

# FASTRANS: Food and Agriculture Sector Movement and Marketing Tracking System *The Next Phase*

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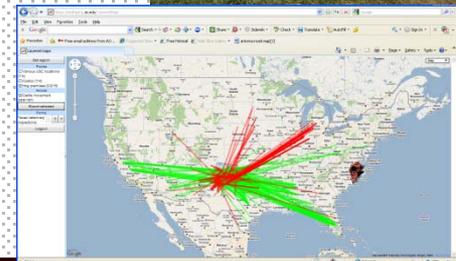
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FAZD Center

30 March 2011



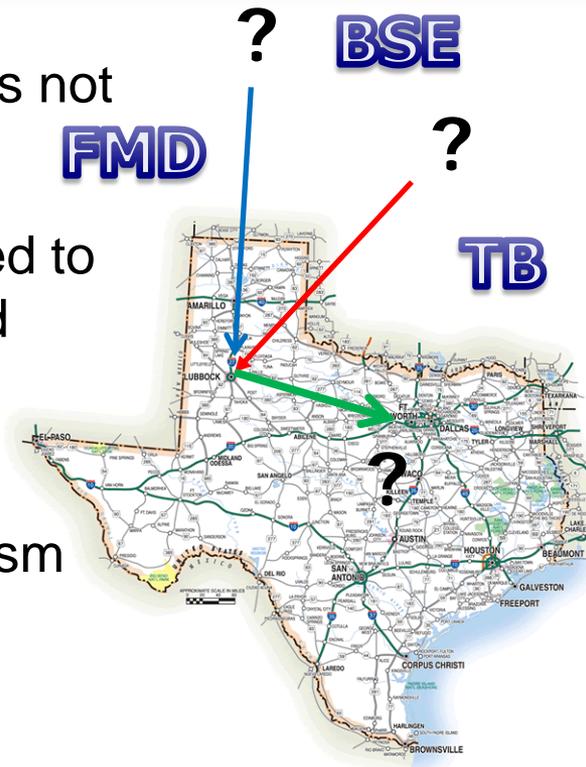
# Outline

- **Review:** Need for a national Food and Agriculture Sector (FAS) movement and marketing system
- From FASTRANS I to FASTRANS II
- What FASTRANS can do for the country



# Protecting The Food Supply – Problem: Tracking Movement

- **Need to Document**: The FAS commodity transportation and movement infrastructure is not well documented
- **Need to Monitor Movement**: There is a need to monitor interstate movement of livestock and other commodities
- **Disease Vector**: Livestock movement is a significant disease vector – with no mechanism in place to monitor or control
- **Impact from Non-Ag Events**: Impacts to commodity movements due to non-agriculture events (e.g., natural disaster) is not well understood



# The Problem (Cont.)

- **Need Trace-Back/Track-Forward:** Responders to high consequence/highly contagious diseases need to know where infected animals have been and are going
- **Movement Options:** Livestock producers need to know the risks involved from livestock shipments to their premises and that of their neighbors. What are my movement options?

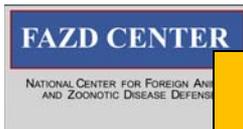
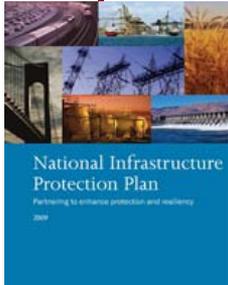


Currently, tracing livestock movements at state and national levels is not practical.

# National Infrastructure Protection Plan (NIPP)

- **Key steps:**

- Documentation of the national infrastructure
- Providing access to this information to key planners
  - government and the private sector
- Provision of analytic tools to access and effectively employ the information:
  - Support the NIPP goals
  - The hazards analysis provisions of the FDA Food Safety Modernization Act - FSMA (U.S. House of Representatives, 2010)
- Providing accurate/current input to the DHS annual data call for critical sector information from the states

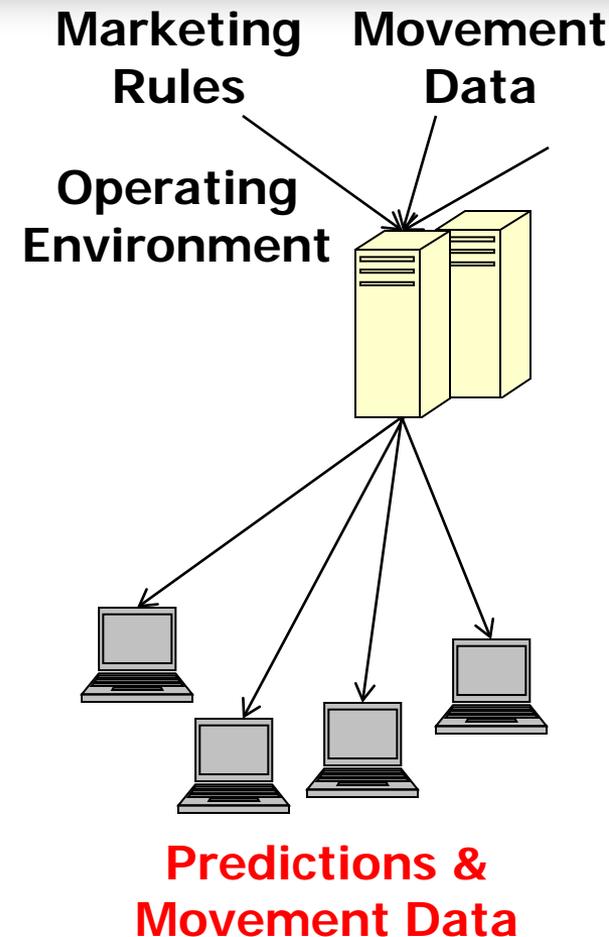


Strategic Steps Required to Protect Infrastructure



# FASTRANS will address these needs

- **Secured repository** of inter and intra-state livestock movement records, premises and infrastructure data
- **Access** to information is **controlled** via State privacy access laws
- Provides **trace-back and trace-forward** livestock movement support (based on history and market-driven conditions)



# FASTRANS (Cont.)

- **Re-Routing:** Maintain livestock movement by re-routing according to travel restrictions
- Monitor **species specific movements**
- Promote **business resiliency**
- Aid responders, decision-makers, and industry leaders (also aid in **training**)



Movement data can be used to protect industry, enhance resiliency, and identify risks to transportation infrastructure.

# FASTRANS I to FASTRANS II

FASTRANS I (2008/2009) project was tasked with:

- 1) Identifying representative business rules for livestock movements
- 2) Collect a representative sample of livestock movement data
- 3) Collect data on location, transaction modalities and livestock way points
- 4) Develop an initial livestock routing model
- 5) Conduct a pilot study to determine the effect of livestock movement on spread of FAD such as FMD.



Original project focused on the determining the feasibility of the project – what are the challenges?

# FASTRANS Phase 1: Lessons Learned

- Access to Data: Movement records are stored in various formats, some digitized, others not and there are sensitivity issues
- Business rules: There are general rules (rules of thumb) and stakeholder specific rules – which can be sensitive
- Utility of FASTRANS:
  - Stakeholders contacted support the idea of a FASTRANS system for tracking movement of commodities
  - User interface needs to be simple
  - Pilot study suggests data produced by the project benefits epidemic models

# Research Challenges

- **Prediction through Fusion**: Predicting movement of commodities by fusing marketing rules, current operating environment and historical movement information
  - Example (Beef Cattle):
    - Market-Driven: “The Great Fall Run”
    - Environment: Fall, warm temperatures
    - Historical: Interstate movement health certificates
- **Information Sensitivity**: Providing predictions/recommendations while respecting information sensitivity
  - Abstraction of data (by regions, by zip code, etc.)

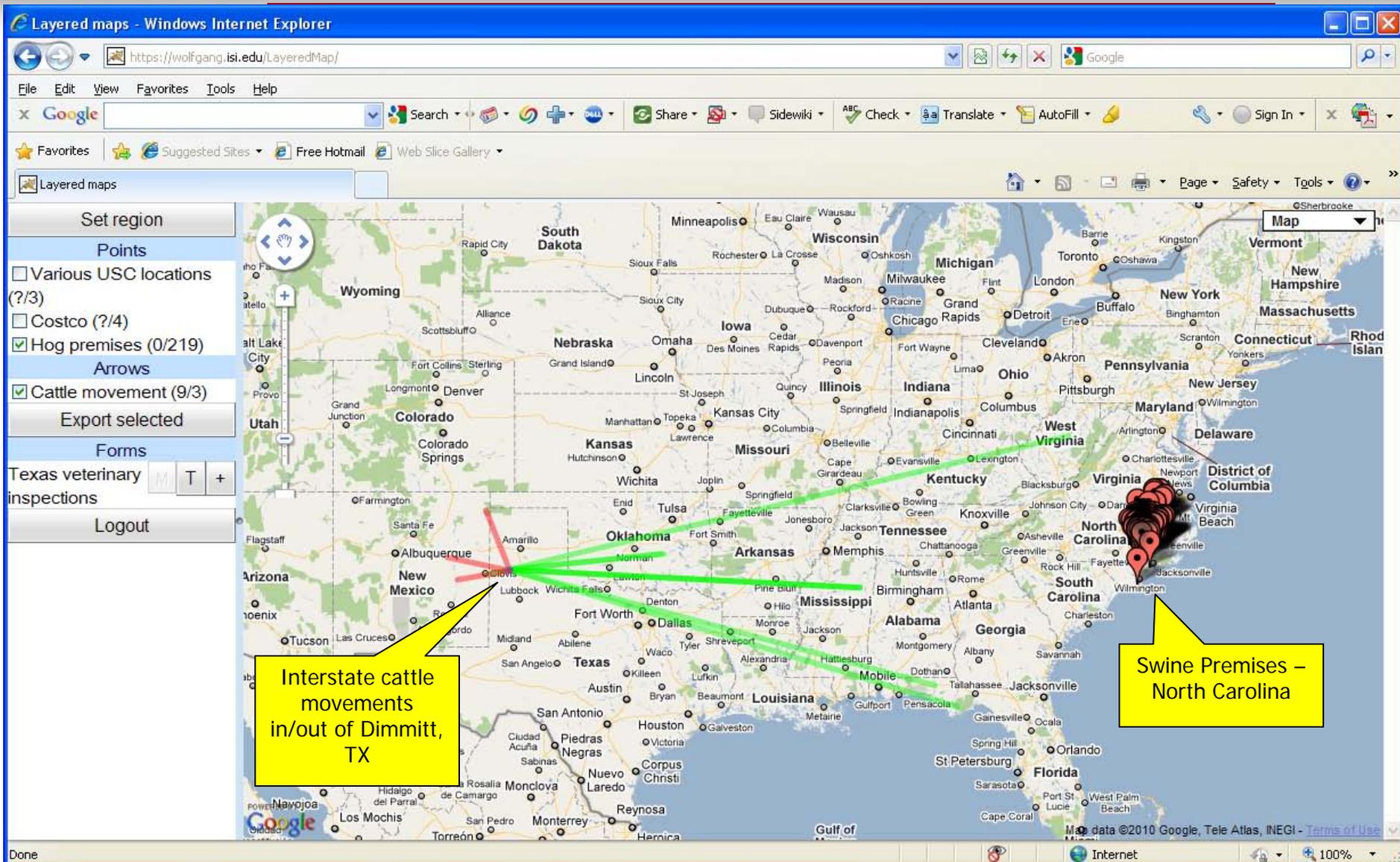
# FASTRANS II

- Prototype FASTRANS (FASTRANS 1.0) system is operational
  - Populated with a small subset of cattle and swine movement data for CA, TX, NC, MN, IA
  - Test server located at USC Information Sciences Institute
  - Access control implemented
- Movement and premises information can be displayed via Google Maps
- Limited routing capability (via Google Maps)
- Data can be exported for use in other systems and models



Protected web-based interface to movement records

# FASTRANS Software



# FASTRANS Software

Layered maps - Windows Internet Explorer

https://wolfgang.tsi.edu/LayeredMap/

File Edit View Favorites Tools Help

Google Search

Layered maps

Set region

Points

- Various USC locations (?/3)
- Costco (?/4)
- Hog premises (?/219)

Arrows

- Cattle movement (??)

Export selected

Forms

Texas veterinary inspections

Logout

User selected region

Map data ©2010 Europa Technologies, Google, INEGI - Terms of Use

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Arrows

- Cattle movement (7/0)

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The map displays the United States with state boundaries and major cities. A purple polygon highlights the Las Vegas area in New Mexico. Three thick green arrows originate from this area and point towards the following locations: Amarillo, Texas; Lubbock, Texas; and Fort Worth, Texas. The map interface includes a search bar, navigation controls, and a sidebar with various tool options.

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Done Internet 100%

# FASTRANS Software

Layered maps - Windows Internet Explorer

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Layered maps

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From Wau-Ban-See Ranch (Backyard) to Dead Horse Ranch(Backyard) on 09/14/2006  
Count: 11

Map data ©2010 Europa Technologies, Google, INEGI, Bananas

Done Internet 100%

# FASTRANS Software

Browser: https://wolfgang.isi.edu/LayeredMap/

Page Title: Texas Animal Health Commission

## CERTIFICATE OF VETERINARY INSPECTION

74- A102339

|                    |          |                         |          |                         |      |   |  |
|--------------------|----------|-------------------------|----------|-------------------------|------|---|--|
| Name of Consignor  |          | Name of Consignee       |          | Reconsigned To          |      | Date Issued   |  |
| Address            |          | Address                 |          | Destination             |      | Void After  |  |
| City and State     | Zip Code | City and State          | Zip Code | Accredited Veterinarian | Date | Permit Number   |  |
| County of Origin   |          | Destination of Shipment |          | Consignee's Phone       |      | Carrier: <input checked="" type="radio"/> Truck <input type="radio"/> Other |  |
| Origin Premises ID |          | Destination Premises ID |          | Reconsigned Premises ID |      | Name: _____<br>Address: _____   |  |

|                                    |                               |                                    |                                 |                                       |                                  |   |                           |                             |     |     |                   |             |
|------------------------------------|-------------------------------|------------------------------------|---------------------------------|---------------------------------------|----------------------------------|---|---------------------------|-----------------------------|-----|-----|-------------------|-------------|
| <b>Species:</b>                    |                               | <b>No. of Animals Shipped</b><br>0 | <b>Purpose of Movement:</b>     |                                       | <b>Brucellosis Status:</b>       |   |                           | <b>Herd or Flock Status</b> |     |     | <b>OTHER TEST</b> |             |
| <input type="radio"/> Beef Cattle  | <input type="radio"/> Goats   |                                    | <input type="radio"/> Breeding  | <input type="radio"/> Feeding/Grazing | <input type="radio"/> Class Free | Cert. Bruc. Free Herd No.               | Swine Bruc. Val. Herd No. | CWD Monit. Herd No./Status  | For | Lab | Date              | Accession # |
| <input type="radio"/> Dairy Cattle | <input type="radio"/> Sheep   | <input type="radio"/> Show         | <input type="radio"/> Slaughter | <input type="radio"/> Class A         | Accred. TB Free Herd No.         | Swine PRV Qual. Herd No.                | Flock No.                 |                             |     |     |                   |             |
| <input type="radio"/> Swine        | <input type="radio"/> Poultry | <input type="radio"/> Sale         | <input type="radio"/> Other     | <b>TB Status:</b>                     | <input type="radio"/> Free       | <input type="radio"/> Mod. Accred. Adv. | Other                     |                             |     |     |                   |             |
| <input type="radio"/> Horses       | <input type="radio"/> Cervids |                                    |                                 |                                       |                                  |   |                           |                             |     |     |                   |             |
| <input type="radio"/> Other:       |                               |                                    |                                 |                                       |                                  |   |                           |                             |     |     |                   |             |

| TUBE NO. | OFFICIAL IDENTIFICATIONS | DESCRIPTION | VACCINATION TATTOO SYMBOL | AGE | SEX | BREED | TUBERCULIN TEST |                 |              | BRUCELLOSIS |      |           | Results |      |
|----------|--------------------------|-------------|---------------------------|-----|-----|-------|-----------------|-----------------|--------------|-------------|------|-----------|---------|------|
|          |                          |             |                           |     |     |       | DATE OF INJ.    | DATE OF OBSERV. | TEST INTERP. | Lab         | Date | Signature |         | Card |
|          |                          |             |                           |     |     |       |                 |                 |              |             |      |           |         |      |

**RATIFICATION OF ISSUING VETERINARIAN**  
 I certify, as an accredited veterinarian, that the above described animals have been inspected by me and that they are not showing signs of infectious, contagious and/or communicable disease (except where noted). The vaccinations and results of tests are as indicated on the certificate. To the best of my knowledge the animals listed on this certificate meet the state of destination and federal interstate requirements. No further warranty is or defined.

Credited Veterinarian Signature \_\_\_\_\_ Owner/Agent Statement Required? Yes  No  (initial in blank)

Printed Name \_\_\_\_\_ Telephone \_\_\_\_\_ Vet Code \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

**OWNER / AGENT STATEMENT**  
 The animals in this shipment are those certified to and listed on this certificate.

\_\_\_\_\_

# Next Steps

- Finalize simple truck routing using Google Map technology
- Develop smart truck routing
  - Bridge weights
  - Movement restrictions
  - Desired waypoints
- Implement movement rules (leverage FASCAT)
  - Market conditions
  - Environment
  - Movement restrictions
- Implement trace-forward/trace-back analytics
- Continue to populate with movement data (leverage FASCAT and other sources)



# What FASTRANS can do for DHS & Industry

- **Improves Response**: Faster mitigation and control of disease spread
- **Identifies Vulnerabilities**: Identify risks to current livestock transportation systems
- **Promotes Business Resiliency**: Allows industry to reroute movements (animals, feed, eggs, milk, etc.) to avoid quarantine/restricted-travel or high-risk regions



Promotes business resiliency by allowing responders and industry to react quickly





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**ISI**  
Information Sciences Institute

**FAZD CENTER**  
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AND ZOOLOGICAL DISEASE DEFENSE

Thank You

The Texas A&M University System

