

Horizon Scanning Module

Session 3. How can crime science theory and methods inform understanding of the future?

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<https://crimeframeworks.com>

- Futures mindset – ways of looking at issues
- Conventional quantitative approaches to future projection
- Using theoretical frameworks from Crime Science

A receptacle
for grime?



Or a tool
for crime?



Competition organisers

Design Out Crime Research Group
Curtin University Australia
www.designoutcrime.org

Failure to 'think drug user' or 'think urinator'



How can we forecast future crime?

- Simple induction – all our yesterdays – underlies hotspot policing
- Time series analysis (e.g. ARIMA)
 - trends, cycles and lags – tomorrow and tomorrow and tomorrow?
- Time series analysis – statistical modelling based on a range of explanatory variables

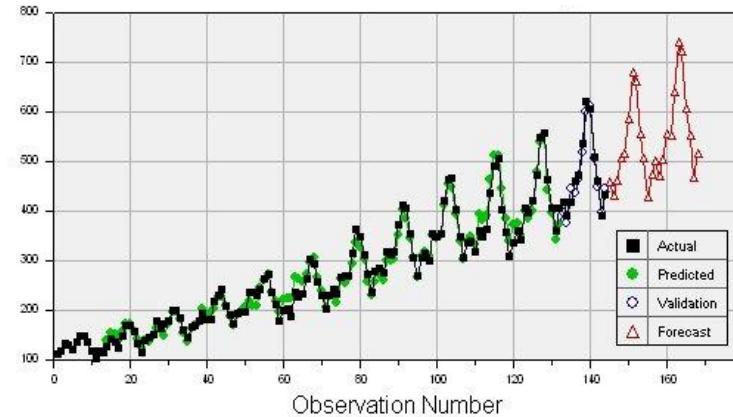
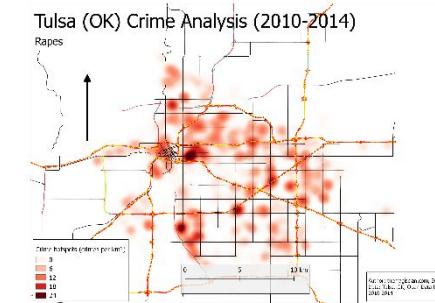
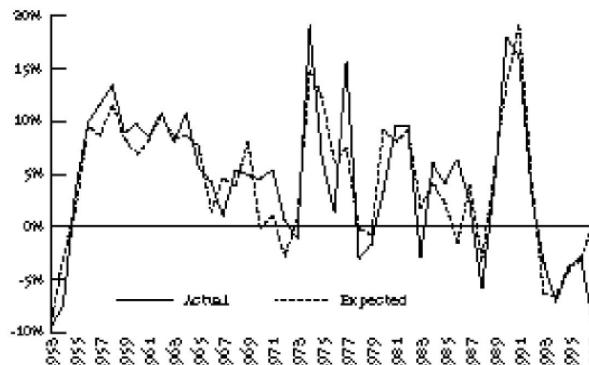


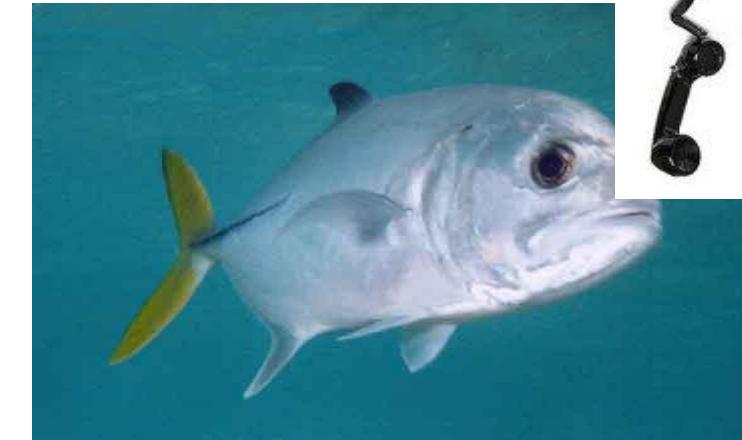
Figure 2. Explaining theft trends. Actual annual change in theft and change 'expected' on the basis of the model.



	Model T4 ΔLog (Theft)	Model B4 ΔLog(burglary)	
Dependent variable	Estimated coefficients		
Independent variables			
Intercept	-0.03 (0.02)	0.05 (0.02)	
Error correction mechanism (lagged residuals from cointegrating regressions)	-0.52 (0.12)	-0.24 (0.11)	
ΔLog(consumption over 4 years)	-0.61 (0.93)	1.88 (1.04)	
ΔLog(males aged 15 plus males aged 20)	0.43 (0.14)	0.37 (0.24)	
ΔLog(consumption)	-1.25 (0.38)	-2.67 (0.62)	
ΔLog(consumption) lagged one year	1.10 (0.51)	not included	
Dependent variable lagged one year	0.58 (0.12)	0.36 (0.11)	

How can we forecast future crime?

- Simple induction and complex time series
 - No logical guarantee that tomorrow will be like yesterday
 - what factors could change?
- Statistical modelling – may, or may not, have captured all the background variables that are associated with change; data may not be available at suitable temporal/geographical scales
- More generally, factors underlying crime patterns may have complex interactions, emergent properties and nonlinearities
 - the underlying causal mechanisms may be tricky to discern and forecast quantitatively
- In any case, headline categories like ‘theft’ are unhelpful for guiding preventive interventions centred on Problem-Oriented approaches, which should be highly specific (Goldstein) and often localised (e.g. theft of luggage at LHR T5)
- Changes in crime are central, but changes in **operating context** of crime prevention/law enforcement may be equally important in influencing future performance



- Future changes can happen under any of the PESTLE headings – Political, Economic, Social, Technological, Legal, Environmental [or PESTELOMI – Political, Economic, Social, Technological, Environmental, Legal, Organisational, Media, Infrastructure]
- Some changes are **criminogenic**, others **criminocclusive**, others may act either way
- *Changes could be trends, cycles; events/shocks or steps, incl innovations*
 - *How might we stop **criminogenic** changes from happening, and prepare for any that do? This means lowering **risk** by eliminating **possibility**, reducing **likelihood** and reducing or mitigating **harm** by blocking, diminishing or deflecting **causes** and influencing **risk and protective factors***
 - *And how might we foster **criminocclusive** changes in civil society?*
 - *How do we anticipate offenders doing the opposite, i.e. **seeking out and even creating opportunities** offered by future changes?*
 - *How do we understand the influence of **multiple factors** acting in combination?*
 - *What special issues are raised by the **rate of change** as well as by the nature of change?*
 - *How do we **protect** our **preventive processes** from future constraints (also under PESTLE headings) and **exploit** new possibilities for designing and deploying them?*

- Crime Science has a range of familiar approaches which can help – provided we develop a ***Futures mindset***
- **Description** of crime
 - Crime Pattern Analysis (induction)
 - Crime Scripts
- **Causation** of crime, and **Intervention** in causes/ risk factors to eliminate possibility, reduce likelihood and reduce or mitigate harm
 - Routine Activities (ecological)
 - Rational Choice (psychological/pragmatic)
 - Crime Pattern Approach/ Geometry of Crime (ecological/geographical)
 - Crime Precipitators (psychological/social)
 - 25 Techniques of Situational Crime Prevention
 - Risk and Protective Factors (CRAVED, EVIL DONE, IN SAFE HANDS etc) – correlational, help targeting of intervention but could indicate causal factors
- **Process** of doing prevention
 - SARA
- And some less familiar ones – **CCO, M&S, 5Is**

<https://popcenter.asu.edu/content/step-31-know-products-are-craved-thieves>
<https://popcenter.asu.edu/sites/default/files/library/reading/PDFs/PolicingTerrorism.pdf>
https://www.researchgate.net/publication/227059965_IN_SAFE_HANDS_A_review_of_mobile_phone_anti-theft_designs

Routine Activities

- Everyday routine activities bring together a likely (capable, motivated) offender, with a suitable target, and absence of capable guardians
- Changes to the activity of any one of these elements (not just offenders) can influence the likelihood of crime occurrence
- E.g. new technology changing targets, women's employment emptying homes during daytime, inauguration of new metro line

In Future:

- *How might this innovation, trend or event affect the presence and actions of likely offenders, suitable targets and capable guardians?*
- *How might these changes influence the factors that bring the RA triad together or keep them apart?*

Rational Choice

- Offenders make ‘rational’ decisions to commit particular criminal acts at particular times and places as a function of their perception of risk, effort and reward, i.e. **opportunity factors**
- E.g. scalable offending on the internet, more valuable targets, police cuts

In Future:

*How might this change affect the **objective** levels of risk, effort and reward encountered or engendered by offenders?*

*How might it independently affect the **subjective** counterparts (**perceived** risk etc)?*

In fact, how might it tip the balance between these?

*How might it affect broader **opportunity structures** and **criminal involvement** choices as well as individual classes of opportunity and individual criminal action decisions?*

Crime Pattern Approach

- Understanding offender **activity spaces** and **movement patterns** and how this shapes their perception and awareness of local environments and the crime opportunities they offer
- E.g. introduction of new transit systems, use of mobile navigation applications that direct people through areas they would otherwise not visit, or availability of data on the activity and content of places

In Future:

- *How might change affect offenders' ability to move within, spot opportunities and get to know risks in their activity space?*
- *How might that activity space itself change?*
- *How might offenders develop activity spaces in virtual environments, or in physical ones made accessible by new technology (e.g. unmanned aerial vehicles open up airspace – and the third dimension)?*

Crime precipitators

- A psychological approach that considers the role of factors in or near the immediate crime situation which influence the motivation/emotion of offenders, making their search for, or exploitation of, criminal opportunities more likely. Environmental cues, events or influences can **prompt, pressure, permit or provoke** criminal behaviour
- E.g. children becoming visible on social media, train travel becoming more stressful, expression of racist views online

In Future:

How might change influence the nature, strength and patterns in situational precipitators, or the susceptibility of offenders to them?'

25 Techniques of Situational Crime Prevention

- Extensive catalogue of practical techniques (www.popcenter.org/25techniques/) organised around situational prevention principles (risk, effort, reward to offender; excuses and provocations).
- E.g. new cutting disk material and cordless drill defeat current target hardening technique

In Future:

How might change enable or constrain the successful realisation, operation or implementation of each of these categories of preventive technique, or individual exemplars?

Risk and protective factors

- RF suites such as CRAVED (Clarke 1999) have been developed to inform understanding of what makes a product “hot” (i.e. targets at high risk of theft/misappropriation), or a place/facility more risky. Hot products are considered to be those that are Concealable, Removable, Available, Valuable, Enjoyable, and Disposable
- Other suites cover **protective** factors e.g. IN SAFE HANDS (Whitehead et al) for mobile phone design
- E.g. how might firearms become more/less concealable, copper metal more/less desirable?

In Future:

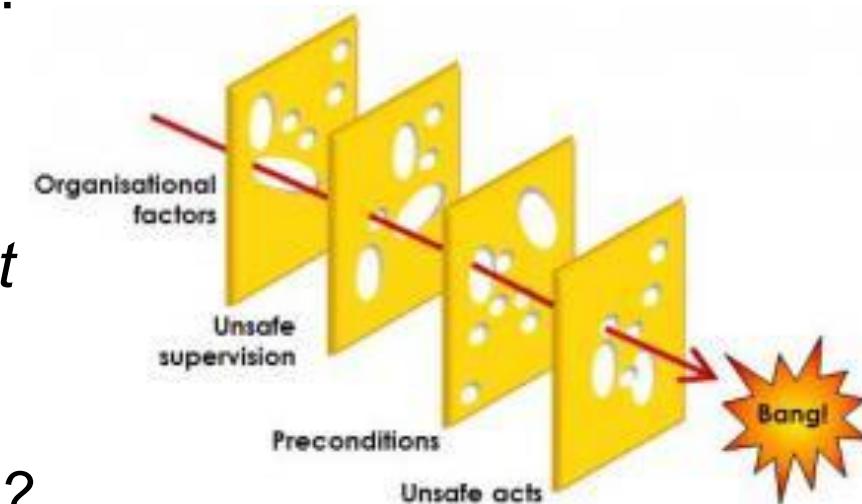
- *How might change influence individual risk or protective factors, or sets thereof?*
- *How might change shift the balance between risk versus protective factors?*

Crime scripts

- These describe **sequences** of action and decision-making, usually by offenders, in what might be a complex Modus Operandi. Can identify ‘opportunity paths’ (cf Reason’s Swiss Cheese model of accident causation) and ‘pinch points’ where intervention is most efficient/effective.
- E.g. Approach ATM, check if anyone looking, fit scanner device, return later to collect data, sell/misuse data...

In Future:

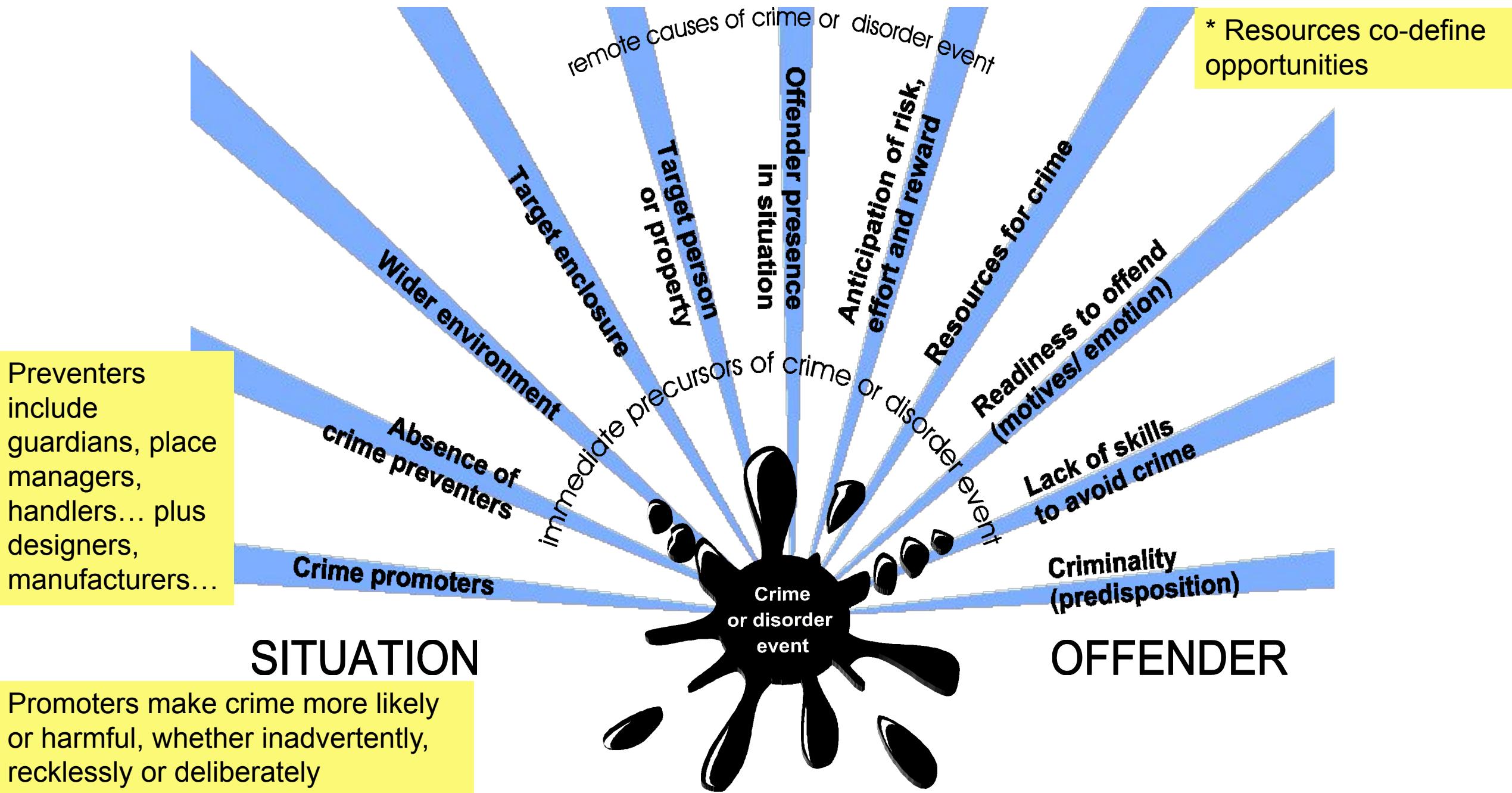
- *How might change facilitate or inhibit particular script elements, and how they fit together as a workable sequence?*
- *How might change enable entirely new crime scripts?*



- We can identify **tactical clashes** between offenders and security at key stages of their scripts
 - Wield force v resist (Damage v protect, Injure v keep intact)
 - Act at will v control misbehaviour
 - Conceal traces and tracks v detect
 - Take v keep
 - Confront v avoid
 - Surprise/ ambush v be alert
 - Challenge suspect v give plausible response
 - Surveill v conceal
 - Snoop v maintain privacy
 - Pursue v escape
 - Trap v elude
 - Conceal criminal intent v detect
- These clashes
 - Influence **criminal plans and outcomes**
 - are **generic and perennial** – will always need to be faced
- Innovations can **disrupt the balance** of these clashes, and favour one side over other
- *In future, which side will gain from a sudden breakthrough?*
- *How can we design things to **advantage the good side**?*
- Approaches to **inventiveness** like TRIZ highlight these contradictions, and also identify **evolutionary trends in invention** – *maybe we can predict inventions useful to offenders/preventers?* <https://triz.org/index.php/triz/evolution>

- The traditional Crime Science frameworks don't join up very well – there are overlaps, differences in terminology and gaps, and they focus on different levels (psychological, ecological, geographical...)
- In thinking about future crimes and preventive interventions, it's better to bring them all into a single framework
- The **Conjunction of Criminal Opportunity** tries to do this
 - Ecological and psychological
 - Identifies 11 kinds of cause of criminal events – agents and entities – and 11 counterpart preventive interventions intended to block those causes
 - Focuses on immediate or proximal causes – what the offender brings to the crime situation – rather than remote, upstream or distal ones
 - But we can work back upstream to the more remote ones (causes of causes; causes of combinations of causes)

The Conjunction of Criminal Opportunity – Causes



We can start with **causes**, and we can ask:

For each of these 11 causes of criminal events

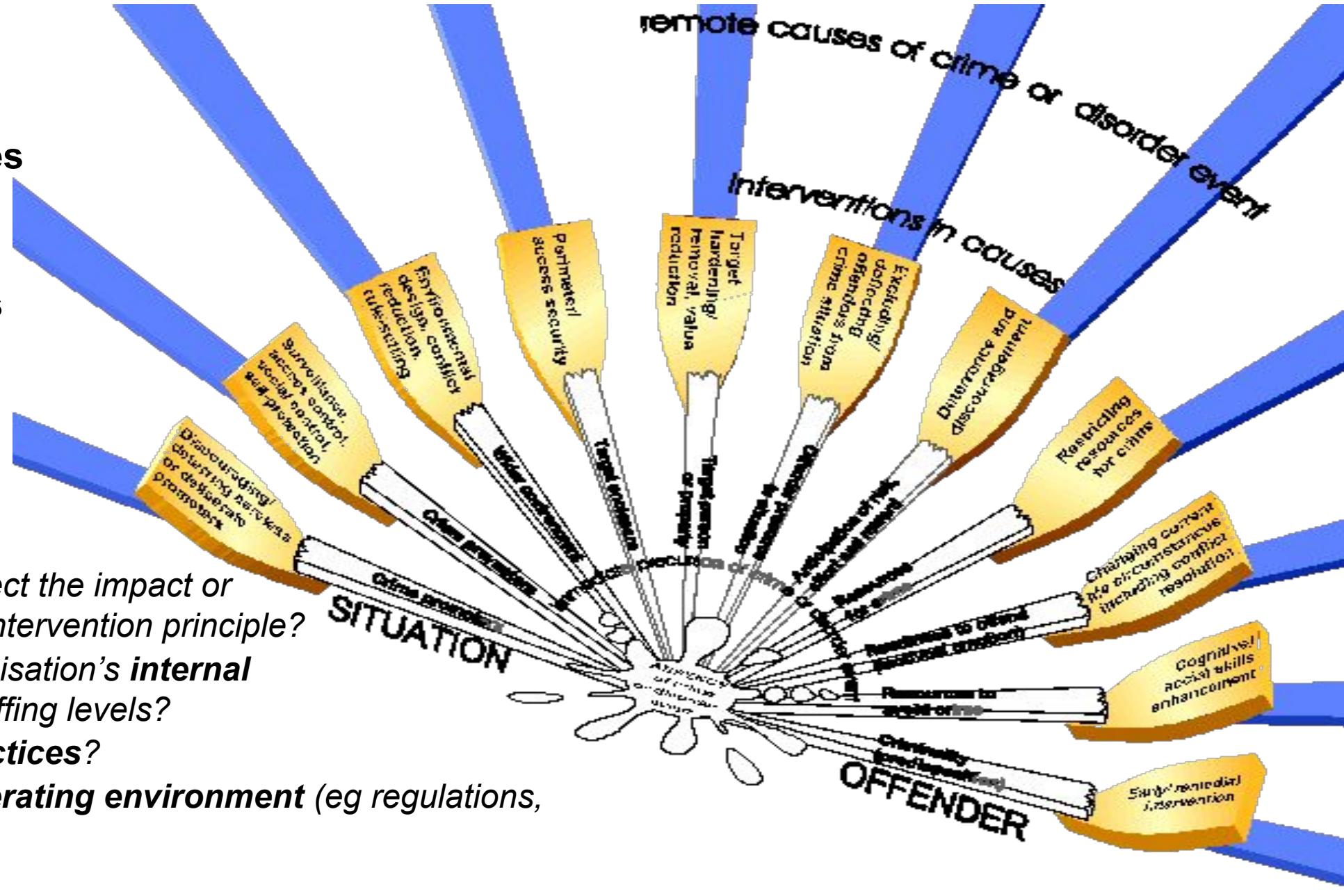
- *What future **changes** can we anticipate, which might affect this cause, or combination of causes?*

Or we can start with a **change** and ask

- *Which of the 11 **causes** of criminal events might this change influence?*

Conjunction of Criminal Opportunity: Intervention

- Each of the causal elements has a counterpart set of **intervention principles**
- These are realised through practical **intervention methods** as described in the 25 Techniques



We can again ask:

- *What changes might affect the impact or implementability of this intervention principle?*
 - *In police or other organisation's **internal environments** e.g. staffing levels?*
 - *In their **policies & practices**?*
 - *In their **immediate operating environment** (eg regulations, traffic levels etc)?*
 - *In the **wider society**?*

- CCO covers crime risks in general
- But we can focus on more specific risks too, taking the POV of offenders and their **affordances**
- Any change, can feature in criminal actions/ scripts/ events in various ways
- So –
- *How might this new product, societal change or social or procedural innovation, be Mistreated, Misappropriated, Misused etc?*

Mistreatment (damage/ harm)

Misappropriation (theft)

Mishandling (e.g. fraud)

Misuse (as tool/weapon)

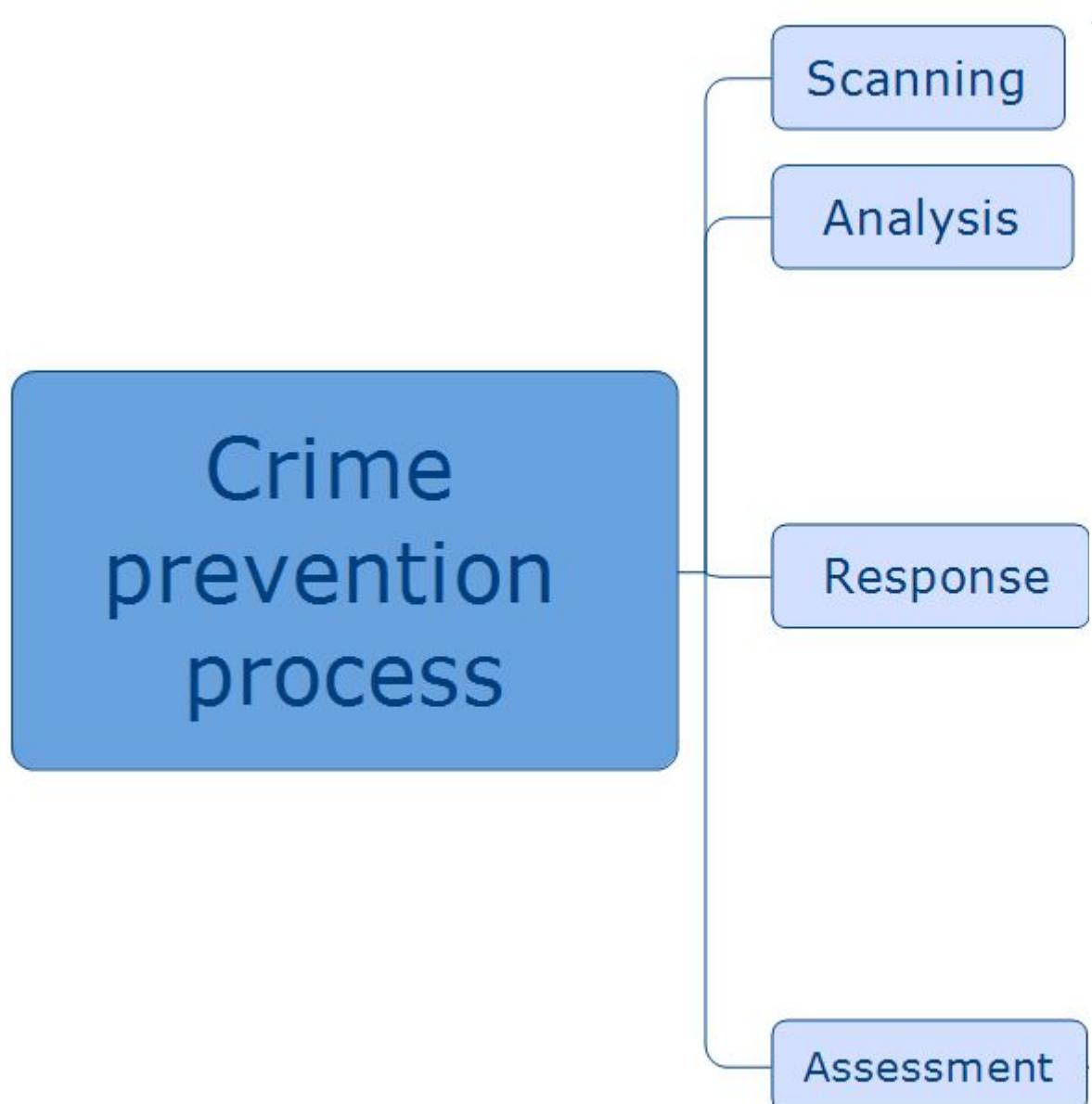
Misbehaviour (nuisance, conflict)

Mistake (e.g. false alarm)

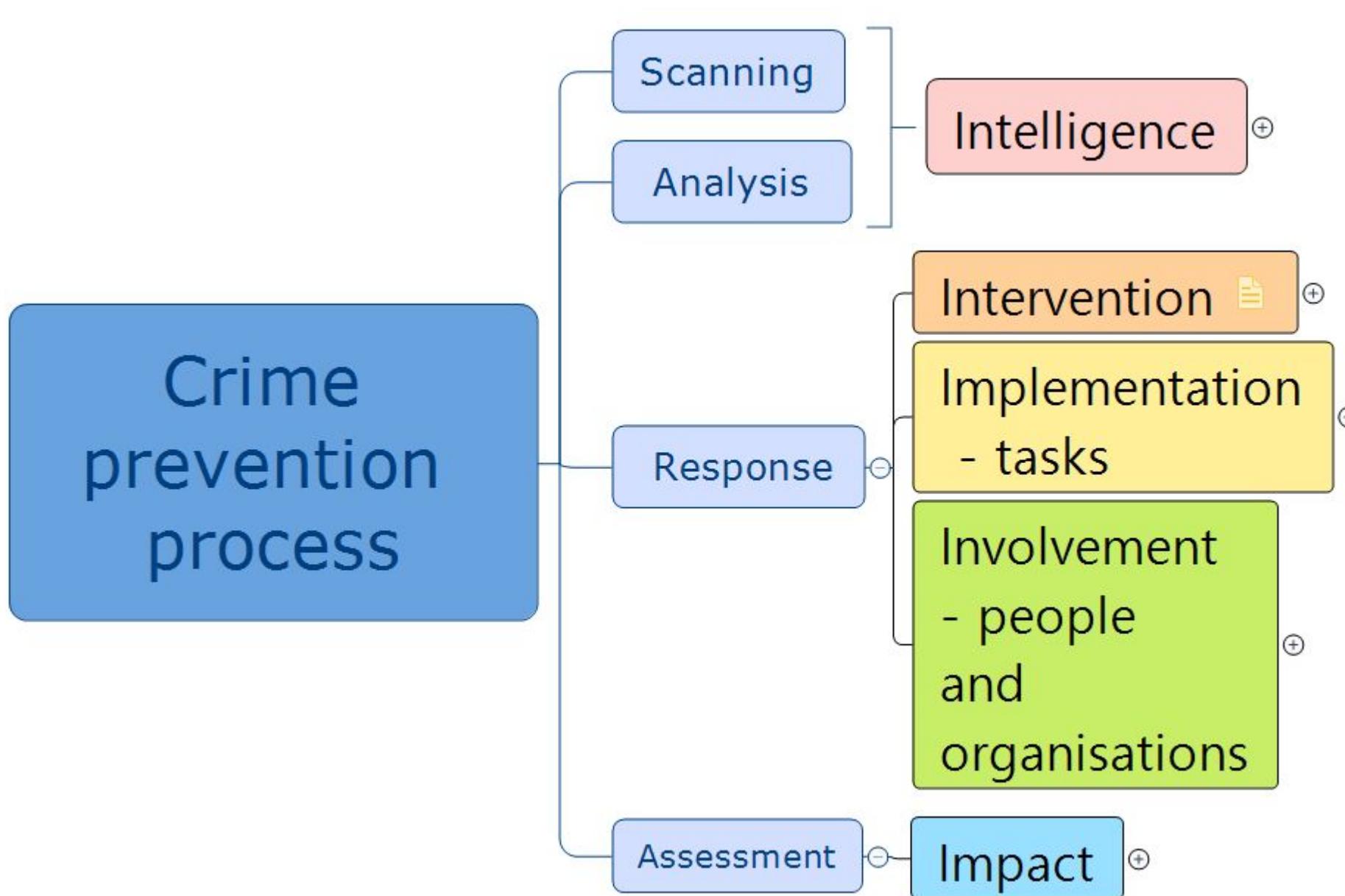
Target of crime

Contributor to crime
eg **resource** or **readiness** (provocation)

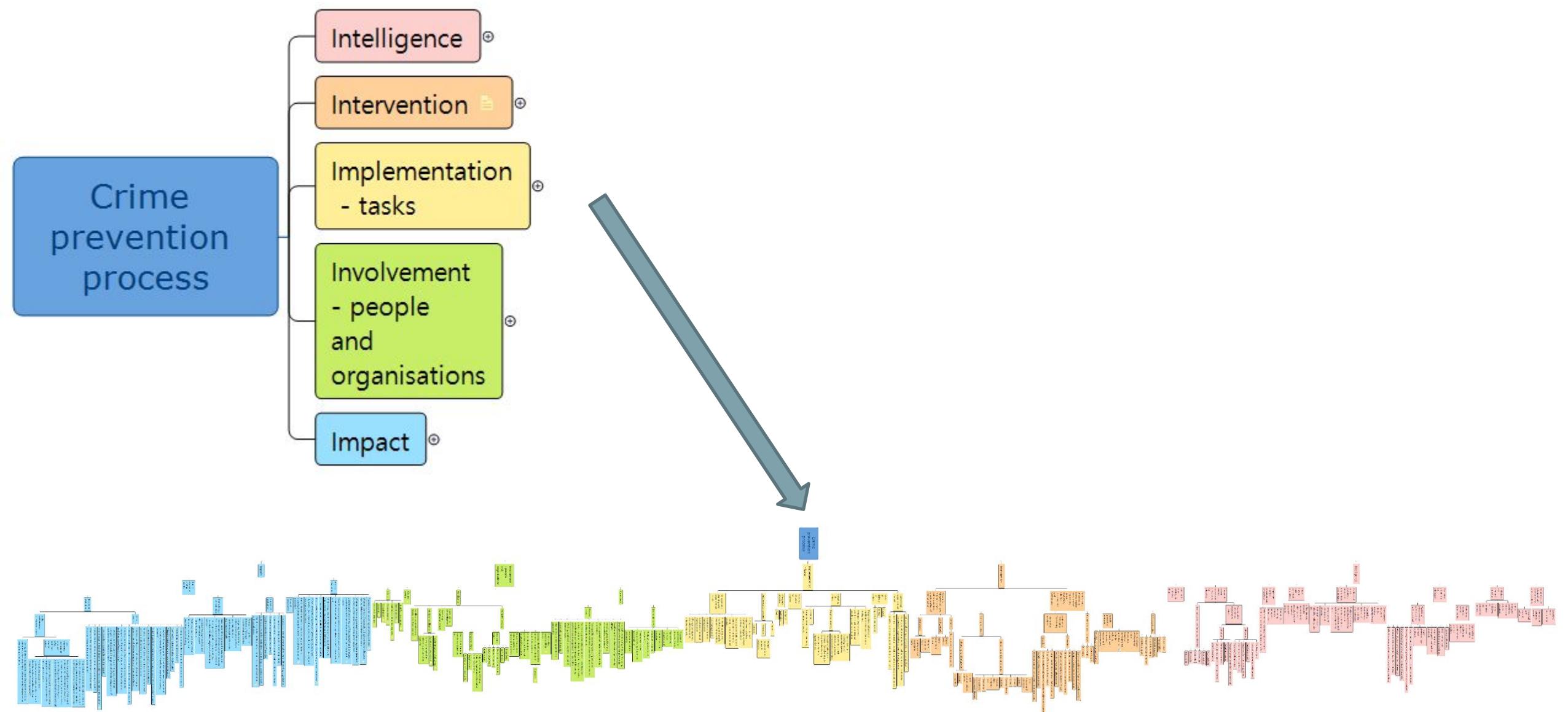
Downside of prevention



- The traditional process model for Situational Crime Prevention is SARA
- But this is insufficiently detailed to capture the breadth and depth of knowledge of practice to enable anticipation and appraisal of future changes (not to mention for purposes of learning from failure, intelligent replication of good practice in new contexts etc)
 - In particular, the Response stage is too amorphous
- An extension of SARA is the 5Is
 - <http://5isframework.wordpress.com>



5Is – capture of practical detail



- We can ask about the performance of crime prevention:
 - *How might future changes affect the capacity and motivation of Police and their partners, and the context of undertaking the tasks (and their detailed sub-tasks) of*
 - *Intelligence*
 - *Intervention*
 - *Implementation*
 - *Involvement (partnership, mobilisation, climate-setting, accountability etc)*
 - *Impact and process evaluation?*

- Look at some examples with, say, the Routine Activities perspective in mind and ask:
- In this forecast new arrangement (for, say, transport)
 - ‘What might the routine activities be, of potential offenders and potential victims, that bring them together and generate opportunities for crime or motivation for conflict?’
 - ‘What might the risks, effort and reward be to offenders contemplating crime in this scenario?’
 - ‘How might the police/security side be hindered or helped in their endeavours to reduce crime and enforce the law?’