An Operational Analysis of County Lines and Serious Organised Crime Data From the Police National Database Using i2 Analyst's Notebook

Stuart Jones
National County Lines Coordination Centre, East Midlands Special Operations Unit, United Kingdom

Seth Cooke*
i2 Group, United Kingdom

Abstract

The Police National Database (PND) is an invaluable National source of cross-border intelligence, yet its data has historically been underexploited for core tasks of network and criminal business analysis. This operational analysis by the National County Lines Coordination Centre explores the investigative scale, depth, results and efficiency benefits of importing and analysing PND data in i2 Analyst's Notebook (ANB). PND exports of East Midlands, West Midlands and Police Scotland data were imported, merged and deconflicted. The resulting analysis produced several findings using existing data that, while adequately recorded, had not previously been understood in a Regional and National context. These results included identifying vulnerable children and adults, the criminal business model responsible for exploiting them, and the best opportunities for intervention and disruption – as well as identifying previously unknown links between Organised Crime Groups (OCG) and County Lines, improving Police understanding of their criminality and exploitation. The analysis highlights the investigative opportunities afforded when the value of existing intelligence is maximized using appropriate tools and tradecraft. The i2 tools and tradecraft for PND described herein have been recommended as best practice to all Analysts in the National County Lines Coordination Centre Network.

Keywords: County lines, National county lines Co-ordination centre, Police national database, PND, Analyst's notebook, i2

Introduction

The National County Lines Coordination Centre (NCLCC) is the Home Office funded National Police Chief's Council response to County Lines, set up to

---

*Corresponding author: e-mail: Seth.Cooke@i2group.com

share intelligence with all forces to direct disruption activity and safeguarding opportunities. i2 is utilised by the NCLCC to format, analyse and interpret large Serious & Organised Crime (SOC) data sets extracted from the PND.

PND is a national information management system that improves the ability of the Police Service to manage and share intelligence and other operational information, to prevent and detect crime and make communities safer. PND offers a capability for the Police Service to share, access and search local information electronically, overcoming artificial geographical and jurisdictional boundaries (National Policing Improvement Agency, 2010).

PND was set up following the Bichard Inquiry (2004) into the Soham murders where failures in police intelligence gathering and sharing were identified. The system has since become a single national repository for SOC – including uplifted capability for direct entry and export of data relating to Organised Crime Group (OCG) Mapping, County Lines and Modern Slavery and Human Trafficking (MSHT) investigations. Whilst not all Police data is held on PND, it remains the largest single national repository of UK Police intelligence.

In November 2018, the Director General of the National Crime Agency exercised their formal tasking powers, pursuant to Section 5 Crime and Courts Act 2013, in respect of County Lines drugs supply with specific focus on the following areas (National Crime Agency, 2018):

- Generation of intelligence against the County Lines threats including drug supply, serious violence and vulnerability (including MSHT and CSAE);
- Submission of intelligence through compliance with the requirement to complete the County Lines Intelligence Collection Matrix (CLICM); CLICM has migrated to PND from a spreadsheet;
- Delivery of a reactive prioritised response to intelligence packages received from National County Lines Coordination Centre NCLCC. Identification of high-risk criminal gangs, drugs supply lines and vulnerable adults and children subject to exploitation;
- Co-operation at Force and ROCU level to these prioritised intelligence packages, which will be linked to criminality in multiple force areas. This will be delivered through existing tasking mechanisms and supported by the NCLCC.

Use of Section 5 powers continued until 2021 to design and mandate the tasking infrastructure, which has since continued through custom and practice.

Production of these intelligence packages is facilitated through the use of i2 ANB. i2 was founded in 1990 to address the requirement for a software platform that can support Visual Investigative Analysis, Link Analysis and Telephone Toll Analysis (Morris, 1986). While i2's ANB application is commonly associated with techniques such as network analysis, criminal business analysis and communications analysis (College of Policing, 2024), it

also affords graph, temporal, pattern and geospatial analysis capabilities. Due to its flexibility, open architecture, and near-ubiquitous adoption by UK Law Enforcement, National Security and Defence agencies, ANB is well-associated with evidence-based research – with examples including analyses of co-offender relationships (Frydensberg, Ariel, & Bland, 2019), child sex trafficking (Cockbain, Brayley, & Laycock, 2011), and naval war gaming (Ducharme & Brightman, 2010).

This analysis uses i2 ANB to exploit the aforementioned PND capability uplift for OCG, MSHT and County Lines data. Whilst PND does contain some network diagram functionality, this is designed to accelerate light research tasks. ANB provides specialised capability for data fusion and analysis, and as such was deemed to be a more appropriate tool for analysis at this scale.

Method

Several Excel export templates were built during the project to migrate all County Lines and MSHT data onto PND, allowing for the monthly extraction of SOC intelligence in bulk. Whilst extremely valuable, the exports contain 895 fields of data split across 25 spreadsheets, making the data difficult to interpret.

The exports were modelled and imported into i2 ANB using Import Specifications that can be shared and re-used by anyone authorized to work with PND data. Consistent unique identifiers were used to automatically merge common entities, showing their relationships to various Serious and Organised Crime (SOC) entities. Once imported, the application affords further automated and manual capabilities for deconfliction. Deconfliction is essential; for the East Midlands export, this process automated the reduction of 13,156 entities and 12,653 relationships to 9,923 and 8,957 respectively.

Adopting the 5Vs model for meeting the challenges of data processing – velocity, volume, value, variety and veracity/validity – ANB restructures the variety of data in PND into an aligned graph structure, enriching its validity by rationalising duplicates. The analytical affordances of the application are thus capable of extracting value from volumes of data that would otherwise be difficult or impossible for a law enforcement professional to assess, at a velocity that significantly exceeds that of transactional manual research. ANB's domain-agnostic functions such as Social Network Analysis, List Most Connected and Find Clusters afford commonly required graph analysis and community detection capabilities. These were used to identify relevant entities and relationships. The software affords manual arrangement and style functions, allowing Analysts to disseminate containing consumable charts.

As i2 is already available to all Territorial Forces, Regional and National Units via the Access for All Agreement, these specifications have been shared across the NCLCC network, allowing this process to be replicated and scaled nationally. At present the three PND exports for OCG, MSHT and County

Lines are the only available means of exporting bulk intelligence from PND, constraining the use of this methodology for other crime and vulnerability thematics. For example, applying this method to Counter Terrorism, including Extreme Right-Wing, would require recording and reporting review and uplift through the creation of bespoke exports.

Results

Figure 1 depicts an overview of the SOC network for the East Midlands Region in October 2021. The chart contains 9,923 entities 8,957 links extracted from PND. The large network at the top left demonstrates a high degree of interconnectivity in Serious & Organised Crime, with intelligence links between OCGs, County Lines, MSHT investigations and people. Utilising ANB, the data was cleaned and structured to identify criminal networks, business models, and instances whereby OCGs have control of street-level criminality such as the exploitation of vulnerable children for County Lines drug supply. As a manual process, creating this chart would take days. Utilising the pre-built import specifications, it can be replicated in c.20 minutes.

i2 network analysis of intelligence held within PND reveals the extent of the interconnectivity amongst County Lines and OCGs by virtue of shared membership. Charting Active OCGs with current members linked to Active County Lines within the East Midlands (October 2021) identified 19 OCGs controlling 33 County Lines. Furthermore, the analysis identified that these lines were linked to the potential exploitation of 56 juveniles and vulnerable adults. In some cases, the exploitation and County Lines criminality was not initially identified within the OCG's mapping assessments. Visual analysis of the intelligence in ANB therefore highlighted threat, risk and harm and
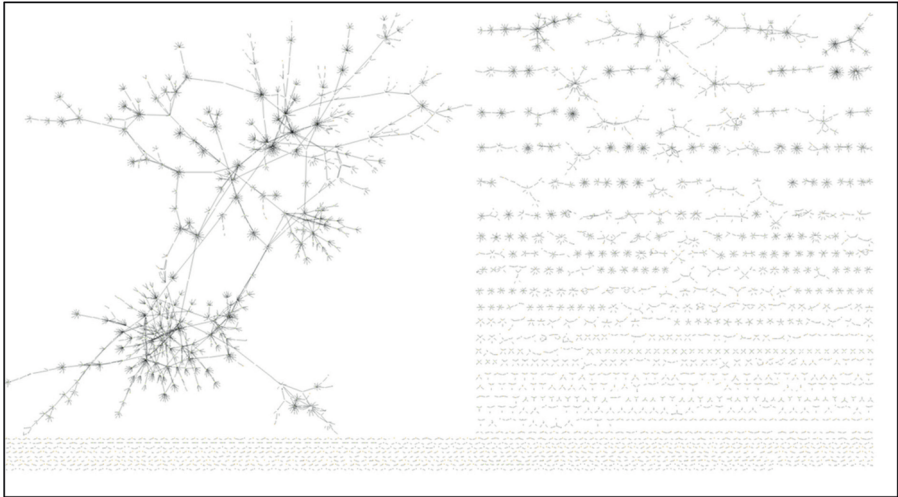

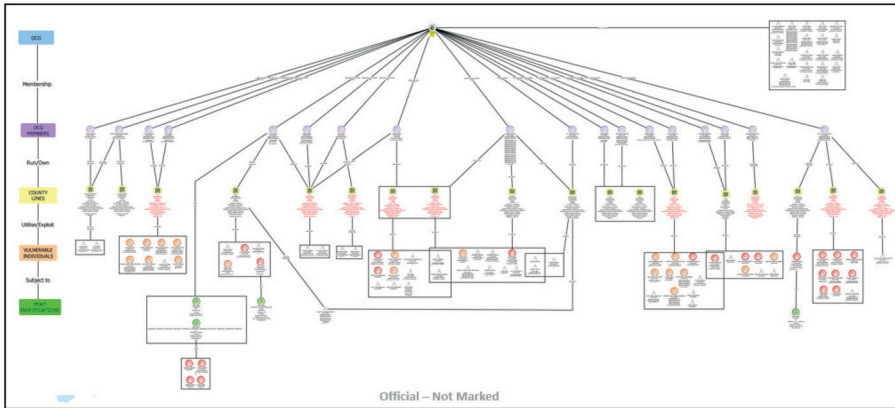**Figure 1. East Midlands SOC, October 2021**

Figure 2. Mapped OCG, associated County Lines and Vulnerable individuals

intelligence opportunities that we were previously unaware of, despite it being recorded in PND.

Figure 2 details the structure of a known OCG and its criminal enterprises. The chart is extracted from the high-volume data in Figure 1, then further arranged and stylised using ANB.

The chart details a single OCG controlling 18 separate County Lines over a period of four years. Of the members, 6 were in prison at the time of the analysis. These lines relied on the exploitation of 21 identified children and 19 identified vulnerable adults to service their drug supply. The chart also includes 4 MSHT investigations.

Figure 2 Depicts:

- The County Lines criminal business model, demonstrated through the hierarchical layout.
- That OCG control of street-level activity can still be exerted remotely from within prison.
- The OCG's continued use of vulnerable individuals over a period of 4 years. While this vulnerability was key to the OCG's operating model, the children and vulnerable adults who are carrying the risk are not part of the OCG. They are used by their exploiters as replaceable resources.
- Understanding the criminal business model allows the Police to focus on identifying, understanding and disrupting the SOC controlling elements. Successful upstream intervention tactics at this level will cascade harm reduction as the exploitative business model is dismantled.

The extent of this OCG's reliance on criminal exploitation was not fully understood prior to applying data reduction and analysis to PND data in ANB. The context of the operating model is key – intervening only with those at the

bottom of the hierarchy will not greatly disrupt the criminal earning power of the group as a whole. Moreover, the vulnerable street-level cohort requiring safeguarding intervention will be perpetually refreshed by the criminal business until the control is successfully disrupted. Criminal business analysis such as this is applicable to many exploitative thematics; County Lines can be exchanged for cannabis cultivation, brothels, nail bars and other thematics, and the business model of exploiting the vulnerable would still apply.

PND is an essential resource for nationally accessing intelligence from other Territorial Constabularies, Regional and National policing agencies. Figures 3 and 4 demonstrate this graphically, by contrasting SOC intelligence for a known OCG member (Male A, currently serving 30 years for murder) held on a regional system (Figure 3) with national intelligence held on PND (Figure 4). When understood in the context of the East Midlands region, Male A is linked to 2 Northamptonshire OCGs controlling 7 County Lines across 2 territorial constabularies. When understood nationally, incorporating data from the West Midlands and Police Scotland, Male A is connected to 5 OCGs controlling 15 County Lines across 5 constabularies. The two ANB charts depict that Male A has a serious national impact and shows the interconnectivity of the enriched intelligence picture across multiple regions. This allows PND to be used as the resource for which it was designed: to both enhance the Police's understanding of cross-border criminality, and to connect territorial forces who otherwise risk working in silos, improving collaboration while reducing duplication of effort.

These examples demonstrate the application of i2 ANB to PND data, affording the production of intelligence packages which assist in the "*Identification*
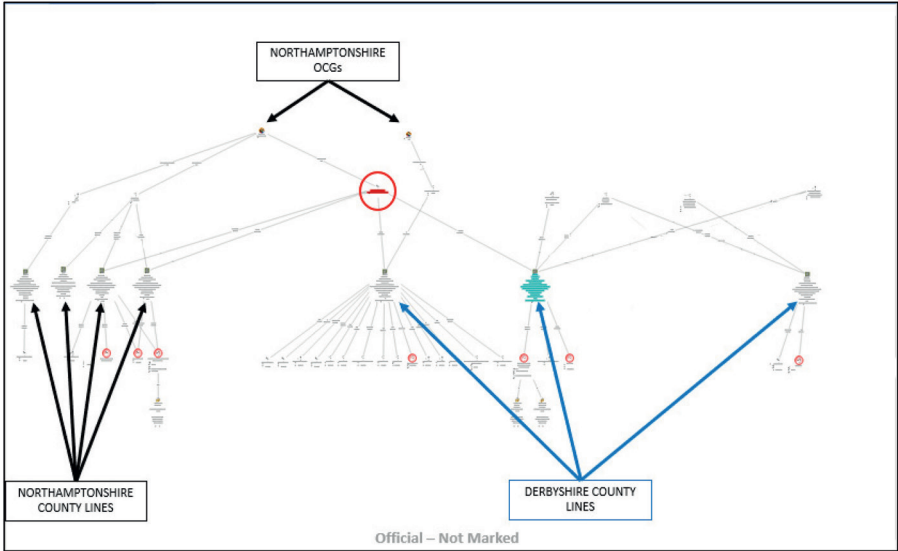

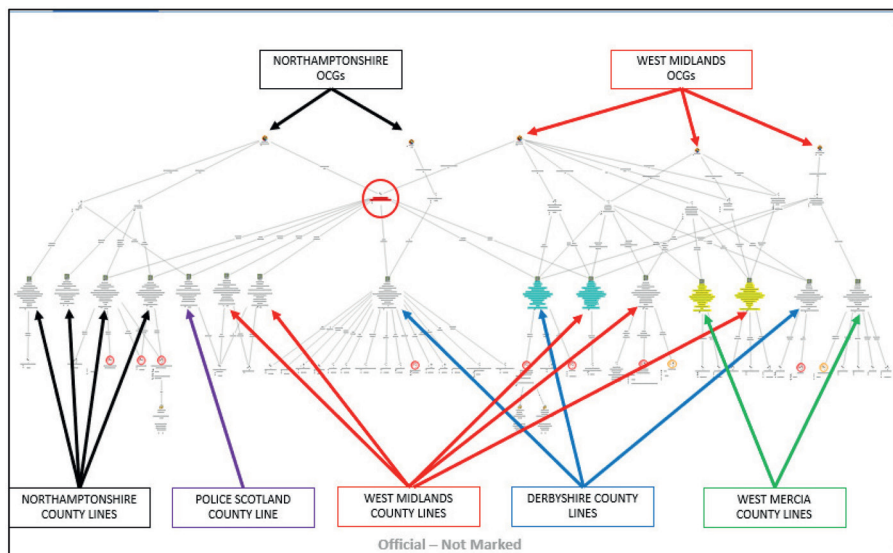**Figure 3. East Midlands SOC mapping for Male A**

Figure 4. National SOC mapping for Male A

of high-risk criminal gangs, drugs supply lines and vulnerable adults and children subject to exploitation" in line with the terms of reference under which the NCLCC was established (NCA, 2018). Whilst this paper cannot disclose police tactics, this analytical methodology has already influenced a number of operational decisions. These include improved OCG mapping, identification of common OCG control over previously unlinked lines, catalysing new investigations and identification of previously unobserved exploitation in the criminal business models of some OCGs. This has allowed for increased and improved coordination of response across lines where links were identified.

Conclusion

Since the implementation of the UK government austerity programme following the Great Recession, Territorial Constabularies, Regional and National units have been repeatedly challenged to *do more with what you already have.* The collection of intelligence into PND is an invaluable resource for meeting this challenge – yet the volume of data requires appropriate tooling to deliver cross-border insight. i2 ANB is one such tool, already available universally across the Police software estate. Charting national SOC data using i2 maximises the value held within PND. Visual analysis allows the Police to:

- Identify ongoing threat, risk, and harm that – whilst already adequately recorded – may not be recognised and understood in its full context.
- Identify, analyse and depict criminal business models, demonstrating SOC control over street-level activity and highlighting appropriate levels for disruption.

- Identify cross-border threats, demonstrating the geographic extent of organised criminality.
- Identify potential investigative crossover, improving collaboration between law enforcement agencies and reducing silo working and duplication of effort.
- Identify intelligence gaps and potential lines of investigation.
- Highlight the value of PND and drive engagement to improve data quality. Recording locally while thinking nationally results in better data, and therefore better results.

This paper recommends extending the methodology to incorporate other available datasets. While PND is scope-constrained to ingest specific types of Police Crime and Intelligence data, i2 ANB's flexible graph data model is dataset agnostic, allowing any available additional or enrichment source to be imported and overlaid alongside PND data for analysis and discovery. This paper also recommends deeper technological integration to extend these capabilities beyond those described here. For example, an API integration with PND meets the 5V challenge of data velocity, mitigating the timeliness risk of monthly exports by augmenting that architecture with an access-on-demand model. This also meets the BlueLight Commercial (2024) UK Police Industry Charter principle of Integration First – a PND capable of API integration facilitates innumerable valuable uses of the data alongside other sources and technologies.

This initial overview of the capability recommends wider distribution of the tools and tradecraft described herein to appropriate Analysts working territorially, regionally and nationally. The ongoing development of i2 ANB is significantly increasing its capacity across larger data volumes, allowing these methods to scale further regionally and nationally. While this paper leverages the recording and reporting uplift afforded for County Lines, MSHT and OCG data, ANB's capability to overlay any additional dataset presents opportunities for more flexible ways of working. For example, an API integration designed for generalised access would allow Analysts to leverage thematic threat harm risk and vulnerability indicators found in sources outside PND, while using PND data to maximise their cross-border value. This affords far broader thematic application, including agile adaptation to new thematics and emerging threats. This would allow the method to be adapted for more granular, local child safeguarding and harm prevention analysis, as many of the earliest indicators of child risk, held in Command and Control, Missing Person, or Partnership data, do not meet the criteria for PND upload.

References

Bichard, M. (2004). *The Bichard Inquiry Report*. Ordered by the House of Commons to be printed 22nd June 2004, London: The Stationery Office. Retrieved from https://dera.ioe.ac.uk/id/eprint/6394/1/report.pdf

BlueLight Commercial UK. (2024). Police Industry Charter. Retrieved from https://bluelightcommercial.police.uk/media/2152/police-industry-charter-v10.pdf

Cockbain, E., Brayley, H., & Laycock, G. (2011). Exploring internal child sex trafficking networks using social network analysis. *Policing: A Journal of Policy and Practice*, *5*(2), 144. https://doi.org/10.1093/police/par025

College of Policing. (2024). *Authorised Professional Practice: Analytical Techniques & Analysis Intelligence Products.* Practice Advice on Analysis, National Policing Improvement Agency, 2008.

Ducharme, D., & Brightman, H. (2010). *US Naval War College Digital Commons: Global Shipping Game '10.* Game Reports, 16. https://digital-commons.usnwc.edu/game-reports/16

Frydensberg, C., Ariel, B., & Bland, M. (2019). Targeting the most harmful co-offenders in Denmark: A social network analysis approach. *Cambridge Journal of Evidence-Based Policing*, *3*, 21–36. https://doi.org/10.17863/CAM.53609

Morris, J. (1986). *Crime Analysis Charting.* Palmer Press.

National Crime Agency. (2018). *Director General Direction to Perform a Task Pursuant to Section 5(5) Crime and Courts Act 2013.* Tasking letter sent to all UK police forces outlining the remit of NCLCC.

National Policing Improvement Agency. (2010). *Code of Practice on the Operation and Use of the Police National Database.* Retrieved from https://assets.publishing.service.gov.uk/media/5a7b8841ed915d4147620fc5/9999102808.pdf