

# TRANSDEC: Transportation Decision Making

Fall'09-CS599  
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# Agenda

- Project Overview
- System Architecture
- Tasks
- Technical Background
- Plan

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# TransDec


- TransDec: a real-data driven and immersive framework that enables on-the-fly spatio-temporal querying, analysis and planning of transportation systems
- Two main focus
  - Moving objects
    - Nearest Neighbor
    - Range Queries
    - Geofence
    - Historical Playbacks
  - Traffic sensors
    - Continuous Monitoring
    - Historical Traffic Patterns
    - TD Shortest Path
- Real-world spatiotemporal data



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# Traffic Sensor Data


- Provided by RIITS
  - Real-time highway congestion
  - Real-time arterial congestion
  - Events
  - Metro Bus & Train locations
  - CCTV
- Highway sensors spread over 18 highways inside LA
- Total 1523 highway sensors covering 1183 miles
  - Update rate every 1 minute
    - Daily 2.2 million rows, 300MB of data (only highway sensors)



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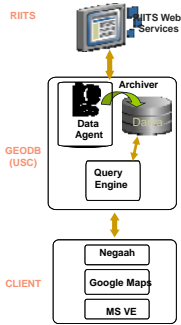
# Moving Objects

- Provided by USC Transportation office
  - 40 Vehicles
  - Update rate is every 5 seconds
- Moving object trajectory lat/long, speed



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# System Architecture



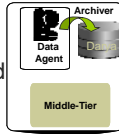
```

    graph TD
        RIITS[RIITS] --> RIITS_Web[RIITS Web Services]
        RIITS_Web --> Archiver
        subgraph GEODB_USC [GEODB (USC)]
            Data_Agent[Data Agent]
            Archiver
            Query_Engine[Query Engine]
            Data_Agent --> Archiver
            Archiver --> Query_Engine
        end
        Query_Engine --> CLIENT
        subgraph CLIENT
            Negaah
            Google_Maps[Google Maps]
            MS_VE[MS VE]
        end
    
```

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## [Tasks]

- Real-time data integration from RIITS
  - Traffic sensor data for main streets
  - CCTV
- Generic query interface, "Middle-Tier", implementation that enables structured information exchange
- Porting TransDec (traffic sensor visualization and querying) to ArcGIS
- Documentation and workshop paper



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## [Technical Background]

- Oracle Spatial – PL/SQL
- AJAX, Flex
- Java- Servlet, Jsp
- SOAP, XML, WSDL

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## [Plan]



- **Weekly meetings**
- **Milestones & Progress**

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## [Why is this project existing?]

- If you plan to pursue PhD
  - Numerous research challenges that you can pick
  - Real dataset: easy to motivate and run experiments
- If you plan to work in Industry
  - Great for your resume: state-of-the-art architecture, programming languages and tools
  - Big companies (e.g.: Google, ESRI) are already interested in such projects

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