Private Room on the Wheel

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“private room on the wheel”
creating a new form of transient lifestyles

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dwelling practices on the road...
The American highway is not only used for commerce and commuting, but it creates diverse lifestyles as well. The cross-country highway and road trip are deeply rooted in the American psyche, supported by the vast Federal Highway Network and the rapid growth in ownership of automobiles by American families since the 1940s, establishing a sense of freedom in their mobile lifestyles. Other highway users have less control over their daily routine.

Truck drivers spend a majority of their times on the road, while the remaining part of their day is spent sleeping in fixed truck cabins or eating at all-night truck stops. This thesis reconsiders the truck stop along the U.S. freeways, by studying the transport network at multiple scales, including truck drivers’ daily routines and their live-work practices.

The truck stop’s narrow focus on providing limited and costly services to truck drivers, constitutes a missed opportunity to re-conceive of such infrastructure, as well as the truck cabin itself as \textit{flexible and transitory}. Connected by the existing American highway network, these infrastructures should not only better address truck drivers’ needs, but can promote a transitional lifestyle based on \textit{mobility}. This thesis proposes the truck stop as a core element of a future \textit{instant city} designed to create a new transient dwelling lifestyle.
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Figure b. There’s no way like the American Way Billboard
With the invention and flourishment of automobiles, the Amerians enjoyed using the highway and getting to places that are even 2000 miles away. This lifestyle has deeply rooted in the American psyche. Before automobiles and trucks, the United States was heavily depending on the railroad network to carry large amount of materials between coasts for the Civil War. Pony express emerged for a short period of time to deliver important message. In 1956, President Eisenhower signed the Federal-Aid Highway Act of 1956, fully expanding the usage of highway through the United States.

Truck transport is currently the main freight transport industry in the United States, and it is expected that the United States will continue rely on using it in the future.
drivers on the road:

road trippers

truck [drivers]

US Highway System

stay away from

truck [drivers]

truck stop

small vs. BIG
“Truck Freight Demand Surges at Fastest Rate Since November 2013”

“The American Trucking Associations says a strengthening U.S. economy sent its shipping index to the second-highest level ever recorded...”

-- the Wall Street Journal

America needs truck drivers. The trucking industry is closely related to the retail sales and its demand. The freight demand is surging recently, largely due to “growing disparity in United State income distribution and the increasing strength of e-commerce sales channels”. “E-commerce retail sales are 6.2% of retail trade and are expected to grow to 8% by the end of 2017.” Products are much easier to be accessible and purchased with just one click, or two-days away. Freight transportation by trucks is popular in the United States to deliver goods across the nation within couple days, or even locally, within hours. Truck drivers are spending 11 hours (sometimes more) on the road, trying to deliver those immediate goods.
Studies from the IPUMS-CPS², Minnesota say that the most “common” job in the US in 2014 is truck driving. Yet in the same year, the American Trucking Associations (ATA) showed that not only there was but also there will be a shortage of truck drivers. “In 2014, the trucking industry was short 38,000 drivers. The shortage is expected to reach nearly 48,000 by the end of 2015.” Some of the main causes of the truck driver shortage are:

- **Demographics, Age**: higher median age than other work industry
- **Demographics, Gender**: female drivers are taking only a small %
- **Lifestyle**: it’s more than just work, it’s a tough lifestyle
- **More Job Alternatives Available**

² Integrated Public Use Microdata Series — census microdata for social and economic research. Minnesota Population Center
Approximately 7 million persons hold trucking-related jobs with 3.2 million employed as truck drivers. The American truck drivers’ ages have a wide range, some start as soon as they graduate high school, while some work for more than 40 years. The average age of male drivers ranges from 40-50, and it went up by two years: from 46 to 48 years-old over the last eight years. There is an increasing population of female truck drivers: 1.0%. The Average age of female drivers increasing by three years, from 48 to 51 years old.
These charts show the geographic profile for this occupation as a truck driver. Texas, California, Pennsylvania, Florida, and Illinois are the states with the highest employment level in this occupation. Zooming into smaller areas where most populated employment include Chicago IL, Houston TX, Atlanta GA, Los Angeles CA, Riverside - San Bernardino CA; assuming the truck drivers are living in the suburbs around those cities.

Almost every truck driver used to be paid by the miles they have driven per day, so they were reinforced to drive certain amount of miles by the truck company. However, GPS including the tracking devices on their phones could be used as the electrical log book for logging in.

### Employment and Pay Information

<table>
<thead>
<tr>
<th>Employment</th>
<th>Mean annual wage</th>
<th>Paid per Mile</th>
<th>Mean hourly wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,625,290</td>
<td>$ 41,930</td>
<td>$ 0.28 - 0.40 / mi</td>
<td>$ 20.16</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics
Convenience sample of 300 commercial truck drivers from 6 truck shows in the United States over a 10-month period (2010-2011)
Average Age: 47 years (ranging from 24 - 71 years)
86.3% male, 88.3% white

1 of every 15 people in the workforce is employed in the trucking industry
50% of truck drivers are obese
26.7% of national population are obese
For the males, differences in the means of all four dimensions were found to be statistically significant. Although the male truck drivers were on average shorter than males in the U.S. general population, they were nonetheless heavier. The truck drivers were, on average, 13.5 kg heavier than those in the U.S. general population, and their thigh and waist circumferences were larger than those of men in the U.S. general population.

- Truck drivers are heavier than the U.S. general population, with a difference in mean body weight of 13.5 kg for males and 15.4 kg for females.
- The current truck drivers have a different anthropometric profile from their counterparts of 25 to 30 years ago, exemplified by a heavier mean body weight (by 13 kg) and larger width and girth dimensions.

U.S. Truck Driver Anthropometric Study

Source: NCBI—National Center for Biotechnology Information
The mean duration of sleep periods was 5.21 (2.84) hours, however sleep timing and duration had a biphasic distribution. The majority of sleeps (90%) occurred between 8 PM and 6 AM and were of relatively long duration, mean ¼ 5.41 (2.70) hours. A secondary cluster of sleeps (8%) occurred between 12 PM and 6 PM and were of relatively short duration, mean ¼ 1.93 (2.46) hours.

Source: Applied Ergonomics
A truck driver could drive across the nation with minimal amount of time to stop and rest. These images show how one truck driver manages to travel from Chicago, IL to Vernon, CA and back to Chicago within five days. Commercial motor vehicle (CMV) drivers are limited to 11 cumulative hours driving in a 14-hour period, following a rest period of no less than 10 consecutive hours. Drivers employed by carriers in “daily operation” may not work more than 70 hours within any period of 8 consecutive days. Drivers may see their families every once a week, or sometimes even longer.
The scale of the trucks remains same in this diagram, depicting the time and scale relationship between different roles/locations. The products of family dollars are relatively cheap, yet the truck drivers are taking dangerous responsibilities transporting those goods.
One day’s routine of a typical truck driver. Note that only one to two hours of rest throughout the day.

DWELLING ON THE ROAD, UNDER THE SYSTEMS

One day’s routine of a typical truck driver. Note that only one to two hours of rest throughout the day.

DWELLING ON THE ROAD, UNDER THE SYSTEMS
There are majorly four types of commercial trucks widely used in the United States freight transportation. A semi-trailer truck is the combination of a tractor unit and one or more semi-trailers to carry freight. It is variously known as a semi, tractor-trailer, big rig, or eighteen-wheeler in the United States.

- The day cab has no sleeper berth, mainly used locally or short distance
- The Mid-Roof cab has a flat roof with compact areas containing two beds
- The Raise-Roof cab has a sloped roof with larger head room and also contains two beds
- The last type is the largest with a sleeper room attached to a day cab

Different sizes of truck cabs with different sizes of sleeper berth
Inspired by the economy and design, the truck segment is pivotal to the category. Clear indications of the model indicate a variety of features, including plastic, fiberglass, and steel. The structure frame is distinct, with laminated safety glass an essential component. Materials such as vinyl, cloth, and leather are also visible, offering a range of comfort and style options. The dimensions provided are critical, with length and width playing key roles in the truck’s functionality and design. The overall length limit is noted, indicating a focus on efficiency and maneuverability. Given the truck's classification as under 80,000 lbs, it aligns with the large category of vehicles designed for efficiency and flexibility in various contexts.
INSIDE THE HOME

components inside truck cab

bed bunk inside truck cab

beds folded up, day

beds folded down, night

Cab-over-engine dimensions
on freeway

truck stop / on side of the road
Truck driver is only able to see the road or the cars in the front that are 20 ft away.
Truck cabin is strictly designed in a way that certain things can be reached in a hand’s reach. One of the thing that is within an arm’s radius are two handbooks required by law (Emergency Handbook, and the Regulation Book).

An arm’s reach: 2.6-3 ft in diameter
Truck Cabin Dwelling Unit:
Maximum height: 101"
Maximum width: 101"
314.8 cu ft
There is a need for change in the near-term (2015) that not only the truck cab but also the truck stop should provide higher standard for the truck drivers. The truck stops should no longer be a "product" resulted from US Highway System and trucks, but should be functioning autonomously and at the same time revive its identity.
BETWEEN THE small and BIG
“I argue against the common idea that modernization of society is bringing about placelessness by the commodification and standardization of many public places (Relph 1976; Auge´ 1995). Although chains prevail in the industry (Charter 1997), the sense of place that exists for long-haul drivers is not eradicated, but merely shaped, by this oligopolization.”

_home away from home: meanings of the American truck stop_

Stephanie Kozak  
Department of Geography, University of Kansas, USA
By the road

Truck Stop Amenity:

- ATM
- Load Monitor
- Scales
- Trucker Store
- Convenience Store
- Restaurant
- Truck Repair
- Truck Inspection
- Food Court
- Drive-Thru
- Truck Services
BMW SUV Volume: 100 cu ft
FreightLiner Volume: 314.8 cu ft
Route by cars (black) and trucks (red) into the truck stop Iowa 80.

Super Truck Showroom = 30,000 sf
Main Building = 100,000 sf
Parking for 900 trucks and 15 fuel pumps

Typical Truck Stop Amenity:
- ATM
- Trucker Store
- Convenience Store
- Restaurant / Fast Food

Iowa 80 Truck Stop Amenity:
- ATM
- Trucker Store
- Convenience Store
- Restaurant
- Showers
- Laundry
- Museum
- Hair Salon
- Dental
- Chiropractor
The Daimler truck industry has just introduced the “polited” truck that would be on the road in 30 years or so. This would change completely that the truck driver is not going to be driving all the time, but they still need to be present to watch over the road.

If trucks are piloted in the future, what would happen to the truck stops? What is the permanency of the truck stop?
TRANSPORTABLE DWELLING

Diogene, Renzo Piano

Nakagin Capsule Tower, Kisho Kurokawa

The Environment Bubble, Reyner Banham

TRANSITORY CITY

Instant City, Archigram

Fun Palace, Cedric Price

New Babylon

in the process of producing analytical drawings...
In the post-World-War II era, large freeway infrastructure network was built across the United States and automobile industries flourished. More people started to acquire cars to pursue a sense of mobility and freedom on the road. A different kind of lifestyle and sensibility emerged.

The American highway is nationally used for commerce and commuting, but it creates diverse lifestyles as well. The cross-country highway and road trip are deeply rooted in the American psyche, supported the vast Federal Highway Network and the rapid growth in ownership of automobiles by American families since the 1940s, establishing a sense of freedom in their mobile lifestyles. Other highway users have less control and freedom over their daily routine.

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This thesis would investigate and negotiate between three scales: the individual truck cab dwelling, the existing US Highway Network, and the truck stop as the product of the two. By proposing the truck stop as an instant city, this thesis hopes to not only address the near-term (2015) issue, but also those of the future (2045) where the trucks would be “piloted”.

private room on the wheel
a new form of transient dwelling


http://atri-online.org/ (American Transportation Research Institute)

http://hfs.sagepub.com.libezproxy2.syr.edu/content/54/5/849 (US truck driver anthropometric study and multivariate anthropometric models for cab designs)


Cover Image - AS in DS: An eye on the road
Figure a - http://www.trucking.org/
Figure b - photo taken by the author during a road trip
Figure 1 - CNBC.com
Figure 2 - IHS.com
Figure 3 - http://www.npr.org/sections/money/2015/02/05/382664837/map-the-most-common-job-in-every-state
Figure 4 - American Trucking Association (ATA)
Figure 5 - Applied Ergonomics

Uncredited images are production of the author.