



# Saudi Rail Road Management

CRP-514

Term-081

Offer-14<sup>th</sup>

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# Outline

- **Introduction**
- **GIS**
- **Railways in Saudi Arabia**
  - **Existing lines**
  - **Future Plans**
- **Objectives of Study**
- **Study Area**
- **Selection Criteria**
- **Data Source and Analysis Tool**
- **Optimum Line**
- **Finding & Recommendation**

# Introduction

- **Growing tourism industry, leads to increasing need for development of tourism-related facilities.**
- **The advances in technology related to computing have revolutionized the ways in which many companies can use the data at their disposal to do better business.**
- **It should come as no surprise, that relatively new technologies such as Geographic Information Systems (GIS) could be useful to one of the world's first major capitalized industries, the railroads.**

# GIS

## GIS (Geographic Information System)

- **Lack of scholarly work on rail road considering GIS made it difficult to acquire literature particularly pertaining to this subject.**
- **Some have certainly occurred, however; the ESRI website cites the effective use of GIS in several aspects of railroad operations and planning.**
- **GIS, however, provides tools which were formerly unavailable (or that would have come at too great a cost) to analyze rail lines.**

# GIS

- **The practice of buffering features around rail corridors is not new to rail analysis; it often is useful in cases involving planning for passenger stations in populated areas.**
- **A recent study involving the rail transit system MARTA in Atlanta, Georgia, buffered rail stations to make a case for accessibility in populated census tracts along a proposed new rail line.**

# Railways in Saudi Arabia

- **Rail transport in Saudi Arabia is managed by Saudi Railway Organization.**
- **It provides freight service on three main lines, 1018 km total, which connect Riyadh with Persian Gulf port of Dammam.**
- **There are plans for extending the network to the Red Sea port of Jeddah and, eventually to the borders of Jordan, Yemen, and assumingly all the way to Egypt.**
- **The first railway in Saudi-Arabia was Hejaz railway, running from the border of Jordan to Madinah. This railway opened in 1908, was shut down in 1915. This line was narrow gauge.**

# Railways in Saudi Arabia

- **Modern Railroads were introduced in Saudi Arabia after World War II, to facilitate transport of goods for Saudi ARAMCO from Persian Gulf ports to warehouses in Dhahran.**
- **Construction started in October 1947 and the first line was inaugurated on October 20, 1951. Initially, it was run by ARAMCO, but subsequently transferred to the state.**
- **Since 1968, it operates as a public corporation. Several development projects have been completed thereafter – such as extension of the line to Riyadh, construction of several passenger terminals and opening of a dry port in Riyadh.**

# Railways in Saudi Arabia

## Existing Lines

- Currently Saudi rail network consist of the following main lines:
  - **Line 1:** Dammam – Abqaiq – Hofuf – Riyadh (449.11 km), used by passenger trains.
  - **Line 2:** Dammam – Abqaiq – Hofuf – Haradh – Al Kharj – Riyadh (555.951 km), used by freight trains
  - **Line 3:** Dammam Port Line (12.854 km)



# Railways in Saudi Arabia

## Future Plans

- Saudi Railway Organization is planning to enhance its network in the following directions:
- **The Saudi Landbridge** – construction of a 950 km line from Riyadh to Jeddah and 115 km from Dammam to Jubail, which will connect Persian Gulf with Red Sea
- **The North South Railway**-which will go from Riyadh via Buraidah, Hail and Al Jawf to Al Haditha, with a branch to Ras Azzwar at the Gulf coast and some minor branches to bauxite and phosphate mines. It is mainly considered for mineral transport but also for general freight and passenger transport.
- **Line to Makkah and Madinah**- will be connected with the network at Jeddah, to provide a safe and comfortable transport for Hajj pilgrims arriving via Jeddah.



# Objective

Furnishing most efficient as well as effective rail route  
between Riyadh and Abha



# Study Area

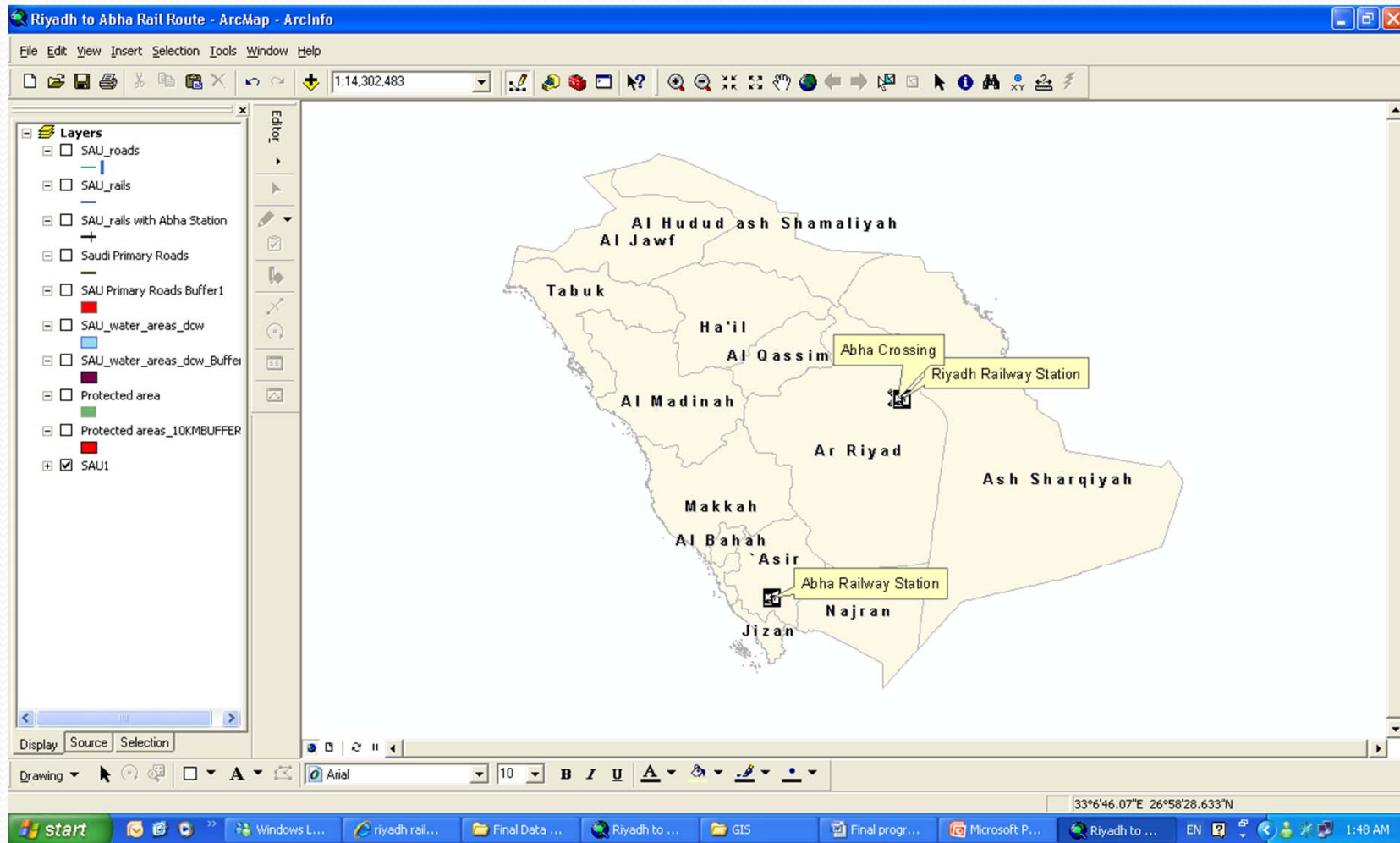
- The study area for this project is a line between Riyadh and Abha.
- Riyadh is the capital of Saudi Arabia. It comes under central province and is the largest homed to over 4,260,000.
- On the other hand Abha is the capital of Asir province in Saudi Arabia. It is situated at 2,200 meters (7,200 ft) above sea level in the fertile mountains of south-western Saudi Arabia.
- Its mild climate makes it a popular tourist destination for Saudis.



# Study Area

- The Saudi government has been promoting Abha as a tourist destination and has created events, such as the Abha Festival during the summer, to draw people to the city.
- Events are organized to attract visitors to discover the city and its surroundings, such as sporting events, shows, exhibitions and musical performances by famous Arabic poets and singers.
- Being the most favorite tourist location is Saudi Arabia; Rail Routes connecting other Saudi cities to Abha will be of strategic importance.

# Study Area



# Data Source and Analysis tool

## Data Source

- <http://www.wdpa.org> - protected areas including Bird sanctuaries, Nation Nature Reserves, protected Area, Wildlife Management Area etc.
- <http://biogeo.berkeley.edu/bgm/gdata.php> - existing Rail Routes, Road network and inland water bodies.
- **Analysis Tool - ArcGIS 9.2**

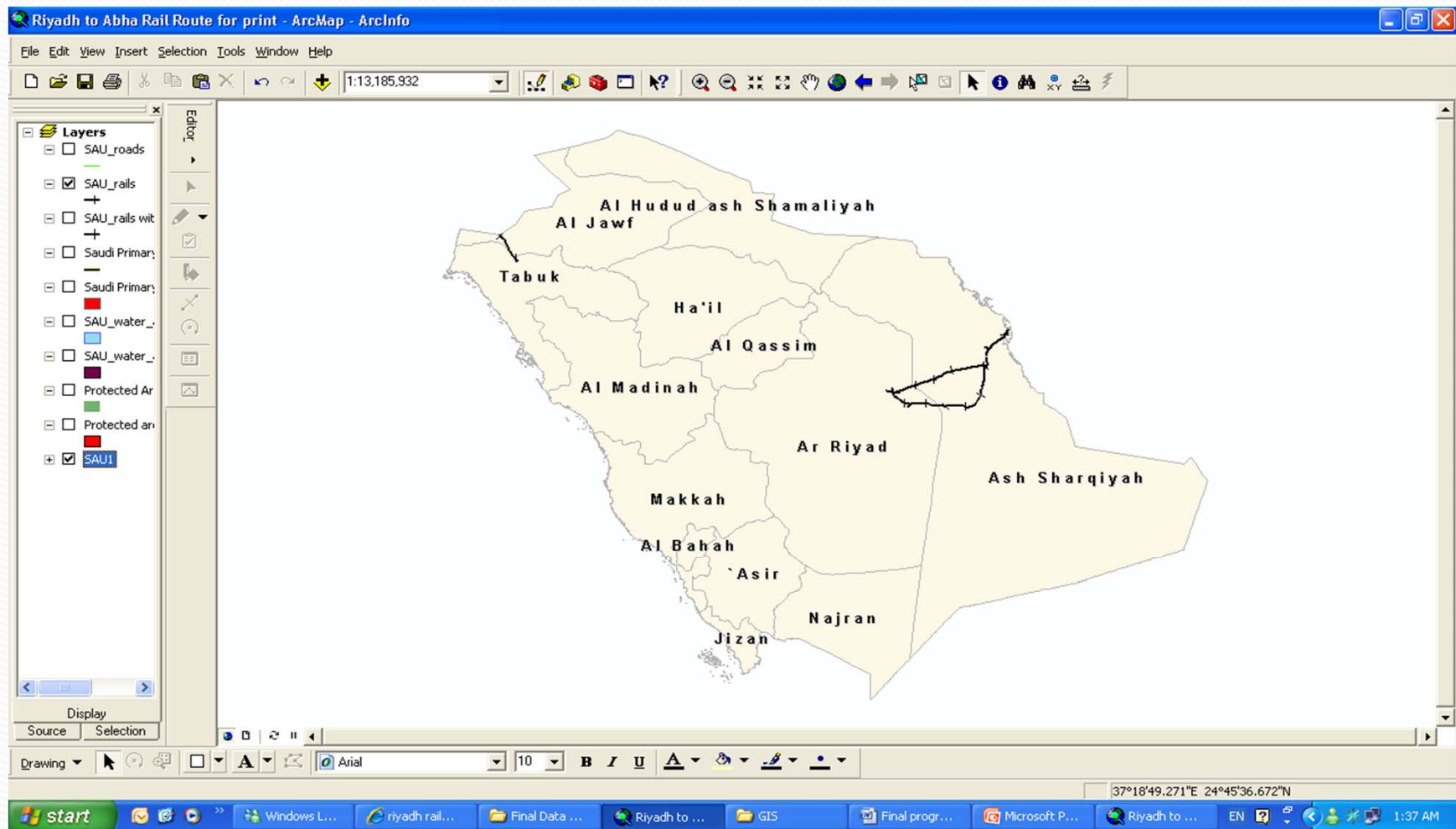


# Selection Criteria

The proposed Rail Route is to be constructed with keeping the following points in mind:

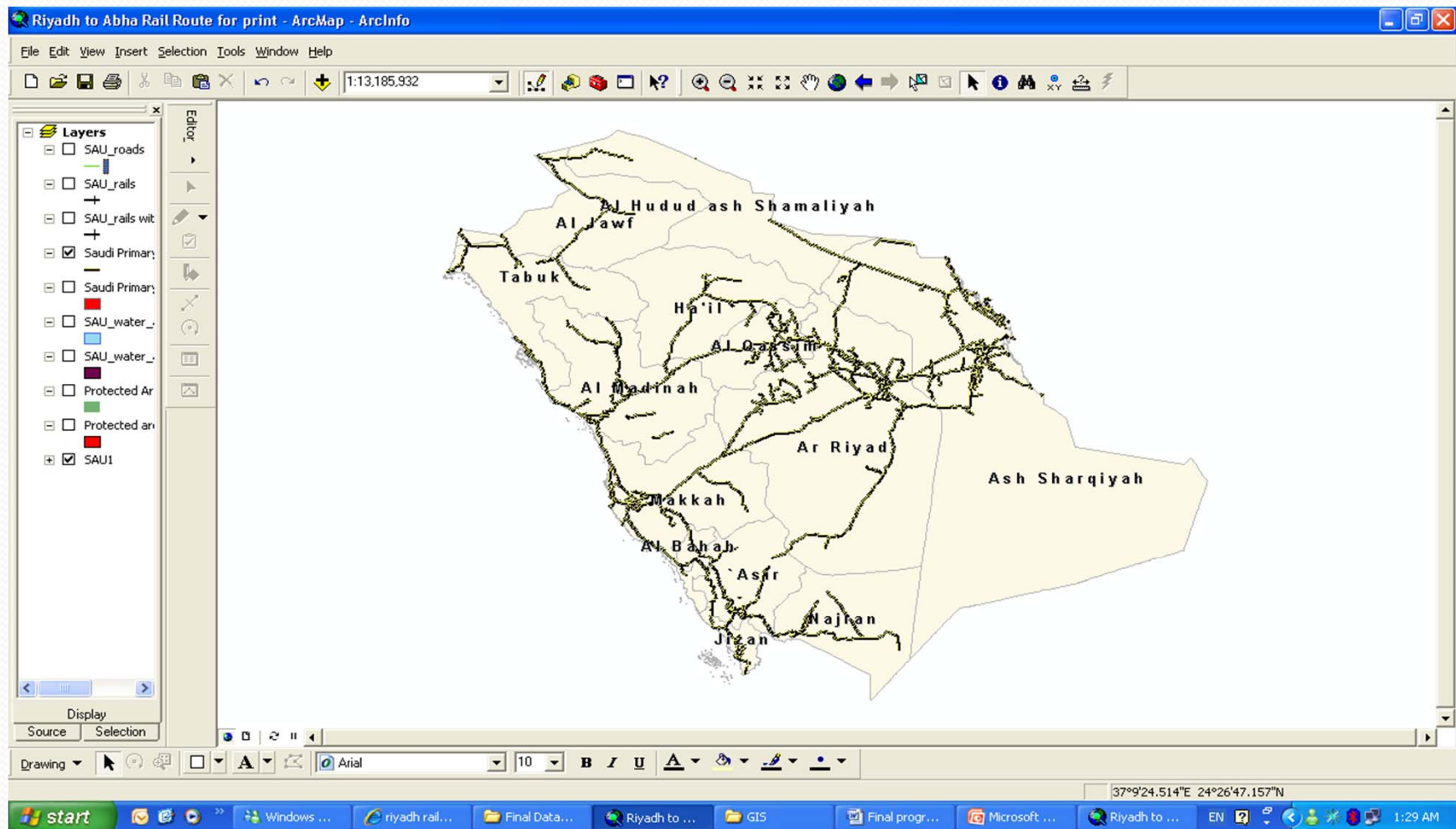
- The Rail Route should be at least 10 Km away from Protected Areas.
- The Rail Route should be at least 1 Km away from all water bodies.
- The Rail Route should be at least 1 Km away from Highways and should not cross them

# Existing Rail Lines

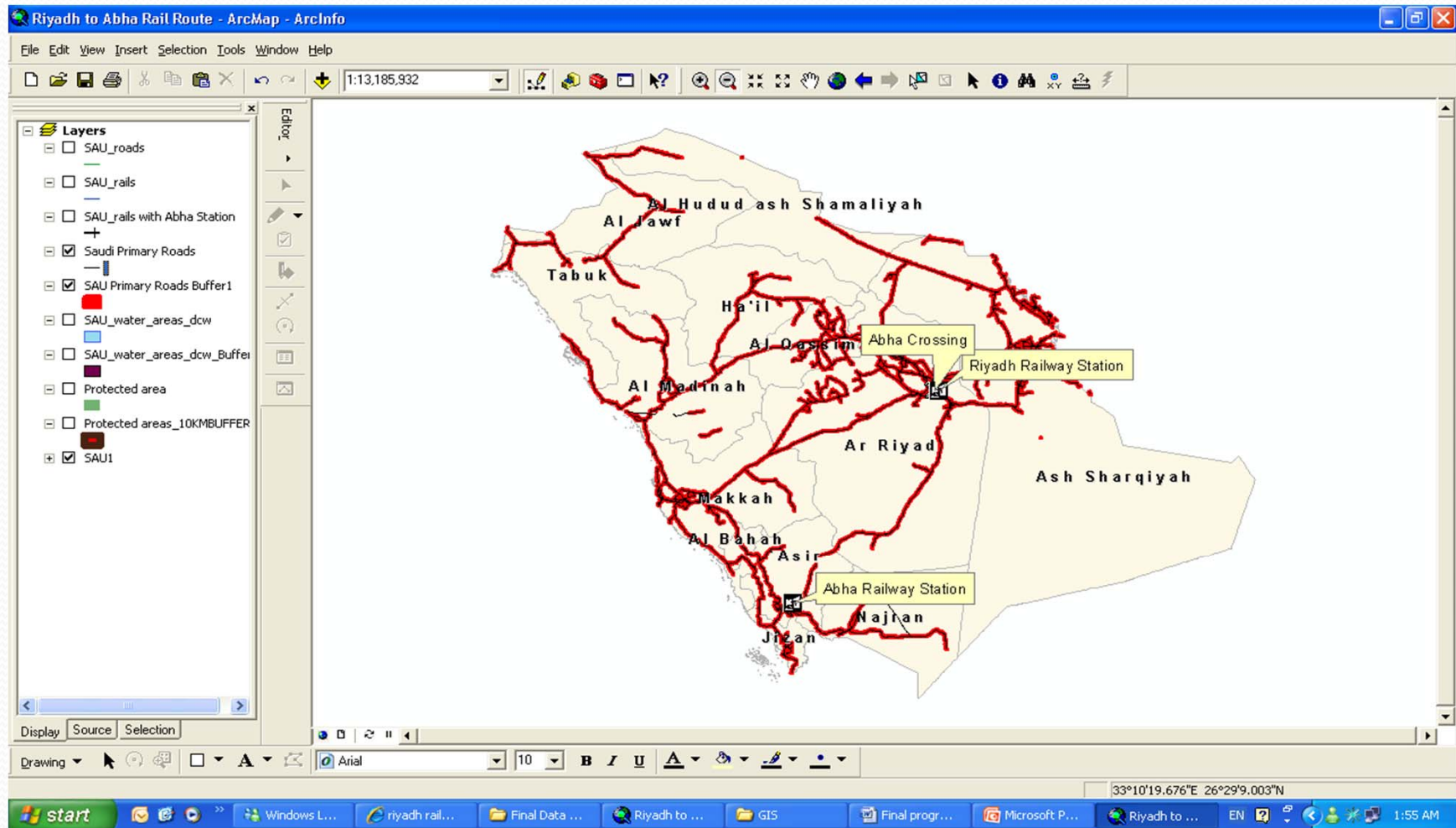




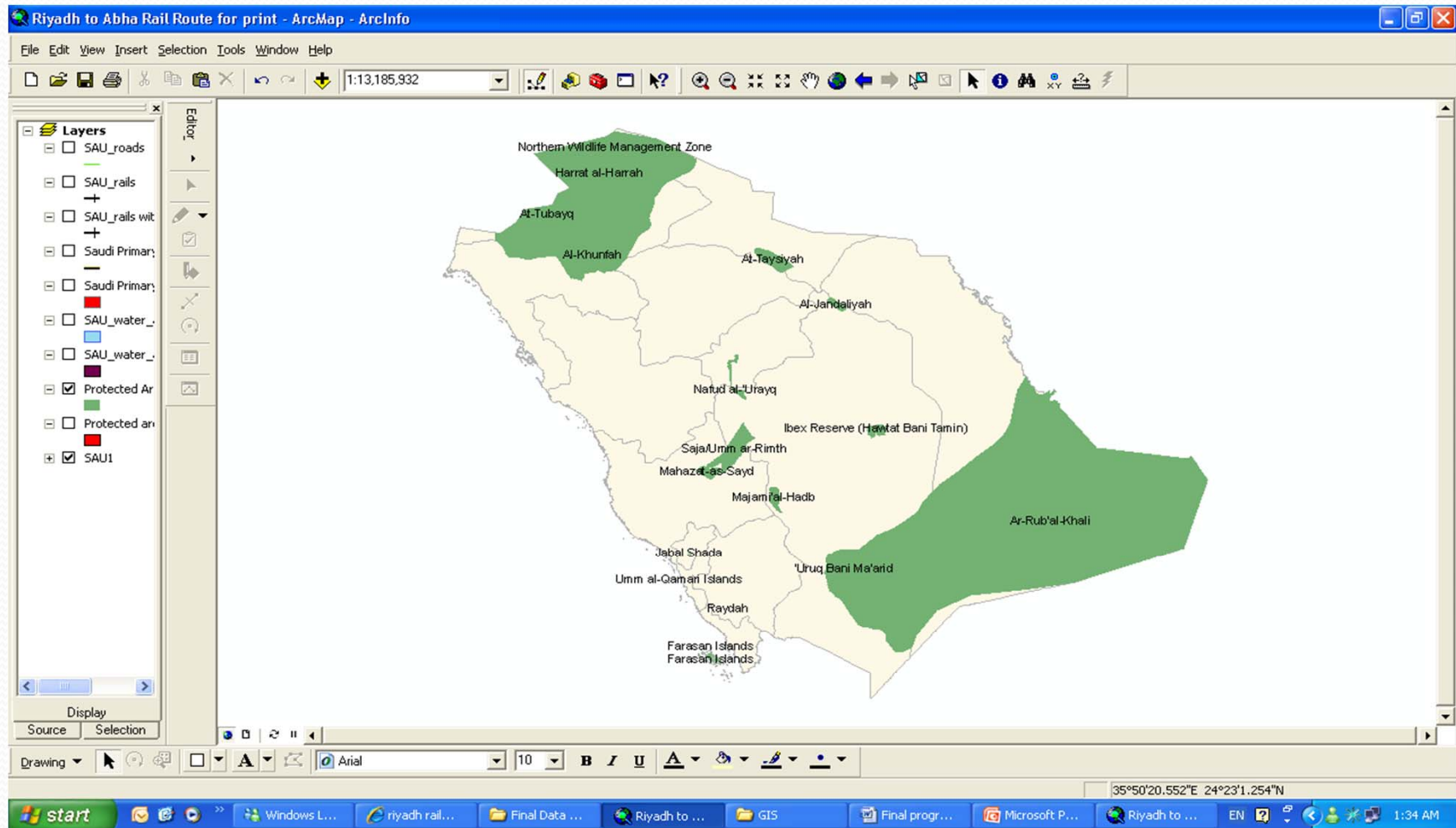
# Primary roads



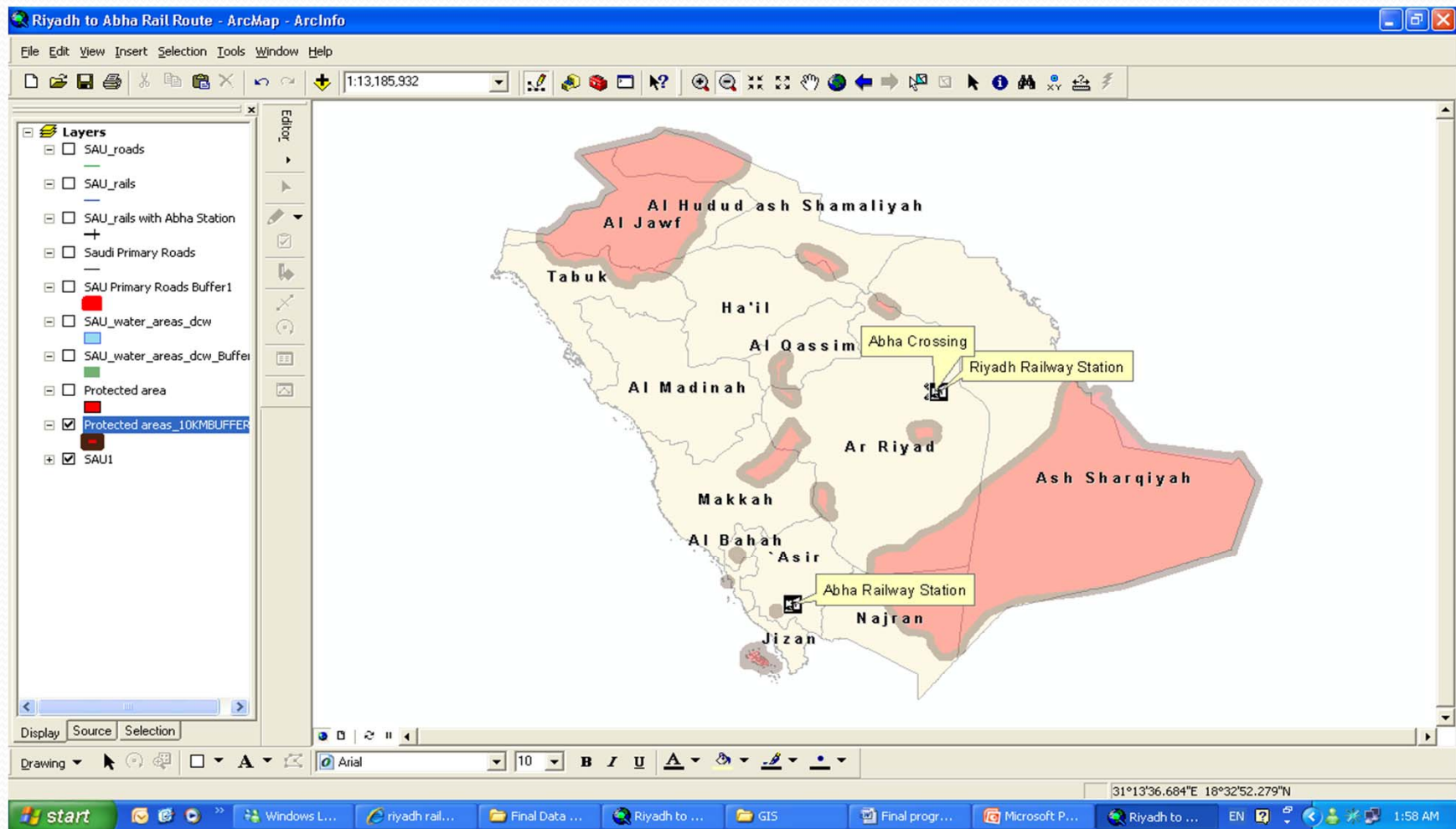
# 1 Km Buffer of Primary Roads



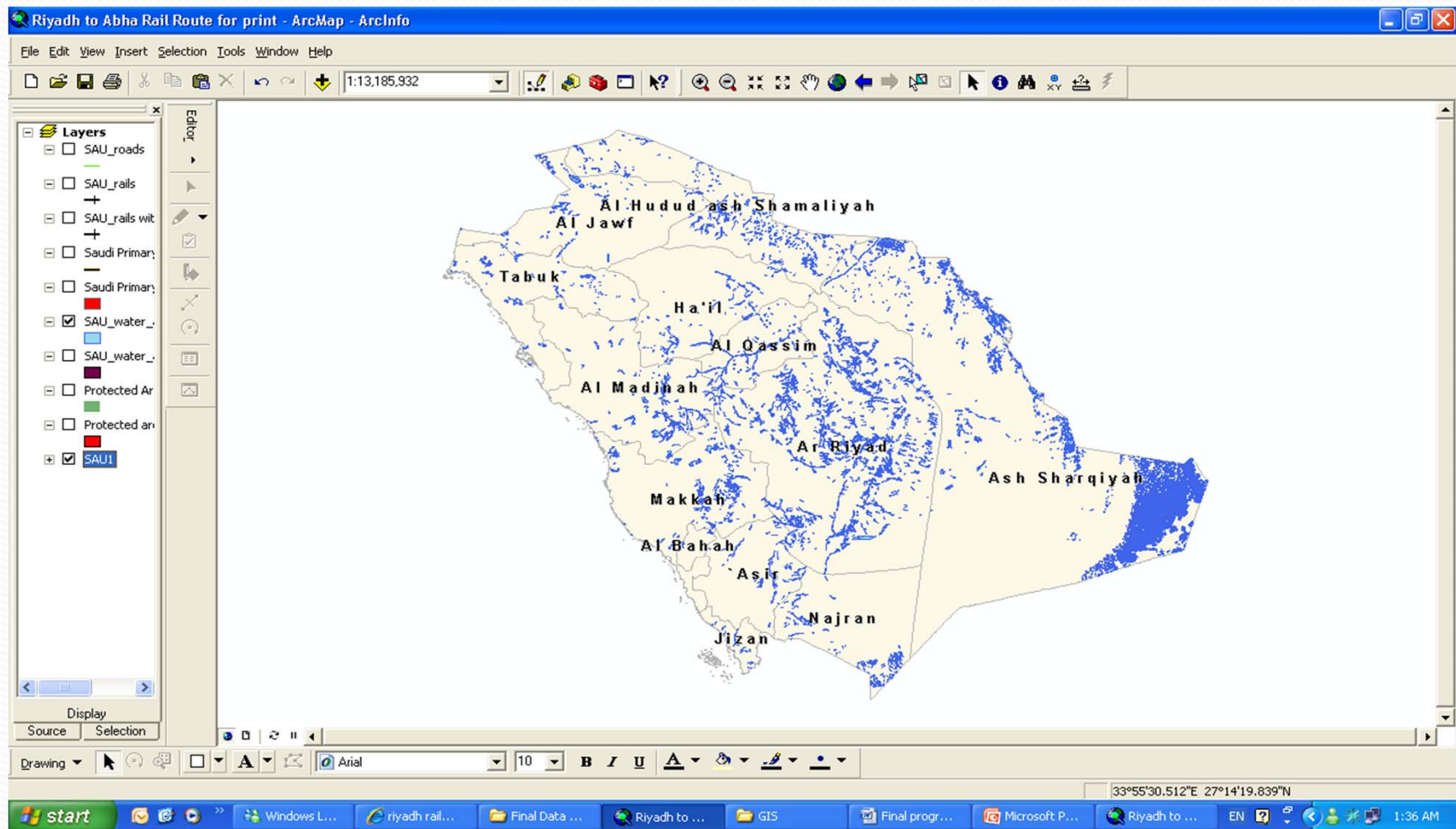
# Protected Areas



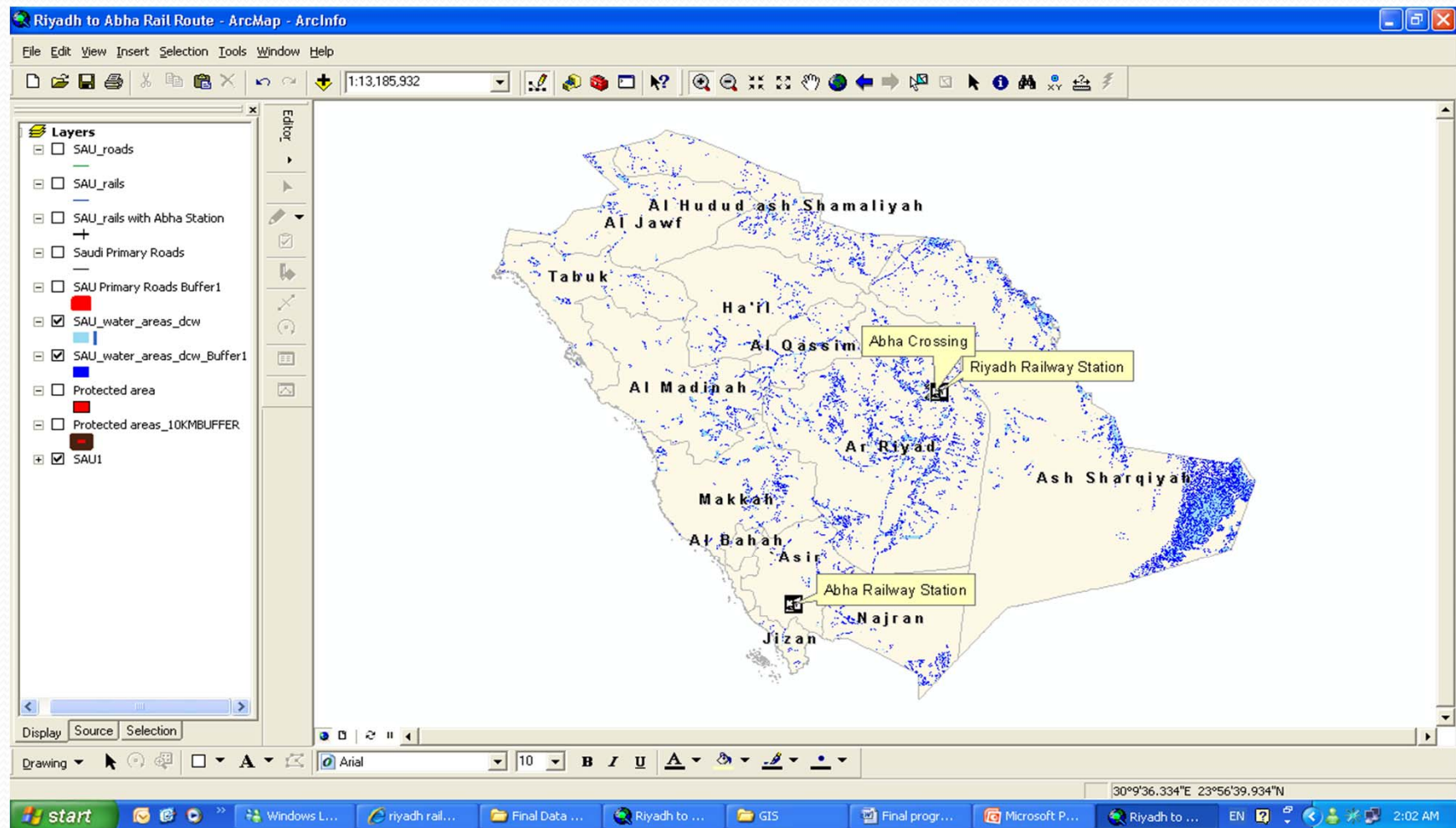
# 10 Km Buffer of Protected Areas



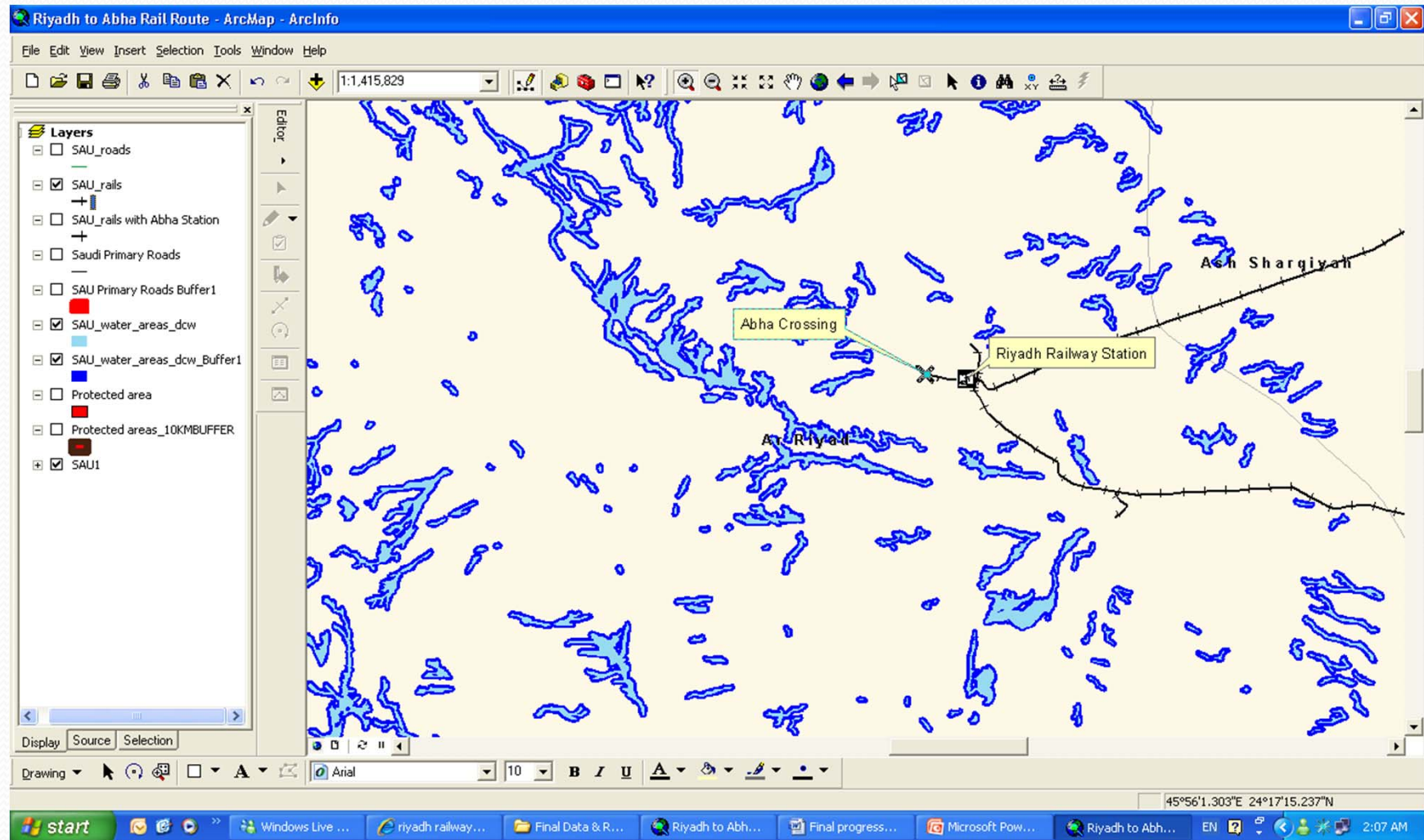
# Water Bodies



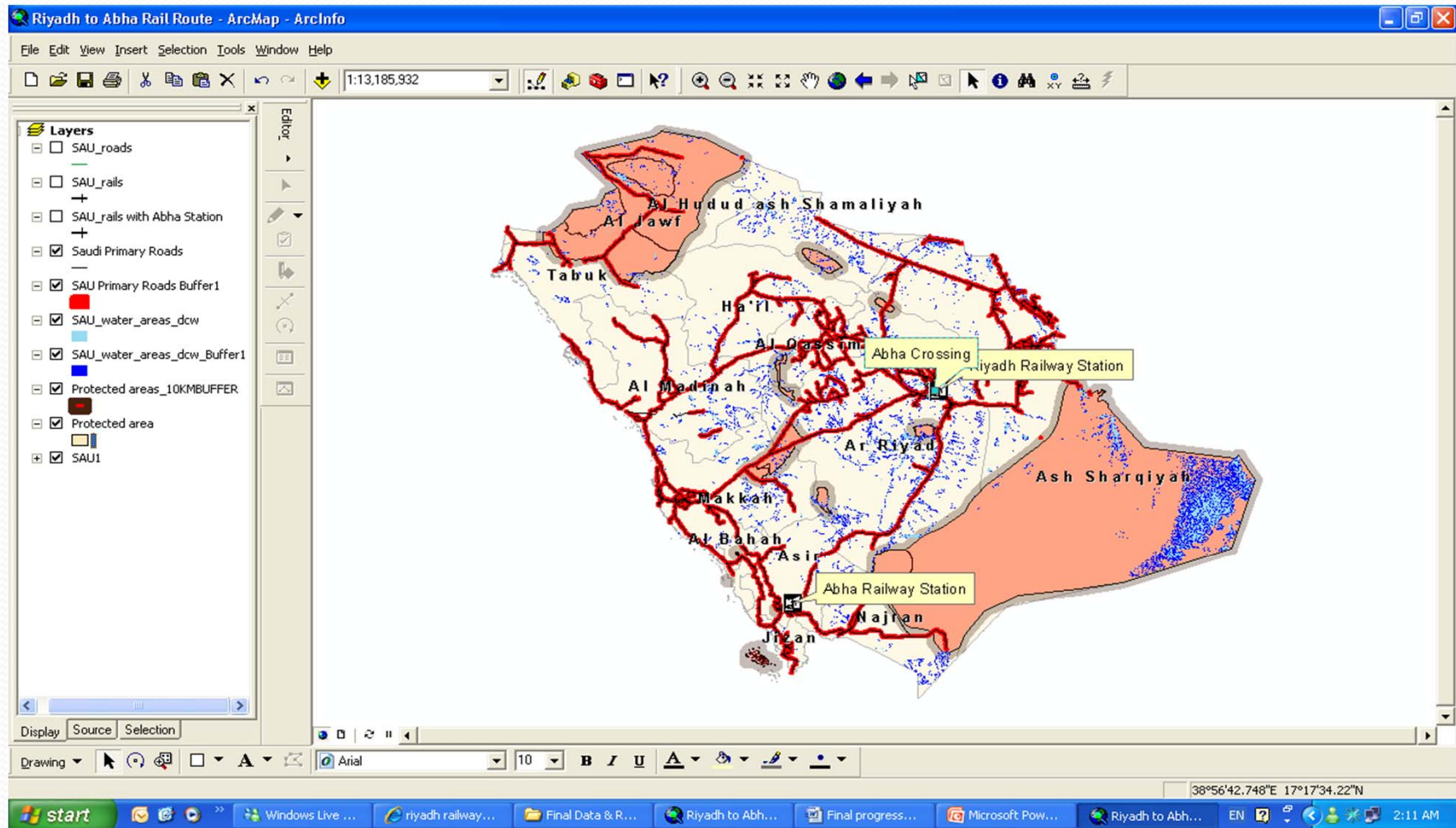
# 1 Km Buffer of Water Bodies



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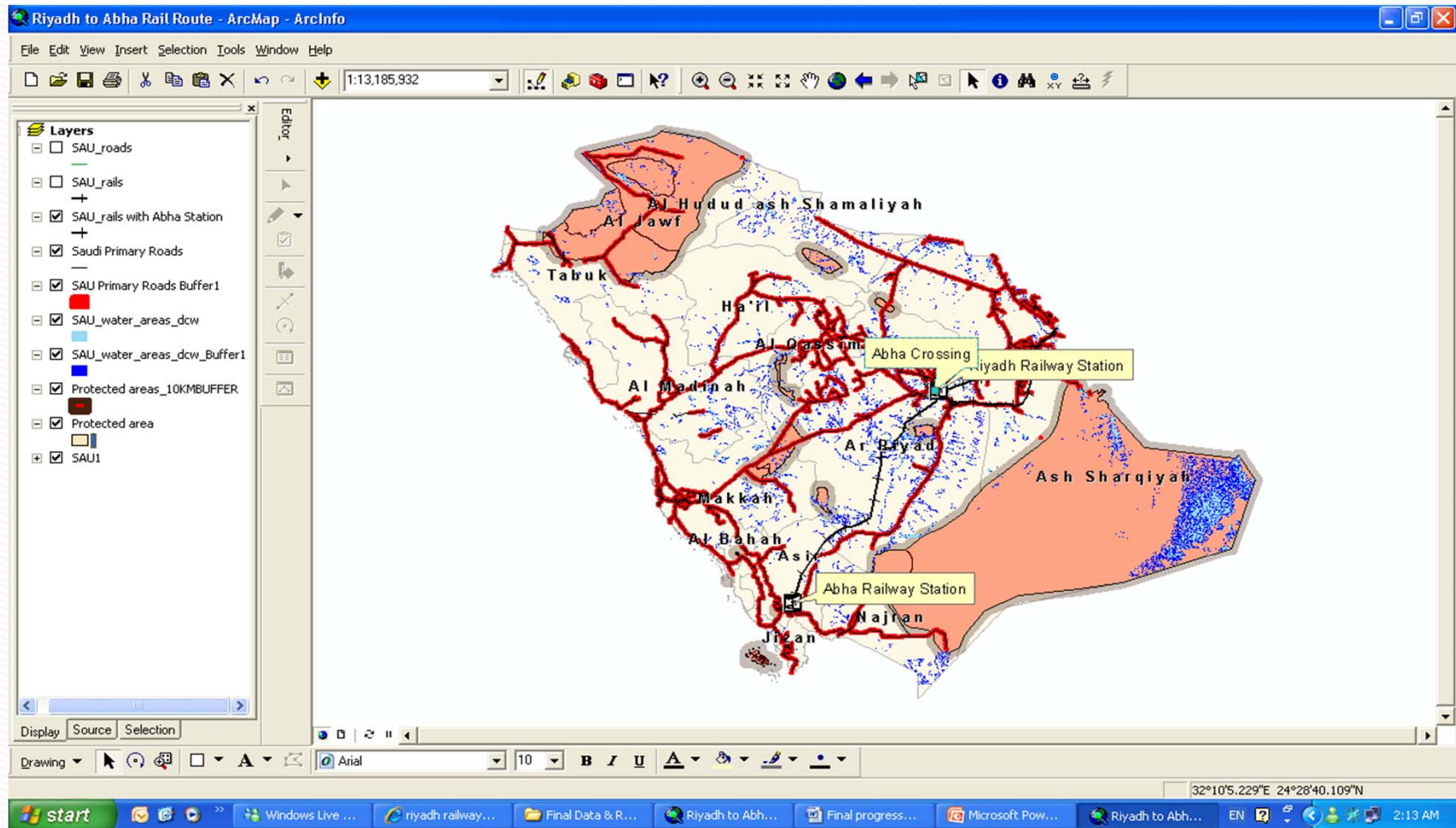


# All Buffered Layers

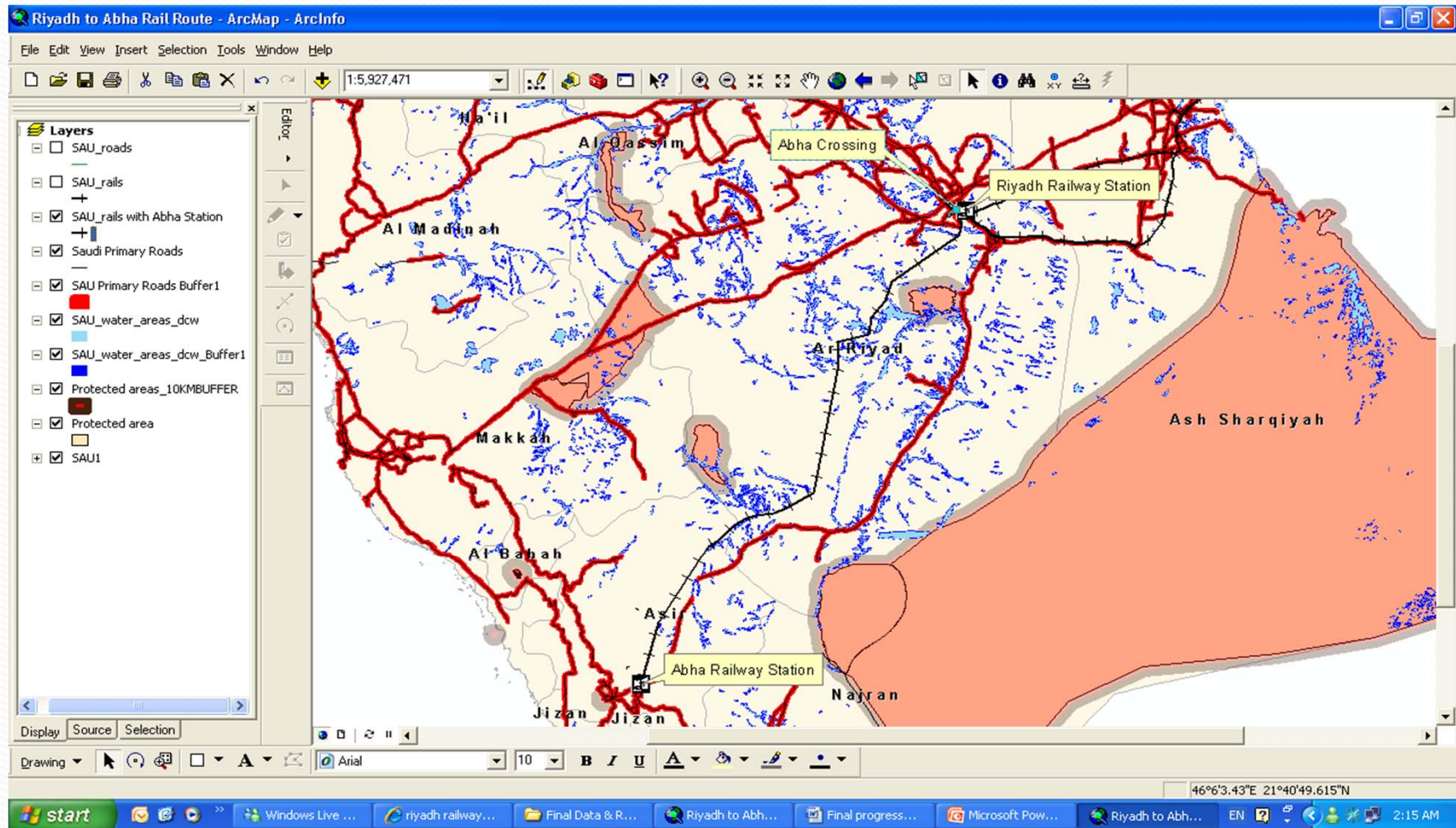




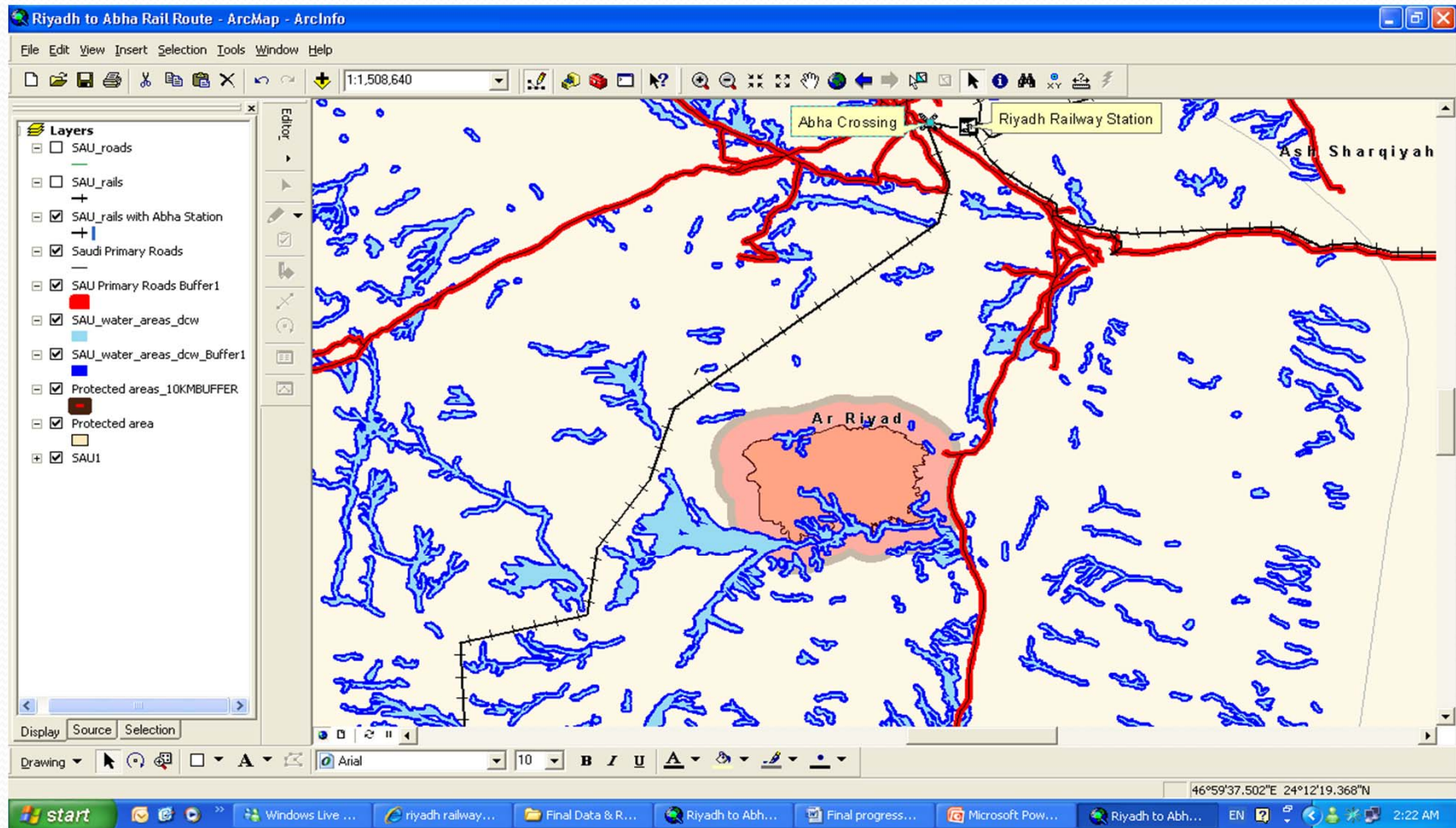
# Proposed Rail Route Between Riyadh And Abha



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# Optimum Rail Route

- Distance between Riyadh Station and proposed Abha rail Crossing is only around 12 KM
- Distance between Abha Crossing and Abha Railway station is around 876 Km.
- The optimum Distance between Riyadh Railway station and Abha Railway station is around 888 Km



## Finding & Recommendation

- **Presently, GIS application is gaining popularity and becoming a necessity.**
- **However, due to the high cost of commercial software, the use of GIS is limited, especially in developing countries such as Saudi Arabia.**
- **There are clearly a wealth of other variables that may be at play. E.g. dense population, natural elevation.**
- **Further analysis can be carried out if necessary data are available in the right format and standard.**
- **More criteria can be added easily as more information becomes available**



THANK YOU