Kansas DOT's New Implementation of Active Straight Line Diagrams (SLD) within their GIS web portal

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Introduction

- Overview of existing KGATE web portal
- Business drivers to add SLD’s
- SLD architecture
- SLD functionality
- Summary
KGATE Mission

- Central point of discovery for KDOT and partners
- Streamlines data access and research
- Access to data is expanded to new users
- Consistent access mechanism to data throughout the agency
- Allows viewing of multiple data sets simultaneously
KGATE Scope

- KGATE combines layers of information about a location to give users a better understanding of the location
- KGATE Users
  - Internal
    - Have permission to see everything
  - External
    - Can only see what we’ve given them permission to see
KGATE External Users

Kansas Highway Patrol
- Used for accident analysis
- Can see where KHP Troop areas are located, the scanned in accident reports, etc.

Kansas Trucking Connection
- Used to route trucks through Kansas
- Can obtain useful information about bridges, vertical clearances, construction locations, etc.
KGATE - Mapping

- Functional Class
KGATE - Integration

- Map bridges, select bridge, view video log
SLD - Definition

- Is a view of a roadway as lines
- Displays features along the road linearly
- Depicts road characteristics linearly
- Can consist of one or multiple pages per alignment section
- There are usually 3 basic components to an SLD:
  - Plan View
  - Schematic
  - Attribute View
SLD Business Drivers

- KDOT personnel want the data that solves their business problem
- Integrate and publish SLD’s within KGATE
- Access to spatial data without GIS training
- Provide specific information to selective groups
- More ad hoc queries capability
KGATE – SLD Integration

- Intergraph SLD application was customized and enhanced for integration into KGATE
SLD Benefits

- Create SLDs with a button push (saves time)
- Flexible data selection
- Provides interactive tool tips, measurements, and color
- Printing on demand
- Uses KDOT’s existing LRS and event data
- Leveraged existing Intergraph products used by KDOT (GeoMedia Transportation and GeoMedia Web Map Pro)
- Simple integration with KGATE
- No need to create a web site - both Web and Desktop clients are available
SLD Configuration

- SLD Web Service runs on GeoMedia WebMap
  - Uses a MapServer object
- SLD Web Service has two methods:
  - GetNetworkInfoXML
  - GetSLDSVG
- SLD IE web client
- Connects directly to Oracle
- Configured by XML document
SLD Web Service Architecture

Published web-methods
  - getNetworkInfo
  - getSLDSVG

GM WebMap Pro

NetworkInfo.xml

SLD Web Service

Data

SchemaMap.xsd

SchemaMap.xml

Server-side application to edit/create schema map

Published web-methods
  - getNetworkInfo
  - getSLDSVG
SLD Components

- The SLD engine a VB.NET-based web service

**SLD Web Service**
- Provides the user a choice of routes
- Linearly referenced data to display
- Returns SVG file for route and requested attributes

**SLD Web Client**
- Facilitates use of SLD Web Service
- Unlimited usage across enterprise
- On startup, this application populate a series of pulldown menus and list boxes from which the user selects a route and attributes
- User selects the Submit button and SLD file is created/displayed
User selects the following to send to the SLD web service:

- LRS route
- Begin and end logmile
- Miles per sheet
- Attributes
  - Attribute view
  - Schematic view
SLD Layout – Map View

- Map View:
  - Route network display in planimetric view
  - Tooltip of route information
  - Backdrop information
  - Highlight route section when attribute record selected
  - Legend explaining symbology used in the map view
SLD Layout – Schematic View

- Schematic View:
  - True straight line view
  - Symbols for events (bridge over, bridge under, intersection, etc.)
  - Display relationships to connecting roads
  - Dynamic measurement tool
**SLD Layout – Attribute View**

- **Attribute View:**
  - Display of multiple route attributes in sections
  - Route attributes displayed from database
  - Color coded representations of the selected events
  - Directional Display
  - Attribute dynamic segmentation in Map View
  - Attribute tool tip
  - Dynamic Measurement tool

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**Speed Limit (D-SB): 45**

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Legend

- Symbols displayed in Schematic view
SVG Pop Up Menu

- Adobe SVG Viewer
  - Right-click Item
SLD Print Studio

- Reposition the SLD
- Resize the SLD
- Add, reposition, or delete Title text
- Add labels by key-in
- Add labels by tool tip capture
- Set font characteristics for title text and labels
- Reposition, rotate, or delete added labels
- Move logos, titles and legend
SLD Print Studio

- Draw geometries (points, lines, and rectangles)
- Set user-added geometry characteristics (line weight, color, fill color, opacity)
- Move or resize user-added linear and area geometries
- Print drawing window contents (with changes)
- Adjust print output (widths and/or heights) from within SLDPrintStudio module
SLD Web Service – XML Configuration

- Connect to LRS and Event data from various sources and formats. No hard-coded table or field names
- Set symbology for Map View items (routes and backdrops)
- Set symbology in Schematic View for point and linear data
- Setup a Legend with user-defined names and symbols
- Define the tooltips for both LRS and Event data
- Predefine titles and logo for printing
- Set the labels for data entry fields in the client applications based on user requirements
SLD Web Service – XML Configuration

- The XML configuration file has 6 major parts:
  - MapView
  - SchematicView
  - AttributeView
  - CoordinateSystemInfo
  - PrintSVG
  - OptimizeSLD

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<SLDWebService xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  + <MapView>
  + <SchematicView>
  + <AttributeView>
  + <CoordinateSystemInfo>
    + <PrintSVG>
      <OptimizeSLD>0</OptimizeSLD>
    </PrintSVG>
  </CoordinateSystemInfo>
</SLDWebService>
```
Summary

- Quick method of analyzing route data
- No GIS experience necessary for linear analysis
- Integrates into KGATE enterprise web portal
- Easily accessible throughout the KDOT enterprise
- Up to date decision support information
- Customized to KDOT’s business needs