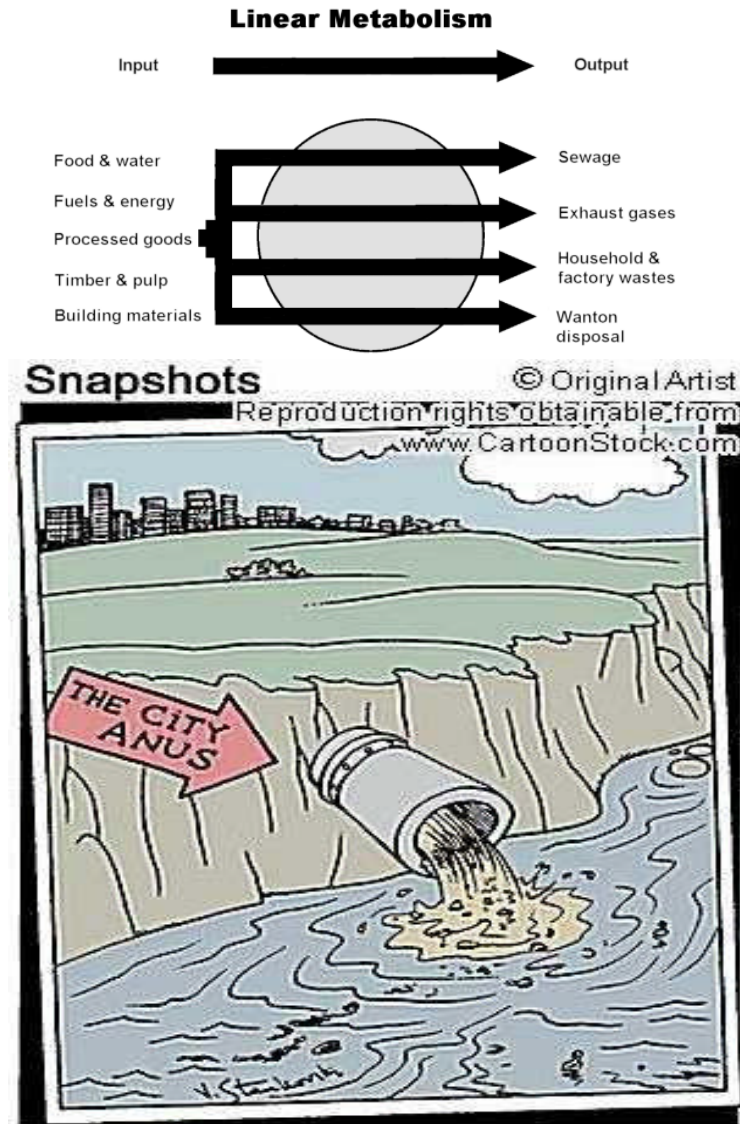
1. Context of wider crisis of fat deposition– “fat cities”, “fat bodies” and “sewer fat crisis” mediated through cities.
2. Understand intersections between multiple metabolisms of the city, people and socio-technologies.
3. Systemic attempts to intervene in the metabolisms of fat by mobilising people, lean sewer ordinances etc.
4. Mapping the political ecology of fats metabolism – production, distribution, deposition, removal, disposal – social and economic interests, space and place.
5. Consequences - re-commodification of fat, re-mobilisation of selected metabolisms but also missing metabolisms and linkages.

What does this paper do?

- Attempts a partial analysis of the changing metabolism of fat through sewers - mainly in a US and UK context.
- Illustrates complex socio-technical issues involved in reshaping metabolisms.
- Demonstrates importance of re-commodifying fat in reconfiguring metabolism...
- Identifies missing elements of fats metabolism associated with this temporary solution to the sewer fat crisis.
- Focuses on 6 different phases of urban FOG metabolism.

1. Linear Urban Metabolism.

- Healthy modern urban ideal
- Sewers “cleansing” the city...
- Fat expensive - not wasted ?
- Waste fat “recycled” – re-rendered as an animal feed...



2. Unruly Metabolism – FOG Deposition

- Fat city – “municipal heart attack”.
- Reduce costs of fats – rendering market weak - higher costs of disposal.
- Dumping FOG in sewers – HMOs, restaurants, fast food take-aways.
- Fat accretes and blocks sewers and equipment.
- Sewer overflows... 60% FOG associated.



How A Sewer Blockage Affects the Sewer System

Sewer Blockage Formation



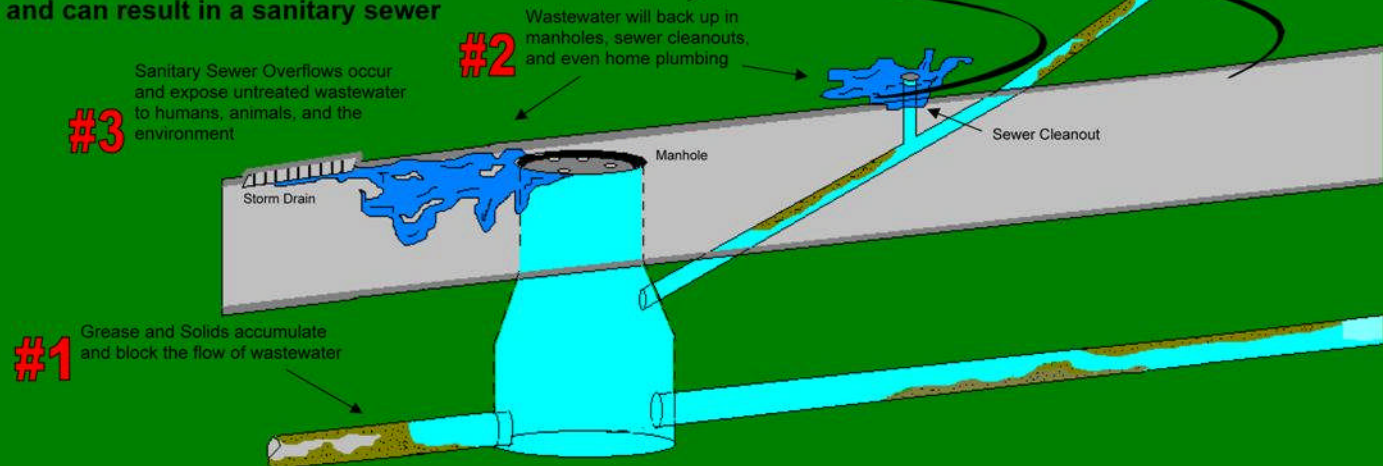
The start of a blocked pipe begins when grease and solids collect on the top and sides of the pipe interior.



The build-up increases over time when grease and other debris are washed down the drain.

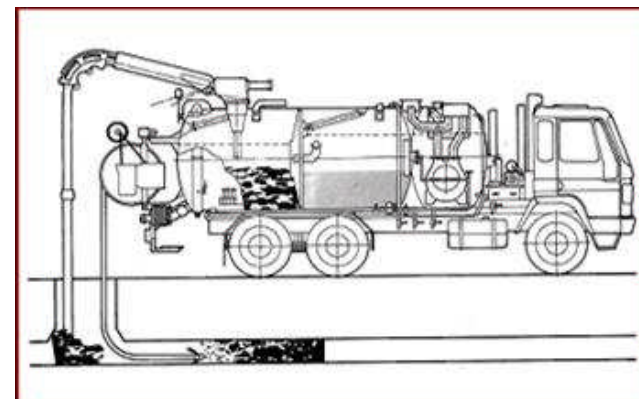
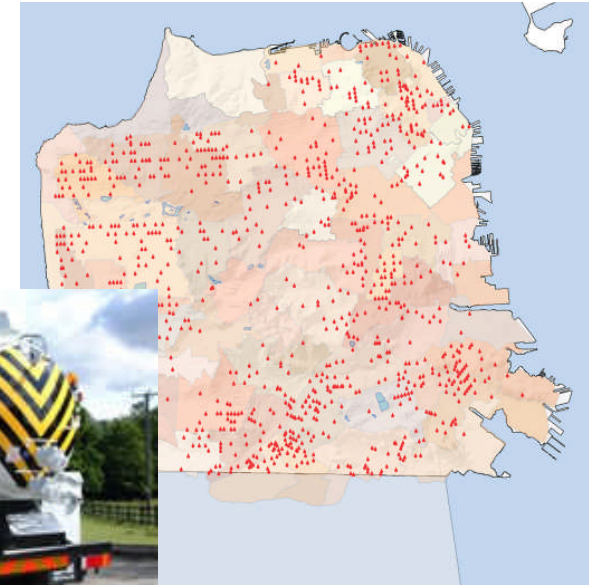


Excessive accumulation will restrict the flow of wastewater and can result in a sanitary sewer overflow.



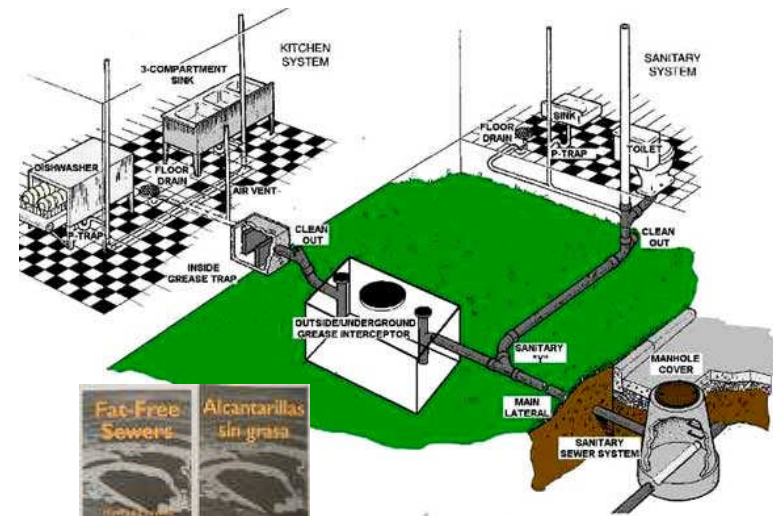
3. Extraction of FOG – from Sewer Metabolism

- Remobilising FOG through removal
- New utility programmes of FOG removal.
- New techniques - chemical, bio-chemical, jet pressure, sucking out, boring, by-hand!
- Mapping blockages and areas at risk.
- Disposal of extracted FOG?
- Preventing deposition?



4. Intercepting FOG – Remobilising Sewer Metabolism

- New strategies to maintain mobility of FOG through interception.
- New FOG guidelines and “lean sewer” ordinances – reshape behaviour and installation of “fat-traps”
- Targeted at “zones” of blockages to divert FOG away from sewers.
- What to do with the collected waste - clogged highway!

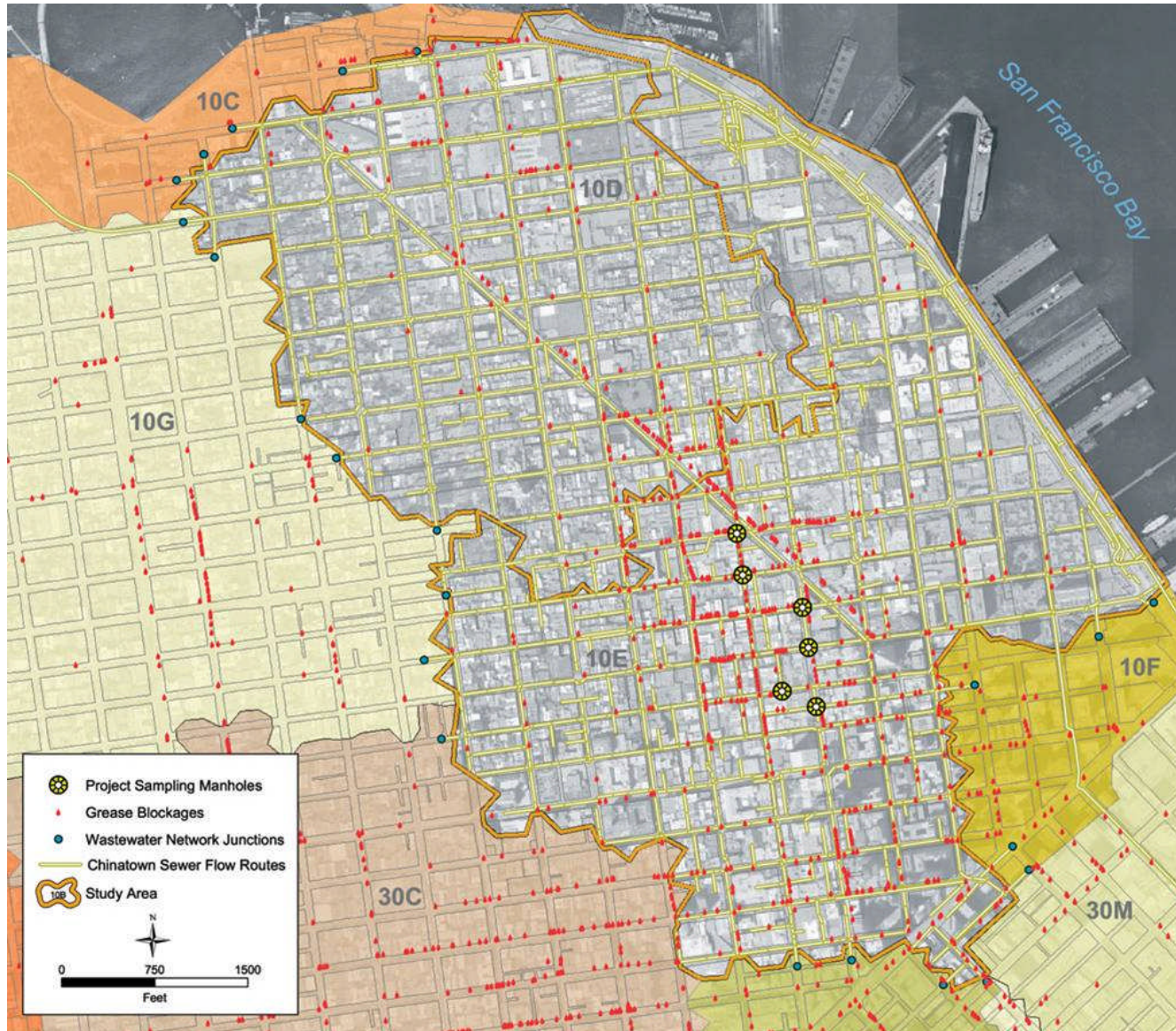


**Fats, Oils and Grease
Control Manual**

DECEMBER 2004



San Francisco FOG Reduction Program



5. Circular Metabolism of FOG— “Fat as Fuel”

- 3 billion gallons of FOG produced pa. in US.
- Eco-warriors illegal use of waste as fuel...
- Urban crop collected for free – re-commodification of FOG - re-processed as premium fuel...
- New strategic niches – community and corporate initiatives.
- Systemic reshaping of diesel fuel systems at local/city scale.
- Sewer fat crisis “solved” through reconnection to fuel system?

How can Biodiesel Solve Waste and Water Pollution Problems?

By converting waste grease to a higher value commodity.

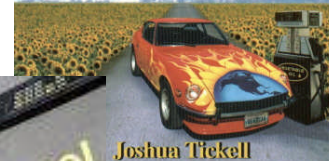
- Diverts large waste stream from:
 - Landfills or illegal dumping
 - Publicly-owned treatment works (POTWs)
- Prevents spills and sewer blockages:
 - Raw sewage and grease onto land and water
 - In 2001, EPA sued Los Angeles for 2,000 sewer spills, 40% due to FOG (fat-oil-grease)



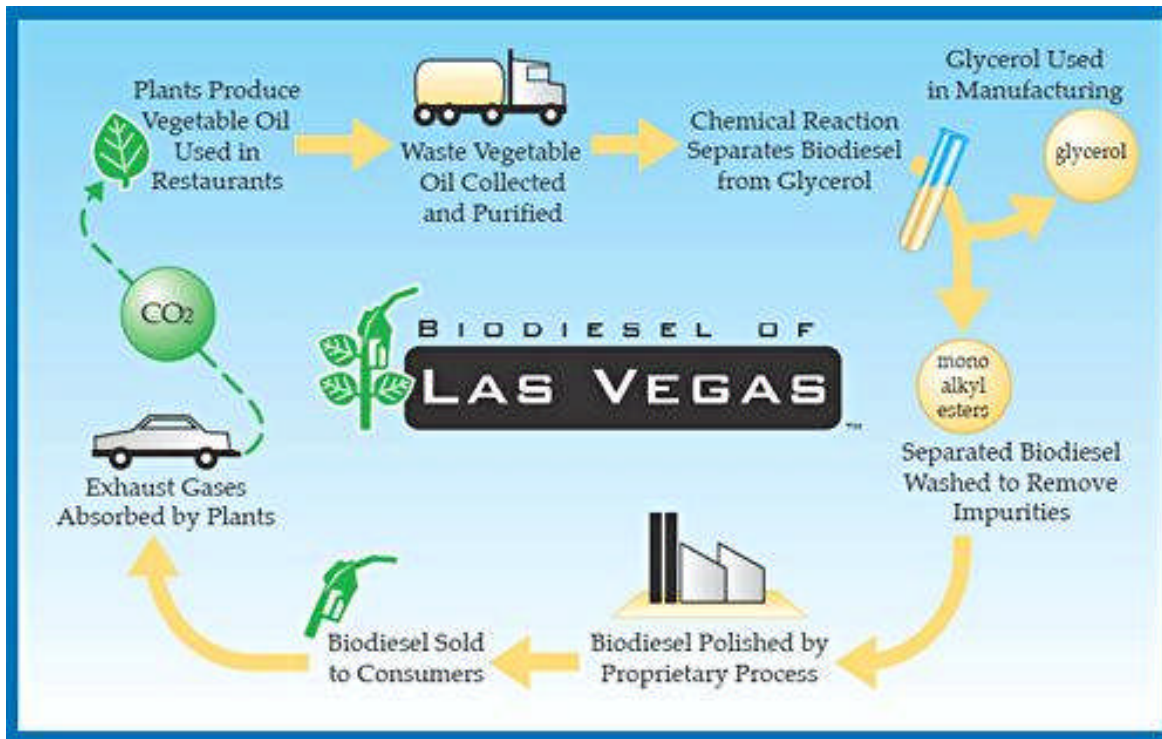
From the Fryer to the Fuel Tank

The Complete Guide to Using Vegetable Oil as an Alternative Fuel

Joshua Tickell



©2005 Gale, John Clark



ATTi Director Gerald Bernstein, “Biodiesel is not merely a rural issue. The use, emissions and health impacts of petroleum-based diesel exhaust make the need for Biodiesel a serious urban need. This also fits well with the initiatives by the City of San Francisco to promote the use of renewable fuels in municipal fleets.”

“Replacing traditional diesel with biodiesel fuel is especially important in communities like the Bayview Hunters Point neighborhood which is heavily burdened by truck traffic on its streets. Use of biodiesel will enable the city to achieve significant reductions in very fine soot particles. These microscopic particles are one of many toxic pollutants that are emitted from diesel exhaust, which has been linked to an array of serious health problems, such as asthma and premature death.”

How do you Make Biodiesel?

• Transesterification

Waste oil	+ Alcohol	+ Catalyst	→	Biodiesel	+ Glycerol
87%	12%	1%		90%	10%



- Biodiesel can be splash-blended with petroleum diesel
 - B2 vs. B20 vs. B100 (2% to 100%)

Using Human Fat as Fuel!

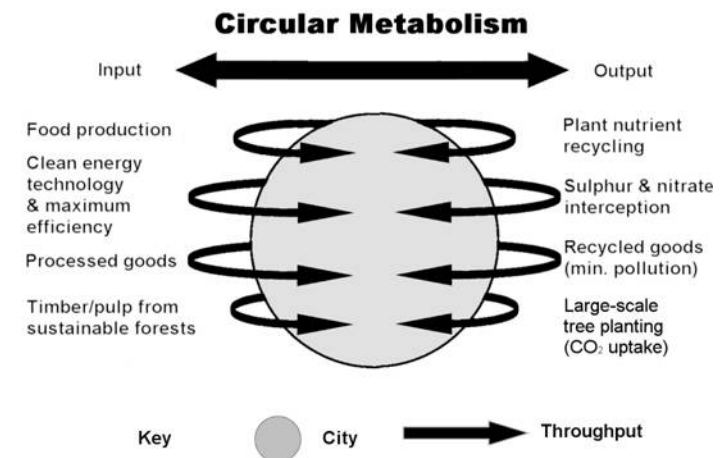
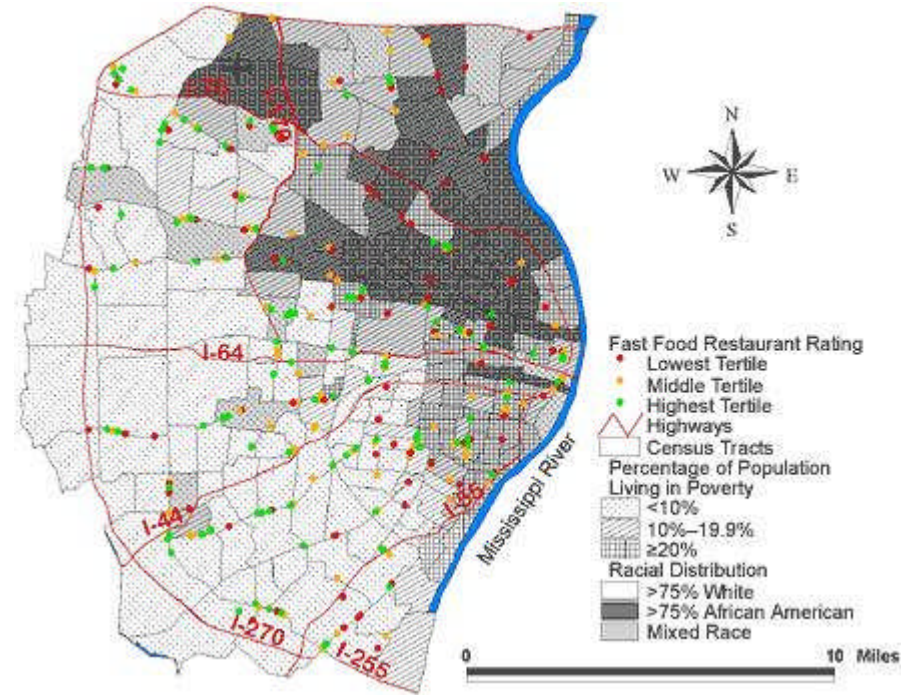
- **Boat aims to set speed record...powered by human fat**
- **If fuel prices keep rising, liposuction will pay for itself**



- **Fortune in fat**
- **A Norwegian businessman Lauri Venøy wants to use the product created from liposuction to develop bio-diesel.**
- **The Norwegian's firm in Miami, Florida is in the process of signing an agreement with US hospital giant Jackson Memorial. This deal would give Venøy & Co. around 11,500 liters of human fat a week from liposuction operations, which is enough to produce about 10,000 liters of bio-diesel.**
- **"Maybe we should urge people to eat more so we can create more raw material for fuel," Venøy said.**

6. Missing Metabolisms of Fat?

1. Production and circulation of fats?
2. “Obesogenic environments”?
3. Autarkic cities?



'Fit towns' plan to tackle child obesity

- The government is planning to tackle the growing obesity epidemic in Britain by broadening its plans for eco towns and turning them into healthy or fit towns. The health secretary, Alan Johnson, is convinced that two great challenges facing Britain - climate change and obesity - are linked.
- He believes it makes sense that 10 eco towns already being planned by the government should now be built and designed to confront the UK's obesity crisis, drawing on pioneering schemes already producing results in Australia, France and Finland.
- Regular weigh-ins for children starting as they leave primary school, including the recording of body mass indexes
- Increasing the number of cycle lanes
- Designing safe walking routes to schools and the centre
- Programmes to inspire children to eat healthily, avoid fast food outlets, learn to cook and play sport from a young age

Conclusions

1. Unruly metabolisms – fat moves across different metabolisms – mobile, immobile
2. Managed and systemic attempts to re-shape selected metabolisms of fat.
3. Missing or ignored metabolisms as cities attempt to build “autarky”.