

Case 42

Protecting the Public

The Greenacres City Council has just been informed that the city park may have had a low-grade contaminant included with the latest annual mosquito spraying. The city's health department has been assigned the task of testing for the contaminant and quantifying the health impact of exposure if the contaminant is present.

Even though the department cannot yet quantify the effects, they have identified the causal chain for the health problems. The key link here is burning of contaminated vegetation, which puts the contaminant back in the air as a vapor. This vapor is irritating to the eyes and may cause acute damage to people wearing contact lenses. This is substantial evidence that there is no problem if it is touched or even eaten. Thus the chief danger appears to be campfires, disposal of windblown leaves (which would mix in with local residential area), or the chance of wildfire in the park.

The health department has also verified that sunshine reduces the toxicity for the potential contaminant over a 2 to 3 year period. By year 4 the danger should be gone.

Because of the adverse publicity that the council expects, it has decided that a benefit/cost analysis must be conducted immediately—before the health department can supply any results. In fact, their meeting is tomorrow night, and you (the city's manager) have been ordered to have preliminary results by then.

While they would like to have definitive conclusions, you believe that they will settle for an analysis that quantifies the two worst-case scenarios. One scenario involves removing all

vegetation and turning the park into a landfill, while the second scenario involves the maximum health cost in the complete absence of recovery efforts.

The city engineer has dragged together the estimates for the landfill scenario. Here the first step is to remove the vegetation and burn it in a specially controlled environment where the exhaust is passed through a catalyst. Fortunately, the city is in an industrial area, so that facilities for disposal of hazardous wastes are available. If these facilities were not close by, then costs would be even higher than the expected \$2 million to \$5 million.

The second step is to create a substantial cover by using the site as a temporary landfill. Fortunately, water table and location factors are positive, except that 20 homeowners will have to be bought out through eminent domain. The appraised value of their properties averages \$135,400. The city engineer suggests that all of the other costs associated with using this as a landfill can be ignored, since the city would be incurring them at another site in any case.

In about three years the cover would be deep enough and the landfill could be converted back into a park. The park currently emphasizes vegetation, jogging paths, and similar natural uses, but plantings and regrowth are likely to be far too slow. Thus the engineer has suggested using the area for a complex of playing fields for softball, baseball, soccer, and football. This would cut the regrowth time to the minimum and would only require \$300,000 for construction.

The planner for the city park department has looked at usage levels for other playing fields within the city, and has used benefit numbers developed for justification of another small group of playing fields last year. From this she has suggested that the playing field complex would have a “net benefit” stream of \$125,000 annually after maintenance costs are considered. She also identified 5% as the discount rate that the city council accepted for that study.

The scenario for health impacts if there is no recovery effort is far less defined. Here the difficulty lies in estimating the probability of different kinds of fires, and then estimating how many people might be affected. A wildfire is clearly the least likely; but it could affect the 35,000 people who live in moderate proximity to the park. The fire chief has estimated the normal wildfire possibility at .002, but this may increase to .01 due to publicity and arson.

On the other hand, over a 3-year period, someone is almost certain to build a fire with a stick that has been sprayed. Over 20% of the park’s visitors are picnickers, and a quarter use wood, not charcoal fires. This year’s leaves are less of a problem, although taking all leaves to the special incinerator is likely to cost nearly \$1 million (from close-by neighborhoods, as well as the park).

It is clear that, if the contaminant is there and if you burn it under your hamburger, there is still a sizable chance that you will have absolutely no problem. But, the exact danger is not known. It appears likely that the cumulative danger is related to park usage, which is currently 250,000 visitor-hours per year—growing at about 15,000 hours per year, slightly faster than the city's population.

You know that other uncertainties include the study period and the value of avoiding eye damage. Clearly, an exact answer is impossible. Nevertheless, an answer is required.

Suggestions to the Student

1. For the landfill/sports complex option, is it appropriate to include the benefits of the later years?
2. What study period, fraction of population with contacts, etc., must be guesstimated?
3. The role of population growth is likely to matter only for park usage, and not for potential eye damage. Why?
4. What other options should be suggested, based on the economic analysis? Which pieces of the two options have particularly good or poor benefit/cost impacts?