Supplemental Report from the Office of the Independent Monitor

Early Intervention Recommendations

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Recommendation on MPD's Early Intervention System

The Office of the Independent Monitor recommends that MPD implement a machine-learning-based early intervention system (EIS), to identify officers at risk of misconduct/adverse events, as recommended initially by the MPD Policy & Procedure Review Ad Hoc Committee report (recommendation #173).[1] This potentially could be used in conjunction with IAPro/EIPro (MPD's current Internal Affairs database system and initial rudimentary EIS). Officers flagged by a machine-learning EIS should receive adequate and effective intervention. OIM further recommends that MPD consider implementing the Benchmark Analytics First Sign EIS, which also integrates an early intervention system for officer wellness. This machine-learning-based EIS should reduce the risk of civil rights violations and tragedies, and consequent liability, as well as improving officer awareness and access to the services they need, and lead to a reduction in Worker's Compensation claims.

Until such a machine learning system is operational, ranking all MPD officers by the total number of Police Standards and Internal Affairs (PS&IA) cases over 2 years, with a threshold of the top 5 percent, should provide useful interim predictive accuracy for targeting interventions to officers at elevated risk of adverse events.

In addition, OIM recommends that the EIS SOP include an additional two items in its list of example stressors for commissioned personnel: (1) Whether an employee has secondary employment; and (2) Peer pressure. MPD supervisors should be made aware of the empirical link between these two stressors and misconduct risk.

As the MPD Policy & Procedure Review Ad Hoc Committee report notes:

> It has long been known that in most police departments, a small proportion of officers are responsible for the bulk of adverse events (e.g., complaints, inappropriate use-of-force cases, etc.). For example, it's known that officers who are involved in one questionable officer-involved shooting are far more likely to be involved in additional subsequent shootings. In response, police departments through the U.S. have implemented early intervention systems (also referred to as early warning systems) – systems to identify officers at high risk of future adverse events, to allow early intervention (retraining, counseling, reassignment, or other measures) to prevent adverse events. Such systems allow a department to intervene to avert potential tragedies.

In response to OIR's recommendations, MPD implemented an initial EIS. MPD Police Standards and Internal Affairs (PS&IA) staff have provided OIM with a tutorial on MPD's EIS approach, which has many positive features. MPD uses a software product called EIPro to track several appropriate indicators. Incidents are tracked with a time window of a year, on a rolling 12-month basis. Many police departments inappropriately use a shorter time window, which is less informative in flagging officers in need of intervention. One indicator used by MPD's EIPro is the total number of complaints about the officer *submitted* to PS&IA. Some police departments only use *sustained* complaints, which provides far

[1] MPD Policy & Procedure Review Ad Hoc Committee report Recommendation 173: "MPD should continue its work on an early warning system and move in the future towards working with Chicago Data Science for Social Good to enhance the early warning system." https://repository.law.wisc.edu/s/uwlaw/media/41516

less information and predictive accuracy for adverse events.[2] EIPro allows real time tracking, with a user-friendly interface, and MPD supervisory officers track indicators for officers beneath them on an ongoing basis, performing periodic check-ins with the supervised officers.

OIM has several recommendations to improve on this EIS. EIPro, though useful, is a rudimentary early intervention system and lacks the capacity to integrate across different types of data (so as to model risk holistically) and has been found to be ineffective in studies.[3] A system that only tracks factors individually cannot provide a quantitative assessment of risk and has very limited predictive value. By analogy, if you wish to predict whether someone will receive a drunk driving ticket this year, individual factors, each considered alone (e.g., the average number of drinks they consume per week, whether they own a car, etc.), may be relatively weak predictors. However, combining such factors together with an appropriate mathematical formula (i.e., a calibrated statistical model) can provide far more accurate prediction.

Currently MPD appears to use EIPro in an informal manner, without thresholds and alarms. This is not inappropriate – thresholds on individual indicators often carry relatively little predictive information. Alarms generated by a simple system such as EIPro, with multiple indicators and thresholds for each, would most often be false alarms. And ongoing check-ins between officers and their supervisors allow for continuous input and guidance for officers. One downside to MPD's relatively informal approach is that officers at a high risk of adverse events may not be identified in EIPro and therefore not receive adequate intervention. Moreover, a system such as this has limited accuracy for distinguishing between the risks different officers with different assignments may face. A system with multiple indicators, used in an informal manner, combined with the human capacity to rationalize events, could lead to cases of officers at high risk not receiving needed intervention. For accurate prediction of at-risk officers you really need the equivalent of proactive holistic review as opposed to reactionary incident management reviews.

OIM recommends that MPD implement a machine learning system EIS, as recommended in the MPD Policy & Procedure Review Ad Hoc Committee report (potentially alongside EIPro). Such a system can make much more accurate risk predictions based on a larger number of variables and provide continuous risk scores on a spectrum for each officer rather than a simple binary flag. Such a holistic EIS can also account for contextual factors such as an officer's patrol area and shift. It is important to take contextual factors into account since certain assignments might intrinsically lead to a higher number of difficult interactions and elevated numbers for certain indicators, without necessarily signifying that the officer is at high risk for an adverse event. A machine learning system can *much more accurately identify officers in need of intervention while generating far fewer false positives* than a simple system such as EIPro.

[2] Stoddard, G., D.J. Fitzpatrick, & J. Ludwig (2024) Predicting Police Misconduct. NBER Working Paper Series. https://www.nber.org/system/files/working_papers/w32432/w32432.pdf

[3] Katz, C.M, Cheon, H., Freemon, K. and D. Wallace. 2025. Evaluating the Effectiveness of a Police Early Intervention System: From the Predictive Validity of Officer Identification to the Impact of Intervention. Police Quarterly. DOI: 10.1177/10986111251353487

The only commercial product in this category, at the moment, is the First Sign Early Intervention System[4] sold by Benchmark Analytics (based on technology licensed from the University of Chicago and developed by the Data Science for Social Good program[5]). Data compiled by Benchmark Analytics showed that, for the 5% of officers scored by First Sign as having the highest risk of misconduct in the next year, on average 85% of flagged officers proved to be true positives, with the system flagging 20-40% of all true positives. This top 5% also accounted for 66% of injuries and disproportionate use-of-force incidents.[6] Based on data from 10 large law enforcement agencies' implementation of First Sign, police activity remained constant, while the frequency of use of force dropped 13%. The severity of the force used dropped by two levels (a large reduction) and citizen-based complaints dropped 48% (reducing the number of adverse events and liability). Agencies implementing First Sign have also seen substantial reductions in officer injuries, with decreases in missed shifts/overtime/worker's compensation claims.

Moreover, a machine-learning system such as Benchmark Analytics First Sign EIS, that inherently generates risk scores, has other advantages:

> Risk scores enable the agency to rank officers by risk, to explicitly choose tradeoffs (e.g. precision vs. recall), and to allocate resources in a prioritized manner....In addition to being a better fit for the resource constraints faced by today's American police force, risk-score systems can identify which officers are doing well as easily as which are at risk. The department can use this information when assigning officers to partners or when looking for best practices to incorporate into its training programs.[7]

In January of 2025, Benchmark Analytics rolled out an additional separate function integrated into the First Sign package – a proactive wellness system which outputs wellness notifications, based on predictive factors such as excessive paid time off, amount of overtime (where excessive overtime can lead to exhaustion/burnout), exposure to significant incidents, etc. It identifies officers who may be struggling and provides personalized support recommendations - evidence-based interventions proven to reduce PTSD symptoms, depression scores, anxiety levels, etc.[8] Such a proactive wellness support system can substantially enhance officer well-being and resilience.

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[4] Benchmark Analytics - First Sign® Early Intervention. https://www.benchmarkanalytics.com/first-sign-officer-advocacy-suite/early-intervention/

[5] Helsby, J., S. Carton, K. Joseph, A. Mahmud, Y. Park, A Navarrete, K. Ackermann, J. Walsh, L. Haynes, C. Cody, M.E. Patterson, & R. Ghani (2017) Early Intervention Systems: Predicting Adverse Interactions Between Police and the Public. Criminal Justice Policy Review 29(2):088740341769538. https://www.researchgate.net/publication/314485776_Early_Intervention_Systems_Predicting_Adverse_Interactions_Between_Police_and_the_Public

[6] Benchmark Analytics. March 19, 2024. Identifying Officers at Risk of Misconduct. https://www.benchmarkanalytics.com/wp-content/uploads/2024/04/2024-03-19-London-Data-Science-Presentation-Final.pdf

[7] Carton, S., Helsby, J., Joseph, K., Mahmud, A., Park, Y., Walsh, J., Haynes, L., Cody, C., Patterson, E., & R. Ghani, Identifying Police Officers at Risk of Adverse Events. 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD-2016). https://www.kdd.org/kdd2016/papers/files/adf0832-cartonAemb.pdf

[8] Benchmark Analytics Wellness Slides. https://docs.google.com/presentation/d/1rbe43hqX5xRTRBIDtvKBUxqM5KE50V-c/edit?usp=sharing&ouid=108008223587818276362&rtpof=true&sd=true

Officer mental well-being should be treated as a priority, both for the sake of our officers themselves and for the safety of our community. As the MPD Policy & Procedure Review Ad Hoc Committee report notes:

> Policing is a high demand/low control profession that requires constant peak performance levels. Studies show that these kinds of professions present unique health risks and increase the probability of mental and physical health problems and therefore call for optimal mental and physical healthcare.[9]….
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> Relative to the civilian population, police officers experience traumatic events at a greatly elevated frequency – with measurements showing an average rate of three traumatic events for every six months on the job.[10] Such events can range from violent altercations to depressing events, such as handling a deceased individual. This places police officers at elevated risk of post-traumatic stress disorder (PTSD). Studies have found a rate of PTSD among officers of 7-19%, compared to a rate of 4% in the general population.[11] Moreover, PTSD increases suicide risk, and the rate of suicide among police officers greatly exceeds the national average (to date for this year [2019], 41 officers have been killed by felonious assault[12] whereas 163 officers have taken their own lives[13]).

In August 2021, the National Fraternal Order of Police (NFOP), the largest organization of law enforcement officers in the world, undertook a national survey of members of United States law enforcement.[14] One of the aims of the study was to measure and compare various sources of stress experienced by law enforcement personnel. These police stressors were categorized into Trauma and Critical Incident stress, Operational stress, and Organizational stress. For Trauma and Critical Incident Stress, unsurprisingly the top two stressors involved the officers witnessing or participating in violence on the job. However, the next highest stressor that officers ranked were cases involving harm to children. These direct and indirect traumas, even the daily possibility of experiencing said traumas, have a measurably dangerous effect on officers and the public they serve.

As the survey report noted, "Among active officers, over half (53.6%) reported experiencing high levels of burnout; 44% of active and almost 31% of former officers reported some level of psychological

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[9] Redman, J. (2018, Jan. 23) Why do cops avoid counseling? Eight myths about law enforcement officers and mental health treatment. Counseling Today. Retrieved from https://ct.counseling.org/2018/01/why-do-cops-avoid-counseling-eight-myths-about-law-enforcement-officers-and-mental-health-treatment/

[10] Patterson, G. T. (2001). The relationship between demographic variables and exposure to traumatic incidents among police officers. Australasian Journal of Disaster and Trauma Studies, 2, 1–9.

[11] Klimley, K.E., Van Hasselt, V.B., & Stripling, A.M. (2018) Posttraumatic stress disorder in police, firefighters, and emergency dispatchers. Aggression and Violent Behavior. 43, 33-44.

[12] Officer Down Memorial Page (2019) Retrieved from https://www.odmp.org/search/year/2019

[13] Blue Help (2019) Retrieved from https://bluehelp.org

[14] Martin, S. & J.M. Drew (2023). Critical issues in Policing Survey: Comprehensive Report of 2021 Survey Findings. A collaboration between National Fraternal Order of Police and Griffith Criminology Institute, Griffith University. https://fop.net/wp-content/uploads/2023/09/2021-Survey-Report-202309.pdf

distress." 12.4% of active officers reported receiving a formal diagnosis of PTSD, 14.1% reported a diagnosis of depression, and 17.0% reported a diagnosis of anxiety. These rates are all far higher than in the general population. Moreover, "6.2% of officers (both active and former) had suicidal ideation during the previous 12 months and 18.5% had suicidal ideation at some point in their police career."

PTSD generally stems from a single traumatic event or a series of distinct incidents. These events involve direct or threatened death, serious injury, or sexual violence, experienced firsthand. Repeated exposure to disturbing details or sights, like first responders tasked with collecting human remains or police officers investigating child abuse, can also trigger the symptoms of PTSD. Symptoms encompass intrusive memories, avoidance of reminders, negative thoughts and feelings, and hyperarousal which may manifest as flashbacks, nightmares, emotional numbing, irritability, and difficulty concentrating. PTSD develops in response to an isolated, albeit horrific, experience that disrupts the person's established coping mechanisms for daily life. Complex PTSD (C-PTSD), on the other hand, arises from prolonged and repeated trauma, often in situations where escape is impossible, like ongoing childhood abuse, domestic violence, or captivity. C-PTSD encompasses all the core PTSD symptoms, with additional difficulties in emotional regulation, self-concept, and relationships. Individuals may struggle with intense emotions, feelings of worthlessness, and have difficulty forming healthy connections. The chronic nature of the trauma profoundly impacts the structuring of one's identity, leading to deeper challenges in managing emotions, maintaining a stable self-image, and forming trusting relationships with others.

Due to the external causes of these disorders and the nature of the law enforcement profession, there is little that officers can do to simply avoid the danger of developing PTSD or C-PTSD. Part of the solution to this problem is the building of professional resilience in officers. "Psychologists define resilience as the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress… As much as resilience involves 'bouncing back' from these difficult experiences, it can also involve profound personal growth."[15] Everyone builds their own resilience in slightly different ways but access to professionals that can assist this process, unstigmatized communication with supervisors about the effects of the job on officers' mental health, and an automated alarm system that generates recommended personalized evidence-based interventions, such as the Benchmark Analytics First Sign wellness tracking component, are a comprehensive way we can protect our officers and empathetically enable our officers to protect us.

[15] American Psychological Association. February 1, 2020. Building your resilience. https://www.apa.org/topics/resilience/building-your-resilience

Figure 1. Graphic from Benchmark Analytics presentation on officer wellness component of First Sign package.

The number of law enforcement departments employing Benchmark Analytics First Sign is expanding rapidly, given the unique capacities of this system. When the Minneapolis Police Department implemented First Sign in 2024, a press conference was held,[16] with Mayor Jacob Frey highlighting the value of the system:

> [I] want to just say what a big deal this is for our city…[what] a big deal this is for transformation within our police department and giving officers the necessary tools that they need.

As Nick Barkley, Director of Early Intervention, noted:

> With the addition of automated processes through Benchmark Analytics, we will be able to do [early intervention] faster. We will be able to do it more accurately. We will be able to do it more holistically. And we'll be able to predict who will have performance issues and intervene before those… issues can even occur. Benchmark Analytics is the industry leader in early intervention systems.

First Sign has a cost of $250 per officer per year, or roughly $125,000 total for a force of Madison's size. Given the cost, one possible alternative would be to implement the system piecemeal – for example, initially only implementing it for patrol officers. However, the accuracy of the machine learning system would be reduced by the smaller sample of officers that it could learn from, necessitating the use of auxiliary datasets from other comparable jurisdictions (i.e., effectively "borrowing data" to improve accuracy and the metrics by which officers are evaluated).

Another alternative could be the creation of an equivalent homemade machine learning system, employing an approach such as gradient boosted trees. Python code for the system developed by the Data Science for Social Good program is freely available[17] and could be adapted for MPD. It also should be feasible to program such an early intervention system using the statistical platform R. However, there are problems with this alternative. First, the staff developing such a system would face a steep learning curve. Second, this homemade EIS would not include the officer wellness component found in the Benchmark Analytics EIS.

A machine-learning EIS would not necessarily be used for real-time tracking, but instead could provide periodic assessments (e.g., quarterly) for supervisors with a good level of predictive accuracy. A threshold (e.g. the top 5 percent of all officers) should be used for this and officers flagged for concern should receive appropriate non-disciplinary intervention. In the interim, until such a system is operational, ranking all officers on their total number of PS&IA cases over the last 2 years, with a threshold of the top 5 percent, could provide tolerable predictive accuracy. A recent study found "that targeting preventive interventions even with a simple prediction model – number of past complaints, which is not as predictive as machine learning but lower-cost to deploy – has a marginal value of public funds of infinity" (i.e., such a policy leads to a net reduction of government costs).[18]

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[16] City of Minneapolis. May 20, 2024 Early Intervention System (EIS) press conference. https://www.youtube.com/watch?v=PKbcbc_A6Zs

[17] https://github.com/dssg/police-eis

[18] Stoddard, G., D.J. Fitzpatrick, & J. Ludwig (2024) Predicting Police Misconduct. NBER Working Paper Series. https://www.nber.org/system/files/working_papers/w32432/w32432.pdf

Careful thought should be given to the most appropriate form of intervention for individual officers. A recent study examining misconduct among NYPD officers found that "when considering management action, it was evident that among officers who commit serious misconduct, current remedial approaches did not appear effective…there are clear knowledge gaps in best practice relating to remediation of misconduct-prone officers."[19] As MPD's EIS SOP recognizes, stress may be an important contributor to adverse events. Risk of on-duty misconduct and off-duty misconduct appear highly correlated,[20] suggesting that interventions to improve officer wellness may be helpful. In addition, OIM would encourage use of interventions supported by empirical evidence of efficacy, such as the Situational Decision-Making Training ("Sit-D") recommended by OIM in its 2023-2024 Annual Report. Officers at heightened risk of adverse events might be prioritized for more frequent "boosters" of this type of Sit-D training.

OIM also recommends that MPD add two more factors to its list of example stressors for officers in its EIS SOP. The first additional factor is whether an officer has a second job outside of the Department. Secondary employment has been shown to have substantial predictive value for officer misconduct.[21] [22] This may be due to the stress and fatigue of overwork and burnout, or the secondary employment may be indicative of underlying financial stress. Outside employment by MPD employees is subject to the provisions of sections 5.03(2), 3.35(5)(c), and 3.53(5) of the Madison General Ordinances. Before any employee is permitted to engage in part-time employment, permission must be obtained through an approval process that ends with a determination by the Police Chief. The employee must submit a request to their commanding officer who then determines whether the outside employment will interfere with work performance and whether the outside employment would conflict with the public interest. The commanding officer forwards this request to the Chief with their recommendation.[23]

At the time of reporting, the Independent Monitor has spoken with both Chief John Patterson and Assistant Chief Angela Kamoske about the nature of outside employment of MPD staff. Outside employment is limited to no more than 15 hours per week, in accordance with MGO 5.03(2). Most allowed outside employment requests relate to MPD employees teaching classes in their areas of subject matter expertise. Further, outside employment with establishments holding an alcoholic beverage license is highly scrutinized.

[19] Cubitt, T.I.C. & P. Birch (2021) A machine learning analysis of misconduct in the New York Police Department. Policing: An International Journal 44(5): 800-817. https://heinonline.org/HOL/LandingPage?handle=hein.journals/polic44&div=59&id=&page=
[20] Stoddard, G., D.J. Fitzpatrick, & J. Ludwig (2024) Predicting Police Misconduct. NBER Working Paper Series. https://www.nber.org/system/files/working_papers/w32432/w32432.pdf
[21] Cubitt, T., K. Wooden, E. Kruger, & M. Kennedy (2020) A predictive model for serious police misconduct by variation of the theory of planned behavior. The Journal of Forensic Practice. 22(4): 251-263. https://www.emerald.com/insight/content/doi/10.1108/jfp-08-2020-0033/full/html
[22] Cubitt, T., K.R. Wooden, & K.A. Roberts (2020) A machine learning analysis of serious misconduct among Australian police. Crime Science 9:22. https://doi.org/10.1186/s40163-020-00133-6
[23] City of Madison Police Department Standard Operating Procedure: Outside Employment. Effective 9/16/2015. https://www.cityofmadison.com/police/documents/sop/OutsideEmployment.pdf

Meanwhile, "peer pressure" (as indicated by high values on a set of eight survey items[24]) also appears to have substantial predictive value for misconduct.[25] It is easy to imagine how conflict with fellow officers, or a degree of bullying[26], or pressure for conformity in police subculture[27], may cause high levels of work stress for particular officers. **Therefore, the MPD EIS SOP should be amended to include these factors of secondary employment and peer pressure for consideration.**

Critical Incident Stress Management (CISM) is a supportive supervisory system designed to help officers cope with strong emotional reactions resulting from various critical incidents, which are defined as stressful events that can interfere with an individual's ability to function and are not limited to major disasters. Examples include injuries or deaths involving the public or colleagues, prolonged rescue efforts, or unusually distressing events. CISM aims to facilitate a recovery process through individual or group sharing, emphasizing resilience being strengthened through support rather than merely "toughing it out." Response to such incidents involves a timely referral and support from the department, with services including pre-incident education, debriefing sessions usually held 24 to 72 hours after the event, and ongoing follow-up. These debriefings can provide individuals with opportunities to discuss their experience, learn and strengthen coping skills, and access further assistance if needed, with procedures in place for requesting support and ensuring employees attend debriefings on paid time. [28] [29]

MPD currently has a well-developed CISM SOP.[30] It is worth noting that the scope of this SOP is somewhat narrow – it covers only management of officers involved in critical incidents (as defined in the SOP), which constitute only a fraction of officers. Myriad factors can impact officer wellness outside of the types of critical incidents listed in this SOP. The officer wellness EIS discussed above covers all officers, integrating holistically across a much larger set of factors (using a validated quantitative model grounded in data) and guiding officers toward evidence-based wellness solutions. The CISM SOP should

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[24] Hart, P.M., A.J. Wearing, & B. Headey (1993) Assessing Police Work Experiences: Development of the police Daily Hassles and Uplifts Scales. Journal of Criminal Justice 21(6): 553-572.
https://www.sciencedirect.com/science/article/abs/pii/004723529390043M
Specifically, high scores on the following set of eight survey items regarding coworkers:
Working with people who lack professionalism.
Other members not pulling their weight.
Working with people who are incompetent.
Working with people who are not suited for police work
Working with people who are inconsiderate.
Working with people who do not listen.
Problems with coworkers
Disagreement about how to do something.

[25] Rahman, R.A., S. Masrom, J. Ahmad, L. Maryasih, N.B. Zakaria, M. Auzan, & M. Nor (2023) Machine learning prediction of law enforcement officers' misconduct with general strain theory. International Journal of Advanced and Applied Sciences 10(1): 48-54. https://science-gate.com/IJAAS/Articles/2023/2023-10-01/1021833ijaas202301007.pdf

[26] Brogan, D. March 8, 2018. Shielded. Isthmus. https://isthmus.com/news/cover-story/shielded/

[27] Frewin, K. & K. Tuffin (1998) Police status, conformity and internal pressure: a discursive analysis of police culture. Discourse and Society 9(2): 173-185.
https://journals.sagepub.com/doi/abs/10.1177/0957926598009002003

[28] https://www.cityofmadison.com/employee-assistance-program/services/critical-incident-stress-management

[29] https://www.cityofmadison.com/mayor/apm/2-15.pdf

[30] https://www.cityofmadison.com/police/documents/sop/CriticalIncidentStressMgmt.pdf

be viewed as complementary to the Benchmark Analytics officer wellness EIS and represents a human factor. Human judgement, in recognizing officers who could benefit from assistance, is a valuable complement to computational systems, and may flag officers in need of help that the computational system has missed. For example, a computational system may not be aware of a series of stressful "near misses". As OIR Report recommendation #133 notes, "Rather than rely entirely on the computer to identify early intervention candidates, MPD's Early Intervention System should regularly request first-level supervisors to identify officers who might benefit from the remedial aspects of the program."[31]

If MPD does implement the Benchmark Analytics First Sign package, it may ultimately wish to update its CISM SOP, integrating material and policies for the utilization of the Benchmark Analytics officer wellness component.

[31] Gennaco, M., Connolly, S., & J. Ruhlin. December 2017. Madison Police Department Policy and Procedure Review. Report to the City of Madison and the Madison Police Department Policy and Procedure Review Ad Hoc Committee. OIR Group.
https://www.boarddocs.com/wi/mmsd/Board.nsf/files/AUX59D003731/$file/Madison%20OIR%20Group%20Report%20on%20Madison%20PD.pdf