DOES ONE SIZE FIT ALL?

CONSIDERATIONS IN ESTABLISHING A SPEED DATA COLLECTION PROGRAM AND DATABASE

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Before starting data collection Know Why are you collecting the data

▸ **Some common reasons:**
- ◦ The Feds required it for 55 compliance and we just kept on collecting it
- ◦ WIM and Class counts create it so why not keep it
- ◦ To study specific issues
  - Establish speed limits
  - Measure speed limit compliance
  - Establish enforcement programs
  - Determine effects on speed of predefined variables
    - Congestion
    - Lane closures
    - Enforcement Operations

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Your Research needs defines your collection parameters

- How long/often do you need to collect data
  - Continuous
  - Short duration
- For what time increments
  - Daily
  - Hourly
  - Quarter hour
- For what spatial element
  - Total roadway
  - By direction
  - By Lane

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Metadata needs to determine validity/quality of speed data

- Type of sensors used
- Layout of sensors
- Speed limit
- Enforcement level
  - None or minimal
  - Know speed trap
  - Advertised enforcement target area

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Metadata continued

- Incident level
  - Free flowing
  - Construction impact
  - Weather impact
  - Special event impact
  - Other incident

Binning Data

▸ Does one bin scheme meet all needs?

  ◦ *Probably Not*
    - Single scheme simplifies the effort
    - BUT
    - It may not meet the needs for details at either the low end or high end of the speed spectrum
    - It is arbitrary
    - And in life one size seldom fits all

Considerations in defining a Bin Scheme

▸ What are the generally expected minimum and maximum speeds

▸ What is the standard range for a bin

▸ A formula for establishing bins might be based on speed limit and the maximum number of bins desired to be collected and a standard range for a bin.

  ◦ As an example using a speed limit, 15 bins and 5 mph increments

BIN	Speed Limit 45		Speed Limit 55		Speed Limit 65		Speed Limit 70		Speed Limit 75	
	loval	hival	loval	hival	loval	hival	loval	hival	loval	hival
1	0	10	0	20	0	30	0	35	0	40
2	11	15	21	25	31	35	36	40	41	45
3	16	20	26	30	36	40	41	45	46	50
4	21	25	31	35	41	45	46	50	51	55
5	26	30	36	40	46	50	51	55	56	60
6	31	35	41	45	51	55	56	60	61	65
7	36	40	46	50	56	60	61	65	66	70
8	41	45	51	55	61	65	66	70	71	75
9	46	50	56	60	66	70	71	75	76	80
10	51	55	61	65	71	75	76	80	81	85
11	56	60	66	70	76	80	81	85	86	90
12	61	65	71	75	81	85	86	90	91	95
13	66	70	76	80	86	90	91	95	96	100
14	71	75	81	85	91	95	96	100	101	105
15	76	∞	86	∞	96	∞	101	∞	106	∞

How Does Tradas© handle multiple speed schemes?

- Each binning scheme is given an ID number
  - Each bin within a scheme is defined by it's lower value, upper value and midpoint
- Add a bin – add a scheme definition
- Link/Bind each data file to a bin scheme
- All standard speed statistics can be generated using the volume in a bin and a combination of the lower, upper and midpoint bin values

Advantage of Multiple Bin Schemes

▸ Researchers can query data based on their specific needs

▸ Neither low speeds or high speeds are arbitrarily truncated.

▸ With the example speed bins – vehicles exceeding the speed limit by 20mph are in bins 13 – 15

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Validity / Quality

▸ Valid data is data that is assumed to represent actual observed speeds

▸ All valid data should be included

▸ Quality measures tend to be subjective

◦ Does the data match an anticipated pattern

• Yes – then it is quality for your needs

• No – use the metadata to determine why not

• If conditions that caused the abnormality can be defined then it is quality data for that condition

Recommendation

- Accept multiple binning schemes
  - Maximizes granularity of the data
  - Allows researcher to query data best suited to meet their needs
- Accept all data that is presumed valid
  - If the related Class or Length data is valid then speed is valid
  - If speed is not valid then related class / length can not be valid
- Flag data that is anomalous