Estimation Procedure

The Michigan estimation procedure was developed based on the process used on the national level by the Federal Bureau of Investigation (FBI). The following decisions were made and followed in the estimation procedure:

- Crime will be estimated for both offenses and arrests
- Crime will be estimated to the law enforcement agency level only for the purpose of calculating state totals, not for use at the agency level
- Only state total estimated figures will be published in the annual report
- Population figures used in cross sectional estimating will come from the FBI estimated data
- Arrest data will be estimated only for the total, not for the breakdowns of age, race, and sex
- Agencies that are classified as "zero population" (see Appendix B for definition) that fall into the cross sectional estimation method will not be included in the estimation

Three different methods are used depending on the extent of missing data:

Averaging Method
Definition
Taking the existing months of data and calculate the average. Use the averaged figure for the remaining months of missing data.

When Used
When an agency has submitted six or more months of actual data.

Steps:
1. Identify agencies that have reported six or more months of data for the year.
2. For each arrest and each offense take the numbers reported, add them together, and divide by the number of months reported.
3. Multiply this averaged figure for each arrest and offense by 12.

Longitudinal Method
Definition: Taking the same agency's data from last year, calculating the rate of change between the two previous years, applying this rate of change to last year's data, and using these calculated figures for the current year.

When Used: When an agency has reported less than six months of data for the year, but reported 12 months of data the previous two years.

Steps:
1. Identify all the agencies that have reported less than six months of data for the current year but reported 12 months of data the previous two years.
2. Calculate the rate of change between the two complete years.
3. Disregard any data reported during the current year.
4. Apply the rate of change from the two complete years to the most recent complete year's data to calculate the current year's estimate.

Cross Sectional Method

<u>Definition</u>: Taking averaged crime rate data from a group of similar agencies and applying this figure to agencies with missing data.

<u>When Used</u>: When an agency has reported less than six months of data for the year, and did not report 12 months of data for the previous year.

<u>Steps</u>:
1. Identify all agencies with 12 months of data reported for the current year.
2. Place all agencies with full data for this year into the appropriate population group, based on their population.
        a)   up to 999
        b)   1,000 – 2,499
        c)   2,500 – 4,999
        d)   5,000 – 9,999
        e)   10,000 – 24,999
        f)   25,000 – 49,999
        g)   50,000 – 99,999
        h)   100,000 – 249,999
        i)   over 250,000
3. For each agency, calculate the crime rate for each offense and arrest.
4. For each agency, for each offense and arrest, add the total rates within each group and divide by the number of agencies to get an average.
5. Apply the averaged figure for each arrest and each offense for those agencies missing data and fitting into the grouping.