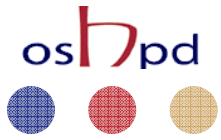# California Healthcare Atlas –
Integrating Geography and the Data Warehouse

California Office of Statewide Health
Planning & Development

Michael O'Neill, Michael Byrne, Scott Christman

Outline Overview

- ## What is OSHPD?
  - Mission and Data
- ## Typical Data Delivery
- ## Atlas' Evolution: Steps in the Right Direction
  - Yesterday's Healthcare Atlas (v1)
  - Today's Healthcare Atlas (v2)
  - Future Healthcare Atlas
- ## Lessons Learned

About OSHPD

- CA State Dept $^w/_{in}$ Health & Human Services Agency
- Facilities Development & **Permitting**
  - Code enforcement
  - Earthquake retrofitting
- **Workforce** Planning
- Data **Collection**
  - Patient data
  - Facility
  - Financials
  - Utilization
- Mortgage **Insurance**
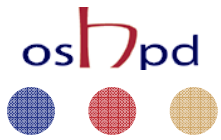
About our Data Warehouse

6 yrs old

- **Inpatient**
  - 12 years
  - 48M encounters
  - 400+ attributes
- **Emergency Dept.**
  - 3 years
  - 26M encounters
  - 500+ attributes
- **Ambulatory Surgery**
  - 3 years
  - 11M encounters
  - 500+ attributes

- **Facility**
  - 6400 facilities
- **Financial** *
  - 5 years in data mart (in progress),
  - 33 yrs in mainframe
    - 1741 data elements
  - 17 yrs in hospital pivot tables
    - 254 attributes
- **Utilization** *
  - 5 years in data mart (in progress),
  - 4200-4600 reports annually
  - 131 to 615 data elements each report

* Coming soon

Voice from the Past

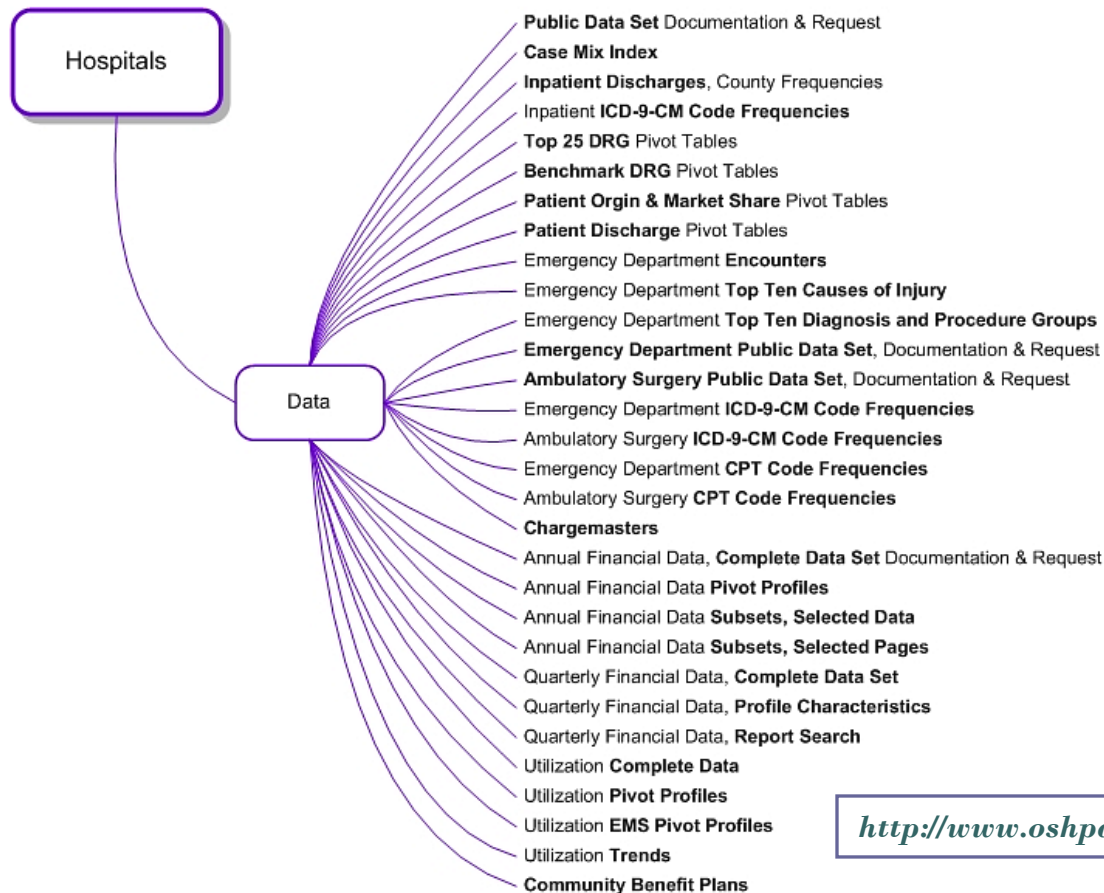"...wherever the people are well *informed* they can be trusted with their own government..."[1]

- Thomas Jefferson, 1789
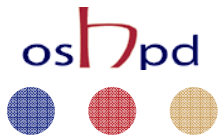
Transparency → Better Health Policy
How ?

ESRI International User Conference

August 6, 2008

Transparent, Yes – Useful?

Example, Hospital Data

Hospitals — Data

- **Public Data Set** Documentation & Request
- **Case Mix Index**
- **Inpatient Discharges**, County Frequencies
- Inpatient **ICD-9-CM Code Frequencies**
- **Top 25 DRG** Pivot Tables
- **Benchmark DRG** Pivot Tables
- **Patient Orgin & Market Share** Pivot Tables
- **Patient Discharge** Pivot Tables
- Emergency Department **Encounters**
- Emergency Department **Top Ten Causes of Injury**
- Emergency Department **Top Ten Diagnosis and Procedure Groups**
- **Emergency Department Public Data Set**, Documentation & Request
- **Ambulatory Surgery Public Data Set**, Documentation & Request
- Emergency Department **ICD-9-CM Code Frequencies**
- Ambulatory Surgery **ICD-9-CM Code Frequencies**
- Emergency Department **CPT Code Frequencies**
- Ambulatory Surgery **CPT Code Frequencies**
- **Chargemasters**
- Annual Financial Data, **Complete Data Set** Documentation & Request
- Annual Financial Data **Pivot Profiles**
- Annual Financial Data **Subsets, Selected Data**
- Annual Financial Data **Subsets, Selected Pages**
- Quarterly Financial Data, **Complete Data Set**
- Quarterly Financial Data, **Profile Characteristics**
- Quarterly Financial Data, **Report Search**
- Utilization **Complete Data**
- Utilization **Pivot Profiles**
- Utilization **EMS Pivot Profiles**
- Utilization **Trends**
- **Community Benefit Plans**

- ○ Pivot tables
- ○ PDF
- ○ Silos typically by year & data type.
- ○ Jargon

http://www.oshpd.ca.gov/HID/DataFlow/HospData.html

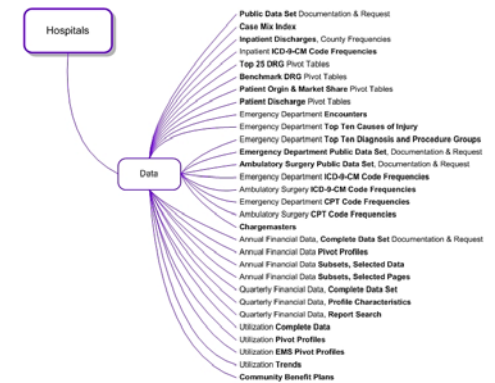# Typical Data Delivery

- ○ **Types** of Data Delivery
  - ● PDF
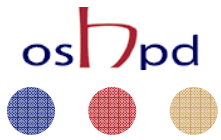 - ● Website silo
  - ● Excel Spreadsheet/Pivot Table
- ○ **Problems** with Traditional Methods
  - ● Static
  - ● Difficult to <u>use</u>
  - ● Difficult to <u>compare</u>
  - ● Difficult to <u>browse</u>
  - ● No inherent spatial <u>visualization</u> or <u>analysis</u>

Example, Excel Pivot Table

Good up to a point, but…

- Require more effort
- Limited functionality
- Opportunity for misuse/error
- Cannot reference specific data element

ESRI International User Conference   August 6, 2008

Example, Adobe PDF

- Static
- Difficult to compare dimensions
  (time, facility, geography, attributes)
- Lack of other context

ESRI International User Conference

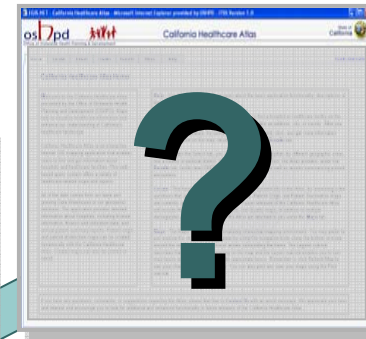August 6, 2008

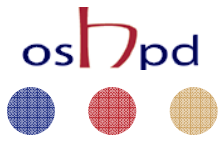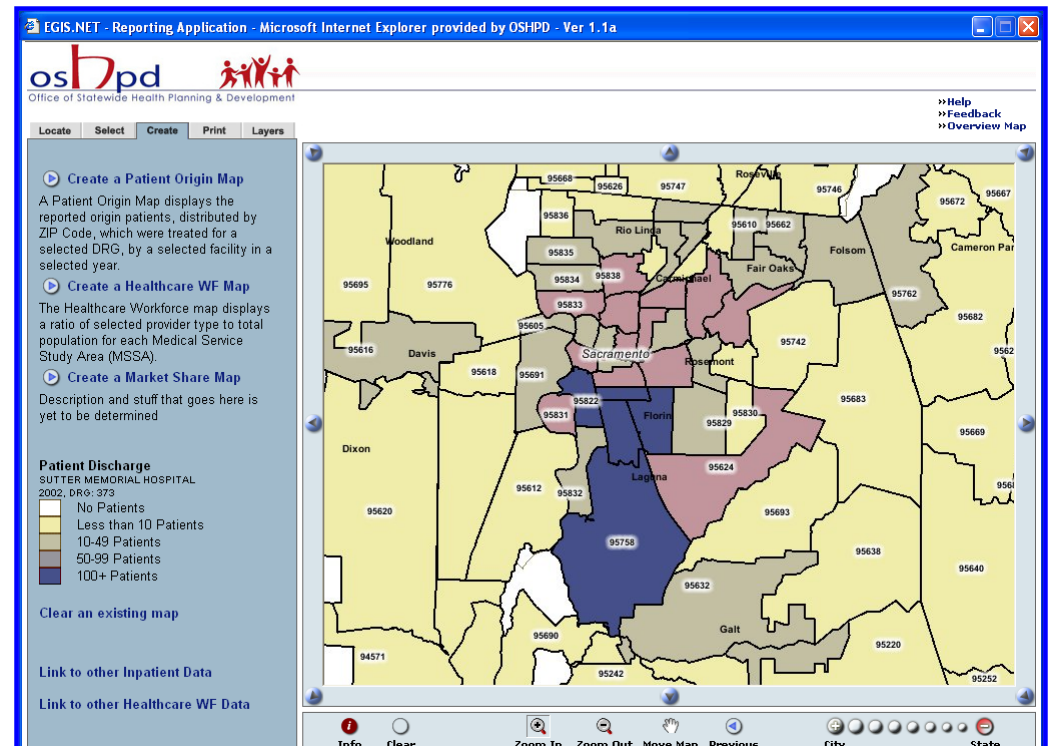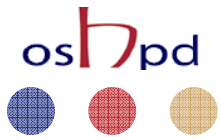# Atlas: Evolving Data Delivery

PDF & Pivot

1995
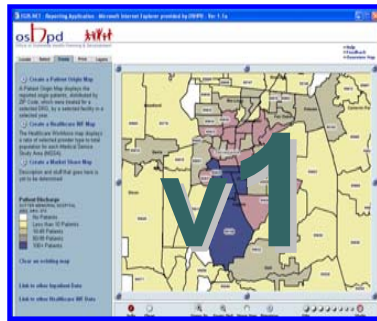
2005
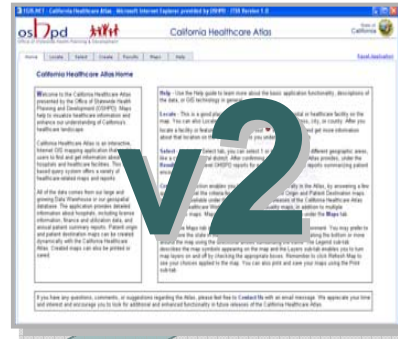
2007

?

Delivering healthcare data in
increasingly more meaningful ways.

Atlas v1.0 – Good 1st Step

- Emphasized the map
- Initial use of ArcIMS
- Warehouse
  - E.T.L. only
  - On learning curve
  - Immature

Live Demonstration – v2.x

- Locate
  - Locate 'things' on the map

Focus → - Select
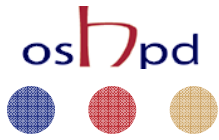 - Discover info and compare hospitals

Focus → - Create
 - Create specific types of thematic maps

- Other tabs
  - Results, Map, Help

Today's Atlas v2.x – Better 2nd Step

- Tabs & Workflows
  - Increased usability
- Better performance
- More functionality
  - More maps
  - Hospital comparisons
- Integrates more data sources
  - Inpatient, emergency dept., ambulatory surgical center, financial, utilization, charity care, workforce, vital statistics
- Some stakeholder outreach pre-production
- In maintenance phase now
  - Stabilize the product
 - Room to plan next generation application

http://www.oshpd.ca.gov/atlas
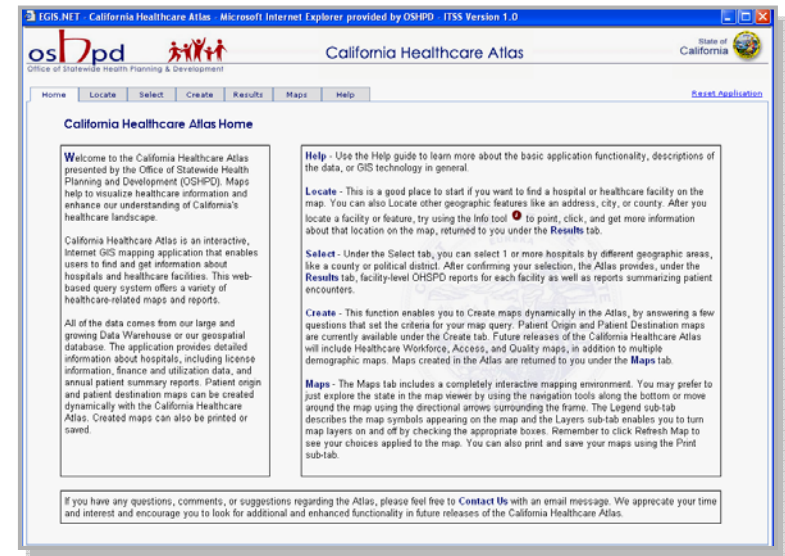
System Architecture – Atlas v2.x

ESRI International User Conference

August 6, 2008
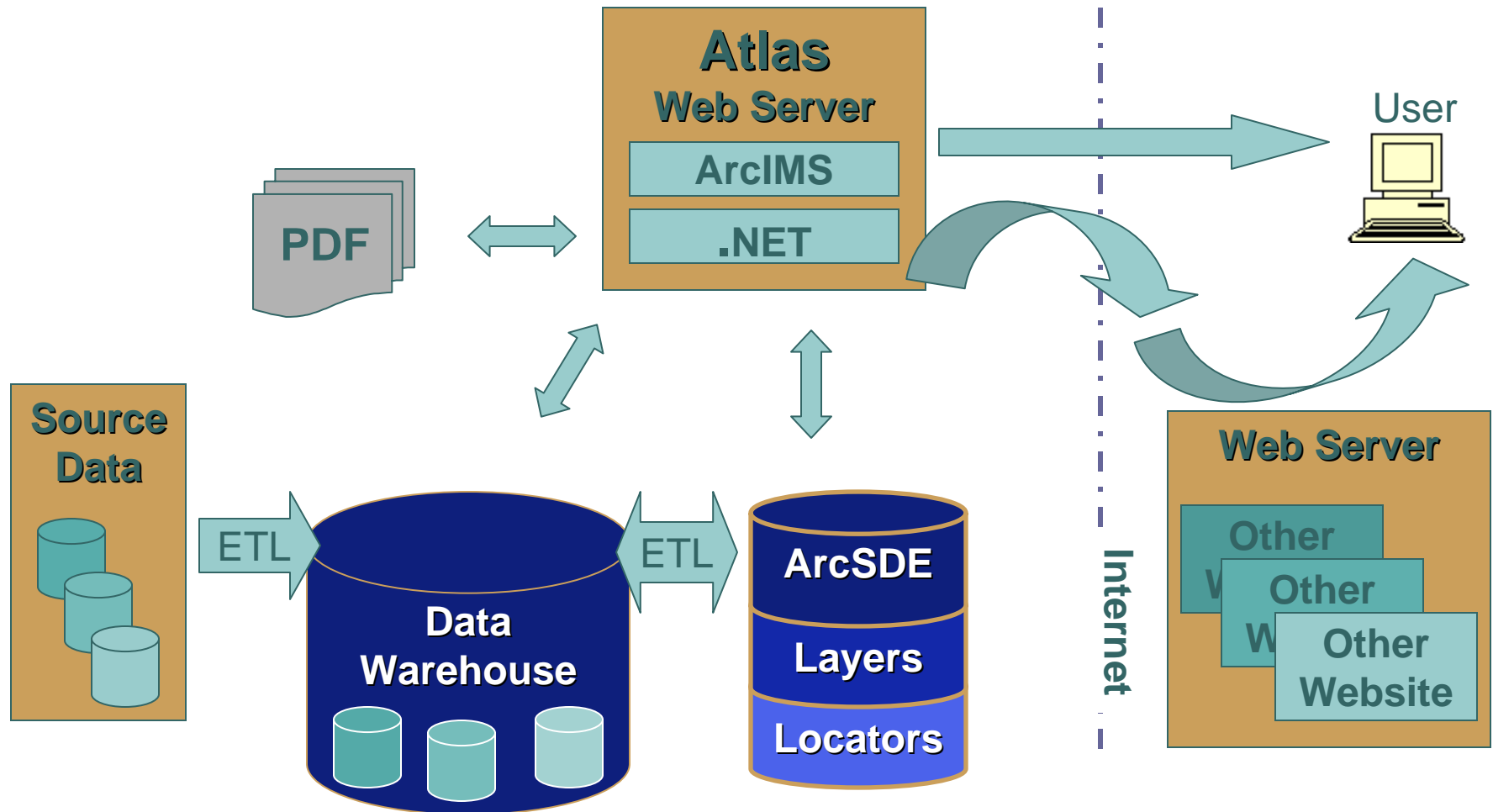
Atlas: Next Generation

- Sustainable architecture
- Data use cases
  - Refocus on the user
- More data integration
  - Warehouse growing & maturing
  - 3 data marts (now)
  - 2 more marts (coming soon)
- More effective, easier, & faster investigations
- Quick, easy answers (as appropriate)
- Web 2.0 – enabling the community
- "Story telling" – data don't talk, people do
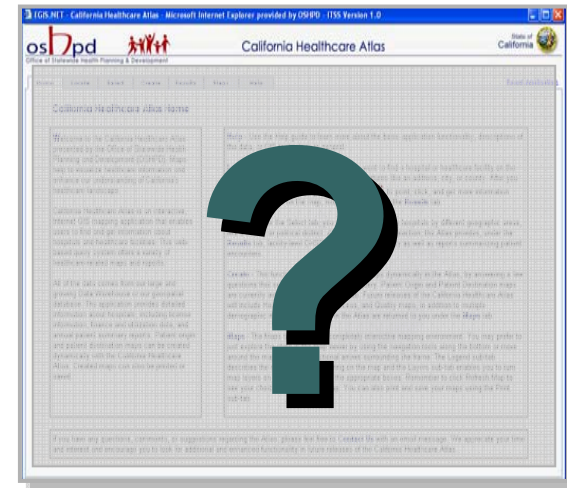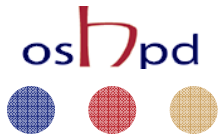
Lessons (being) Learned

- Data warehouse is catalyst
- <u>Best</u> comments come <u>after</u> product released
- Observe many users
- Be *flexible* & adaptive
  - Build it in to your plan & architecture
- Grow paths are <u>not linear</u> (embrace that)
- "Data Use Cases"
  - **Mission + User + Data = ACTION**
- Web 2.0 is a giant megaphone
- Geography cuts across all boundaries

August 6, 2008

Acknowledgements

- OSHPD Staff
  - Michael Byrne (Project Manager)
  - Michael O'Neill (Enterprise GIS Coordinator)
  - Mulan Wang (Data Warehouse Administrator)
- Vestra Resources
  - Brian Hoefer (Project Manager)
  - Tony Preston (Developer)
- ESRI
  - Professional Services
  - Scott Christman (former OSHPD GIS Coordinator)

Questions ??

"…wherever the people are ***well*** *informed* they can be trusted with their own government…"[1]

- Thomas Jefferson, 1789

useful   *of info*

Transparency → Better Health Policy

Michael O'Neill & Michael Byrne
gisWebmaster@oshpd.ca.gov
http://www.oshpd.ca.gov/atlas