

# Field Survey Planning in Remote Areas Using Imagery and Route Analysis

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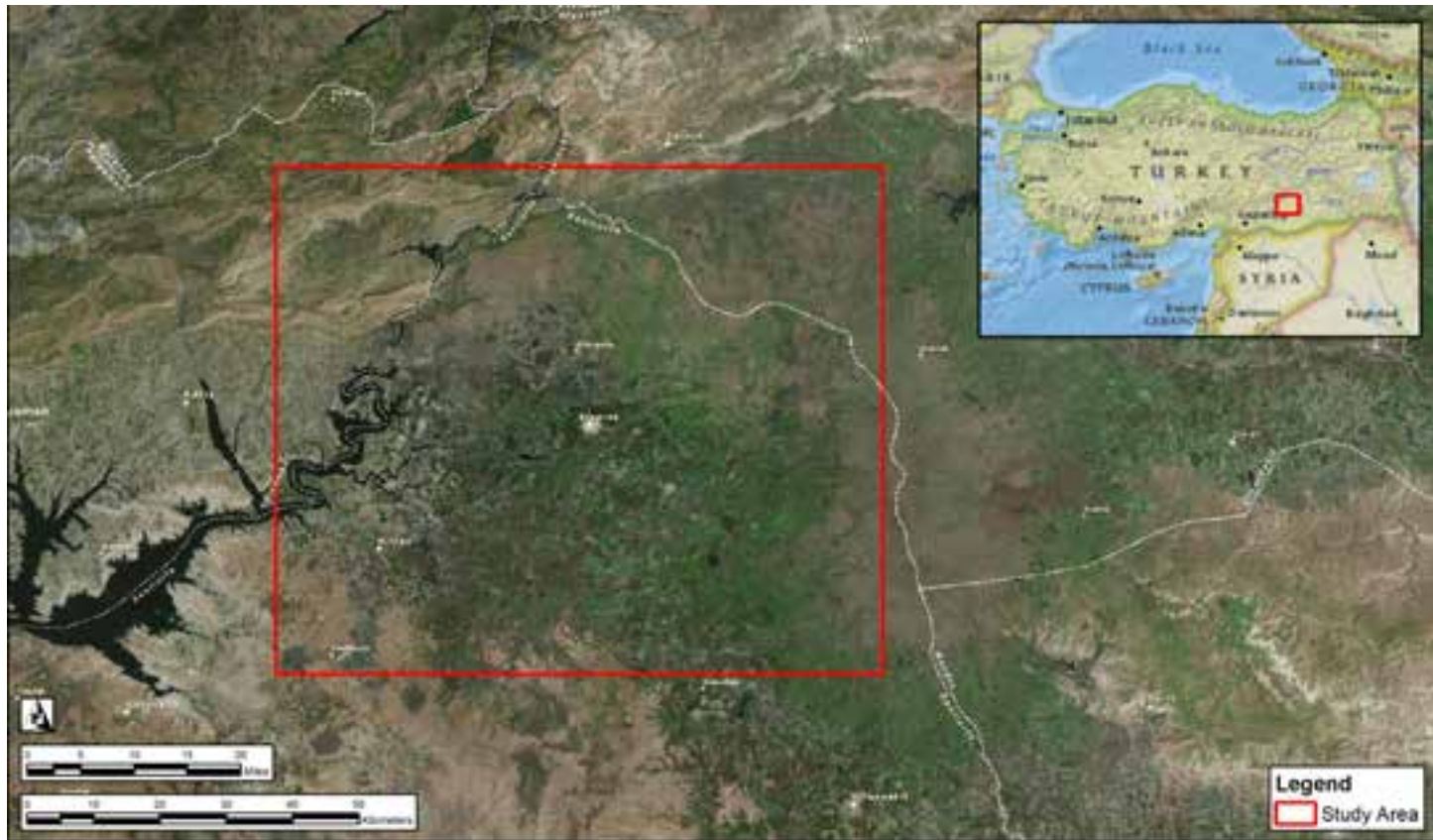
# Agenda

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- Project Overview
- Define Problem
- GIS Solution
- Conclusions
- Future Developments

# Project Overview

- Environmental & Social Impact Assessment (ESIA) for Oil & Gas Development
- Multiple baseline field studies (due diligence, ecology, water resources)
- GIS critical throughout project lifecycle from planning through reporting



# The Problem

*“Identify survey locations and develop a journey management plan in accordance with stringent Health & Safety protocols for remote areas”*

## Project Delivery

- Visit representative sites to establish baseline environmental conditions

## Health & Safety Protocols

- Pre-determined detailed trip itinerary
- Required rest stop locations, driving time limits, speed restrictions, daylight
- Avoid dangerous areas, road conditions

## Efficiency

- Conduct field survey efficiently at lowest cost



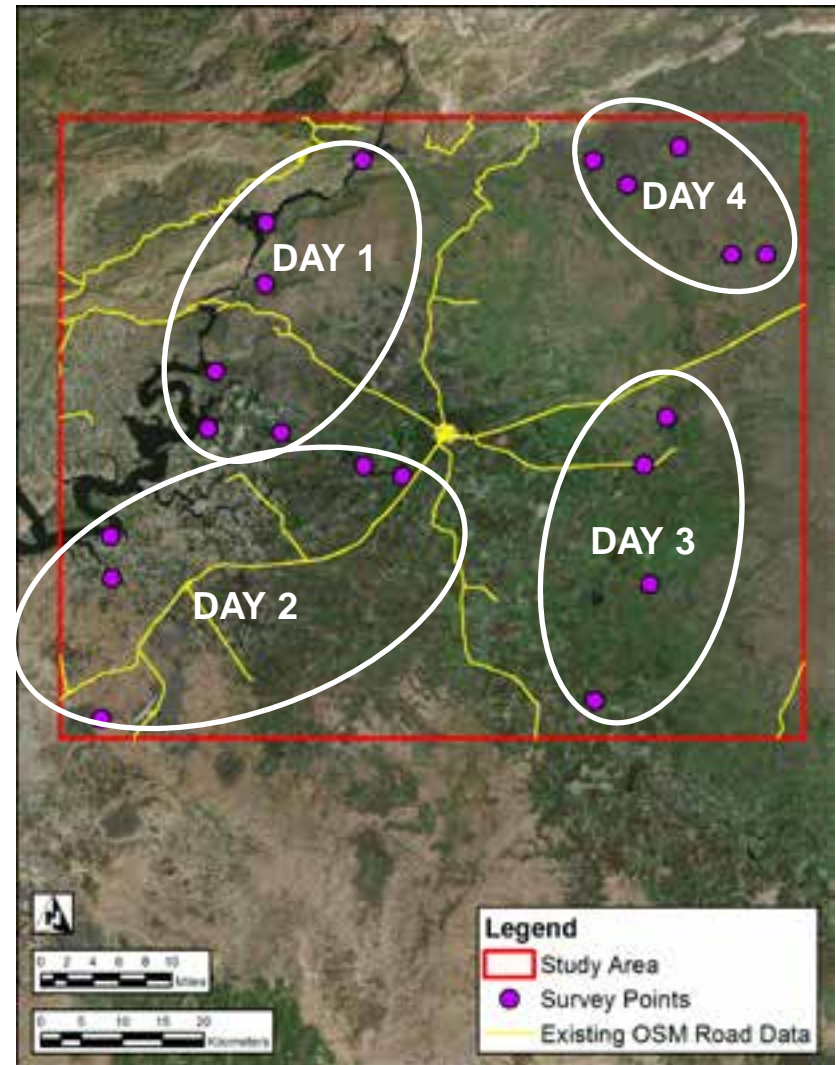
# The Solution: Project Delivery

## Identify Survey Sites

- Acquire satellite imagery
- Share project data on web-GIS viewer
- Enable specialists to identify survey points

## Initial Route Planning

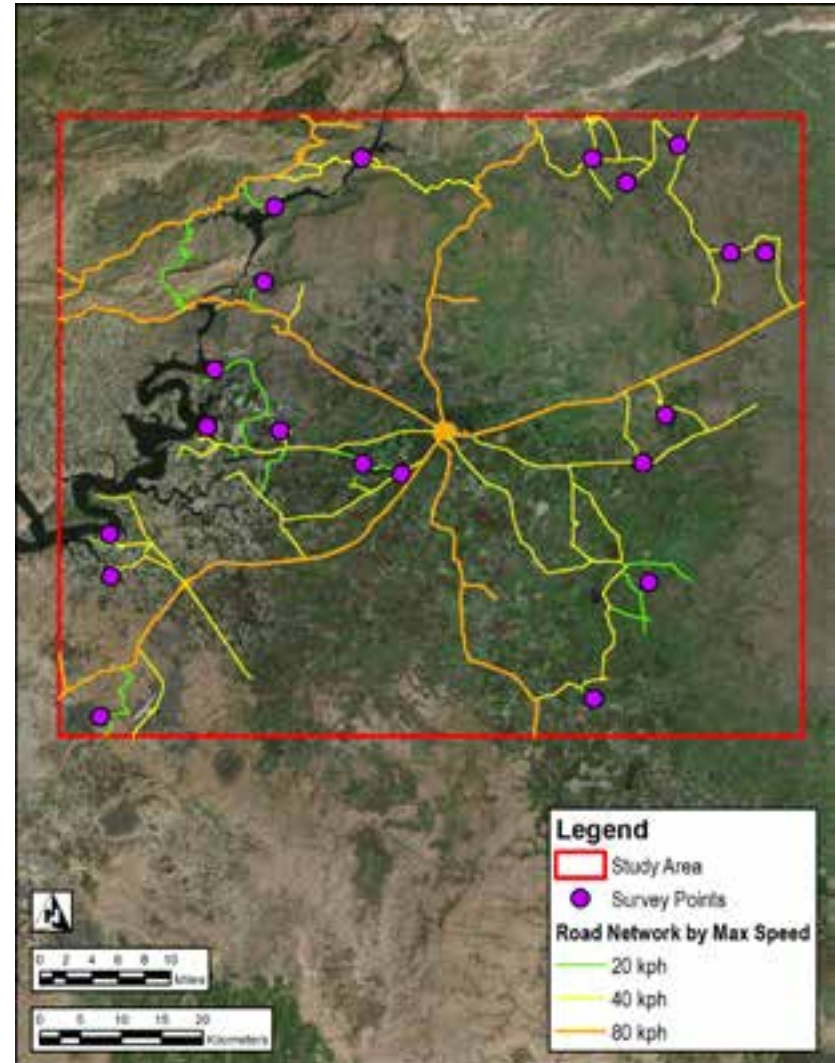
- Are the sites accessible?
- How long will it take to get to them?
- Estimated total trip time: 4 days



# The Solution: Health & Safety Restrictions

## Building Network Dataset

- Digitized routes to sites from imagery
- Ensured connectivity to main road network
- Avoided potential vehicle hazards
- Assigned speed limits based on road surface



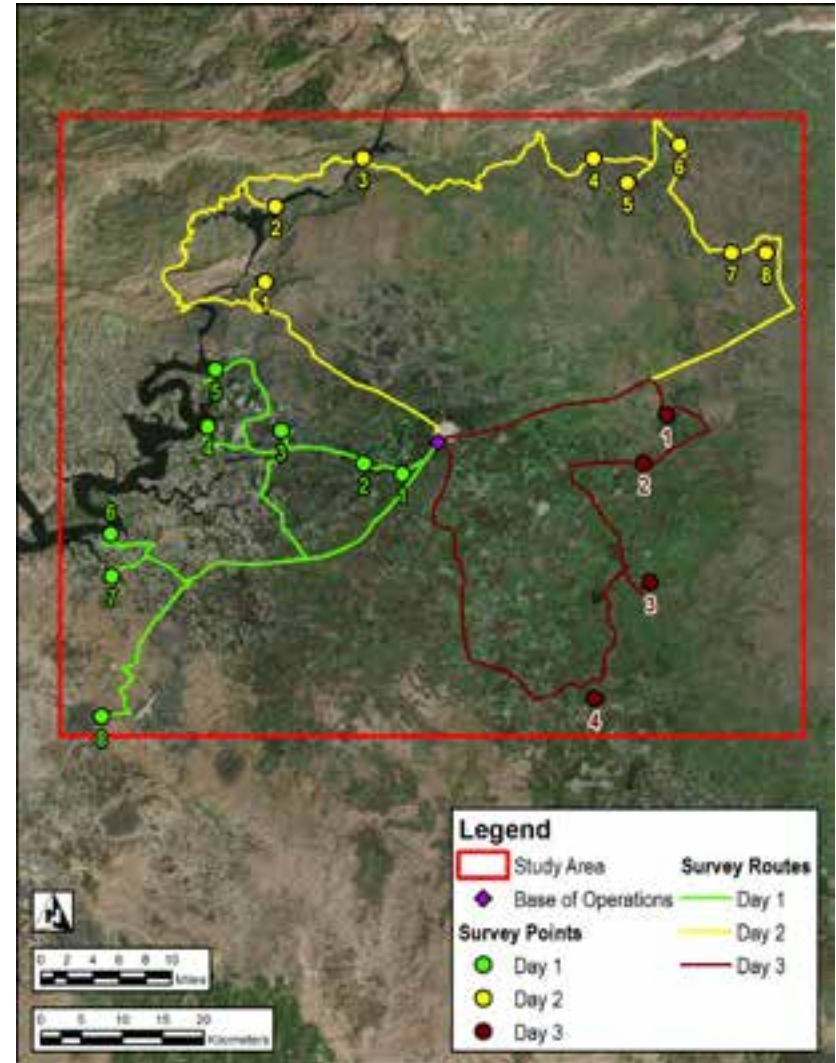
# The Solution: Route Optimization

## Health & Safety Requirements

- Fixed start / stop times
- Driving time limits

## Route Optimization

- Acceptable 3-day route identified
- GIS database ready for route map and itinerary production



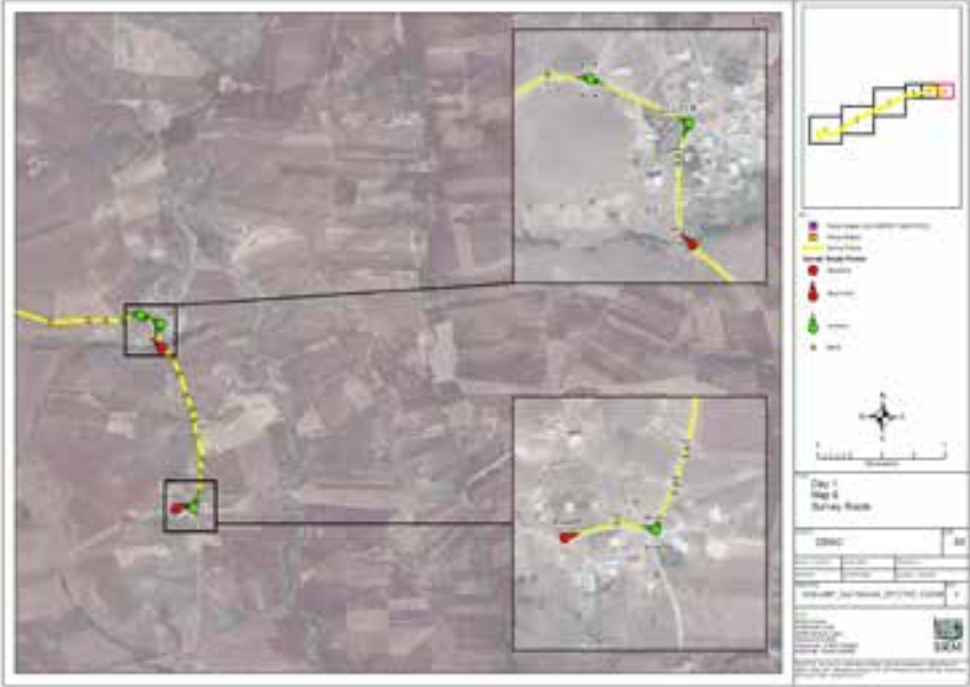
# The Solution: Journey Documentation

## Health & Safety Requirements

- Paper maps of daily route
- Tabular itinerary
- Pre-loaded GPS for navigation

## GIS Solutions

- Data driven pages and map templates
- Automated route calculation templates
- GPS data export tool



RouteID	WaypointID	PointType	Surface	Speed	Description	LegDist_KM	ArrivalTime	DepartureTime
1	D1SP	Start Point	Surfaced	60	Leave onto heading southwest and turn right heading northwest.	0.000	13:00	13:00
5	D1J1	Junction	Surfaced	60	At junction with turn right onto the slip road to head northeast	2.944	13:02	13:02
13	D1J2	Junction	Surfaced	60	Turn left and head north at town of road	11.157	13:14	13:14
20	D1J3	Junction	Surfaced	60	North of fork left remaining on blacktop road	7.255	13:21	13:21
32	D1J4	Junction	Surfaced	60	Turn right onto gravel/surfaced track running through small farming settlement	6.216	13:27	13:27
36	D1J5	Junction	Gravel	20	Turn right onto track heading to well site	1.153	13:31	13:31
38	D1S1	Stop	Gravel	20	STOP - Leave site along entrance route	0.395	13:32	14:17



# Conclusions

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## Project Summary (8 Day Survey)

- 47 Survey Points
- 179 Road / Track Junctions
- 1500 Total GPS points
- 127 Survey and Route maps

## Conclusions

- GIS web-viewer enhanced site selection
- GIS routing reduced survey days by 20%
- Cost savings covered GIS development
- Repeatable methodology for future surveys

# Future Developments

- Replacing manual field collection with tablets
  - Collector for ArcGIS App
- Use custom road network for live navigation
  - Navigator App

