January 30, 2009
Gordon Feller, Urban Age Institute

- Big picture... on only one project, as an example
- Seoul’s Smart Transportation
- Seoul’s Smart Work and Smart Work Center
- Seoul’s Personal Travel Assistant
- Seoul’s Smart Transportation Pricing
- Hamburg’s initiatives
- one US city’s starting-point vision of a Hub
Connected Urban Environments: Urbanization

Configurability

Mobile Interactions

Energy Contribution

Eco-Social Networks

Eco-Social Networks
**Connected Urban Development**
A Blueprint for City Transformation

### Connected & Sustainable Work
- Smart work centres
- Digital Swarming & Hub Pavilions
- Connected Workplaces
- Connected Workforce

### Connected & Sustainable Mobility
- Smart Road Pricing
- Personal Travel Assistant
- Connected Public Transportation

### Connected & Sustainable Buildings
- Homes
- Office Buildings
- Public Spaces
- Public Transit Hubs
- Hospitals and Schools

### Connected & Sustainable Energy
- Renewables & co-Generation
- Urban Monitoring & Measurement
- Citizens Energy Efficiency

### Sustainable Socio - Economics
- Active Citizenship & Eco Maps
- Innovative Green Business Models and Sustainability Clusters

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**Sustainable Urban Planning**

**Broadband Platform**
IP-Enabled Homes and Offices, Roads, Utilities, Workplace Design
Progresses with CUD city projects

- 14 active projects recently reduced to 8, based on a still unconfirmed 1,76M$ FY09 assumption

  Smart Work Centers (Amsterdam – pilot completed, moving to large local rollout and replicating in other cities)

  EcoMap (SF and all other cities – demo completed, need to move to pilot in SF by April – Earth Day)

  Smart road pricing (Seoul - proof of concept developed, moving to pilot)

  Personal Travel Assistant (Amsterdam and Seoul – demo created, working proof of concepts ready by summer)

  Smart Homes (Birmingham – PoC being defined, EnergyWise pilot as first element. Madrid – PoC defined and launch in Q3)

  Smart Energy for Schools (Lisbon – PoC being defined, EnergyWise pilot as first element)

  Intelligent Traffic Management (Hamburg - PoC being defined)

  Connected Bus (SF pilot under completion, replicating in other cities)
CUD Seoul Vision – Energy & CO₂ Reduction by Connected & Sustainable Urban Mobility

Energy/Carbon Reduction

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
<th>2020</th>
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<tbody>
<tr>
<td>Value</td>
<td>16,450</td>
<td>15,182</td>
<td>14,500</td>
<td>13,980</td>
</tr>
<tr>
<td>Change</td>
<td>-7.7%</td>
<td>-12%</td>
<td>-15%</td>
<td></td>
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</table>

Traffic Condition Enhancement

- Transit share: 62.3%
- Travel speed (CBD): 14.0km/h
- Transit share: 63.3%
- Travel speed (CBD): 20.0km/h
CUD Seoul Projects

Objectives of CUD Seoul: Smart Transportation

Priority of CUD projects

1. Personal Travel Assistant
2. Smart Transportation Pricing
3. Smart Work Center
4. Connected Bus

Connected & Sustainable Urban Mobility

1. Reduce physical travel needs
2. Reduce road congestion and traffic delays
3. Explore and introduce the most effective technologies
4. Seamless and personalized passenger experience
Transform urban mobility & transportation patterns
Enhance citizen engagements

Connected Work Center
Mobile Working Enhancement
Smart Development: Integration of Transport and Land Use

Area-wide, Time-based Flexible Road Pricing
Smart Transportation Pricing
Modal Shift Encouragement to Public Transport

Smart Congestion Management
Area-wide Vehicle Tracking
Low-Emission, HOV Vehicles
Smart Parking Management

Connected Transit Complex
Connected Bicycle
Connected Bus Stop
IP Bus
Connected Station

Personal Activity Coordinator
Personal Travel Assistant

Informed decision-making: day to day ‘Travel Moments’ ...focused on improving choice and experience

City-wide infrastructure for Ubiquitous Connectivity
Personal Travel Assistant

Overview

Objectives

- **Transform urban mobility patterns** by providing **real-time personalized travel information services**
- Enable users to organize their work and social activities with better options in terms of Carbon/Time/and Financial impact

Strategy

- Link with **TOPIS Development Plan**: Multi-phased approach and u-TransPolis Implementation Roadmap
- Co-Develop **Technology Architecture** (Device Independent) and Standard Service Platform

Key Features

**Travel Planning**
- Day-to-day travel moments
- Smart traveler: automated recommendations based on profile

**Carbon Calculator**
- Carbon, Time, and Financial incentive suggestive alternatives
- Proactive service offerings based on profile

**Reservation**
Schedule and reserve travel and work based on personal needs

**Safety & Emergency**
- Real-time safety alert and remote diagnosis
Personal Travel Assistant of Seoul
Pilot Co-development

City of Seoul

- Web Server (at TOPIS)
- Development Tool (ESRI) – ArcGIS, ArcView
- Traffic Condition & Volume Data
- Public Transport Operation Data and Shortest-Route Tools
- Carbon Calculation Logic

Cisco

- Vision, Concept, and Core Features
- Development Partner – Y&H E&C or Sundo Soft
- Design and GUI Templates
- Web2.0 Service and Networking Technology

PTA Seoul Pilot
(Will be located in TOPIS Center)

Web Service Platform

Personalized Travel Information Service Widgets

- Trip Planner
- Real-Time Trip Router
- Carbon Calculator
- Personal Travel Planner

- Real-time road traffic info
- Real-time public transit info

Service Channel (Roll-Out)

- Mobile Phone
- PDA*(Navigator)
- IPTV
- Smart Media
PTA Seoul will be operated with Carbon Mileage Program

- **PTA Users**
  - Member Registration/Request Mileage
  - Carbon Mileage
  - Travel & Carbon Reduction Demands
  - Eco-Friendly Transit Services
  - Public Transit Authorities
  - Carbon Mileage Operator
    - Carbon Reduction Policy
    - Operation Support (Subsidy)
    - Campaign/PR Support
    - Support to Attract Affiliates
  - Carbon Mileage Program Manager
    - Request mileage payment
    - Payment for Mileage
    - Register Participation
    - Recruit Eco-Service Provider
  - Carbon Mileage Use
    - Public Transport Fare
    - Utilities & Local Tax
    - Smart Work (Welfare) Center
    - Maintenance Payment
    - Donation to Green NGO
Smart Transportation Pricing

Overview

Objectives
- Pricing reforms **aimed at reduce traffic and parking congestion**
- Enables area-wide, time and distance based **variable charging schemes**

Strategy
- Time, Location, and Distance-based **Flexible Pricing using GPS and Wireless Network**.
- Improve public acceptance with universal mobility account and financial incentives

Key Features

**Flexible Pricing Scheme**
- Time, Location, and Distance-based flexible Road Pricing
- OBU-RSU: Wireless Network (Wibro/ WiMax)
- RSU-Pricing Center: Metro-Ethernet (Fiber-Optic)

**Effective Enforcement**
- ANPR based
- Mobile Enforcement

**Mobility Account**
- Integrated payment system
- Congestion charging, public transportation, and parking

**One Day Pass**
- Another option for the infrequent drivers
- Various payment options
Smart Transportation Pricing of Seoul Co-Development

Seoul’s preparation

- Seoul has studied technological feasibility, socio-economic and traffic effects, legislative barriers, related transportation measures.
- To attract public interest in and support for smart pricing, various types of public outreach are being used.

CUD project progress

- By using GPS and Wireless Network technologies, time and distance based smart pricing project was launched.
- Being conducted now: Visual Kit development as a Proof-of-Concept; Field Drive test, data integration; data platform development.
Smart Transportation Pricing – Communication Network Architecture

- Traffic information filed at local traffic center -- which provides drivers and users with traffic information using intelligent wireless technology + high quality wired & wireless network
- Develop communication infrastructure to support wireless communication over 120km
Smart Work Center
Overview

Objectives

- Transform work into Smart Work
- Reduce physical travel volumes by meeting mobility needs remotely
- React to transport saturation from constantly increased mobility needs

Strategy

- Relieve Peak-Time Saturation of Public Transport and Traffic Congestion by adopting Smart Work (2-3 days flexible work options)
- Link with ‘Administration Autonomy Restructuring Plan’ : Office Remodeling
- Link with ‘Transit Complex Development Plan’ and ‘Public Bicycle Enactment Program’

Key Features

Mobile Work Environment
- Flexible spaces
- Wired/wireless broadband

Smart Collaboration
- Meeting rooms
- Standard collaboration devices

Link Green Campaign
- Family-oriented work culture
- Public bicycle and docking stations

Intelligent Operation
- Remote command & control
- Reservation, pricing and billing
Seoul: Personal Travel Assistant

Source: IBSG 2008
Smart Work Centers Chain, in Korea

Government Commitment

Current State

- Negative view on home working only
- Limited work infrastructure for mobile workers
- Tech. superiority Vs. Piece by piece TP business case

Forces At Work
Climate change adaptation
Less congestion and energy consumption
Work Productivity and Speed

Desirable Future State

- Smart work is highly adopted
- Nation-wide smart work centers chain: Metropolitan (Transit Centers) > Mega cities
- Country transformation-based large scale UC & TP business case

Development Progress

- Aug. 2008
- Sep. 2008
- Oct. 2008
- Nov. 2008
- Dec. 2008

Meeting with MOPAS/u-Planning
AMS CUD global conference
- Presentation to MOPAS
- Deliver reports to NIA
- VIP Seminar (Simon Willis)
- PT to MOPAS/national CIO
- Speak at Green Ocean Conf.
- Speak at u-Work Forum
- Support public sector budgeting – MOPAS, NIA, MLTM (KT)

Government setup the budget for 16 SWCs Chain, USD 19Mil by 2012.
Cisco has well positioned to key decision makers of both central and local gov. armed with SWC best practice and value case.
Smart Work Centers Chain, in Korea

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First Smart Work Center operational in the City of Almere, Netherlands. Official launch on September 23rd during Amsterdam CUD Global Conference. More than 10 additional SWC’s currently being deployed in the Amsterdam area with a self sustainable business model being driven by local companies. The Smart Work Center model is being implemented in other parts of the world, from Japan to Korea, from Costa Rica to Denmark

**SWCs are distributed public workspaces: enabled by Cisco collaboration, TelePresence and connectivity solutions, following Cisco Connected Workplace solutions model.**
Smart Work Centers Seoul and Global Network Co-Development

Smart Work Centers in Seoul Link with Global Collaboration Network

DDP Dongdaemun Design Plaza & Park

New City Hall

Mobility & Presence

Concierge Services

TelePresence

Signage, Events, Media

Smart Work & Collaboration Platform

10 Transit Centers in Metropolitan Area

10 SWCs in Netherland (~2009)

Europe

Smart Work Centers Chain (Netherlands, Denmark, & Germany)

Tata

22 Public TP Rooms (10 Live, 12 booked on phase2)

Cisco TP Exchange B2B

Amsterdam

Almere

Rotterdam

Schiphol

The Hague

Utrecht

Den Bosch
Connected Bus (SF): IP-enabled municipal bus delivering integrated passenger services, using the bus as a node in the network

Bus now circulating in SF, as part of the one year pilot. Other municipal governments across the world are starting to implement the same solution (eg, the city of Bangalore, India)
Facing the climate challenge
Hamburg’s approach to sustainable development and smart growth

One strategy being developed within the EU
Who we are and where we come from – a brief introduction…

- Germany’s second largest city and one of 16 federal states with a population of 1.7 M in the city and more than 4 M in the metropolitan area
- Second largest port & aviation technology center in Europe
- Green city on the waterside (40 % green and water spaces)
- Rich variety in the metropolitan region (14 counties)

- Annual CO₂-emissions will decrease by 2 M tons within 5 years as compared to now (almost -30% p.c. since 1990) as laid out in Hamburg’s Climate Action Plan, which provides an extra funding of 25 M Euro for the year 2008
Focus project: Metro Traffic Mgmt

Objective:
Seamless integration of all modes of transport in the Metropolitan Region to enhance citizen experience and promote use of public transport

Project description:
Based on the analysis of real-time traffic data (road/rail system) develop and distribute intelligent recommendations on best routes and means of transport

Initial project partners:
City of Hamburg
County of Pinneberg (Metro Region)
Hamburg Public Transport Authority
BPV – Traffic system consultants
Traffic Mgmt: Project Phases

- Brainstorming Phase: Done
- Establish Project Team: Done
- Prepare Project Description: Done
- Political Approval and Support: Underway
- Secure Initial Budget: Underway
- Feasibility Study: Q4/2008
- Apply for Federal Funding: Q4/2008
- Start of Main Project: 2009
Further Projects currently being evaluated

- **Urban Planning:**
  Sustainable development of East Harbor City

- **Clean Energy**
  Extend use of fuel-cell/hydrogen technology in Public Transport, buildings and IT datacenter

- **Logistics:**
  Optimization of Harbor logistics
## The Hamburg Transport Authority – Energy saving activities

<table>
<thead>
<tr>
<th>Power consumption of the Metro System</th>
<th>1995</th>
<th>2006</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Million car-km p.a.</td>
<td>58.37</td>
<td>74.54</td>
<td>+27.7%</td>
</tr>
<tr>
<td>Total power consumption [million kWh]</td>
<td>97.68</td>
<td>103.97</td>
<td>+6.4%</td>
</tr>
<tr>
<td>Specific consumption [kWh/car-km]</td>
<td>1.67</td>
<td>1.39</td>
<td>-16.8%</td>
</tr>
</tbody>
</table>

Automatic driving recommendations for energy-efficient train operation. Return of braking energy into the electricity network. Energy storage systems. New lightweight construction vehicle concept.
Best Practice in transportation:

Zero Emission Public Transport - The Hamburg fuel cell concept

✓ Fuel-cell powered hydrogen buses are 100% environmentally compatible and operate at low noise and emission rates

✓ HOCHBAHN operates nine fuel cell powered buses in the regular daily inner-city traffic thus constituting the largest hydrogen powered bus fleet in the world
Urban Planning

The Hamburg HarbourCity

- establish criteria for sustainable planning in development plans and building permits
- create urbanity and urban structure with a inspiring mix of public spaces; new districts with residential and office usage; institutions and networks; cultural and entertainment facilities; and a dense grid of walkways and cycling paths
- extend spatial conversion (brownfields at harbour, railway, industrial, etc.)
Best Practice in smart growth and advanced urban planning

Hamburg Harbour City
San Francisco: Connected Public Transportation

Source: IBSG 2008
Global EcoMap: San Francisco Pilot

- **Challenge:** Currently, no universal collaboration, visualization, and measurement tool exists for greenhouse gas emissions from city activities.

- **Solution:** Develop an open source collaboration web 2.0 platform that will enable citizens and business to see the collective results of their individual climate change behaviors, aggregated by zip-code, to take actions to mitigate environmental impacts, and track the results of these actions.

- **Results:** Connected Urban Development (CUD) prototype under development. 10+ cities in North America, Europe, and Asia are engaged, with the City and County of San Francisco taking the lead.
Next Generation Thought Leadership – beyond CUD as a program

- Gradually moving away from vertical solutions in silos (Bus, SWC, Road Pricing, Home) into a horizontal urban planning approach (Broadband and ICT as the 4th Utility)

- EcoMap as the first embryo of a Urban pSkin:
  - Data Flows sensing and collection (people, vehicles, goods, data, energy, water, etc)
  - Meshup – turning data into information
  - Presentation – to Citizens (EcoMaps), Government (Urban Planning Dashboard) and carbon markets (pSkin)

  Outstanding feedback from cities all over the world (Shanghai, London, CUD cities, Masdar, Toronto Waterfront, etc) and availability to seriously invest

- San Francisco as the first EcoMap pilot by April 2009.
CONCEPTUAL VIEW

SOUTH KIRKLAND TRANSPORTATION HUB

SERVICES:
- Swift Bus Rapid Transit
- Mobile Van (MVC) Taxi
- Nickelodeon Community Service
- Sea Bus Express
- Sound Transit Option
- RapidRide Hybrid Electric Vehicles

FEATURES:
- Zipcar Parking
- Adjacent Park-and-Ride (in north Kirkland)
- Visitor Information Center
- Local Retail Venues
January 30, 2009

- Gordon@UrbanAge.org
- www.MeetingoftheMinds.org
- www.MtgoftheMinds.org
- www.Meeting-Minds.org

- Thank you