



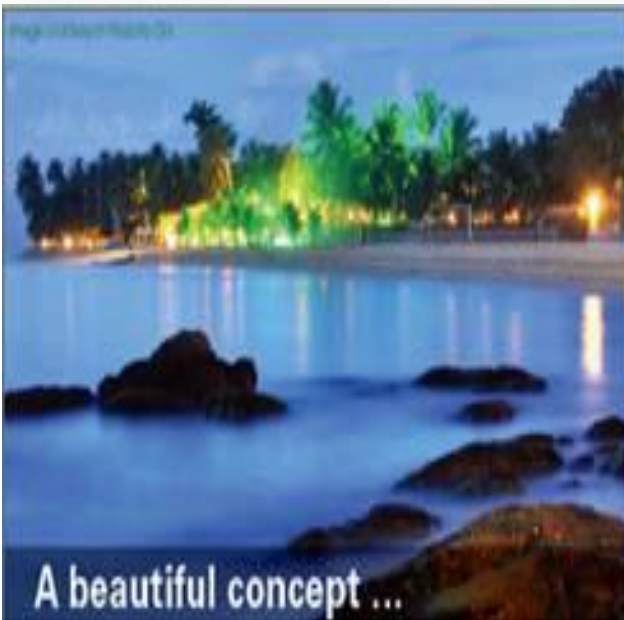
National Academy of Sciences Regional Approaches to Urban Sustainability: A focus on Portland

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CH2M HILL
May 29, 2013*

Integrating Research into Urban Sustainability Strategies

- Rapid Deployment of Research
- The Power of Social Networking to Create Sustainable Cities
- Revitalizing Singapore's Waterways

Rapid Deployment of Research and The Valley of Death



City Scale Technology Deployment

Overcoming the Valley of Death through a Structured Approach

Research & Development

Pilot

Production

Investigation

Feasibility

Development

Introduction

Growth

Maturity

University
Partners

National
Laboratories

Industrial Laboratory
Collaborators

- Develop Prototype
- Conduct Tests

- Production Prototype
- Pilot Demonstration

- Commercial Design
- Scale Up to System Demonstration

- Scale up Product Production
- Replicate System Deployment

Industrial and Advanced Technology

Infrastructure
Engineering Groups

Overcoming the Valley of Death through a Structured Approach

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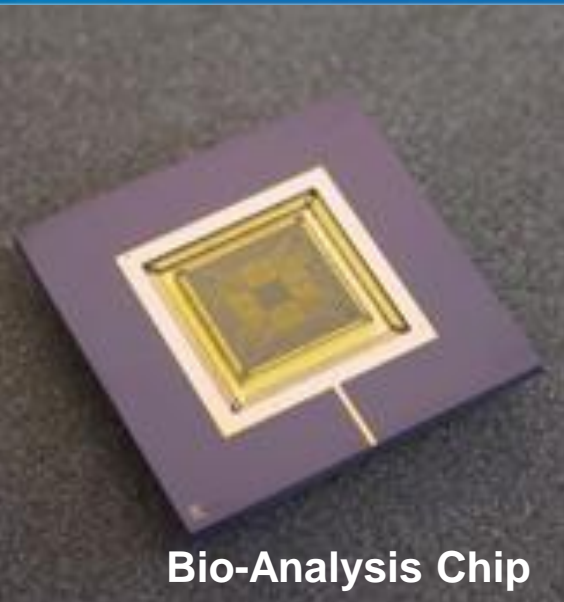
Industrial and Advanced Technology

Industrial Laboratory
Collaborators

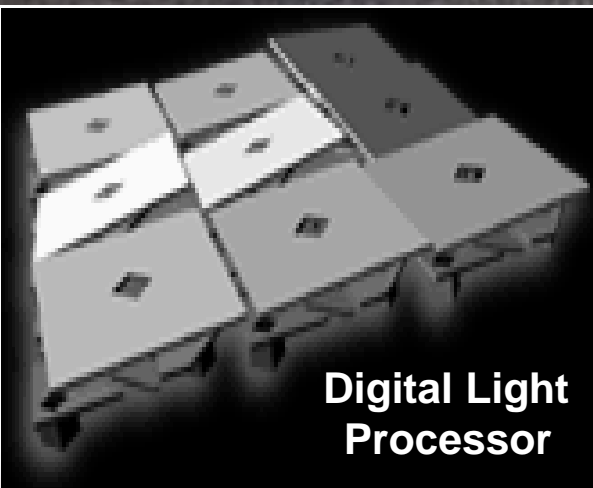
City/State
Partners

Infrastructure
Engineering Groups

Staff knowledge on new technology that is effective and can be scaled up

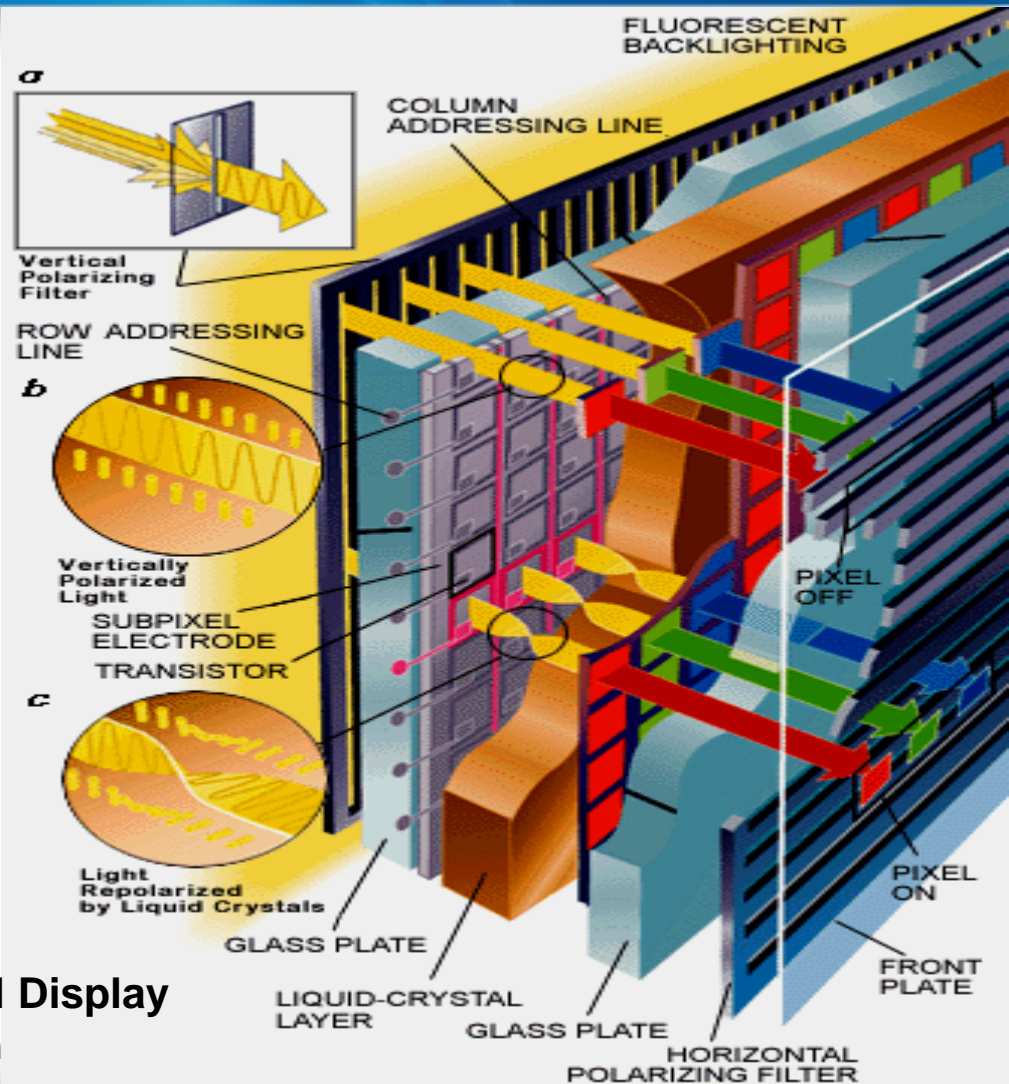


Bio-Analysis Chip



Digital Light Processor

Liquid Crystal Display Cross section



Local Collaboration using a Structured Approach Produces Results

- Oregon State University
- Portland State University
- Pacific Northwest National Laboratory
- Oregon Department of Transportation
- TriMet
- Local Industrial Clients (Confidential)





Nanomanufacturing at the ONAMI Microproducts Breakthrough Institute

B. Paul, C. Chang, V. Remcho,
D. Palo, L. Kannberg,

December



CH2MHILL.

CH2M HILL has
performed as an
MBI collaborative
partner on selected
projects



Low Energy and Low Cost Desalination of Sea Water using Micro-channels



Anticipated size of the EDT replacement technology for equivalent desalination capacity

Intelligent Transportation Systems increase efficiency and improve options for motorists



The Power of Social Networking to Create Sustainable Cities



<http://urbanecomap.org/>

green
updc



<http://greenup.dc.gov/>

1 Set Your Goals
Move the sliders to adjust your starting point.

2 Plan Your Actions
Identify actions that you will take in each of the following areas:

Transportation

- ☐ Bike or Walk to Work
- ☐ Bike or Walk for Daily Travel in Town
- ☐ Carpool
- ☐ Drive a Hybrid
- ☐ Take Public Transit to Work
- ☐ Take Public Transit for Daily Travel in Town
- ☐ Utilize A Car Share Program for Regional Travel

Energy

- ☐ Cold Weather Clothing
- ☐ Do Not Use Heating and Cooling
- ☐ Flip the Switch and Unplug
- ☐ Hang Clothes to Dry
- ☐ Install Double Pan Windows
- ☐ Install Energy Star Appliances
- ☐ Install Programmable Thermostat
- ☐ Insulate Water Heater
- ☐ Run Dishwasher
- ☐ Run Dishwasher Washing Machines with Full Loads
- ☐ Take Short Showers (5 minutes)
- ☐ Upgrade Light Bulbs

Waste

- ☐ Compost Expired Food and Table Scraps
- ☐ Compost Yard and Garden Waste
- ☐ Recycle Plastic
- ☐ Recycle Aluminum
- ☐ Recycle Cardboard
- ☐ Recycle Glass
- ☐ Recycle Paper, Newspaper and Magazines
- ☐ Reuse Containers, Bottles, etc.

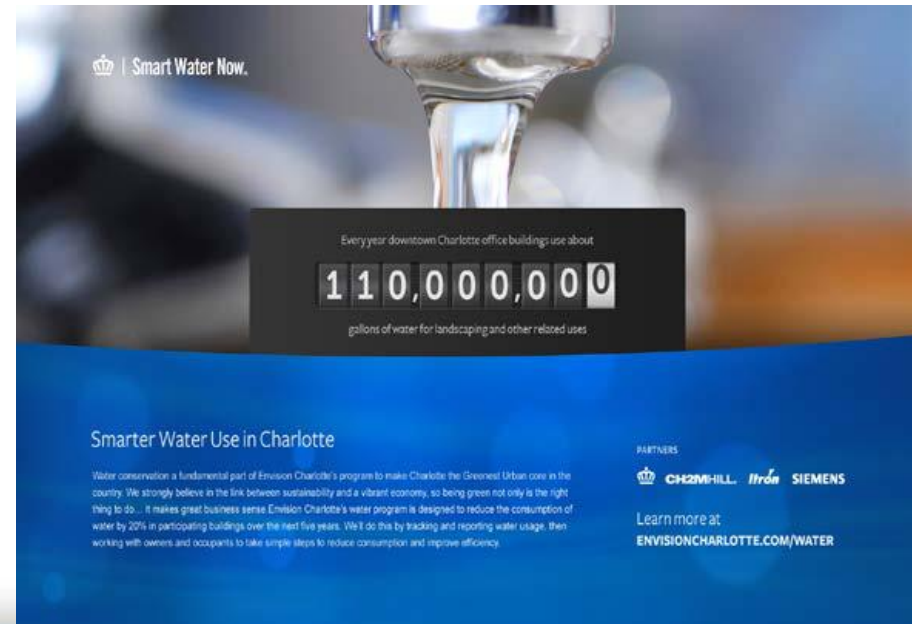
3 See Your Results
Chart your contribution.

By CO2 Impact

Take Action with plan



<http://www.envisioncharlotte.com/>



CH2MHILL.

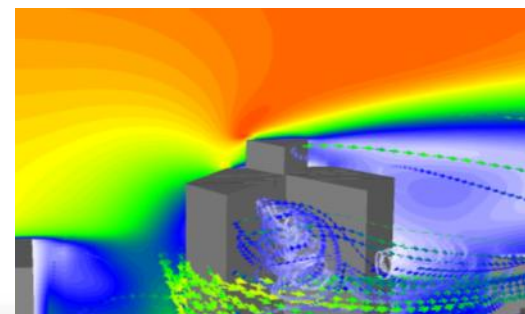
Energy Mapping: a portal to visualizing solar and wind energy

DOE selected CH2M HILL to help 25 U.S. cities accelerate the adoption of solar energy through the Solar America Cities Program. San Francisco provided leadership for the public to make their own decisions.

- View their rooftops online
- Calculate the available area for solar panels and urban wind
- Estimate the solar/wind energy that could be generated
- Estimate electricity savings and GHG emission reductions
- See which neighbors have adopted solar/wind

<http://sfenergymap.org/>

<http://greenenergy.reno.gov/energy/>



Revitalizing Singapore's Waterways – ABC Waters Programme





The Central Catchment – Adopting the Watershed Approach

Key Drivers

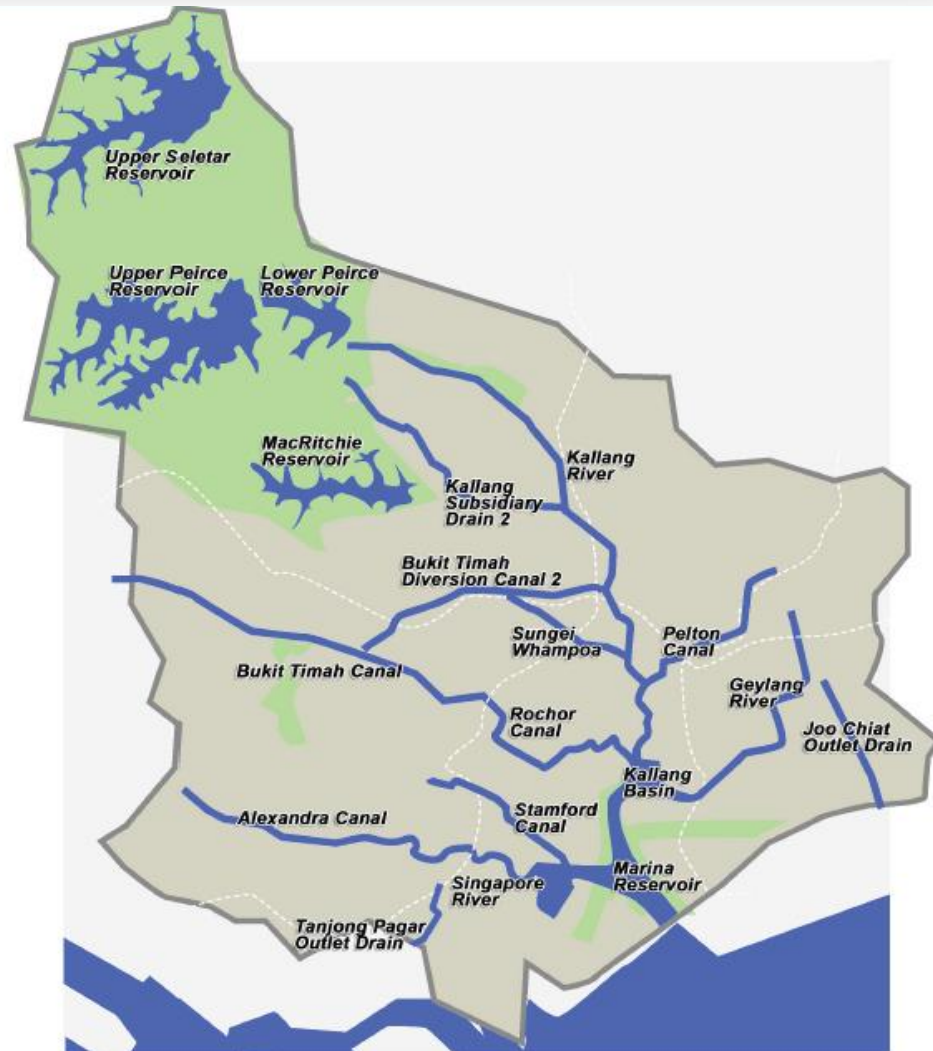
- Water Resource
- Water Quality
- Land Use Integration
- Community Stewardship
- Sustainability



The Central Catchment

Goals

- Go beyond functional uses
- **A**ctive, dynamic, full of life and activities
- **B**eautiful, aesthetically pleasing
- **C**ommunity bonding
- Improve quality of life
- Education, to impart value of keeping our water catchments clean
- Long-term improvement in water quality



...and we made streams & wetlands...



Collaborative integration of scientists, universities, NGOs, public agencies and the private sector is key to solving district, regional and large-scale sustainability issues

