Model Performance in Fire Prevention

SYMPOSIUM 2016

Community Risk Based Inspection & Enforcement Program

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Kitsap County Department of Community Development

Mission Statement

“Enable the development of quality, affordable, structurally safe, and environmentally sound communities”
The Risk Check Mission

Risk Check supports our department mission of creating safe and healthy communities by deploying our prevention resources where they are most needed.
Objectives

1. Deploy prevention resources where they are most needed with higher risk scoring occupancies receiving priority for inspection.

2. Inspect all occupancies within upper 50th percentile of Risk Check scores not less than annually.

3. Assure that the frequency of inspection does not exceed 4 years for any occupancy.

4. Identify specific risks and implement programs to address those risks such that 3 year loss trends do not exceed geographically adjusted national loss trends.
FORMATIVE EVALUATION
Formative Evaluation
Process Steps Taken

Determined Risk & Mitigation Strategies

- Researched and compared national and local loss history data based on occupancy.
- Examined risk assessment and loss predictability methods used by other jurisdictions and authorities.
Identified & Addressed Needs

- Identified need for better local data
- Established local stakeholder group to define program objectives.
- Examined data management and reporting systems capable of meeting program needs.
PROCESS EVALUATION
Process Evaluation

Several false starts that did not meet goals and needs

Needed a data driven inspection program that supported core principals.

Not all occupancies are created equal!
Process Evaluation

Idea started with fault tree/probability analysis format,

But it was too difficult to explain to the affected parties.

$$E(\text{Hits in an Inning}) = \sum_{h=0}^{\infty} \frac{(h+2)!}{2!h!} \left( \frac{1-\text{OBP}}{1-P(\text{BB})-P(\text{HBP})} \right)^3 \left( \frac{P(H)}{1-P(\text{BB})-P(\text{HBP})} \right)^h$$

$$= \sum_{h=1}^{\infty} \frac{(h+2)!}{2!(h-1)!} \left( \frac{1-\text{OBP}}{1-P(\text{BB})-P(\text{HBP})} \right)^3 \left( \frac{P(H)}{1-P(\text{BB})-P(\text{HBP})} \right)^h$$

$$= 3 \frac{P(H)}{1-\text{OBP}} \sum_{h=1}^{\infty} \frac{(h+2)!}{3!(h-1)!} \left( \frac{1-\text{OBP}}{1-P(\text{BB})-P(\text{HBP})} \right)^4 \left( \frac{P(H)}{1-P(\text{BB})-P(\text{HBP})} \right)^{h-1}$$

$$= 3 \frac{P(H)}{1-\text{OBP}} \left[ \text{because } \sum_{h=1}^{\infty} \frac{(h+2)!}{3!(h-1)!} \left( \frac{1-\text{OBP}}{1-P(\text{BB})-P(\text{HBP})} \right)^4 \left( \frac{P(H)}{1-P(\text{BB})-P(\text{HBP})} \right)^{h-1} = 1 \right]$$

$$= \frac{3H}{AB+SF-H}$$
Risk Check Formula

Started by identifying critical risk and mitigation factors

- Ignitability
- Combustibility
- Endangerment
- Defined Hazards
- Maintained Sprinkler System
- Maintained Alarm System
- Resistance
- Fire Department Rating
### Formula in Action

Risk Check formula written into adaptable program

<table>
<thead>
<tr>
<th>Business Name</th>
<th>Risk Factor Total</th>
<th>Mitigation Total</th>
<th>Risk Check Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>19th Hole Bar &amp; Grill</td>
<td>...</td>
<td>2.7</td>
<td>2.05</td>
</tr>
<tr>
<td>2 Margaritas</td>
<td>...</td>
<td>2.7</td>
<td>1.60</td>
</tr>
<tr>
<td>3100 Bldg. Buckley Hill Rd, Leasing Office</td>
<td>...</td>
<td>2.0</td>
<td>1.60</td>
</tr>
<tr>
<td>5 Star Laundry</td>
<td>...</td>
<td>2.0</td>
<td>1.60</td>
</tr>
<tr>
<td>7 Eleven - Lund Ave</td>
<td>...</td>
<td>1.9</td>
<td>1.60</td>
</tr>
<tr>
<td>7 Eleven - Silverdale Way</td>
<td>...</td>
<td>2.4</td>
<td>1.60</td>
</tr>
<tr>
<td>7 Imports</td>
<td>...</td>
<td>1.9</td>
<td>2.05</td>
</tr>
<tr>
<td>Danwood Apartments</td>
<td>...</td>
<td>4.5</td>
<td>1.60</td>
</tr>
<tr>
<td>Grannies Place Adult Family Home</td>
<td>...</td>
<td>4.5</td>
<td>1.60</td>
</tr>
<tr>
<td>Willow Creek Adult Home No. 1</td>
<td>...</td>
<td>4.5</td>
<td>1.60</td>
</tr>
<tr>
<td>Periquet Adult Family Home</td>
<td>...</td>
<td>4.5</td>
<td>1.60</td>
</tr>
<tr>
<td>Willow Creek Adult Family Home No. 2</td>
<td>...</td>
<td>4.5</td>
<td>1.60</td>
</tr>
<tr>
<td>Willow Creek Adult Family Home No. 3</td>
<td>...</td>
<td>4.5</td>
<td>1.60</td>
</tr>
<tr>
<td>Silverdale Loop Rd Apartments (1 Bldg)</td>
<td>...</td>
<td>4.2</td>
<td>1.60</td>
</tr>
</tbody>
</table>
Process Evaluation

1. Risk Factors Identified
2. Mitigation Factors Identified
3. Algorithm Weighing Risk & Mitigation Factors Developed
4. Occupancies in Risk Check Program compared to NFIRS Data
5. Occupancy Information Verified and Entered into Risk Check Database
6. Program to Calculate Algorithm & Establish Scores Created
7. Educational Programs Presented to County Fire Services, Business Community & Elected Officials
8. Risk Check Program Implemented in Community
9. Continual Evaluation and Modification of Risk Check Program
Impact Evaluation
Risk Check Impact

- Projected that inspections of the upper 50\textsuperscript{th} percentile Risk Check scored occupancies will be completed by September 2016.
- Reduce re-inspections by 20% in first year.
- Maintain and build program support
YTD Top Risk Check Score Inspections Completed

- Inspections Completed YTD Under Risk Check: 21%
- Occupancies with Risk Check Score of 30 or higher: [Diagram representation]

No. of Inspections Done Under Risk Check
OUTCOME EVALUATION
Outcomes will be evaluated by:

- Three year loss trends (pre and post Risk Check)
- Program modifications
- Funding
- Reduction in commercial fires and loss of life
RECOMMENDATIONS
MODEL PERFORMANCE IN FIRE PREVENTION

Vision 20/20

Life is Everyone's Fight™
Recommendations

- Know how to communicate with your customer.
- Have a strong support team.
- Work with your community.
RESOURCES
Resources

- Insurance Services Office (ISO)
- National Fire Protection Association (NFPA)
- International Fire Service Training Association (IFSTA)
- Your friends at Kitsap County!
  - Angela Donn or David Lynam at (360) 337-5777