# Crime Data Analysis Report Tamil Nadu (2014- Present)

## 1. Introduction

Understanding crime patterns over time is fundamental to evidence-based policing and public-safety policy. Tamil Nadu, one of India's most urbanised states, exhibits a dynamic mix of traditional offences (property, violent) and emerging digital threats (cyber-crime). This report dissects nine years of official crime data to uncover trends, diagnose underlying drivers, and recommend practical interventions.

## 2. Objectives & Scope

The study was commissioned by Albaatros with four primary objectives:

- Quantify and visualise longitudinal crime trends from 2014 through 2022.
- Identify shifts in crime composition and growth hot-spots.
- Correlate categories to detect co-moving offence clusters.
- Translate findings into actionable safety measures for state and district authorities.

## 3. Data Source & Preparation

Data originate from the consolidated "Crime report.xlsx" workbook supplied by the hiring team. Sheet 2 contains 56 specific IPC/SLL offence rows mapped to seven aggregated categories and nine yearly columns (2014-2022). Key preparation steps included:

- Forward-filling missing 'Category' labels.
- Converting year columns to integers and ensuring numeric types.
- Aggregating specific offences to build category-level matrices for multi-year analysis.

No outlier suppression or scaling was applied; counts reflect officially recorded FIRs.

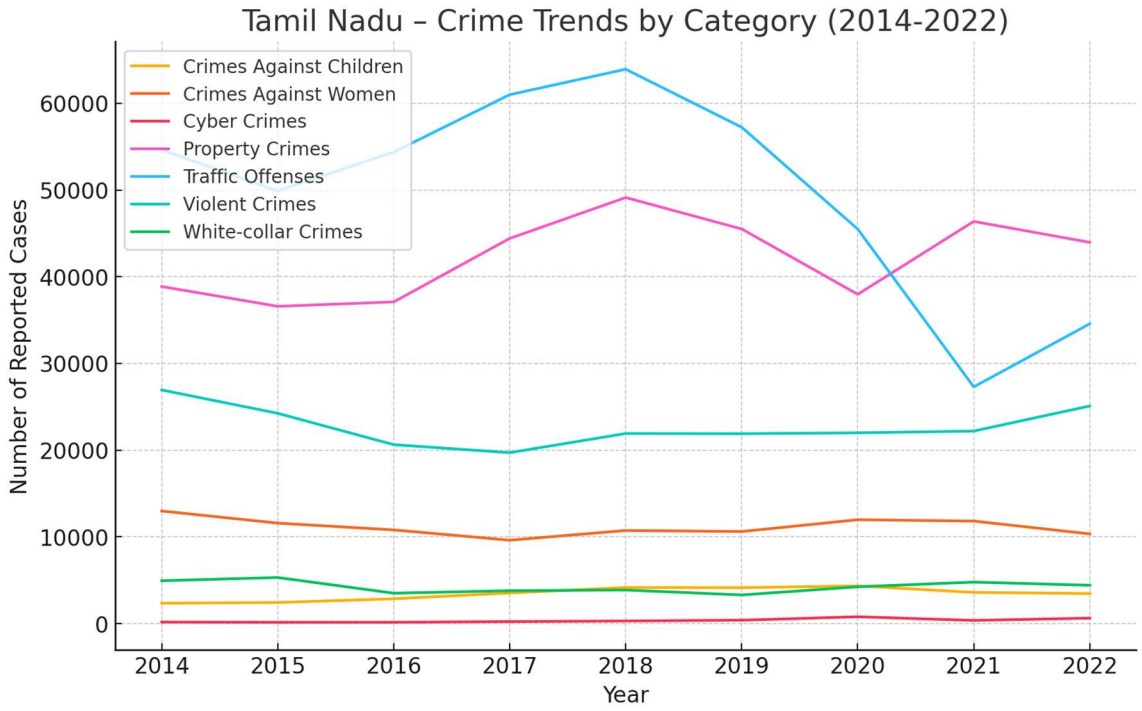
### 3.1 Data Preview

| Specific Crime Type | Category | 2014 | 2022 |
|---|---|---|---|
| Murder | Violent Crimes | 103 | 1676 |
| Rape | Violent Crimes | 923 | 1375 |
| Assault / Grievous Hurt | Violent Crimes | 12440 | 9492 |
| Total Violent Crimes | Violent Crimes | 13466 | 12543 |
| Murder for Gain | Property Crimes | 127 | 57 |
| Dacoity | Property Crimes | 101 | 86 |

## 4. Exploratory Analysis & Key Patterns

A battery of statistical charts was produced to surface both macro-level and micro-level insights. Each subsection summarises the transformation pipeline, the insight, and its operational implication.

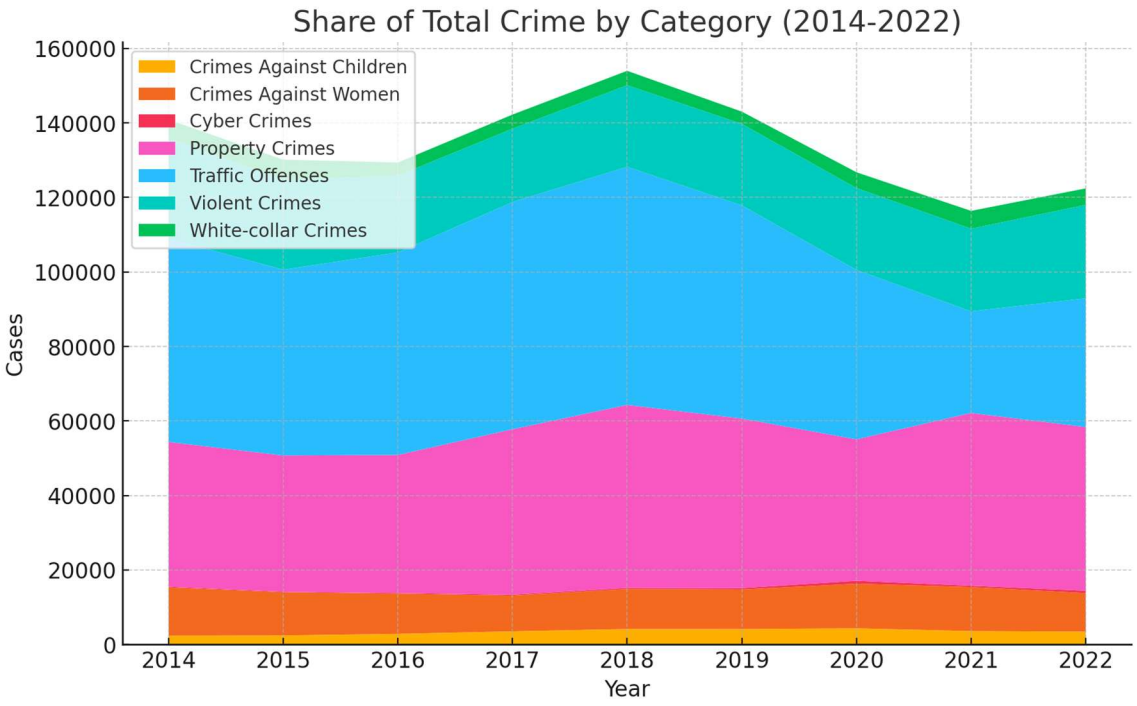
## 4.1 Multi-Line Trend (Category Totals)




**Input:** Category-year matrix (7×9). Transformation: summed counts plotted yearly per category.

**Insight:** Cyber and Property crimes rise sharply till 2018; COVID restrictions cause 2020-21 troughs, followed by partial 2022 rebound. Violent crime remains broadly flat, signalling policing stability in that domain.

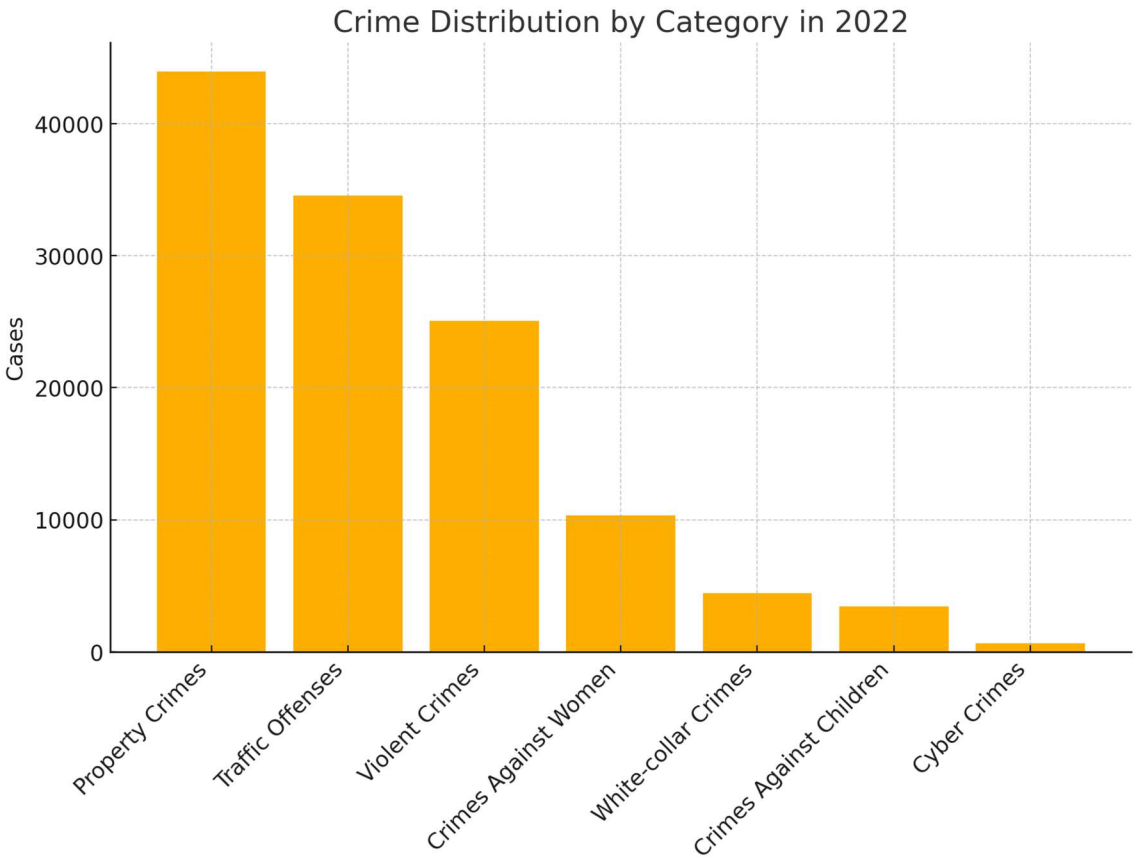
## 4.2 Stacked-Area Composition




**Input:** same matrix. Transformation: cumulative stackplot to visualise proportional share.

**Insight:** Digital and child-related crimes steadily claim a larger slice of the crime pie, while traffic violations' share contracts post-pandemic.

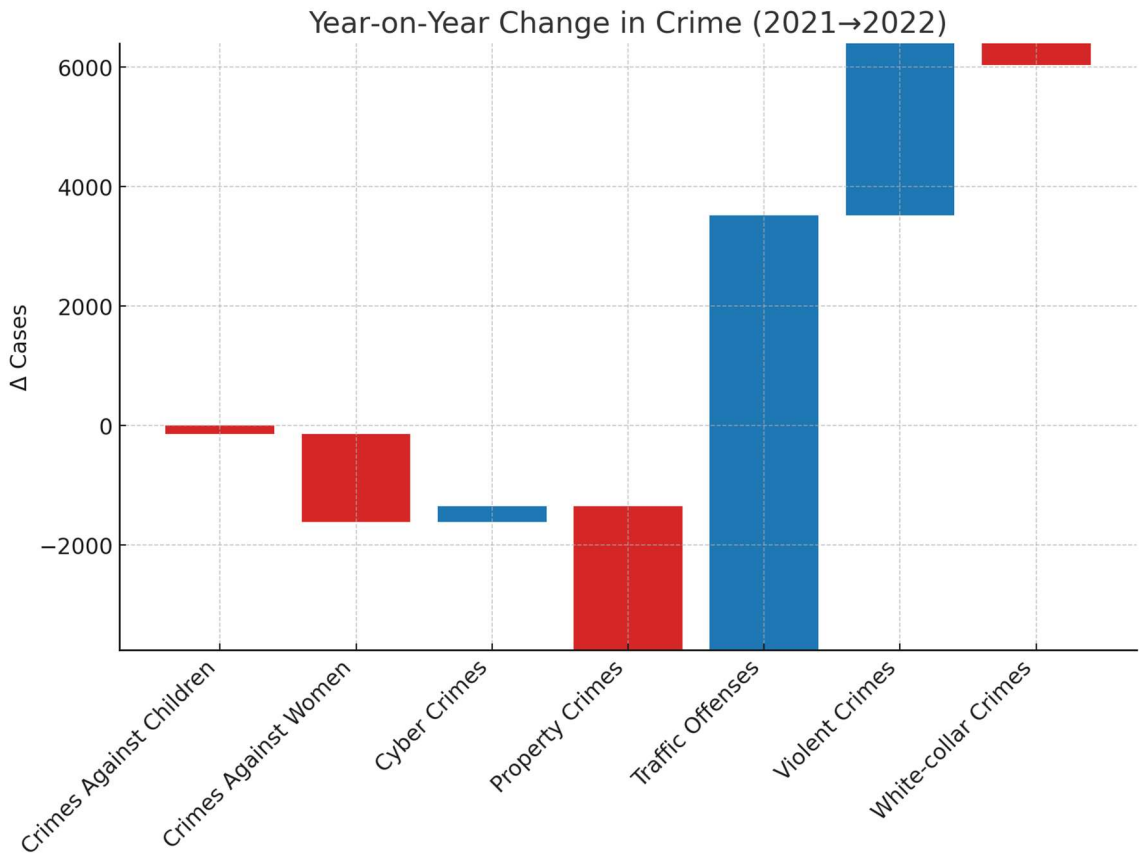
## 4.3 Bar Chart – 2022 Crime Mix




**Input:** 2022 single-year slice. Transformation: vertical bar ranking categories.

**Insight:** Property and Traffic offences constitute >65 % of all recorded cases, defining frontline workload.

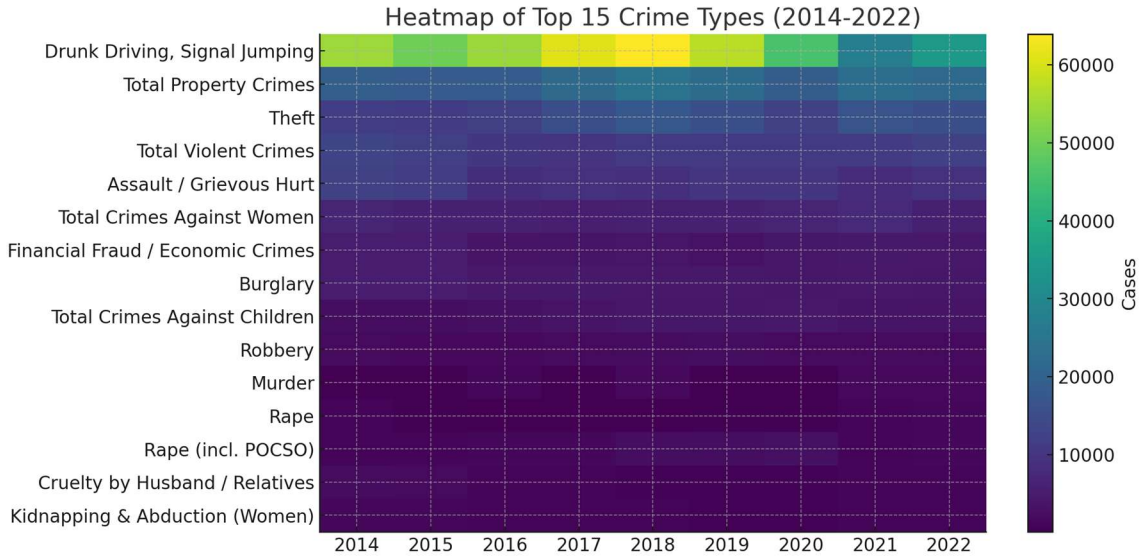
## 4.4 Waterfall – Year-on-Year Delta (2021→2022)




**Input:** Delta vector of 2022 minus 2021 counts. Transformation: sequential waterfall visual.

**Insight:** Traffic offences (+14 k) and Violent crimes (+6 k) account for the bulk of the net statewide increase, pinpointing urgent areas for resource infusion.

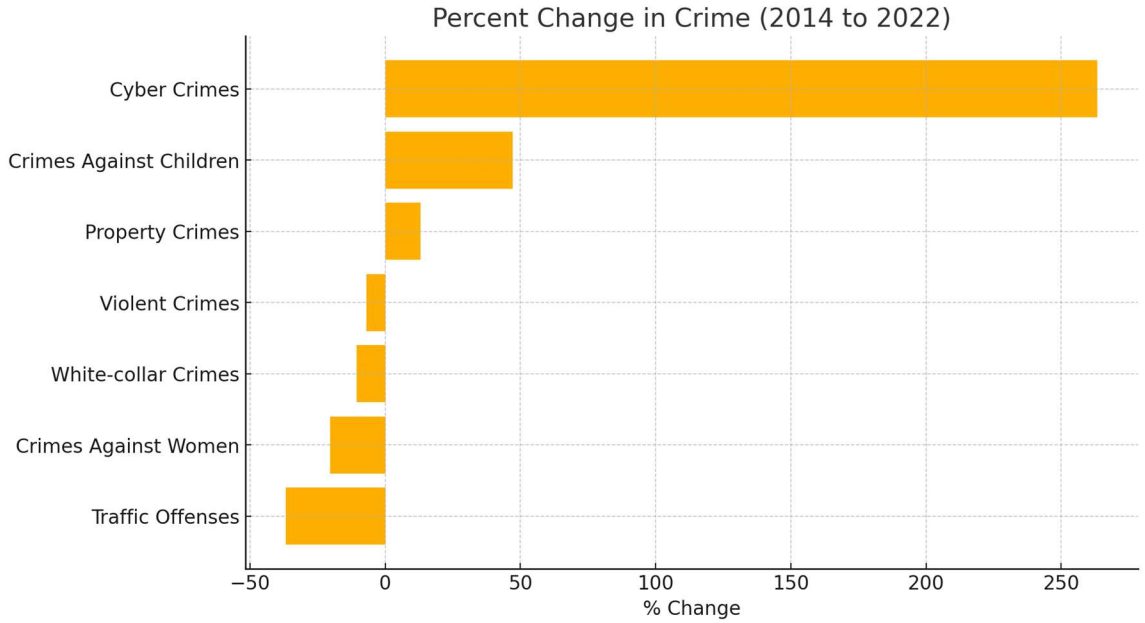
## 4.5 Heatmap – Top 15 Specific Offences




**Input:** top-15 offences by 2022 volume. Transformation: 15×9 matrix mapped to colour scale.

**Insight:** Drunk Driving dominates throughout; Assault & Theft persistently high; Economic Fraud intensifies 2020-22, underscoring new financial-crime vectors.

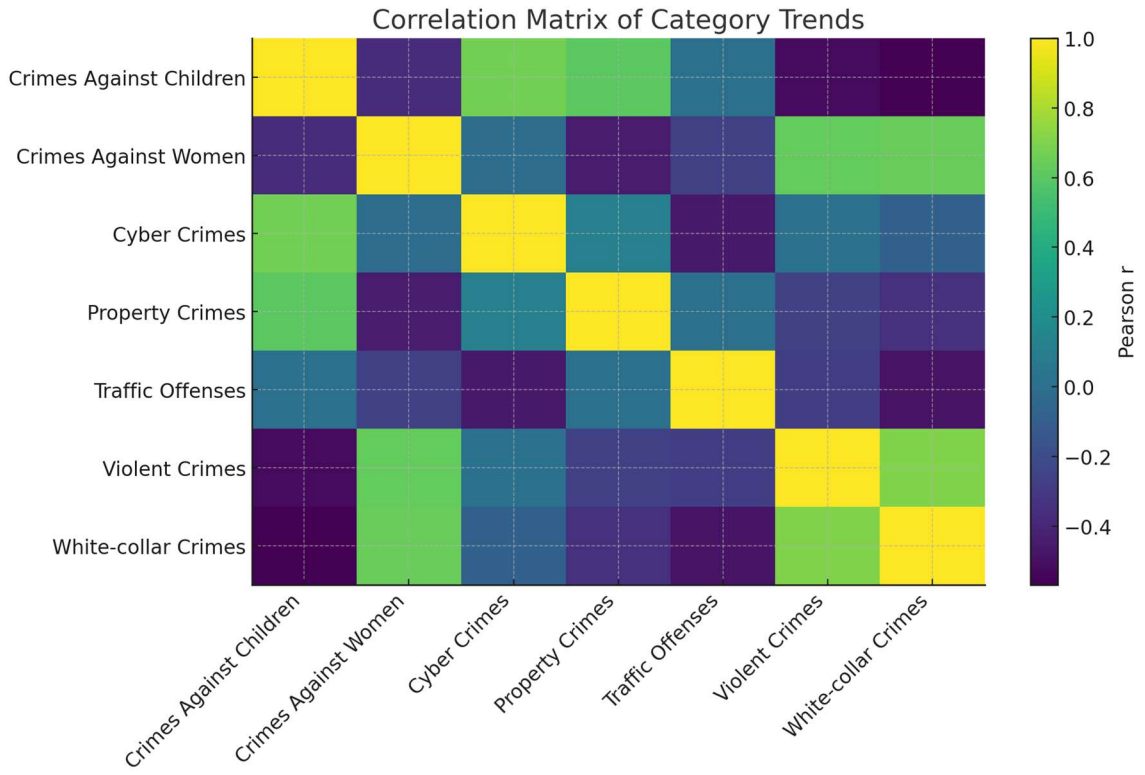
## 4.6 Percent Change 2014 to 2022



**Input:** base-year 2014 vs. 2022 counts. Transformation: horizontal bar of % change.

**Insight:** Cyber crime skyrockets (+263 %), Traffic drops (−37 %), validating divergent enforcement success and new threat growth.

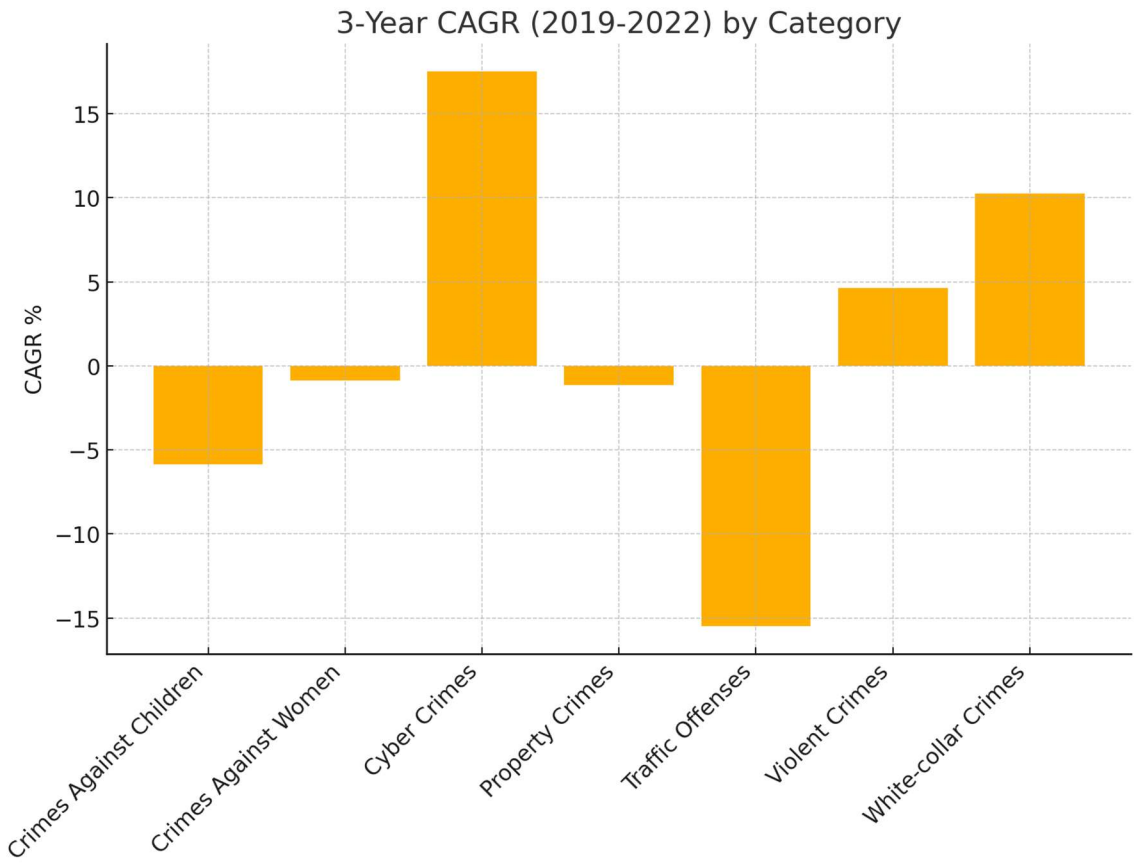
## 4.7 Correlation Matrix




**Input:** Pearson correlations of category trends. Transformation: 7×7 heatmap.

**Insight:** Violent & White-collar crimes correlate (r≈0.66) hinting at socio-economic stress overlap; Cyber vs. Traffic mildly inverse (r≈-0.35), likely influenced by movement restrictions.

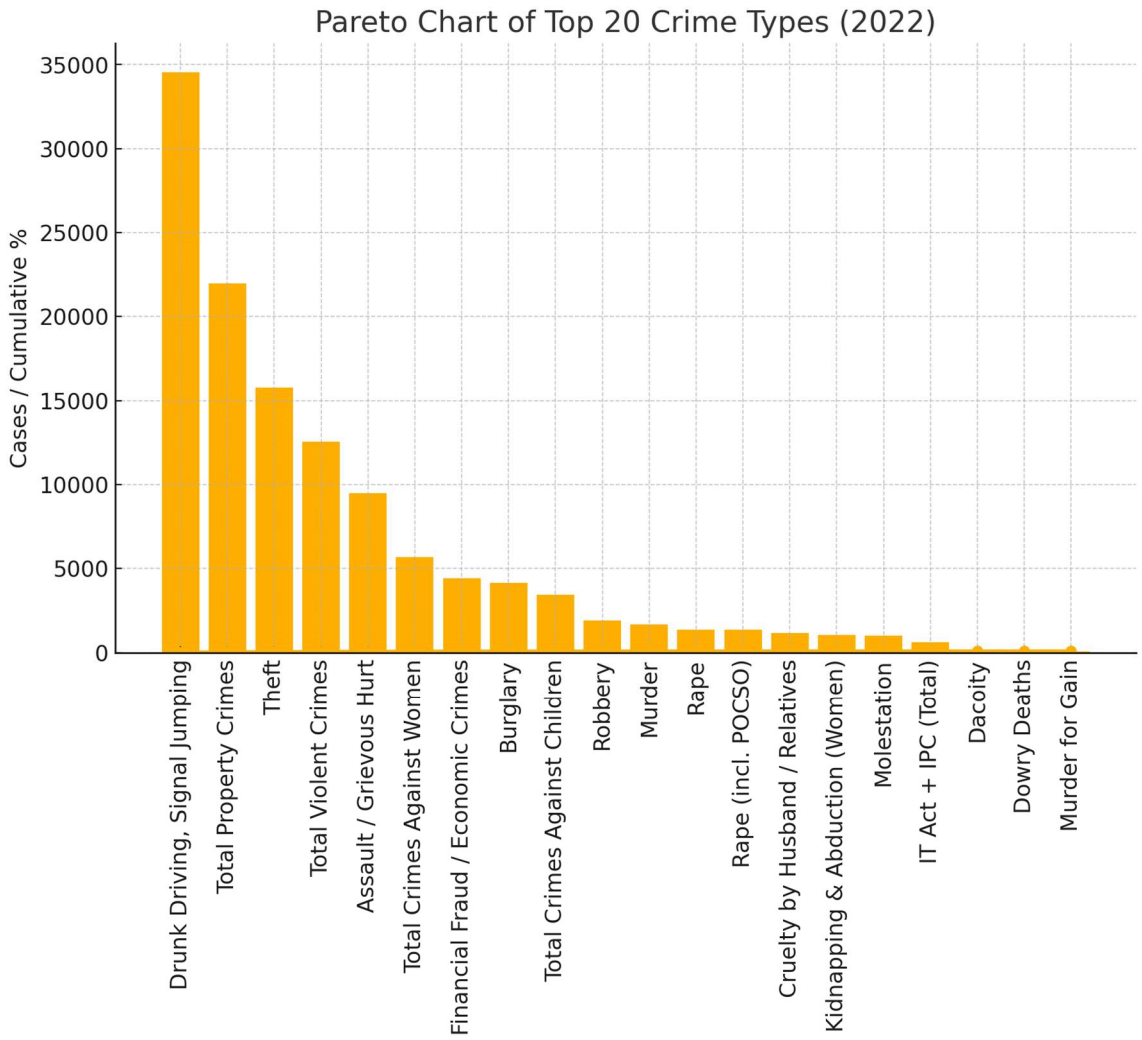
## 4.8 3-Year CAGR (2019-22)




**Input:** 2019 and 2022 counts. Transformation: compound annual growth computation.

**Insight:** Cyber crime exhibits +17 % CAGR, fastest among all categories, signalling sustained momentum even post-lockdown.

## 4.9 Pareto Chart – Top 20 Offences 2022




**Input:** 2022 offence counts sorted. Transformation: bar + cumulative percentage line.

**Insight:** First three offences comprise >50 % of total volume, suggesting concentrated enforcement could yield outsized impact.

## 5. Insights & Discussion

The analytical suite converges on three narrative arcs:

- **Digital Surge:** Cyber-crime and economic fraud are exponential, demanding specialised cyber forensics and public literacy campaigns.
- **Pandemic Distortion:** 2020-21 saw artificial dips in mobility-linked crimes; 2022 rebound proves suppressed, not solved, problems.
- **Concentrated Offences:** A minority of offence types—chiefly traffic violations, petty theft, and assault—consume the majority of policing effort.

## 6. Recommendations & Safety Measures

### 6.1 Cyber-crime Mitigation

- Establish district-level cyber desks with trained digital volunteers.
- Run quarterly phishing-awareness drives for SMEs and college campuses.

### 6.2 Traffic Offence Control

- Expand AI-enabled speed cameras to tier-2 highways.
- Implement ‘No Helmet, No Fuel’ statewide.
- Integrate e-challan collection with vehicle-fitness renewals.

### 6.3 Property & Violent Crime

- Hotspot policing informed by theft density heat-maps.
- Community mediation centres to pre-empt assault escalations.
- Subsidised CCTV schemes for small businesses.

### 6.4 Children & Women Safety

- Deploy school cyber-tipline interface.
- Strengthen One-Stop Crisis Centres co-located with district hospitals.

## 7. Conclusion

Tamil Nadu's crime landscape is at an inflection point. Traditional offences remain substantial, but digital and economic crimes are the fastest-growing threats. Data-driven resource allocation—prioritising cyber capacity, traffic enforcement tech, and targeted property-crime patrols—can yield the greatest marginal safety return. Continuous year-on-year monitoring is recommended to evaluate the effectiveness of proposed interventions.