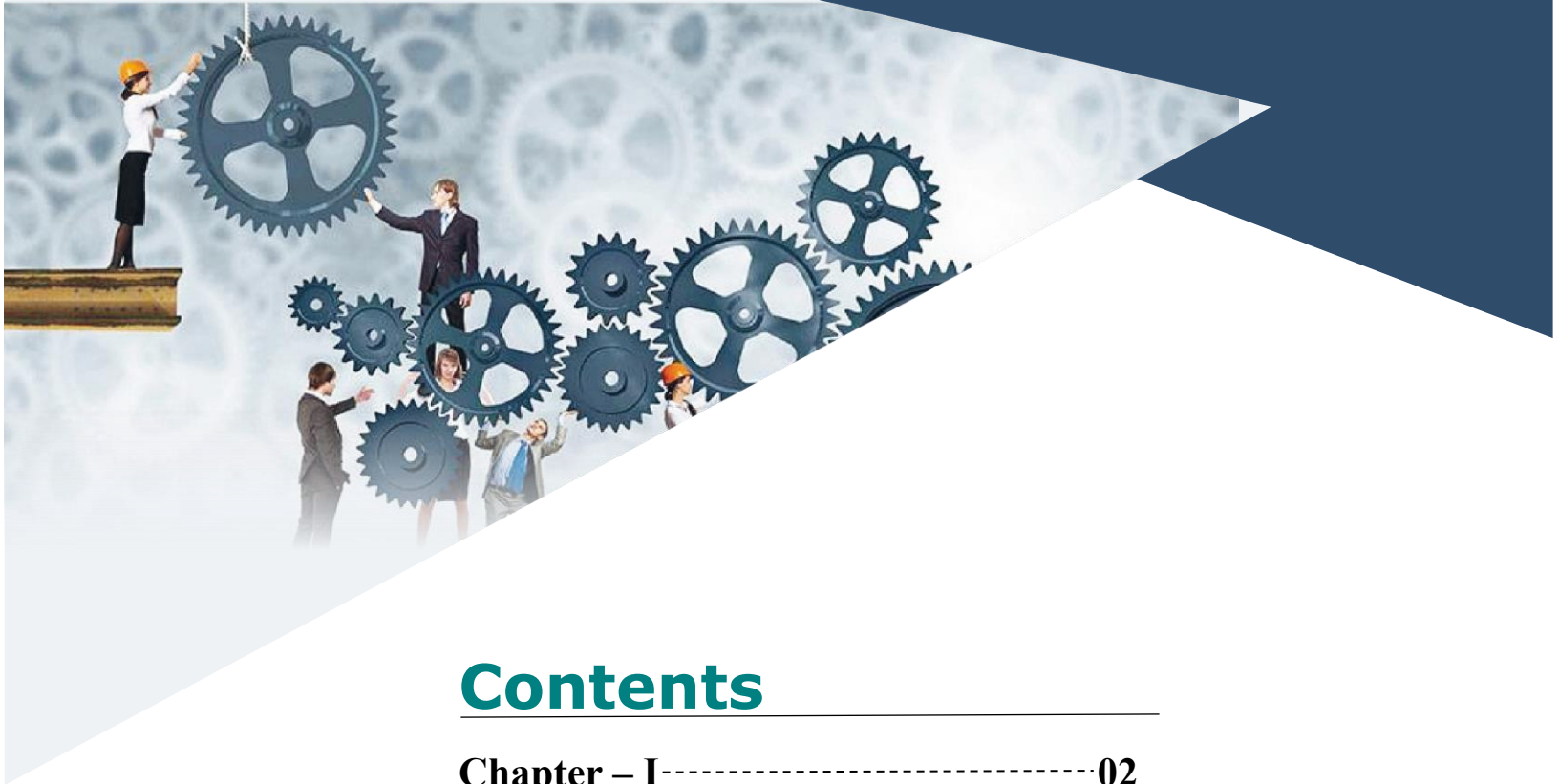


Growth Analysis of Telangana

Codebasics Resume Project Challenge #7

Challenge: Analyse Growth and Present Insights to the Telangana Government





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I. Introduction

Telangana is one of the fastest-growing states in India and one of the states with an open data policy.

Purpose of the analysis and objective of the report:

The purpose of this report is to examine the trends and patterns in Stamp Registration, Transportation, and TS-iPASS departments, and present a comprehensive overview of Telangana's overall growth through relevant insights and visuals. This analysis will enable the Telangana Government to make informed decisions based on data, thereby facilitating the state's progress.

Overview of the departments:

- **Stamp Registration:** Stamp registration revenue is a vital gauge of economic activity and property transactions in Telangana. This dataset presents the historical data of stamp duty challan collections, encompassing both document registration and Estamps.
- **Transportation:** The growth in vehicle sales in Telangana offers valuable insights into the interdependence of economic progress, urbanization, and mobility needs. This dataset presents historical data on vehicle sales across different types and classes, including Agricultural, MotorCar, MotorCycle, and fuel types such as Diesel, Petrol, and Electric.
- **TS-iPASS:** The Telangana State Industrial Project Approval and Self Certification System (TS iPASS) initiative is a pivotal catalyst for industrial growth and investment inflow in Telangana. This dataset displays the historical investment data of various industrial sectors in different districts.

II. Methodology

Data Collection and Sources for Analysis:

- The approach adopted for the analysis was based on the use of data provided by Codebasics.
- Codebasics was able to procure the data due to the OpenData policy of Telangana Government.

Time Frame: The analysis covers a specified time frame, a range of consecutive years from 2018 to 2023, to capture meaningful trends and growth patterns.

The analysis comprises of the following steps:

- Analysis of primary & secondary data using relevant statistics tools, charts, diagrams.
- Under the Resume Project Challenge tools, Codebasics has provided us with research questions which has massively helped in giving shape to this analysis.

Tools Used:

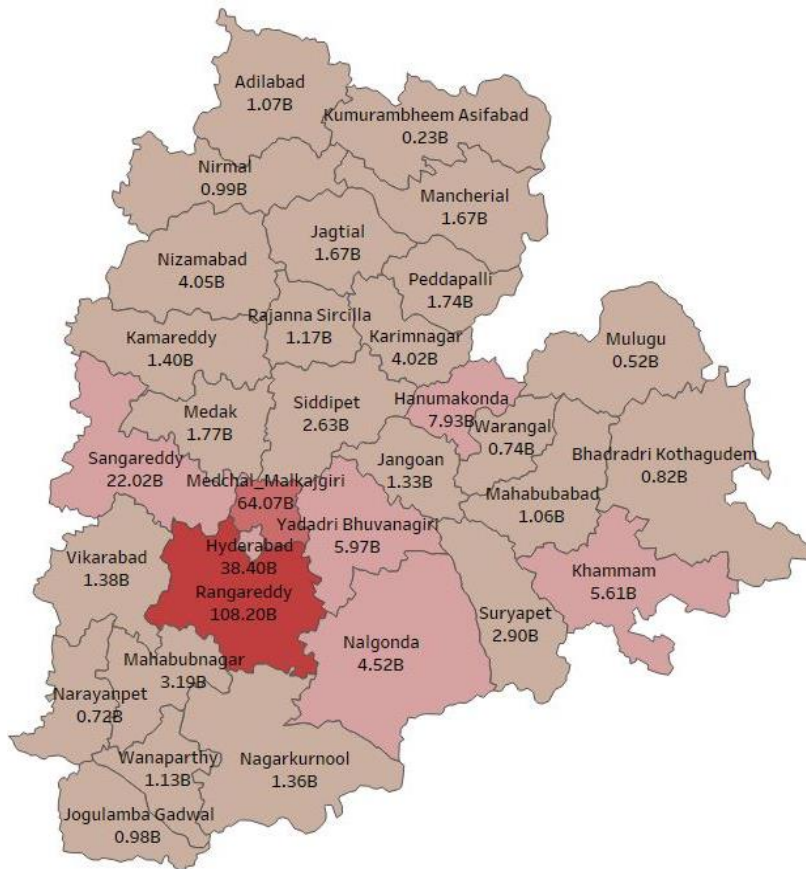
- **Tableau 2023.2**
- **Microsoft Word 2021**
- **Microsoft Excel 2021**



III. Stamp Registration Analysis

Problem statement:

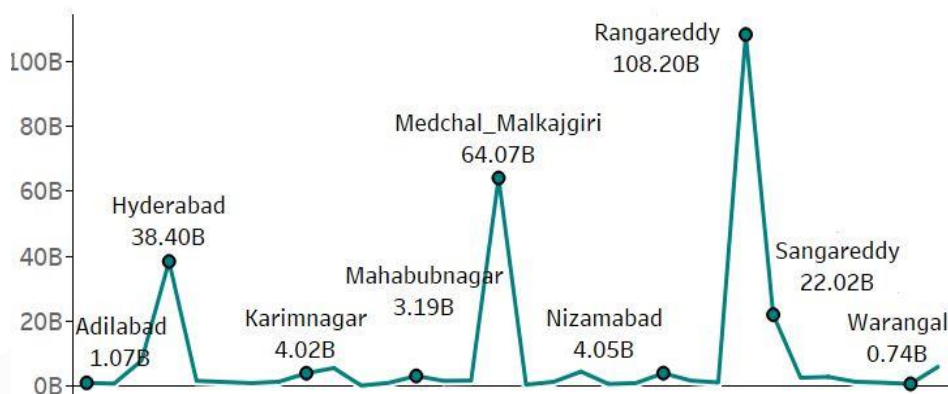
1.1. How does the revenue generated from document registration vary across districts in Telangana?



Hyderabad, Rangareddy, Medchal-Malkajgiri, and Sangareddy have recorded significant revenue from document registration due to high property transactions.

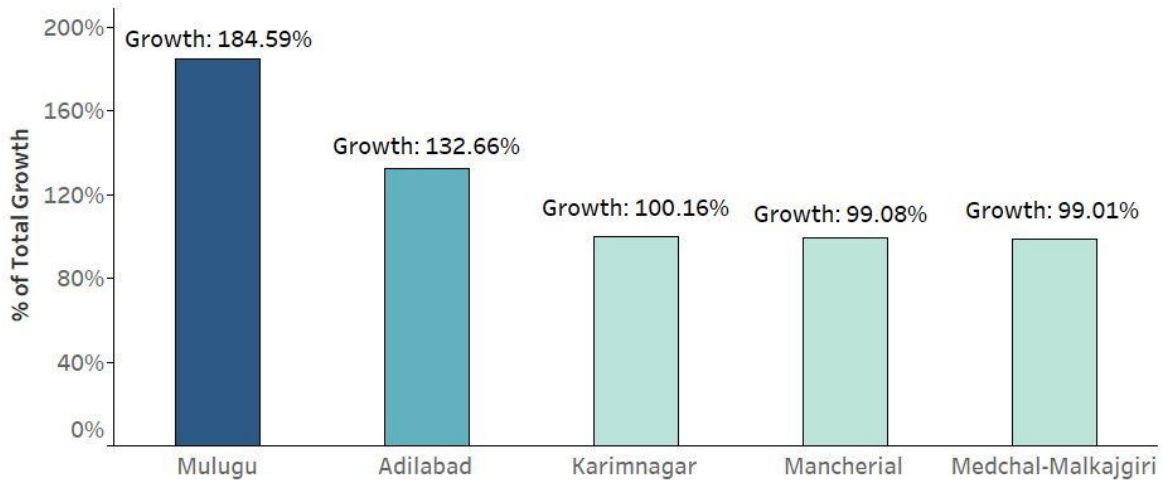
Conversely, Adilabad, Karimnagar, Mahabubnagar, Nizamabad, and Warangal have reported minimal revenue in this regard.

Document Registration Revenue



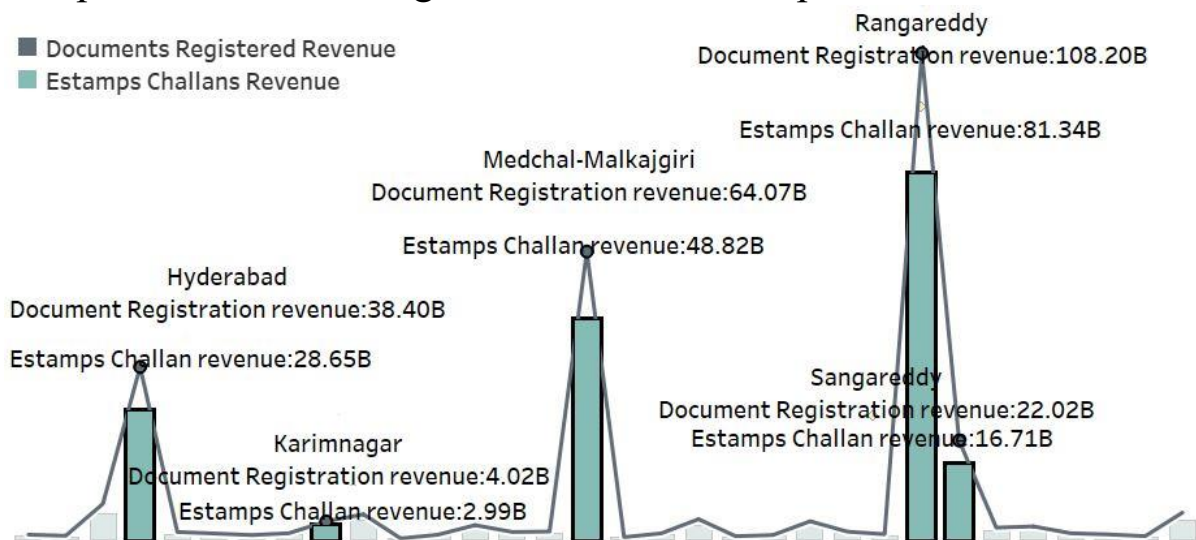
1.2. List down the top 5 districts that showed the highest document registration revenue growth between FY 2019 and 2022.

Top 5 Districts



Mulugu, Adilabad, Karimnagar, Mancherial, Medchal-Malkajgiri have shown the highest document registration revenue growth between FY 2019 and 2022.

2.1. How does the revenue generated from document registration compare to the revenue generated from e-stamp challans across districts

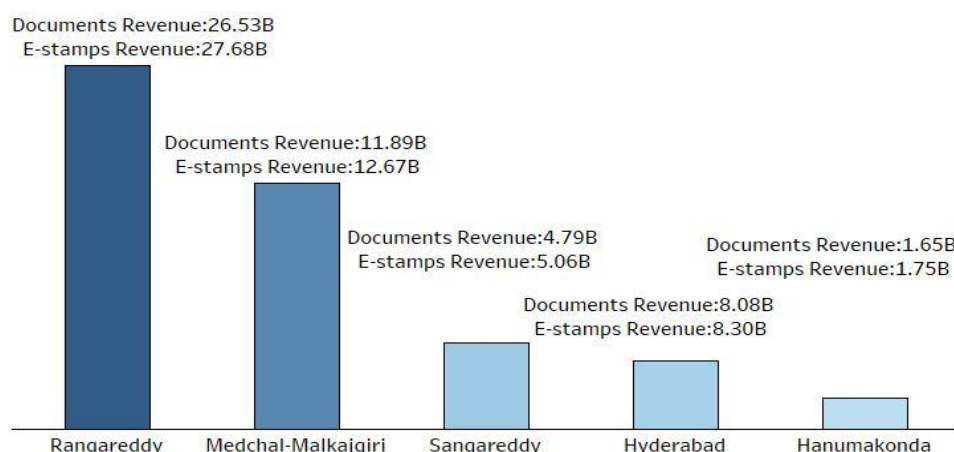


There is a direct correlation between revenue generated by Documents registration and E-stamps challan.

District	Documents Registered Revenue	Estamps Challans Revenue
Adilabad	1.07B	0.83B
Bhadradri Kothagudem	0.82B	0.62B
Hanumakonda	7.93B	5.75B
Hyderabad	38.40B	28.65B
Jagtial	1.67B	1.20B
Jangoan	1.33B	0.84B
Jogulamba Gadwal	0.98B	0.71B
Kamareddy	1.40B	0.98B
Karimnagar	4.02B	2.99B
Khammam	5.61B	4.21B
Kumurambheem Asifabad	0.23B	0.15B
Mahabubabad	1.06B	0.78B
Mahabubnagar	3.19B	2.24B
Mancherial	1.67B	1.25B
Medak	1.77B	1.25B
Medchal-Malkajgiri	64.07B	48.82B
Mulugu	0.52B	0.41B
Nagarkurnool	1.36B	0.98B
Nalgonda	4.52B	3.01B
Narayanpet	0.72B	0.52B
Nirmal	0.99B	0.71B
Nizamabad	4.05B	3.05B
Peddapalli	1.74B	1.27B
Rajanna Sircilla	1.17B	0.83B
Rangareddy	108.20B	81.34B
Sangareddy	22.02B	16.71B
Siddipet	2.63B	1.95B
Suryapet	2.90B	2.09B
Vikarabad	1.38B	1.00B
Wanaparthy	1.13B	0.83B
Warangal	0.74B	0.48B
Yadadri Bhuvanagiri	5.97B	4.25B

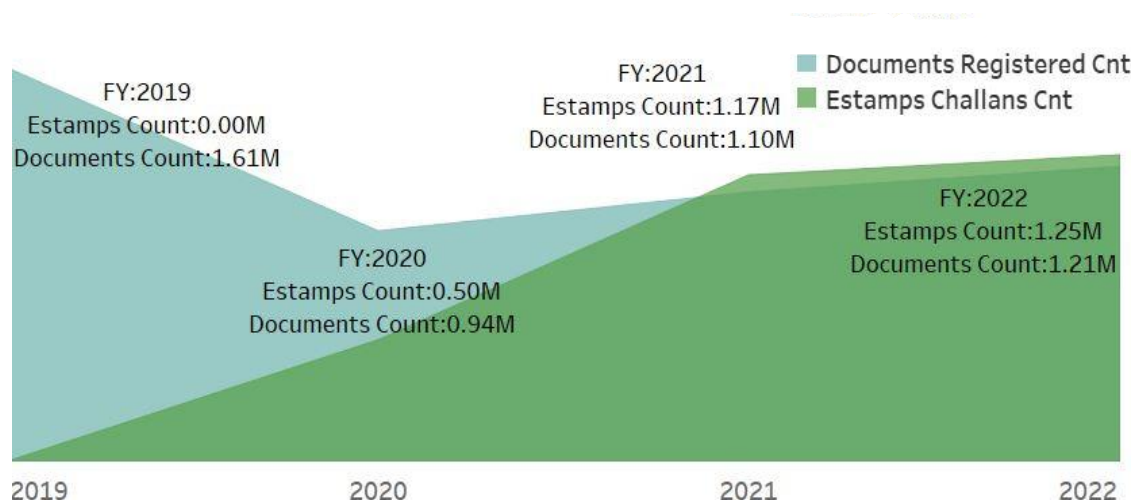
Districts like Rangareddy, Sangareddy, Medchal-Malkajgiri, and Hyderabad generated substantial revenue from both document registration and E-stamps challan.

2.2. List down the top 5 districts where e-stamps revenue contributes significantly more to the revenue than the documents in FY 2022.



Rangareddy, Medchal-Malkajgiri, Sangareddy, Hyderabad and Hanumakonda are the districts where e-stamps revenue contributes significantly more to the revenue than documents in **FY 2022**.

3. Is there any alteration of e-Stamp challan count and document registration count pattern since the implementation of e-Stamp challan? If so, what suggestions would you propose to the government?



Our data indicates that the implementation of E-stamp challan commenced in **January 2020**.

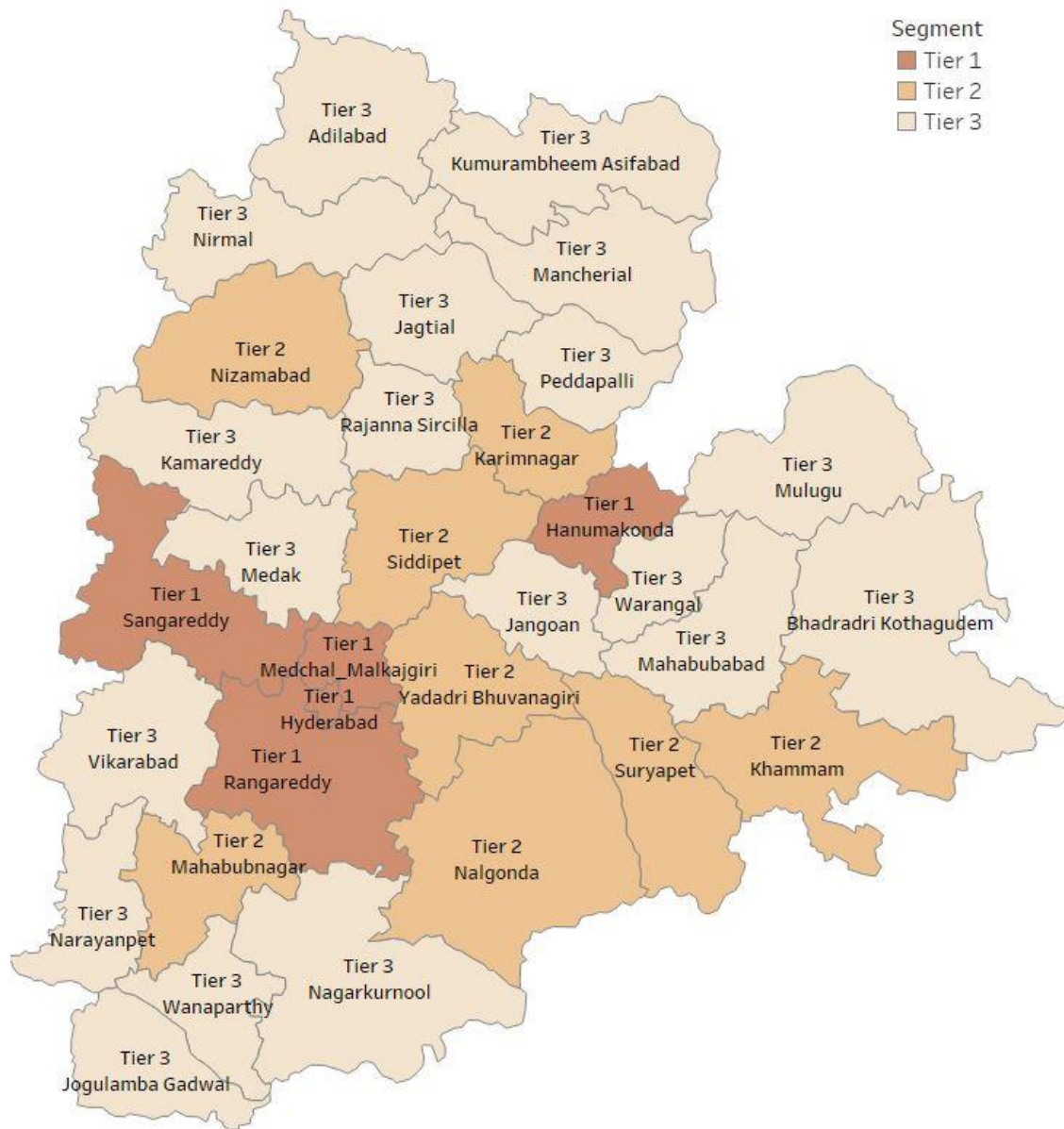
We can clearly see there is a significant E-stamp challan count in 2020 itself, i.e., **500,000**.

While there has been a noticeable increase in E-stamp challan count over the years, the growth between **2021-2022** has been insignificant compared to the significant growth observed between **2020-2021**.

To overcome this plateau, the government can:

- Educate users about the benefits and ease of using E-stamps by organizing **Public awareness campaigns**, especially targeting those who have not yet made the transition.
- Offer **incentives** to people who choose to pay stamp duty through E-stamp challan.
- Include **UPI** as an option to make the payment for the stamp fee.

4. Categorize districts into three segments based on their stamp registration revenue generation during the fiscal year 2021 to 2022.



The districts are segmented as **Tier 1, Tier 2 and Tier 3** based on their stamp registration revenue generation during the **fiscal year 2021-2022**.

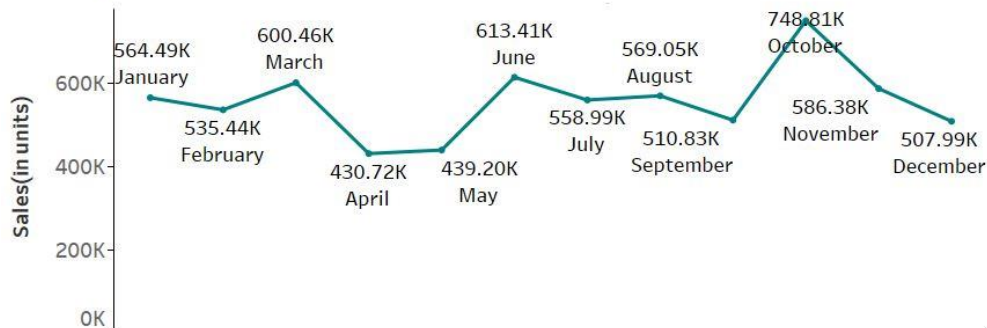
IV. Vehicle Sales Analysis

Problem statement:

1. Investigate whether there is any correlation between vehicle sales and specific months or seasons in different districts. Are there any months or seasons that consistently show higher or lower sales rate, and if yes, what could be the driving factors? (Consider Fuel-Type category only)

District	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Adilabad	6.49K	7.48K	8.04K	5.54K	5.86K	6.13K	6.24K	5.92K	4.91K	9.84K	7.42K	5.47K
Hyderabad	95.09K	91.33K	108.78K	74.32K	68.18K	97.89K	95.35K	105.23K	93.04K	124.65K	102.46K	87.16K
Karimnagar	12.88K	11.50K	12.61K	10.52K	11.61K	15.78K	12.73K	14.41K	12.70K	18.72K	13.53K	11.82K
Mahabubnagar	13.05K	13.23K	13.88K	11.92K	12.76K	16.92K	15.21K	14.32K	10.66K	19.91K	15.28K	12.81K
Medak	7.61K	8.44K	9.07K	6.63K	6.64K	10.07K	7.62K	7.51K	7.16K	9.85K	9.37K	8.73K
Medchal-Malkajgiri	81.71K	79.45K	93.59K	65.74K	57.97K	85.49K	82.34K	88.42K	77.64K	110.62K	89.04K	80.38K

Monthly Sales



Yes, there exists a correlation between vehicle sales and seasonal fluctuations across various districts.

Sales are **typically higher** during the **summer** season as compared to the **monsoon** and **winter** seasons.

Sales during **starting of the year (Jan)** and **ending of the year (Dec)** is comparatively lower than other months.

In general, the month of **October** exhibits a consistent high in vehicle sales, while the months of **April** and **May** consistently demonstrate a low in vehicle sales across various districts.

2. How does the distribution of vehicles vary by vehicle class (MotorCycle, MotorCar, AutoRickshaw, Agriculture) across different districts? Are there any districts with a predominant preference for a specific vehicle class? Consider FY 2022 for analysis.

FY 2022

District	Agriculture	AutoRickshaw	MotorCar	MotorCycle
Adilabad	409	314	1,560	11,691
Bhadradri Kothagudem	1,910	928	3,346	18,645
Hyderabad	32	8,618	52,898	208,465
Jagtial	820	239	2,197	14,978
Jangoan	1,238	273	1,209	9,494
Jayashankar Bhupalpally	1,796	166	1,352	9,633
Jogulamba Gadwal	874	103	937	11,110
Kamareddy	725	261	2,230	16,581
Karimnagar	1,244	801	5,153	20,947
Khammam	2,078	2,433	6,155	28,690
Kumurambheem Asifabad	117	221	543	7,184
Mahabubabad	865	533	1,295	11,951
Mahabubnagar	958	617	3,529	19,739
Mancherial	375	421	2,348	12,142
Medak	1,642	471	2,401	12,893
Medchal-Malkajgiri	304	41	63,529	165,042
Nagarkurnool	1,738	242	2,100	13,622
Nalgonda	2,823	874	5,174	29,940
Nirmal	876	290	1,694	12,573
Nizamabad	1,143	801	6,091	30,456
Peddapalli	674	316	2,319	11,672
Rajanna Sircilla	679	124	1,430	8,967
Rangareddy	441	45	73,532	153,109
Sangareddy	1,506	2,575	14,995	42,257
Siddipet	2,469	436	3,502	18,682
Suryapet	2,255	543	3,188	20,410
Vikarabad	1,951	1,393	5,716	26,074
Wanaparthy	962	257	1,278	9,339
Warangal	684	1,054	3,127	18,884
Yadadri Bhuvanagiri	1,762	487	3,472	15,491

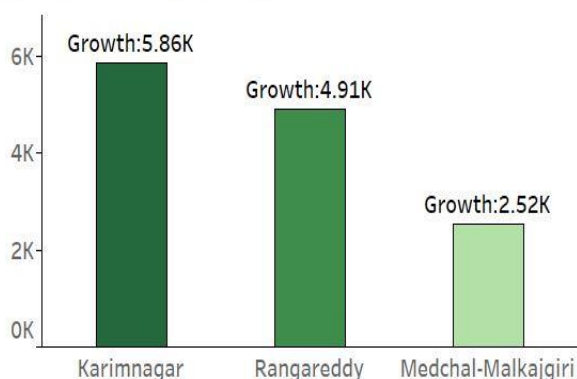
Hyderabad, Medchal-Malkajgiri and Rangareddy have a predominant preference for **MotorCycles** and **MotorCars**.

Hyderabad, Khammam and Sangareddy have a predominant preference for **AutoRickshaws**.

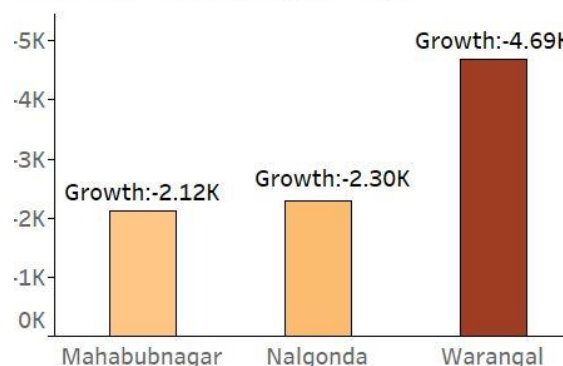
Nalgonda, Khammam, Siddipet and Suryapet have a predominant preference for **Agricultural vehicles**.

3. List down the top 3 and bottom 3 districts that have shown the highest and lowest vehicle sales growth during FY 2022 compared to FY 2021. (Consider and compare categories: Petrol, Diesel and Electric)

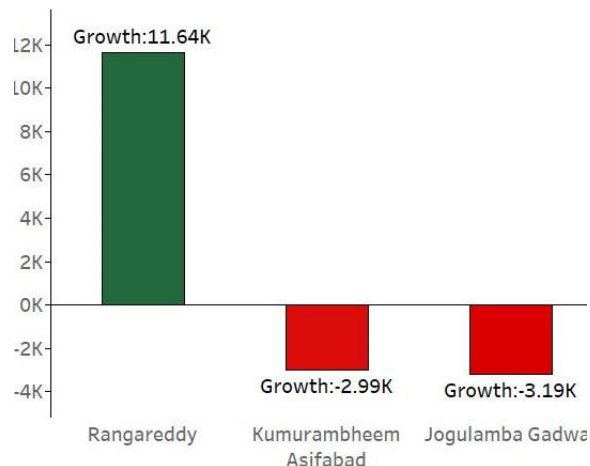
Top 3 Districts(Diesel)



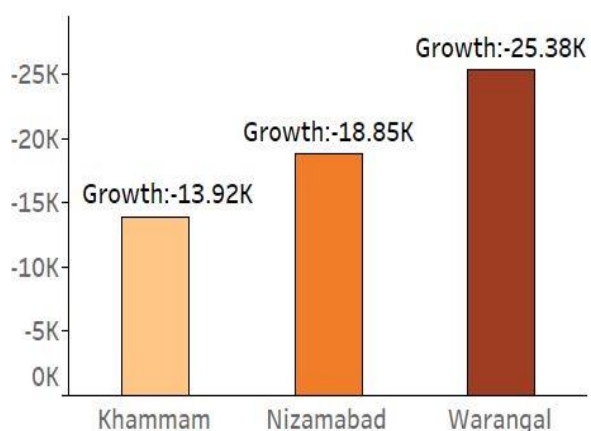
Bottom 3 districts(Diesel)



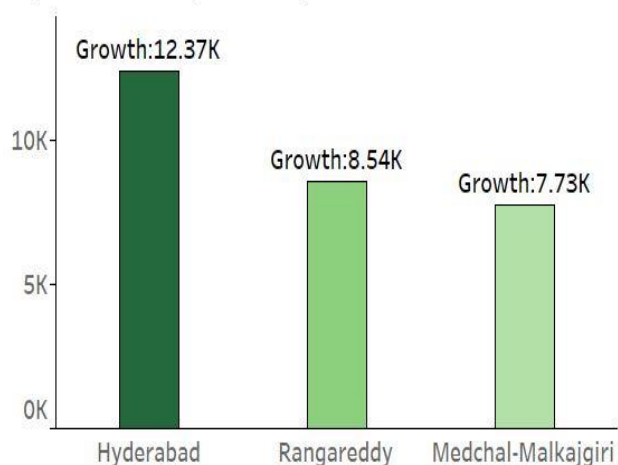
Top 3 Districts(Petrol)



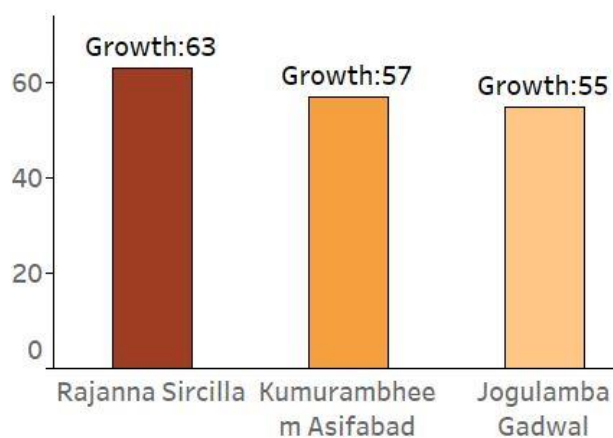
Bottom 3 districts(Petrol)



Top 3 Districts(Electric)



Bottom 3 districts(Electric)

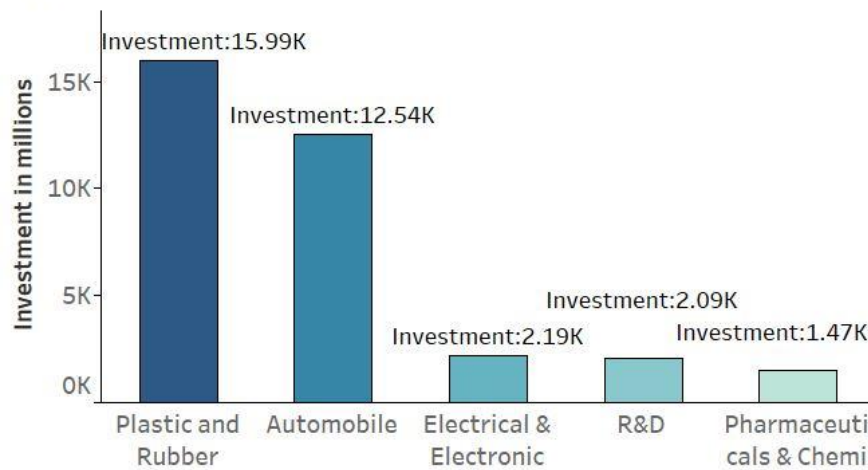


V. TS-iPASS Analysis

Problem statement:

1. List down the top 5 sectors that have witnessed the most significant investments in FY 2022.

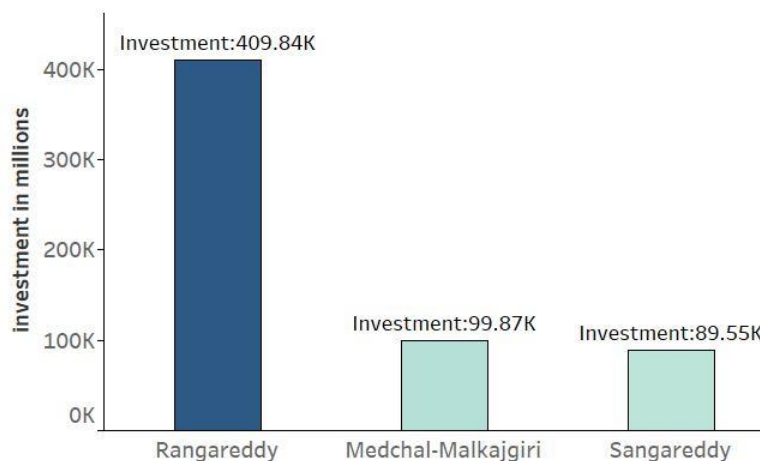
Top 5 Sectors in FY 2022



Plastic and Rubber, Automobile, Electrical & Electronic Products, R&D and Pharmaceuticals & Chemicals sectors witnessed the most significant investments in FY 2022.

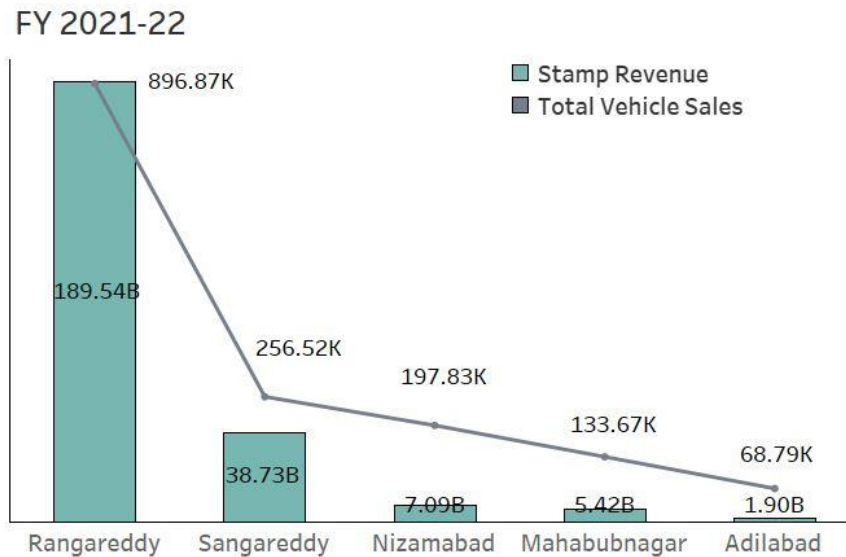
2. List down the top 3 districts that have attracted the most significant sector investments during FY 2019 to 2022?

Top 3 Districts FY 2019-22



Rangareddy, Medchal-Malkajgiri and Sangareddy attracted the most significant investments during FY 2019-22.

3. Is there any relationship between district investments, vehicles sales and stamps revenue within the same district between FY 2021 and 2022?



It appears that a **linear** correlation between **Stamp Revenue** and **Vehicles Sales(by Fuel type and Class)** exists.

Specifically, districts with elevated levels of stamp revenue also exhibit a corresponding increase in total vehicles sales within said district.

Note: This insight might not be true for all districts.

Additional statistical analysis is crucial to accurately quantify and validate this relationship.

Each district possesses distinct economic and demographic characteristics which can influence the relationships between investments, stamp revenue and vehicle sales.

4. Are there any particular sectors that have shown substantial investment in multiple districts between FY 2021 and 2022?

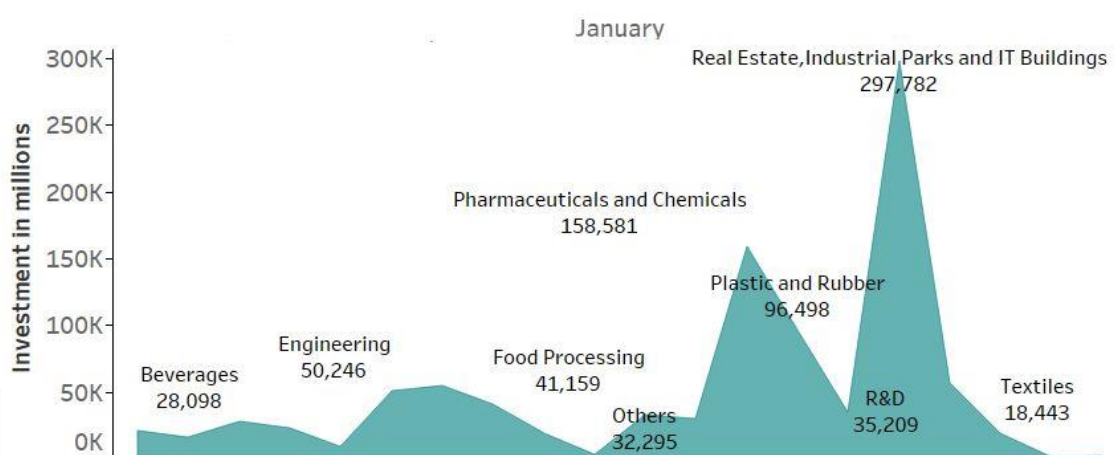
FY 2021-22

	Kamared..	Mahabub..	Medak	Medchal..	Nalgonda	Narayanp..	Rangared..	Sangared..	Siddipet	Suryapet	Wanapar..	Yadadri Bh uvanagiri
Beverages						14.55K		3.26K			3.30K	
Engineering			6.82K	4.50K			9.97K	3.73K				2.06K
Pharmaceuticals and Chemicals	5.86K	2.13K	7.12K	19.37K	8.25K		12.21K	28.08K	4.56K	3.85K		12.66K
Plastic and Rubber				2.27K			42.55K	12.55K				
R&D				14.68K			4.22K	2.17K				
Solar and Other Renewable Energy	3.26K	10.32K	2.28K				2.27K					

Beverages, Engineering, Pharmaceuticals and Chemicals, Plastic and Rubber, R&D and Solar and other Renewable Energy sectors have invested \geq 2000 Millions in multiple districts between FY 2021 and 2022.

5. Can we identify any seasonal patterns or cyclicity in the investment trends for specific sectors? Do certain sectors experience higher investments during particular months?

It is not quite possible to identify seasonal patterns in the investment trends because we have investment data only for the month of **January**.



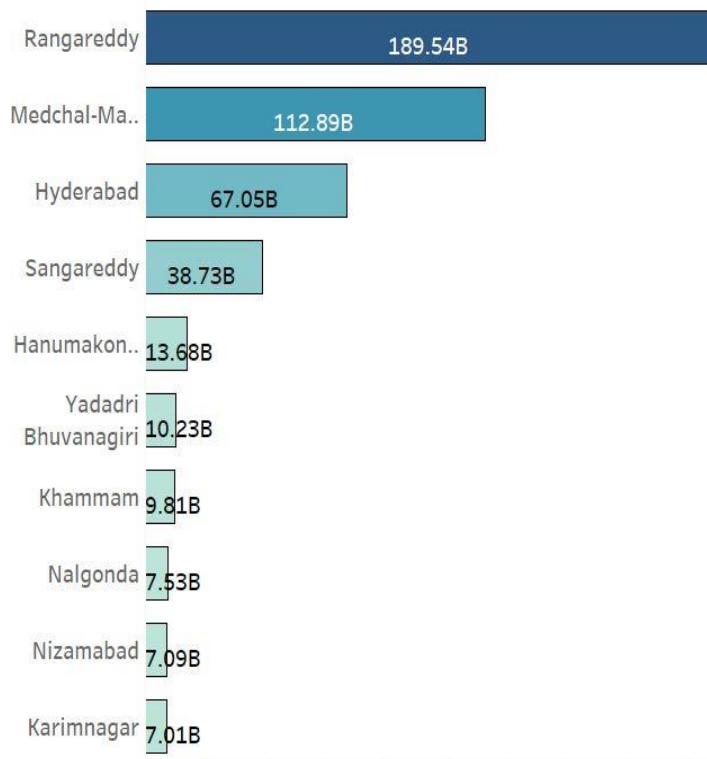
But if we consider only January month, it is evident that certain sectors, namely **Real Estate, Industrial Parks and IT buildings, Pharmaceuticals and Chemicals, and Plastic and Rubber industries,** have witnessed a substantial influx of investments.

VI. Secondary Research

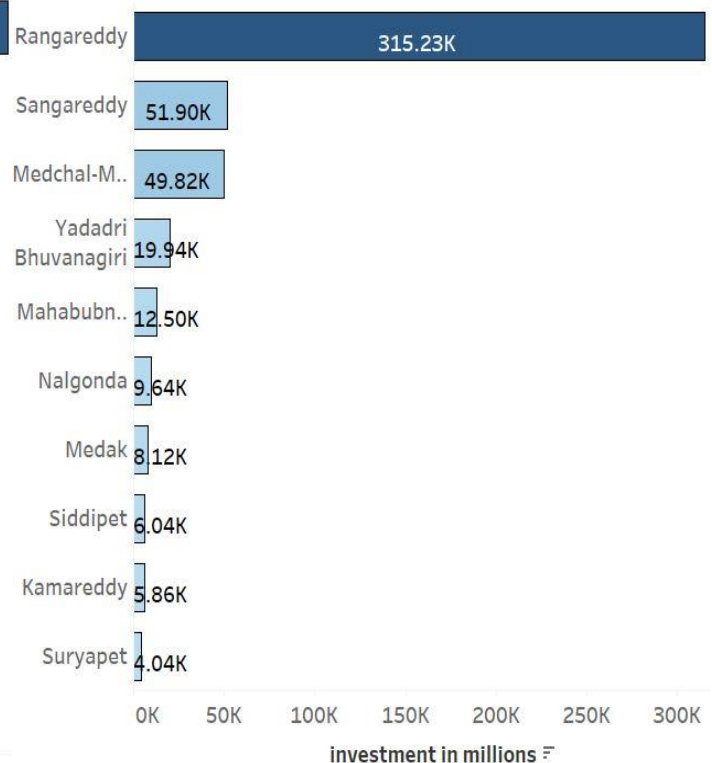
Problem statement:

1. What are the top 5 districts to buy commercial properties in Telangana? Justify your answer.

Top 10 districts by Stamp Revenue



Top 10 districts by Sector Investment



S.No. ⬆	District ⬆	GDP 2018-19 ⬆	GDP 2019-20 ⬆	GDP 2020-21 ▼
27	Ranga Reddy	1,71,136	1,83,299	1,98,997
26	Hyderabad	1,61,759	1,66,039	1,62,564
25	Medhcal-Malkajgiri	61,768	67,559	62,506
12	Sangareddy	41,285	46,438	45,626
23	Nalgonda	29,891	37,269	38,927

A significant amount of revenue generated from **stamp duty** is indicative of **increased economic activity** and **heightened property transactions**.

Similarly, a **robust GDP** is a crucial factor in ensuring a **superior quality of life** and **enhanced access to resources**.

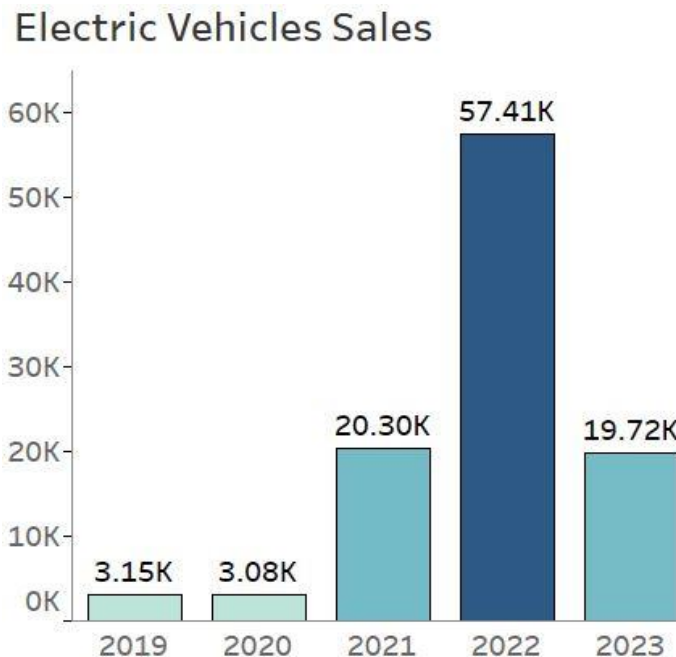
Investment from **Automobile,Electrical and Electronic Products,Industrial Parks and IT buildings,Pharmaceuticals and Chemicals,Real Estate** sectors is also an important factor to consider while purchasing commercial properties.

Considering these 3 factors,the top 5 districts to buy commercial properties in Telangana are:

- **Rangareddy**
- **Hyderabad**
- **Medchal-Malkajgiri**
- **Sangareddy**
- **Nalgonda**

2. What significant policies or initiatives were put into effect to enhance economic growth, investments, and employment in Telangana by the current government? Can we quantify the impact of these policies using available data?

- **Telangana Electric Vehicle & Energy Storage Policy 2020-2030:** The Telangana Electric Vehicles and Energy Storage Policy 2020-2030 was announced by the State IT and Industries Minister KT Rama Rao to encourage electric vehicles use by providing exemption of road tax, registration fee and retro-fitment incentive.

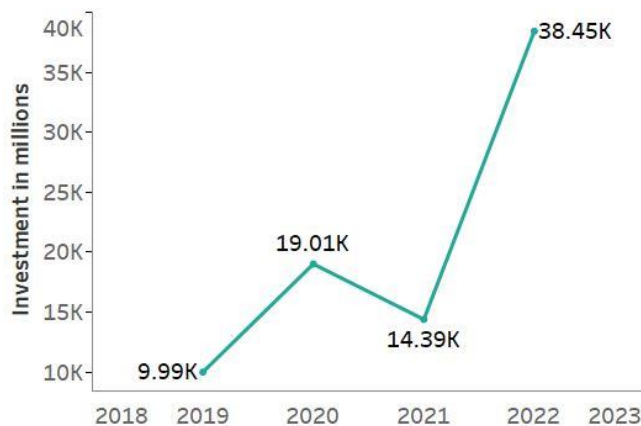


In the years following the enactment of this policy, i.e., in 2020, the sales of electric vehicles have **risen** significantly.

The surge in sales of electric vehicles in Telangana ensures heightened investment from the **automobile** sector.

This will consequently lead to a rise in employment prospects within the industry.

- **TSIIC:** Telangana State Industrial Infrastructure Corporation also known as (TSIIC) is a Government of Telangana initiative for providing infrastructure through the development of industrial areas in the state of Telangana. TSIIC was established in 2014.
- **TS-iPASS:** The Telangana State Industrial Project Approval and Self-Certification System (TS-iPASS) Act, 2014 was enacted for speedy processing of applications for issue of various clearances required for setting up of industries and also to create investor friendly environment in the State of Telangana.



State	Score(%)	2016 Rank	2015 Rank
Telangana	98.78	1	13
AP	98.78	1	2
Gujarat	98.21	3	1
Chattisgarh	97.32	4	4
Madhya Pradesh	97.1	5	5

Since 2019, a predominantly ascending trajectory can be observed in the investment made by diverse sectors in Telangana.

The Covid-19 pandemic may have had an impact on the numbers for the period of 2020-21; however, the subsequent recuperation has been substantial.

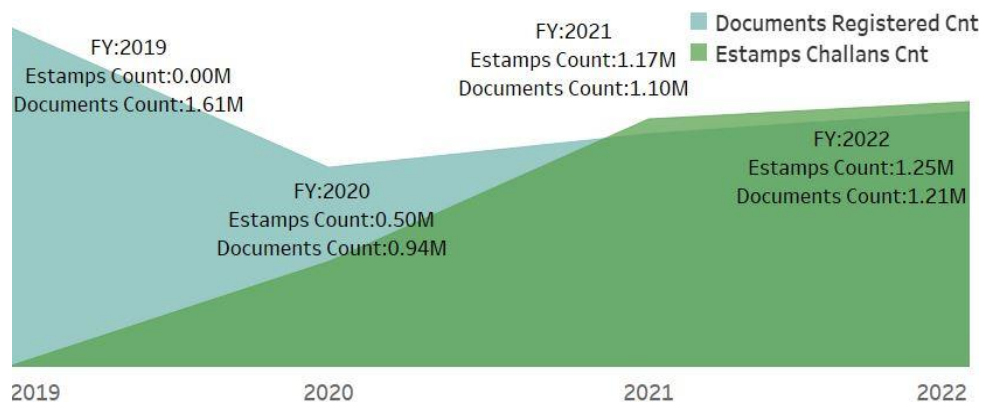
The TSIIC initiative can be duly attributed to the **enhancement of the infrastructure of Telangana**, thereby resulting in substantial investments from diverse industrial sectors.

The TS-iPASS policy has been instrumental in elevating Telangana's ranking in the **Ease of Doing Business** index. This policy has facilitated the establishment of industries, thereby attracting greater investments from diverse industrial sectors.

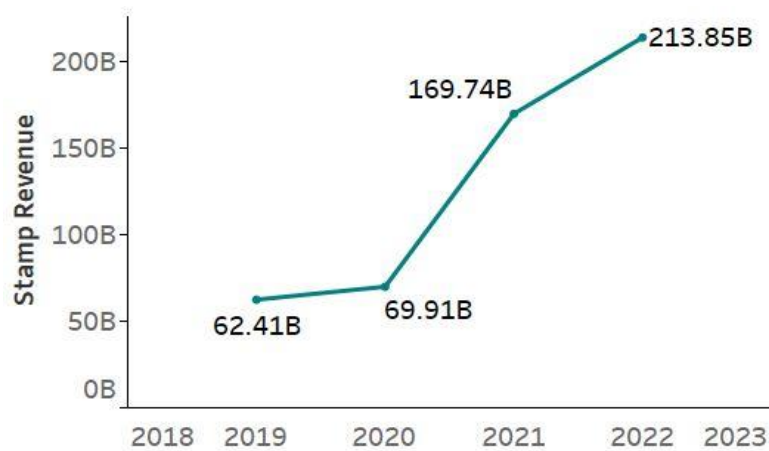
Both of these policies have had a **significant impact** on the **unemployment rates** in Telangana, as **increased** investments have resulted in the **creation of more job opportunities**, hence contributing to economic growth and prosperity.

3. Provide top 5 Insights & 5 recommendations to Telangana government for sustained growth in the next 5 years based on your analysis.

Insights:

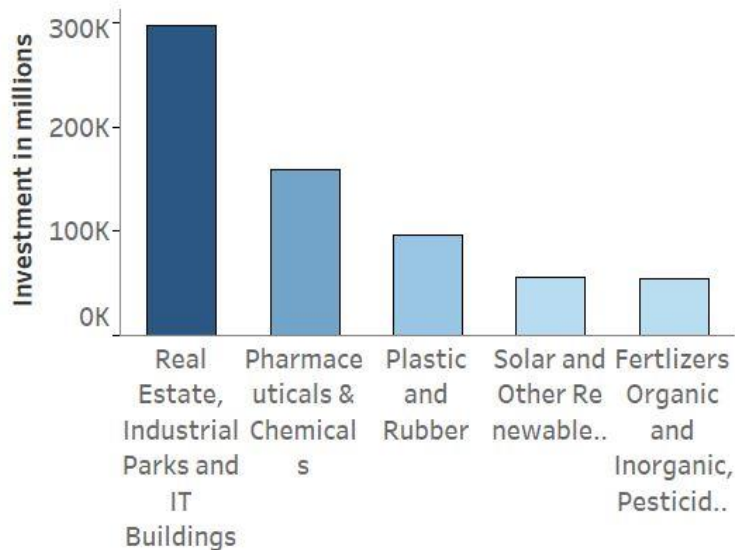


- The adoption of E-Stamps challans experienced a notable surge in 2020, but has since plateaued in 2021, likely due to market saturation and user resistance stemming from technological unfamiliarity and inconvenience.



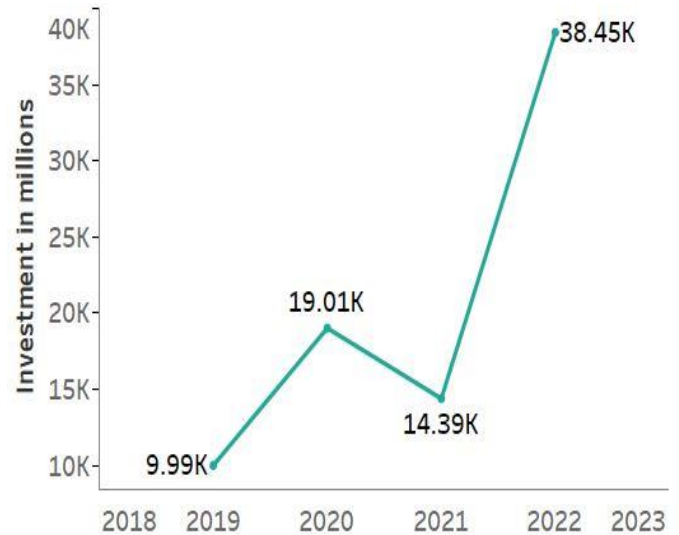
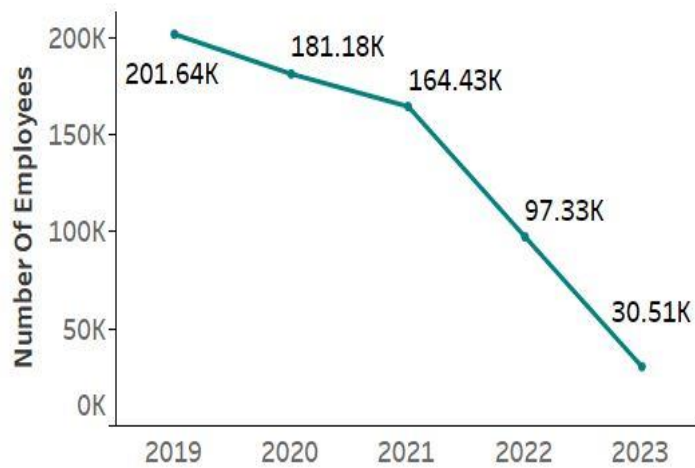
- There has been a discernible upward trajectory in Stamp Duty revenue since 2019, which can be attributed to a surge in property transactions and a thriving real estate market.

Top 5 Sectors

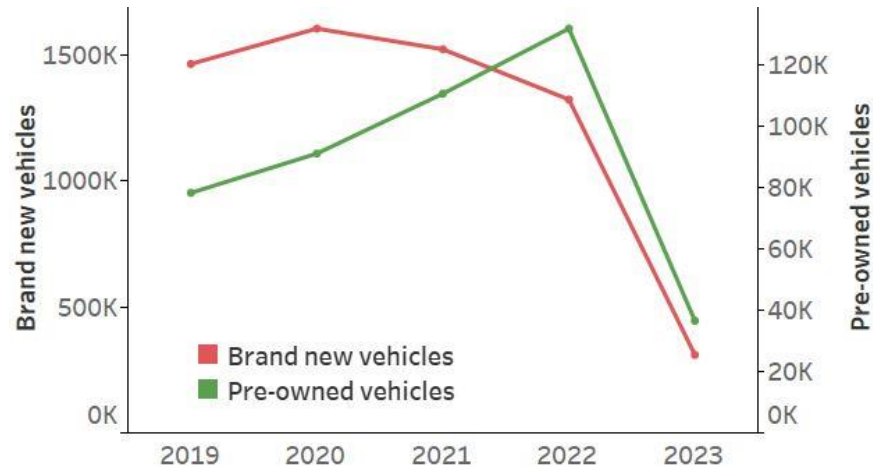


- These sectors which have made significant investments in Telangana can be attributed to the favorable business environment created by TS-iPASS and the incentives offered to these sectors under the Industrial Policies.

Employment 2019-2023



- Despite the upward trend in investments since 2019, the employment trajectory has consistently declined, possibly due to businesses adopting automation and technology to reduce labor costs. As industries advance technologically, there may be a shortage of skilled workers to operate and maintain these systems.



- The demand for new vehicles has decreased while the demand for used vehicles has increased since 2019 (excluding incomplete 2023 data). This trend may be due to rising vehicle prices, making used vehicles more affordable. Additionally, limited government financing and leasing programs may contribute to this.

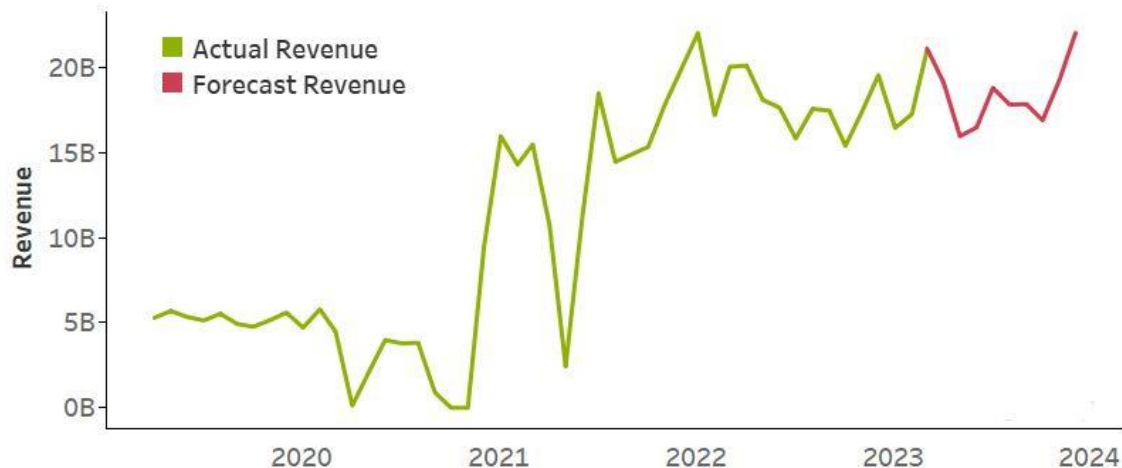
Recommendations:

- ✓ Establish dedicated helplines staffed with trained operators capable of providing guidance to individuals navigating the e-stamp online fee payment process via telephone, in order to surmount the growth plateau.
- ✓ Consider investing in affordable housing projects with a portion of increased stamp duty revenue.
Also, consider implementing progressive stamp duty rates that increase with property values. This generates higher revenue from luxury transactions while keeping the tax burden lower for lower-income buyers.
- ✓ Formulate a comprehensive infrastructure development plan to capitalize on the substantial investments made by various sectors. Refine inducements offered to industries to maximize investment returns with minimal incentives.
- ✓ Allocate resources towards training and reskilling initiatives to facilitate the transition of displaced workers, caused by skill mismatch, into growing industries. Implement social welfare policies to aid local communities affected by this displacement.
- ✓ Offering incentives for electric or hybrid vehicles can influence new vehicle preferences.
Introduce financing and leasing programs for new vehicles.
Unattractive financing terms may prompt consumers to explore used vehicles.

Additional Research

Predicting the Stamp Duty Revenue for the remainder of FY 2023.

Revenue Prediction FY 2023



Model: Exponential Smoothing

The prediction was generated utilizing the **Forecast Formula** within Excel, while the model employed was that of **Exponential Smoothing**. Exponential Smoothing is a very important model while dealing with **Time Series data**.

- Based on our predictive model, it is anticipated that there will be a **significant decline** in Stamp Duty Revenue during the second quarter.
- The Telangana Government has the opportunity to leverage such predictions to inform policy adjustments and allocate resources in a strategic manner.