Theory of Urban Fabrics

*a Product of New Models and Practices*

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Finnish Environment Institute

Leo Kosonen
Architect, Senior Researcher
A Comprehensive Theory
HISTORY - THEORY - CHALLENGE

Urban Fabrics

-60 y  -50 y  -40 y  -30 y  -20 y  -10 years

+10 years  +20 y

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Waves of Innovation, History of Urban Fabrics and Stages of Urban Development

1. One system
   Walking Cities

2. Two systems
   Walking- and Transit Cities

3. Three systems
   Walking- Transit- and Car Cities

- Steam trains
- Electric streetcars
- Cars
- Information Technology
- 1st Wave
- 1845
- 2nd Wave
- 1900
- 3rd Wave
- 1950
- 4th Wave
- 1990
- 5th Wave
- 6th Wave
- 201x
Newman

Sustainability and Cities
Overcoming Automobile Dependence
Peter Newman & Jeffrey Herworth

City Models

Kosonen

Local Practises

Theories
A Prototype
Kuopio Model
Since 1993
Fingers of the Walking- and Transit City Fabrics need to be repaired and regenerated. This promotes sustainable and healthy urban development.

The fingers balance the growth and development of the Car City Fabric (yellow colour).
Walking City Fabric

Old alleys 10 km, 1776-

Old alleys were used as an element of the Car City Fabric (parking)

They have been turned back to a basic element of the Walking City Fabric (walking and cycling only)
Walking City Fabric

Old alleys 10 km, 1776-

Old alleys were used as an element of the Car City Fabric (parking)

They have been turned back to a basic element of the Walking City Fabric (walking and cycling only)

New Walking City type housing for 4000 inh
A Finger of the Transit City Fabric

A small neighbourhood of 2500 inh was renovated and a supplementary bus oriented area of 1300 inh was built.

A bus street combines the areas.
A Finger of the Transit City Fabric

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A bus street combines the
Kuopio Model Finland

An Element of all Three Fabrics - a Landscape Street

Landscape Street is a new access to growth areas and a beautiful park.

New potential for a well located TOD of 8000 inh.

Improved location for areas of the Car City Fabric (6000 inh).

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An Element of all Three Fabrics - a Landscape Street

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50% reduction of costs and GHG emissions of transportation in 50 years
Three Fabrics of Other Cities
UF project

Four Cities 2010
Finland

Areas of
Car- Transit- and
Walking City
Fabrics

13.8.2012  UF  Leo Kosonen
UF project

Oulu 1960-2010

Areas of the Car- Transit- and Walking City Fabrics

13.8.2012 UF Leo Kosonen
Urban Zone project

Scales of the Urban Fabrics

the City Area:

- 2 km Walking City
- 5 km cycling distance
- 8 km Inner Transit City

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Urban Zone Project
Finland

**Scales of the Urban Fabrics**

**the City Area:**
- 2 km Walking City
- 5 km cycling distance
- 8 km Inner Transit City
- 20 km Outer Transit City
- Car City

**The Region:**
- 20 - 50 km
  - **Rail based** towns and villages
  - **Car based** periurban areas, villages and towns

source: 10.6.2013 UF Leo Kosonen
Global Cities
1990

Scales of the Urban Fabrics

the City Area:
2 km Walking City
5 km cycling distance
8 km Inner Transit City
20 km Outer Transit City
Car City

The Region:
20 -50 km
Rail based towns and villages
Car based periurban areas, villages and towns

Sourcebook 1999:
- Central Business District
- Inner City
- Metropolitan Area

source: Kenworthy etc An International Sourcebook 1999

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Global Cities
1990

Scales of the Urban Fabrics

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Three City Types
Indicate the Roles of the Fabrics
source: Newman & Kenworthy 1989
Cities by Type of Public transportation Systems (%)

Continents by Size Groups of Cities

- **USA, Car Cities**
- **Canada and Australia, Car Cities**
- **Europe, Transit Cities**

**Source:** Combination of several sources, Kosonen 2013
Motorization is Peaking or Getting Balanced
Countries with different types of cities face different levels

Countries with different types of cities face different levels:

- **Car Cities 600 to 800 cars / 1000 inh**
  - USA
  - Iceland
  - Italy
  - Japan
  - Kanada
  - Australia
  - Switzerland
  - Austria
  - Finland
  - Germany
  - Sweden
  - Norway
  - The Netherlands
  - Ireland

- **Transit Cities 400 to 600 cars / 1000 inh**
  - Denmark
  - Finland
  - Sweden
  - Norway
  - The Netherlands
  - Ireland
  - Slovenia
  - Estonia
  - Lithuania
  - Denmark
  - Greece
  - Poland

Main sources:
- EU Energy and Transport in Figures 2011
- Auto ja tie 1978 - 98
- Transportation Energy Databook 2012 (USA)
- National statistics

Vans etc included by estimation

30.4.2013
Leo Kosonen
Kuopio, Finland

28.4.2013 UF Leo Kosonen
Model of Three Urban Fabrics
Basic Model of a City

- **Walking City**
- **Inner Transit City**
- **Outer Transit City (buses)**
- **Outer Transit City (rail)**
- **Inner Car City**
- **Outer Car City**

- Edge Cities can be units of the Transit City Fabric or the Car City Fabric or both.

- City center is hosting the CBD and it is a combination of all three fabrics.
An element of all three fabrics

Walking City Fabric

Inner Walking City
A lot of pedestrians and activities, radius 1 km

Outer Walking City
Accessible on foot, 1 to 2 km

Outer Walking City can be extended up to 5 km by effective city traffic (tram, citybus, metro) or cycling
Walking City Fabric

Transit City Fabric

Inner Transit City Fabric

Outer Transit City Fabric

- Express bus
- Busway
- Feeder bus
- Trams and basic buses up to 8 km
- Metro
- Light Rail
- Local Train

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Areas outside the Transit City Fabric are car based or car dependent parts of the Car City Fabric.

Elements of the Car City Fabric are covering also the areas of the other fabrics.

Car City Fabric

Areas of the Car City Fabric

Coverage of the Car City Fabric

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Two City Types

A Big Transit City

A Big Car City

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Elements of the Fabrics
# URBAN FABRICS

## Elements of the Fabrics

<table>
<thead>
<tr>
<th>Elements</th>
<th>Walking City</th>
<th>Transit City</th>
<th>Car City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner City Hospitals</td>
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<td>Inner City bus stops, 100 to 300 m</td>
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<td>Local services</td>
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<td>Station, (Main City)</td>
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Theory of Urban Fabrics
CIAM 1933
Modern City

FUNCTIONAL CITY MODEL
City Model of 2 systems

Land Use
Traffic

Land Use and Traffic Models orientate towards new type of a city, not respecting the three existing fabrics of the cities

Old Cities of 1 system (Walking City) Since 1845
Cities of 2 systems (Walking and Transit City)

Since 1950
Cities of 3 systems (Walking-Transit-and Car City)
Theory of Urban Fabrics

CIAM 1933
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Land Use  Traffic

Cities of 3 systems
(Walking- Transit- and Car City)

Since 1950

URBAN FABRICS MODEL
City Model of 3 systems

Walking City Fabric
Transit City Fabric
Car City Fabric

Recognize

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Theory of Urban Fabrics

FUNCTIONAL CITY MODEL
City Model of 2 systems

URBAN FABRICS MODEL
City Model of 3 systems

Since 1950
Cities of 3 systems
(Walking-Transit-and Car City)

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Theory of Urban Fabrics

Sustainable City
A New Paradigm

Objectives and Goals:
Sustainability and Balance of the Fabrics

URBAN FABRICS MODEL
City Model of 3 systems

Since 1950
Cities of 3 systems
(Walking-Transit-and Car City)

Recognize
Repair
Regenerate

Walking City Fabric
Transit City Fabric
Car City Fabric
Challenges
Potentials and Challenges 2010-2035

The Transit City Fabric is the key factor of the change

Population by Areas of Urban Fabrics
An Intermediate City, Finland (Radius 8 km)

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Challenges are addressing sustainability and resilience of each of the Fabrics.

Walking and Transit City Fabric will face new problems.

Car City Fabric is problematic and 50% will face new problems.

Opportunities for healthy exercise and social cohesion.

Road safety, good air quality, and access to employment by car only.

Labour market and employment.

Acceptable noise levels.

Positive environmental awareness.

Inner City / Urban fingers / Urban sprawl / Car City.

An Intermediate City, Finland (Radius 8 km).

Walking City, Transit City, Car City.

Opportunity for healthy exercise.

Social cohesion.

Equity.

Access to employment.

Road safety.

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Three Urban Fabrics

Recognize
Repair
Regenerate

Walking City Fabric
Transit City Fabric
Car City Fabric

A good tool to address potentials, needs and problems of cities

www.urbanfabrics.fi