Community Risk Reduction Model Plan

Risk Reduction Strategies: A Black Swan Group Practitioner Framework

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Ratione Non Ira — By reason, not rage

How to use this document

This document presents five risk-reduction strategies developed in compliance with NFPA 1300: Standard on Community Risk Assessment and Community Risk Reduction Plan Development, and integrated with Black Swan Group doctrine for adaptive, ethics-grounded operations in complex and resource-constrained environments.

Each strategy is a template. Placeholder values appear in [brackets] and are accompanied by adapter notes explaining what data to gather and why it matters for your specific community. The worked examples throughout draw from a rapidly growing mid-sized city and are clearly marked as illustrations, not mandates.

Each strategy also includes a domain classification and a Black Swan lens section. The domain classification tells you what kind of problem you are solving before you start solving it. The Black Swan lens names the exaptive opportunities already present in your community and the ethical keel considerations specific to that risk area. These are not decorative additions; they are the difference between a plan that sits on a shelf and a plan that gets used.

What this document contains:

- **Black Swan CRR Doctrine**: Six operating principles that govern the plan
- **Community Profile**: Fillable templates for geographic, demographic, hazard, and organizational data
- **Risk Assessment Methodology**: Four-phase CRA process with domain classification and community risk signal pathway
- **Five Strategies**: Smoke alarms, WUI, large-scale events, non-emergent alarms, cooking fires; each with domain classification, 5 E's structure, partner lists, measures, and Black Swan lens
- **Implementation Framework**: Governance, plan revision protocol, 90-day/year-one/year-two-through-five phasing, training, and resourcing
- **Evaluation Framework**: Three-tier measures, Black Swan AAR at three operational tempos, debrief protocol, leadership reporting, and graceful extensibility
- **Six Appendices**: Incident data templates, demographic data templates, response and hazard profiles, budget templates, ROI calculator, and annual scorecard with AAR record

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Key terms used in this plan:
This plan uses terminology from Black Swan Group doctrine. These terms appear throughout the strategies, evaluation framework, and implementation guidance. Each is explained in full where it first appears; this reference provides a quick orientation for new readers.

- **Ethical keel** — Four operational functions (inner command, consequence honesty, terrain sensitivity, moral courage) that constrain action when certainty is thin, and pressure is high. The keel keeps the program honest. *(Full explanation: Black Swan CRR Doctrine section)*

- **Domain classification** — Identifying what kind of problem you are solving (clear, complicated, complex, or chaotic) before designing the intervention. The most costly CRR error is treating a complex problem as a complicated one. *(Full explanation: Domain Awareness section and Risk Assessment Methodology)*

- **Exaptive recombination** — Repurposing an existing capability, relationship, or resource for a function it was never designed for. In CRR, a hospital's home-visit program becomes a smoke alarm delivery pathway. A school's communication system becomes a multilingual fire safety channel. *(Full explanation: Exaptive Recombination section)*

- **Consequence honesty** — Judging the program by what it actually produces — changed risk indicators — not by what it was intended to produce or by how many activities it completed. *(Full explanation: Ethical Keel section)*

- **Terrain sensitivity** — Designing for the community that exists, not the one that would be convenient to serve. A program that delivers English-only materials to a community where the highest-risk population speaks Somali is terrain-insensitive. *(Full explanation: Ethical Keel section)*

- **Self-limiting leadership** — The coordinator makes intent explicit, accountability visible, and their own control footprint small — so partners can act within their own expertise without waiting for permission. *(Full explanation: Governance and Ownership section)*

- **Dormant partner** — A maintained but not currently active relationship with an organization that could serve as a backup delivery pathway if the primary partner withdraws. Low cost, high value when activated. *(Full explanation: Trust and Shared Orientation section)*

- **Community risk signal pathway** — A structured process for partner organizations to surface emerging risks between formal assessments. The advisory group's quarterly question: "What risk are you seeing that this program is not addressing?" *(Full explanation: Risk Assessment Methodology section)*

- **Multi-tempo AAR** — The seven after-action questions run at three speeds: quarterly (fast sensing), mid-year (structural check), and annually (full reorientation). *(Full explanation: The Black Swan After-Action Review section)*

- **Graceful extensibility** — The capacity of the program and the community to stretch without breaking in response to surprise — and to do so in ways that preserve future adaptive capacity rather than consuming it. *(Full explanation: Graceful Extensibility section)*

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Quick Start: The First Five Moves

If you have one person, 90 days, and no budget — start here.

This plan is over 25,000 words and 65 pages in length. You do not need to read all of it before you start; no one has that kind of time. But you do need to read this page, make five moves, and come back for the rest when the first strategy is running.

Move 1: Know your terrain.

Turn to the Community Profile section and fill in what you already know. You have most of this data. Your incident reports, your census data, and your department roster are already in your files or available online. Where the data does not exist, write "unknown" and keep moving. An incomplete picture that you act on is more valuable than a perfect picture that takes a year to assemble. *(Community Profile, page 9])*

Move 2: Pick one risk.

Look at the example five strategies in this plan: smoke alarms, WUI, large events, non-emergent alarms, and cooking fires. Pick the one where your data is clearest, your community's need is most urgent, and you have the best chance of showing a measurable result within six months. For most communities, that is smoke alarms. You do not need to launch all five. You need to launch one. *(Strategies, pages 15, 19, 23, 27, and 31)*

Move 3: Find one partner.

You cannot do this alone, and you do not need to. Identify one organization in your community that already has access to the people your chosen strategy needs to reach — a healthcare system, a social service agency, a community organization, a school district, or a property manager. Call them. Show up with your data and ask one question: "What are you seeing in your work that relates to this risk?" That conversation is the beginning of your delivery network. *(Days 31–60: Build the Partnerships, page 37)*

Move 4: Establish your baseline.

Before you install the first alarm, conduct the first inspection, or distribute the first flyer, document where you are starting from. How many residential fires last year? How many had working alarms? What is the fatality rate? You cannot demonstrate that your program worked if you do not know where it started. *(Risk Assessment Methodology, page 11; Appendix A, page 48)*

Move 5: Run it for six months.

Then measure. Launch the strategy. Collect data on what you did (process outputs) and what changed (impact outputs). At six months, ask three questions: Did we reach the people we intended to reach? Did the leading indicators move in the right direction? What do we need to adjust? Those three questions are the beginning of the evaluation cycle that will tell you whether this plan is working — or whether it needs to change. *(Evaluation, page 40)*

That is the starting sequence. Everything else in this plan — the doctrine, the domain classifications, the Black Swan lens, the multi-tempo AAR, the revision protocol — is the architecture that makes the program durable, adaptive, and honest over a five-year period. You will need all of it eventually. You do not need all of it on day one. Start with these five moves. Come back for the rest when the first strategy is running, and you are ready to add the second.

If your organization has ten people, no dedicated prevention staff, and a budget that came from a car wash, this plan was built for you. Not in spite of your constraints — because of them. Everything in this plan is designed to work with what you already have, reach people through partners who already have access, and measure what actually changes rather than what is easy to count. The constraints are not the obstacle. They are the terrain. And this plan is built for that terrain.

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About This Model Plan

Community Risk Reduction (CRR) is one of the most important things a fire and emergency services organization can do with its limited resources, and one of the most frequently done badly. This model plan exists because the gap between a compliance document and an operational one is wide, and most fire departments lack the time, expertise, or outside perspective to close it on their own.

The Black Swan Group Community Risk Reduction Model Plan is not a template in the sense of a form to fill out. It is a practitioner framework: a set of structures, principles, tools, and worked examples that give a department a genuine head start on building a CRR program that will be used, not shelved. The structures come from NFPA 1300 and the USFA 5 E's model. The principles come from Black Swan doctrine and complexity science. The worked examples come from a mid-sized, rapidly growing inland city that built and implemented all five strategies presented here.

This document is suitable for use by:

- Fire and emergency services organizations developing a CRR plan for the first time
- Departments updating or replacing an existing CRR plan that has not been operationally effective
- Emergency management organizations adding community risk reduction capacity to an existing all-hazards program
- Consulting professionals using it as a foundation for client-specific CRR plan development

Adapting this plan to your community requires three things: your community's data in the placeholder fields, your department's honest assessment of current capacity in the implementation section, and the willingness to measure outcomes rather than just activities. The plan will tell you what to do. The data will tell you whether it is working.

A question that will arise from city managers, partner agencies, elected officials, and within the department itself is why the fire department leads community risk reduction rather than the health department, the housing authority, or the emergency management agency. The answer is not that the fire department does all the work. It is that the fire department owns the outcomes.

The fire department is the agency that responds when prevention fails. It collects the incident data that measures whether risk is being reduced. It is accountable to the community for the consequences when it is not. No other agency occupies that position. Healthcare systems see the injuries. Housing authorities see the code violations. Social service agencies see the vulnerable populations. But only the fire department sees the full picture — the incident, the address, the occupancy type, the alarm status, the ignition cause, the human cost — and only the fire department is called to account when the next one happens.

The CRR plan coordinator is not doing the health department's job. The coordinator is connecting the fire department's risk data to the community's existing delivery capacity — and measuring whether the connection produces results. Every partner in the network benefits from that connection. The healthcare system that adds a two-minute fire safety conversation to its home visits reduces the burn injuries that strain its emergency department. The housing authority that incorporates alarm compliance into its inspections reduces the liability exposure in its properties. The school district that distributes multilingual safety materials reaches families that no single agency can reach alone. The fire department coordinates the network, measures the outcomes, and is accountable for the results. That is what lead agency means.

This positioning matters for one additional reason that is becoming more urgent as federal support models shift. As the federal government moves toward a supporting rather than primary role in emergency and disaster management, and as the future of organizations like DHS and FEMA remains uncertain, local jurisdictions will increasingly bear the full weight of their own risk management. Funding that was once automatic may disappear. Grant programs that sustained CRR activities may contract. In that environment, a fire department that can demonstrate measurable risk reduction using local resources and community partnerships — rather than depending on outside funding and outside personnel — is a department that has built genuine self-reliance. This plan is designed for that reality. Everything in it works with what you already have, because in the environment that is arriving, what you already have may be all you get.

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Standards compliance

This plan is developed in accordance with the following standards and frameworks:

- NFPA 1300: Standard on Community Risk Assessment and Community Risk Reduction Plan Development. The NFPA 1300 structure governs the five strategies: each strategy includes a risk statement, goal, objectives, strategies organized by the 5 E's, internal participants, strategic partners, required resources, communication and marketing methods, and evaluation measures, including process outputs, impact outputs, and outcomes.
- USFA 5 E's Community Risk Reduction Model: Education, Engineering, Enforcement, Emergency Response, and Economic Incentives. Each strategy incorporates at least three of the five E's, and the majority incorporates all five.
- Vision 20/20 Strategic CRR Planning Framework: The community engagement orientation, partnership development structure, and long-term sustainability planning in this document reflect Vision 20/20 principles.
- FEMA National Incident Management System (NIMS): Organizational and command structure references are NIMS-compliant.

Compliance with these standards is necessary but not sufficient. A plan can satisfy every NFPA 1300 requirement and still fail to reduce risk if it is not grounded in honest data, honest evaluation, and organizational commitment to act on what the data reveals. This plan is designed to meet both the compliance and operational requirements.

Why Standard CRR Plans Fail

Most fire departments in the United States allocate less than 3% of their annual budgets to prevention and mitigation activities. The rest goes to response capability: stations, apparatus, personnel, training. The logic behind that allocation is understandable; the fire department is the organization the community calls when something is burning, and elected officials and the public evaluate it primarily on response performance.

The problem is that this logic produces a system that is permanently reactive and structurally unable to reduce the volume of demand it is responding to. Every dollar spent on response after an incident costs between 12 and 30 dollars more than a dollar spent on prevention beforehand. The National Institute of Building Sciences has documented this ratio consistently across multiple disaster types and jurisdictions. Fire departments allocating three percent to prevention are spending the remaining ninety-seven percent managing consequences that a higher investment in prevention could have reduced.

This is not primarily a budget problem. It is a cultural and structural one, and a CRR plan that does not account for it will not survive contact with the organization it is supposed to serve.

The three failure modes

Failure mode 1: The plan is compliance, not commitment

Many CRR plans are written to satisfy an accreditation requirement, a grant condition, or an administrative mandate. They are produced by a small group of people, approved by leadership, filed, and never referenced again. The strategies are generic. The measures are activity counts. The evaluation cycle never happens because no one owns it. The department continues operating exactly as it did before the plan was written.

A CRR plan that is not operationalized does not fail quietly. It consumes the credibility of the next attempt. Personnel who participated in the last process, the one that produced nothing, are harder to mobilize for the next one. Community partners who were engaged and then never heard from again are harder to re-engage. Leadership that approved a plan and saw it produce no measurable outcome finds it harder to convince that resources should be reallocated toward prevention.

The Black Swan model treats this as a consequence honesty problem. The honest measure of a CRR plan is not whether it was written. It is whether risk indicators changed. If you cannot measure whether the plan is working, you do not have a plan. You have a document.

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Failure mode 2: The plan treats the community as a static object

Communities change. Demographics shift. Development patterns alter the risk profile. New construction introduces new hazard types. Established neighborhoods age, and their populations change. A CRR plan that was accurate in year one may be substantially wrong by year three if it is not grounded in a living community risk assessment process.

More fundamentally, communities are complex adaptive systems, networks of interacting people, organizations, infrastructure, and behaviors that produce emergent patterns at the system level. Risk does not distribute itself according to simple categories. It concentrates on specific locations, populations, and combinations of conditions that static analysis misses. A plan built on a one-time risk assessment that is never updated is navigating with an outdated map in shifting terrain.

The Black Swan model treats community risk assessment as an ongoing process, not a document. The community profile and risk assessment sections of this plan are designed to be updated on a defined cycle and to feed continuously into the strategy evaluation process.

Failure mode 3: The plan is designed for the community the department wants, not the one it has

Generic CRR programs produce generic results. A cooking fire prevention program that delivers English-language stove safety materials to a community where a significant portion of the highest-risk population speaks Somali, Burmese, or Spanish will produce impressive outreach numbers and no measurable reduction in cooking fire rates. A Wildland Urban Interface (WUI) program that delivers defensible space education through a department website to property owners who are skeptical of government involvement in their land management will not achieve compliance.

Terrain sensitivity, one of the four functions of the Black Swan ethical keel, is the discipline that prevents this failure. It requires the department to describe the community it is actually serving before designing programs for it: which populations, which languages, which cultural practices, which trust relationships exist, and which do not. A CRR plan built on that honest assessment will reach people. One built on assumptions about who the community is will not.

Black Swan CRR Doctrine

The Black Swan Exaptive Spiral is a field doctrine for generating coherent action when conditions outstrip standard plans. It was developed in the context of military operations, hazardous materials response, and CBRNE consequence management, environments where the terrain shifts faster than inherited procedures can absorb, and where adaptation without an ethical anchor produces failures that look decisive in the moment.

Community risk reduction is that kind of environment. The terrain shifts: demographics change, new hazards emerge, resources fluctuate, community trust is earned and lost, and the departments that navigate it effectively are not the ones with the most resources or the most detailed initial plans. They are the ones with the strongest ethical foundation, the clearest picture of the actual terrain, and the ability to repurpose what they have rather than waiting for what they wish they had.

Six principles from Black Swan doctrine run through this plan:

The ethical keel

Community risk reduction is built on trust, and trust is built on character. A department that produces accurate data about community risk, even when that data is uncomfortable for elected officials, earns the credibility to act on it. A department that softens its findings, overstates its outcomes, or designs programs for populations that are easy to reach rather than populations that need to be reached loses that credibility over time, often without noticing until a funding request is denied or a community partner withdraws.

The ethical keel in CRR work consists of four operational functions:

- **Inner command**: The discipline to stabilize yourself before you attempt to stabilize the environment. In CRR work, this means reporting what the data shows rather than what leadership wants to hear, and maintaining that standard under budget pressure, political pressure, and the

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organizational incentive to look successful. It also means the plan coordinator models that standard visibly, accounting for what the program got wrong before asking anyone else to evaluate their area.

- **Consequence honesty**: Evaluating programs by whether risk indicators actually changed, not by whether activities were completed. Counting the number of smoke alarms installed is a process measure. Whether those alarms alert occupants in actual fires is the outcome measure. Both matter, but only the outcome measure tells you whether the program is working.
- **Terrain sensitivity**: Designing programs for the community that exists, its actual languages, cultures, trust relationships, economic conditions, and risk distribution, not the community that would be convenient to serve. A script that worked three years ago may no longer fit a community that has changed.
- **Moral courage without guarantee**: Advocating for prevention investment in an organizational culture that rewards response performance. Recommending corrective actions that will be unpopular with property owners or event organizers. Acknowledging program failures honestly and using them to improve the next iteration, without certainty that the next iteration will succeed either.

Trust and shared orientation

A CRR program does not operate through the fire department alone. It operates through a distributed network of partners: healthcare systems, social service agencies, school districts, property managers, alarm monitoring companies, community organizations, and other city departments. That network is the program's actual delivery infrastructure, and its effectiveness depends on trust.

Trust in a CRR context is not a good working relationship. It is the operational infrastructure. When trust is intact, a community health worker will add a two-minute cooking fire safety conversation to a home visit because she understands why it matters and believes the fire department will use the resulting data responsibly. When trust is absent, the same health worker will treat the fire department's request as one more unfunded mandate from an agency she does not hear from between requests.

That kind of trust is built before the program needs it. It is built in the Days 31–60 partnership meetings described in the implementation framework, showing up with data and a question rather than a request. It is built by sharing outcomes honestly with partners, including outcomes that show the program is not working. And it is built by the plan coordinator's behavior: a coordinator who makes the program's intent explicit, shares credit visibly, and accounts for the program's failures before asking partners to account for theirs will build a network that activates independently when new risks emerge. A coordinator who centralizes control and manages information will build a network that waits to be told what to do, and that network will not survive the coordinator's departure.

An antifragile partner network is designed so that the loss of any single partner does not collapse the strategy that depends on it. For each strategy, the plan should identify at least one dormant partner, an organization that could serve a similar function from a different institutional position but is not currently active in the program. Maintain that relationship at a low level: an annual meeting, a shared data report, an invitation to the advisory group. The investment is minimal. The return appears when a primary partner withdraws, loses capacity, or changes priorities, and instead of the strategy going dark, the dormant partner activates. This is exaptive recombination applied to the partnership network itself: a capability that exists but is not currently serving this function, held in reserve for the moment it is needed.

The practical diagnostic for trust in a CRR program is the same one that applies to any high-consequence operation: how long does bad news take to travel from the person who sees it to the person who can act on it? If a partner organization notices that a strategy is not reaching its intended population and that information takes six months to surface in a program review, the trust infrastructure is failing, and the program data will reflect it before anyone names why.

Distributed coordination

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A CRR program that operates only through the fire department's own channels — its own website, its own events, its own personnel — in a community that speaks six languages and trusts its healthcare providers more than its fire department does not have enough internal variety to absorb the complexity of the problem it is trying to solve. This is Ashby's law applied to community risk reduction: a control system must have at least as much variety as the system it is trying to regulate.

In practice, this means that the program's delivery network must be at least as diverse as the community's risk distribution. If the cooking fire risk is concentrated in Somali and Burmese households, the program needs trusted partners with access to those households — not a translated flyer posted on the department website. If WUI risk concentrates in neighborhoods where residents are skeptical of government involvement in their land management, the program needs a pathway through HOA boards and neighbor-to-neighbor communication — not an inspector with a clipboard.

Every strategy in this plan identifies the specific partners required to achieve sufficient variety. The exaptive opportunities named in the Black Swan lens callouts are not optional additions — they are the mechanism by which the program achieves the breadth of coordination that single-agency delivery cannot.

Domain awareness

Cynefin, the sense-making framework developed by Dave Snowden, distinguishes between clear, complicated, complex, and chaotic operational environments. Each domain calls for a different mode of action. The most common and most costly error in CRR work is treating complex problems as if they were complicated.

A complicated problem has a right answer discoverable through expert analysis: an engineering calculation, a suppression system design, a building code compliance determination. Expertise resolves it. A complex problem has no right answer that can be discovered in advance. Behavior change in a diverse community, trust-building with populations that have reason to be skeptical of government, the way a cultural practice evolves in response to education — these require probing, learning, and adjustment in motion. Expert analysis informs them, but does not resolve them.

The domain classification callout at the beginning of each strategy in this plan identifies the appropriate mode of intervention before the program is designed. A cooking fire prevention program designed as a complicated problem — a technical solution deployed uniformly — will miss the behavioral and cultural complexity that actually drives cooking fire risk in most communities.

Exaptive recombination

Exaptation is the repurposing of an existing capability, relationship, or resource for a function it was never originally designed to serve. In CRR work, it is the primary mechanism for expanding program reach without expanding program budget. Every community already contains most of the infrastructure a CRR program needs:

- Healthcare systems with home-visiting programs that reach the highest-risk residential populations
- Social service networks with trusted relationships in communities that the fire department cannot access through its own channels
- School systems with established communication pathways to families across the entire community
- Parks and public works departments with equipment and access agreements that can support fuel reduction and WUI mitigation
- Alarm monitoring companies with account data that identifies repeat-offender properties
- Neighborhood associations and HOA boards with established communication networks in WUI-proximate areas

The Black Swan lens callout at the bottom of each strategy names the specific exaptive opportunities in that risk area and the partnerships required to activate them.

Scaffolding, not framework

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The Black Swan Exaptive Spiral is scaffolding, not a framework. A framework becomes part of the structure — static, permanent, designed once and inhabited. Scaffolding is erected around a specific problem, in a specific configuration, for a specific purpose, and then adapted as conditions change. The only permanent element is the ridgepole: the ethical keel, which must be in place before the scaffolding goes up.

The strategies in this plan are scaffolding. They are designed for the five highest-priority risk areas in a typical growing community, but they are not a permanent structure. The permanent structure is the community itself, becoming safer and less dependent on emergency response to manage risks that prevention could have reduced. The goal is not to replicate this plan. The goal is to enable the next community to build its own.

Community Profile

A CRR plan without a community profile is a generic document. The community profile establishes the specific terrain — geographic, demographic, economic, and organizational — within which all five strategies operate. If the profile is inaccurate or incomplete, every strategy built on it will be miscalibrated. Complete each section using the data sources identified in the adapter notes. Where current data is not available, document the gap and identify how it will be filled.

Geographic and jurisdictional profile

> ▶ **Adapter note:** *Complete this section using GIS data, census boundary files, and your emergency operations plan geographic annexes. Your state hazard mitigation plan contains jurisdiction-specific geographic and hazard data.*

Jurisdiction name: [Department name and parent jurisdiction]

Geographic area: [Total square miles of service area]

Jurisdictional boundaries: [Counties, municipalities, and special districts included]

Location and terrain: [Geographic description — river corridor, prairie, coastal, mountainous, urban core, suburban fringe, or mixed. Include major transportation corridors, waterways, and topographic features that affect fire behavior or emergency access]

Climate and weather extremes: [Document the weather events that affect incident frequency and severity: tornado frequency, hurricane risk, blizzard/ice storm history, wildfire season, flood-prone areas, extreme heat periods. These are not rare events — they are the operational baseline]

Major infrastructure: [Interstate and highway corridors, rail lines, pipelines, utility infrastructure, industrial facilities, hospitals, and other critical infrastructure within the service area]

Demographic profile

> ▶ **Adapter note:** *Primary sources: US Census Bureau American Community Survey (5-year estimates), city or county planning department demographic reports, school district enrollment data for language and cultural diversity, and your department's Community Risk Assessment if completed.*

Total population: [Current estimated population, source, and date]

Population growth rate: [Annual percentage growth or decline and trend direction over the past decade]

Daytime population fluctuation: [If your jurisdiction has a significant daytime population increase from commuters, students, or workers, document the estimated daytime peak and the facilities driving it]

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Age distribution: [Percentage of population under 18, 18–64, and 65+. A growing senior population directly affects smoke alarm, cooking fire, and EMS demand]

Racial and ethnic composition: [Document composition and trajectory of change over the past decade. A community that has shifted from 5% to 20% non-native-English-speaking population in ten years requires a different outreach model than one that has been stable]

Primary languages other than English: [List all languages spoken by more than 1% of the population. These are the languages in which your high-priority educational materials must be available]

Socioeconomic indicators: [Median household income, percentage below the federal poverty line, percentage renter-occupied housing, and housing cost burden percentage. These are direct predictors of smoke alarm coverage, manufactured home prevalence, and access to fire-safe equipment]

Vulnerable population concentrations: [Document the geographic distribution of vulnerable populations: senior living facilities, low-income housing concentrations, manufactured home communities, group homes, shelter facilities. Map these against your incident data — the overlap is where your highest-priority prevention resources belong]

Hazard inventory

> ▶ **Adapter note:** *Primary sources: State Hazard Mitigation Plan, FEMA Threat and Hazard Identification and Risk Assessment (THIRA), NFIRS/NERIS incident data, and local emergency operations plan hazard annex.*

Document all hazards present in your jurisdiction. For each, record: historical frequency or probability, potential consequence severity (life safety, property, continuity of operations), geographic concentration within the service area, and existing mitigation measures.

- Natural hazards: [Floods, tornadoes, severe thunderstorms, winter storms, drought, wildfire, earthquake — all that apply to your jurisdiction with historical frequency data]
- Technological hazards: [Fixed industrial facilities with hazardous materials, transportation corridors carrying hazardous cargo, pipeline infrastructure, utility system failure risks, dam failure potential]
- Human-caused hazards: [Active threat risk at identified high-consequence venues, critical infrastructure vulnerability]
- Emerging hazards: [Hazards increasing in frequency or severity due to climate change, demographic change, or changes in land use or technology. Lithium-ion battery fires, wildland-urban interface expansion, and extreme heat events in communities without cooling infrastructure are current examples]

Organizational profile

> ▶ **Adapter note:** *Complete using your department's current budget document, organizational chart, and accreditation or ISO rating documentation.*

Department name and type: [Career, combination, or volunteer; fire-only, fire-EMS, or all-hazards organization]

Accreditation and ISO rating: [CPSE accreditation status, ISO Public Protection Classification rating]

Number of stations and staffing: [Total stations, total authorized positions, current filled positions, minimum daily staffing, and any staffing gap context]

Annual call volume: [Total calls by type — fire, EMS, hazmat, technical rescue, non-emergent alarm, public service. Document the percentage breakdown and the trend over the past five years]

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Annual operating budget: [Total budget, prevention and mitigation as a percentage of total, and any dedicated CRR funding streams]

Current prevention and mitigation capacity: [Positions assigned to fire prevention, community risk reduction, and public education. If prevention is currently a collateral duty rather than a dedicated function, document that honestly — it is a significant constraint on program capacity]

Current CRR programs: [Any existing prevention, education, or mitigation programs currently operating, their reach, and their current effectiveness as measured by available data]

Community vulnerability summary

Based on the data above, document your community's primary vulnerability drivers in plain language. This is not the complete risk assessment — that follows in the next section — but the two or three conditions that most significantly drive your community's risk profile.

> **Worked example**
>
> A mid-sized inland city with 220,000 residents experiencing rapid population growth, a minority population that has grown from near-zero to 20% in two decades, approximately 16 manufactured home communities with high proportions of recently expired smoke alarms, a WUI boundary that has expanded significantly as development moves into previously rural areas, and a fire department allocating less than 3% of its budget to prevention. The combination of rapid demographic change, the need for multilingual outreach capacity that does not yet exist, expanding WUI exposure, and the concentration of manufactured home fire risk creates a vulnerability profile that response investment alone cannot address.

Risk Assessment Methodology

A Community Risk Reduction Plan is only as good as the risk assessment that informs it. This section describes the methodology used in this model plan and provides a process for departments to conduct or update their own community risk assessment using the same approach.

The methodology is built on three principles: it uses quantitative data where available and does not substitute assumption for analysis; it treats the community as a complex adaptive system rather than a static object; and it classifies risks by domain before designing responses, ensuring that the mode of intervention matches the nature of the problem.

The Community Risk Assessment process

NFPA 1300 defines the Community Risk Assessment (CRA) as the foundation of any CRR plan. The CRA answers three questions: What are the risks in this community? Where and with whom are they concentrated? What is the department's current capacity to address them?

The recommended CRA cycle for a growing or changing community is every three to five years at a minimum, with annual updates to high-priority risk indicators. A community experiencing rapid growth, significant demographic change, or substantial new development should not wait five years between assessments. The terrain is changing faster than a five-year cycle can track.

The CRA process consists of four phases:

- Phase 1 — Data collection: Gather incident data (NFIRS/NERIS), demographic data (Census ACS), geographic data (GIS), and organizational data (budget, staffing, current programs). Supplement with structured stakeholder input from community organizations, healthcare partners, social service agencies, and property managers in high-risk areas.

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- Phase 2 — Data analysis: Identify incident frequency, incident severity, geographic concentration, and demographic concentration for each risk type. The question is not "where did fires happen" — it is "where did fires happen disproportionately relative to population, housing stock, and occupancy type."
- Phase 3 — Domain classification: Classify each identified risk by domain before designing responses. This is the step that most CRA processes skip, and its absence is a primary driver of program failure.
- Phase 4 — Prioritization: Rank risks by frequency, severity, preventability, and departmental capacity. The five strategies in this model plan represent the highest-priority risks in a typical growing community. Your CRA may identify different priorities.

Domain classification of risks

Before designing a response to an identified risk, classify the domain in which that risk operates. The classification determines the mode of intervention.

Measure type	What is measured	Timeframe/target
Clear	Cause-and-effect is known. The right procedure produces the right result.	Code compliance violations with clear remediation requirements; apparatus pre-positioning based on known response time data
Complicated	Cause-and-effect relationships are knowable through expert analysis. Requires expertise but can be determined in advance.	WUI fuel load assessment; suppression system design; building code development
Complex	Cause-and-effect is only knowable in retrospect. Requires probing, learning, and adjustment in motion.	Behavior change in diverse populations; community trust-building; smoke alarm maintenance compliance rates
Chaotic	No discernible cause-and-effect relationship. Requires immediate stabilizing action.	Active large-event incident; WUI fire running in structure-proximate terrain; mass casualty event

The most costly error in CRR program design is treating a complex problem as a complicated one. When a department responds to low smoke alarm compliance rates with a purely technical solution — more alarms, stricter enforcement — without addressing the behavioral, cultural, and trust dimensions that drive the compliance rate, it is applying the wrong mode of intervention. The result is activity without outcome: alarms installed, compliance rates unchanged, fatality rates unchanged.

Risk prioritization criteria

After classifying each identified risk by domain, prioritize for the CRR plan using four criteria:

- Frequency: How often does this risk produce incidents? High-frequency risks strain resources continuously. Low-frequency, high-consequence risks require a different investment logic.
- Severity: What is the life safety, property, and community impact when this risk produces an incident? A risk that results in two fatalities per year may be a higher priority than one that results in ten minor incidents.
- Preventability: How much can CRR intervention realistically reduce this risk? Cooking fires, alarm-related fatalities, and non-emergent alarm volume are highly preventable with relatively modest investment. WUI risk requires sustained, multi-year effort.
- Departmental capacity: Does the department have the resources, relationships, and expertise to address this risk effectively? A risk that requires multilingual outreach capacity, which the

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department does not yet have, requires different phasing than one that is addressable with existing capability.

Community risk signal pathway

The Community Risk Assessment described above is a structured, periodic process, conducted every three to five years, with annual updates. It is necessary. It is also insufficient for a community that is changing faster than the assessment cycle can track.

Between formal assessments, the CRR program's partner network is the primary mechanism for detecting emerging risks that the current five strategies do not address. A community health worker who notices a pattern of burn injuries in a recently arrived immigrant population. A property manager who reports that a building type not covered by the current inspection cycle is generating repeated alarm activations. A school resource officer who identifies a concentration of residential fire incidents in a neighborhood that has shifted demographically since the last census estimate. These signals exist in the community whether or not the fire department captures them.

The community risk signal pathway is the structured process by which those signals enter the program:

- At each quarterly advisory group meeting, the standing agenda item "What risk are you seeing?" collects signals from partners. The plan coordinator documents each signal with the source, the population or geography affected, and the estimated severity.
- Signals that align with an existing strategy are routed to that strategy's next evaluation cycle as a data point. A signal that the cooking fire strategy is missing a population is actionable immediately within the existing strategy structure.
- Signals that identify a risk not addressed by any current strategy are documented and accumulated. When three or more independent signals point to the same emerging risk, or when a single signal indicates a life-safety-level threat, the plan coordinator initiates a focused risk assessment of that specific issue using the Phase 1–3 CRA methodology.
- If the focused assessment confirms the risk, the coordinator presents findings to the advisory group and to city leadership with a recommendation: modify an existing strategy, add a new strategy, or document the risk for the next full CRA cycle. The decision depends on severity, departmental capacity, and whether the risk is growing or stable.

This pathway does not replace the formal CRA. It supplements it with the distributed sensing capacity of a partner network already in the community, interacting with populations the department cannot reach on its own, and generating information that has value if the program is structured to receive it.

Data sources

The following data sources ground the community risk assessment and feed into the annual program evaluation:

- NFIRS / NERIS: Your department’s incident data is the primary quantitative foundation. Analyze by incident type, occupancy type, geographic area, time of day, and contributing factors. Document the transition timeline if moving from NFIRS to NERIS.
- US Census Bureau American Community Survey: Five-year estimates at the census tract level, enabling mapping of demographic risk concentrations against incident data.
- GIS department data: Parcel data, occupancy type data, zoning data, and infrastructure data. Establish the relationship with your city or county GIS department before you need the data.
- State Hazard Mitigation Plan: Contains jurisdiction-specific hazard frequency and consequence data that supplements your incident history.
- ISO Fire Suppression Rating Schedule: Generates data on water supply, response capability, and communications directly relevant to CRR planning.

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- Community stakeholder input: Quantitative data tells you what happened. Stakeholder input tells you why. Structured engagement reveals causal factors and intervention opportunities that data analysis alone will not identify.

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The five strategies that follow represent the highest-priority risks in a typical growing community based on available data and documented experience. They are the plan's initial hypothesis — not its permanent structure. The CRA process, the community risk signal pathway, and the annual AAR exist to test that hypothesis and revise it when the data indicate otherwise. If your community's CRA identifies a risk not covered by these five strategies, the Strategy Development Guide in Appendix G provides a template for building a new strategy using the same architecture.

Strategy 1: Smoke Alarms in Residential Occupancies

Domain classification

Complex: *This is a behavior change and trust problem, not an engineering problem. You cannot install your way to compliance in a community that doesn't trust you or doesn't know you exist. Expert analysis informs targeting; disciplined outreach drives results.*

Risk statement

Working smoke alarms are the single most effective life safety technology available to residential occupants. The data is unambiguous: the majority of residential fire deaths occur in homes with no working alarm, and a significant portion of those homes once had an alarm that was never maintained.

In a typical growing community, a substantial fraction of single-family homes, 40 to 60 percent, contain smoke alarms that have exceeded their ten-year service life and no longer function reliably. This problem is not evenly distributed. Manufactured home communities face disproportionate risk: the lightweight construction materials used in manufactured homes accelerate fire growth and reduce the time to flashover, compressing the window for escape. Residents of these communities are often unaware of this accelerated timeline, and working alarm coverage in these communities is typically lower than in the general housing stock.

The secondary populations at elevated risk — older adults, low-income households, non-English speakers, people with disabilities — are also the populations least likely to be reached by generic public education campaigns. A smoke alarm program that does not specifically account for these communities will miss them entirely.

▶ **Adapter note:** *[Insert your community's residential occupancy count, percentage of homes with expired alarms if available from CRA data, number of manufactured home communities and estimated units, and demographic breakdown of high-risk populations. National NFPA data on alarm failure rates in fire fatalities can substitute for local data if local data is not yet available.]*

Goal

Increase the presence of working smoke alarms in all residential occupancies, with priority targeting of manufactured home communities and high-risk populations, measurably reducing fire-related fatalities and injuries within the plan period.

Objectives

- Educate residents across the community on alarm maintenance requirements, testing protocols, and replacement timelines.
- Provide physical assistance — testing, installation, and replacement — to qualifying residents who cannot manage alarm maintenance independently.

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- Establish and sustain a non-emergency access point (such as a 211-referral line or department hotline) for residents to request alarm services without requiring emergency contact.
- Develop culturally and linguistically appropriate materials for non-English-speaking residents, with particular attention to the primary non-English languages present in the community.

Strategies by the 5 E's

Education

The core education challenge is not awareness — most residents know smoke alarms exist. The challenge is maintenance behavior: testing alarms monthly, replacing batteries annually, and replacing the entire unit at the ten-year mark. Education must be specific, actionable, and delivered where the audience already is, not where the fire department is comfortable going.

- Develop a plain-language alarm maintenance guide available in all primary languages spoken in the community.
- Integrate alarm messaging into every community touchpoint: school programs, neighborhood events, hospital discharge paperwork, social service referrals, and utility bill inserts.
- Train firefighters and community risk reduction personnel to conduct brief alarm education during any residential contact, whether a fire inspection, a community event, or a follow-up visit.

Engineering

The engineering component focuses on what can be installed or retrofitted to remove the behavior requirement from the equation entirely for the highest-risk occupancies.

- Identify occupancies where ten-year sealed-battery alarms or interconnected alarm systems would eliminate the maintenance failure point.
- Partner with healthcare institutions, social service agencies, and housing authorities to incorporate alarm installation into existing home visit programs, eliminating the need to create a separate access point for the highest-risk residents.
- Evaluate and pilot heat-limiting stove element technology in manufactured home communities with repeated cooking fire histories.

Enforcement

Enforcement is most effective as an educational opportunity rather than a punitive one in the residential context. The goal is not citations — it is compliance.

- Incorporate alarm status into every residential fire inspection and home visit as a standard check item, not an optional addition.
- Develop a clear referral pathway from inspection findings to alarm assistance resources so that identified deficiencies are corrected, not merely documented.
- For rental and multi-family residential properties, coordinate with the city's housing or property maintenance code enforcement to ensure that smoke alarm compliance is included in habitability inspections and rental licensing requirements. In occupancies where voluntary compliance is insufficient, code-based enforcement through the housing authority or property maintenance division provides a pathway that the fire department's own inspection cycle may not reach. The goal is not to add a punitive burden to vulnerable tenants. It is to place the compliance obligation where it belongs: on the property owner, not the occupant.

Emergency response

- Track alarm activation status for every residential structure fire in your incident reporting system. This data is the primary outcome measure for the program — it tells you whether the alarms you installed are actually alerting occupants.
- Brief operational personnel on the smoke alarm program status, manufactured home community locations, and highest-risk areas so that pre-incident knowledge informs response decisions.

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Economic incentives

- Establish funding mechanisms for alarm and battery distribution — grants, community foundation partnerships, and departmental budget line items — so that cost is never the barrier to compliance for qualifying residents.
- Pursue partnerships with large local employers, homebuilders' associations, and service organizations to fund alarm distribution events.
- Explore tax credit or insurance discount partnerships for residents who voluntarily upgrade to ten-year sealed-battery or interconnected systems.

Internal participants

- Lead Community Risk Reduction Specialist (primary coordinator)
- Fire prevention division personnel
- Operations personnel (alarm installation events and follow-up visits)
- Bilingual or multilingual personnel for non-English outreach
- Administration (grant management, marketing, records)

Strategic partners

- American Red Cross (alarm supply, installation volunteers, joint programming)
- Local hospitals and healthcare systems (discharge referral pathway, home health visit integration)
- Social service agencies and housing authorities (access to high-risk populations)
- 211 system or equivalent non-emergency referral network
- Community organizations serving senior, immigrant, and low-income populations
- Home builders association and property management companies

Resources required

- Alarm and battery inventory with tracking system
- Installation tools and personal protective equipment for installation events
- Multilingual educational materials (print and digital)
- PSA video production in primary community languages
- Grant funding pipeline and tracking system
- Data collection forms for home visits and alarm installation records

Communication and marketing

- Non-emergency hotline or 211 integration prominently featured at every public event and in all printed materials
- Social media campaign coordinated with community partners
- Targeted outreach in manufactured home communities: signage, door hangers, community association partnerships
- Multilingual PSA videos distributed through community partner networks, not just department channels
- Annual report to city leadership on program reach and outcomes

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Measures

Measure type	What is measured	Timeframe/target
Process output	Total residents reached by alarm education (events, video views, door-to-door)	Track annually
Process output	Number of manufactured home community residents directly served; percentage of homes accessed	Track annually by community
Process output	Number of alarms installed, by type and location	Track per event and annually
Impact output	Pre/post knowledge assessment at structured education events, where feasible	Track per event
Impact output	Number of alarms found working vs. non-working at home visits before and after program intervention	Track per visit
Outcome	Percentage of residential structure fires where a working alarm was present and activated	Baseline year 1; reassess years 3 and 5
Outcome	Fire-related fatalities in manufactured home communities	Zero fatalities target by plan end year
Outcome	Fire-related fatalities in high-risk population areas	Measurable reduction from baseline by plan end year

Black Swan lens

Exaptive opportunity: Your community already has most of the distribution network you need for this program. Hospital discharge teams, social workers, home health aides, and visiting nurse programs are already entering the highest-risk homes. Repurposing those touchpoints for alarm checks costs almost nothing and reaches people who would never respond to a hotline. The manufactured home community managers are your fastest path to their residents — one meeting can open fifty doors.

Ethical keel: Consequence honesty matters here more than in almost any other strategy. It is easy to count alarms installed and call the program successful. The honest measure is whether those alarms alert occupants when there is a fire. Track alarm activation in incident reports. If you install five hundred alarms and a resident dies in a home where the alarm should have functioned, that outcome demands examination — not concealment.

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Strategy 2: Wildland Urban Interface (WUI)

Domain classification

Complex-to-chaotic transition risk: *WUI incidents appear complicated in the planning phase and become complex or chaotic once ignition occurs. Pre-incident mitigation is the only window where deliberate expert analysis and engineering have full effect. Once a WUI fire is running in structure-proximate terrain, the domain has shifted, and the plan must shift with it.*

Risk statement

Rapid urban expansion routinely pushes residential and commercial development into terrain that was not designed to accommodate it: stands of overgrown timber, grassland corridors, creek drainages, and hillsides with accumulated fuel loads. The result is a Wildland Urban Interface — a zone where the physics of wildland fire and the vulnerability of built structures meet simultaneously.

WUI fires are not simply larger versions of fixed-facility fire problems. They involve wind-driven spotting behavior, ember cast distances that can bypass defensible space, multi-structure involvement faster than available apparatus can address, and post-fire effects — flooding, erosion, contaminated runoff — that persist long after suppression. Communities that treat WUI as an extension of structural firefighting, rather than as a distinct operational environment requiring its own doctrine, consistently underperform in WUI incidents.

The economic consequences compound the life safety problem. WUI incidents generate suppression and rehabilitation costs, as well as long-term ecological damage, that strain municipal budgets over multiple fiscal years. The return on investment from pre-incident mitigation — fuel reduction treatments, structure hardening, community education — is among the highest of any risk reduction strategy.

▶ **Adapter note:** *[Insert your community's current WUI boundary extent, number of residential and commercial structures within the WUI zone, fuel load assessment data if available, history of WUI incidents and associated costs, and any existing Community Wildfire Protection Plan (CWPP) status. If your community is in the early stages of WUI recognition, state forestry agency data and USFS Wildland Risk to Communities mapping can provide baseline figures.]*

Goal

Reduce the frequency, intensity, and community impact of WUI fire incidents through a sustained combination of fuel reduction, structure hardening, community education, and operational capability development, while building the cross-agency relationships that WUI response requires.

Objectives

- Educate property owners, developers, and residents in WUI-proximate areas about defensible space requirements, home hardening measures, and evacuation planning.
- Develop and enforce a WUI code or ordinance establishing minimum fire-safe construction and vegetation management standards for new development in WUI zones.
- Conduct fuels reduction treatments in high-priority WUI areas in partnership with relevant land management agencies.
- Build operational WUI response capability in department personnel through training, equipment, and pre-incident planning.
- Establish mutual aid and memoranda of understanding with regional wildland fire partners before an incident, not during one.

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Strategies by the 5 E's

Education

WUI education has a different challenge than residential alarm education: the people most at risk often choose to live at the WUI boundary because of the environment, and they frequently resist the message that their environment is a liability. The approach must acknowledge that directly.

- Develop a WUI property assessment program where trained personnel conduct free home hardening assessments, providing specific, prioritized recommendations rather than generic fire safety advice.
- Use community demonstration projects — a neighborhood fuels reduction treatment, a side-by-side comparison of a hardened versus non-hardened structure — as education tools. Showing is more effective than telling in this context.
- Present to city planning and development commissions regularly so that WUI considerations are integrated into development approval processes from the front end, not retrofitted after construction.

Engineering

Structure hardening and fuels reduction are the two engineering interventions with the best evidence base for WUI risk reduction. Both require sustained effort across multiple years.

- Develop a prioritized structure hardening guide specific to the construction types and materials prevalent in your WUI zone, with cost tiers so that property owners can take action within their means.
- Identify fuel reduction treatment zones using fire behavior modeling and execute treatments in priority order, tracking fuel load reduction per acre treated.
- Work with public works and parks departments to establish and maintain vegetation management standards on public lands within or adjacent to the WUI zone.
- Advocate for fire-resistant roofing and ember-resistant venting requirements in building codes for new construction in WUI-designated areas.

Enforcement

- Develop or adopt a WUI code establishing minimum standards for defensible space, vegetation management, and structure hardening for properties in WUI-designated zones.
- Establish a WUI inspection program with a clear compliance pathway, including timelines, technical assistance, and economic incentive options for owners who cannot immediately achieve compliance.
- Coordinate with the planning and development department to ensure that WUI standards are applied during the development review process for any new construction in or proximate to WUI zones.

Emergency response

Operational WUI capability is not just a training issue. It requires the right equipment, the right pre-incident intelligence, and personnel who understand that WUI incidents operate on different decision timelines than structural response.

- Develop pre-incident plans for every structure within the WUI zone at elevated risk, with specific attention to access route vulnerability, water supply limitations, and defensible space conditions.
- Establish and exercise WUI-specific response protocols, including trigger points for transitioning from structure defense to life safety operations when fire behavior exceeds suppression capacity.
- Conduct annual WUI training exercises with mutual aid partners so that the first time you work together is not on an active incident.

Economic incentives

- Identify and publicize available grant funding for structure hardening and defensible space improvements for residential property owners in WUI zones.

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- Engage the insurance industry — properties with documented hardening and defensible space maintenance may qualify for reduced premiums, which creates a sustained financial incentive for compliance that enforcement alone cannot generate.
- Explore cost-share programs with state forestry agencies for fuels reduction treatments on private lands in high-priority zones.

Internal participants

- Assistant Chief of Operations
- Division Chief of Operations and Fire Marshal
- Wildland fire committee or WUI working group (recommend establishing if not present)
- Fire prevention division (code development, inspection program)
- Training division (WUI curriculum and exercises)
- Emergency management division (evacuation planning, CWPP coordination)

Strategic partners

- State forestry agency (fuels reduction partnership, technical assistance, grant funding)
- US Forest Service or Bureau of Land Management if applicable to your jurisdiction
- City planning and development commission
- Neighboring jurisdictions and regional fire departments (mutual aid agreements)
- Homeowners associations in WUI-proximate neighborhoods
- Insurance industry representatives
- Utility companies with infrastructure in WUI zones

Resources required

- WUI code or ordinance (legal development and adoption process)
- WUI-capable apparatus and equipment (hand tools, personal protective equipment rated for wildland operations, water tender if not currently available)
- Personnel trained to NWCG Firefighter Type 1 or equivalent
- Pre-incident plans for WUI-zone structures
- GIS mapping of WUI boundary, fuel load, access routes, and water supply
- Community education materials specific to defensible space and home hardening

Communication and marketing

- Annual community WUI preparedness event coinciding with fire season onset
- City council and planning commission presentations at each update cycle
- Partner with utility companies for bill insert WUI messaging to all customers in WUI-proximate zones
- Maintain a WUI resources page on the department website with current information on assessment programs, code requirements, and available incentives

Measures

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Measure type	What is measured	Timeframe / target
Process output	Acres of fuel reduction treatment completed annually	Track per treatment; cumulative annually
Process output	Number of WUI home assessments completed	Track annually by zone
Process output	Number of structures brought into WUI code compliance	Track annually
Impact output	Change in fuel load per acre in treated zones (pre/post)	Reassess 2 and 5 years post-treatment
Impact output	Percentage of WUI-zone structures meeting defensible space standards	Baseline year 1; target increase by year 3
Outcome	Number and acreage of WUI incidents within plan period	Track per incident; compare to pre-plan baseline
Outcome	Cost of WUI suppression and rehabilitation annually	Track per incident and annually
Outcome	Structures lost or damaged in WUI incidents	Compare rate to pre-plan baseline

Black Swan lens

Exaptive opportunity: Your parks department, public works crews, and utility right-of-way maintenance teams are already doing vegetation management in your community. Their equipment, schedules, and access agreements can be exapted for strategic fuel reduction in WUI buffer zones at a fraction of the cost of a standalone program. The key is coordination before the season starts, not emergency improvisation during it. Similarly, neighborhood association meeting networks, HOA boards, and local outdoor recreation groups are already organized — they are your fastest path to reaching the WUI-proximate population.

Ethical keel: Terrain sensitivity is the ethical keel function that matters most in WUI strategy. The temptation in a resource-constrained department is to default to suppression capability investment and defer mitigation. That inversion is expensive and ultimately ineffective — you cannot suppress your way out of decades of accumulated fuel load. Consequence honesty requires acknowledging to city leadership, clearly and on the record, that suppression-only strategy in a WUI environment transfers cost from prevention budgets to incident budgets and that the transfer ratio consistently favors prevention investment.

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Strategy 3: Large-Scale Community Events

Domain classification

Complicated with built-in domain-shift risk: *Pre-event planning is a complicated problem — engineering, logistics, life safety systems analysis. The event itself can shift into complex or chaotic with little warning. The plan must be built with that transition in mind, not just for the scenario the organizers anticipated.*

Risk statement

Large-scale community events — concerts, sporting events, festivals, marathons, fairs, holiday gatherings — concentrate large numbers of people in temporary configurations that were not designed for those occupancy loads and are often staffed by organizations with limited emergency response experience. The same event, executed in the same venue year after year, can produce a manageable incident or a mass casualty event depending on which variable tips first: crowd density, weather, structural failure, fire, an active threat, or a medical emergency in a congested access corridor.

Growing communities face compounding risk in this area. As the population and economic activity increase, the number, size, and complexity of community events increases. New venues are built or repurposed for event use. Outdoor event footprints expand into areas with limited emergency vehicle access. Organizers who were competent at managing a crowd of five hundred are now managing five thousand using the same mental model.

The additional threat dimension that cannot be ignored is active shooter and hostile event response (ASHER). Events that attract large numbers of people are attractive targets. Pre-incident planning for large events that does not include a realistic assessment of hostile event response is incomplete by current standards.

▶ **Adapter note:** *[Insert your community's inventory of large-event venues and permitted annual events, historical incident data from large events including EMS call volume and response time degradation, and any active threat assessments relevant to your jurisdiction. For the ASHER component, coordinate with law enforcement partners to ensure alignment with their operational planning.]*

Goal

Minimize the life-safety impact of large-scale incidents at community events through pre-incident planning, operational coordination with event organizers and law enforcement partners, and trained personnel capable of managing both conventional mass-casualty and active-threat scenarios.

Objectives

- Establish a tiered event permitting and pre-incident planning process that scales with event size and complexity.
- Develop and maintain Incident Action Plans (IAPs) for recurring large events at fixed venues.
- Integrate ASHER planning into all large-event pre-incident plans in coordination with law enforcement.
- Build relationships with event organizers so that pre-event planning is a collaborative professional engagement, not an adversarial permitting process.

Strategies by the 5 E's

Education

The primary education audience for this strategy is event organizers and venue managers, not the general public. Most life-safety failures at large events stem from decisions made by organizers, not from the behavior of attendees.

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- Develop a large-event life safety training program for event organizers covering crowd management, emergency communication, evacuation procedures, medical emergency protocols, and coordination with public safety agencies.
- Establish a pre-event planning meeting requirement for events above the threshold size in your jurisdiction, with a standardized agenda that includes fire, EMS, and law enforcement representation.
- Build a relationship with your local concert and sporting venue management teams so that fire and life safety expertise is welcomed at planning meetings, not viewed as a regulatory obstacle.

Engineering

- Conduct pre-incident surveys of all large-event venues, documenting life safety systems status, occupancy capacities, emergency egress routes, fire suppression system condition, and emergency vehicle access routes.
- Develop and maintain site diagrams for all primary event venues, updated annually or following any physical modification.
- Evaluate temporary structure permits (stages, bleachers, tents) against applicable standards and document findings in the pre-incident plan.
- Identify and document water supply limitations at outdoor event venues in advance of events that may require suppression capability.

Enforcement

- Establish clear authority for fire department pre-event inspection and the right to require corrective action as a condition of event approval in conjunction with the city permitting process.
- Conduct pre-event walkthroughs for all permitted large events at or above the threshold size, with documentation of life safety conditions and any corrective actions required.
- Develop a clear, published standard for what constitutes a safe large event so that organizers can plan to meet it rather than discovering deficiencies on the day of the event.

Emergency response

Emergency response capability for large events requires pre-positioning, pre-coordination, and pre-authorization — the three things that are impossible to establish after an incident has begun.

- Develop tiered response protocols for large events based on event type, size, and venue, specifying resource pre-positioning requirements, medical station locations, and command post placement.
- Integrate ASHER protocols into all large-event response plans in coordination with law enforcement. The fire and EMS roles in an active-threat scenario, casualty collection points, warm-zone operations, and trauma-care integration must be rehearsed, not improvised.
- Establish unified command structure and communication protocols for multi-agency large-event response before each event, not on arrival.

Economic incentives

- Offer expedited permitting or reduced permit fees for event organizers who complete the large-event life safety training program.
- Develop a tiered fee structure for pre-event inspection services that scales with event complexity, ensuring that small community events are not priced out of compliance.

Internal participants

- Fire Marshal and fire prevention division (permitting, pre-event inspections)
- Operations division (response plan development, pre-positioning)
- EMS division (mass casualty planning, medical station staffing)
- Emergency management division (unified command, multi-agency coordination)
- Training division (ASHER training, large-event exercise facilitation)

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Strategic partners

- Law enforcement agencies with jurisdiction (ASHER planning, unified command, venue security)
- Event organizers and venue managers
- City permitting and licensing department
- Regional trauma centers and hospitals (mass casualty notification protocols)
- Private security companies operating at large venues
- Volunteer organizations with mass casualty support capacity

Resources required

- Pre-incident plan templates for primary event venues
- Tiered event permitting process in coordination with city licensing
- Large-event response equipment cache (mass casualty supplies, command post materials)
- ASHER training curriculum for fire and EMS personnel
- Multi-agency exercise program for large-event scenarios

Communication and marketing

- Annual large-event life safety training open to all permitted event organizers in the community
- Published large-event life safety standards guide available to organizers during the planning phase
- Post-event after-action review process with organizers for all major events

Measures

Measure type	What is measured	Timeframe / target
Process output	Number of large-event pre-incident plans on file	Develop for all primary venues in year 1; update annually
Process output	Number of pre-event walkthroughs conducted annually	Track per event; 100% compliance target for threshold events
Process output	Number of event organizers completing large-event life safety training	Track annually
Impact output	Life safety deficiencies identified and corrected at pre-event inspections	Track per event; trend toward zero-day-of deficiencies
Impact output	EMS call volume and incident severity at large events compared to attendance	Track per event; establish rate baseline in year 1
Outcome	Serious injuries or fatalities at large events within the plan period	Establish baseline; measurable reduction target by year 3
Outcome	Response time to large-event medical or fire incidents	Compare pre-positioned vs. standard response scenarios

Black Swan lens

Exaptive opportunity: Event organizers are already building logistics, security, and crowd management infrastructure for their events. A fire department that approaches pre-event planning as a professional partner rather than a regulatory checkpoint gains access to that existing operational network. The security briefings, site coordinator radio channels, and medical tent locations that the organizer has already established are exaptive assets — they can be integrated into the incident command structure before the event starts at no additional cost.

Ethical keel: The ethical keel consideration for large events is moral courage without guarantees. The most consequential decisions in large-event life safety happen before the event: the fire marshal who requires a

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> corrective action that costs the organizer money, the operations chief who insists on a pre-positioned unit over the city manager's objection about overtime costs, the incident commander who activates a mass casualty protocol before confirmation of casualty count. The standard for those decisions is not certainty. It is consequence honesty about what the alternative costs.

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Strategy 4: Non-Emergent (Priority-3) Alarms

Domain classification

Complicated at the systems level, complex at the behavioral level: *The alarm systems generating non-emergent responses are not mysterious — they are aging, poorly maintained, or incorrectly installed systems operating in environments they were not designed for. That is a solvable engineering problem. The behavior change required to achieve sustained compliance is a more complex, trust-dependent problem that engineering alone will not solve.*

Risk statement

Non-emergent or Priority-3 alarm activations — system-generated alerts that do not indicate an actual emergency — represent one of the most significant and least visible resource consumption problems facing urban and suburban fire departments. In many departments, non-emergent alarm responses account for twenty to thirty percent or more of total call volume, consuming apparatus, personnel hours, and operational bandwidth that would otherwise be available for life-threatening emergencies.

The consequences are not merely administrative. Every non-emergent dispatch commits resources that may be needed elsewhere simultaneously. In a resource-constrained department, sustained high non-emergent call volume degrades response capability to actual emergencies in ways that compound over time and are difficult to trace back to their source.

The root cause is almost never a single faulty system. It is a systems design and maintenance culture failure: detection devices installed in environments incompatible with their technology, systems that have not been inspected or maintained on required schedules, monitoring companies using alarm confirmation protocols that do not adequately filter system malfunctions from actual events, and occupants who do not understand their systems and do not know how to respond when an activation occurs.

▶ **Adapter note:** *[Insert your community's non-emergent alarm call volume as a percentage of total calls, top contributing occupancy types and addresses, and any existing ordinance or fee schedule for false alarm response. The NFIRS or NERIS data for your jurisdiction will identify repeat offenders and contributing system types.]*

Goal

Measurably reduce the volume of non-emergent alarm responses through a combination of technical standards, occupant education, enforcement with proportionate economic consequences, and sustained engagement with the commercial alarm and monitoring industry in your jurisdiction.

Objectives

- Identify the top contributing occupancies, system types, and geographic concentrations in the non-emergent alarm problem.
- Establish or enforce an ordinance providing a structured false alarm response policy with proportionate fee escalation for repeat offenders.
- Develop an occupant notification and technical assistance program so that businesses and property managers understand their systems and their compliance obligations.
- Engage alarm monitoring companies operating in your jurisdiction on confirmation protocol standards.

Strategies by the 5 E's

Education

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Most non-emergent alarm problems persist because occupants do not understand their systems, do not know they have a compliance problem, and do not know what they are required to do about it. Education precedes enforcement.

- Develop a plain-language false alarm prevention guide for business owners and property managers covering the most common causes of system-generated non-emergent activations and the steps required to address them.
- Notify occupants of their non-emergent call history in writing after each threshold is reached, with clear information on the cause if determinable, the corrective action required, and the timeline before fee escalation applies.
- Make technical assistance available to occupants who need help identifying the source of repeated activations and connecting with qualified alarm service contractors.

Engineering

- Track non-emergent activations by system type, occupancy type, and specific address to identify the highest-leverage intervention points.
- Identify detection devices deployed in environments incompatible with their technology — ionization detectors in commercial kitchens, detector placement near HVAC vents or steam sources — and require correction as a condition of continued occupancy permit.
- Incorporate non-emergent activation history into the annual inspection process so that fire inspection visits include a review of alarm system condition and activation history.

Enforcement

An effective false alarm ordinance does three things: it provides clear notice of expectations, it applies proportionate consequences that create genuine incentive for correction, and it provides a compliance pathway so that occupants who respond in good faith can resolve their situation.

- Establish or review the existing false alarm ordinance to ensure it includes fee escalation for repeat offenders, a clear appeals process, and an amnesty or waiver provision for occupants who complete a corrective action plan.
- Establish a tracking database for non-emergent responses that enables enforcement action without depending on dispatch memory or paper records.
- Coordinate with city finance or municipal court on fee collection to ensure that the ordinance has actual deterrent effect and is not simply generating paper with no follow-through.

Emergency response

- Review dispatch protocols for non-emergent alarm responses to identify whether reduced-resource deployment is appropriate for specific occupancy types or repeat-offender addresses while maintaining adequate capability for the possibility of an actual event.
- Track the proportion of non-emergent alarm responses that do ultimately reveal an actual condition requiring intervention — this is the data that calibrates appropriate response level decisions.

Economic incentives

- Offer a fee waiver for a first-time non-emergent alarm response if the occupant completes a documented corrective action within a specified period.
- Explore partnerships with alarm monitoring companies and alarm service contractors to provide discounted inspection services to repeat-offender occupancies as part of a compliance assistance program.

Internal participants

- Fire prevention division (ordinance enforcement, occupant notification, inspection integration)
- Operations division (dispatch protocol review, data collection from responses)
- Administration (fee tracking, database management, legal coordination)

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Strategic partners

- City attorney or municipal court (ordinance development and fee collection)
- Alarm monitoring companies operating in the jurisdiction
- Local alarm installation and service contractor community
- Building and property management industry associations
- City finance department

Resources required

- Non-emergent alarm tracking database integrated with or linked to dispatch records
- False alarm ordinance (draft, adopt, or update as needed)
- Notification letter templates and mailing process
- Technical assistance guide for occupants
- Staff time for enforcement follow-up and coordination

Communication and marketing

- Annual summary report to city leadership on non-emergent alarm volume, cost to the department, and program outcomes
- Direct notification to each non-emergent alarm address at threshold points
- Outreach through business association and property manager networks to raise awareness of the compliance program before enforcement actions begin

Measures

Measure type	What is measured	Timeframe / target
Process output	Total non-emergent alarm responses annually	Establish baseline year 1; track quarterly
Process output	Number of repeat-offender addresses receiving written notification	Track annually
Process output	Number of fee assessments issued and collected	Track annually
Impact output	Percentage of notified addresses achieving compliance within 90 days	Track per notification cycle
Impact output	Reduction in non-emergent alarm responses at addresses following corrective action	Track per address; 6-month and 12-month post-intervention
Outcome	Total non-emergent alarm volume as percentage of total call volume	Baseline year 1; target measurable reduction by year 3
Outcome	Apparatus hours consumed by non-emergent alarm responses annually	Baseline year 1; translate to dollar cost for leadership reporting

Black Swan lens

Exaptive opportunity: Alarm monitoring companies operating in your jurisdiction are already reviewing activation data for their accounts. A structured engagement with the major monitoring companies — not as adversaries but as professional partners with a shared interest in reducing nuisance activations — can exapt their existing data review processes for your compliance program. A monitoring company that proactively flags accounts with repeated activations and requires corrective action before dispatch is doing your work for you. This relationship is worth building before the ordinance enforcement cycle begins.

Ethical keel: Consequence honesty is the critical ethical function here. The argument for aggressive false alarm enforcement always encounters institutional resistance: the fees are unpopular, the enforcement is

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> administratively burdensome, and the political pressure from affected businesses is real. The honest counter-argument is quantitative: every apparatus hour consumed by a non-emergent alarm response is an apparatus hour not available for a concurrent actual emergency. Compute that cost, put it in the annual report to city leadership, and let the data make the argument. Do not soften it.

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Strategy 5: Cooking-Related Fire Incidents

Domain classification

Complex — culturally and demographically distributed: *Cooking fires are not a generic behavior problem requiring a generic education solution. The distribution of cooking fire risk in most communities is concentrated in specific occupancy types, demographic groups, and behavioral contexts. Interventions that treat cooking fire prevention as a universal campaign will miss the people who actually need them.*

Risk statement

Cooking-related fires are the leading cause of residential fires and residential fire injuries in the United States. They are also among the most preventable. The behavioral causes are well-documented: unattended cooking, cooking while impaired or fatigued, combustibles left near heat sources, grease accumulation in cooking equipment. None of these are mysterious, and none require technical expertise to address.

The challenge is reach. Cooking fire risk is not evenly distributed across a community. It concentrates in specific populations — older adults living alone, residents of multi-family housing with limited English proficiency, households where cooking practices originate from cultural traditions that include open flame, high-heat, or extended unattended cooking methods. Generic public education campaigns reach the people who are already engaged with the fire department's communication channels. The people generating the highest cooking fire risk are typically not in those channels.

The secondary concentration is in specific occupancy types: older multi-family residential buildings, senior living facilities, single-room-occupancy hotels, and similar occupancies where cooking equipment is present in individual units without the fire detection and suppression coverage of commercial cooking environments. Grease accumulation in ductwork and exhaust systems in these occupancies is a recurring ignition source that inspection and engineering interventions can directly address.

▶ **Adapter note:** *[Insert your community's cooking fire incident rate, injury rate, and property loss data from NFIRS or NERIS. Identify the top contributing occupancy types and the demographic characteristics of occupants involved in cooking fire incidents. Cross-reference with your community demographics to identify which populations are underrepresented in your current outreach channels.]*

Goal

Reduce cooking-related fire incidents, injuries, and property losses through targeted outreach to high-risk populations, engineering interventions in high-risk occupancies, and the integration of cooking fire prevention into every residential contact the department makes with vulnerable populations.

Objectives

- Identify and map the high-risk occupancy types and demographic concentrations contributing most to cooking fire incident rates in the community.
- Develop culturally specific education materials and outreach strategies for the primary at-risk populations identified in the community risk assessment.
- Deploy engineering interventions — automatic stove shut-off technology, upgraded detection, grease trap maintenance — in the highest-risk occupancies.
- Integrate cooking fire prevention into every home visit, medical response, and community engagement touchpoint that reaches high-risk populations.

Strategies by the 5 E's

Education

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The most effective cooking fire education reaches people in the context where cooking actually happens: at home, with specific information relevant to their cooking practices, delivered by someone they trust. Generic fire safety messaging delivered at a department open house will not reach this population.

- Partner with community health workers, visiting nurses, social workers, home health aides, and trusted community organizations to deliver cooking fire prevention messaging as part of existing home visit programs. These partners already have the trust and the access.
- Develop cooking fire prevention materials that reflect the actual cooking practices of the at-risk populations in your community, not idealized American household cooking. If a significant portion of your cooking fire incidents involve wok cooking, pressure cooking, or outdoor grilling migrated indoors, the education materials need to address those specific practices.
- Integrate cooking fire messages into EMS responses at residential addresses with cooking fire history. An EMT completing a non-fire response at a high-risk address can deliver a brief, relevant safety message in the time it takes to document the call.

Engineering

Automatic stove shut-off technology is one of the most promising engineering interventions for cooking fire reduction in high-risk occupancies. When properly installed and maintained, automatic shut-off devices eliminate the unattended cooking failure mode entirely for electric stovetop cooking — the most common source of cooking fire ignition.

- Identify the highest-risk multi-family residential occupancies and senior living facilities and pilot automatic shut-off technology installation in partnership with property owners and healthcare partners.
- Develop a grease trap and exhaust duct inspection and cleaning protocol for multi-family occupancies with commercial or semi-commercial cooking equipment, integrated into the fire inspection cycle.
- Evaluate suppression system upgrades for cooking areas in high-risk multi-family occupancies that do not currently meet commercial kitchen suppression standards.

Enforcement

- Incorporate cooking equipment condition and grease accumulation status into the fire inspection checklist for multi-family residential, senior living, and SRO occupancies.
- Establish a corrective action timeline for occupancies found with significant grease accumulation, with follow-up inspection to confirm compliance.
- Track cooking fire history by address and incorporate that history into the inspection priority schedule, ensuring that addresses with repeated cooking fire incidents receive proportionately more frequent inspection attention.

Emergency response

- Track cooking fire incidents by occupancy type, ignition source, and demographic characteristics of the occupants to continuously refine the targeting of prevention activities.
- Develop a post-cooking-fire follow-up protocol so that occupants involved in cooking fire incidents receive a safety consultation and, where applicable, automatic shut-off technology or upgraded detection within a defined period after the incident.

Economic incentives

- Provide automatic shut-off technology at no cost to qualifying residents in high-risk occupancies through grant funding and community partnership.
- Engage property owners with demonstrated cooking fire history on the financial case for engineering interventions: the cost of a single cooking fire incident in tenant displacement, property damage, and insurance consequences typically exceeds the cost of automatic shut-off installation many times over.
- Explore whether local healthcare systems with high readmission rates for burn injuries or smoke inhalation would co-fund cooking fire prevention programs as a cost avoidance investment.

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Internal participants

- Community risk reduction specialist (program coordination, partner outreach)
- Fire prevention division (inspection integration, data analysis)
- EMS division (post-incident follow-up protocol, point-of-care messaging)
- Multilingual personnel or interpreter network for non-English communities

Strategic partners

- Community health workers and visiting nurse programs (trusted access to high-risk populations)
- Local hospitals and healthcare systems (discharge pathway, co-investment in prevention)
- Social service agencies serving older adults, low-income households, and immigrant communities
- Multi-family residential property managers and senior living operators
- Cultural and community organizations with relationships in high-risk demographic groups
- Automatic stove shut-off technology suppliers and installers

Resources required

- Multilingual cooking fire education materials specific to the at-risk populations in the community
- Automatic shut-off technology supply and installation funding (grants, healthcare partnerships, departmental budget)
- Post-incident follow-up protocol and staff capacity
- Training for community partner organizations on referral pathway to department cooking fire prevention resources

Communication and marketing

- Partner organization training on cooking fire prevention messaging so that the program operates through trusted community channels, not just department channels
- Integration of cooking fire prevention into existing healthcare and social service outreach, not as a standalone fire department campaign
- Annual summary of cooking fire incident data shared with property owners in high-risk occupancy categories

Measures

Measure type	What is measured	Timeframe / target
Process output	Number of high-risk residential contacts receiving cooking fire prevention messaging	Track annually through partner organizations
Process output	Number of automatic shut-off devices installed in high-risk occupancies	Track annually by occupancy type
Process output	Number of grease accumulation violations identified and corrected at inspection	Track per inspection cycle
Impact output	Pre/post knowledge assessment for structured cooking fire education programs where feasible	Track per program delivery
Impact output	Compliance rate at follow-up inspection for occupancies with identified grease violations	Track per follow-up cycle
Outcome	Cooking-related fire incidents annually	Baseline year 1; measurable reduction target by year 3
Outcome	Cooking-related fire injuries and fatalities annually	Baseline year 1; target measurable reduction by year 5

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Measure type	What is measured	Timeframe / target
Outcome	Cooking fire rate in highest-risk occupancy types vs. general population	Baseline year 1; track differential reduction

Black Swan lens

Exaptive opportunity: Healthcare systems and social service agencies are already running programs that visit your highest-risk population at home. That access is the most valuable resource in this strategy and it costs the fire department nothing to exapt — it only requires building the relationship and training the partner. A hospital discharge coordinator who adds a two-minute cooking safety conversation to every discharge for a high-risk patient is doing outreach that no public education campaign can replicate. The Tempe, Arizona Fire Medical Rescue Department's paramedicine program demonstrated exactly this model: using EMS data to identify repeat-contact patients and redirect them to prevention resources before the next call.

Ethical keel: Terrain sensitivity is the ethical keel function that prevents this strategy from failing before it starts. A cooking fire prevention program that delivers generic stove safety messaging in English to a population that primarily cooks in Burmese, Somali, or Spanish, using methods that differ from American stovetop cooking, will not reduce cooking fire rates. It will produce impressive outreach numbers and no measurable outcome. Consequence honesty demands that you measure what actually changes — incident rates in high-risk populations — not what is easy to count.

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Implementation Framework

A CRR plan that cannot be executed in the real conditions of a real department will not be executed. This section provides an implementation framework organized around what is actually achievable given the resource and organizational constraints most departments face. It does not assume a dedicated CRR division, unlimited budget, or enthusiastic organizational support. It assumes a department that wants to build something real and is starting from wherever it currently is.

The framework is organized in three phases: the first 90 days, year one, and years two through five. Each phase has clear priorities and a honest accounting of what is required.

Governance and ownership

Before any strategy is executed, two questions must be answered clearly: Who owns this plan, and what authority do they have to implement it? A CRR plan owned by no one in particular will be implemented by no one in particular.

- Assign a named plan coordinator: a specific position or individual responsible for tracking implementation, managing partner relationships, and reporting outcomes. In a department without a dedicated CRR position, this may be a collateral duty assignment, but it must be a named assignment.
- Protect a minimum time allocation for the coordinator role. A CRR program that exists only in the margins of someone's operational duties will degrade to a document within six months. The coordinator does not need to be a full-time position — most departments cannot afford one, and this plan does not require one. But the coordinator needs protected time: hours that are not subject to operational callback, shift coverage demands, or reassignment. For a department running one active strategy with one primary partner, the minimum viable allocation is approximately four hours per week of protected time — enough to maintain the partner relationship, collect and review data, and prepare for the quarterly advisory meeting. For a department running all five strategies, eight to twelve hours per week is realistic. If the department cannot protect even the minimum allocation, the program will not sustain beyond the launch phase. Name that constraint honestly before assigning the role, not after the coordinator has been set up to fail.
- Define the coordinator's role as self-limiting leadership, not centralized control. The coordinator's job is not to manage every partner interaction and program element. It is to make the program's intent, standards, and evaluation criteria clear enough that partners can act within their own domains of expertise without waiting for permission. A coordinator who reduces their own control footprint — making their behavior predictable, their accountability visible, and the program's information environment as clean as possible — creates the conditions for partner organizations to contribute at the edge of their own capability. A coordinator who centralizes decision-making builds a program that cannot function without them, which is a single point of failure that the brittleness question in the annual review will eventually surface.
- Establish a CRR advisory group: a small, standing group with representatives from fire prevention, operations, EMS, and at least two community partner organizations. This group meets quarterly to review outcomes, identify emerging risks, and recommend adjustments. It is not a steering committee—it is a sensing mechanism. Every quarterly meeting includes a standing agenda item: "What risk are you seeing in your work that this program is not addressing?" Partner organizations occupy different positions in the community than the fire department does. They see different populations, different behaviors, and different failure patterns. A healthcare partner who reports a cluster of burn injuries in a population that the current cooking fire strategy is not reaching has identified a signal that no amount of departmental data analysis would have produced. The advisory group's primary value is not oversight. It is the distributed intelligence of a network that sees what no single agency can see alone.

  Additionally, each quarterly meeting runs the three fast-tempo AAR questions (domain fit, stale assumptions, informal coordination) described in the evaluation section. This is a ten-minute

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structured check, not a full review, but it ensures that drift is detected quarterly rather than annually. Dormant partners identified for each strategy are invited to observe one advisory group meeting per year. This observation serves as the dormant partner's annual touchpoint — it maintains the relationship, keeps the dormant partner current on program direction, and requires no additional effort from the coordinator beyond the invitation. When a primary partner fails, and the dormant partner needs to activate, the transition begins from a position of awareness rather than from a cold start.

- Secure explicit leadership commitment: The fire chief or department director must publicly endorse the CRR plan as an organizational priority, not merely as an administrative document. This endorsement is the only thing that protects the plan when budget pressures arrive — and they will.
- Document the plan's status with city leadership: Submit the plan to the city manager or equivalent authority with a summary of anticipated outcomes and resource requirements. A plan that city leadership does not know exists cannot receive the funding and cooperation it requires.
- Prepare for leadership transitions. Fire chiefs retire, are replaced, or move on. A new chief who did not build the CRR program may not prioritize it — and that is the single most common cause of CRR program death in the fire service. The primary defense is not the outgoing chief's endorsement. It is the program's independent standing with city leadership, the documented outcomes that demonstrate value, and the partner network that would notice if the program were discontinued. A program that exists only in the chief's sponsorship is a single point of failure. A program that exists in the city's budget data, in the partner organizations' operational workflows, and in the community's awareness of what the fire department does beyond response is institutionalized. Institutionalized programs survive leadership transitions. Build the program's political base before the transition arrives — through consistent leadership reporting, visible partnership activity, and outcome data that speaks for itself — so that when the transition comes, the program's value is a matter of record, not a matter of one person's advocacy.

Plan revision protocol

This plan is designed for a five-year period with annual evaluation. It is not designed to remain unchanged for five years. Three trigger conditions require formal plan revision before the scheduled cycle ends:

Trigger 1: Critical incident in a covered population. A fire fatality, mass casualty event, or significant injury cluster in a population that an active strategy was designed to protect. This is the most important trigger because it tests the plan against the outcome it exists to prevent. When it occurs, the plan coordinator convenes the advisory group within 30 days, runs all seven AAR questions against the affected strategy, and produces a documented plan revision within 90 days. The revision is submitted to city leadership alongside an honest accounting of whether the strategy was operating as designed, whether it reached the affected population, and what specific changes are required. This is not a blame exercise. It is the plan applying consequence honesty to itself at the moment when it matters most.

Trigger 2: Loss of critical capacity. The withdrawal, defunding, or incapacity of a partner organization, funding source, or internal position that eliminates a strategy's ability to deliver. If a healthcare partner that provides home-visit access to the highest-risk population withdraws from the program, the smoke alarm and cooking fire strategies lose their primary delivery mechanism. Waiting until the annual review to address this means six to twelve months of strategy degradation. When critical capacity is lost, the coordinator activates the dormant partner relationship for the affected strategy, documents the transition, and revises the strategy's delivery model within 60 days.

Trigger 3: Material change in community risk profile. A rapid demographic shift, a major annexation, a large-scale development project, or a new hazard (such as a lithium-ion battery storage facility or a significant WUI boundary expansion) that introduces a risk not addressed by the current five strategies. When the community risk signal pathway or an external data source identifies a material change, the coordinator initiates a focused risk assessment using the Phase 1–3 CRA methodology and presents the findings to the advisory group, along with a recommendation to add, modify, or reprioritize strategies.

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Every plan revision is documented with the trigger that initiated it, the AAR findings that informed it, the specific changes made, and the revised measures by which the adjusted strategy will be evaluated. The documentation becomes part of the program record and informs the next full CRA cycle.

A CRR plan that revises itself in response to the events it was designed to prevent is not a failed plan. It is an antifragile one, a plan that gets better from encountering the failures it was built to address. A plan that cannot revise itself is a monument. Monuments do not reduce risk. They commemorate it.

The first 90 days

The first 90 days are not about executing strategies. They are about building the foundation that execution requires. Departments that skip this phase produce impressive launch activity and unsustainable programs.

Days 1–30: Establish the baseline

- Complete the community profile template with current data. Document every gap — missing data is a program design risk that needs to be named.
- Pull and analyze five years of NFIRS or NERIS data for the five risk areas covered in this plan. Document frequency, severity, geographic concentration, and demographic concentration for each.
- Identify the top five addresses or occupancy types contributing most to each risk category. These are your first-year priority targets.
- Map vulnerable population concentrations against incident data. The overlap is where your limited resources will have the highest impact.

Days 31–60: Build the partnerships

Community risk reduction runs on trust. Trust is built in person, before the program needs it, not by sending letters requesting cooperation when a strategy is already underway.

- Schedule and conduct introductory meetings with your three highest-value potential partners for each strategy. For smoke alarms and cooking fires: healthcare systems and social service agencies. For WUI: state forestry agency and HOA network. For large events: major venue managers and law enforcement. For non-emergent alarms: alarm monitoring companies and property management associations.
- Do not arrive at these meetings with a request. Arrive with your data and a question: “What are you seeing in your work that relates to the risks we are both trying to address?” The answer will tell you more about the actual terrain than any planning document will.
- Identify which partners already have home-visit access to your highest-risk populations. These are your most valuable exaptive assets, the people who can reach the residents your programs would otherwise miss.
- For each strategy, identify at least one dormant partner: an organization that could serve a similar delivery or access function but is not the primary partner for this cycle. Establish a low-maintenance relationship, an annual meeting, a shared data report, and an invitation to observe the advisory group. This is not a backup plan on paper. It is a living relationship maintained at low cost so that if the primary partnership breaks, the program has a pathway that does not start from zero.

When partners do not engage:

Not every organization will return your call. Not every healthcare system will see fire prevention as their problem. Not every social service agency has the capacity for one more partnership request from one more government agency. This is normal, and it is not a reason to stop.

When a primary partner declines or does not respond, ask two questions. First: is the barrier institutional (policy, funding, capacity, legal concern) or relational (no existing trust, no prior contact, skepticism about fire department motives)? Institutional barriers may resolve over time as the program demonstrates value. Relational

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barriers resolve only through sustained, low-pressure contact — showing up, sharing data, asking questions, and not asking for anything until the relationship earns it.

Second: Does the dormant partner identified for this strategy have a clearer pathway? If so, promote the dormant partner to primary and identify a new dormant relationship to maintain. The partner network does not require the optimal institutional arrangement on day one. It requires a functional pathway to the population — any pathway — that can be improved as the program matures and as trust is built.

In communities where no partner organization will engage initially, start with the partner who will — even if that partner is a single community member, a neighborhood association president, a manufactured home community manager, or a volunteer organization. The first partnership does not need to be a hospital system. It needs to be a human being who knows the people you are trying to reach and is willing to help you reach them. Everything else builds from there.

For organizations operating in the "Same Ten People" reality — where the entire response capability is a small group of people who do everything — the partner may be someone already on your team who has a second role in the community: a firefighter who is also a school board member, a volunteer who works at the hospital, an EMT who is active in a community organization. These dual-role connections are exaptive assets. They already exist in your organization. Name them, use them, and build from them.

Days 61–90: Stand up the first strategy

Do not attempt to launch all five strategies simultaneously. Pick one. The best choice for a first strategy is the one with the clearest data support, the strongest existing partner relationships, and the highest confidence of a measurable outcome within six months. In most communities, that is smoke alarms.

- Establish the baseline measures for your selected strategy before launch. You cannot demonstrate impact without a baseline.
- Train internal participants on the strategy, their roles, the data collection requirements, and the partner relationships. A strategy that only the coordinator understands is a coordinator's project, not a department program.
- Conduct the first partner outreach event or activity within the 90-day window. Momentum is the rarest resource in CRR work and the hardest to rebuild once lost.
- Design training exercises and tabletop scenarios so that no two iterations present the same starting conditions. The goal of CRR training is not to rehearse a fixed response to a familiar scenario. It is to calibrate the orientation from which the correct response self-organizes under whatever conditions are actually present. A team that can recognize a domain shift in the cooking fire strategy only when it matches the scenario they rehearsed has trained a pattern. A team that can recognize a domain shift from any starting position — because the underlying orientation is robust enough to read the terrain regardless of how it presents itself — has trained a capacity. Vary the scenario, vary the information picture, vary the partner participation. The measure is not whether the team follows the same path each time, but whether the team reaches coherent action from a different path every time.

Year one priorities

Year one is about establishing operational rhythms, not achieving final outcomes. The measures that matter at the end of year one are process outputs and early impact outputs — the baseline data and the first signs that the program is reaching the people it is designed to reach.

- Launch strategies sequentially, not simultaneously. Add a new strategy every 60 to 90 days once the previous one has achieved operational stability. By the end of year one, all five strategies should be active.
- Conduct a mid-year review at month six: review process outputs for each active strategy, identify any strategies that are not reaching their intended population, and adjust before the second half of the year.
- Submit a year-one summary to city leadership documenting reach, resource utilization, and early impact indicators. Do not wait until outcomes are measurable to report to leadership — build the reporting relationship before you need it to support a budget request.

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- Document every partner relationship established, every data gap filled, and every program adjustment made. This institutional memory is what allows the program to survive personnel changes.

Years two through five

The five-year plan period is designed to align with the NFPA 1300 recommended CRA cycle. By year five, the department should have completed a full program cycle: baseline, implementation, mid-cycle evaluation, adjustment, and final outcome measurement that informs the next CRA.

- Year two: First full cycle of impact output measurement. Compare year-two indicators against year-one baseline. Strategies that are not showing impact need to be examined honestly — is the strategy reaching the right population? Is the intervention matched to the actual cause of the problem?
- Years three and four: Sustained execution and partner development. The relationships built in the first two years should be deepening into institutionalized collaboration. A smoke alarm program that required firefighters to knock on manufactured home community doors in year one should have a referral pipeline from the home health system running independently in year three.
- Year five: Outcome measurement and plan update. Measure the outcome indicators established for each strategy against the baseline. Commission an updated CRA using five years of NFIRS/NERIS data and updated census data. Use the outcome data from the current plan period to inform priority selection for the next.

Resourcing the program

The National Institute of Building Sciences research on mitigation return on investment is the most powerful resource tool available for building a CRR budget argument. For every dollar invested in mitigation and prevention activities, organizations save between twelve and thirty dollars in response and recovery costs. This is not a theoretical claim — it is a documented ratio across multiple hazard types and jurisdictions.

Translate that ratio into local terms. If your department spends $500,000 annually responding to incidents that a $50,000 prevention investment could reduce by 20%, the argument for the investment is measurable and specific. City leaders respond to numbers with local faces on them more reliably than to national statistics.

Funding sources to pursue in priority order:

- FEMA Assistance to Firefighters Grant (AFG) — Prevention and Safety: The AFG Prevention and Safety grants directly fund smoke alarm programs, fire safety education, and CRR program development. This is the most accessible federal grant for CRR work and should be the first external funding source pursued.
- FEMA Hazard Mitigation Grant Program (HMGP): Available following presidentially declared disasters. If your jurisdiction has received an HMGP allocation, WUI mitigation and resilience infrastructure projects may qualify.
- State fire marshal and state forestry agency grants: Most states have grant programs specifically for local fire department prevention activities. Your state fire marshal's office is the starting point.
- Community foundation and healthcare system partnerships: Local community foundations and healthcare systems with population health missions are increasingly interested in funding prevention programs that reduce emergency utilization. A cooking fire prevention program co-funded by a hospital system as a burn injury reduction initiative is not unusual.
- City general fund: The baseline argument for general fund allocation is the ROI data translated to local terms. A department that can show city leadership a measurable reduction in fire incidents, EMS call volume, or non-emergent alarm responses has earned the argument for a budget increase.

Evaluation: Measuring What Actually Changes

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Most CRR program evaluation systems measure activity, not impact. They count smoke alarms installed, workshops conducted, and flyers distributed. These are process outputs — evidence that the program ran, not evidence that it worked. A program that installs ten thousand smoke alarms and produces no measurable change in fire fatality rates has not succeeded. It has generated data that looks like success while obscuring the actual outcome.

The evaluation framework in this plan is built on three tiers: process outputs (evidence the program ran), impact outputs (early evidence the program is producing its intended effect), and outcomes (evidence that risk indicators changed). All three tiers matter, but they have different weights and different purposes. Process outputs justify continued investment. Outcomes justify the program's existence.

The three evaluation tiers

Process outputs

Process outputs answer the question: Did we do what we said we would do? They are counting measures: number of alarms installed, number of inspections completed, number of people reached by education programs. They are necessary for program management and grant reporting, but they do not tell you whether the program is reducing risk.

Collect process outputs consistently and completely, but do not report them to city leadership as evidence of program success. They are evidence of program operation. The distinction matters.

Impact outputs

Impact outputs answer the question: Is the program producing the intermediate changes that should eventually reduce risk? They include: knowledge levels pre- and post-education (do people know more after the program than before?), compliance rates at follow-up inspections (are occupancies correcting identified deficiencies?), and behavior change indicators (are alarm systems being tested more frequently after a home visit program than before?).

Impact outputs are leading indicators. They tell you whether the program is working before final outcomes are measurable, which gives you the ability to adjust course during the plan period rather than discovering failure at the end of it.

Outcomes

Outcomes answer the only question that matters for program justification: Did risk indicators change? For fire and life safety programs, outcomes include fire incident rates, injury rates, fatality rates, property loss per incident, and EMS utilization rates for the targeted risk areas.

Outcomes take time. A smoke alarm program launched in year one may not produce measurable fatality rate changes until year three or four, because the statistical base for fatality rate measurement is small and requires multiple years of data to detect a significant change. This is not a failure of evaluation design — it is the nature of low-frequency, high-severity events. Plan for it explicitly so that leadership expectations are calibrated correctly.

Not all outcomes are program-attributable, and the coordinator's leadership reports should clearly make that distinction. A fire fatality in an occupancy type, population, or geographic area that the program was not designed to reach is a community risk event — it belongs in the community's risk profile, but it is not evidence of program failure. A fatality in a manufactured home where the program installed a working alarm and the alarm activated and alerted occupants is a different kind of event — it tells you the program reached the right population and the technology functioned, and the investigation should focus on what other factors contributed. Report all outcomes. But distinguish between incidents in populations and occupancy types the program was designed to reach, and incidents in populations it was not. This distinction prevents both overclaiming credit when outcomes are favorable and accepting blame when outcomes are outside the program's mechanism of action. Consequence honesty requires reporting what actually happened, including what happened outside the program's influence — but it also requires not allowing the program to be evaluated against outcomes it had no pathway to affect.

The Black Swan after-action review

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The standard fire service after-action review asks three questions: What was planned? What happened? What should be different next time? This structure is adequate for tactical events with a clear beginning and end. It is insufficient for CRR program evaluation, which involves complex causal chains, lagging outcomes, and the need to distinguish between program failure and measurement lag.

A Black Swan CRR after-action review asks seven questions, applied at the strategy level at least annually:

- What domain was this strategy actually operating in — and was the intervention matched to that domain? A strategy designed for a complicated problem that is actually complex will produce activity without impact.
- What assumption stopped fitting? Every strategy rests on assumptions about the population it is reaching, the cause of the risk it is addressing, and the effectiveness of the intervention. Which assumptions have been tested against data and which have not?
- Where is brittleness emerging? Which program elements depend on a single individual, a single partner relationship, or a single funding source? Single points of failure in a CRR program produce sudden collapse when they break.
- Does the program's structure have enough variety for the problem? A smoke alarm program that operates in English only, through fire station-based events, in a community where the highest-risk population is non-English-speaking and unlikely to visit a fire station, lacks the variety to absorb the complexity of the actual problem.
- What cognition and coordination is happening outside the formal program — and is it working with the program or around it? Community members, partner organizations, and other city departments often develop informal responses to the same risks the CRR program is addressing. Understanding those informal systems is more valuable than ignoring them.
- What can be repurposed without creating downstream fragility? Every program evaluation is an opportunity to identify exaptive assets that were not activated in the current cycle.
- What action fits this terrain right now — without violating the ethical keel? The annual program adjustment must maintain consequence honesty: if the data shows the program is not working, that conclusion must be reported accurately, not reframed as success.

These seven questions are not a form to fill out. They are a sensemaking process, and the structural discipline of that process matters as much as the questions themselves.

The annual CRR program review should follow the same protocol that effective operational debriefs use: the plan coordinator opens by accounting for what the program got wrong — which assumptions proved incorrect, which strategies underperformed, which partner relationships weakened, and which data gaps remain unfilled. Before asking anyone else to evaluate. Before presenting the good news. The act of going first with honest self-accounting lowers the activation energy required for partners, subordinates, and leadership to be honest in return. Without it, the review produces a narrative — a version of the year that protects the program's reputation. With it, the review produces an orientation — a picture accurate enough to build the next year's adjustments on.

This is consequence honesty made structural. A CRR program that only reports success to itself will eventually report success to leadership while the risk indicators remain unchanged. The debrief protocol is the mechanism that prevents that drift.

The seven questions operate at three tempos, each producing different information at different cost.

Quarterly (advisory group meeting): Run questions 1, 2, and 5 — domain fit, stale assumptions, and informal coordination. These are the fast-moving questions. They detect drift before it compounds. At a quarterly meeting, the coordinator asks, "Is each strategy still operating in the domain for which it was designed?" Has an assumption stopped fitting that we haven't named yet? What is happening outside the formal program that we should know about? Ten minutes of structured conversation. The answers go into the program record and inform the mid-year review.

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Mid-year (month six review): Run all seven questions with a focus on questions 3 and 4, brittleness, and requisite variety. These are the structural questions. They catch design flaws before they produce outcome failures. Where is a single point of failure emerging from: a single person, a single partner, a single funding source? Does the program have enough variety to absorb the complexity of the community it is serving, or are there populations, languages, or geographies the current structure cannot reach? The mid-year review produces specific adjustments for the second half of the year.

Annual (full debrief with Appendix F scorecard): Run all seven questions with full documentation, following the debrief protocol; the coordinator goes first with honest self-accounting before anyone else evaluates. This is the full sensemaking process that produces the orientation for the next program year. The annual review feeds directly into the leadership report and the resource request for the following year.

The effect of three tempos is that the program is continuously sensing and adjusting rather than annually reviewing. Quarterly catches signals. Mid-year catches structural problems. Annual produces the full reorientation. Each cycle produces information that makes the next cycle more accurate, and the cost of each individual cycle is low enough that the discipline can be sustained over a five-year plan period without burning out the coordinator or the advisory group.

Reporting to leadership

The purpose of annual reporting to city leadership is not to demonstrate that the program is succeeding. It is to provide accurate, honest information that enables good resource allocation decisions. A CRR program that only reports good news to leadership will eventually lose credibility when the outcomes do not materialize, and will lose the trust of the leadership it depends on for continued investment.

An effective annual CRR program report contains five elements:

- The risk baseline: current state of each risk indicator compared to the baseline established at program launch. Report the number, not a narrative about it.
- Program reach: process outputs for each strategy, with honest assessment of whether the program is reaching its intended population.
- Early impact indicators: the impact outputs showing whether the program is producing the intermediate changes that should eventually reduce risk.
- What is working and what is not: a direct statement about which strategies are on track, which are not, and what adjustment is required. Do not bury underperformance in qualifications.
- Resource requirements for the next year: specific funding requests tied to specific expected outcomes, using the ROI framework to make the investment case in terms leadership can evaluate.

Communicating during the measurement gap.

The hardest leadership conversation in CRR work happens in year two — after the program has been running long enough to generate process and impact data, but before outcome indicators have had time to move. A coordinator who presents a year-two report showing "500 alarms installed, 30 home visits completed, partner network operational" but "fatality rates unchanged" will face a city manager who reasonably asks: "Is this working?"

The honest answer is: the leading indicators say yes, and the outcome data is not yet available. Here is how to communicate that.

For low-frequency, high-severity events — fire fatalities are the primary example — three to five years of post-intervention data are required before statistically meaningful trend changes are detectable. A community that averages two to four fire fatalities per year cannot produce a statistically significant reduction in a single year, because the numbers are too small for year-over-year comparison to be meaningful. This is not a program failure. It is the mathematical reality of rare events.

What the leading indicators tell you during the gap period is whether the program is on a trajectory that should produce improved outcomes. Are working alarm rates increasing at follow-up visits? Are the alarms the program installed actually activating in incidents? Are the high-risk populations being reached? If these

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impact indicators are moving in the right direction, the program is doing what it was designed to do — and outcome data will follow on the timeline the statistics require.

Present this to leadership explicitly, in advance, before the gap period arrives. Do not wait until year two to explain measurement lag. Include it in the year-one report: "Outcome measurement for fatality rates requires a three-to-five-year baseline. We will report impact indicators annually and outcome indicators beginning in year three. If impact indicators are positive and outcome indicators are not yet available, the program is on track." Leadership that understands the measurement timeline in advance will not interpret year-two data as evidence of failure. Leadership that learns about measurement lag for the first time in a year-two report will.

For higher-frequency indicators — non-emergent alarm volume, cooking fire incidents, WUI code compliance rates — measurable changes in outcomes may appear as early as year two. Report these when they appear. They provide the early evidence of program value that sustains investment during the period when the highest-stakes outcomes (fatality rates) are not yet measurable.

Graceful extensibility

The ultimate evaluation question for a CRR program is not whether it succeeded in year five. It is whether the community is more capable of managing its own risk profile at the end of the plan period than it was at the beginning. David Woods calls this graceful extensibility: the capacity of a system to extend its performance envelope in response to surprise, to stretch without breaking, and to do so in ways that preserve rather than consume future adaptive capacity.

A CRR program that achieves graceful extensibility has done more than reduce incident rates during its plan period. It has:

- Built partner relationships that will activate independently when new risks emerge, without requiring the fire department to coordinate every intervention
- Developed community capacity — residents who know their risk, have the tools to manage it, and trust the department enough to call for help before an emergency rather than after
- Established data systems that make the next risk assessment faster, more accurate, and more actionable than the first one
- Created organizational knowledge within the department that survives personnel changes and does not depend on a single champion to sustain the program

These are not soft outcomes. They are the structural conditions that determine whether the next five years of community risk reduction will be more effective than the last five. Measure them explicitly and report on them honestly.

How this plan fails

The Black Swan Exaptive Spiral demands consequence honesty from the programs it informs, and this plan is not exempt. CRR programs built on this doctrine can fail in specific, predictable ways that practitioners should recognize before they encounter them.

Domain classification as inaction. A department that learns the language of complexity can use it to justify not intervening. "Cooking fire risk in immigrant communities is a complex problem; we can't just install stove shut-offs without understanding the cultural dynamics." That framing is correct. It is also, if taken to its logical extreme, a reason to never act. Domain classification is an analytical tool, not a permission structure for inaction. If the domain is complex, the obligation is to probe, to try something bounded, measure its effect, and adjust. A complex problem that receives no intervention because the intervention might not be perfectly calibrated is not being respected. It is being avoided.

Consequence honesty as paralysis. The demand to measure outcomes rather than activities can become so literal that a program cannot act until perfect data exists. The data will never be perfect. A smoke alarm program that delays launch because the baseline fatality data is insufficient for rigorous statistical comparison will never launch, because the baseline for rare events requires years of data that can only be collected while the program is running. The honest answer is to document the data limitations, establish the best available

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baseline, act, and measure what you can while acknowledging what you cannot. Consequence honesty requires acting on imperfect information honestly, not waiting for perfect information endlessly.

Exaptive overreach. The exaptive recombination principle is powerful and, like every powerful tool, can be misused. A fire department that routes smoke alarm distribution, cooking fire education, fall risk assessment, medication compliance checks, and social isolation screening through a single community health worker partner has not built a distributed network. It has built a dependency that will exhaust the partner and erode the trust the program depends on. Each exaptive partnership must be evaluated for sustainability: does the ask fit within the partner's existing mission and capacity, or is it stretching them beyond what the relationship can sustain? The test is simple. If the partner's supervisor would object to the time commitment, the ask is too large.

Scaffolding that stays too long. A strategy designed for a specific risk condition must be examined when that condition changes. If a manufactured home community that was the primary target of the smoke alarm program is demolished and replaced with market-rate apartments, the strategy's targeting must shift with the terrain. A program that continues allocating resources to a risk that has migrated is not being faithful to the plan. It is being faithful to the plan's first draft, which is a form of terrain insensitivity that the ethical keel is designed to prevent. Every strategy in this plan is scaffolding. Scaffolding that remains after the building has changed shape is not structure. It is obstruction.

The plan becomes identity. This is the terminal failure mode; the one that makes all the others invisible. The moment a department defends this plan against evidence that it needs revision, it has stopped being a tool and become a monument. A CRR program that cannot survive its own after-action review does not deserve continued investment. The plan earns its place one cycle at a time, or it does not earn it at all.

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References

The following references are cited throughout this model plan or represent primary sources for the standards, frameworks, and research that inform it. For practitioners who want to go deeper into any area of this plan, the references are organized by category. The ones marked with a ● are the highest-value starting points for a practitioner new to that area.

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Appendix A: Incident Data Summary Template

This template summarizes the incident data required to complete the risk assessment methodology described in Section 5. Populate using five years of NFIRS or NERIS data. Export raw incident records to a spreadsheet or GIS environment for geographic analysis before completing the summary fields.

> ▶ **Adapter note:** *Your NFIRS or NERIS coordinator can pull these data exports. If your department does not have a dedicated data analyst, contact your state fire marshal's office for assistance with NFIRS/NERIS data extraction. The USFA's data portal at apps.usfa.fema.gov/nfirs-search also allows aggregate analysis by jurisdiction.*

A.1 Overall incident profile

Field	Enter your community's data here
Jurisdiction	*[Department name and reporting jurisdiction]*
Data period	*[Start date] through [End date]*
Data source	*[NFIRS / NERIS / CAD system — specify]*
Total incidents (all types)	*[Number]*
Total fire incidents	*[Number] ([Percentage of total]%)*
Total EMS incidents	*[Number] ([Percentage of total]%)*
Total HazMat incidents	*[Number] ([Percentage of total]%)*
Total technical rescue incidents	*[Number] ([Percentage of total]%)*
Total non-emergent alarm responses	*[Number] ([Percentage of total]%)*
Total public service calls	*[Number] ([Percentage of total]%)*
Annual incident trend	*[Describe 5-year trend: increasing, decreasing, stable, and rate of change]*

A.2 Fire incident detail

Field	Enter your community's data here
Residential structure fires	*[Number annually; 5-year average]*
Commercial / industrial structure fires	*[Number annually; 5-year average]*
Vehicle fires	*[Number annually; 5-year average]*
Wildland / grass fires	*[Number annually; 5-year average]*
WUI structure-threatening fires	*[Number annually; 5-year average]*
Fire fatalities	*[Number; identify which incidents produced fatalities]*
Fire injuries (civilian)	*[Number; severe and minor]*
Fire injuries (firefighter)	*[Number; OSHA-recordable and lost-time]*

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Field	Enter your community's data here
Average property loss per residential fire	*[Dollar amount]*
Total annual property loss (all fires)	*[Dollar amount]*
Top 3 ignition causes	*[List with percentage of total each represents]*
Top 3 contributing factors	*[List with percentage of total each represents]*
Percentage of fires where working alarm was present	*[Percentage]*
Percentage of fires where alarm activated and alerted occupants	*[Percentage]*

A.3 Geographic concentration

Complete this section using GIS mapping of incident addresses against census tract boundaries, occupancy type data, and demographic data. The goal is to identify the spatial overlap of high incident frequency with high-vulnerability population concentrations.

Field	Enter your community's data here
Fire incident hotspots	*[Census tracts or geographic areas with disproportionately high fire incident rates relative to population or housing units]*
Manufactured home community incident rate	*[Incidents per 1,000 units annually, compared to general residential rate]*
Multi-family residential incident rate	*[Incidents per 1,000 units annually, compared to single-family rate]*
Top 5 high-incident addresses / occupancies	*[Address, occupancy type, incident count over 5 years, and primary incident type]*
Non-emergent alarm hotspots	*[Addresses or occupancy types generating the highest non-emergent alarm volume]*
WUI incident locations	*[Map reference or geographic description of WUI incident locations relative to WUI boundary]*

A.4 CRR strategy-specific data

Populate the following fields for each of the five strategies. These become the baseline measures against which program outcomes are evaluated.

Strategy 1: Smoke alarms

Field	Enter your community's data here
Residential fire fatalities (5-year total)	*[Number]*
Fatalities in manufactured home communities	*[Number]*

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Field	Enter your community's data here
Fires with no working alarm present	*[Number and percentage of residential fires]*
Estimated homes with expired alarms	*[Number or percentage, from CRA data or national estimate]*
Current smoke alarm program reach (annual)	*[Households served per year if program exists; 0 if not]*

Strategy 2: Wildland Urban Interface (WUI)

Field	Enter your community's data here
WUI fire incidents (5-year total)	*[Number]*
Structures threatened or damaged in WUI incidents	*[Number]*
Suppression and rehabilitation cost (5-year total)	*[Dollar amount]*
Current WUI boundary area (acres or square miles)	*[Extent]*
Number of structures within WUI zone	*[Residential and commercial separately]*
Existing CWPP status	*[In place / in development / not started]*

Strategy 3: Large-scale events

Field	Enter your community's data here
Permitted large events annually (above threshold size)	*[Number; define your threshold]*
EMS incidents at large events (annual average)	*[Number and average severity]*
Response time degradation during large events	*[Average response time during events vs. normal; describe any notable incidents]*
Number of venues with current pre-incident plans	*[Number out of total primary event venues]*
ASHER planning status	*[Current state of active threat planning for large events]*

Strategy 4: Non-emergent alarms

Field	Enter your community's data here
Non-emergent alarm responses (annual average)	*[Number and percentage of total call volume]*

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Field	Enter your community's data here
Apparatus hours consumed annually	*[Hours; translate to dollar cost at fully-burdened hourly rate]*
Top 10 contributing addresses / occupancies	*[Address, occupancy type, annual count]*
Current false alarm ordinance status	*[In place with fee schedule / in place without fees / not in place]*
Current ordinance effectiveness	*[Describe fee collection rate and any measurable compliance effect]*

Strategy 5: Cooking-related fire incidents

Field	Enter your community's data here
Cooking fire incidents (annual average)	*[Number and percentage of structure fires]*
Cooking fire injuries (annual average)	*[Number]*
Cooking fire property loss (annual average)	*[Dollar amount]*
Primary ignition sources	*[Stovetop / oven / microwave / other; percentage each]*
Top contributing occupancy types	*[Single-family / multi-family / senior living / other]*
Primary at-risk demographic groups	*[Based on incident data and demographic overlay]*

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Appendix B: Community Demographic Data Template

This template organizes the demographic data required for the community profile and risk assessment. Primary data source is the US Census Bureau American Community Survey 5-year estimates. Secondary sources include city or county planning department reports, school district enrollment data, and healthcare system community health needs assessments.

> ▶ **Adapter note:** *Access ACS data at data.census.gov. Search by your jurisdiction's FIPS code or name. Use the 5-year estimates for the most stable small-area data. Your city or county GIS department may have pre-processed ACS data at the census tract level that will accelerate this section significantly.*

B.1 Population overview

Field	Enter your community's data here
Total population (current estimate)	*[Number, source, and year]*
Population at last decennial census	*[Number and year]*
Annual average growth rate (10-year)	*[Percentage]*
Population projection (5 years)	*[Number and source]*
Estimated daytime population	*[Number, if significantly different from resident population]*
Population density (persons per square mile)	*[Number]*

B.2 Age distribution

Field	Enter your community's data here
Under 5 years	*[Number and percentage]*
5–17 years	*[Number and percentage]*
18–64 years	*[Number and percentage]*
65–74 years	*[Number and percentage]*
75 years and over	*[Number and percentage]*
Median age	*[Years]*
Senior population trend	*[Growing / stable / declining; rate of change]*

B.3 Race and ethnicity

Field	Enter your community's data here
White alone (non-Hispanic)	*[Number and percentage]*

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Field	Enter your community's data here
Black or African American	*[Number and percentage]*
Hispanic or Latino	*[Number and percentage]*
Asian	*[Number and percentage]*
American Indian or Alaska Native	*[Number and percentage]*
Two or more races	*[Number and percentage]*
Other	*[Number and percentage]*
Foreign-born population	*[Number and percentage]*
Diversity trend (10-year)	*[Describe the direction and rate of demographic change]*

B.4 Language profile

Field	Enter your community's data here
Speaks only English at home	*[Number and percentage]*
Speaks English less than 'very well'	*[Number and percentage — this is the limited English proficiency population]*
Primary non-English language 1	*[Language, number of speakers, percentage]*
Primary non-English language 2	*[Language, number of speakers, percentage]*
Primary non-English language 3	*[Language, number of speakers, percentage]*
Languages with >1% of population	*[List all; these require translated materials]*

B.5 Socioeconomic profile

Field	Enter your community's data here
Median household income	*[Dollar amount]*
Per capita income	*[Dollar amount]*
Population below federal poverty line	*[Number and percentage]*
Population below 200% of poverty line	*[Number and percentage — this is the working poor threshold used for many assistance programs]*
Unemployment rate	*[Percentage]*
Owner-occupied housing units	*[Number and percentage of total]*
Renter-occupied housing units	*[Number and percentage of total]*

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Field	Enter your community's data here
Housing cost-burdened households (>30% income to housing)	*[Number and percentage]*
Severely housing cost-burdened (>50%)	*[Number and percentage]*

B.6 Housing stock

Field	Enter your community's data here
Total housing units	*[Number]*
Single-family detached	*[Number and percentage]*
Single-family attached / townhome	*[Number and percentage]*
Multi-family (2–4 units)	*[Number and percentage]*
Multi-family (5+ units)	*[Number and percentage]*
Manufactured / mobile homes	*[Number, percentage, and number of communities]*
Median year built	*[Year]*
Units built before 1980	*[Number and percentage — pre-smoke detector era construction]*
Vacant units	*[Number and percentage]*

B.7 Vulnerable population locations

Map the following facilities and populations against your incident data using GIS. The geographic overlap of vulnerable populations with high-incident areas defines the highest-priority intervention zones for the smoke alarm, cooking fire, and EMS-related strategies.

Field	Enter your community's data here
Senior living facilities	*[Number; names and addresses; combined resident capacity]*
Subsidized / low-income housing complexes	*[Number; names, addresses, and unit counts]*
Manufactured home communities	*[Number; names, addresses, and estimated unit counts]*
Group homes and residential care facilities	*[Number and total capacity]*
Transitional housing and shelter facilities	*[Number and total capacity]*
Public housing authority properties	*[Number and total unit count]*
Schools with ELL population >10%	*[Names and ELL enrollment percentage]*

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Appendix C: Response Profile and Hazard Risk Template

This template documents your department's operational response profile and the hazard risk context that shapes CRR priorities. The response profile data informs resource allocation decisions in the implementation framework. The hazard risk data feeds directly into the risk assessment methodology.

> ▶ **Adapter note:** *The FEMA THIRA (Threat and Hazard Identification and Risk Assessment) process, described in CPG 201, provides a standardized federal methodology for the hazard profile section. Your state's current Hazard Mitigation Plan contains jurisdiction-specific data for most of the natural hazard fields.*

C.1 Operational response profile

Field	Enter your community's data here
Number of fire stations	*[Total; list station locations]*
Total authorized positions	*[Number]*
Total filled positions	*[Number; note vacancy rate]*
Minimum daily staffing	*[Total across all stations]*
Apparatus in daily service	*[Number and types: engines, trucks, medic units, hazmat, etc.]*
Annual call volume (most recent year)	*[Total and by type]*
Average daily call volume	*[Total and by type]*
Busiest time of day / day of week	*[Based on CAD data analysis]*
Average response time (first unit)	*[Turnout + travel; compare to NFPA 1710 benchmark of 4 minutes]*
First alarm assignment depth	*[Number of units and personnel on initial dispatch]*
Mutual aid dependency	*[Percentage of incidents requiring mutual aid; primary mutual aid partners]*

C.2 Natural hazard profile

Hazard	Historical frequency	Maximum extent	Probability (annual)	Life safety consequence	Property consequence	Current mitigation
Flood	[Events per decade]	[Maximum affected area]	[% chance per year]	[Fatality / injury history]	[Dollar loss history]	[Levees, warning systems, etc.]
Tornado / severe wind	[Events per decade]	[EF scale; typical path width]	[% chance per year]	[Fatality / injury history]	[Dollar loss history]	[Warning systems, shelter program]
Winter storm / ice	[Events per year]	[Maximum snowfall / ice accumulation]	[Seasonal certainty]	[Fatality / injury history]	[Infrastructure impact]	[Road treatment, shelter program]

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Hazard	Historical frequency	Maximum extent	Probability (annual)	Life safety consequence	Property consequence	Current mitigation
Wildfire / WUI	[Events per year]	[Maximum acreage; structures at risk]	[Seasonal probability]	[Fatality / injury history]	[Dollar loss history]	[CWPP status, fuel reduction]
Extreme heat	[Days per year above threshold]	[Maximum temperature; duration]	[Annual certainty]	[Heat-related illness history]	[Infrastructure impact]	[Cooling centers, warning protocols]
Earthquake	[Events per decade]	[Maximum MMI at jurisdiction]	[% chance per 50 years]	[Based on fault proximity]	[Based on building stock age]	[Building code status]
Drought	[Events per decade]	[Maximum drought index]	[Seasonal probability]	[Agricultural / economic]	[Water supply impact]	[Water conservation programs]

C.3 Technological hazard profile

Hazard	Location / corridor	Quantity / volume	Worst-case scenario	Current controls
Fixed HazMat facility (Tier II reporters)	[Names and addresses]	[Primary chemicals and quantities]	[LEPC planning basis]	[LEPC plan status, community notification]
Highway HazMat corridor	[Route numbers]	[Primary cargo types]	[PHMSA worst-case]	[Response capability, pre-plans]
Rail HazMat corridor	[Rail lines and operators]	[Primary cargo types; TIH cars]	[ERG worst-case]	[Response capability, rail contacts]
Pipeline (gas, liquid, chemical)	[Operators and pipeline types]	[Diameter and pressure]	[Rupture / ignition scenario]	[811 program, emergency contacts]
Utility system failure risk	[Substation locations, grid dependencies]	[Cascade potential]	[Multi-day outage scenario]	[Utility coordination MOUs]

C.4 Special hazards and critical infrastructure

Field	Enter your community's data here
Hospitals and healthcare facilities	*[Names, addresses, bed capacity, and any known vulnerability]*
Schools and universities	*[Number; total student population; any notable concentration or vulnerability]*
Large-capacity venues	*[Names, addresses, maximum occupancy, and primary event types]*
Critical utility infrastructure	*[Water treatment, wastewater, power generation, and communication nodes]*
Transportation hubs	*[Airport, intermodal facilities, major highway interchanges]*
Government and public safety facilities	*[City hall, EOC, police stations, fire stations — any identified vulnerability]*

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Field	Enter your community's data here
High-risk industrial facilities	*[Facilities with Tier II hazardous materials reporting requirements, petroleum storage, etc.]*

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Appendix D: CRR Program Budget Template

This template provides a framework for documenting the CRR program's annual resource requirements. Complete a budget projection for each year of the plan period. The template is organized by strategy to make the connection between resource investment and program outcomes explicit when presenting to city leadership.

▶ **Adapter note:** *When presenting CRR budget requests to city leadership, translate resource investments into ROI terms using the National Institute of Building Sciences $12–$30 return figure. A $50,000 prevention investment that can demonstrably reduce incident volume by 10% in a jurisdiction spending $2 million annually on response generates between $240,000 and $600,000 in avoided response cost. Calculate and present these figures specifically for your jurisdiction.*

D.1 Personnel costs

Position	FTE or % collateral	Annual salary + benefits	Funding source	Year 1	Year 2–5 (average)
CRR Coordinator / Lead Specialist	[Dedicated or collateral]	[Dollar amount]	[General fund / grant]	[Amount]	[Amount]
Fire Prevention Inspector (CRR duties)	[Percentage of time]	[Prorated cost]	[General fund / grant]	[Amount]	[Amount]
Public Education Specialist	[FTE or collateral]	[Dollar amount]	[General fund / grant]	[Amount]	[Amount]
Bilingual Outreach Personnel	[FTE, part-time, or contracted]	[Dollar amount]	[Grant / general fund]	[Amount]	[Amount]
Operations Personnel (alarm events)	[Hours annually]	[Overtime / straight time]	[General fund]	[Amount]	[Amount]
Total personnel costs				[Year 1 total]	[Year 2–5 average]

D.2 Program costs by strategy

Strategy	Materials / equipment	Marketing / outreach	Partner costs	Training	Total
Strategy 1: Smoke alarms	[Alarms, batteries, tools]	[PSA production, signage]	[Red Cross program]	[Installer training]	[Total]
Strategy 2: WUI	[Fuel reduction equipment, materials]	[Community education]	[Forestry agency cost-share]	[NWCG training]	[Total]
Strategy 3: Large events	[Pre-incident plan materials, command post]	[Organizer training program]	[Law enforcement coordination]	[ASHER training]	[Total]
Strategy 4: Non-emergent alarms	[Database, notification mailings]	[Business outreach]	[Court / finance coordination]	[Staff training]	[Total]

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Strategy	Materials / equipment	Marketing / outreach	Partner costs	Training	Total
Strategy 5: Cooking fires	[Shut-off device supply, materials]	[Multilingual materials, partner training]	[Healthcare co-investment]	[EMT integration training]	[Total]
Total program costs					[Grand total]

D.3 Grant funding pipeline

Document the grant opportunities being pursued in each year of the plan period. Treat grant funding as a supplement to base budget, not a replacement for it. Programs dependent entirely on grant funding are fragile — they collapse when the grant cycle ends. The goal is to use grant funding to build capacity and demonstrate outcomes that justify general fund investment.

Grant program	Administering agency	Eligible activities	Award cycle	Typical award	Application deadline
AFG Prevention and Safety	FEMA / USFA	Smoke alarm programs, public education, CRR planning	Annual	$10K–$200K	[Typically August–October]
BRIC (Building Resilient Infrastructure and Communities)	FEMA	Mitigation planning, hazard mitigation projects	Annual	Variable	[Typically September–November]
HMGP (Hazard Mitigation Grant Program)	FEMA	Post-disaster mitigation projects	Post-declaration	Variable	[Following presidential disaster declaration]
State Fire Marshal Prevention Grants	[State agency name]	[State-specific eligible activities]	[Annual / biennial]	[State-specific]	[State-specific]
State Forestry WUI Grants	[State forestry agency]	Fuel reduction, CWPP development, WUI education	[Annual]	[State-specific]	[State-specific]
Community Foundation	[Local foundation name]	[Foundation-specific; often community health, safety, or education]	[Annual]	[Varies]	[Foundation-specific]
Healthcare System Community Benefit	[Hospital system name]	Prevention programs that reduce emergency utilization	[Annual community benefit cycle]	[Negotiated]	[Per system cycle]

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Appendix E: Strategic Partner Directory

A CRR program that exists only inside the fire department will be limited to fire department reach, fire department trust, and fire department resources. This directory documents the partner relationships that extend all three. Complete it before the program launches, not after it is underway.

Relationships deteriorate when contact is intermittent and instrumental — when the fire department only calls when it needs something. Build the relationship through regular touchpoints before you need the partnership to carry weight. The most important column in this directory is the last one: the date of most recent contact. If that date is more than 90 days ago for a critical partner, the relationship needs attention.

E.1 Core program partners

Organization	Primary contact	Role in CRR program	Strategy #	Agreement status	Last contact
American Red Cross — local chapter	[Name, title, phone, email]	Smoke alarm supply, installation volunteers, joint outreach events	1	[MOU / informal / none]	[Date]
[Primary hospital system]	[Name, title, phone, email]	Discharge pathway, home health integration, cooking fire co-investment	1, 5	[MOU / informal / none]	[Date]
[Secondary hospital system]	[Name, title, phone, email]	EMS coordination, burn injury data sharing	5	[MOU / informal / none]	[Date]
[Primary social service agency]	[Name, title, phone, email]	Access to low-income and vulnerable populations for alarm and cooking fire programs	1, 5	[MOU / informal / none]	[Date]
[Area Agency on Aging]	[Name, title, phone, email]	Senior population outreach, home visit integration	1, 5	[MOU / informal / none]	[Date]
211 / helpline system	[Name, title, phone, email]	Non-emergency referral pathway for alarm program	1	[Data sharing agreement / informal]	[Date]
[State forestry agency]	[Name, title, phone, email]	WUI technical assistance, fuel reduction cost-share, CWPP development	2	[MOU / grant agreement / none]	[Date]
[Primary law enforcement agency]	[Name, title, phone, email]	ASHER planning, large-event unified command	3	[Joint operations plan / MOU]	[Date]
[Primary alarm monitoring company]	[Name, title, phone, email]	Non-emergent alarm data sharing, confirmation protocol alignment	4	[Data sharing agreement / informal]	[Date]
City GIS / Civil Analytics dept.	[Name, title, phone, email]	Risk mapping, data analysis support for all strategies	All	[Interagency agreement / informal]	[Date]

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E.2 Community and neighborhood partners

Organization	Primary contact	Community served	CRR role	Last contact
[Manufactured home community manager 1]	[Name, phone, email]	[Community name and unit count]	Alarm program access, resident notification	[Date]
[Manufactured home community manager 2]	[Name, phone, email]	[Community name and unit count]	Alarm program access, resident notification	[Date]
[Immigrant services organization]	[Name, phone, email]	[Primary language group served]	Multilingual outreach, trusted messenger for alarm and cooking programs	[Date]
[Faith community — large congregation]	[Name, phone, email]	[Neighborhood / demographic]	Community event hosting, distribution network	[Date]
[Neighborhood association / HOA — WUI area]	[Name, phone, email]	[WUI zone neighborhood]	Defensible space program, resident communication	[Date]
[Large employer — smoke alarm partner]	[Name, phone, email]	[Employee demographic]	Alarm distribution, workplace safety messaging	[Date]
[School district / ELL coordinator]	[Name, phone, email]	[Schools with high ELL enrollment]	Family outreach through school communication channels	[Date]

E.3 Government and regulatory partners

Agency	Primary contact	Role in CRR program	Current coordination status
City / county planning and development	[Name, title, phone, email]	WUI code development, development review for fire-safe construction, large-event permitting	[Active / periodic / needs development]
City attorney / municipal court	[Name, title, phone, email]	False alarm ordinance enforcement and fee collection	[Active / periodic / needs development]
City finance department	[Name, title, phone, email]	CRR budget tracking, grant administration, false alarm fee collection	[Active / periodic / needs development]
Emergency management department	[Name, title, phone, email]	THIRA integration, CWPP coordination, CERT program	[Active / periodic / needs development]
Public works department	[Name, title, phone, email]	WUI vegetation management coordination, access route maintenance	[Active / periodic / needs development]

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Agency	Primary contact	Role in CRR program	Current coordination status
Parks department	[Name, title, phone, email]	WUI fuel reduction coordination in park lands and greenways	[Active / periodic / needs development]
Local emergency planning committee (LEPC)	[Chair name, contact]	HazMat risk planning, Tier II facility data, LEPC plan coordination	[Member / observer / needs engagement]

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Appendix F: Annual Program Evaluation Scorecard

This scorecard consolidates the key evaluation measures from all five strategies into a single annual reporting instrument. Complete it at the end of each program year using the measure definitions established in each strategy section. Report the completed scorecard to city leadership as part of the annual CRR program report.

> ▶ **Adapter note:** *The scorecard is a reporting tool, not an evaluation methodology. The evaluation methodology is the seven-question Black Swan after-action review described in Section 8. Use the scorecard to organize and communicate results. Use the after-action review to understand them.*

F.1 Program-wide summary

Field	Enter your community's data here
Plan year reported	*[Year 1 / Year 2 / Year 3 / Year 4 / Year 5]*
Total program budget expended	*[Dollar amount]*
Grant funding received	*[Dollar amount and sources]*
Total population reached by CRR activities	*[Estimated number]*
Number of active strategic partnerships	*[Number; compare to prior year]*
Overall assessment	*[On track / adjustments required / significant revision needed]*

F.2 Strategy scorecards

Strategy 1: Smoke alarms

Measure	Target	Actual	Trend vs. prior year	Status
Residents reached by alarm education	[Year 1 target]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Manufactured home community coverage (%)	[Year 1 target]	[Actual %]	[↑ / ↓ / —]	[On track / below / above]
Alarms installed (total)	[Year 1 target]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Alarm activation rate in residential fires	[Baseline + improvement target]	[Actual %]	[↑ / ↓ / —]	[On track / below / above]
Fire fatalities in manufactured home communities	Zero by year 5	[Actual]	[↑ / ↓ / —]	[On track / below / above]

Strategy 2: Wildland urban interface

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Measure	Target	Actual	Trend vs. prior year	Status
Acres of fuel reduction completed	[Annual target]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
WUI home assessments completed	[Annual target]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Structures achieving defensible space standards (%)	[Year 3 target %]	[Actual %]	[↑ / ↓ / —]	[On track / below / above]
WUI incidents (number and acreage)	[Below 5-year average]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Annual WUI suppression cost	[Below 5-year average]	[Actual]	[↑ / ↓ / —]	[On track / below / above]

Strategy 3: Large-scale events

Measure	Target	Actual	Trend vs. prior year	Status
Pre-incident plans on file (% of primary venues)	100% by year 1	[Actual %]	[↑ / ↓ / —]	[On track / below / above]
Pre-event walkthroughs completed	100% of threshold events	[Actual %]	[↑ / ↓ / —]	[On track / below / above]
Organizers completing life safety training	[Annual target]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Day-of life safety deficiencies at inspected events	Trend to zero	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Serious injuries at large events (rate per 10K attendees)	[Baseline rate]	[Actual]	[↑ / ↓ / —]	[On track / below / above]

Strategy 4: Non-emergent alarms

Measure	Target	Actual	Trend vs. prior year	Status
Non-emergent alarm responses (total)	[Below baseline by year 3]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Non-emergent alarms as % of total calls	[Below baseline by year 3]	[Actual %]	[↑ / ↓ / —]	[On track / below / above]
Repeat offenders achieving compliance (% within 90 days)	[Target %]	[Actual %]	[↑ / ↓ / —]	[On track / below / above]
Apparatus hours saved vs. baseline	[Target hours]	[Actual]	[↑ / ↓ / —]	[On track / below / above]

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Measure	Target	Actual	Trend vs. prior year	Status
Fee collection rate on assessed penalties	[Target %]	[Actual %]	[↑ / ↓ / —]	[On track / below / above]

Strategy 5: Cooking-related fire incidents

Measure	Target	Actual	Trend vs. prior year	Status
High-risk contacts receiving cooking fire education	[Annual target]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Automatic shut-off devices installed	[Annual target]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Grease violations corrected at follow-up inspection (%)	[Target %]	[Actual %]	[↑ / ↓ / —]	[On track / below / above]
Cooking fire incidents (annual)	[Below baseline by year 3]	[Actual]	[↑ / ↓ / —]	[On track / below / above]
Cooking fire injuries (annual)	[Below baseline by year 5]	[Actual]	[↑ / ↓ / —]	[On track / below / above]

F.3 Annual Black Swan after-action questions

Record the answers to the seven Black Swan after-action questions annually. These answers become the primary input to the following year's program adjustments. File them with the scorecard in the program record.

Field	Enter your community's data here
1. Domain classification	*Was each strategy operating in the domain it was designed for? Where did domain transitions occur that the program did not anticipate?*
2. Stale assumptions	*Which assumptions built into the program at launch have been tested by data? Which have been validated? Which have been contradicted?*
3. Brittleness	*Where did single points of failure appear — in staffing, partner relationships, funding, or data systems? What was done to address them?*
4. Requisite variety	*Which strategies lacked the variety (language capacity, geographic reach, occupancy coverage) to absorb the complexity of the problem?*
5. Informal coordination	*What CRR-relevant activity is happening outside the formal program? Is it complementary or competitive?*
6. Exaptive opportunities	*What resources, relationships, or capabilities identified this year could be activated or repurposed in the next program year?*
7. Ethical keel	*Was the program's evaluation honest? Were underperforming strategies reported accurately? Were outcome measures — not just process outputs — presented to leadership?*

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Appendix G: Strategy Development Guide

This appendix provides a template for building a new CRR strategy using the same architecture as the five strategies in this plan. Use this template when your Community Risk Assessment identifies a high-priority risk that is not addressed by the existing five strategies — such as commercial occupancy fire load, HazMat transportation corridor risk, lithium-ion battery storage, flood-zone residential risk, or any community-specific risk that your data identifies and your CRA prioritizes.

The architecture is the same for every strategy. What changes is the data, the partners, and the terrain.

Step 1: Domain classification

Before designing the strategy, classify the domain. Use the domain classification table in the Risk Assessment Methodology section. Ask: Is this risk primarily a clear problem (known procedure resolves it), a complicated problem (expert analysis resolves it), a complex problem (requires probing, learning, and adjustment), or does it have chaotic-domain potential (requires stabilizing action when it escalates)? Most CRR risks operate across multiple domains — the planning phase may be complicated, while the behavior-change component is complex. Name both, the way the existing strategies do, and design the intervention to match.

Write your domain classification in the same callout format used in the five strategies:

> **Domain classification:** *[Your classification and the reasoning behind it, including which aspects of the risk operate in which domain.]*

Step 2: Risk statement

Describe the risk using your CRA data. Include: what the risk is, why it matters (frequency, severity, trend), where and in whom it concentrates (geographic and demographic distribution), and what the current departmental capacity to address it is. Use local data wherever possible. National statistics contextualize; local data motivates action.

Step 3: Goal and objectives

State one goal: the measurable condition the strategy exists to achieve. Then state three to five objectives that, if accomplished, should produce that outcome. Each objective should be specific enough to measure and broad enough to sustain over a five-year plan period.

Step 4: Strategies by the 5 E's

For each of the five E's, identify the specific interventions your strategy will employ:

- **Education:** Who needs to know what? How will you reach them — through department channels, partner channels, or both? What format and language does the target population require?
- **Engineering:** What physical, technological, or design interventions can reduce this risk independent of behavior change? What can be installed, retrofitted, or modified?
- **Enforcement:** What code, ordinance, or regulatory mechanism exists to require compliance? Is the enforcement pathway through the fire department, another city department, or a state agency? Is the enforcement posture educational or punitive, and why?
- **Emergency Response:** How does the department's operational response to this risk type feed data back into the prevention strategy? What post-incident follow-up protocol would connect response to prevention?

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- **Economic Incentives:** What financial mechanisms — grants, fee reductions, insurance incentives, cost-share programs, penalty avoidance — create sustained motivation for compliance beyond what enforcement alone can produce?

Not every strategy requires all five E's at equal depth. But document your reasoning for any E that receives less emphasis — the annual AAR will revisit that decision.

Step 5: Internal participants and strategic partners

Name the internal positions responsible for each component of the strategy. Name the external partners required for delivery, data, or access — and identify at least one dormant partner who could serve a similar function if the primary partner withdraws.

Step 6: Resources required

List the personnel time, materials, equipment, funding, and partner commitments the strategy requires. Be specific enough that the budget template in Appendix D can be populated from this list.

Step 7: Communication and marketing

How will the strategy's existence, availability, and results be communicated — to the target population, to partners, to city leadership, and to the department's own personnel?

Step 8: Three-tier measures

Design measures at all three tiers:

- **Process outputs:** What activities will the strategy produce that demonstrate it is operating? (Number of inspections, installations, contacts, events.)
- **Impact outputs:** What intermediate changes should the strategy produce that indicate it is working? (Compliance rates, knowledge assessment scores, behavior change indicators.)
- **Outcomes:** What risk indicators should change if the strategy succeeds? (Incident rates, injury rates, fatality rates, property loss — in the specific populations and occupancy types the strategy targets.)

For each measure, establish a baseline before the strategy launches, a target for years three and five, and a tracking frequency.

Step 9: Black Swan lens

Complete the Black Swan lens callout for the strategy:

- **Exaptive opportunity:** What existing community capability, relationship, or resource can be repurposed for this strategy's delivery without building new infrastructure?
- **Ethical keel consideration:** Which of the four keel functions — inner command, consequence honesty, terrain sensitivity, moral courage — is most likely to be tested by this strategy's implementation, and what does that test look like in practice?

This template produces a strategy that is structurally identical to the five strategies in the main plan — same domain classification, same 5 E's structure, same three-tier measures, same Black Swan lens. The architecture is proven. The content is yours.

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These five strategies are the operational core of the CRR plan. Each one was selected because the data supported it, the resources exist to execute it, and the community conditions that make it necessary are not going away. None of them will succeed on a shelf. They require personnel who know the plan, partners who trust the department, and leadership willing to measure outcomes honestly and adjust when the data says something isn't working.

The Black Swan doctrine running underneath all five strategies is not complicated: classify the terrain before you act on it, build the ethical keel before you need it, repurpose what already exists in the community rather than building new infrastructure from scratch, and measure what actually changes rather than what is easy to count. A CRR plan built on those principles will continue generating value long after the plan period ends.

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By reason, not rage

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