

ENTERPRISE GIS STRATEGIC PLAN IMPLEMENTATION





LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

A COMPLETE ENTERPRISE GIS





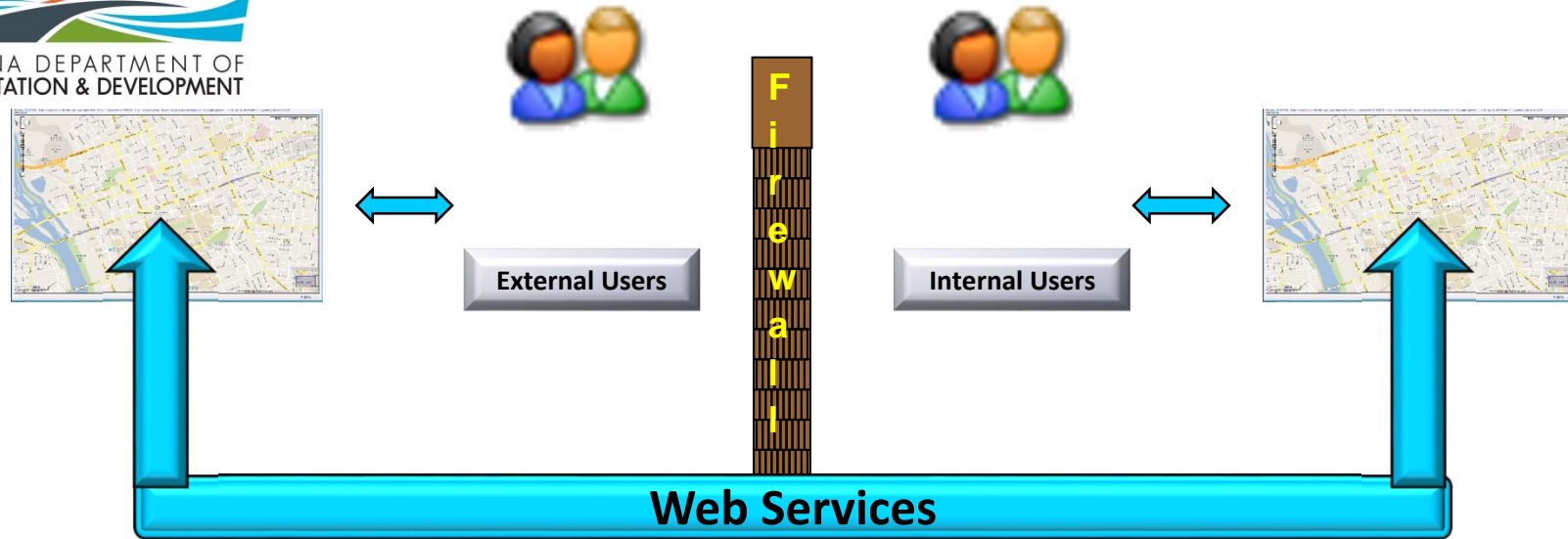
COMPONENTS OF AN ENTERPRISE GIS

- **GEOMETRIC FEATURES**
(ROADS, RAILS, WATER, LAND, etc.)
- **ATTRIBUTE DATA**
(SURFACE TYPE & WIDTH, LANES, SHOULDERS, etc.)
- **HIGHWAY ASSETS**
(SIGNS, SIGNALS, etc.)
- **COMPUTERS, SERVERS, & HANDHELD UNITS**
- **GIS SOFTWARE & BUSINESS SYSTEMS SOFTWARE**
- **INTRANET AND INTERNET APPLICATIONS**
- **PEOPLE** (EMPLOYEES AND THE GENERAL PUBLIC)



An Enterprise Approach

Internet/Intranet Portals



Integrated Business Systems



GIS/LRS



GOALS OF AN ENTERPRISE GIS

- **REDUCE/ELIMINATE DUPLICATION OF WORK**
- **IMPROVE ACCURACY OF AGENCY DATA**
- **IMPROVE EFFICIENCY OF REPORTING**
- **IMPROVE COMMUNICATION/COOPERATION WITH LOCAL GOVERNMENT ENTITIES**





GIS STRATEGIC PLAN

- Contracted  Software Consultants, Inc.
- Conducted Interviews
- Provided Top Priority Recommendations



GIS FUTURE?



Mission

- Identify future GIS capabilities and our customer needs
- Identify ways to get even more out of our GIS capabilities

Vision

We work as one team in partnership with our customers to deliver awesome results for the agency and the state!





GIS STRATEGIC PLAN

We Are Doing Many Things Right Throughout The Agency!



Executive Management Support



GIS and LRS Foundation



Solid GIS Software Base



GIS Literacy





PRIORITY RECOMMENDATIONS

Create GIS Enterprise Implementation Team

Fully Implement Enterprise LRS

Define and Integrate Participating Business Systems

Define and Create Enterprise Applications

Implement Statewide Clearinghouse





IMPLEMENTATION OF THE ENTERPRISE GIS

**FORM THE “GIS
ENTERPRISE
IMPLEMENTATION TEAM”
TO REVIEW THE
FIRST PRIORITY
RECOMMENDATIONS IN
‘THE STRATEGIC PLAN’**



Create GIS Enterprise Implementation Team

- Exec Sponsor: Kirt Clement
 - IT Sponsor: Tom Sands
 - **Team Chair: Jason Chapman, Planning**
- Jim Mitchell, IT GIS
- Doug Albert, IT GIS
- Kurt Johnson, IT GIS
- Dan Magri, Safety
- Darryl Mack, Planning
- Vince Latino, Operations
- Leslie Mix, Operations
- CJ Marchand, IT Applic.





Create GIS Enterprise Implementation Team

THE “GIS ENTERPRISE IMPLEMENTATION TEAM” MET TO REVIEW AND DISCUSS THE FIRST PRIORITY RECOMMENDATIONS IN ‘THE STRATEGIC PLAN’ FROM PMG. THEY FORMED TEAMS FOR EACH RECOMMENDATION.



- ACTION PLANS -

Fully Implement Enterprise LRS

- CONDUCT AN ENTERPRISE WIDE INFORMATION SYSTEMS ARCHITECTURE ANALYSIS
 - EVALUATE SERVERS AND NETWORK COMPONENTS
 - EVALUATE CONNECTIVITY TO FIELD OFFICES
- MAKE ANY RECOMMENDED IMPROVEMENTS



- ACTION PLANS -

Fully Implement Enterprise LRS

- COLLECT AND MAINTAIN STATE AND NON-STATE ROADWAY GEOMETRY AND ATTRIBUTE DATA
 - CONTINUE TO COLLECT GPS AND VIDEO DATA FOR STATE MAINTAINED ROADWAYS
 - INITIATE COLLECTION OF GPS AND VIDEO FOR ALL NON-STATE MAINTAINED PUBLIC ROADWAYS
 - DOTD INVENTORY STAFF COLLECT GPS AND ATTRIBUTE DATA FOR CONSTRUCTION AS PROJECTS ARE COMPLETED





- ACTION PLANS -

Fully Implement Enterprise LRS

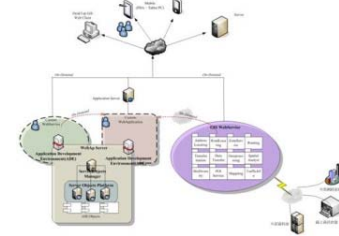
- SELECT AN LRS MANAGEMENT SOFTWARE
(ESRI ROADS & HIGHWAYS)
- IMPLEMENT ESRI PRODUCTION MAPPING
- IMPLEMENT ESRI ROADS & HIGHWAYS



- ACTION PLAN STATUS -

Fully Implement Enterprise LRS

- ENTERPRISE ARCHITECTURE ANALYSIS COMPLETE



- CONTRACT TO COLLECT STATE MAINTAINED ROADWAYS VIDEO, GPS, AND PAVEMENT CONDICTIONS ON A TWO YEAR CYCLE



- CONTRACT TO COLLECT NON-STATE MAINTAINED PUBLIC ROADWAYS VIDEO & GPS ON A ONE-TIME THREE YEAR COLLECTION



- ACTION PLAN STATUS -

Fully Implement Enterprise LRS

- DOTD INVENTORY STAFF COLLECT GPS & ATTRIBUTE DATA FOR COMPLETED CONSTRUCTION AS PROJECTS ARE ACCEPTED



Figure 2. Trimble Pro-XRS GPS system.



- CONTRACT TO ADJUST EXISTING GIS ROADWAY FEATURE:
 - ADJUST ROADWAY FEATURE TO IMAGERY DETERMINED TO BE ACCURATE WITHIN 6 INCHES
 - ADD ROADWAYS MISSING FROM EXISTING ROADWAY FEATURE
 - RESTRUCTURE THE SCHEMA OF THE ROADWAY FEATURE FOR ROUTING, GEO-CODING, AND MAPPING AGENCY DATA

SINGLE LINE STATE HIGHWAY CONTROL SECTIONS

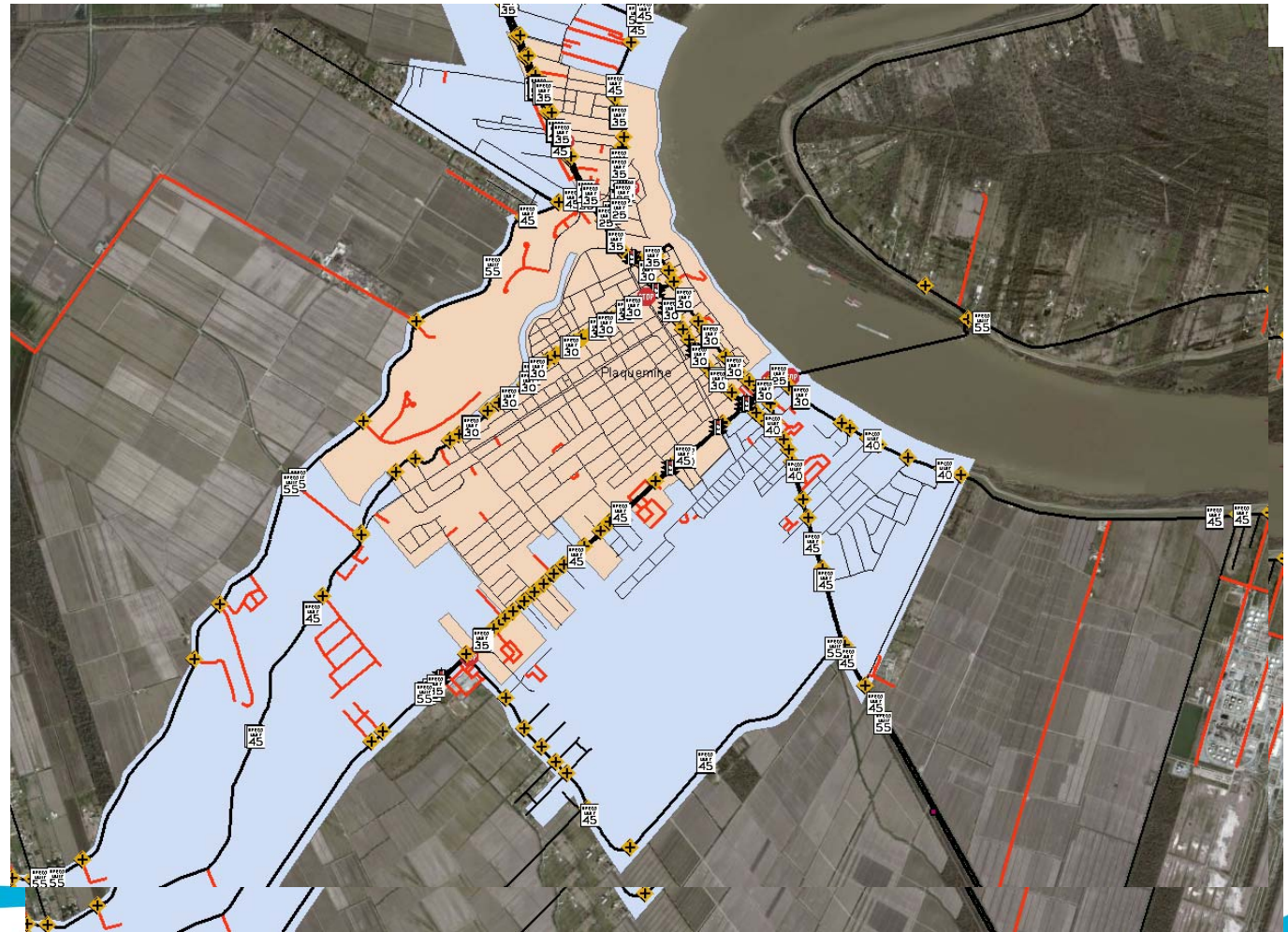




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MULTI-LAYER GIS SYSTEM

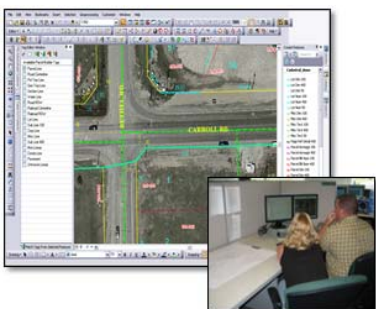
- Imagery
- State System
 - Control Section
 - Lanes
 - AADT
- All Roads
- Boundaries
 - City
 - Urban Area
- Assets
 - Intersection
 - Speed Signs



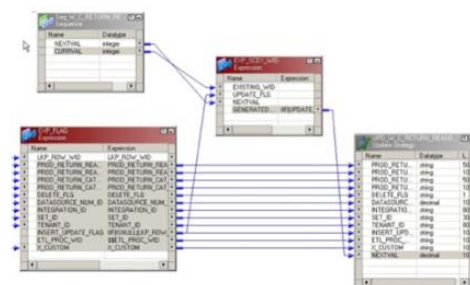
- ACTION PLAN STATUS -

Fully Implement Enterprise LRS

- INSTALL AND BEGIN MAINTENANCE OF GIS FEATURES AND DATA USING GIS SPATIAL DATABASE for the ENTERPRISE



- INSTALL AND IMPLEMENT PRODUCTION MAPPING SOFTWARE AND PROGRAMMING



- ESTABLISH A CONTRACT TO IMPLEMENT AND TRANSITION EXISTING GIS FEATURES AND DATABASE ATTRIBUTES INTO THE ESRI ROADS AND HIGHWAYS SOFTWARE





- MAINTENANCE PLANS -

Fully Implement Enterprise LRS

- CONTRACT TO COLLECT STATE MAINTAINED ROADWAYS VIDEO, GPS, AND PAVEMENT CONDITIONS ON A TWO YEAR CYCLE
- DOTD INVENTORY STAFF COLLECT GPS & ATTRIBUTE DATA FOR COMPLETED CONSTRUCTION AS PROJECTS ARE ACCEPTED
- IMPLEMENT ESRI ARCGIS ONLINE FOR LOCAL MUNICIPALITIES AND PARISHES TO PROVIDE UPDATES FOR ROADWAYS AND CITY LIMITS
- CONTRACT TO CONDUCT COOPERATIVE EFFORTS WITH LOCAL MUNICIPALITIES AND PARISHES TO MAINTAIN ROADWAY DATA IN ACCORDANCE WITH THE IMPLEMENTATION OF ENTERPRISE GIS





- ACTION PLANS -

Define and Integrate Participating Business Systems

- CONDUCT A USER SURVEY TO IDENTIFY CONCERNS AND/OR APPLICATIONS USERS MIGHT BE INTERESTED IN USING TO COMPLETE DAILY TASKS.
- IDENTIFY BUSINESS SYSTEMS INSIDE THE AGENCY WHICH SHOULD BE CONNECTED TO A ROADWAY
- IDENTIFY BUSINESS SYSTEM OWNERS



- ACTION PLANS -

Define and Integrate Participating Business Systems

- ENSURE REAL-TIME CONNECTIVITY OF BUSINESS SYSTEMS
- CONDUCT A BUSINESS SYSTEMS ANALYSIS WORKSHOP TO EDUCATE OWNERS IN THE USE OF THE LRS_ID
- CREATE THE LRS_ID, LRS_BEGIN_MILE, AND LRS_END_MILE FIELDS IN EACH BUSINESS SYSTEM TABLE. POPULATE THE LRS_ID FIELD.





- ACTION PLANS -

Define and Integrate Participating Business Systems

- ESTABLISH A POLICY REQUIRING BUSINESS OWNERS TO ENTER THE THREE LRS FIELD DATA TO ACCOMMODATE THE TRANSFER FROM USING CONTROL SECTIONS TO USING THE LRS_ID AS THE UNIQUE IDENTIFIER
- COMMUNICATE, EDUCATE AND ENFORCE THIS POLICY CONCERNING LRS FIELD USAGE





- ACTION PLAN STATUS -

Define and Integrate Participating Business Systems

- CONDUCTED USER SURVEY
- IDENTIFIED BUSINESS TABLES AND OWNERS
- PLACED LRS_ID FIELD IN ALL BUSINESS TABLES AND POPULATED IT FOR THE STATE MAINTAINED SYSTEM



- ACTION PLANS -

Define and Create Enterprise Applications

- SURVEY USERS TO GET AN IDEA OF APPLICATIONS THEY MIGHT NEED OR USE EVERYDAY



- CONDUCT FOCUS GROUPS AS NECESSARY



- ACTION PLANS -

Define and Create Enterprise Applications

- DEVELOP A LIST AND HIERARCHY OF APPLICATIONS REQUESTED
- PLAN, DESIGN, CREATE, AND PUBLICIZE APPLICATIONS BEGINNING WITH THE ONES INTENDED FOR INTERNAL USE FIRST.



- Action Plans -

Implement Statewide Clearinghouse

- LA ACT 409 of 2012 REQUIRES DOTD TO DEVELOP AND MAINTAIN A STATEWIDE GEOSPATIAL DATABASE FOR TOPOGRAPHIC MAPPING WITH ASSISTANCE FROM OTHER AGENCIES. INCLUDED IS A RESPONSIBILITY TO PLAN AND MANAGE DATA COLLECTIONS FOR THE ENTIRE STATE.
- THIS ACT PLACES DOTD IN THE LIKELY POSITION TO BE HEAVILY INVOLVED IN A STATEWIDE CLEARINGHOUSE FOR GEOSPATIAL DATA TO BE USED THROUGHOUT THE STATE AS ONE BASE MAP.



- Action Plans -

Implement Statewide Clearinghouse

- WHEN THE REPORT BY PMG WAS SUBMITTED, A PLAN WAS IN PLACE TO WORK OUT AGREEMENTS WITH ANOTHER STATE AGENCY TO FORM THIS CLEARINGHOUSE.
- SINCE THIS TIME A MAJOR CHANGE HAS OCCURRED INVOLVING A CONSOLIDATION OF MOST INFORMATION TECHNOLOGY PERSONNEL INTO A NEW OFFICE OF INFORMATION TECHNOLOGY (OIT).





- Action Plans -

Implement Statewide Clearinghouse

- AT THIS TIME, DOTD IS MOVING FORWARD WITH PLANS TO PROVIDE TRANSPORTATION RELATED TOPOGRAPHIC MAPPING LAYERS TO A STATEWIDE CLEARINGHOUSE.
- AT SOME TIME IN THE FUTURE, THE RESPONSIBILITY OF THE CLEARINGHOUSE WILL BE DETERMINED. WE WILL GLADLY PARTICIPATE HOWEVER WE CAN TO FURTHER ENTERPRISE GIS STATEWIDE THROUGHOUT ALL GOVERNMENT AGENCIES.





Timeline



Create Enterprise GIS Steering Committee	Established by end of 2012; then ongoing
Fully Implement Enterprise LRS	3-6 years
Define and Integrate Participating Business Systems	1-3 years, then ongoing
Define and Create Enterprise Applications	2 years to define; TBD to create
Implement Statewide Clearinghouse	Implementation TBD





Management Approval

- A PRESENTATION SIMILAR TO THIS WAS PRESENTED TO DOTD EXECUTIVE STAFF .
- WE RECEIVED APPROVAL TO PROCEED
- AT THIS TIME WE ARE MOVING FORWARD WITH THREE ACTIVE CONTRACTS DELIVERING NECESSARY DATA TO PROVIDE AN ACCURATE LRS OF THE PUBLIC ROADS OF LOUISIANA





SUCCESS???

- For a Successful Enterprise System
 - Dependent on real-time connectivity of all business systems including systems maintained outside of DOTD
 - Dependent of Funding estimated at least \$15M
 - Dependent on Adequate Resources
 - Hardware, Software, Personnel, and Training





LRS & DATA TRANSITION

- DEVELOPMENT OF LRS PREPARING FOR TRANSITION TO ROADS AND HIGHWAYS
- DEVELOPMENT OF ATTRIBUTE TABLES TO TRANSITION DATA TO THE PROPER FORMAT FOR ROADS AND HIGHWAYS





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LRS FORMAT

CURRENTLY DOTD HAS THREE CONTRACTS IN PLACE WHICH ARE SUPPLYING CRITICAL DATA FOR A COMPLETE PUBLIC ROAD LRS FOR LOUISIANA.

TWO CONTRACTS ARE COLLECTING GPS, IMAGERY, AND ASSET DATA.

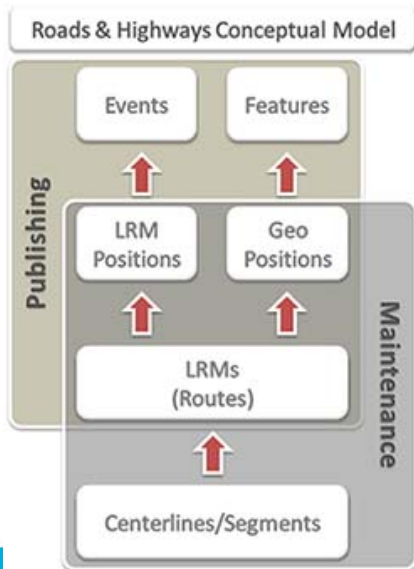
THE THIRD CONTRACT IS SUPPLYING A ROAD FEATURE WITH ATTRIBUTES AS SHOWN HERE. THE FEATURE IS ADJUSTED TO IMAGERY ACCURATE TO 6".

Attributes	
SDE_Roads_08152014 Coker Worsham	
OBJECTID	187773
UUID	00000000000000396
STATE_FIPS	Louisiana FIPS code
DOTD_DIST_L	DOTD District 08
DOTD_DIST_R	DOTD District 08
PARISH_NUM_L	Sabine Parish
PARISH_NUM_R	Sabine Parish
PARISH_FIPS_L	Sabine Parish
PARISH_FIPS_R	Sabine Parish
CONTROL_SECTION	<Null>
DIRECTION_TRAVEL	Primary Direction o
LRS_ID_L	<Null>
LRS_ID_R	08590102600299101
LRS_L_BEGIN_MILE	<Null>
LRS_L_END_MILE	<Null>
LRS_R_BEGIN_MILE	<Null>
LRS_R_END_MILE	<Null>
SEGMENT_LENGTH	<Null>
GIS_SEGMENT LENG	<Null>
RAMP_INTERSECT_L	<Null>
RAMP_INTERSECT_R	<Null>
OWNERSHIP	Parish Highway Ag
STATE_ROUTE	<Null>
FULL_NAME	Coker Worsham Rd
PREFDX	<Null>
PRETYPE	<Null>
NAME	Coker Worsham
ROADWAY_TYPE	Rd
SUFFDX	<Null>
NAME_DIRECTION	<Null>
ADDR_FR_L	2093
ADDR_TO_L	2665
ADDR_FR_R	2092
ADDR_TO_R	2666
OBJECTID	Object ID Null values not allowed

Attributes	
SDE_Roads_08152014 Coker Worsham	
ADDR_TO_R	2666
FULL_NAME_1	<Null>
PREFDX_1	<Null>
PRETYPE_1	<Null>
NAME_1	<Null>
ROADWAY_TYPE_1	<Null>
SUFFDX_1	<Null>
NAME_DIRECTION_1	<Null>
ADDR_FR_L_1	<Null>
ADDR_TO_L_1	<Null>
ADDR_FR_R_1	<Null>
ADDR_TO_R_1	<Null>
FULL_NAME_2	<Null>
PREFDX_2	<Null>
PRETYPE_2	<Null>
NAME_2	<Null>
ROADWAY_TYPE2	<Null>
SUFFDX2	<Null>
NAME_DIRECTION_2	<Null>
ADDR_FR_L_2	<Null>
ADDR_TO_L_2	<Null>
ADDR_FR_R_2	<Null>
ADDR_TO_R_2	<Null>
FULL_NAME_3	<Null>
PREFDX_3	<Null>
PRETYPE_3	<Null>
NAME_3	<Null>
ROADWAY_TYPE_3	<Null>
SUFFDX_3	<Null>
NAME_DIRECTION_3	<Null>
FULL_NAME_4	<Null>
PREFDX_4	<Null>
PRETYPE_4	<Null>
NAME_4	<Null>
OBJECTID	Object ID Null values not allowed

Attributes	
SDE_Roads_08152014 Coker Worsham	
NAME_4	<Null>
ROADWAY_TYPE_4	<Null>
SUFFDX_4	<Null>
NAME_DIRECTION_4	<Null>
FULL_NAME_5	<Null>
PREFDX_5	<Null>
PRETYPE_5	<Null>
NAME_5	<Null>
ROADWAY_TYPE_5	<Null>
SUFFDX_5	<Null>
NAME_DIRECTION_5	<Null>
ZIP_L	
ZIP_R	
FR_SPEED_LM	<Null>
TO_SPEED_LIM	<Null>
FROM_LANES	<Null>
TO_LANES	<Null>
FROM_ZLEV	<Null>
TO_ZLEV	<Null>
ONE_WAY	<Null>
FT_DIR	<Null>
TF_DIR	<Null>
SPEED_CAT	<Null>
EDITOR	D2154
EDIT_DATE	8/13/2014 3:25:10 P
EDIT_REASON	<Null>
DOCUMENTATION	<Null>
EDIT_COMMENTS	<Null>
CREATOR	D2150
CREATE_DATE	8/11/2014 8:03:15 A
RETIRED	No
RETIRED_DATE	<Null>
INVENTORY_DIRECT	Primary Direction o
SHAPE_Length	1321.77399
OBJECTID	Object ID Null values not allowed

DATA TABLE FORMAT



CURRENTLY DOTD HAS A CONTRACT BEGINNING WHICH WILL IMPLEMENT ESRI ROADS AND HIGHWAYS.

IN PREPARATION, DOTD HAS BEGUN THE PROCESS OF TRANSITIONING OLD AND NEW DATA INTO A FORMAT WHICH WILL FUNCTION BETTER WITH THE ROADS AND HIGHWAYS PRODUCT.

THIS IS AN EXAMPLE OF THE DATA WE ARE RECEIVING FROM THE OTHER TWO CONTRACTS IN PLACE.

Field	Value
ID	7745
DISTRICT	61
PARISH_NUM	17
ROUTE	LA1248
CONTROL_SE	258-33
DIRECTION	1
LRS_ID	258-33-1-010
LRS_BEGIN_	3.687
LRS_END_LO	3.821
ASSET LENG	707.373
MEDIAN_TYP	Curbed
MEDIAN_WID	13.302
FILLET_PRE	Yes
COMMENTS	
BEGIN_LATI	30.36965
BEGIN_LONG	-91.10254
BEGIN_ELEV	38.103
BEGIN_IMAG	\\pms\2010-2011_Data_Collection_Cycle\Images\ROW'
END_LATITU	30.37138
END_LONGIT	-91.10151
END_ELEVAT	31
END_IMAGE	\\pms\2010-2011_Data_Collection_Cycle\Images\ROW'
FILENAME	OCCODY10
VEHICLE_ID	1754
COLLECTION	12/12/2010
Shape	Polyline ZM



ENTERPRISE GIS

- INVOLVES THE WHOLE ORGANIZATION
- REQUIRES TEAMWORK
- REQUIRES COOPERATION
- REQUIRES ORGANIZATION
- REQUIRES PATIENCE

➤ **G.E.T.I.T. DONE!!!**

**GEOSPATIAL ENTERPRISE TRANSPORTATION
IMPLEMENTATION TEAM**

