Smarter Cities Challenge

Dallas

February 2015

Dallas Smarter Cities Challenge

How can the city of Dallas and its citizens best exploit the multiple data stores they own and have access to? How can they use the latest available technologies to derive insights from this data, and to share and publish information, in order to make the city a safer, more pleasant environment for all its inhabitants?

Focus areas:

- Bridge the 'trust gap' between citizens and authorities

- Make policing, fire and rescue services more effective

- Target investments for benefit of neighborhoods

- Give the public information they need to improve their neighborhoods

Smarter Cities Challenge

City of Dallas

Dallas Smarter Cities Challenge -the Team and the Study

Mandi Hanks, Joe Doria, John Black, Judy Lyne, Anand Ranganathan, Rajesh Sukhramani

- Study period: 2 -20 Feb 2015

- Over 80 city leaders interviewed:

  - City Managers, Chief of Police, CIO

  - City of Dallas officials (DPD, CIS, Fire & Rescue, Libraries, Planning, City Attorney, Community Prosecutor, City Courts, OEM)

  - Community Leaders (Safer Dallas, CrimeWatch, Habitat)

  - Dallas County CIO

  - Chamber of Commerce

- Study of city datasets, websites and apps

- Research and comparison with other cities

- Presentation followed by full written report

Summary of Findings

1. Data and insights trapped in silos

AIS TCIC NCIC Drivers License Records ● ● ●

2. Poor user experience to get relevant data for a given task

3. "Protective" culture around data limits sharing; users do not know where data exists outside of their domain
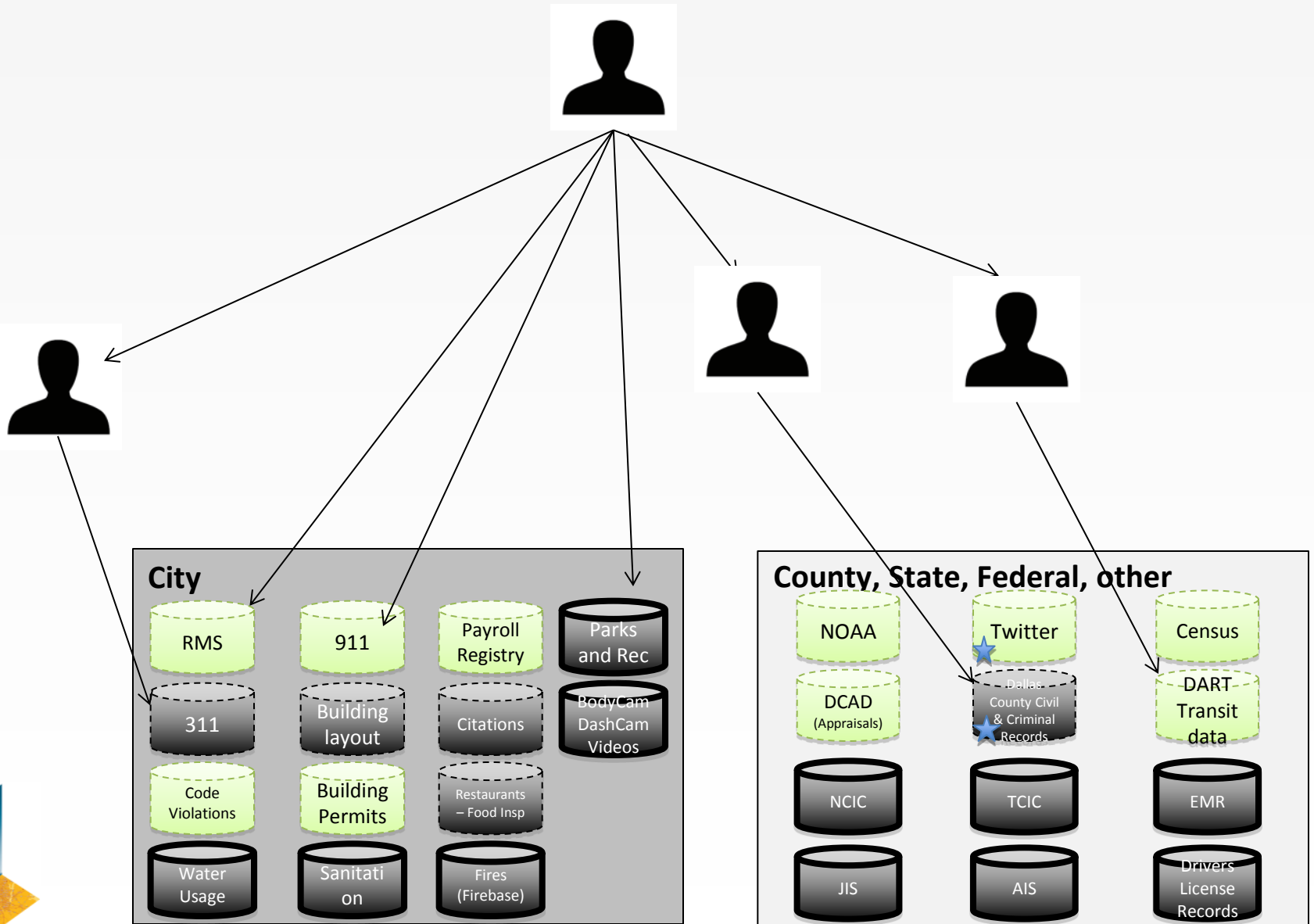

DALLAS CWEB

4. Trust and perceptions are critical issues to address between the City, Neighborhoods, and Citizens

5. CIS sponsored enterprise-wide IT projects are challenging to fund

Access to data is time-consuming and complicated in the current state

City

- RMS
- 311
- Code Violations
- Water Usage
- 911
- Building layout
- Building Permits
- Sanitation
- Payroll Registry
- Citations
- Restaurants – Food Insp
- Fires (Firebase)
- Parks and Rec
- BodyCam DashCam Videos

County, State, Federal, other

- NOAA
- DCAD (Appraisals)
- NCIC
- JIS
- Twitter
- Dallas County Civil & Criminal Records
- TCIC
- AIS
- Census
- DART Transit data
- EMR
- Drivers License Records

A vision for data…..

- Consolidate city data

- Integrate other data sources

- Provide question/search capability across all data

- Control access centrally

- Make data easier to access, analyze and share

…improving safety for all

- 'Right data at the right time' for all users

- Make Emergency Services and all City Officials more effective

- Strengthen 'Open Government' and improve trust with the community

- Enable communities to share 'value add' analysis

- Increases engagement between City, Police and Communities

Safety in Dallas…

….enabled by data

Realizing the Vision: 3 Key Recommendations

Improve USER EXPERIENCE

Provide SEARCH AND ANALYTICS

Data Lake

ORGANIZE and GOVERN data

City

RMS	911	Payroll Registry	Parks and Rec
311	Building layout	Citations	BodyCam DashCam Videos
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NCIC	TCIC	EMR
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7
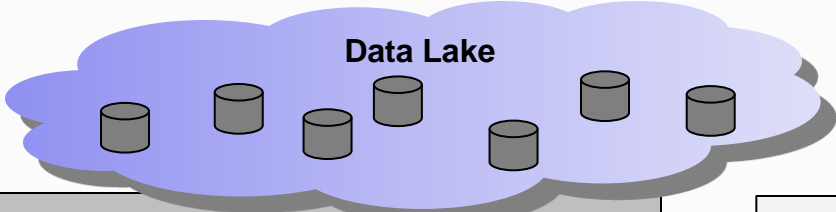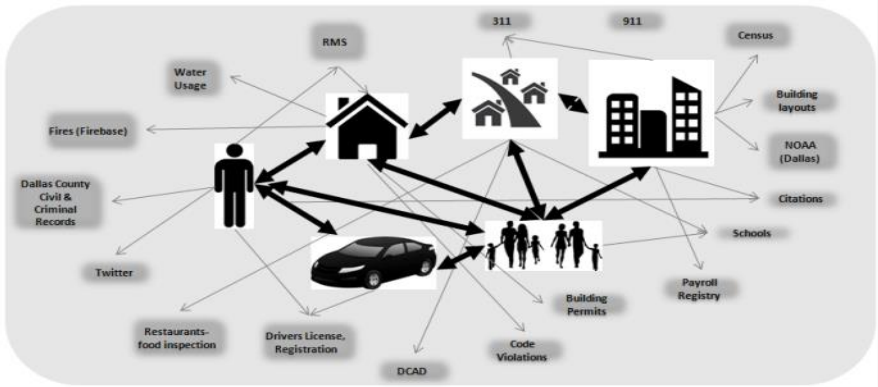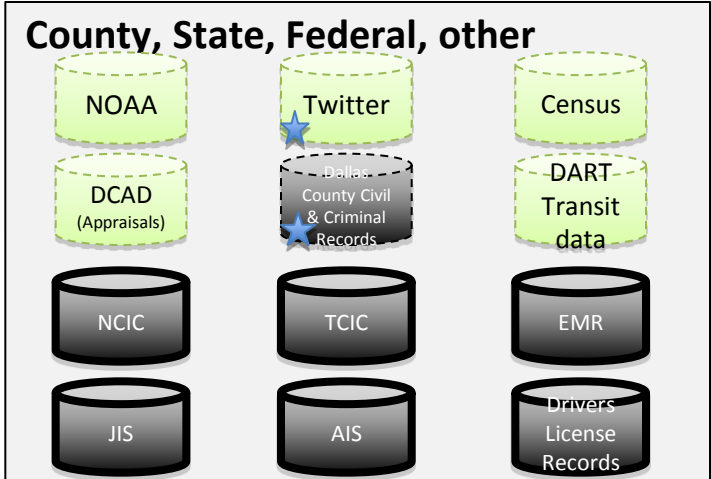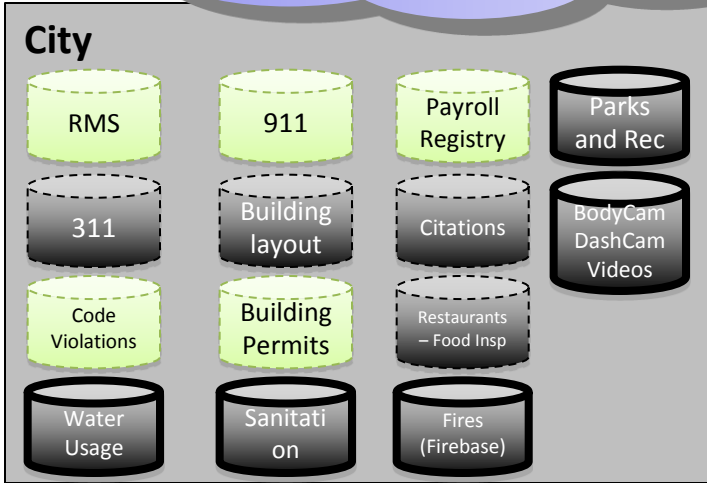
Recommendation 1: Consolidate, Organize and Govern Data

Data in Dallas today…

Available for public access

Not available to public

Downloadable — Entire data set can be downloaded for local analysis

Searchable Not downloadable — Not downloadable, only available for search or queries

⭐ Multi-user, multi query access available for charge

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8

Recommendation 1: Consolidate, Organize and Govern Data

Data Lake

Cloud-Based
Secure
Scalable
Reliable
Available
Access-Controls
Privacy-Preserving

City

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Recommendation 1: Consolidate, Organize and Govern Data

How do we do this?

1. Culture : Change from "Need to Know" to "Duty to Share"

2. Data Sharing : Agree on common standards

3. Organization : Chief Data Officer in charge of initiating and managing data lake

The "Data Lake" makes city data available quickly, reliably and accurately. It helps all involved in public safety be more effective, and grows the trust and confidence of citizens.

Data Lake

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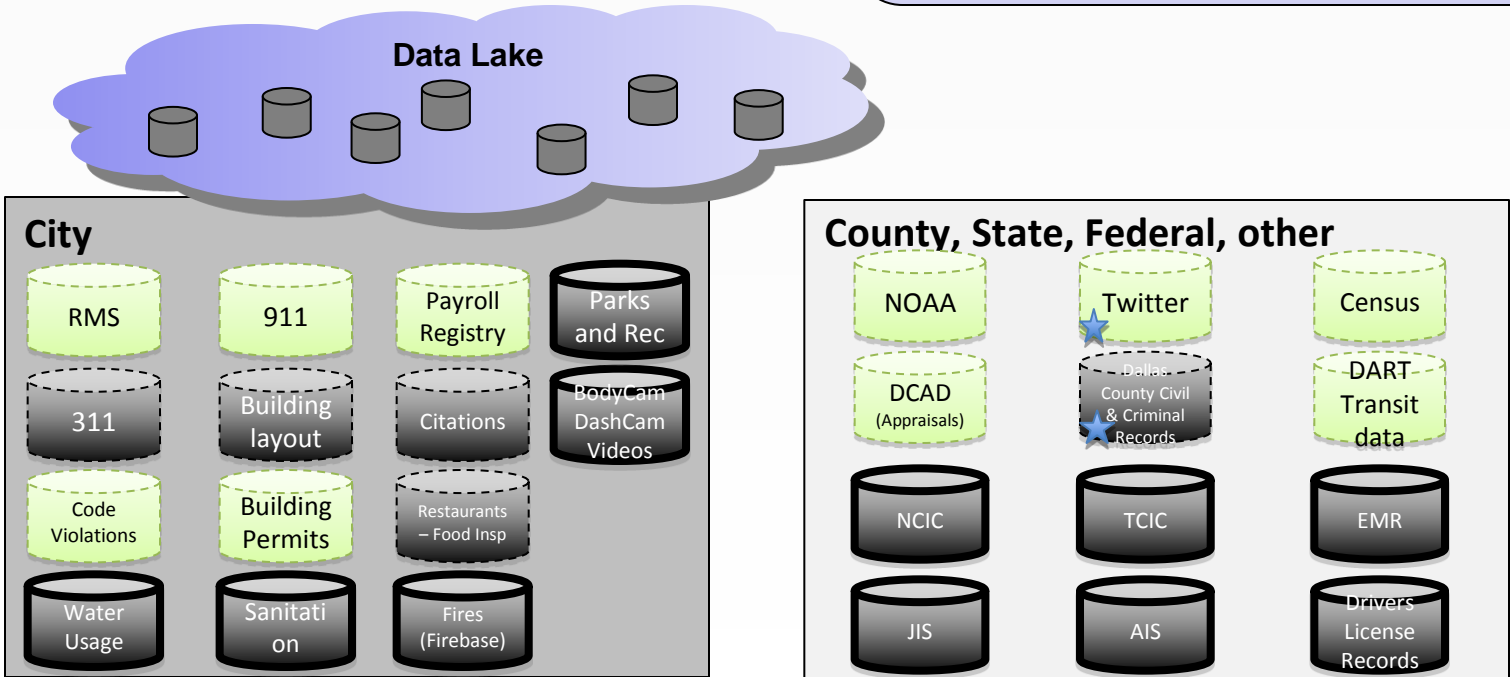
Recommendation 2: Create Search and Analytics Capability

Provide SEARCH AND ANALYTICS

Data Lake

ORGANIZE and GOVERN data

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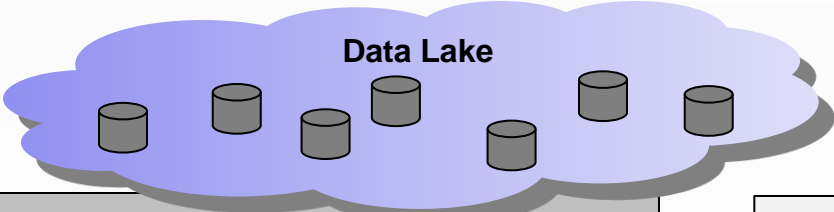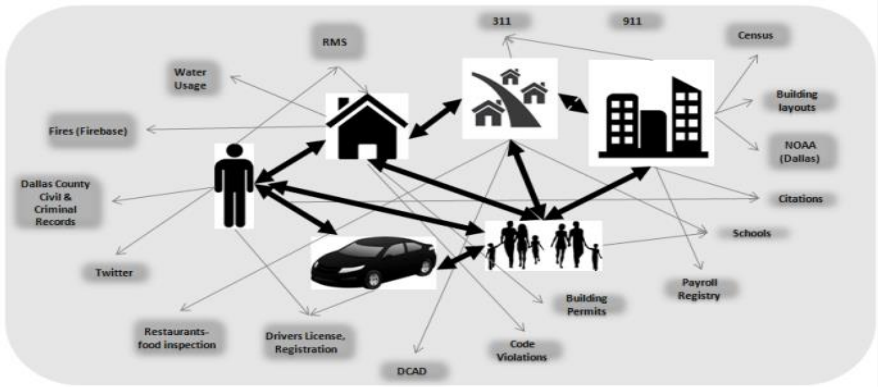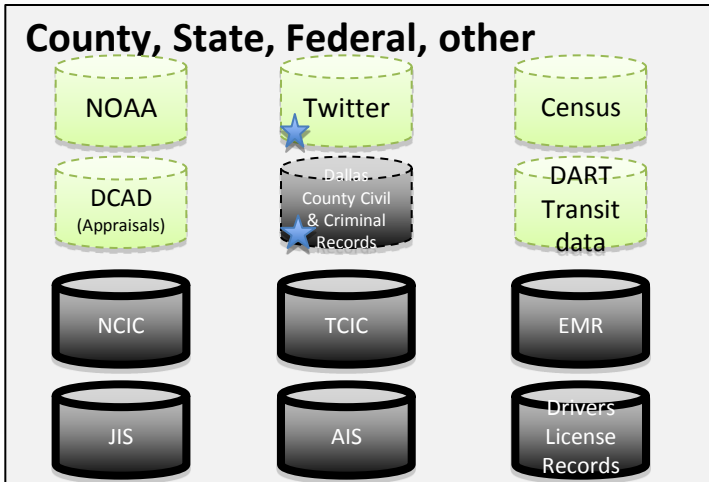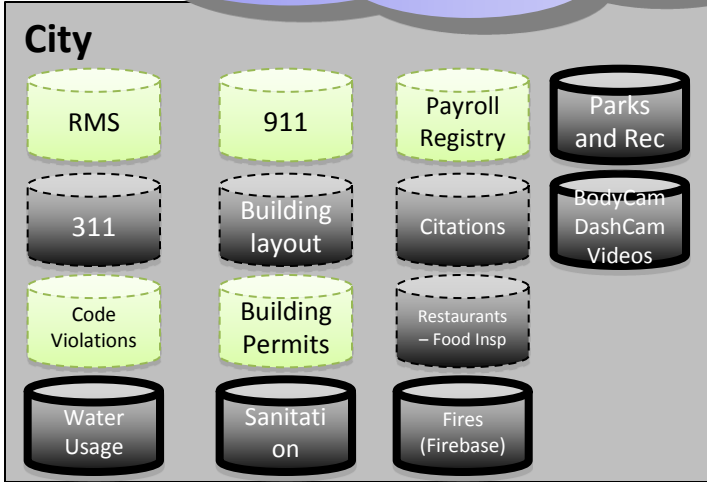
Recommendation 2: Create Search And Analytics Capability

***Organize around key data items*:**

- Person
- Address
- Vehicle

- Family
- Community
- Building….
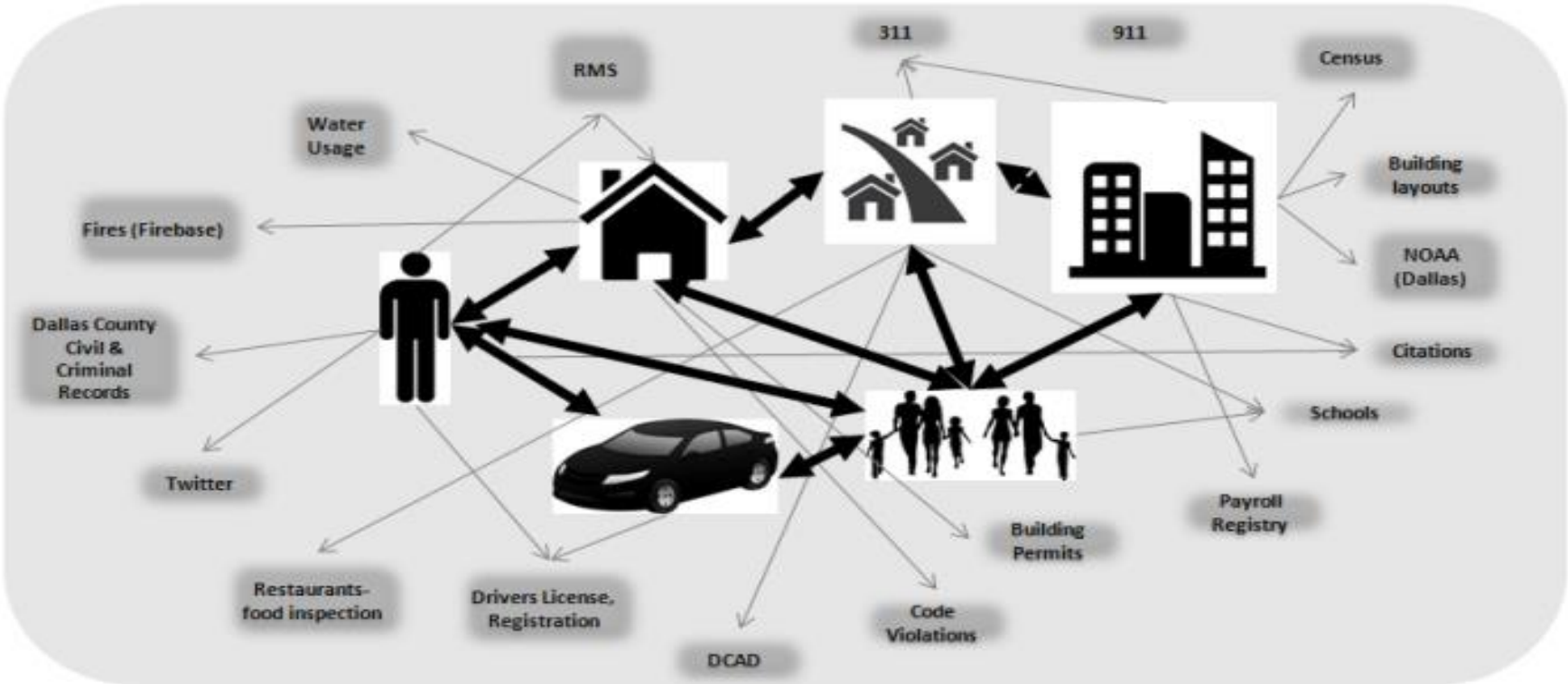
Recommendation 2: Create Search and Analytics Capability

- Descriptive
- Predictive
- Prescriptive

- Real-Time
- Batch

- Federated
- Structured, Unstructured
- Access Controlled

Analytics

Query

311   911
RMS   Census
Fires (Firebase)   Building Layouts
Dallas County Civil & Criminal Records   NOAA (Dallas)
Twitter
Restaurants-food inspection   Drivers License, Registration   Code Violations   Building Permits   Payroll Registry
DCAD
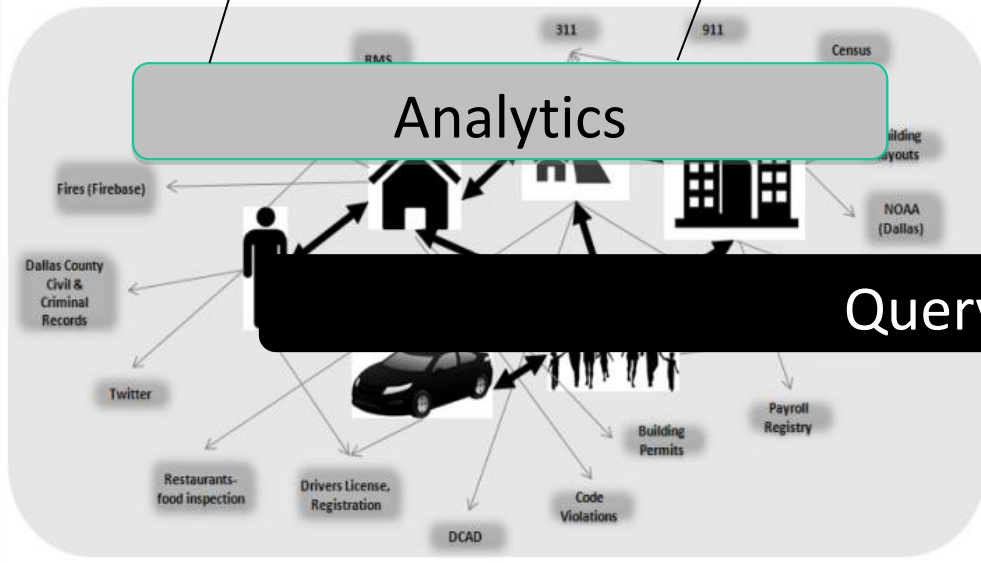
City Owned & Public data

Non-public data, owned by other parties

JIS

AIS   TCIC

EMR

Drivers License & Records   NCIC

13
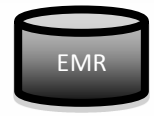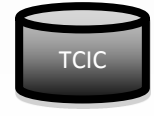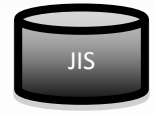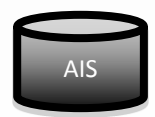
Recommendation 2: Create Search and Analytics Capability

- Establish team of cross-organization data scientists

- Use analytics and insights to optimize city operations

- Share data and insights with community - encourage community to perform their own analyses

Data Lake

City

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The ability to integrate and analyze multiple sources unlocks the power of the data, and can produce new insights for City officials and all citizens

NCIC	TCIC	EMR
JIS	AIS	Drivers License Records

Better data organization and search / analytics - *examples*

What's the latest trend in burglaries in my neighborhood?

Which houses have constant issues with code violations?

Give me all previous complaints and issues related to this address.

Does this person have a criminal history?

Link family and known associates to wanted criminal.

Do lower income areas suffer from lack of transit access to grocery stores?

What are the main causes and symptoms of high crime?

Recommendation 3: Improve USER EXPERIENCE

Very difficult for all users to access and work with data

Focus on '**total user experience**'…..

- Appoint '**user champions**' for key roles

- Introduce '**user-centred design**'

- Identify 'quick win' scenarios

  - Patrol officer

  - Community
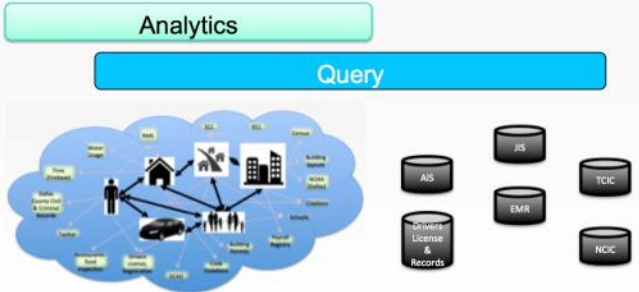
Better user experience can make city officers more effective.
A new integrated public presence (web / app) can stem the 'erosion of trust' between the city and communities

16

Recommendation 3: Improve USER EXPERIENCE - *examples*

from Dallas Police Department
to 5300 Royal Ln

14 min (6.7 miles)
via TX-12 Loop E and Midway Rd

▶ **Vehicle**

▶ **Person**

▼ **Address**

5300 Royal Lane

**Private residence,
owner: Rajesh Sukhramani**

**Previous 911 calls: none
Previous 311 calls: none
Code violations:**
garbage, 2014
construction, 2012

Vehicles: Blue Lincoln, TX3075

911 Call Details

**Call number #57698
03:45am February 17 2015**

COMP: Althea Sukhramani

INCIDENT: Burglary

**DETAILS: Comp reports
burglary in progress. White
van licence plate TX4507
reported at scene.**

Recommendation 3: Improve USER EXPERIENCE - *examples*

Creating a positive user experience for citizens opens up many possibilities

Partnership with communities can

lead to *powerful innovation*....

> *move 'followers' to 'supporters' using data - to enable safer, more prosperous neighborhoods*

Visualizing San Francisco's urban growth with open data

NYC bicycle accidents

Animal – related requests

Graffiti – related requests

High Weeds – related requests

Request for Police Beats
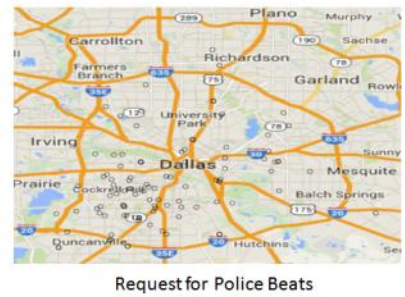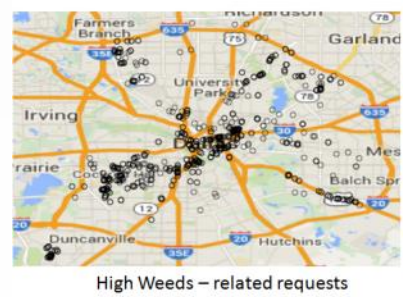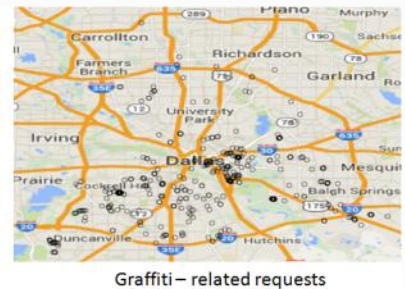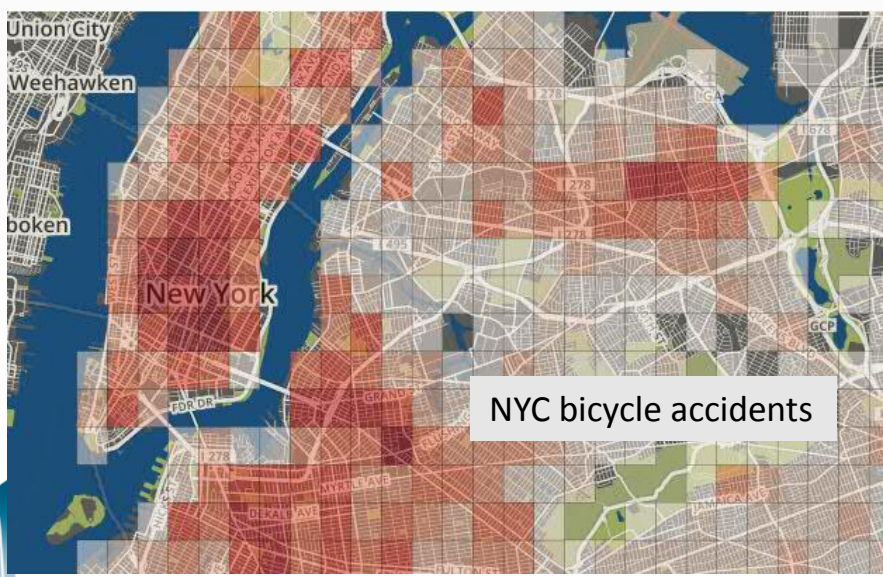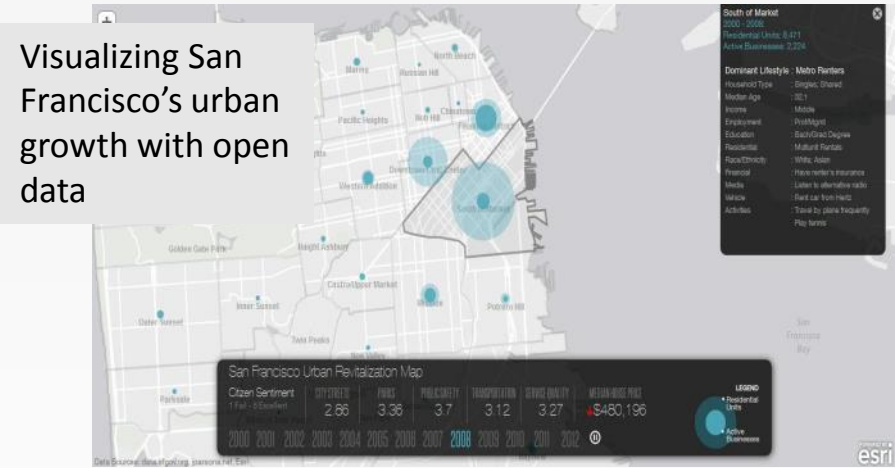
Dallas 311 data insights - Jan 2015

Summary of Recommendations

Focus area	● 0-12 months	● 1-3 years	● Year 4 and beyond
Organization & Culture	• Create the Office of Chief Data Officer under the CIO with support staff to execute City's data strategy • Create governance policies around data sharing and access control	• Implement & enforce governance policies	
Organize and Govern Data	• Inventory different databases & analytic capabilities across the city • Create and populate a 'data lake' - city owned, public databases and other data sources • Establish required controls: encryption, access control, expungement • Enable export of data, in a privacy-preserving manner, for community consumption • Investigate possibility for 'whole city/shared' data lake with other agencies	• Complete migration of data to 'data lake' – close down local DBs	
Provide Search & Analytics	• Identify key data items: e.g. PERSON / ADDRESS / CAR • Develop/install query tools for different user and data types	• Establish cross-department team of data scientists to uncover insights and patterns from multiple data sets • Use analytics and generated insights to optimize specific city operations • Set up query capabilities to external (county, state, federal) data • Develop real-time analyses on streaming data	• Investigate natural language query tools
User Experience	• Appoint "User Champions" for major user groups focus on user centered design • Identify 3-5 key 'quick wins' and develop new user experience	• Embed user-centered design in all systems selection and delivery	
Other	• Extend 'Buy-not-Build' thinking to infrastructure – exploit cloud • Invest in network bandwidth as a key enabler		

1 — Lay the foundations / Reset the culture / Execute 'quick wins'

2 — Implement the vision / Track the results

3 — Augment the vision

Conclusion

ORGANIZE and GOVERN data

Provide SEARCH AND ANALYTICS

Improve USER EXPERIENCE

One common goal…

…enabled by 3 key recommendations…

Safety in Dallas…

….enabled by data

…implemented through a phased roadmap…

…for the benefit of all users in Dallas

City of Dallas

Mayor Mike Rawlings

City Manager's Office
A.C. Gonzalez, City Manager
Jill Jordan, Assistant City Manager
Joey Zapata, Assistant City Manager
Eric Campbell, Assistant City Manager

Theresa O'Donnell, Director of Planning

Police Department:
Chief David Brown
First Assistant Chief Charles Cato
Lt. Kimberly Owens, Police Technology
Sgt. Chuck Schmidt, Police Technology
Sr. Corporal Stephan Gable, Police Technology
Sgt. Eric Garrett, Crime Analysis
Major Melissa McGee

Fusion Center:
Sgt. Adriene Thompson
Sgt. Desiree Webb
Sr. Corporal Johann Ortega

Lt Archie King, Assaults
Police Research Specialist Tim Brown, Assaults
Police Specialist John Bonham, Robbery
Sgt. L. Gonzalez, Robbery
Sgt. Calvin Johnson, Homicide
Lt. Thomas Castro, Homicide
Detective Harold Varner, Homicide
Sgt. Steven Armon
Sgt. Henry Lozano
Ryan McCarrick, Detective

Patrol Officers:
Sr. Corporal Matt Gnagi
Police Officer Leah Risse

Pavala Armstrong, City Attorney
Sylvia McClellan, City Attorney

Bill Finch, CIO
Tony Aguilar, Assistant Director
Justine Tran, Assistant Director
Sheila Robinson, Assistant Director
Cornell Perry, Sr. IT Mgr.
Tyrone Williams, IT Mgr.
Robert Roussell, IT Mrg.
Thanh Phan: Network Analyst
Austin Kelley, Network Analyst
Dale Denton, Programmer Analyst
Gaye Leggett, Programmer Analyst
Sherri Barkley, Database Analyst
Ronnie Jackson, Programmer Analyst
Girish Ramachandran,IT Architect
Lynn Chaffin, Sr. IT Mgr
Pavel Isham, Sr. IT Mgr.
Roald van Antwerpen, Business Analyst
Tuan Nguyen, Business Analyst
Will Walling, Sr. IT Mgr

Community Prosecutors:
Maureen Milligan
Yulise Waters

City Courts, Marshals
Baron Poitier
Claudia Chavez
Ron Everett
Ryan Rogers

OEM
Kevin Oden, Sr. Emergency Management Specialist
Greg Guthrie, Emergency Management Specialist

Dallas Fire Rescue:
Daniel Salazar, Assistant Chief
George Gamez, Deputy Chief
Chris Martinez, Deputy Chief
Tameji Berry, Deputy Chief
Dwight Freeman, Fire Marshall

Community Affairs:
Shawn Williams, Manager
Sgt. Felicia Thornton
Joli Robinson, Representative

Dallas Public Library
Jo Giudice, Director
C.K. Mandava

Business & Community Leaders:
Gary Griffith, Safer Dallas
Paul Landfair
Rene Martinez, LULAC
Edna Pemberton
Linda Long, General Manager, Southwest Center Mall
Vicki Martin, President, Ferguson Rd. Initiative
Greater Dallas Chamber of Commerce
Pat Priest, COO
Angela Farley, VP of Education
Jeremy Vickers, VP of Innovation

Habitat for Humanity:
Jane Massey, Director of Neighborhood Research & Revitalization
Beverly Stibbens, Director of Corporate Engagement
Melissa Cameron, Chief Development Officer

Dallas County
Stanley Vic" Victrum, CIO
Richard Ballard, Asst. IT Chief
Gary Miller, Software Support Mgr
Brett Taylor, Justice Systems Architect

Crime Watch Executive Committee:
Anna Hill, SE
Alex Garcia, SW
Carl Raines
Judy Brooks, SW
Manuel Valadez, Jr., SE
Darren Dattalo, Central
Phillip Gipson, SC
Carol Gatzler, NW
Michael Przekwas, Central
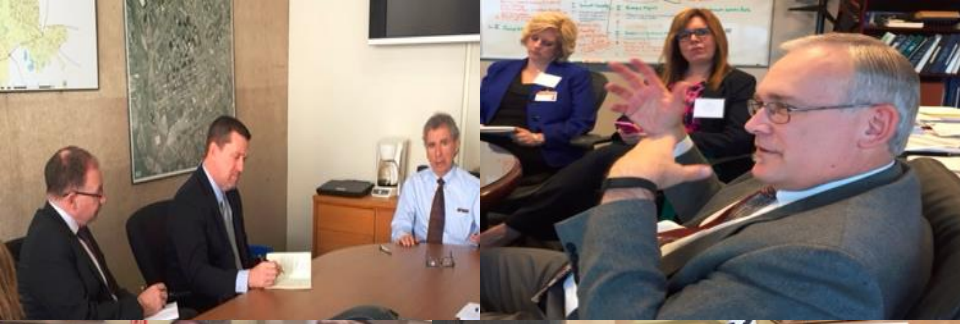
There are data silos in Dallas
Leaving them as is would be callous
So data we will integrate
And innovation we will stimulate
And help make Dallas even more marvelous.
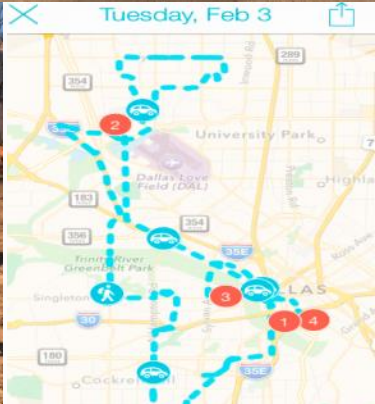
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Dallas

February 2015

See videos, reports, blog entries
and news coverage of past grants

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@CitiesChallenge

smartercitieschallenge.wordpress.com

info@smartercitieschallenge.org

IBM