


The Treasury and Ministry of Justice

Actuarial advice on feasibility: A long-term investment
approach to reducing the harm associated with crime

15 April 2015



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1 EXECUTIVE SUMMARY

INSIDE THIS REPORT:

This report contains actuarial advice on the feasibility of an investment approach to reducing the harm associated with crime. It includes:

- **Context**, including the purpose of, and background for this work
- **Feasibility**; how it is defined, and confirmation of conceptual feasibility
- **Why** introduce a framework; and confirmation of its value add
- **What** a framework for a long-term view of crime and harm could look like
- **How** to develop the framework, and confirmation of its technical feasibility
- **Conclusions, recommendations and next steps** for moving forward

1.1 Context

The **purpose** of this report is to provide high level actuarial advice on the feasibility of an investment approach to reducing the harm caused by crime. This advice is provided in the **context** of the Government's intent to adopt an 'Investment Approach' to social expenditure more broadly, building on recent changes to the welfare system. By investing in populations at risk where poor social outcomes are heavily concentrated, there is an opportunity to both improve outcomes and reduce long-term costs.

The criminal justice sector (meaning broadly Police, Courts and Corrections) has some important similarities to the welfare system, including overlap in the client base. **Considerations** include key differences between the two systems. For example, success in reducing crime only generates fiscal savings through secondary decisions to trim cost.

1.2 Feasibility

An **actuarial approach** can be thought of as a disciplined framework for estimation, monitoring and re-estimation of uncertain long-term costs. The **investment approach** applies this actuarial discipline to the social sector. It is based on the premise that **making long-term financial signals transparent can encourage better investment decisions based on a long-term view of outcomes**. The policy and operational implication is that investing upfront to improve outcomes for vulnerable populations can offset long-term social consequences and as well as costs.

For the purposes of this report, the **definition of feasibility** includes conceptual and technical elements and a requirement that an investment approach be useful and add value to management of the criminal justice system. Two key **determinants of conceptual feasibility** are:

- An appropriate proxy for harm that serves as a common currency to align activities throughout the criminal justice system; and,
- Levers in the criminal justice system to reduce that harm.

There may be good reasons to take a policy or operational decision that incurs increased costs; for example, improved public safety. The value in an actuarial framework is that it provides increased visibility of the relationship between drivers of change—including policy and operational changes—and long-term costs.

An investment approach framework could be used for information, or to measure performance:

- An **information framework** would make use of underlying information provided by the framework as a source of business intelligence to inform strategic and operational decisions.
- A **performance framework** would use movements in long-term costs, or a subset of those costs as a performance measure.

Both types of frameworks could interact. For example:

- A performance framework could apply for certain components in the context of a sector-wide information framework.
- An information framework could be introduced as a first step, with a performance framework developed over time based on the resulting intelligence.

Recommendation

After considering a range of options, **we recommend all costs associated with recorded crime as potential proxy for harm**, including:

- Cost of government response within and outside of the justice sector; and,
- Costs (tangible and intangible) associated with harm to society.

Recommendation

We recognize that development of such a broad proxy may prove somewhat complex, and that alternative approaches to weighting the severity of harm may also warrant further consideration.

A progressive approach to implementation, **beginning with an information framework**, would allow time for the relationship between long-term cost signals and business objectives to become clear.

Feasibility advice

An investment approach is **conceptually feasible** for the criminal justice system:

- A proxy for the harm caused by crime can be developed; and,
- Government has levers to continue to reduce this harm.

1.3 Why?

An actuarial approach is based on an actuarial control cycle that compares actual experience to forecast. This helps to manage complex systems by:

- Measuring risk, uncertainty and change
- Providing insight into the distribution of long-term costs; and
- Measuring the high level impact of interventions.

Recommendation

Randomised, controlled trials (RCTs) are best practice for evaluating the impact of interventions. RCTs make it possible to disaggregate programme impacts from external influences, to understand return on investment.

RCTs also enable high quality analysis of effectiveness and return on investment for population subgroups, by characteristic and/or location. This analysis enables improved targeting of investments.

Actuarial approaches are **well-suited to the criminal justice system** because:

- Crime is harmful and costly to society
- Harm and costs are unevenly distributed; particularly from a long-term perspective; and,
- Government has levers to continue to reduce the harm caused by crime.

There is a wealth of existing tools in the justice sector to analysis risk, cost, and effectiveness. The point of difference with an actuarial approach is to bring together these types of analysis into **a framework that offers a whole-of-system, long-term view of expected future crime and harm**. Systematic measurement of change provides insight into what works to reduce crime and harm, and for whom.

Table 1.1 Value add of an investment approach in the criminal justice system

Value add	Examples (hypothetical)
System oversight	<ul style="list-style-type: none"> • How much are money has the Government saved over the long-term due to progress on BPS measures? • How much of the change in recorded crime rates from one year to the next is driven: <ul style="list-style-type: none"> • By a change in reporting rates? • By factors outside management influence, such as demographics and the economy? • By policy and operational changes?
Agency and population group drill-down	<p>Which population subgroups of offenders and victims, and which crime hotspots can we expect to contribute most to crime over the next ten years?</p> <ul style="list-style-type: none"> • What is the total expected future cost associated with offenders who first offend before age 17? • Which types of crime have been reduced over the long term due to progress in reducing youth offending? • What is the total cost associated with harm to chronic victims? • What share of costs is associated with offenders and victims with a history in state care? What characteristics differentiate between those in state care who go on to have intensive involvement with the sector, and those who do not?
Disciplined innovation	<ul style="list-style-type: none"> • Which responses by Police or Victim Services reduce chronic victimisation the most? • What is the long-term impact of therapeutic courts and restorative justice on re-offending by crime type? • Which Corrections rehabilitation and reintegration activities have the most impact in reducing the severity of recidivism and duration of criminal careers for high-complexity offenders? • Are social sector initiatives such as the Vulnerable Children Agenda and the Youth Service having an impact on youth offending and victimisation?

There is also an important opportunity for **collaboration across sectors**, given the considerable overlap in risk factors for, and populations at risk of recidivist offending, repeat victimisation and other adverse social outcomes.

Feasibility advice

An investment approach **adds value in terms of high level policy and management focus** by:

- Providing a broad information framework to understand system-level performance in reducing the harm associated with crime
- Offering insight into drivers of long-term cost and changes over time; and,
- Informing policy development and areas of strategic interest to management.

Feasibility advice

An investment approach **adds value in terms of an operational focus on important segments (subgroups of clients)** by:

- Offering insight into concentrations of risk that drive poor long-term outcomes and performance for those groups; and,
- Assisting in the identification of groups of offenders, victims or locations with a high potential for new investment and for other targeting decisions.

Feasibility advice

An investment approach **adds value through return on investment framework** that:

- Allows comparison of the return on investment for different options to reduce harm and crime
- Provides insight into long-term dimensions of performance; and,
- Informs decisions about which interventions to trial, scale up or terminate.

1.4 What?

Not all crimes cause equal harm; some are more severe than others. Risk, harm, and cost are concentrated among some populations: recidivist offenders and repeat victims. **This concentration of harm and cost is magnified when viewed from a long-term perspective.** The overlap between risk factors in the justice and social sectors is striking. Differentiating by severity of crime, and integrating a long-term view in measuring system and investment performance would strengthen signals to reduce the harm caused by crime.

A long-term view of expected future crime and harm provides the basis for an insight, monitoring and analysis framework which can be used for **decision-making and, if desired, performance measurement.** The framework can be used to incentivise and reward a focus on effective investments that provide a return on a long-term basis. An investment approach would encourage a crime prevention investment portfolio that balances near-term and longer-term priorities:

- Volume-based measures and traditional cost-benefit analysis are already effective for high-volume, lower-harm segments.
- Measuring long-term costs complements these measures through a focus on complex problems, such as the severity and concentration of offending, victimisation, and related costs.

Recommendation

Taken together, the problem definition, levers, and expected outcomes form the basis of the **intervention logic** for an investment approach to reducing the harm caused by crime:

- By optimising cross-agency investments in prevention activities, the desired outcomes are fewer offenders, less severe offences, fewer victims and less harm, as well as safer locations.
- The flow-on impact can include lower fiscal costs to government in the justice sector as well as other sectors, and lower social and economic 'costs' of crime. This includes both tangible aspects such as costs, as well as the important non-tangible aspects of harm.
- We note as well the broader community benefits associated with reducing crime.

Figure 1.1 A long-term view of crime: multiple lenses

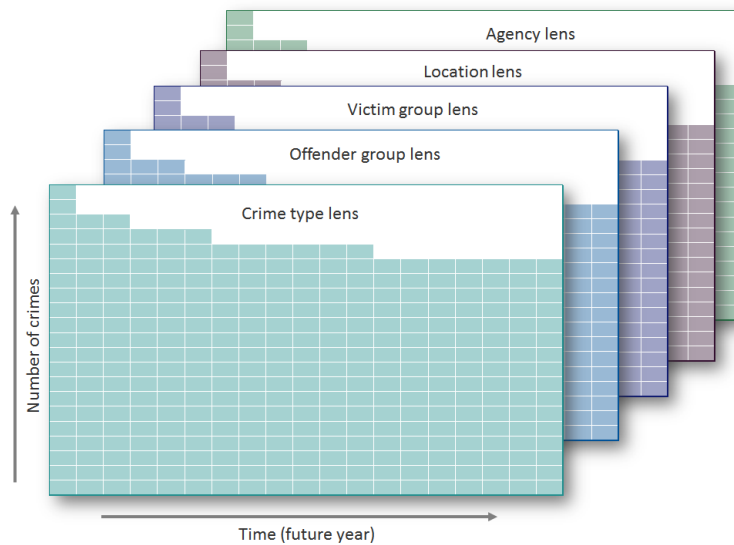


Figure 1.1 provides an illustrative example of a 'grid' of all expected future crime, by high-level crime type. Each cell represents an expected crime and its characteristics; such as cost.

Various potential 'views' allow identification of concentrations of future harm, and monitoring of change over time. These lenses also enable measurement of investment impacts.

A possible framework for the criminal justice system is illustrated below.

Figure 1.2 An investment approach framework for the criminal justice system

Top down	Level 1: System oversight	Provides a view of complete system, long term future costs, drivers of change <i>Source of top-down cost signals for information framework; common currency for performance framework, augmented by other measures</i>			
Bottom up	Level 2: Agency & cohort drill down	<i>Police</i>	<i>Justice</i>	<i>Corrections</i>	<i>CYF, others...</i>
		Ability to quantify past and future costs associated with crime and harm, and change over time; broken down into agency level accountabilities. Drill down to see cost concentration by location, offender, victim, crime type etc. Behavioural insights assist in targeting decisions and driving innovation			
Bottom up	Level 3: Disciplined innovation	View of investment effectiveness, comparison of return on investment <i>Source of innovation and continuous improvement; bottom up information signals to optimise portfolio based on a consistent measure of long-term value</i>			

The framework integrates management and insight by means of a **common currency that serves as a proxy for the harm caused by crime**. The framework can be used to demonstrate increased public value for money, even if overall sector investment remains relatively stable, rather than decreasing in the near term.

An investment approach in the criminal justice system would introduce a new approach to measurement that is well-aligned to current sector priorities; such as concentrations of crime and harm within specific communities, family violence, the Youth Crime Action Plan; and broader government activities addressing vulnerable children, youth, families, and communities.

Recommendation

We consider that a framework for the criminal justice system would be **most valuable—for example, to identify population subgroups of interest—if drill-down capability included:**

- All recorded crime by crime type, and related costs
- All justice sector agencies, including Child, Youth and Family (CYF) in its Youth Justice capacity
- Offenders, including data related to youth offending
- Victims, including relationship to offender and data related to childhood victimisation
- Locations where crimes are committed

1.5 How?

Key considerations in developing a **potential modelling approach** for the framework discussed in the previous section include predictability, complexity, and scope. Tendencies for recidivist offending, repeat victimisation and crime allow for better than random predictability.

Recommendation

While other options are also possible, we believe that it is **feasible to build a similar type of model as is used in the welfare valuation**. This approach to modelling long-term benefit dynamics could be adapted to provide insight into patterns in expected future crime.

One important feature of any actuarial framework would be the ability to distinguish between background trends in crime and changes caused by various investments. This is a more difficult problem compared to the welfare system, where a significant number of economic indicators can be used to monitor the welfare system against the broader economy. However, there are some possibilities for achieving some insight in the justice sector, including analysis that incorporates findings from the NZ *Crime and Safety Survey* (NZCASS).

Recommendation

A more frequent NZCASS would provide a more complete view of crime, and the impact of reporting levels on recorded crime rates. At the least a simplified annual version of the NZCASS would be desirable in addition to a triennial in-depth NZCASS.

A broad range of data sources exist within the Justice and broader Government Sector which would enable various types of models, with differing levels of complexity, to be constructed. The framework proposed in this report recommends looking at crime through the lenses of offenders, victims, locations and agencies. The data available on adult offenders, youth offenders, and locations is adequate for the type of modelling we propose. At this stage to data related to victims is not sufficient to develop a long-term view for victims, but collection is improving, and more will be possible over time as a result.

Feasibility advice

An investment approach framework is **technically feasible** for the criminal justice system:

- Appropriate models can built and recalibrated to improve accuracy over time
- There is sufficient administrative data; and,
- An investment approach would significantly enhance the sector's capability.

1.6 Next steps

Enabling conditions to assist in managing the scale of change that an investment approach could potentially mean for the criminal justice system include:

- Clarity of vision and purpose; including alignment between policy settings, agency mandates, operational strategies and measurement approach
 - Leadership and coordination; including appropriate governance mechanisms
 - Collaboration and cooperation; to manage change by developing buy-in
 - A strategic plan; particularly useful to build a shared understanding in an interagency context
- A focus on continual improvement; a culture that paces change so as to fail small and early.

Recommendation

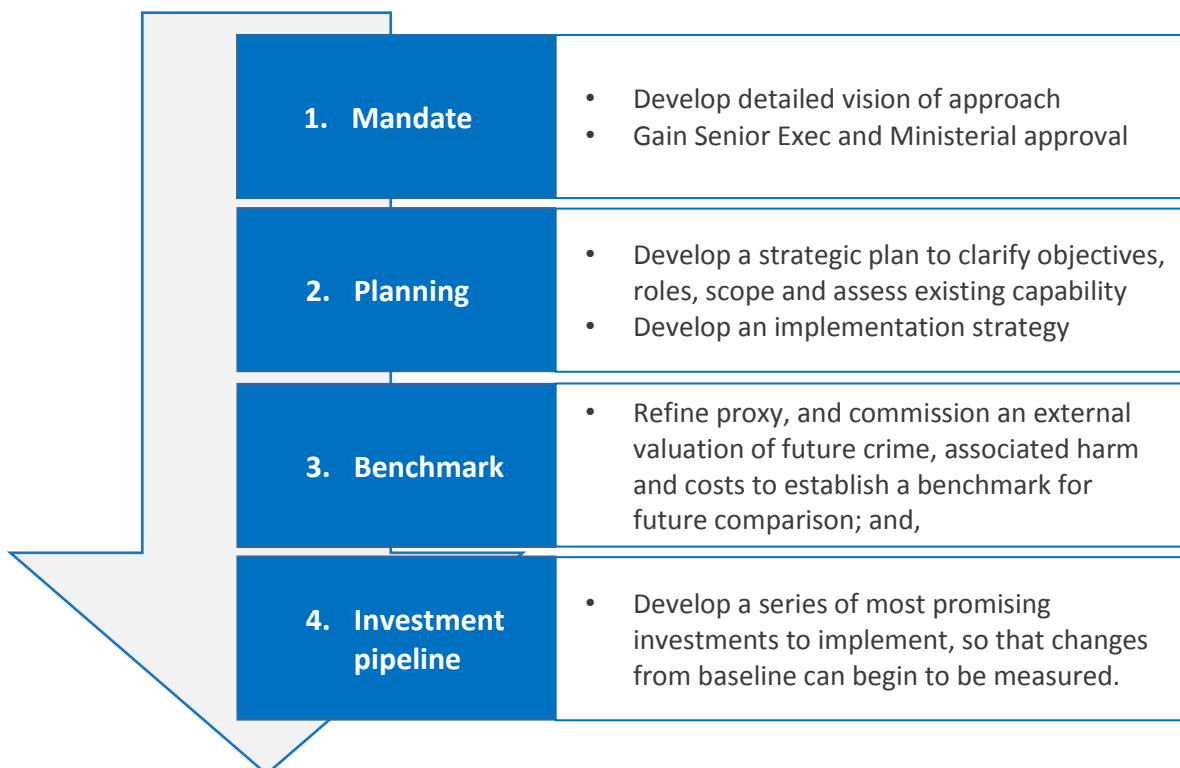
The criminal justice system necessarily features high levels of discretion. To avoid perverse incentives, if fiscal costs—or even a full proxy for harm—were introduced as performance measures, it would be important to complement them with **supplementary monitoring for key decision points**; such as reporting rates, prosecution rates, etc. **Some critical decisions would need to be protected from pressure to reduce costs** at the expense of due process, fairness, and public safety; such as sentencing and parole decisions.

Recommendation

A phased approach introducing an actuarial framework is easier, faster, and less risky:

- Progressive development of insights, with care in the design phase; and,
- Business as usual from an operational perspective, with course adjustments as evidence emerges.

Should Government wish to proceed with the development of a framework for the criminal justice system along the lines described in this report, the following approach may be useful:



2 CONTEXT

INSIDE THIS SECTION:

- About this report: purpose and scope
- Background: context and considerations

2.1 Summary

This chapter outlines the **purpose** of this report: to provide high level advice on the feasibility of an investment approach to reduce the harm caused by crime.

The Government is interested in how it might be possible to provide more consistent and robust advice on investment options to reduce the harm caused by the existence of crime in society. An approach in the criminal justice system should be consistent with the Government's intent to adopt an 'Investment Approach' to social expenditure more generally, including a focus on where and how to invest to improve outcomes and reduce future cost.

The criminal justice sector (meaning broadly Police, Courts and Corrections) has some important similarities to the welfare system, including overlap in the client base. **Considerations** include key differences between the two systems. For example, success in reducing crime only generates fiscal savings through secondary decisions to trim cost, primarily by cutting property and workforce expenditure whereas success in placing welfare recipients in employment has an immediate fiscal saving through reduced benefit payments.

2.2 About this report

2.2.1 Purpose

The Treasury and the Ministry of Justice have jointly commissioned external specialist advice on the feasibility of introducing actuarial or related methods in the criminal justice system. The purpose of this advice is to assist in their consideration of **whether—and if so, how—the sort of long-term investment approach framework and tools introduced in NZ's welfare system might add value in reducing the harm caused by crime.**

2.2.2 Scope

This report contains high-level advice on the extent to which these methodologies may:

- Allow for comparison of the return on investment of different options to reduce the harms associated with crime, including identification of groups of offenders, victims or locations with a high potential for new investment; and/or
- Provide a broader information framework with which to understand system-level performance in terms of reducing the harms associated with crime.

Detailed advice on appropriate methodologies and comment on current performance are out of scope.

2.3 Background

2.3.1 Context for this work

One of the most important objectives of the justice system is **to reduce the harm that is caused by crime**, harm that in many cases can be interpreted as long term social and economic costs. This harm includes, for example:

- The fiscal costs incurred by justice sector agencies in responding to crime, and other fiscal costs outside the justice sector
- Direct financial costs to businesses and individuals related to crime
- Intangible costs experienced by victims and others in society as a direct result of specific crimes, or as a result of being involved in the criminal justice system
- Intangible costs experienced by people in society as an indirect result of crime, such as fear of crime.

The Government is interested in how it might be possible to provide more consistent and robust advice on investment options, to help better identify those options most likely to reduce the harm caused by the existence of crime in society. Any approach would ideally be consistent with the Government's intent to adopt an 'Investment Approach' to social expenditure more generally, including a focus on where and how to invest to improve outcomes and reduce future cost. This social investment has a strong focus on understanding which population groups are at risk of the poorest outcomes and highest costs and thus may benefit from upfront investment. Investment is used in a broad sense to capture policy proposals and practice changes as well as specific programmes.

At the same time, investments to reduce the harms arising from crime also need to be considered in the terms of any effect they may have on other important justice sector outcomes, such as trust and confidence in the police, due process, safe and humane containment and protecting victims' rights.

The criminal justice sector (meaning broadly Police, Courts and Corrections) has some important similarities to the welfare system. Most importantly, both the welfare and justice sectors are responsible for providing services in response to, and minimising the ill effects of, adverse events – unemployment in the example of welfare, and crime in the example of the justice sector. There is also a degree of overlap in the client base.

A central part of the current Government's Welfare Reform programme was the introduction of a new information framework with which to understand the performance of the welfare system. This new information framework uses an estimate of the future cost of the benefit system as a proxy measure of welfare system success at achieving its goal of reducing the long term social and economic costs of benefit dependency. A key advantage of this information framework is the ability it gives the Ministry of Social Development (MSD) to compare the return on investment of different options to support beneficiaries into employment.

2.3.2 Considerations

There are several features of the justice system that are different to the welfare system, which may mean that an actuarial approach to summarising return on investment is more challenging, or that may require actuarial methods to be applied in a different way. Some of the **key differences** we were asked to consider include that, for example:

- Benefits are an entitlement, with clear and stable eligibility rules, whereas justice sector processes in response to crime result from a complex and dynamic interplay of legislative parameters, citizen choice and practitioner decision-making, including by constitutionally independent actors (namely the Police, Judiciary and Parole Board).

- The fiscal costs of benefits are largely defined by a stable set of benefit rates, whereas the fiscal costs of crime are largely defined by agency funding decisions, in particular decisions about capital and workforce expenditure.
- Unemployment typically results in contact with Work and Income whereas many crimes are unreported, meaning that the broader social and economic costs of crime are often not directly visible to the justice sector.
- Benefits are administered by a single agency whereas the justice system traverses multiple agencies, each with its own information system.
- Success in moving a beneficiary into employment automatically generates fiscal savings through a reduction in benefit payments, whereas **success in reducing crime only generates fiscal savings through secondary decisions to trim cost**, primarily by cutting property and workforce expenditure.

2.3.3 Existing sector tools and capabilities

The sector has **an existing base of intellectual capital** used to compare the return of different investment types including:

- Risk assessment tools, such as the RoC*RoI instrument for predicting re-imprisonment among Corrections-managed offenders.
- Forecasts of key justice sector volumes, such as the prison population.
- International league tables of the cost-benefit ratio of various crime prevention options, most notably the example of the Washington State Institute for Public Policy.
- International sources of meta-analyses of experimental and quasi-experimental evaluations of crime reduction interventions, for example the Campbell Collaboration.
- Quasi-experimental evaluations of intervention effectiveness, most notably the annual assessment of Corrections' suite of rehabilitation programmes that is reported in their Annual Report.
- Estimates of the total social cost of crime, such as the Treasury Report from 2006 entitled *Estimating the Costs of Crime in New Zealand in 2003/04*.
- Estimates of the extent of unreported crime, particularly from the *New Zealand Crime and Safety Survey*.

2.3.4 Taylor Fry's experience in the welfare sector

Taylor Fry has had significant involvement in the development of the investment approach to welfare, in partnership with the Ministry of Social Development (MSD). We provided initial actuarial advice on the feasibility of the approach, available on MSD's website:

<https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/taylor-fry-ia-feasibility/taylor-fry-feasibility-of-an-ia-for-welfare-report.pdf>

We have since completed four valuations of the welfare system, also available on MSD's website. The most recent valuation, as at June 2014, is available at:

<http://www.msd.govt.nz/documents/about-msd-and-our-work/newsroom/media-releases/2015/valuation.pdf>

We mention this by way of context for discussion in this report that refers to initial feasibility considerations in the welfare context, as well as the types of analysis that actuarial methods have enabled in the welfare sector.

2.3.5 Acknowledgments

This report is very much the result of a collaborative process. We are grateful to the many officials we met from the Ministry of Justice, the Treasury, the Department of Corrections, NZ Police and MSD. These

officials familiarised us, to the extent possible in a short time frame, with the broad range of activities across the sector, as well the tools and analysis currently in use and under development.

We are particularly indebted to Tim Hughes, from the Ministry of Justice for exposing us to the wealth of intellectual capital related to investment management already in place within the sector and for his own significant contributions to that intellectual capital (such as the investment briefs cited) as well as to the development of the ideas contained in this report. Gwen Rashbrooke, from the Treasury, has been instrumental in shaping the strategic direction for this work, and also participated in the development of its content; as did Sarah Wood, also from the Ministry of Justice.

3 FEASIBILITY

INSIDE THIS SECTION:

- An investment approach defined
- Feasibility defined
- Determinants of conceptual feasibility
- Conceptual feasibility confirmed

3.1 Summary

This chapter explains what we mean in this report by an actuarial framework, and **an investment approach**.

An **actuarial approach** can be thought of as a disciplined framework for estimation, monitoring and re-estimation of uncertain long-term costs. The **investment approach** applies this actuarial discipline to the social welfare sector. It is based on the premise that **using long-term financial signals can encourage better investment decisions based on a long-term view of outcomes**. The policy and operational implication is that investing upfront to improve outcomes for vulnerable populations can offset long-term social consequences as well as costs.

The chapter goes on to outline **how feasibility is defined** for the purposes of this report: it includes conceptual and technical elements, but also a requirement that an investment approach be useful and add value to management of the criminal justice system.

Two key **determinants of conceptual feasibility** are the existence of:

- An appropriate proxy for harm that serves as a common currency to align activities throughout the criminal justice system; and,
- Levers in the criminal justice system to reduce that harm.

Recommendation

After considering a range of options, **we recommend all costs associated with recorded crime as potential proxy for harm**, including:

- Cost of government response within and outside of the justice sector; and,
- Costs (tangible and intangible) associated with harm to society.

Recommendation

We recognize that development of such a broad proxy may prove somewhat complex, and that alternative approaches to weighting the severity of harm may also warrant further consideration.

A progressive approach to implementation, **beginning with an information framework**, would allow time for the relationship between long-term cost signals and business objectives to become clear.

Feasibility advice

An investment approach is **conceptually feasible for the criminal justice system**:

- A proxy for the harm caused by crime can be developed; and,
- Government has levers to continue to reduce this harm.

3.2 An investment approach defined

An investment approach was introduced to the New Zealand welfare system based on the following 2011 recommendation of the Welfare Working Group:

“A long-term view – The welfare system needs to recognise the value of investing early to reduce the long-term social, economic and fiscal costs of welfare dependency. Adopting an actuarial approach to measuring the forward liability will therefore be an important feature of any reform.”¹

The Government adopted the investment approach as the underpinning for its reform of the welfare system:

“The investment approach aims to reduce long-term benefit dependency. Actuarial methods are used to quantify and make transparent the long-term costs of the benefit system and to guide investment toward improving employment outcomes in ways that reduce long-term benefit use.”²

Actuarial methods measure risk and uncertainty over long periods of time, typically in an insurance or social insurance context. MSD uses the resulting business intelligence to manage the welfare system, including investment decisions such as which types of case management and employment programmes are most effective, and for whom.

“An actuarial approach has been taken to measure the forward liability associated with the welfare system. The liability acts as a proxy for assessing people’s risk of long-term benefit dependency and provides a tool to assist management in working with those people.”³

An **actuarial approach** can be thought of as a disciplined framework for estimation, monitoring and re-estimation of uncertain long-term costs. The **investment approach** applies this actuarial discipline to the social welfare sector. It is based on the premise that **making long-term financial signals transparent can encourage better investment decisions based on a long-term view of outcomes**. The policy and operational implication is that investing upfront to improve outcomes for vulnerable populations can offset long-term social consequences as well as costs.

The Government has indicated its intention to look at other sectors where an investment approach may be appropriate and opportunities for collaboration between sectors. According to State Services Minister Paula Bennett, who was previously Minister for Social Development through Welfare Reform:

“And both Minister English and I have the intention of rolling out the investment approach wider than just Work and Income. You can see how it fits particularly with those children who are most vulnerable across all different agencies. We’re talking about the same children. If we know who they are earlier, then we’re willing to invest more for that long term gain, both for

¹ Welfare Working Group report: <http://igps.victoria.ac.nz/WelfareWorkingGroup/Index.html>

² Welfare Reform Cabinet Paper A: Overview: <https://www.msd.govt.nz/documents/about-msd-and-our-work/newsroom/media-releases/2013/wr-cab-paper-a-overview.pdf>

³ Benefit System Performance Report: <https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/investment-approach/2013-benefit-system-performance-report.pdf>

them as far as what they can achieve in life and it always makes sense as well balancing the books."⁴

Actuarial approaches and their potential for transferability to the criminal justice system are discussed further in Section 4.2.

3.2.1 A common currency

An investment approach **uses a common currency to tie management and insight together through all levels of the system.** This common currency:

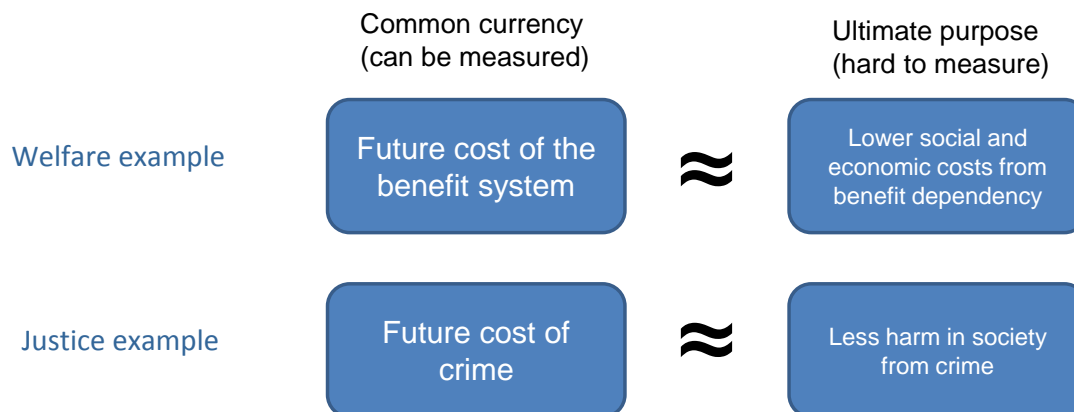
- Is a proxy for the ultimate purpose of the system, which would otherwise be unmeasurable; and,
- Aligns analysis across the business, providing a unified view of risk and performance.

In the welfare system, lifetime estimates of benefit receipt provide insight into who is at greatest risk of long-term benefit receipt. The future cost of the benefit system serves as a proxy for the harm caused by long-term benefit receipt, associated with negative social, economic and fiscal outcomes. Importantly, cost signals sent by movements in this proxy align with MSD's objective to reduce long-term benefit receipt.

The future cost of benefit receipt provides:

- A unified measure of system-level performance
- A basis for comparing beneficiaries' level of risk, and an understanding of the distribution of long-term costs in the system
- A basis for comparing return on employment and work-readiness investments.

To ensure alignment between cost signals and business objectives, an appropriate proxy for harm that serves as a common currency within the justice sector would be a necessary condition for feasibility of an investment approach performance framework.



3.2.2 Information versus performance frameworks

Not all good management decisions result in savings. There may be good reasons to take a policy or operational decision that incurs increased costs; for example, improved public safety, a deliberate attempt to increase reporting rates to address particularly harmful crimes, or requirements to respect due process. There are a number of potential scenarios in the justice sector in which movements in the

⁴ NZ Herald, Bennett rolls out 'investment approach': http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11338071

future *cost* of crime may not signify a corresponding change in the level of *harm* caused by crime. These are discussed in further detail in Section 7.3.

The value in an actuarial framework is that it provides increased **visibility of the relationship between drivers of change—including policy and operational changes—and long-term costs**. Quantifying these relationships provides insight into the long-term implications of various types of decisions that is useful in managing the system. Decisions about how best to make use of this information are appropriately made by Government and management, respectively.

There is an important distinction to be made between **using the framework for information and using it to measure performance**:

- An information framework would make use of the underlying information provided by the framework as a source of business intelligence to inform strategic and operational decisions; such as movements in key drivers of long-term cost, population groups of particular interest and impact of policy and operational levers on the long-term cost.
- A performance framework would use movements in long-term costs, or a subset of those costs as a performance measure. This could potentially be the share of liability considered to be under management influence or the share associated with a specific agency's costs.
- Both types of frameworks could interact with one another; for example:
 - An information framework could cover the whole sector, with a performance framework for only certain components of the system; and/or
 - An information framework could be introduced as a first step, with a performance framework developed based on a stronger understanding over time of the relationship between levers and financial performance.

3.3 Feasibility defined

For an investment approach framework to be **conceptually feasible** in the criminal justice system, it would need to meet the following tests:

- An effective proxy for harm can be developed.
 - A performance framework requires this proxy to align cost signals and business objectives.
 - An information framework would be strengthened by, but does not depend on alignment of cost signals and business objectives.
- Government has levers to continue to reduce harm, as measured by that proxy.

These determinants of conceptual feasibility are assessed at a high level in the remainder of this chapter, and in further detail in *Chapter 5: What?*

Not only should an investment approach framework be feasible, it would also need to be **useful** in managing the criminal justice system, over and above existing tools. *Chapter 4: Why?* establishes the **value add** of an investment approach framework by showing that it:

- Provides a broad information framework to understand system-level performance in reducing the harm associated with crime
- Assists in identifying groups of offenders, victims or locations with a high potential for new investment; and,
- Allows for comparison of the return on investment of different options to reduce the harm associated with crime.

Finally, an investment approach would need to meet tests related to **technical feasibility**:

- A suitable methodology can be developed; and,

- Available data are of sufficient quality to enable the development of tools required to support the framework.

These technical conditions are discussed in *Chapter 6: How?*

3.4 Conclusion: Conceptual feasibility

3.4.1 A suitable proxy for harm

Recommendation

After considering a range of options, **we recommend all costs associated with recorded crime as potential proxy for harm**, including:

- Cost of government response within and outside of the justice sector
- Costs (tangible and intangible) associated with harm to society

The basis for this recommendation is discussed in Section 5.5.

Recommendation

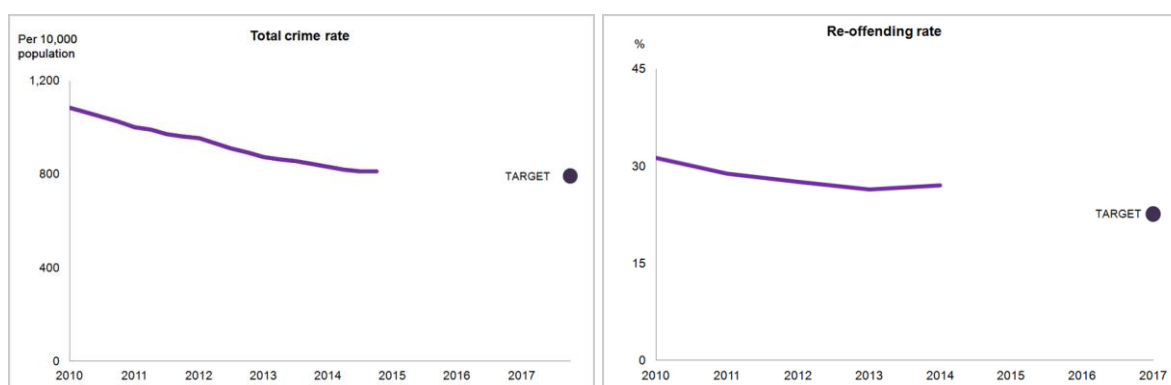
We recognize that development of such a broad proxy may prove somewhat complex, and that alternative approaches to weighting the severity of harm may also warrant further consideration.

A progressive approach to implementation, **beginning with an information framework**, would allow time for the relationship between long-term cost signals and business objectives to become clear.

3.4.2 Levers to reduce harm

Government has Better Public Services (BPS) targets to reduce crime and re-offending. Progress is illustrated in Figure 3.1.

Figure 3.1 Progress on Reducing crime and re-offending to date, reproduced from the BPS website⁵



There has been a sustained downward trend in crime for decades, and progress has continued against BPS targets in recent years. Nevertheless, crime remains harmful and costly to NZ society, as discussed in Section 4.3. Some population groups are particularly affected.

⁵ <http://www.ssc.govt.nz/bps-reducing-crime>

Section 5.2 discusses how an investment approach would build on volume-based BPS targets to incentivise and reward a focus on more complex aspects of the justice sector; such as reducing the severity and concentration of crime, harm and related costs.

The justice sector has multiple objectives, some of which are listed below. Not all of these objectives are amenable to an investment approach. Therefore **the scope of an investment approach would be limited to the criminal justice system.**

Table 3.1 Broad overview of justice sector

Justice responsibilities	Justice aims
<ul style="list-style-type: none"> • Crime response • Civil justice • Safe and humane containment • Offender rehabilitation • Support for victims • Legal help • Road safety 	<ul style="list-style-type: none"> • Less crime • Build trust and confidence • Safer communities • Fair delivery of justice and punishment

In addition to their core function responding to crime, justice sector agencies already invest in a range of prevention activities, many of which continue to offer promise of improved outcomes in the future. These are discussed further in Sections 4.3 and 5.3.

Feasibility advice

An investment approach is **conceptually feasible** for the criminal justice system:

- A proxy for the harm caused by crime can be developed; and,
- Government has levers to continue to reduce this harm.

4 WHY?

INSIDE THIS SECTION:

- Why an actuarial approach?
- Why the criminal justice system?
- What is the value add?

4.1 Summary

The chapter explains what **an actuarial approach** is, introducing key concepts such as an actuarial control cycle that compares actual experience to forecast, and explaining why these help to manage complex systems by:

- Measuring risk, uncertainty and change
- Providing insight into the distribution of long-term costs; and,
- Measuring the impact of interventions.

Actuarial approaches are **well-suited to the criminal justice system** because:

- Crime is harmful and costly to society
- Crime, harm and costs are unevenly distributed—particularly from a long-term perspective; and,
- Government has levers to continue to reduce the harm caused by crime.

There is a wealth of analysis and tools already in existence within the justice sector. **The point of difference with an actuarial approach is to bring together these types of analysis into an integrated framework that offers a long-term view of crime and harm.** Systematic measurement of change provides insight into what works to reduce crime and harm, and for whom.

We propose a possible three-level framework that adds value by:

- Enabling **whole of system performance measurement** and insight into important trends and changes over time
- Providing insight into **concentrations of risk** that drive poor long-term outcomes; and,
- Providing **a consistent framework for evaluation** and drives innovation in crime prevention and harm mitigation.

Feasibility advice

An investment approach **adds value** in terms of:

- High level policy and management focus
- Operational focus on important segments (subgroups of clients); and,
- A framework to understand return on investment.

4.2 Why an actuarial approach?

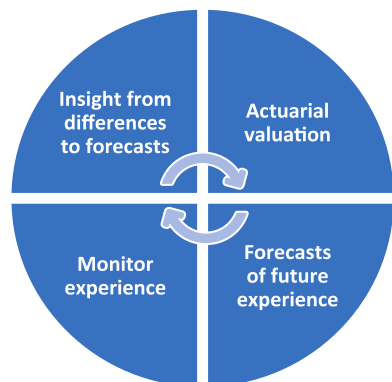
4.2.1 What is an actuarial approach?

In social insurance and insurance schemes – such as workers’ and accident compensation schemes – it is a requirement for actuaries to periodically quantify long-term costs. This typically takes the form of a **valuation of the future liability**; that is, an estimate of the total outstanding costs associated with claims by current clients. Valuations also include estimates of expected future claims for events that have not yet occurred.

4.2.2 Measuring risk, uncertainty and change

Understanding the liability of a scheme—and identifying changes to the liability as they emerge—ensures that schemes are adequately funded so that they remain solvent. **Actuarial methods have been developed specifically to address questions of long-term risk with high levels of uncertainty**; such as:

- Predicting the frequency and cost of natural disasters:
 - How much extra premium does a property insurer need to charge to provide earthquake cover? Flood cover? Terrorism cover?
 - What level of reinsurance and capital is required to provide protection against insolvency?
- Identifying emerging risks to financial sustainability:
 - How do changing building standards affect risks from earthquakes?
 - How is climate change impacting the frequency and severity of weather related disasters?
- Isolating the impact of different factors on the long-term cost;
 - How much will changes in inflation vs changes in frequency of storms vs changes in type of construction, etc. impact the cost of insurance?



A core concept is the **actuarial control cycle**:

- The cycle is based on periodic comparisons of actual scheme experience to forecasts.
- Differences from expectations are an important source of insight into changes.
- Drivers of change include external influences beyond management influence, and performance.
- Financial impact of changes can be allocated between these drivers.

This systematic approach to whole-of-system monitoring is qualitatively different from (but complementary to) using analytics techniques to assist with specific decisions within the system. Forecasts at an aggregate level can be made with greater certainty that estimates related to individual behaviour or isolated events. Moreover, the purpose of frequently revisiting estimates through the monitoring framework is to understand changes from expected and recalibrate those estimates.

4.2.3 Understanding the distribution of costs

Actuarial and statistical methods can also be used to provide insights into client behaviour. Individual long-term cost estimates identify the highest-complexity clients. Segmenting clients into like groups shows how costs are distributed. **This enables organisations to direct their efforts and resources where the liability is concentrated; insofar as it is possible to influence the behaviour of high-cost client subgroups.**

For example:

- ACC achieved impressive reductions in their liability through more effective triage and service differentiation between lower- and higher- cost claims, and by refocusing their business model for serious injury claims (which make up a significant share of the overall liability).
- In the private sector, customer segmentation is used to tailor products, services and marketing strategies to different groups of customers who have similar characteristics or behaviour; such as early adopters of emerging technologies—high value segments.

Many insurers and accident compensation schemes build models to predict future payments expected for individual claims — that is, an estimate of the lifetime cost for each claim based on its own characteristics. Insurers and accident compensation schemes use these models in the workers' compensation sector.

In workers' compensation, the 15% or so of claims in which the claimant is off work for three months or more might consume 90% of the financial cost of all claims. Identifying and proactively managing these claims as early as possible is important to schemes' overall financial sustainability.

Insurers use an understanding of different segments of their claims portfolios to concentrate their management on population subgroups with the most serious (and expensive) claims. Their approach could be as simple as a basic segmentation of claims combined with their duration in order to allocate the most serious claims to the one of the specialist claim teams, such as the serious injury team or the psychological claim team. At the more complex end of the spectrum, insurers use data mining algorithms to build models to predict the probability of a claim becoming serious.

Individual lifetime estimates, triage and segmentation serve a function that is in some respects similar to current risk assessment tools in place in the justice sector; such as the RoC*RoI tool. This type of tool, designed for individual estimates, would likely continue to serve its purpose in the context of an investment approach. A common currency, as proposed in this report, would build on existing tools by:

- **Aggregating results** for multiple offenders, with a financial dimension
- **Identifying populations** where risk, harm and cost are concentrated.
- **Linking risk assessment with performance measurement**; such as the extent to which specific interventions reduce risk and the associated savings.

4.2.4 Measuring the impact of interventions

In the insurance and social insurance context—as elsewhere—an organisation using an evidence-based approach to managing its portfolio will develop a natural cycle of monitoring, analysis, innovation and evaluation. In this cycle, innovation to improve scheme performance is inextricably linked to evaluation of the innovation's success, without which there would be no motivation for further innovation. The continual review and analysis of behavioural and financial information provides management with practical insight into the performance of their portfolios.

Income replacement makes up a large share of the cost of workers' compensation schemes. International evidence supports quick returns to work as a best practice from a health perspective.⁶ Organisations that pro-actively manage their claims portfolio by committing resources and searching for innovation make a material difference to the financial cost of that portfolio through improved health and return to work outcomes.

Randomised Control Trials (RCTs) are the gold standard for measuring the benefits of programs for managing cases and comparing the return on investment from return-to-work programs. RCTs are valuable in evaluating employment programs because they determine the true impact of the program, as

⁶ <http://www.racp.edu.au/index.cfm?objectid=57063EA7-0A13-1AB6-E0CA75D0CB353BA8>

distinct from other factors such as changes in regional labour markets, or changes in the composition of program participants or, importantly, changes over time.

A true understanding of impact is a crucial input to determining return on investment. Comparing return from different programs over a long-term horizon guides decisions about how to re-allocate investments. Using the evaluation results as inputs to the valuation enables analysis of long-term return on investment.

In some cases, such as costly training interventions, a long-term analysis of return on investment yields significantly different results than a short term analysis. An example of this would be a program that improves qualifications and earnings over the long term, but results in a “lock-in effect” where clients remain on benefits in the near-term.

Recommendation

RCTs are best practice for evaluating the impact of interventions. RCTs make it possible to disaggregate programme impacts from external influences, fundamental to understanding return on investment.

RCTs also enable high quality analysis of effectiveness and return on investment for population subgroups, by characteristic and/or location. This analysis enables improved targeting of investments based on which is most effective for whom.

Once again, a common currency, would serve to **integrate impact analysis with other components** of the system. For example:

- What is the financial impact of reduced incidence and severity of recidivist crime due to each rehabilitation and reintegration investment type?
- How does the return on investment compare for each investment?
- Which investments have the most impact for high-complexity segments?
- What would be the expected savings associated with a roll-out of an effective investment?
- How much has the total financial impact of all crime prevention programs changed from one year to the next?

4.3 Why the criminal justice system?

4.3.1 Crime is harmful and costly to society

The Justice Sector’s Briefing to the Incoming Minister (BIM) indicates that **a sustained downward trend in crime has led to a 35-year low**. This is consistent with an international trend towards decreasing levels of street crime in industrialized countries, of which the causes are a source of debate. There are a range of hypotheses related to economic trends, policy and operational choices, environmental factors and changing societal behaviours. A comparison of 15 hypotheses found that the strongest, in terms of a series of tests such as strength of evidence and transferability of findings between countries, was that increasing security is reducing the opportunities for crime.⁷

Nevertheless, the most recent *NZ Crime and Safety Survey* (NZCASS 2009)—the most complete view of the total level of crime—estimated **a total of 2.6 million incidents in 2008, affecting an estimated 36% of the population**.

- Assaults were the most prevalent crime type (27% of incidents).

⁷ Farell, Crime Science 2013, 2:5, <http://www.crimesciencejournal.com/content/2/1/5>

- There were 1,702,000 personal offences (including 699,000 assaults and 548,000 threats); and 910,000 household offences (including 342,000 burglaries and 246,000 vehicle crimes) in 2008.
- If crime were distributed equally, this would mean 50 personal crimes per 100 adults 15 and older, and 56 household crimes per 100 households.
- Of these total crime levels, the survey found that approximately one-third were reported to Police; 40% of crime was not considered a crime by victims. 87% of NZCASS crime was not counted in recorded crime statistics.
- Of crime not reported to Police, 21% was because victims felt the matter was private. The lowest reporting rate of any crime type was associated with sexual offences (just 7%), while the highest was for thefts of vehicles (76%).⁸

According to the Justice Sector Briefing to the Incoming Government, there were **360,000 recorded crimes in 2013**. The Ministry of Justice is the lead agency in the justice sector, which takes a cross-agency view on the criminal justice pipeline.⁹ **Sector spending is approximately \$3.8 billion per year**, with the majority of resources focused on criminal justice services. This is in addition to \$4.4 billion in assets managed by the Crown, such as courts and prisons.¹⁰

There are even greater costs to government and society outside of the justice sector. A 2009 Ministry of Justice paper **estimated the full cost of crime to NZ in the 2005/06 financial year at \$12.6 billion, or 7.9% of NZ's GDP at that time.**

- The paper used a mix of administrative data related to public sector expenditure in the justice, health and other government agencies and the non-profit sector; and survey data related to costs incurred by business, households and individuals.
- Costs incurred by the private sector (private citizens and businesses) represented 80% of that cost (\$10.1 billion), while costs to the public sector represented 20% (\$2.5 billion).
- Deception offences were the most costly crime type (\$2.9 billion) followed by acts causing injury (\$2.8 billion) and theft and burglary (\$1.3 billion).¹¹

4.3.2 Crime, harm and costs are unevenly distributed

Figure 4.1 illustrates the flow of charges, cases and people through the criminal justice pipeline. This shows which agencies are involved at each stage and the volume flows; that is, the share of crimes that are resolved and the share of those that result in convictions and sentences. There are, of course, **administrative costs associated with each point of contact with the sector.**

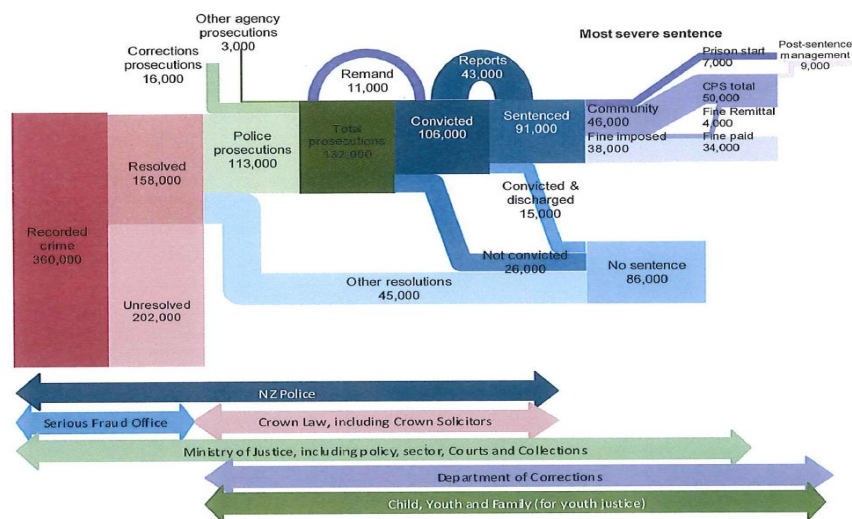
⁸ <http://www.justice.govt.nz/publications/global-publications/n/nzcass-2009>

⁹ Justice Sector Report 2013: <http://www.justice.govt.nz/publications/global-publications/j/justice-sector-report-2013>

¹⁰ 2014 Justice Sector BIM: <http://www.justice.govt.nz/publications/global-publications/b/bim-2014/documents/justice-sector-big>

¹¹ Ministry of Justice: An Estimate of Crime Costs to NZ in 2005/06

Figure 4.1 Flow of charges, cases and people through the criminal justice pipeline 2013, reproduced from Justice Sector Briefing to Incoming Government¹²



Both the level of harm and the cost associated with each crime varies according to its severity. There is not necessarily a direct relationship between the level of harm caused by a crime and the cost of responding to that crime (if it is reported). On balance, however, the least severe crimes will tend to have low administrative response costs (such as suspended sentences), while the most severe crimes will tend to have extremely costly responses (such as more complex investigations and trials, and longer prison sentences in higher-security facilities). Table 4.1 provides estimates of differences in costs by crime type and how they are spread across different sectors.

Table 4.1 Estimated crime cost by sector and category of crime for 2005/06 (\$ million), reproduced from *An Estimate of Crime Costs to NZ in 2005/06*¹³

	Public sector			Private sector	NGO sector	Total cost
	Justice sector	Health sector	Other public			
Abductions	19	-	-	8	-	27
Causing injury	213	27	-	2,593	11	2,844
Dangerous acts	212	328	-	68	9	617
Deceptions	62	-	178	2,670	-	2,910
Homicides	83	10	-	147	0	240
Illicit drugs	107	7	-	25	1	140
Miscellaneous	66	-	35	1,173	-	1,274
Against justice	69	-	-	71	-	140
Property damage	56	-	49	665	-	770
Public disorder	88	-	0	55	-	143
Road traffic	81	-	-	-	-	81
Robbery, extortion	82	0	-	198	0	280
Sexual offences	187	32	-	308	0	527
Theft	184	-	-	1,068	-	1,252
Unlawful entry, burglary	245	-	-	1,035	2	1,282
Weapon offences	34	-	-	8	-	42
Total	1,788	404	262	10,092	23	12,569

¹² <http://www.justice.govt.nz/publications/global-publications/b/bim-2014/documents/justice-sector-big>

¹³ Ministry of Justice: *An Estimate of Crime Costs to NZ in 2005/06*

Moreover, recidivist offending patterns mean that **some offenders will have significantly more frequent contact with the justice sector**, increasing the costs associated with that individual. Victimisation also predicts increased risk of either re-victimisation, or in some cases (such as child abuse) increased risk of offending. There is also a tendency for crime to be concentrated in specific locations. The concentration of harm and costs related to severity of crime, recidivist offending, repeat victimisation and high-crime locations is discussed further in Sections 5.2 and 5.3.

4.3.3 Government has levers to continue to reduce the incidence of crime

As discussed in Section 3.4.2, government has set targets to reduce the total crime rate and reduce re-offending (compared to June 2011). Better Public Services reporting indicates that significant progress has been made in achieving each of these targets.¹⁴

Specifically these targets are to reduce:

- Total crime by 20% by July 2018 (This target was increased at the end of 2014 because the original target of a 15% reduction by June 2017 was exceeded).
- Violent crime by 20% by July 2017
- Youth crime by 25% by July 2017
- Re-offending by 25% by July 2017.

These are the justice sector's key goals and in recent years there has been **an increased focus on education, training and rehabilitation investments which contribute towards crime prevention**;¹⁵ and addressing drivers of crime such as substance abuse.¹⁶

These interventions do make a difference. For example, a justice sector investment brief summarising international and domestic evidence finds strong evidence that alcohol and drug treatment reduces re-offending. For every 5-20 offenders who receive psychological treatment, one instance of reconviction is prevented. For every 5-25 offenders who receive pharmacological treatment, one instance of reconviction is prevented. Live-in treatment appears to reduce re-offending the most. Treatment is more effective for younger adults than for older adults, and treatment provided to adolescents may reduce substance abuse without reducing reoffending. The scale of delivery of alcohol and drug treatment is currently being expanded. Given that the effect size is relatively modest, containing costs is important to cost-effectiveness.¹⁷

The range of levers to respond to and prevent crime and harm will be discussed further in Section 5.3.

4.4 Conclusion: Value add

4.4.1 Why an actuarial approach in the criminal justice system?

Actuarial approaches are well-suited to complex systems characterised by:

- Large costs and long-term dynamics with considerable risk and uncertainty
- An uneven distribution of costs; particularly from a long-term perspective; and,
- Efforts to continuously improve the management of long-term costs.

¹⁴ Better Public Services website: <http://www.ssc.govt.nz/bps-reducing-crime>

¹⁵ Justice Sector Report 2013

¹⁶ Drivers of Crime: Investment package for alcohol and other drug assessments and interventions – implementation plan, Cabinet paper

¹⁷ Justice Sector, Investment Brief: Alcohol and Drug Treatment

Actuarial approaches are being used in other sectors to manage down long-term costs through better client outcomes. In the welfare context, these approaches are used to:

- Make transparent the full lifetime cost of all beneficiaries and isolate the impact of changes to key drivers on this future liability
- Generate lifetime estimates for cohorts and individuals that assist MSD in understanding the distribution of future liability and client behaviour; and,
- Project, measure and compare return on employment investments, based on their impact on these lifetime cost estimates.

The criminal justice system has a number of characteristics that lend themselves well to actuarial methods and an investment approach:

- Crime harmful and costly to society
- Harm and costs are unevenly distributed; particularly from a long-term perspective; and,
- Government has levers to continue to reduce the harm caused by crime.

In the justice sector there is a wealth of sector, domestic and international analysis of:

- Risk factors that contribute to offending, recidivism, and repeat victimisation
- Offending patterns and likelihood of recidivism
- Strategies for weighting the relative severity of crime and harm
- Unit costs associated with various points of contact within the justice sector
- Best practice for responding to and preventing crime and harm, including evaluations of impact size, cost-benefit analysis (CBA) and return on investment (RoI).

The point of difference with an actuarial approach is to bring together these types of analysis into a **framework that offers a whole-of-system, long-term view of future crime and harm**. There is also an important opportunity for collaboration across sectors, given the **considerable overlap in risk factors for offending, victimisation and other adverse social outcomes**.

4.4.2 Case study: Value add in the welfare sector

This section provides real examples of the use of an integrated actuarial framework in the management of the welfare system.

System oversight: High level policy and management focus

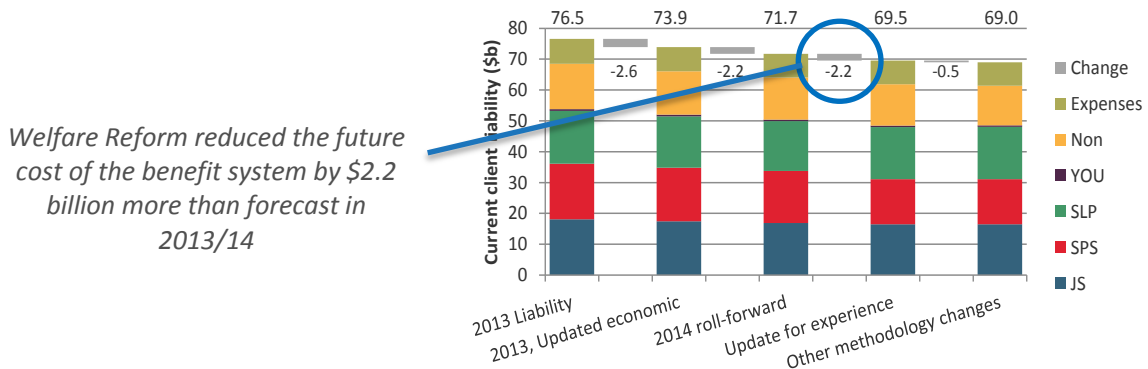
This example demonstrates how the framework can be used to understand what has changed from one year to the next, at a whole-of-system level.

Annual valuations enable attribution of total change in future cost to components, including policy/operational changes, changes in economic conditions.

- The first bar on the left in Figure 4.2 shows the expected future cost of the welfare system as at 30 June 2013, broken into client groups based on main benefit types (shown in colours) and expenses to administer the system.
- The second bar shows the change (-\$2.6 billion, shown in grey) when the 2013 estimate is updated retrospectively to account for the actual economic conditions in 2013/14, and forecast changes going forward (such as lower than anticipated unemployment and inflation rates).
- The third bar shows the 'roll-forward' for 2013/14; that is, expected benefit payments over the course of the year (\$-2.2 billion).
- The fourth bar shows the residual change in system performance (-\$2.2 billion) after these other factors have been accounted for, along with a methodology improvement (shown in the final bar).

By disaggregating factors such as the unemployment rate that are outside management influence, the \$2.2 billion savings can be attributed to policy and operational changes through Welfare Reform.

Figure 4.2 Analysis of change in liability between 2013 and 2014 valuations, by client segment at valuation¹⁸



Enables whole of system performance measurement and insight into important trends and changes over time.

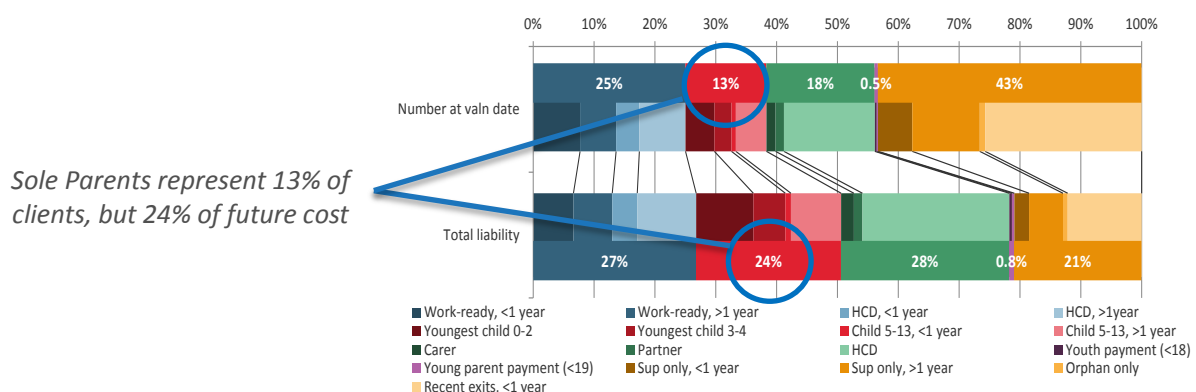
Sector and cohort drill-down: Operational focus on important segments

These examples demonstrate how the framework can be used to understand:

- The overall distribution of the long-term cost among different population groups; and,
- Which population sub-groups have the highest long-term cost.

Total estimates of the future system cost can be broken down by client group. Figure 4.3 compares the distribution all beneficiaries on the valuation date (30 June 2014) to the distribution of their expected future cost. This measures the concentration of costs among some client groups, reflecting their higher likelihood of long-term benefit receipt. Costs associated with non-beneficiaries are shown in yellow.

Figure 4.3 Contributions of beneficiary segments towards client numbers and total liability (as at June 2014)¹⁹



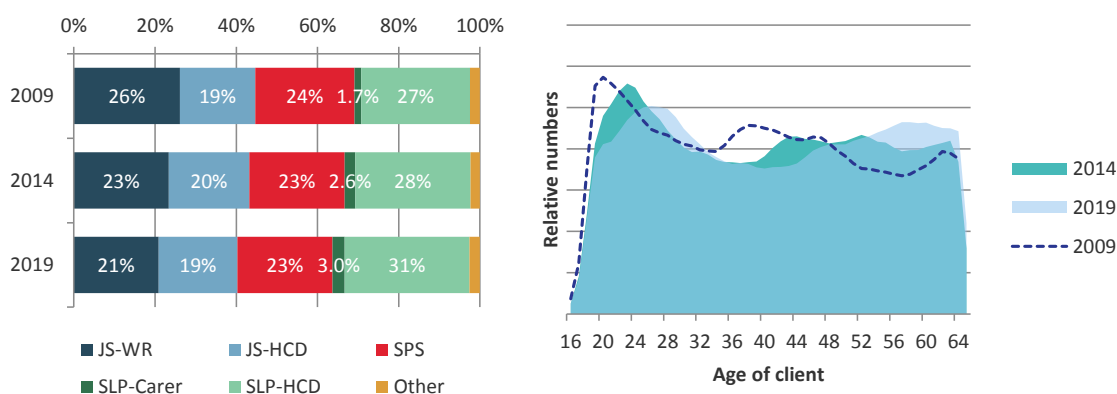
¹⁸ Taylor Fry, 2014 Valuation of the Working-age benefit system, Ministry of Social Development: <https://www.msd.govt.nz/documents/about-msd-and-our-work/newsroom/media-releases/2015/valuation.pdf>

¹⁹ Ibid

Valuation analysis also shows how the make-up of the population is evolving over time, as illustrated in Figure 4.4:

- The figure on the left compares the actual distribution of beneficiaries in 2009 and 2014 with the forecast for 2019. Note that the middle bar reflects the same client volumes as the top bar of Figure 4.3, except that this time non-beneficiaries are excluded. This shows that the population is shifting away from Jobseekers (shown in darkest blue) and towards Supported Living Payment (SLP) beneficiaries (shown in green). SLP made up 29% of the main benefit client base in 2009, compared to our forecast 34% in 2019.
- The figure on the right compares the age distribution of beneficiaries over those same three years. This shows that the benefit population is getting older. The average client age is expected to increase by nearly a year by 2019.

Figure 4.4 Benefit type and age distribution for June 2009, June 2014 and June 2019²⁰



These concentrations of long-term cost are a reflection of the populations at highest risk of long-term benefit receipt. Understanding how the distribution of costs and risk are changing helps to plan for emerging trends, as well as understand performance for different client groups.

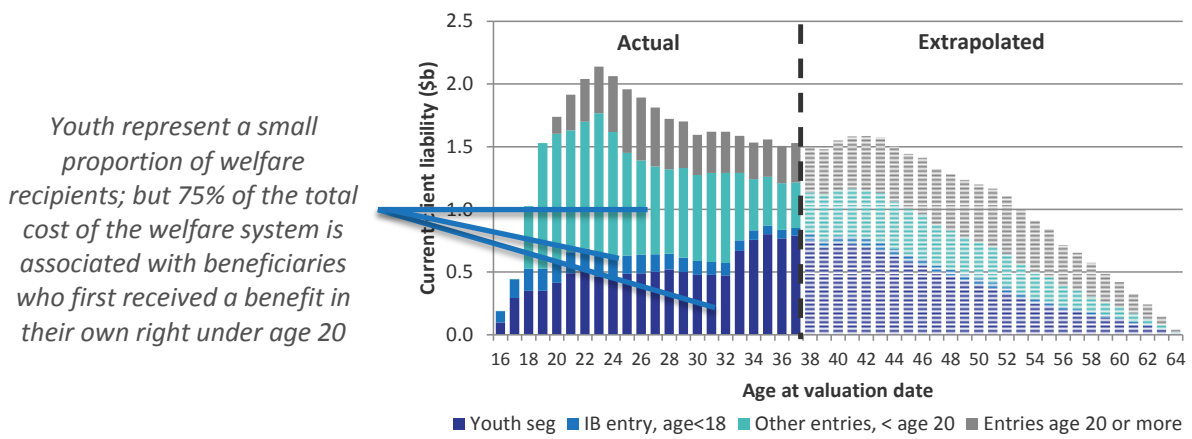
Figure 4.5 shows the total future cost of the benefit system split into age bands by the age of current clients. The size of each bar gives an indication of how much of the liability is associated with each age band.

- For example, the small size of the first two bars reflects the small share of the total liability associated with the very small number of beneficiaries aged 16 and 17 at the valuation date.
- There is a large volume of clients in their early 20s; and therefore they make up a greater share of the liability compared to other age bands.

The colour coding in Figure 4.5 shows the age at first entry into the benefit system. The darkest shade of blue indicates beneficiaries who first entered through the Youth segment; due to family breakdown or as teen parents. The middle shade of blue indicates beneficiaries with severe health conditions and disabilities who first entered under 18. The turquoise shows other entries below age 20. Taken together, the blue shaded areas show that the vast majority of the long-term benefit system is associated with clients who first entered under age 20.

²⁰ Ibid

Figure 4.5 Liability (as at June 2014) split by current client age and age at entry into the benefit system²¹



Youth represent a small proportion of welfare recipients; but 75% of the total cost of the welfare system is associated with beneficiaries who first received a benefit in their own right under age 20

Provides insight into **concentrations of risk** that drive poor long-term outcomes for population sub-groups.

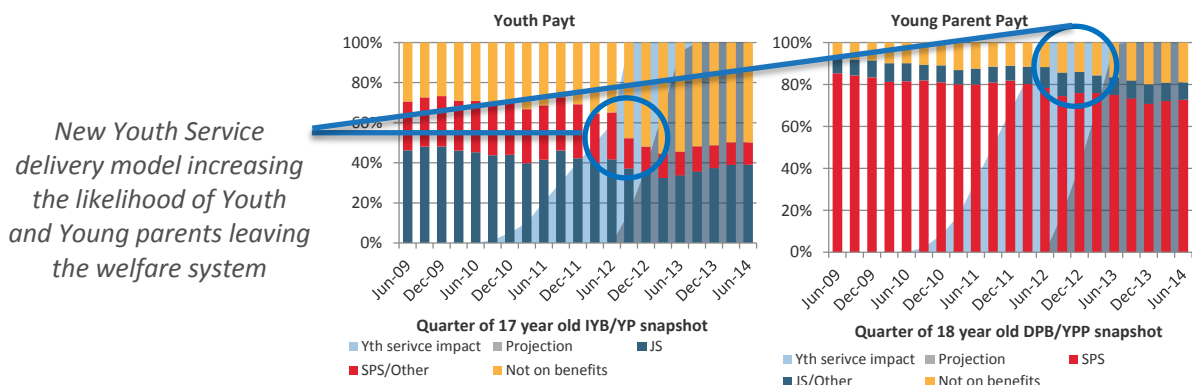
Disciplined innovation: A framework for understanding return on investment

This example demonstrates how the framework can be used to understand the performance of investments.

Valuing the lifetime costs of benefits makes it clear that an effective strategy for working with youth and young entrants is essential to achieving the goal of reducing long-term benefit receipt. While it is still early days, the Youth Service introduced in August 2012 appears to be reducing the likelihood of participants aging into working-age benefits:

- More young adults who received YP at 17 are off benefits (shown in yellow in Figure 4.6) when they turn 19, and fewer have transferred to SPS (shown in red)
- More young adults who received YPP at 18 are off benefits when they turn 20
- The timing of these improvements is closely aligned with the introduction of the Youth Service (light blue shaded area; grey area shows our projected continuation of these early trends).

Figure 4.6 Benefit status for 19 year-olds who were formerly Youth Payment recipients at age 17 (left); and for 20 year-olds who were formerly Young Parent Payment recipients at age 18 (right)²²



New Youth Service delivery model increasing the likelihood of Youth and Young parents leaving the welfare system

²¹ Ibid

²² Ibid

Provides a **consistent framework for evaluation** and drives innovation in crime prevention and harm mitigation by converting risk and return into a common currency based on a long-term view.

4.4.3 Justice sector examples

This section provides hypothetical examples of how such a framework could potentially add value in the criminal justice system, listed in Table 4.2.

Table 4.2 Value add in the justice sector

Value add	Justice sector examples (hypothetical)
System oversight	<ul style="list-style-type: none"> How much money has the Government saved over the long-term due to progress on BPS measures? How much of the change in recorded crime rates from one year to the next is driven: <ul style="list-style-type: none"> By a change in reporting rates? By factors outside management influence, such as demographics and the economy? By policy and operational changes?
Agency and cohort drill-down	<ul style="list-style-type: none"> Which population subgroups of offenders and victims, and which crime hotspots can we expect to contribute most to crime over the next ten years? What is the total expected future cost associated with offenders who first offend before age 17? Which types of crime have been reduced over the long term due to progress in reducing youth offending? What is the total cost associated with harm to chronic victims? What share of costs is associated with offenders and victims with a history in state care? What characteristics differentiate between those in state care who go on to have intensive involvement with the sector, and those who do not?
Disciplined innovation	<ul style="list-style-type: none"> Which responses by Police reduce chronic victimisation the most? What is the long-term impact of therapeutic courts and restorative justice on re-offending by crime type? Which Corrections rehabilitation and reintegration activities have the most impact in reducing the severity of recidivism and duration of criminal careers for high-complexity offenders? Are social sector initiatives such as the Vulnerable Children Agenda and the Youth Service having an impact on youth offending and victimisation?

4.4.4 Value add

Feasibility advice

An investment approach **adds value in terms of high level policy and management focus** by:

- Providing a broad information framework to understand system-level performance in reducing the harm associated with crime
- Offering insight into drivers of long-term cost and changes over time; and,
- Informing policy development and areas of strategic interest to management.

Feasibility advice

An investment approach **adds value in terms of an operational focus on important segments** by:

- Offers insight into concentrations of risk that drive poor long-term outcomes and performance for those groups; and,
- Assists in the identification of groups of offenders, victims or locations with a high potential for new investment and for other targeting decisions.

Feasibility advice

An investment approach **adds value through a return on investment framework** that:

- Allows for comparison of the return on investment for different options to reduce harm and crime
- Provides insight into long-term dimensions of performance; and,
- Informs decisions about which interventions to trial, scale up or terminate.

5 WHAT?

INSIDE THIS SECTION:

- Problem definition, response and intervention logic
- A common currency for the justice sector
- A framework for a long-term view of crime and harm

5.1 Summary

This chapter considers what an investment approach framework for the criminal justice system could look like:

- What **problem** is an investment approach trying to solve; what is the point of difference?
- What **levers** exist to address the problem, and how can an investment approach build on current strategies?

Not all crimes cause equal harm; some are more severe than others. Risk, harm and cost are concentrated among some populations: recidivist offenders and repeat victims. **This concentration of harm and cost is magnified when viewed from a long-term perspective.** The overlap between risk factors in the justice and social sectors is striking. Differentiating by severity of crime and integrating a long-term view in measuring system and investment performance would strengthen signals to reduce the harm caused by crime.

Recommendation

Taken together, the problem definition, levers and expected outcomes form the basis of the **intervention logic** for an investment approach to reducing the harm caused by crime:

- By optimising cross-agency investments in prevention activities, the desired outcomes are fewer offenders, less severe offences, fewer victims and less harm, as well as safer locations.
- The flow-on impact can include lower fiscal costs to government in the justice sector as well as other sectors, and lower social and economic 'costs' of crime. This includes both tangible aspects such as costs, as well as the important non-tangible aspects of harm.
- We note as well the broader community benefits associated with reducing the harm associated with crime.

A long-term view of expected future crime and harm provides the basis for an insight, monitoring and analysis framework which can be used for **decision-making and, if desired, performance measurement.** The framework can be used to incentivise and reward a focus on effective investments that provide a return on a long-term basis. An investment approach would encourage a crime prevention investment portfolio that balances near-term and longer-term priorities:

- Volume-based measures and traditional cost-benefit analysis are already effective for high-volume, lower-harm segments.
- Measuring long-term costs complements these measures through a focus on complex problems (such as the severity and concentration of offending, victimisation and related costs), and higher-risk populations (such as young offenders, recidivist offenders, and repeat victims).
- This approach to measurement is well-aligned to current sector priorities; such as concentrations of crime and harm within specific communities, family violence, the Youth Crime Action Plan; and broader government activities addressing vulnerable children, youth, families and communities.

We propose a **possible framework for the criminal justice system**. The framework integrates management and insight by means of a common currency that serves as a proxy for the harm caused by crime. As discussed in Section 3.4.1, identification of a suitable proxy is an important determinant of conceptual feasibility.

Recommendation

We consider that a framework for the criminal justice system would **be most valuable—for example, to identify population subgroups of interest—if drill-down capability included:**

- All recorded crime by crime type, and related costs
- All agencies within the justice sector, including CYF in its Youth Justice capacity
- Offenders, including data related to youth offending
- Victims, including relationship to offender and data related to childhood victimisation; and,
- Locations where crimes are committed.

5.2 Problem definition

In summary: There are significant differences in harm and costs by severity of crime. Crime and harm are concentrated among recidivist offenders and repeat victims; and this concentration is magnified when viewed via a long-term perspective. Sector priorities include complex issues such as family violence and Māori over-representation. Long-term—even inter-generational—patterns cut across government sectors.

The point of difference: Volume-measures tend to work best for high-volume, low-harm segments of the system. An investment approach framework builds on these measures to incentivise and reward a focus on more complex and long-term aspects of the justice sector; that is, reducing the concentration and mitigating the severity of crime and harm, where long-term costs are also concentrated.

5.2.1 Wicked problems

As outlined in Section 4.3.1, crime is trending downwards, but nevertheless has a significant impact on society, with high associated costs inside and outside of government. Risk, harm and cost are particularly concentrated among some population groups; particularly when viewed from a long-term perspective.

In its recent Briefing to the Incoming Government, the sector identified a number of serious challenges in the justice sector²³:

- Family violence is amongst the highest in the OECD
- Māori are over-represented in offending and incarceration
- Incarceration rates are high by international standards
- Some violent crimes increasing, despite overall trends downwards; and,
- A paper-based court system.

Current policy challenges include the sort of complex issues with **long-term dynamics** that lend themselves well to an investment approach; such as:

- Reducing the **severity** of crime and harm
- Reducing **recidivist offending** and the duration of criminal careers; and,
- Reducing the harm to victims, including **repeat victimisation**.

²³ Justice Sector BIM

These emerging sector priorities include a number of complex challenges, such as family violence and Māori over-representation as both offenders and victims. The term ‘wicked problems’ is used in policy language for problems that have multiple, inter-related and often unclear causes. Wicked problems resist easy solutions. Progress tends to be in gradual terms, often requiring collaboration between multiple actors. These challenges in some cases **mirror risk factors for long-term benefit receipt** discussed in our welfare valuations. For example, higher risk of long-term involvement associated with earlier entry into the system, intergenerational dynamics and Māori over-representation.²⁴

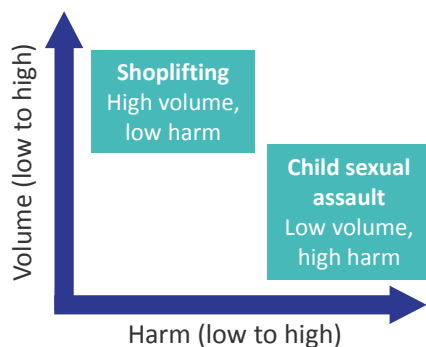
Other characteristics of the criminal justice sector include **a hardening of the prison population**; that is, a greater proportion of recorded crimes tend to be more severe crimes, and the mix of Corrections-managed offenders tends to be shifting towards longer sentences as low-severity incidences of crime reduce. There has been growth in the prison population, which is high in an international context and has tripled since the early 1980’s. The average length of sentences has also increased.²⁵ At the end of 2013, the 776 prisoners serving indeterminate sentences made up 11% of the sentenced prison population.²⁶

Some of these trends suggest that while overall crime is decreasing, the benefits may not be evenly distributed, with the remaining crime and harm becoming more concentrated. A long-term framework that better recognised the continuing evolution of crime and justice and differences by population subgroup, would better reflect progress in reducing the impact of crime. This would encourage continuing improvement in areas of the system that are performing less well.

5.2.2 Severity of harm by crime type

The challenges above are consistent with a mature system that is performing well for lower-harm crimes and offenders. Volume-based measures, such as the current BPS measures, are most effective for monitoring this type of progress. However **the crimes that are the most harmful and costly to society tend to be significantly more challenging and resource-intensive to address**; and result in more gradual improvements over the long-term.

Figure 5.1 Volume of crime versus harm and related costs



To illustrate the point concretely, consider a single incident of shoplifting and a single incident of child sexual assault. A simple volume-based measure would find that preventing two shoplifting incidents was twice as valuable as preventing a single incident of child sexual abuse. Intuitively, however, this is clearly out of step with their relative harm and thus the public value associated with reducing child sexual assaults. There are also significant differences in the associated costs of responding to each crime.

In fact, the BPS targets do go some way to differentiate between these two incidents; reducing violent crime is a separate target. The point nevertheless remains in terms of the differences in severity of crimes within the violent crime category. **Differentiating by severity of crime in measuring system and investment performance would strengthen signals to reduce the harm caused by crime.**

²⁴ Corrections BIM

²⁵ Justice Sector BIM

²⁶ Department of Corrections, Topic Series: Offenders on Indeterminate Sentences

5.2.3 Recidivist offenders

There is a broad consensus among criminologists that: “a small group of individuals is responsible for a majority of criminal activity...Research indicates that chronic offenders tend to exhibit an early onset, a longer career duration, and involvement in [more] serious offenses—including person/violence-oriented offenses—than other offenders.”²⁷

The figures below produced by Corrections illustrate timelines for different types of family violence offenders who have extensive prior involvement with the criminal justice system. Each follows the criminal histories of a selected group over their life-course, up to the point of observation. The length of the timelines varies by age of offender. Crime types are coded by colour, severity by thickness, and duration of sentence by bar length. The pattern in Figure 5.2 (primarily violent offending) is found to apply to around one-third of all family violence offenders, while the pattern in Figure 5.3 (primarily sexual offending) is found to apply to around six percent.

Figure 5.2 Timelines for a sample of family violence offenders, with a strong history of mainly violent offending, reproduced from Corrections Topic Series²⁸

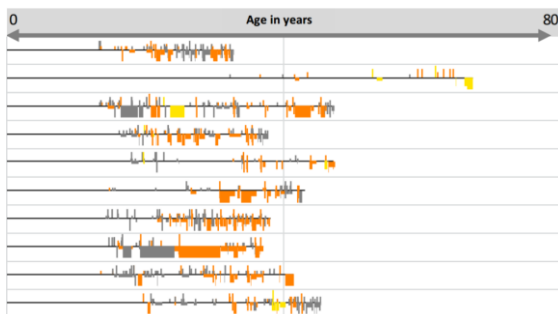
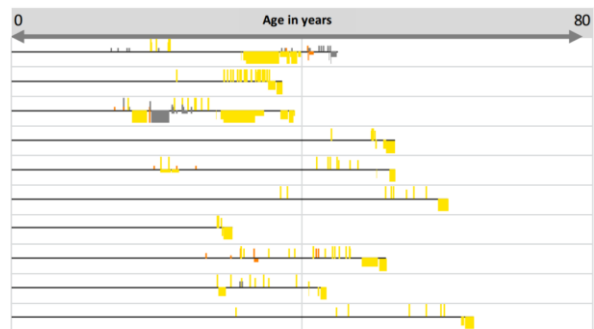


Figure 5.3 Timelines for a sample of family violence sexual offenders, with a strong history of mainly sexual offending, reproduced from Corrections Topic Series²⁹



LEGEND	
Line colour = offence type	
Sexual Offences	Yellow bar
Violence related	Orange bar
Other	Grey bar
Line thickness (above line) = seriousness score	
Score <= 40	Thin line
Score <= 100	Medium-thin line
Score <= 1000	Medium-thick line
Score > 1000	Thick line
Line thickness (below line) = sentence type	
Community sentenced	Thin line
Parole or ROC	Medium-thin line
Remanded in custody	Medium-thick line
Prison sentenced	Thick line

Understanding such timelines are important for a number of reasons, however one important consequence is that repeat offending is a significant issue and **there is a clear concentration of harm and sector costs associated with multiple crimes by repeat offenders over the long term**. Such concentration lends itself to an investment approach, as interventions can be targeted towards future harm.

Analysis of timelines for offenders on indeterminate sentences shows a similar concentration of intensive contact by some offenders over the long term; and thus a concentration of both harm caused by, and justice sector costs associated with those individuals.³⁰ While just over half (53%) of offenders sentenced

²⁷ Farrington, et al, Piquero, in Piquero et al, *The Criminal Career Paradigm*, University of Chicago

²⁸ Department of Corrections, Topic Series: Family Violence Offenders

²⁹ Ibid

³⁰ Department of Corrections, Topic Series: Offenders on Indeterminate Sentences

to life imprisonment had little or no history of prior offending, their longer prison terms nevertheless represent a significant cost, and to some degree reflects the level of harm associated with the offense. Just 10% of offenders sentenced to preventive detention had no prior convictions or sentences. It should be noted that preventive detention may also reduce potential future harm, yet still be costly. These types of exceptions to the core logic of the alignment between cost and harm will be important to consider in the design of a common currency for the framework, as well as in setting appropriate measures for system performance, to ensure appropriate cost signals.

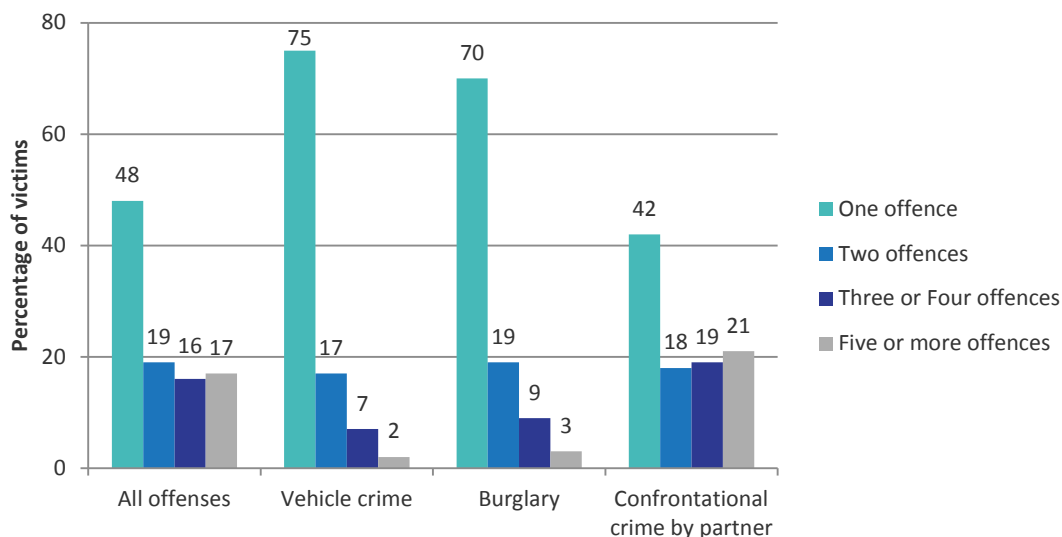
While the view in these timelines is retrospective, actuarial tools attempt to forecast an expected future trajectory. Forecasts would contain more detail than the existing RoC*ROI tool; including expected cost associated with future offending. Moreover, results could easily be aggregated to identify groups of interest and to measure changes in the actual trajectories of these groups, compared to expected. Trials allow accurate cost-benefit measurement of these interventions from a long-term perspective and performance can be compared to expectations.

5.2.4 Repeat victims

Offending is concentrated; and so too is harm and victimisation. According to NZCASS:

- Crime is unevenly distributed; with 64% of the population experiencing no crime, and six percent of people experiencing 54% of the total. These ‘chronic victims’ experienced more than five crimes each in 2008 alone.
- Victims of confrontational crimes (including assaults, threats and robberies) by a partner or person well known to them are more likely to experience multiple incidents than victims of property offences. Figure 5.4 illustrates this concentration of more harmful crimes.³¹

Figure 5.4 Concentration of victimisation by offence type in in 2008, reproduced from Multiple Victimisation analysis based on NZCASS 2009³²



Justice sector analysis of repeat victimisation based on the NZCASS states that this type of concentrated victimisation is consistent with international experience, and “*across different crime types, locations, and types of data...In short,...research has routinely shown that past victimisation is one of the best predictors*

³¹ Ministry of Justice, NZ Crime and Safety Survey 2009: <http://www.justice.govt.nz/publications/global-publications/n/nzcass-2009>

³² Justice Sector, Multiple Victimisation in NZ: <http://www.justice.govt.nz/publications/global-publications/n/nzcass-2009/documents/NZCASS%20Multiple%20victimisation.pdf>

of future victimisation (Farrell and Pease. 1993)...Such findings have been used to justify targeting crime prevention resources on the basis of need and have been empirically proven to both reduce levels of re-victimisation and overall crime levels.” The study also finds that if action were taken to limit victimisation to no more than twice per individual or household, “personal crimes would reduce by 53% (897,000 offences), while household crime would fall by 30% (a drop of 274,000 offences).”³³

The NZCASS looks at a single year, so does not take into consideration the long-term concentrations of victimisation across multiple years. Such a **long-term view would almost certainly magnify this concentration of harm at a victim level.**

NZCASS found that one in five (19%) New Zealanders reported that they experienced two or more offences in 2008. Analysis of risk factors associated with repeat victimisation shows how each subgroup’s risk profile compares to the national average of 19%. For example:

- Age: people aged 15-24 were 14% more likely than average to be repeat victims; and people aged 60 years or more were 11% less likely
- Ethnicity: people who identified as Māori were 12% more likely to be repeat victims, while those identifying as Pacific Islanders were 6% more likely and those identify as Asian 5% less likely
- Economic and household factors: people who were unemployed and/or on benefits were 14% more likely to be repeat victims, sole parents were 16% more likely, and social housing tenants 12% more likely.

The overlap between characteristics that increase risk of long-term benefit receipt in the welfare system and repeat victimisation is striking. **Joblessness and benefit receipt themselves are as significant as Māori ethnicity in terms of elevating risk. Sole parent status is even more significant.** Social housing tenancy was also an important risk factor.

This implies that the concentration of harm caused by crime is multi-dimensional, with a significant number of potential risk factors that cut across government sectors. Introducing an investment approach to reduce harm would enable consistent analysis and coordinated approaches with the welfare sector, and other sectors that may introduce a similar approach in the future.

5.2.5 Vulnerable children, youth and families

A focus on long-term analysis and early investment naturally leads to consideration of youth, childhood, and early childhood experiences and how they shape outcomes over the life-course.

Causal theories differ on the extent to which crime tends to be caused by latent individual traits or external influences, or some combination. Nevertheless, there is a broad consensus that **experiences during childhood and youth are contributing factors to youth and recidivist offending.**

- Family influence—for example, ‘multi-problem families,’ parental criminality, and poor parenting (such as lax discipline combined with erratic/threatening punishments and weak emotional bonds)—have a bearing on behavioural patterns in youth; including the early onset of offending.
- Criminal careers tend to begin in the early teens and peak in the late teens, with a smaller number of chronic offenders continuing to offend into their mid-20s or beyond. The earlier young people begin offending, the greater the odds they will re-offend, and the longer their offending is likely to continue.³⁴

Experiencing victimisation as a young child increases the risk of both future offending and future victimisation. The cycle can occur:

³³ Ibid

³⁴ Piquero et al

- From victim to further victim of violence in the home and community
- From victim to deficient or abusive parent, or abusive spouse
- From victim to perpetrator in the community, often as an antisocial offender
- As a number of these states; for example an estimated 50% of violent men are violent in both the home and the community.³⁵

A long-term view of crime and harm, that takes into consideration the relationships between offending and victimisation has considerable potential to provide insight to assist in reducing the harm associated with crime.

5.3 Reducing the severity and concentration of harm caused by crime

In summary: Government has a range of levers to reduce the harm caused by crime. Agency priorities are already shifting from response to activities such as crime prevention, restorative justice, and prisoner rehabilitation and reintegration. This is consistent with a broader government focus. The sector has a growing investment management capability.

The point of difference: Transparent, long-term cost signals can help drive:

- Better investment decisions
- Innovation
- Awareness of blind spots and gaps
- A focus on long-term outcomes; and,
- Greater focus on high harm/high cost segments.

5.3.1 Justice sector levers

The justice sector has a range of direct **responses** to crime and harm. These include core functions of the criminal justice sector related to investigating crimes, adjudicating, and holding offenders to account. There are also responses to address the needs of victims of crime; some of these are outside the justice sector, such as support of victims from Health and ACC.

The justice sector also has a **portfolio of investments to prevent crime and harm**; graphically represented with examples for each agency in Figure 5.5. We note that the distinction is not always clear; for example, state care and preventive detention are responsive in nature, but may well also serve to reduce future crime and harm.

All sector agencies have priorities and activities that relate to preventing the incidence, severity and concentration of crime and harm. For example:

- The NZ Police's Policing Excellence agenda focuses on better preventing crime and reducing victimisation
- Modernising courts seeks to drive better court performance, but there are also activities such as restorative justice and therapeutic courts with long-term prevention goals
- Corrections has a range of rehabilitation and reintegration investments, and is taking an evidence-based approach to optimizing its portfolio

³⁵ World Health Organisation, University of Birmingham, et al, Cycles of Violence: http://www.euro.who.int/data/assets/pdf_file/0008/98783/E90619.pdf

Figure 5.5 Prevention vs. response – examples by agency

	CYF	Youth Justice	Victim's Services	Police	Courts	Corrections
Investment portfolio (measures of effectiveness, ROI)	Parenting supports	Early intervention for <12s	Building resilience	Place-based policing	Restorative justice	Alcohol and drug treatment
Responsive services: (measures of service quality, efficiency)	State care	Detention	Compensation	Arrests	Trials	Prisons

One of the aims of an investment approach to justice is that it can help justify and optimise the ongoing spending on prevention by demonstrating its effectiveness. The effectiveness of a trialled measure can be evaluated, and savings on the response side can be used to offset the cost of prevention. Evidence-based decision-making compares the value and return on investment of different alternatives.

It is effective investment decisions—combined with effective execution of these decisions—that generate improved outcomes. Design and quality of implementation may be even more important than the class of investment in terms of its impact on outcomes. Actuarial tools assist by identifying risk and measuring change on a consistent basis. That consistent basis is the common currency discussed in Section 3.2.1: a proxy for the harm caused by crime over the long term.

5.3.2 Opportunities for intervention

Justice sector

Its recent Briefing to the Incoming Government, the sector identified a number of potential opportunities in the justice sector³⁶, spanning higher level goals and specific initiatives. These included:

- Reducing family violence
- Expanding restorative justice
- Improving justice services in communities with high crime and victimisation rates
- Adding to the flexibility of police practice
- Better information sharing
- Funding of victim services
- Modernisation of courts
- A policy review to support rehabilitation and reintegration; and,
- Reviewing the judicial boundary between youth and adult categories.

The presence of such opportunities for intervention is important. As discussed in the previous subsection, an actuarial framework is only effective to the extent that it is measuring the change in crime-related harm as a result of Government initiatives.

³⁶ Justice Sector BIM

Cross-agency approaches

Measurement of progress in addressing the more complex and inter-related problems identified in the previous section would be timely. Government has a number of inter-sectoral initiatives underway that are concurrently focusing on the challenges of Section 5.2. These include interventions with potential to improve long-term outcomes in the criminal justice system; such as:

- The Vulnerable Children Agenda
- The Youth Service, and the welfare investment approach more broadly
- The Youth Crime Action Plan
- Strategies to address BPS targets related to improving NCEA 2 and 4 qualification levels that are particularly important for the same groups that are over-represented in the justice sector; and,
- Improved cross-sectoral data analytics capability coming online over the course of the year and the Integrated Data Infrastructure (IDI).

5.3.3 A case study: Place-based policing

This case study is closely based on an investment brief produced by the justice sector; part of a series developed to enhance the sector's evidence-based decision-making capability. Place-based policing is potentially the largest category of crime prevention investment in NZ, currently and is regarded as international best practice. Although, as yet, there is a limited evidence base domestically, it appears to have a modest impact that is concentrated on drug-related offences.

Place-based policing is a proactive strategy to deter crimes in high-crime 'hot spots;' very small places such as street segments or intersections (even within neighbourhoods that generally have lower crime levels). The approach is to develop strategies to avoid the convergence between a likely offender and a suitable target (either victim or property) in the absence of supervision. Strategies include deterrence through frequent patrolling; but also problem-solving approaches, such as changing the environment to reduce opportunistic crime.

The premise for place-based policing is that, similar to the concentration of both offending and victimisation discussed in the previous section, **crime is concentrated in specific locations**. Research finds that:

- less than 5% of places account for over 50% of crime³⁷
- crime is more stable at the level of place than at the level of an individual.³⁸

Reductions in crime-related harm as a result of place-based policing should be measurable, and so the return on investment of moving from responsive call-outs to proactive place-based policing can be measured. It is possible that both a responsive call-out and a proactive strategy could have relatively similar policing costs. Incorporating a measure of the long-term harm and costs enables a better comparison between the value of these two activities.

5.3.4 Comparing return on investment

Rather than looking at programme effectiveness in isolation, an investment approach considers the full spectrum of investments as a portfolio. A consistent approach to understanding performance and return on investment enables decisions about allocation of funding across the portfolio.

Leadership from subject matter experts within the sector is a critical enabler of high quality investment decisions. The sector has already been developing its capability to manage its portfolio of crime prevention investments. This includes thorough analysis of international and domestic evidence about

³⁷ Braga, cited in Justice Sector, *Investment Brief: Place-based Policing*

³⁸ Weisburd, cited in Ibid

the effectiveness and impact size associated with a range of preventive investments, as illustrated by the case studies in Sections 3.4.2 and 5.3.2, and the summary of high-level findings in Table 5.1.

Table 5.1 Investment portfolio evidence ratings to date

Topic	Status	Evidence rating
Restorative Justice	Final	Strong
Alcohol and Drug Treatment	Final	Strong
Sex offender treatment	Final	Very promising
Early intervention for under 12s	Final	Very promising
Family-based prevention for teens	Final	Very promising
CCTV and street lighting	Final	Very promising
Electronic monitoring	Final	Very promising
Family violence respondent treatment	Final	Speculative
Scared straight programmes	Final	Dubious
School-based crime prevention	Draft	Very promising
Place-based policing	Draft	Very promising
Problem-oriented policing	Draft	Very promising
Situational crime prevention	Draft	Very promising
Prevention of repeat burglary	Draft	Very promising
Mental health courts	Draft	Promising
Drug courts	Underway	TBD
Cognitive-behavioural therapy	Underway	TBD
Prisoner education and employment	Underway	TBD

The sector is thus well-placed from a capability stand-point to incorporate additional business intelligence from actuarial tools into its growing investment management systems and processes. There is also some degree of existing flexibility, through the Justice Sector Fund, to reallocate funding from under-spends towards promising investment options.

Cost-benefit analysis (CBA) is a traditional approach to assessing options in government. CBA has been recognized by the OECD and governments internationally as a best practice for decades.³⁹ While CBA would remain a key input into portfolio management, actuarial methods can add to traditional CBA.

CBA currently tends to be applied on short-term time frames, for investments with proven track records. As such, CBA alone will tend towards optimising allocation within the status quo range of investment types and towards lower-cost investments that generate a return in the nearer term. In contrast, an investment approach might also favour new initiatives that have longer-term impact. In this way, **an investment approach complements CBA as a driver of innovation and offers a longer-term view of investment performance.**

We note that long-term investments tend to be associated with greater uncertainty. While there is some risk that this uncertainty reduces the ability to measure longer-term benefits, the higher concentrations of crime-related harm suggest that such projections should be plausible. Input from subject matter experts will supplement projections, potentially improving estimates.

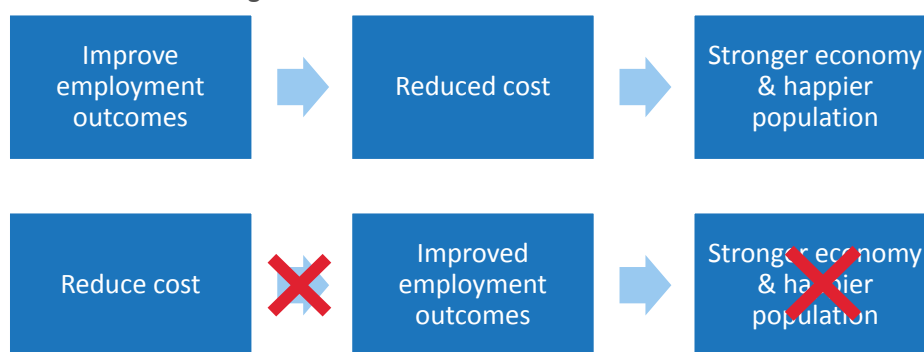
By capturing a complete overview of the system, an investment approach also **identifies blind spots and trade-offs.** For example, if investment is shifted from class A to class B, class B may appear to be performing well when considered in isolation by reducing volumes cost-effectively. But the result of disinvesting from the lower-performing class A investment may be significant in other areas of the system; for example, if it has a lesser effect, but for higher-risk offenders. This trade-off and the net effect of this and other changes would become visible at a system level through an investment approach.

³⁹ OECD, *Regulatory Impact Assessment Best Practice in OECD Countries*: <http://www.oecd.org/gov/regulatory-policy/35258828.pdf>

5.4 Intervention logic

The intervention logic of a framework is the rationale of how improved outcomes will be achieved. An important feature of our initial advice to MSD on the feasibility of an investment approach in the welfare sector was the simple message illustrated below. Improving employment outcomes reduces cost, but reducing cost does not necessarily improve employment outcomes.⁴⁰ Thus reductions in the aggregate cost of the welfare system are viewed as a consequence—not a driver—of improved employment outcomes.

Figure 5.6 Welfare intervention logic



There are similar issues and risks to consider in relation to how a long-term investment approach might work in the justice sector. **A performance framework that incentivized reducing costs without corresponding reductions in harm would not be feasible, because it would not align with the strategic objectives of government and the sector.**

Recommendation

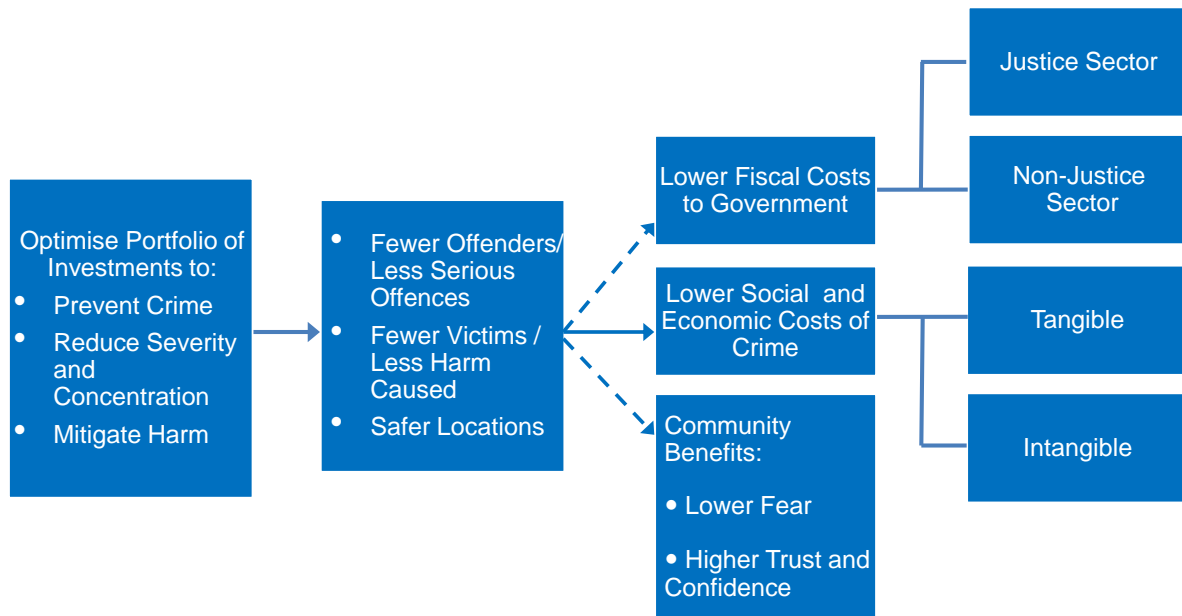
We propose the following intervention logic for an investment approach framework in the criminal justice system:

- By optimising cross-agency investments in prevention activities, the desired outcomes are fewer offenders, less severe offences, fewer victims and less harm, as well as safer locations.
- The flow-on impact can include lower fiscal costs to government in the justice sector as well as other sectors, and lower social and economic ‘costs’ of crime. This includes both tangible aspects such as costs, as well as the important non-tangible aspects of harm.
- We note as well the broader community benefits associated with reducing the harm associated with crime.

The intervention logic we recommend is illustrated in Figure 5.7.

⁴⁰ Taylor Fry, *Actuarial Advice on feasibility: A long-term investment approach to improving employment, social and financial outcomes from welfare benefits and services*, MSD: <https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/taylor-fry-ia-feasibility/taylor-fry-feasibility-of-an-ia-for-welfare-report.pdf>

Figure 5.7 Intervention logic for an investment approach in the justice sector



5.5 A common currency for the Justice sector?

As noted in Section 3.4.1, an investment approach framework integrates system-wide analysis into a common currency. This currency provides a unified view of performance, based on a proxy for the ultimate purpose of the system: reducing the harm caused by crime.

Perhaps the most critical feasibility question is **whether or not it is possible to measure long-term costs in such a way that financial savings are an effective proxy for reduced harm**. This is necessary to ensure that cost signals are aligned with business objectives, and therefore provide a relevant basis for any investment and/or agency performance metrics. Risks, such as perverse incentives, and mitigation strategies, such as building up a gradual understanding of financial signals before using them as a performance measure, are discussed in Section 3.2.

5.5.1 Fiscal costs in the criminal justice system

A particular challenge in the justice sector, compared to the welfare system, is that **reducing volume and severity of crime does not usually translate into short-term fiscal savings** within the sector. For example:

- Fewer recorded crimes will not necessarily mean reductions to the police force, which makes up a significant proportion of Police expenditure. Police have priorities other than responding to crime, such as maintaining confidence in community and public safety. A reduction in crime is more likely to result in a reallocation of existing police to other activities, including crime prevention activities.
- Much of the cost associated with Justice and Corrections is tied up long term in expensive and specialist assets: courts and prisons. Even with significant reductions in crime in a jurisdiction, there may be reasons to maintain a court there, such as distance from the nearest neighbouring court. Further, lower volumes will tend to drive up the average cost; which risks appearing as poorer performance from an efficiency perspective.
- The incremental savings from one less prisoner pale in comparison to the large costs of operating the prison as a whole. Over the long term, significant reductions in crime volumes would result in fewer new prisons being built and potential prison closures. However this type of step vs. incremental change is a design challenge in terms of developing a common currency.

The indirect relationship between reduced volumes and severity of crime, and lower fiscal costs within the justice sector means that **the aggregate cost of the criminal justice system is not an appropriate proxy for harm**. That is, a reduction in aggregate sector cost would not signify reduced harm, and nor would a reduction in harm result directly in reduced sector costs. Thus, movements in the aggregate cost of the justice sector or criminal justice system are not sufficient (alone) as the basis for a performance framework.

Despite the lack of direct fiscal savings, the criminal justice system fiscal costs are an important component in an actuarial framework:

- Any reduction in crime reduces the economic opportunity cost to the sector. For instance, it would allow more time for police to pursue other public interest initiatives, or allow the court system to reduce waiting times. Thus there are genuine measurable benefits to society.
- Significant fiscal savings are able to be realised over the medium to long term. For instance, stabilising and reducing numbers in prison will save the cost of building new facilities.

Another significant issue with fiscal savings is that **fiscal costs are only a small portion of the harm associated with crime**. The 2006 cost of crime paper by NZ Treasury estimates that core justice sector costs represent just 17% of the total cost of crime, with the majority of cost associated with tangible and intangible costs to the private sector. This suggests that a narrow Justice sector fiscal definition will also be inadequate in measuring overall harm related to crime.

5.5.2 A broader scope

Table 5.2 lists a number of alternative proxies for harm considered in consultation with sector officials and the Treasury to shape our feasibility advice. Alongside each possible option is an example of how a similar approach has been used, and pros and cons associated with its potential use as a proxy for harm in the justice sector. For example, the scope could be as narrow as a subset of justice sector costs, such as Corrections costs, or as broad as all financial and non-financial 'costs' associated with the total level of crime in society. We note that there is a trade-off between certainty of measurement with a narrower scope, and appropriateness of cost signals with a broader scope.

Table 5.2 Potential proxies for harm

Option	Example	Pros	Cons
Recorded crime - number	Current BPS target	Simple to measure Intuitive	Insensitive to serious/costly crime
Recorded crime - severity weighted	QALY	Relatively simple to implement	Technical to interpret
Fiscal costs of recorded crime	Welfare	Sends signals for cost control Fits with welfare	Weak relationship between cost/volumes Implementation issues
Wider economic costs of recorded crime	Transport	More comprehensive than just sector costs	Difficult to measure Does not include intangible harm
All costs of recorded crime (tangible and intangible)		Very comprehensive Sends useful signals to reduce harm	Measurement and implementation issues
Total level of crime	NZCASS	Very comprehensive Captures underlying level of crime; trends in reporting	Currently irregular and expensive Scope is beyond agency mandates More difficult to build predictive models

The total level of crime would offer the most complete view, however, would be less aligned with the sphere of influence of sector agencies. Rather, we believe that an index of unreported crime levels should be used as an important input to the analysis of trends in recorded crime levels. Such analysis would require a more frequent, standardised version of NZCASS as discussed in Section 6.3.

We recommend a focus on all **recorded** crime, that includes costs associated with tangible and intangible harm outside of the justice sector, as illustrated in the intervention logic in Section 5.4.

Recommendation

We recommend that costs considered as part of this framework include:

- Justice sector fiscal costs
- Other fiscal costs to government, such as ACC claims and victim compensation
- Tangible cost to the private sector, such as property loss or damage; and,
- A financial or non-financial measure to weight intangible harm, such as trauma.

These costs form a reasonably direct and complete measure of harm. There is a strong relationship between decreased volumes and severity of crime, and decreases in these costs. The inclusion of private sector tangible and intangible costs (a direct measure of harm) largely resolves the cost signalling issue that would flow from a narrow justice sector definition. Thus, **a measure of all recorded crime that incorporates these costs is an appropriate proxy for harm to serve as a common currency for the justice sector.**

This broader definition does bring a number of complications. For instance, while there have been a number of attempts to measure intangible harm, there is considerable subjectivity in setting levels. Non-justice sector fiscal costs are potentially difficult to measure, as it requires coordination across more government departments. Tangible costs to the private sector are also not directly measured; setting

such costs would rely on supplementary analysis and comparisons to international experience. There may also be other proxies for harm worth further consideration.

Despite these complications, we believe the broader definition is most appropriate to the aims of a justice sector investment approach. We also believe that reasonable estimates can be developed for the various components; this is discussed further in Section 6.

Nevertheless, we acknowledge the complex environment and the risk of creating perverse incentives that do not align with sector objectives. This is discussed further in Section 7.3. We recognize that development of such a broad proxy may prove somewhat complex and that alternative approaches to weighting the severity of harm may also warrant further consideration.

Recommendation

A progressive approach to implementation, **beginning with an information framework**, would allow time for the relationship between long-term cost signals and business objectives to become clear.

5.5.3 Demonstrating value

Detailed design specifications are beyond the scope of this high-level feasibility advice. However, we note a few additional potential strategies that may be useful in refining a common currency:

- **Weighting harm:** There are international and domestic precedents that can serve as a guide in developing an appropriate method for weighting harm. For instance, the New Zealand crime seriousness score assigns weight to a crime type based on the average number of imprisonment (or community work) days given when sentencing. This was most recently updated in the Justice sector working paper by Sullivan and Ong (2013).
- **Holding average costs fixed over time to demonstrate changes in value:** For example, if the average cost per maximum security prisoner as at June 2015 is \$100,000/year, a reduction by 10 prisoners as at June 2016 would result in a 'notional' savings of \$1 million in that year. Changes in the actual average could be used as an efficiency measure. This approach could also potentially be useful to strip out the effect of decreased volumes; which would typically increase average costs.
- **Estimating changes in future cost for the *same group of offenders* to demonstrate changes in future cost associated with the frequency and intensity of recidivist offending:** For example, if the total estimated future cost of crimes committed by offenders as at June 2015 was a given dollar amount, and those offenders went on to commit fewer and less severe crimes or reduce risk factors associated with recidivism over the next three years, there would be a savings associated with that group of offenders
- **Bringing forward future savings:** For example, savings associated with the reduced need for new prisons over the long-term, could be gradually brought forward on a per capita basis, in order to strengthen financial signals to reduce harm
- **Splitting response and prevention costs:** 'Costs' of crime and harm would include response costs; prevention costs would be treated separately and leveraged to reduce response costs. A share (not necessarily all) of notional savings on response costs could be reallocated to prevention or other spending. This measures gains, while reflecting the reality in the justice sector of relatively fixed costs.

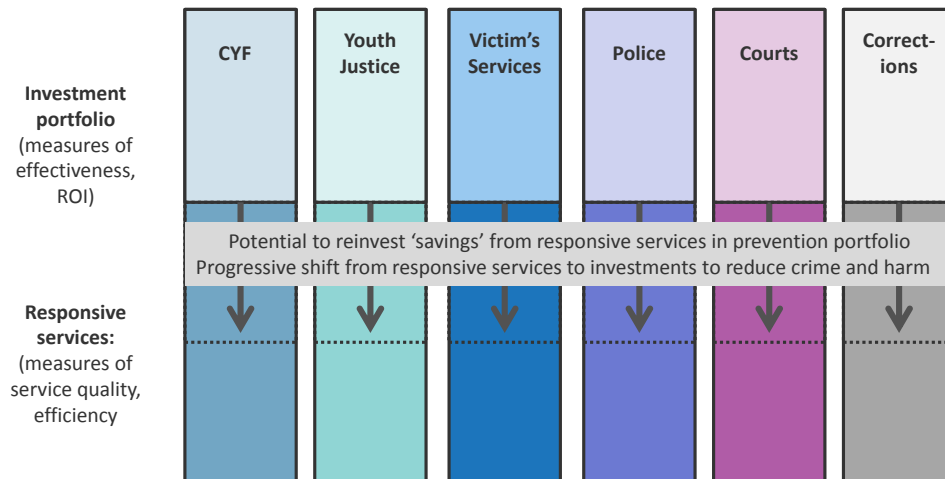
The investment approach framework described in this report **can be used to demonstrate increased public value for money, even if overall sector investment remains relatively stable**, rather than decreasing in the near term.

The common currency would primarily measure effectiveness and return on investment for components of the criminal justice sector that are concerned with effectiveness. Other, complementary measures

related to the framework could assess performance of responsive services against other important dimensions of performance, such as service quality and efficiency.

Over time, ongoing reductions in the severity, concentration and cost of crime and harm could be expected to shift the proportion of investments from response to prevention, as illustrated in Figure 5.8. It should be noted that this would not be a 1:1 reallocation; there are multiple priorities across the justice sector.

Figure 5.8 Response → prevention

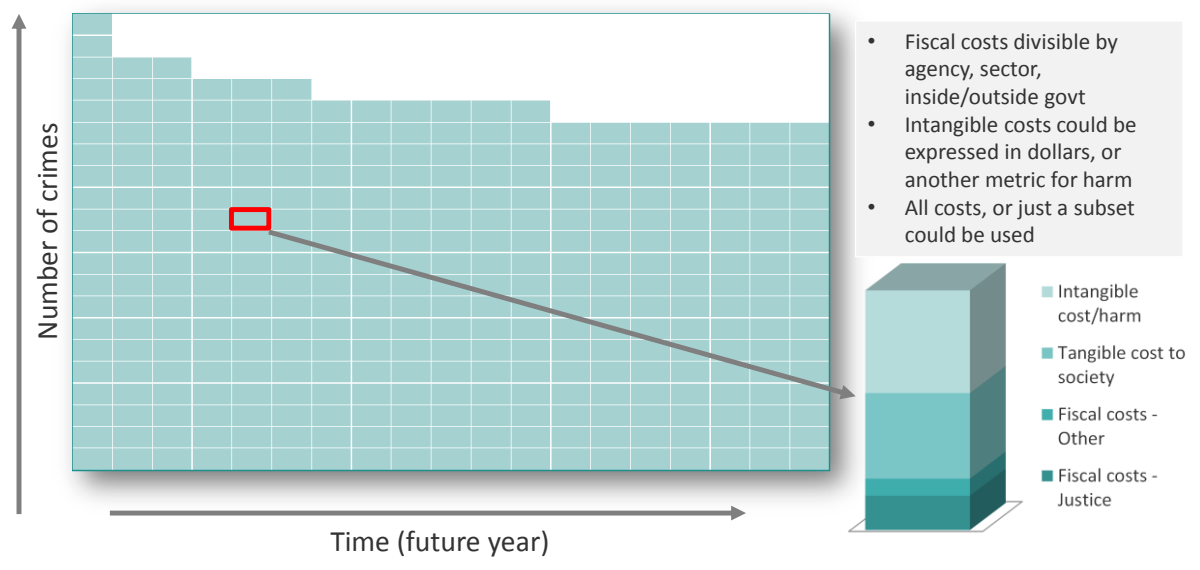


5.6 A long-term view of crime and harm

In this Section we describe the type of actuarial projection that could underpin a justice sector framework. The technical feasibility of such a projection is deferred to Section 6. Figure 5.9 shows a 'grid' which represents all projected future crime over future years.

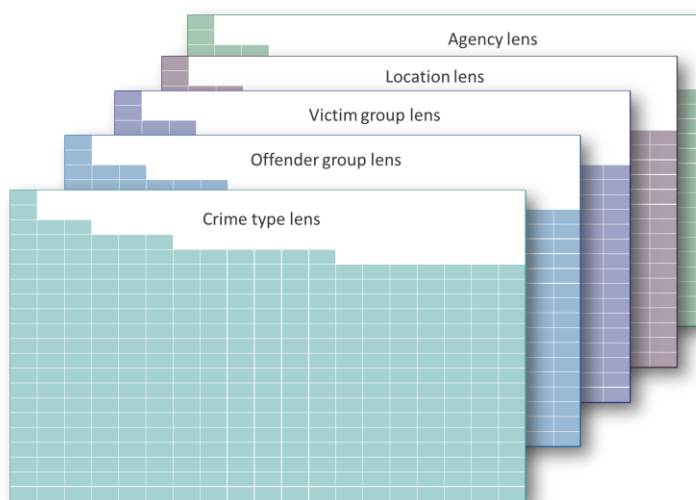
Each cell represents an expected crime, its characteristics and its expected common currency cost. Crimes would be grouped into crime types. Total costs associated with a subset of crimes can be split into its underlying components, such as the direct fiscal cost within each agency, for the justice sector as a whole, as well as the other public and private sector costs. The costs can also be converted into subsequent cash flows; not all costs are incurred at the date of offense.

Figure 5.9 The 'grid' of future projected crime and its common currency cost



If known, each crime would also be tagged by offender, victim, and location. Thus, **the harm and cost attributable to each expected crime could be summed by offender, victim, or location.** This tagging would allow various 'lenses' to be used to view future crime, as illustrated in Figure 5.10. These lenses allow various concentrations of future crime to be explored, and interventions monitored over time.

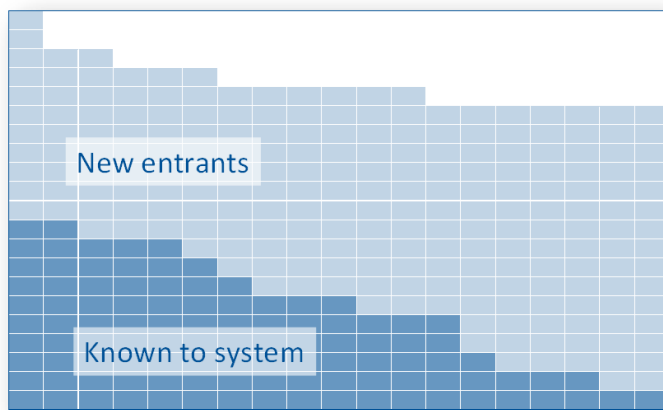
Figure 5.10 Lenses for viewing different aspects of projected crime



For example, the offender group lens would give insight into how individuals' expected crime patterns would contribute to the total future cost. Monitoring changes over time would show how actual recorded crime diverged from expectations.

An important subdivision is what proportion of future crime is committed by people with a history of contact with the Justice sector (see figure below). Further, risk drivers such as youth justice and CYF history, and previous crime types, region and ethnicity could be modelled to account for their correlation with future offending. By summing over future crimes for a cohort of offenders, such a lens could be used to construct 'lifetime cost' estimates which could then be used as a broad management tool for intervention effectiveness.

Figure 5.11 A long-term view of crime: Offender group lens



The combination of forecast crimes and their associated cost is the building block (common currency) for analysis.

For example, offender lifetime cost = sum of all expected future crimes linked to that offender (based on their history).

In a similar fashion, the victim group lens provides insight into how a past victim is likely to interact with the justice system in the future, both in terms of future victimisation and future offending. The location lens would allow identification of new crime hotspots, and measurement of the financial savings from improvement management of those hotspots.

The agency lens recognises the various accountabilities that affect future crime; the likelihood of future crime is affected by different preventive measures undertaken by the various departments. Ideally changes in future crime can then be allocated to various agency programmes, although the interrelatedness of activity will present some challenges in attribution.

Recommendation

We consider that a framework for the criminal justice system would be most valuable—for example, to identify population subgroups of interest—if drill-down capability included:

- All recorded crime by crime type, and related (common currency) costs
- All agencies within the justice sector; including CYF in its Youth Justice capacity
- Offenders, including data related to youth offending
- Victims, including relationship to offender, and data related to childhood victimisation; and,
- Locations where crimes are committed.

5.7 Conclusion: A possible framework

5.7.1 An overview of the framework

Figure 5.12 illustrates a possible investment approach framework for the criminal justice system, described in further detail in the remainder of this section. As noted in Section 3.2, a common currency that serves as a proxy for harm is the means of integrating an investment approach framework.

Figure 5.12 An investment approach framework for the criminal justice system

Top down	Level 1: System oversight	Provides a view of complete system, long term future costs, drivers of change <i>Source of top-down cost signals for information framework; common currency for performance framework, augmented by other measures</i>												
↑ ↓	Level 2: Agency & cohort drill down	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Police</th> <th style="width: 25%;">Justice</th> <th style="width: 25%;">Corrections</th> <th style="width: 25%;">CYF, others...</th> </tr> </thead> <tbody> <tr> <td colspan="4">Ability to quantify past and future costs associated with crime and harm, and change over time; broken down into agency level accountabilities.</td> </tr> <tr> <td colspan="4">Drill down to see cost concentration by location, offender, victim, crime type etc. Behavioural insights assist in targeting decisions and driving innovation</td> </tr> </tbody> </table>	Police	Justice	Corrections	CYF, others...	Ability to quantify past and future costs associated with crime and harm, and change over time; broken down into agency level accountabilities.				Drill down to see cost concentration by location, offender, victim, crime type etc. Behavioural insights assist in targeting decisions and driving innovation			
Police	Justice	Corrections	CYF, others...											
Ability to quantify past and future costs associated with crime and harm, and change over time; broken down into agency level accountabilities.														
Drill down to see cost concentration by location, offender, victim, crime type etc. Behavioural insights assist in targeting decisions and driving innovation														
Bottom up	Level 3: Disciplined innovation	View of investment effectiveness, comparison of return on investment <i>Source of innovation and continuous improvement; bottom up information signals to optimise portfolio based on a consistent measure of long-term value</i>												

5.7.2 Level 1: High level policy and management focus

System oversight	The Justice sector has large costs, and long-term dynamics where there is considerable risk and uncertainty.
	Actuarial tools can offer insight into whole-of-system performance, drivers of long-term cost, and important changes over time.
	This is useful to inform policy development and areas of strategic interest to management.

Introducing an actuarial control cycle, as described in Section 4.2, would entail:

- Developing a benchmark estimate of future crime
- Monitoring and periodically updating the estimate to compare actual scheme experience to forecast
- Identifying key drivers of crime, harm and cost
- Breaking down the impact of key drivers on change to future crime

Drivers of long-term cost include factors such as demographic and economic change that influence the system, but are external to its management. Differences from forecast volumes, costs, and make-up as a result of such drivers signal emerging changes in the external environment that will influence the cost profile over the long-term; such as change in the proportion of the New Zealand population aged 15-24 (the age range for most offending and victimisation).

Policy and operational changes are also cost drivers. For example, a change in sentencing policy could have the effect of increasing the expected future cost of Corrections, especially over a long timeframe. The increase would be visible (and quantifiable) from the first periodic estimate after it takes effect. A further change in sentencing practice at an operational level later on could offset the financial impact of the policy change. This decrease would become visible more gradually, as the emerging practice had an influence on actual sentences. Thus both effects and their net impact could be quantified, providing insight into the policy and operational impacts on the future cost of the system.

One of the most important features of the welfare investment approach has been the ability of the valuation models to isolate the financial impact of changes to important drivers of future costs beyond their influence—such as the unemployment rate—from changes that can potentially be influenced by

management.⁴¹ A similar issue exists in the justice sector, where background trends in crime need to be separated from those that are due to policy and operational changes. This separation is the basis for understanding performance.

5.7.3 Level 2: Operational focus on important segments

Sector and cohort drill down	There is an uneven distribution of costs in the justice sector, particularly from a long-term view.
	Actuarial tools can offer insight into concentrations of risk that drive poor long-term outcomes and the relationship between high-risk segments and system performance.
	This is useful to assist in identifying cohorts for potential investment and other targeting decisions

Throughout this report, we have discussed various ways that **a whole-of-system view can be broken into components and sub-groups:**

- By agency within the sector
- By cost type (e.g., justice sector costs, other fiscal costs, non-government costs)
- By crime type and severity, with associated costs
- By offender, victim, and/or location segment (where known)
- Over time
- By any subgroup of interest.

An important difference between the criminal justice system and the welfare system is the cross-agency dimension of the pipeline. To align agency performance measures with accountabilities, it would be important to have visibility of how different agencies are contributing the long-term objective of reducing crime and harm.

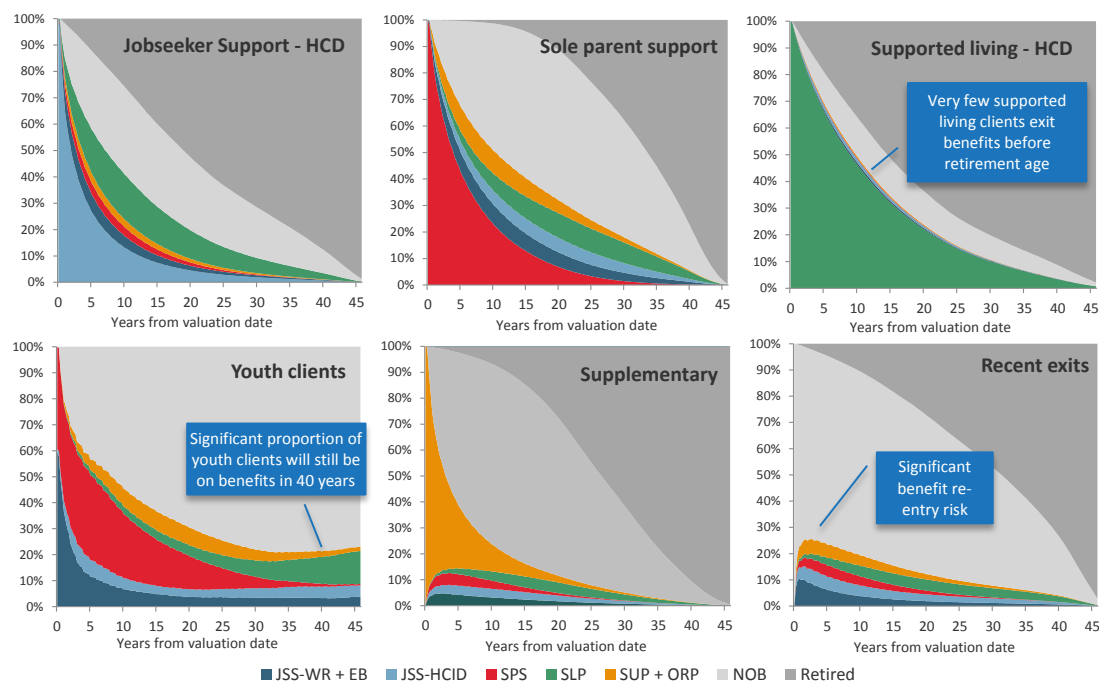
An extremely powerful feature of the framework is the ability to drill down to sub-groups of interest according to a wide range of parameters and individual characteristics. For example the MSD valuation projects benefit dynamics and related costs based on a wide range of client and environmental characteristics including region, education, age and previous benefit history.

The result, as illustrated in the figure below, is a picture of beneficiaries' expected transition patterns from the valuation date until they reach retirement age. Benefit receipt is shown in various colours according to benefit type. Exits are shown in grey, with retirements in dark grey.

The detailed insight goes beyond understanding how costs are distributed; the models also reveal how existing risk factors affect benefit trajectories and how much each factor contributes to differences in total lifetime cost estimates. We envisage a similar level of insight with respect to offenders, victims, and locations.

⁴¹ Edwards and Judd, MSD for NZ Society of Actuaries conference, *Measuring Tomorrow's Outcomes Today*.

Figure 5.13 Lifetime projections of benefit receipt as at 30 June 2014, selected beneficiary segments⁴². Colours indicate future benefit type, headings are benefit type at valuation date.



5.7.4 Level 3: A framework for understanding return on investment

Disciplined innovation	Investments that aim to reduce future harm form the core of the approach.
	Such initiatives should be implemented in a controlled way that permits measurement of effectiveness and cost-benefit comparison.
	A detailed monitoring framework permits appropriate targeting of investments, plus the measurement of long term harm reduction for each intervention.

The justice sector’s investment management capability, and the potential value add of an actuarial approach is discussed in 5.3. A key theme is to encourage investment and innovation in programmes, measuring performance in a disciplined, evidence based fashion.

By way of example, in conjunction with adopting an investment approach, MSD has introduced a portfolio approach to comparing return on investment (ROI) across its operating expenses (employment, work-readiness and income support administration). A new multi-category appropriation progressively introduced from 2014 offers flexibility to reduce long-term benefit receipt and future cost. This can be achieved by re-targeting and re-prioritising investments and through trials of new initiatives.⁴³

At MSD, annual valuations make several important contributions to integrated investment management and innovation:

- Valuations and monitoring help to identify areas of potential management interest. These could be high-risk, high-volume, or growing population groups; drivers or large or growing costs, or other areas of strategic interest. Valuations are also used as an overall measure of performance.
- Lifetime cost estimates provide a consistent basis for comparing ‘risk’ by population subgroup, and ‘return’ by investment type over the long term. These estimates complement shorter-term ROI

⁴² Taylor Fry, 2014 valuation of the benefit system

⁴³ Edwards and Judd

metrics, sometimes sending quite different investment signals. This is particularly true for intensive investments in higher-risk cohorts for whom interventions may be costlier, and for whom results may take longer to eventuate and be subject to greater uncertainty.

- For trialling new approaches, valuation lifetime cost estimates serve as a baseline. Performance expectations are set by projecting how the trial is expected to influence quarterly patterns of benefit receipt and client characteristics (such as improved qualifications, earnings or exits to work). This sets an expectation of both client outcomes and financial benefits from the trial, which forms the basis of measuring its performance.

5.7.5 Practical applications

In addition to the examples provided in Section 4.4, some concrete examples of how the framework could be used are provided below:

Return on investment	The impact of a Corrections rehab program for high-risk violent offenders can be measured as a reduction in lifetime re-offending costs. This allows a more complete cost-benefit analysis.
Justifying prevention	A new car park design centred on crime prevention is trialled with the help of Police (better lighting, visibility etc). The reduction in crime is measured, and the cost of prevention strategy can be compared to the savings in lower response costs (for police and more broadly).
Targeting concentrations of crime	A particular age group and location combination is identified as being disproportionately harmful. A comprehensive programme of education opportunity and active policing is justified by the large savings that result.
Rewarding Efficiency	Technology updates by the Courts system significantly improves efficiency, allowing more trials per unit cost. This reduces fiscal cost per crime, with significant savings over time.

Initiatives of this sort are already going on in the Justice sector. However, they do not have an overarching framework that provides a consistent basis for comparing risk and return that is linked to the overall management of long-term costs at a system level. By linking activities to reduction in the future cost of crime, it is easier to justify and compare them, based on their long-term impact.

6 HOW?

INSIDE THIS SECTION:

- Potential modelling approaches
- Existing data sets and gaps
- Existing tools and value add

6.1 Summary

Key considerations in developing a **potential modelling approach** for the framework discussed in the previous section include predictability, complexity, and scope. The tendencies for recidivist offending, repeat victimisation and crime hotspots discussed in the previous chapter allow for better than random predictability. The ‘pathway’ nature of the justice system lends itself to transition state modelling, with some parallels to the approach for social welfare.

Recommendation

While other options are also possible, **we believe that it is feasible to build a similar type of model as is used in the welfare valuation.** This approach to modelling long-term benefit dynamics could be adapted to provide insight into patterns in expected future crime.

One important feature of any actuarial framework would be the ability to distinguish between background trends in crime and changes caused by various investments. This is a more difficult problem compared to the welfare system, where a significant number of economic indicators can be used to monitor the welfare system against the broader economy. However, there are possibilities for achieving insight in the justice sector.

A broad range of data sources exist within the Justice and broader Government Sector which would enable various types of models, with differing levels of complexity, to be constructed. The framework proposed in this report recommends looking at crime through the lenses of offenders, victims, locations and agencies. The data available on adult offenders, youth offenders, and locations is adequate for the type of modelling we propose. At this stage to data related to victims is not sufficient to develop a long-term view for victims, but collection is improving, and more will be possible over time as a result.

Feasibility advice

An investment approach framework is **technically feasible** for the criminal justice system:

- Appropriate models can be built to forecast volumes, costs (tangible and intangible) and trends by crime type, by offender/victim/location group, and by agency
- These models can be recalibrated to improve accuracy over time
- There is sufficient administrative data; and,
- Approach would significantly enhance the sector’s capability compared to tools currently in existence in the sector.

6.2 Potential modelling approach

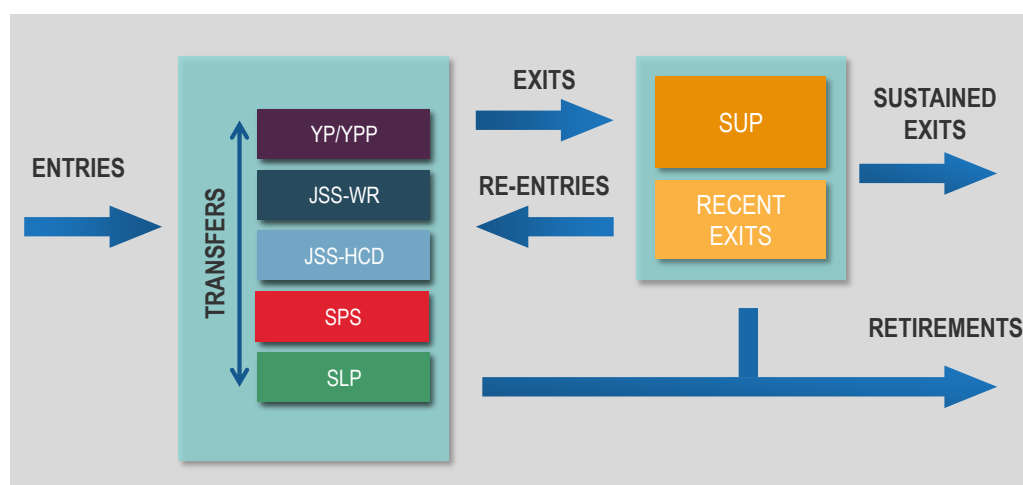
There are a number of different potential modelling approaches to estimate the type of information envisaged in Figure 5.9. Some of the main considerations in adopting any approach are:

- **Predictability:** How effectively does information on past crimes, offenders, victims and locations allow us to predict future crime characteristics? To what extent are crimes random and unpredictable? Evidence in Sections 5.2 and 5.3 shows that reoffenders, repeat victims, and crime hotspots each represent a significant portion of future crime, improving predictability.
- **Complexity:** How detailed should forecasts be? How many historical risk factors should be included to better predict future crime? Is modelling at a too fine-grained level likely to lead to practical difficulties such as time and cost issues?
- **Scope:** What aspects of society need to be incorporated in the model? Do related sectors such as Child Youth and Family, Welfare, or Health need to be incorporated? How far into the future should forecasts be made? To what level of detail do elements such as police operations or court system processing need to be modelled?

Some of these questions require experimentation and exploration of available data, while others depend on the ultimate justice sector framework adopted. For these reasons an exact methodology is beyond the scope of this feasibility study; however we make a number of comments.

First, the approach used in the MSD welfare valuation is instructive. This uses a **transition model** framework applied at an individual level, illustrated in Figure 6.1 . Every individual can be in one of a number of different benefit types (or not on benefits). Each quarter the probability that a client moves to other benefit types (conditional on their characteristics) can be calculated. Thus, various pathways through the welfare system can be simulated.

Figure 6.1 Transition model structure adopted for Welfare valuation, reproduced from 2014 valuation⁴⁴



The transition model structure, simulated at an individual level, offers a number of conceptual benefits:

- Changes in transition probabilities can be monitored and quickly incorporated in projections. By contrast, other approaches have longer time lags before new information can update models
- Projections are easily sub-divisible into cohorts, by selecting those individuals.
- Transition probabilities can be estimated in a way that allows for many risk factors. This is in contrast to aggregate valuation approaches that tend to only allow a small number of risk factors.
- The simulation allows a sense of the range of pathways likely to be taken. For example, many offenders upon release will have a significant probability of re-offending but also of avoiding future crime; such uncertainties can be understood.
- 'What if' scenarios can be implemented reasonably easily by identifying the relevant individuals, states and transitions affected by a proposed change.

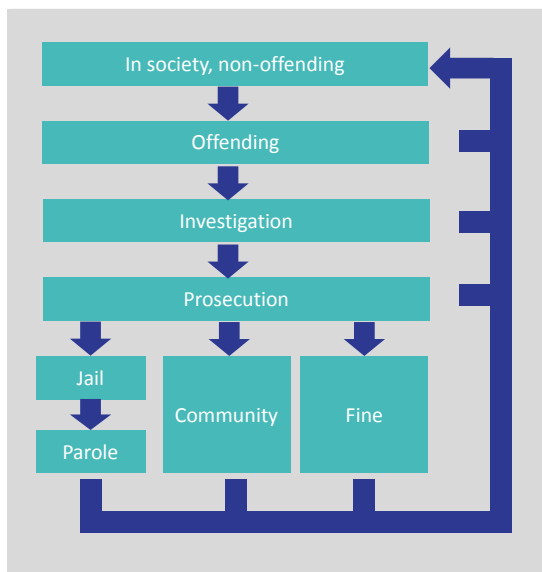
⁴⁴ Taylor Fry, 2014 valuation of the benefit system.

Recommendation

While other options are also possible, **we believe that it is feasible to build a transition-based individual level model** for the justice sector, similar to the approach used in the welfare valuation. Factors leading to transition could be understood and modelled, as could the time taken in the various stages.

In comparison to the welfare approach some extra complexity is required to adequately address the interaction between offender, victim and location. This would involve introducing some co-dependencies in the modelling approach, so that a pathway for one offender, victim or location might be affected by another.

Figure 6.2 Illustrative transition model structure adopted for passage through justice sector



This approach would likely be feasible, given the data available (see the next subsection). Cost and harm can be assigned to each stage and then combined to give the cost associated with the corresponding crime, as discussed in Section 5.6. **This approach would offer some compatibility with the welfare valuation, given that they are both individual based simulations.** It would also be detailed enough to serve the majority of objectives discussed in this report.

While this is one potential approach, we repeat that there are a number of alternatives. In particular, simpler and more aggregated approaches are possible that would produce similar ‘top-level’ information. However, simpler approaches are likely to offer less applicable to specific cost-benefit questions, and less able to quantify specific reform impacts.

6.3 Measuring the background crime rate

One important feature of any actuarial framework would be the ability to distinguish between background trends in crime and changes caused by various investments. This is a more difficult problem compared to the welfare system, where a significant number of economic indicators can be used to monitor the welfare system against the broader economy. However, there are some possibilities for achieving some insight in the justice sector:

- Demographic and economic trends tend to correlate with trends in crime. To the extent they are linked, residual changes in the crime rate can then be identified.
- The use of trials and region based interventions allow comparisons to be made and counterfactuals tested; if there are emerging differences in regions after different intervention strategies are used, this would provide reasonable evidence of impact.

- Input from subject matter experts on emerging trends can be allowed for in attribution.
- The New Zealand Crime and Safety Survey (NZCASS) allows fairly detailed attribution of crime patterns. Detail from this may permit identification of the types of crimes directly affected by an intervention.

These options give some confidence in being able to measure changes in future harm against background trends.

6.4 Existing data sets and gaps

A broad range of data sources exist within the Justice and broader Government Sector which would enable various types of models, with differing levels of complexity, to be constructed. The framework proposed in this report recommends looking at crime through the lenses of offenders, victims, locations and agencies. This section of the report will consider existing sources of data that relate to each of these three key elements, as well as a few additional important sources of information.

6.4.1 Data Relating to Adult Offenders

The data available on adult offenders is longitudinal, generally has an extensive history and is the most thoroughly and accurately recorded type of data available within the Justice Sector. This data exists primarily in the form of administrative records maintained by Police, Courts, and Corrections. Collecting this information together would create a 'lifetime' view of offender movements through the Justice system, from initial apprehension by police through to eventual release from a corrections imposed sentence, and where applicable, further re-offending. Importantly, **all three of these departments identify offenders using a unique Person Record Number (PRN), making it very easy to track individual trajectories through the system over time.** Table 6.1 below gives a high level summary of each source of data on adult offenders.

Table 6.1 High level data summary on adult offenders

Department	Police	Courts	Corrections
Source of data	National Intelligence Application (NIA) system	Courts Management System (CMS)	Integrated Offender Management System (IOMS)
Useable from	Mid-2005 onwards	Early 1980s	On average, 1990s
Major data items	<ul style="list-style-type: none"> -PRN -Offender demographic information -Details of crime(s) (e.g. date/type/location) -Investigation and apprehension details - Initial Proceeding Decision (IPD) (e.g. warning, infringement notice/fine, arrested and charged) 	<ul style="list-style-type: none"> -PRN -Offender demographic information -Details of crime(s) committed relevant to Courts process -Initial case details (e.g. charges, offenders involved) -Detailed dated records of all major court events (e.g. appearances, changes to case or charges, remand and bail, sentencing and orders) -Plea type -Jury or judge alone trial 	<ul style="list-style-type: none"> -PRN - Offender demographic details - Details of sentence/orders, including restrictions - Location of imprisonment and security level, or community probation office assigned to -Detailed dated records of all major events during sentence (e.g. start/end, location movements, early release/parole, changes in security level) -Limited data on attendance of rehabilitation programs -Assessments used to manage offenders e.g. psych reports

Components of the above data are not consistent across time, particularly the Police data, due to continual recording quality improvements and constantly changing front-line policies and practices. In order to obtain a 'lifetime' view of offender movements through the Justice system, a material amount of data transformation and adjustment work would be required, some of which has already been undertaken within the various Justice sector departments.

6.4.2 Data Relating to Youth Offenders

To the extent that young offenders have direct contact with Police, Courts, and Corrections, **data is available in the same quantities and quality it is for adult offenders**. There are two additional sets of information that apply exclusively to young offenders: the Police Youth Case Module (YCM), which is part of the NIA, and Child, Youth, and Family (CYF) data where they have had contact with young offenders.

The Police YCM contains detailed information of all Police interactions with a young offender beyond apprehension (e.g. development of action plans, arrangement of family conferences with CYF), and is currently not linked to the primary Police NIA database. The CYF data contains detailed information about CYF's interactions with young offenders (e.g. organising family conferences, providing advice to Police, Youth Justice plan development) when Police decide there is a need for CYF to be involved.

The Police YCM is presently not linked to the main police database – although a project is currently underway to connect this data. The CYF data on young offenders does not contain PRNs, thus a data match (likely based on name and date of birth) would need to be undertaken for this data to be useful. Similar data matches have been undertaken by CYF previously.

6.4.3 Data Relating to Victims

The data available on victims is not longitudinal, is incomplete (owing partly to current recording procedures and partly to the levels of unreported crime) and generally has a limited history. The data is also heavily weighted towards serious crimes and crimes where insurance compensation is likely to be involved (e.g. vehicle theft). This data exists primarily in the form of administrative records maintained by Police and Victim Support NZ. What is available may be used, to the extent the history permits, to identify and investigate current offenders who were previously victims, or victims that are continually re-victimised. Table 6.2 below gives a high level summary of each source of data on victims.

Table 6.2 High level summary of data on victims

Department	Police	Victim Support NZ	Corrections and Courts
Source of data	National Intelligence Application (NIA) system	Case Management System	CMS and Corrections Victim Register
Useable from	Mid-2005 onwards, substantially higher quality from around 2009	2000 onwards, 2012 onwards for more detailed system with dated events	1980s for CMS, current population of victim register
Major data items	<ul style="list-style-type: none"> -Unique victim identifier -Link to crime/offender PRN -Similar information to offenders (e.g. demographic information of victim, details of crime(s), investigation and apprehension details) -Relationship of victim to offender (very poorly recorded until July 2014) 	<ul style="list-style-type: none"> -Police information where provided -Demographic information -Details of crime(s) -Dated records of all support events and support services provided -Relationships between victims (e.g. family members of a murdered person) 	<ul style="list-style-type: none"> -From the CMS, details of victims when they attend court (e.g. to provide testimony) – identification sometimes unavailable -From the victim register, usually PRN of offender, details of crime, demographic information on victim, other notes as relevant

Due to the short history of useable victim data, and that the majority of victim data only exists for very serious crimes or crimes where an insurance claim may be made, **it would not likely be feasible to develop a long-term or ‘lifetime’ view of victim trajectories through the justice system.** However, it may be possible to determine the expected characteristics of victims from different crime types, offender types, and locations around New Zealand. The existing data may also enable the measurement of the risk of re-victimisation or of a victim becoming an offender over shorter time horizons, and could be used in determining the scale of harm caused by different crime types.

From July 2014 onwards, Police have enacted a compulsory victim recording policy, and substantially improved the data recording process for victims. As time goes on and the pool of data recorded under these new policies grows, it will be possible to do significantly more with victim data.

6.4.4 Data Relating to Locations

The data available on locations of crime is mostly available at a very granular level, and has a history as long as that of offender data. This data exists primarily in the form of administrative records maintained by Police (Courts and Corrections maintain a copy of crime location data passed onto them by Police). This information would allow a very specific analysis of the relationships between locations of crime, types of crimes committed, and the characteristics of offenders and victims involved. Location data is attached to every crime in the Police NIA system. Some victim location data is also available from Victim Support NZ, relating to the location of the victim when the offence was committed (will not always be the same location). Table 6.3 below gives a high level summary of the location data available.

Table 6.3 High level summary of data on location of crimes

Department	Police	Victim Support NZ
Source of data	National Intelligence Application (NIA) system	Case Management System
Useable from	Mid-2005 onwards	Early 1980s
Major data items	-PRN -Details of crime(s) include location of offence, potentially down to a latitude/longitude or ‘meshblock’ level (the smallest geographic unit for which statistical data is collected by Statistics NZ)	-PRN -Location of offence information, obtained from Police -Location of victim during time of offence, obtained from victim

This information could potentially be used to identify crime ‘hotspots’ in some detail, as well as link certain types of crime, or certain types of offenders/victims with particular locations. The Police location data has become more and more accurate over time. If the location data were to be used in a modelling exercise, some analysis would likely need to be done to determine how inaccurate the older data is.

6.4.5 Data Relating to Unreported Crime

If any meaningful commentary is to be made or statistical modelling undertaken on the levels and types of crime occurring over time in New Zealand, it is very **important to consider the level of unreported crime, and how this is changing over time.** The primary means of understanding the level of unreported crime, and the main source of data in this regard, is the New Zealand Crime and Safety Survey (NZCASS).

The NZCASS is usually conducted once every 3 to 5 years. A 2014 survey has been undertaken and is expected to be released in the second half of 2015. Prior to this, the last publicly released NZCASS was in 2009. The 2009 survey found that only around 33% of crimes are reported on average – this rate, and the accuracy of its measurement, differ substantially when broken down by crime type. For example,

theft of, and from, vehicles was found to have the highest reporting levels to Police, while sexual assault had the lowest. Further, sexual assault is a low frequency crime, meaning there are a very limited number of data points available, and any estimate of the level of unreported sexual assaults is subject to an extreme level of statistical uncertainty. More generally, it is very difficult to make meaningful commentary on changes to the levels of unreported crime over time for low frequency crimes such as sexual assault.

Accurately and regularly measuring the level of unreported crime (by crime type) is critically important, because it allows a distinction to be made between (say) an increasing number of recorded assault offences due to an increasing report rate (a positive outcome), against an increasing number of recorded assault offences due to the underlying number of occurrences increasing (a negative outcome). To make matters more complex, these elements may move in opposite directions (i.e. an increasing report rate and a falling underlying occurrence rate), which could send confusing signals about the effectiveness of changes to policy and front-line procedures designed to reduce crime, if the unreported crime rate was not measured over time.

For these reasons, were an annual actuarial modelling exercise to be undertaken aiming to make some level of statistical commentary on future volumes of various types of crime, it would be useful to have the NZCASS conducted more frequently than triennially. This would enable a more meaningful and consistent view of unreported crime, and how it is changing over time. Given that the NZCASS is an exceptionally complex piece of social science which takes almost a year to conduct, and at a substantial cost, one possible approach going forward would be to have a smaller and simpler survey carried out in the intervening years between full surveys, focusing exclusively on the levels of unreported crime by crime type. Establishing the NZCASS, or a simplified version of it, as an annual exercise also has the potential to reduce the per-exercise cost, as it becomes more routine and core staff working on it become more experienced.

Recommendation

A more frequent NZCASS would provide a more complete view of crime, and the impact of reporting levels on recorded crime rates. At the least a simplified annual version of the NZCASS would be desirable in addition to a triennial in-depth NZCASS.

6.4.6 Measuring the Cost of Crime

As discussed in Section 5.5, there are multiple possible approaches to defining and measuring the costs associated with the harm caused by crime. At a high level, the total costs of crime can be broken down into the fiscal costs of crime borne by the Government (inside the Justice sector e.g. Police, Courts, and Corrections departmental costs, and outside of the Justice sector, e.g. Health sector costs for victims of crime), tangible costs of crime borne by society (e.g. value of a stolen vehicle), and intangible costs of crime borne by society (e.g. physical and emotional suffering of victims of serious assault).

For the **tangible costs** that can be measured in dollars, there are two data elements required to construct an actuarial framework – actual dollars spent/incurred/lost at as granular a level as possible, and a method of allocating them to individual crimes or crime types. A tangible cost allocation to crimes or crime types would be possible even with high level financial data, however the more granular the financial data is, and the better the quality of information on how that cost could be broken down, the higher the quality of the resulting cost allocation.

Within the **Government sector**, financial data is recorded in some detail, and could be allocated to crimes or crime types using existing timesheet information or highly detailed financial records. There are some potential issues with existing timesheet data, for example Police and Courts staff timesheets have each been discontinued and had some data quality issues. In these cases however, both departments currently have projects underway to collect information on how staff spend their time, and link the

recordings to specific offenders, crimes, or investigations. Table 6.4 below gives a high level summary of the financial data that exists within the 3 core Justice sector agencies: Police, Courts and Corrections.

Table 6.4 High level data summary on financial and financial allocation information

Department	Police	Courts	Corrections
Known available financial information	<ul style="list-style-type: none"> -HR (salary) information available to a Police station level, by staff type -Overhead costs by district -Breakdown of spend by function (e.g. ministerial and policy advice, general crime prevention, road safety education) available to some extent from 2012 cost modelling exercise undertaken for Police Statement of Intent, including preventive Police activities 	<ul style="list-style-type: none"> -All financial costs are recorded and coded by 'responsibility centre', which are representative of geographical locations -Costs are also coded by 'natural account', e.g. personnel costs, property related costs -In HR system, more detail about salaries, could drill down to staff type and geographical location 	<ul style="list-style-type: none"> -Costs of running prisons available to the 'prison unit' level, including personnel costs and overhead costs, captured monthly -Educational/rehabilitation costs are recorded separately, by program -Program costs more explicit for externally run programs -For non-custodial sentences, costs recorded at a 'probation office' level, similar level of detail -Other overhead costs recorded geographically (e.g. personnel/building costs at national/regional offices)

Tangible costs of crime borne by society at their simplest definition could be taken to mean destroyed/stolen/lost property (e.g. theft of a vehicle, or loss of a house deliberately burned down), but depending on the desired scope of an actuarial framework, could potentially also include preventive expenditure that would not exist in a world without crime (e.g. cost of burglar alarms, deadlocks, security cameras, administrative costs of insurance), and the indirect but tangible costs of lost productivity (e.g. workers unable or unwilling to work due to physical/emotional harm).

Data relating to some of these items exists – for example industry insurance statistics, or more specific insurer data, could be used to determine the average value of destroyed/damaged/lost property for different property and crime types. However, there is no simple way to collect data on the opportunity cost of preventing crime, or indirect tangible crime costs such as lost productivity in the workplace. Were such costs to be included in the scope of an actuarial framework, they would likely have to be estimated by crime type.

One possible estimation methodology for lost output costs would be that used by the UK Home Office in a 2005 paper⁴⁵ estimating the economic and social costs of crime against individuals and households. The method involved collecting data on severity (as measured by working days lost) of various known health related outcomes caused by crime, and translate them into a financial quantity by valuing each day lost at the average daily GDP per capita – thus it is possible to estimate the lost output costs of crime born by society in dollar terms.

Further technical details of how such an approach might work, or any limitations, are out of scope for the purposes of this feasibility report, however it is worth noting that this methodology has already been successfully applied previously in New Zealand, in the 2006 Treasury paper⁴⁶ estimating the total cost of

⁴⁵ The Economic and Social Costs of Crime against Individuals and Households 2003/04 (2005)

⁴⁶ Estimating the Costs of Crime in New Zealand in 2003/04 (2006)

crime in New Zealand in 2003/04. That paper relied on UK severity assumptions for each comparable category of crime, and converted them into New Zealand prices using an appropriate index, implicitly assuming the severity of injuries caused by crime were similar between the UK and New Zealand. Although it is out of scope for the purposes of this feasibility study, if an actuarial framework were to be built in the Justice sector, it would be worth considering whether there is demand, data, or capability to estimate New Zealand specific monetary estimates of lost output caused by crime. Data required would likely come from the Health sector, and involve estimating the duration of various health states arising from violent crime.

Finally, the **intangible costs of crime borne by society** reflect reductions in victims' quality of life. These represent an important component of the total cost of crime – ignoring them in its measurement may lead to policy or operational decisions that directly or indirectly lower the quality of victim's lives. Very little data exists on these costs, thus it is likely that if they were to be included in the scope of an actuarial framework, they would have to be estimated by crime type.

As with the costs of lost output due to violent crime, the UK Home Office 2005 paper offers an approach for estimating intangible social costs associated with crime. The method involved collecting data on the frequency and severity (may be measured by duration of hospital stay/required treatments) of various known health related outcomes caused by crime, and translate them into estimated losses of Quality-Adjusted Life Years (QALYs). Each QALY can be translated into a financial amount via a QALY valuation – thus it is possible to estimate the intangible costs of crime born by society in dollar terms.

It is worth noting that this methodology has also already been successfully applied previously in New Zealand, in the 2006 Treasury paper estimating the total cost of crime in New Zealand in 2003/04. That paper relied on UK monetary estimates for each comparable category of crime (and converted them into New Zealand dollars using an appropriate index), implicitly assuming the severity of injuries caused by crime were similar between the UK and New Zealand. If an actuarial framework were to be built in the Justice sector, it would also be worth considering whether there is demand, data, or capability to estimate New Zealand specific monetary estimates of intangible harm caused by crime.

6.4.7 The IDI – A Supplementary Source of Data

The Integrated Data Infrastructure (IDI) is a linked longitudinal dataset produced and maintained by Statistics NZ. Data extracts are prepared by various Government departments within and outside of the Justice sector, and provided to Statistics NZ regularly, where they are processed and linked together. One of the most powerful potential applications of such a dataset is being able to link together all of a person's interactions with nearly every Government department over their lifetime. This might enable for example, an investigation of whether long-term welfare benefit dependency is correlated with a higher rate of criminal offending, or what the costs of criminal offences are to Government departments outside of the Justice sector, such as costs to the Health sector.

As at March 2015, data which has been made available on the IDI which could be relevant to an actuarial framework in the Justice sector includes conviction and sentencing data from Courts, imprisonment and community service data from Corrections, welfare benefits data, and education data. Relevant data which has yet to either be uploaded or made available, but is expected by around mid-2015, includes Police data (on offenders and victims), CYF (Child, Youth, and Family) data, and detailed Health data.

Some of the data series already available on the IDI, or expected in the near-future, have short histories, which would limit their usefulness in the short to medium term, from a statistical analysis perspective. For example, the IDI Police datasets on offenders and victims will begin from July 2014. This is not an insurmountable issue, as offender data obtained directly from Police (which has a longer history) could potentially be used alongside data from the IDI.

Overall, **the IDI presents a powerful potential source of linked and longitudinal data**. Were an actuarial framework to be constructed in the Justice sector, it could be used to measure crime related costs that

sit outside of the Justice sector, such as costs to the Health sector. The usefulness of such information would ultimately depend on the scope of what the framework was attempting to measure. Section 5.5 discusses possible proxies for harm, and recommends that crime related costs outside of the Justice sector be captured and measured where possible.

6.5 Existing tools and value-add

A number of tools are in use within the Justice Sector which assist in decision making for individual cases and measuring overall performance, or that of particular policies and programs. An actuarial framework has the potential to offer **additional insight into the drivers of crime and recidivism, severity and related costs**. In addition, **a lifetime perspective** on the benefits of various rehabilitation programmes could be gained, which would enable a more effective cost-benefit analysis for such programmes. This section of the report will consider some existing tools already in use throughout the Justice sector, and where specifically actuarial tools may add value. Table 6.5 and Table 6.6 below describe the key tools being used in the Justice sector, and where an actuarial framework will add value to these tools or around them.

Table 6.5 Existing Key Tools in the Justice Sector

Tool	What it does
Recidivism Index (RI)	Measures the proportion of offenders of a particular class known to have re-offended within a defined period.
RoC*RoI: a blend of risk of re-conviction and risk of re-imprisonment models	Measures rate of re-offending within 1-5 years of release from imprisonment/start of community service. Used to advise courts for sentencing, planning offender pathways, input to parole board decisions.
Rehabilitation Quotient (RQ)	Percentage point reduction in RI in a group that has undertaken a rehab/education program, compared to a matched sample of offenders who have not
Seriousness Index	A measure of the overall seriousness of offences committed by cohorts of offenders over any given time period, based on the average number of days spent in prison, or statistical equivalents to prison days in community work or fines
Various Corrections tools used to predict future behaviour (e.g. Dynamic Risk Assessment for Offender Re-Entry – or DRAOR)	Main purpose is to assign appropriate rehab/education programmes and interventions, and reduce risk of future re-offending
10-year volume forecasts	Annually produced forecasts of various volumes in the Justice Sector (e.g. volume of imprisoned offenders and those serving community sentences). A complex system, subject to constant change as policy and operational decisions affect the assumptions.
Various Police tools used by front-line officers to assess risk or determine immediate response action (e.g. Victim History Scorecard, or VHS)	The VHS assigns a colour coded priority to calls from previous victims (e.g. red/amber/green), depending on a mathematical assessment of their victimisation history, and thus likely danger they are in presently. This calculation is run by the system and the police officer given only the result.

Table 6.6 Value-Add of Actuarial Framework to Existing Key Tools

Tool(s)	Value-Add
RI, RQ	RI/RQ are volume-only measures that do not take account of the severity or future cost of crimes. An actuarial framework would add this capability, giving a clearer picture of changes in the overall seriousness of crimes committed, weighted by volume. An actuarial framework may also enable analysis of re-offending via a different crime type to the original offence (e.g. escalation of subsequent offences). Results could be aggregated to group level to estimate expected types and costs of future crimes, and to estimate savings associated with reduced severity and incidence of recidivism.
Seriousness Index	An actuarial framework will enable a future projection of the seriousness index, and could be used for scenario analysis.
Tools used to predict future behaviour	If a transition approach to modelling were taken, an actuarial framework would give clear trajectories of how different offender cohorts are expected to move through the Justice sector in the future, which would give additional information to be used alongside existing tools in deciding the most appropriate intervention actions to take.
10-year volume forecasts	An actuarial framework would be complementary to the annually produced 10 year volume forecasts, e.g. could provide better inputs by linking the level of reported crime to the number of prosecutions, could also use information produced by the forecasts as inputs to the actuarial framework, and/or use them as a point of comparison to better understand underlying trends.
All	None of the above tools apply across multiple Justice sector agencies. An actuarial framework offers an opportunity to have a sector wide perspective, for example what will an offender about to be released from prison cost Police in the future?

6.6 Conclusion: Technical feasibility

Feasibility advice

An investment approach framework is **technically feasible** for the criminal justice system:

- Appropriate models can be built to forecast volumes, costs (tangible and intangible) and trends by crime type, by offender/victim/location group, and by agency
- These models can be recalibrated to improve accuracy over time
- There is sufficient administrative data; and,
- Approach would significantly enhance the sector’s capability compared to tools currently in existence in the sector.

7 NEXT STEPS

INSIDE THIS SECTION:

- Enabling conditions
- Risks and mitigation
- Other considerations

7.1 Summary

Enabling conditions to assist in managing the scale of change that an investment approach could potentially mean for the criminal justice system include:

- Clarity of vision and purpose; including alignment between policy settings, agency mandates, operational strategies and measurement approach
- Leadership and coordination; including appropriate governance mechanisms
- Collaboration and cooperation; to manage change by developing buy-in
- A strategic plan; particularly useful to build a shared understanding in an interagency context; and,
- A focus on continual improvement; a culture that paces change so as to fail small and early.

Recommendation

The criminal justice system necessarily features high levels of discretion. To avoid perverse incentives, if fiscal costs—or even a full proxy for harm—were introduced as performance measures, it would be important to complement them with **supplementary monitoring for key decision points**; such as reporting rates, prosecution rates, etc. **Some critical decisions would need to be protected from pressure to reduce costs** at the expense of due process, fairness, and public safety; such as sentencing and parole decisions.

Should Government wish to proceed with the development of a framework for the criminal justice system along the lines described in this report, the following approach may be useful:

Recommendation

A phased approach to introducing an actuarial framework is easier, faster, and less risky:

- Progressive development of insights, with care in the design phase; and,
- Business as usual from an operational perspective, with course adjustments as evidence emerges.

7.2 Enabling conditions

7.2.1 Clarity of vision and purpose

In order for an investment approach framework to be introduced in the criminal justice system, its intervention logic and the roles of different agencies would need to be clearly defined. We have proposed an overall intervention logic in Section 5.4, but have not attempted to drill down to agency level or beneath. Also, other stakeholders will likely have views that help to further clarify the approach and framework, and how it can be adapted to suit the sector.

Flexibility to reallocate funding in response to evidence about performance is fundamental to the success of the model. Some flexibility exists within the Justice Sector Fund and within agency baselines. Whether this flexibility is adequate will require assessment.

Alignment between policy settings, agency mandates, operational strategies and measurement approach is also important. The framework can support either step change or incremental change, but the magnitude of the financial impact will be dependent on the nature and scale of the changes.

The level of upfront investment required is also dependent on the nature and scope of changes to policy settings and to the operational model, but also to the evaluation and information technology infrastructure required for implementation.

7.2.2 Leadership and coordination

An investment approach framework would reflect significant change in some areas of the sector. This change would entail re-orienting the accountabilities and focus of the criminal justice system to respond to evidence from periodic valuations, monitoring, and impact evaluation.

Clear lines of accountability at very senior levels will be essential for effective management of a change of this magnitude. This will be particularly true in the justice sector, where multiple stakeholder organisations are involved. Consideration should be given to the development of appropriate governance mechanisms, the role for central agencies, and the extent and nature of cross-sectoral collaboration.

7.2.3 Collaboration and co-operation

We recognise that collaboration in the design phase helps introduce change to the system in a positive manner. When key staff are actively involved in the development of a fit-for-purpose framework, potential changes become evident gradually and are introduced in an atmosphere of co-operation.

Implementation risks, some of which may be associated with cultural resistance to the new framework, will be partially mitigated if a spirit of co-operation defines the requirements gathering phase. Cultural buy-in will be more likely if there is a true sense of ownership in the departments involved in the change. In addition, staff will have the opportunity to build knowledge of the framework and management capability, enabling easier implementation and hand-over of management tasks.

7.2.4 A strategic plan

Interested parties will be best able to clarify their roles and next steps through a coordinated strategic planning process. The departments involved may wish to collaborate on such a plan.

An investment approach framework is by nature a long-term undertaking, with an initial development phase and additional learning from experience on an ongoing basis. Not all will be clear at the outset, and a phased approach to introducing the change helps managing expectations in the face of uncertainty.

7.2.5 A focus on continual improvement

Making visible the long-term costs of different cohorts and the relative influence of different drivers of cost brings a long-term focus to the system. This information sends different signals about which types of outcomes are most desirable.

For example in the welfare system there has long been a focus on Job seeker numbers. Investments often targeted primarily incoming job seekers and KPIs placed a premium on exits to work. Valuations highlight that most job seekers have lower future costs than most other client groups, that clients already on benefits usually have higher future costs than incoming clients, that not all client exits are equally valuable and that many clients who exit return to benefits.

Improved performance over time comes from identifying areas of underperformance, and testing new strategies. A culture of continual improvement fosters a tolerance for transparency and a constructive approach to problem solving. A disciplined change program and a trial approach promotes “failing small and failing early”, creating a more robust operating model overall.

7.3 Risks and mitigation: Aligning cost signals with business objectives

There are a number of circumstances in which reducing harm would not reduce future costs, and vice versa. The risk is that **a performance framework could send signals that create perverse incentives** and result in behaviour inconsistent with the goal of reducing the crime caused by harm.

An important example is the difference between *all* crime, and *recorded* crime; our recommended scope for this framework. There is currently a low level of reporting associated with particularly harmful crimes, such as sexual assaults, as noted in Section 4.3.1. It is also difficult to disentangle whether or not movements in recorded crime levels are reflective of movements in underlying crime levels.

There are a few risks here:

- Creating perverse incentives to avoid recording or proactively investigating crimes; particularly the most serious and costly crimes
- Being penalized from a performance perspective if a greater proportion of crime is reported, for example, due to increased public confidence in police, proactive outreach to victims to increase resilience, or measures to reduce re-traumatization that can dissuade victims from reporting.

These risks can be mitigated by measuring changes in the reporting rate as part of the framework. This would help to distinguish between changes in the underlying level of crime and changes in the level of reported crime. We recommend the NZCASS be undertaken annually for this purpose, to enable more consistent measurement of how reporting changes influence recorded crime rates. This recommendation was discussed in the previous chapter.

An incomplete list of other examples of potential issues includes:

- Fixed costs may not fall in line with reductions in crime, as discussed at several points throughout this report
- Changes in sentencing practice could appear to be changes in severity of harm
- The current allocation of administrative costs will not always bear a strong relationship to the relative harm caused by different types of crime
- Costs such as detention can be responsive, but also preventive in nature. Preventive detention may be costly while also preventing future harm that is difficult to measure. Conversely, early release could appear to indicate good performance, but put some victims at risk
- Harm is subjectively and inconsistently experienced by victims. Any proxy for harm will rest on a certain amount of subjectivity, and thus be open to interpretation
- Corporate fraud involves large dollar sums that risk emphasising its importance relative to harm caused by personal crimes against individuals

Our recommendation to introduce an investment approach first as an information framework (see Section 3.2) will help to mitigate the risk that poorly aligned signals drive perverse performance incentives. Measurement can be refined over time to improve signalling.

Recommendation

The criminal justice system necessarily features high levels of discretion. To avoid perverse incentives, if fiscal costs—or even a full proxy for harm—were introduced as performance measures, it would be important to complement them with **supplementary monitoring for key decision points**; such as reporting rates, prosecution rates, etc. **Some critical decisions would need to be protected from pressure to reduce costs** at the expense of due process, fairness, and public safety; such as sentencing and parole decisions.

7.4 Approach to development of the framework

7.4.1 Timeframes and cost

Introducing a framework in the criminal justice sector could mean either significant or incremental change; dependant on the government's and management's priorities for the sector. Based on the welfare reform experience, changes could include:

- Different policy settings and/or changes to sector or agency operating models
- Changes to the scale or nature of prevention investments
- New governance arrangements
- Enhancing in-house evaluation, analytics, data and/or ICT capability; and/or,
- Commissioning external advice, including actuarial tools.

Overall timelines and cost will naturally be subject to the scale of change envisaged; which is a strategic decision.

In terms of the timeframes and costs associated with the actuarial work required to develop the suggested framework, we do not provide a specific estimate here. Instead, we point to the development of the equivalent framework for the Welfare system as a general reference point.

- It is a matter of public record that the initial feasibility work and baseline valuation for the Welfare system cost of the order of \$1 million. The time required for the initial design phase was more than we had envisaged at the outset, resulting in significant write-offs by Taylor Fry that were not charged to MSD.
- In terms of timelines, the initial valuation took almost 1 year to complete. We also conducted a separate client segmentation study that year.
- From the second valuation, results were reported at both aggregate and segment levels, providing considerably more insight into client behaviour, risk factors and populations at risk; as well as analysis of year-to-year change from the baseline valuation.
- Each year has provided more granular insights. The most recent valuation, as at 30 June 2014, includes analysis of intergenerational benefit receipt, regional unemployment rates and their impact on patterns of benefit receipt.

7.4.2 Implementation considerations

The framework outlined in this feasibility study requires significant creativity and skilled resources in both the initial development phase and its ongoing management; as well as sufficient time and budget. None of these items should be underestimated.

Should Government wish to proceed with the development of a framework for the criminal justice system along the lines described in this report, the following considerations may be useful.

Continue with business as usual

As noted in the previous section, the scale of policy and operational change is a strategic decision:

- On the one hand, small operational changes are unlikely to have large impacts on performance. This suggests an argument for large scale change.
- On the other hand, the framework builds insights gradually and recommends evidence-based decision-making in response to those insights on an ongoing basis. This suggests an argument for progressive change.

There is no need to alter the current approach to management of the sector. The sector is already working toward performance targets measured by the BPS. Innovation, policy reform, interventions and so on can continue while the framework is designed and put in place. Ultimately, the goal of the framework is to create performance feedback loops that incentivise ongoing performance improvements.

Employ a phased approach.

A phased approach will be easier, less risky and ultimately faster. We suggest initially building the components that provide the greatest change for the least effort and allowing the framework to become a part of justice sector management by continually developing its use over time.

Phasing options include:

- Beginning with an information framework before introducing performance measures, as noted earlier.
- Including components that are easiest to cost, first; such as fiscal costs within the justice sector.
- Developing lenses gradually; e.g., data regarding crime type and offenders may be more readily available than for victims.
- Using established methodologies to weight harm and then refining them as a more detailed understanding of nuances emerge over time.
- Beginning with agencies that are more ready and then broadening scope gradually.

Care in design phase

Both the design of the framework and communication of results will be key to a successful outcome. To avoid the perverse outcomes highlighted in Section 7.3, we recommend considerable care during the design phase. It may also be advisable to periodically revisit design parameters.

Recommendation

A phased approach to introducing an actuarial framework is easier, faster, and less risky:

- Progressive development of insights, with care in the design phase; and,
- Business as usual from an operational perspective, with course adjustments as evidence emerges.

7.5 Conclusion: Next steps

Should Government wish to proceed with the development of a framework for the criminal justice system along the lines described in this report, the following approach may be useful:

