

Austin Police Department Staffing Project

Patrol Model and Community Survey

January 2022

Austin is the first city to use machine learning to model police staffing. The Greater Austin Crime Commission funded research at the University of New Haven and Texas State University to develop a patrol model and conduct a community survey for the Austin Police Department. The next research phase has already started to model administrative and specialized units, including investigations.

The patrol model analyzed more than six million officer responses to nearly two million calls for service. Machine learning suggests responding to urgent calls for service within 6 minutes and 30 seconds for the best public safety outcomes. Modeling projects 882 patrol positions are required to meet the target response time, which is 108 above current authorization.

Summary

The machine learning modeling by the University of New Haven established a relationship between call-for-service response times and public safety outcomes, including the likelihood of arresting a suspect and recovering a firearm.

- The final analysis supports the initial estimate for a 6 minutes and 30 seconds response time target for P0 (urgent) calls for service.
- Certain P0 call for service categories benefit from even faster response times. Robberies, burglaries, and shots fired calls show better outcomes at response times less than 6 minutes and 12 seconds.
- Additional analysis demonstrated that P1 (emergency) calls for service response times are largely a function of P0 response times and that a response time target for P1 calls should be 8 minutes and 30 seconds.

Based on the machine learning model, the research team recommended a staffing level of 882 patrol positions, which is 108 above current authorization.

- Accounting for vacancies, this authorized staffing level should maintain around 730 working officers. In addition, the research team uncovered patterns in calls for service related to day of week, time of day, and sector that can be used to guide deployment.
- The recommended staffing level with efficient deployment should render average P0 and P1 response times consistent with the response time target.

- The model further suggested that authorizing fewer than 54 patrol positions will likely have a negligible impact on response times. Moreover, it would require 162 authorized patrol positions to achieve the suggested response times without efficient allocation.

The Communitywide Survey of Police Services conducted by Texas State University measured three main categories of patrol activities (responding to calls for service, conducting street patrol, and engaging with the community).

- Residents indicated officers should spend more time engaged in all three of these activities, supporting the machine learning finding that more patrol officers are needed.
- Respondents placed the most emphasis on responding to calls for service (almost three times as important as community engagement), with a strong emphasis on conducting patrol (almost twice as important as community engagement).
- The analytic sample of 369 respondents exceeds the number required to render stable estimates of residents' perceptions of and expectations for police service. Inferences made from the sample likely represent the attitudes and perceptions of Austin residents on average.
- The respondents varied substantially across socio-economic status, demographics, and political orientation, and weighted statistical estimates were used to offset the impact of lower reporting rates for some demographic groups.

Conclusion

The machine learning and survey research components together rendered a relatively consistent view about what policing in Austin should look like. Residents want to emphasize response to calls for service, active patrol efforts, and more community engagement. Additional patrol resources are necessary to accomplish these goals.

The machine learning model suggested that allocating 108 additional patrol positions will render response times that substantially improve public safety. The same staffing level supports the time necessary for patrol officers to engage the community consistent with expectations.