# Determining Class Location

Building Count, Clustering,
Boundaries

ViaData

# §192.5 Class Locations

- (a) This section classifies pipeline locations for purposes of this part. The following criteria apply to classifications under this section.
  - (1) A "class location unit" is an onshore area that extends 220 yards (200 meters) on either side of the centerline of any continuous 1-mile (1.6 kilometers) of pipeline.
  - (2) Each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.

ViaData

# §192.5 Class Locations

- (b) Except as provided in paragraph (c) of this section, pipeline locations are classified as follows:
  - (1) A Class 1 location is:
    - (i) An offshore area; or
    - (ii) Any class location unit that has 10 or fewer buildings intended for human occupancy.
  - (2) A Class 2 location is any class location unit that has more than 10 but fewer than 46 buildings intended for human occupancy.

ViaData

# §192.5 Class Locations

- (3) A Class 3 location is:
  - (i) Any class location unit that has 46 or more buildings intended for human occupancy; or
  - (ii) An area where the pipeline lies within 100 yards (91 meters) of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period. (The days and weeks need not be consecutive.)

ViaData

# §192.5 Class Locations

- (4) A Class 4 location is any class location unit where buildings with four or more stories above ground are prevalent.

- (c) The length of Class locations 2, 3, and 4 may be adjusted as follows:
  - (1) A Class 4 location ends 220 yards (200 meters) from the nearest building with four or more stories above ground.
  - (2) When a cluster of buildings intended for human occupancy requires a Class 2 or 3 location, the class location ends 220 yards (200 meters) from the nearest building in the cluster.

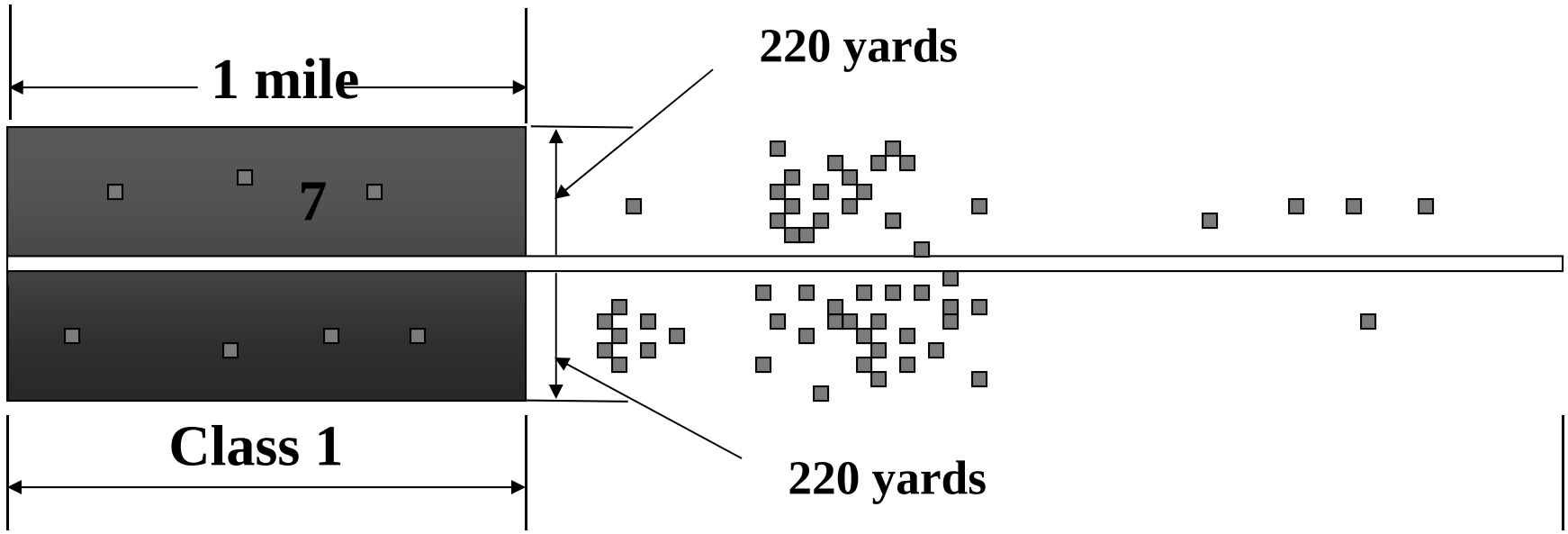
ViaData

# Class Location Unit

– Having a single four or more story building within 220 yards of a gas pipeline does not require upgrading to Class 4 requirements because paragraph (e) states in part: "where buildings with four or more stories above ground are prevalent." The use of "prevalent" indicates that they are common or that there are more than one such building in the area. Therefore, a single four or more story building would not cause an area to be designated a Class 4 location.

ViaData

# Class Location Determination

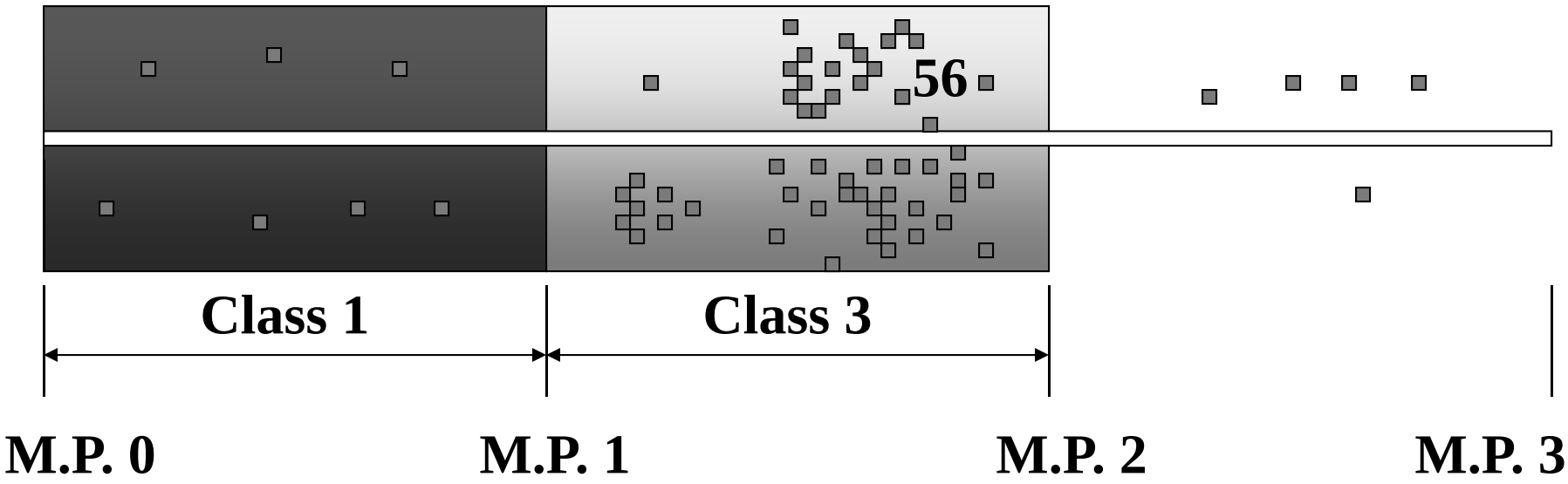



**End to End Mile – the *Wrong Way* to do class location**

**M.P. = Mile Post**

ViaData

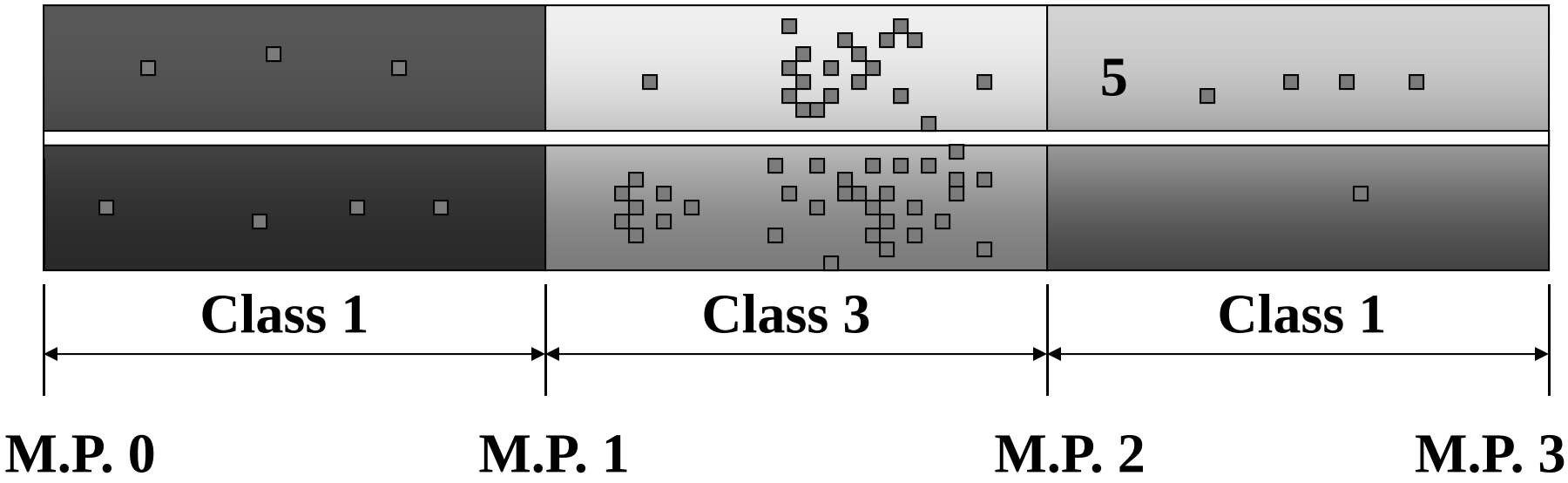
# Class Location Determination




**End to End Mile – the *Wrong Way* to do class location**

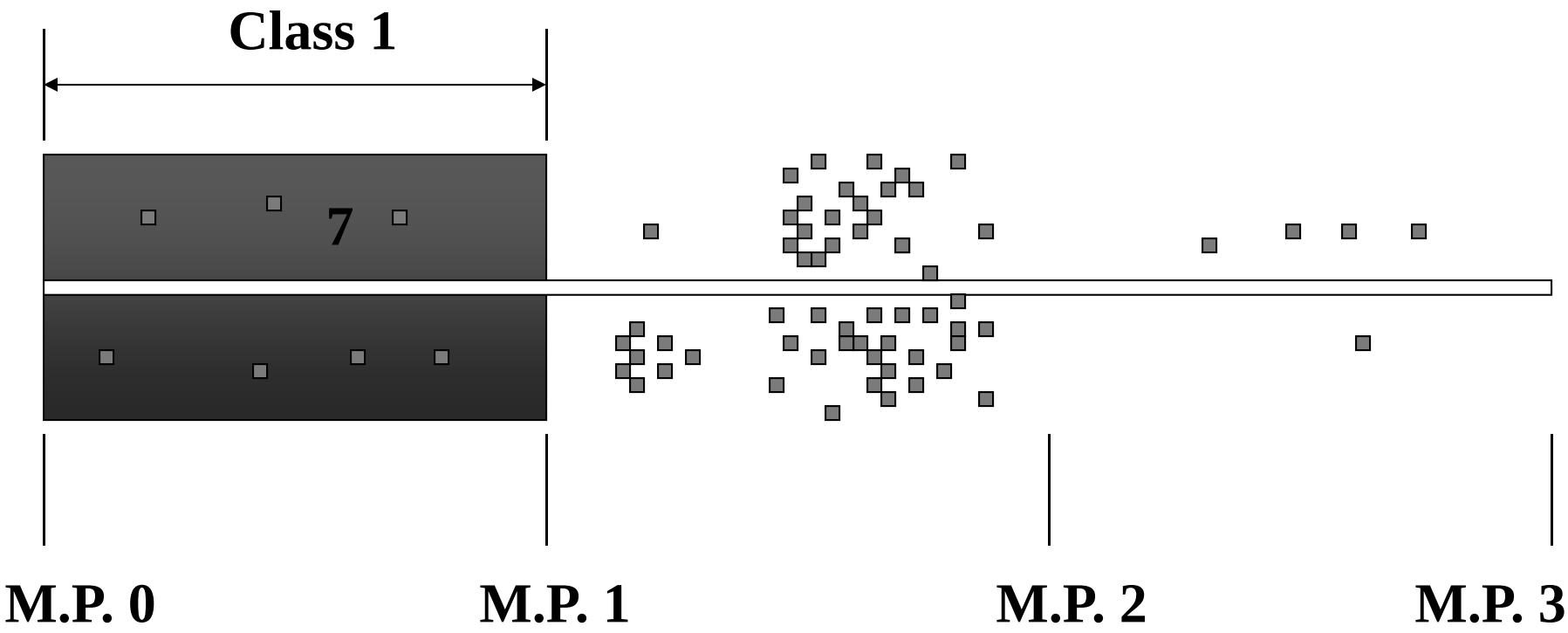
ViaData

# Class Location Determination




**End to End Mile – the *Wrong Way* to do class location**

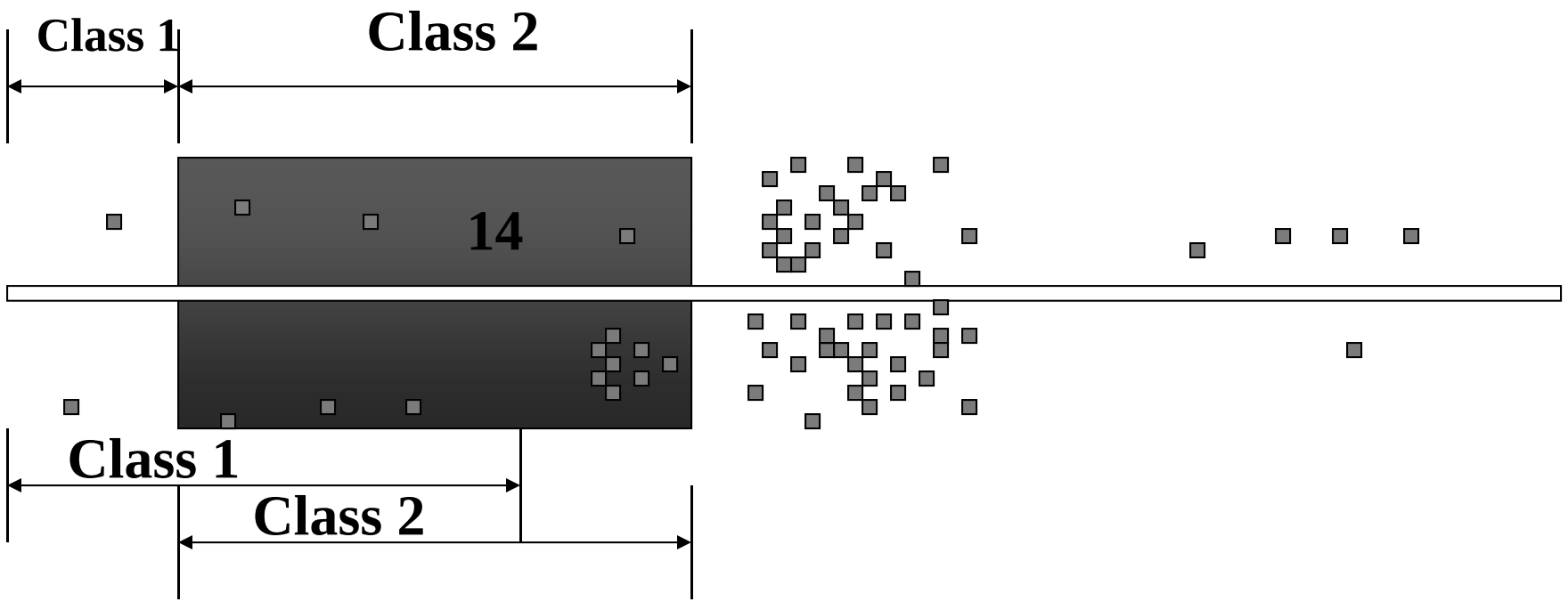
ViaData




***Continuous Sliding Mile – The Right Way***

ViaData

# ***Continuous Sliding Mile***

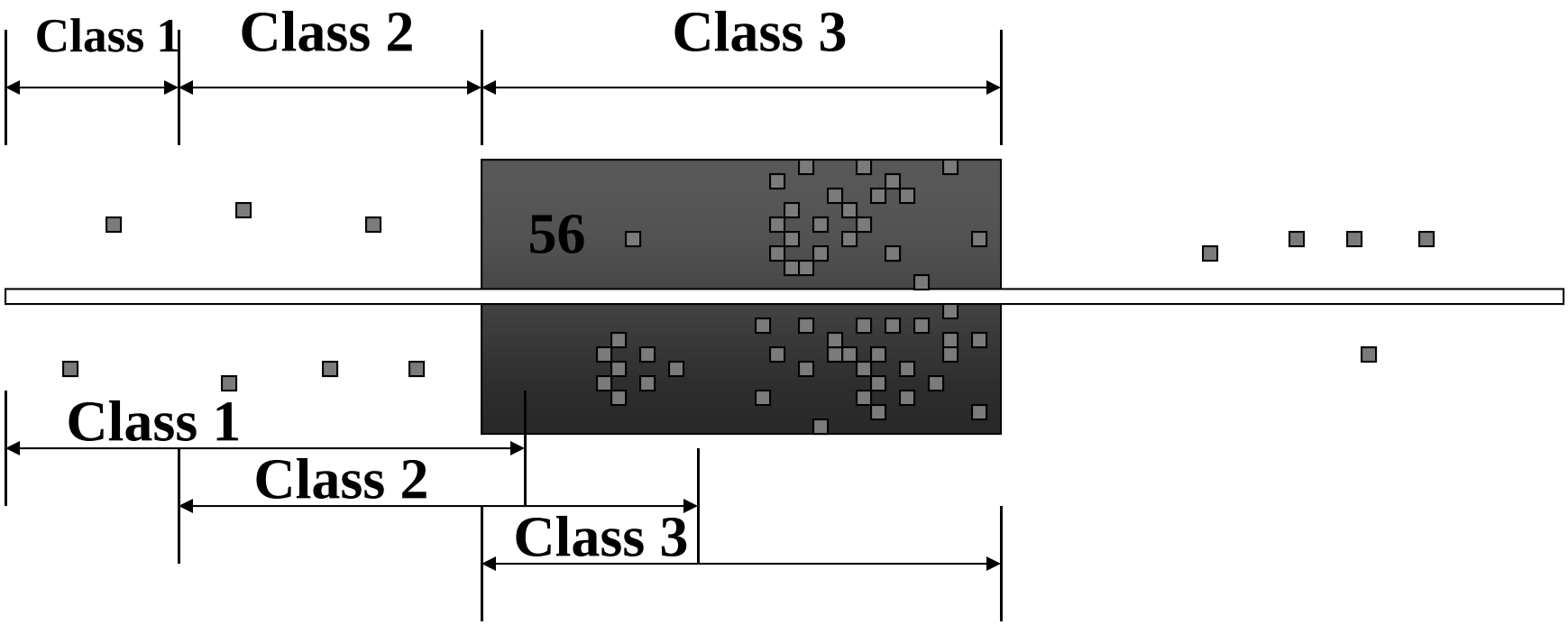



When class locations overlap, the higher classification prevails.

**M.P. 0** **M.P. 1** **M.P. 2** **M.P. 3**

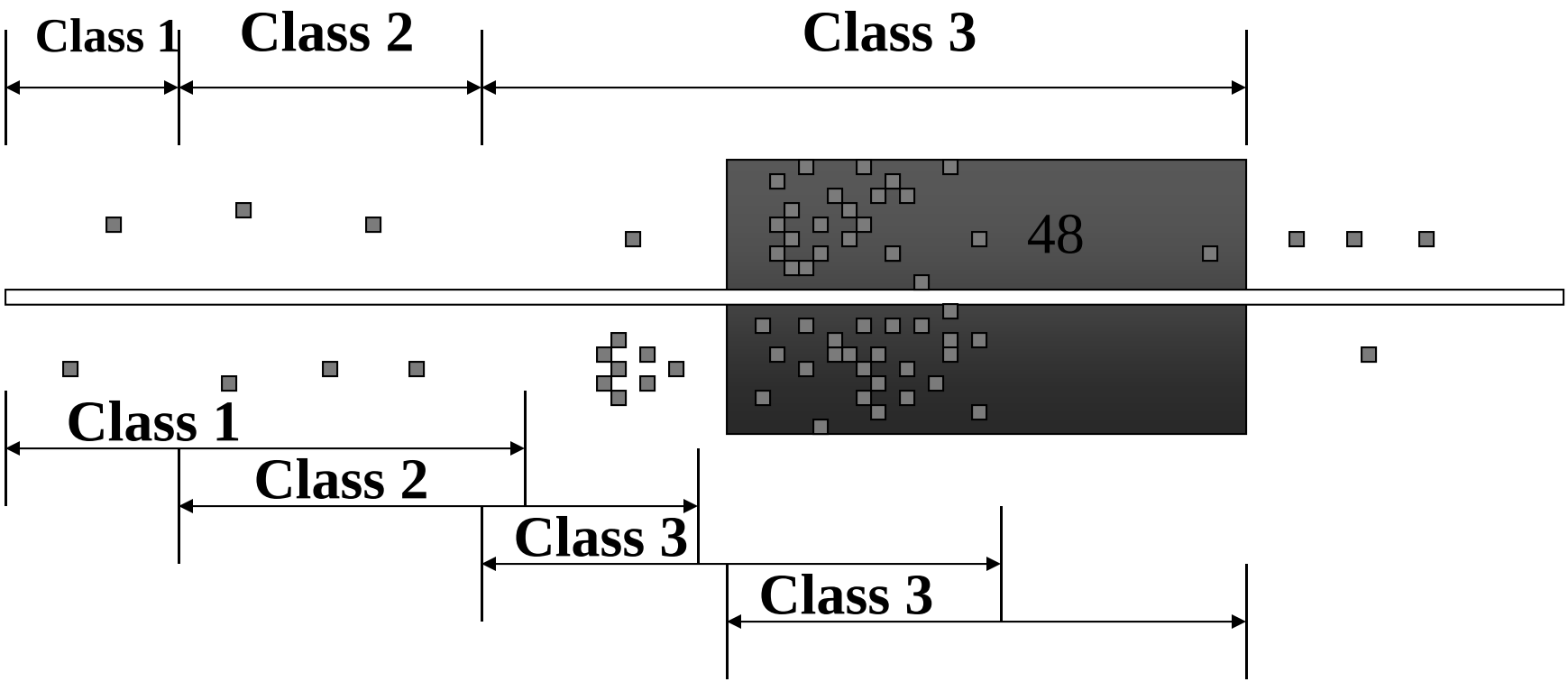
ViaData

# *Continuous Sliding Mile*



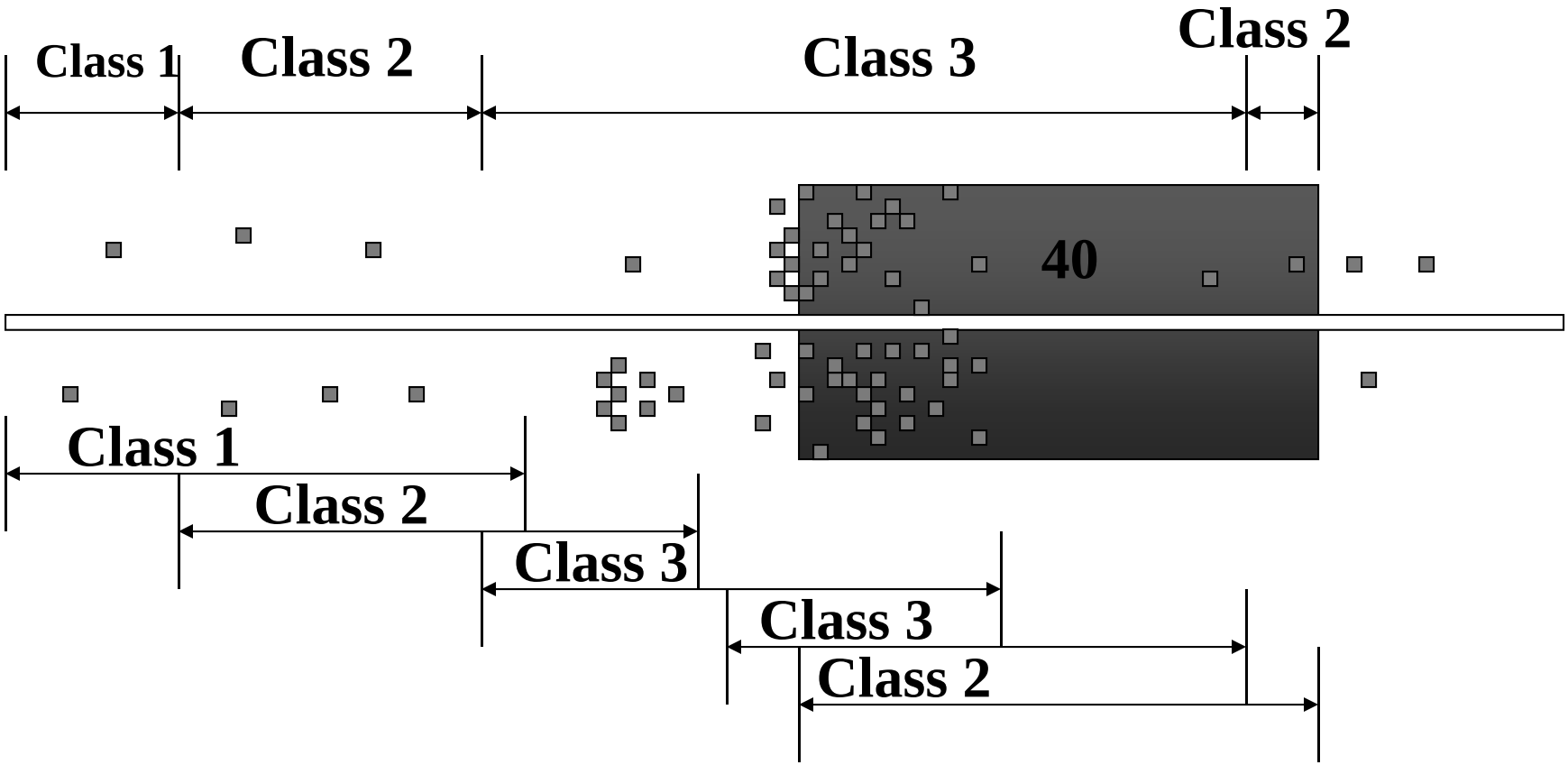

ViaData

# ***Continuous Sliding Mile***



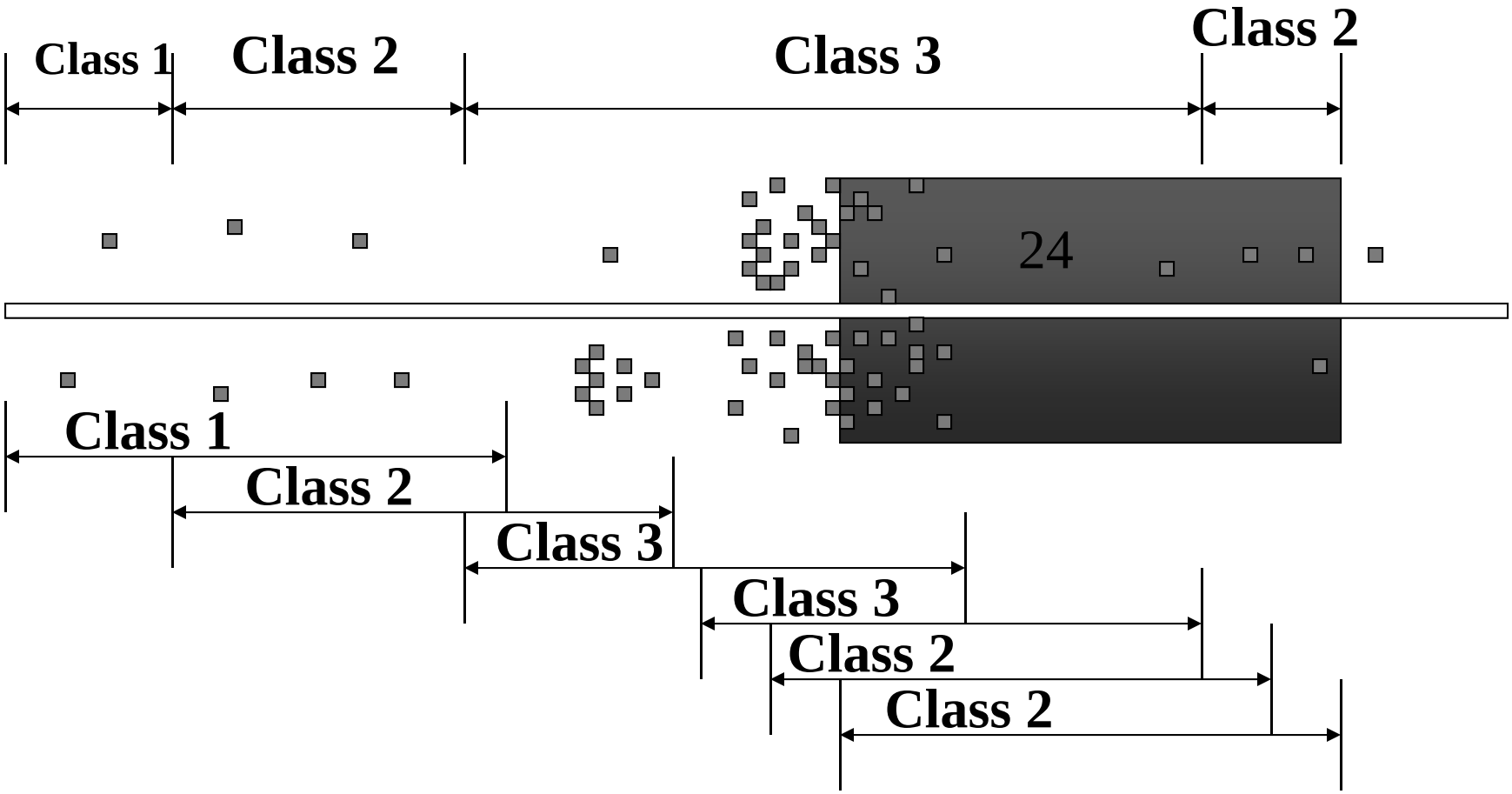

ViaData

# *Continuous Sliding Mile*



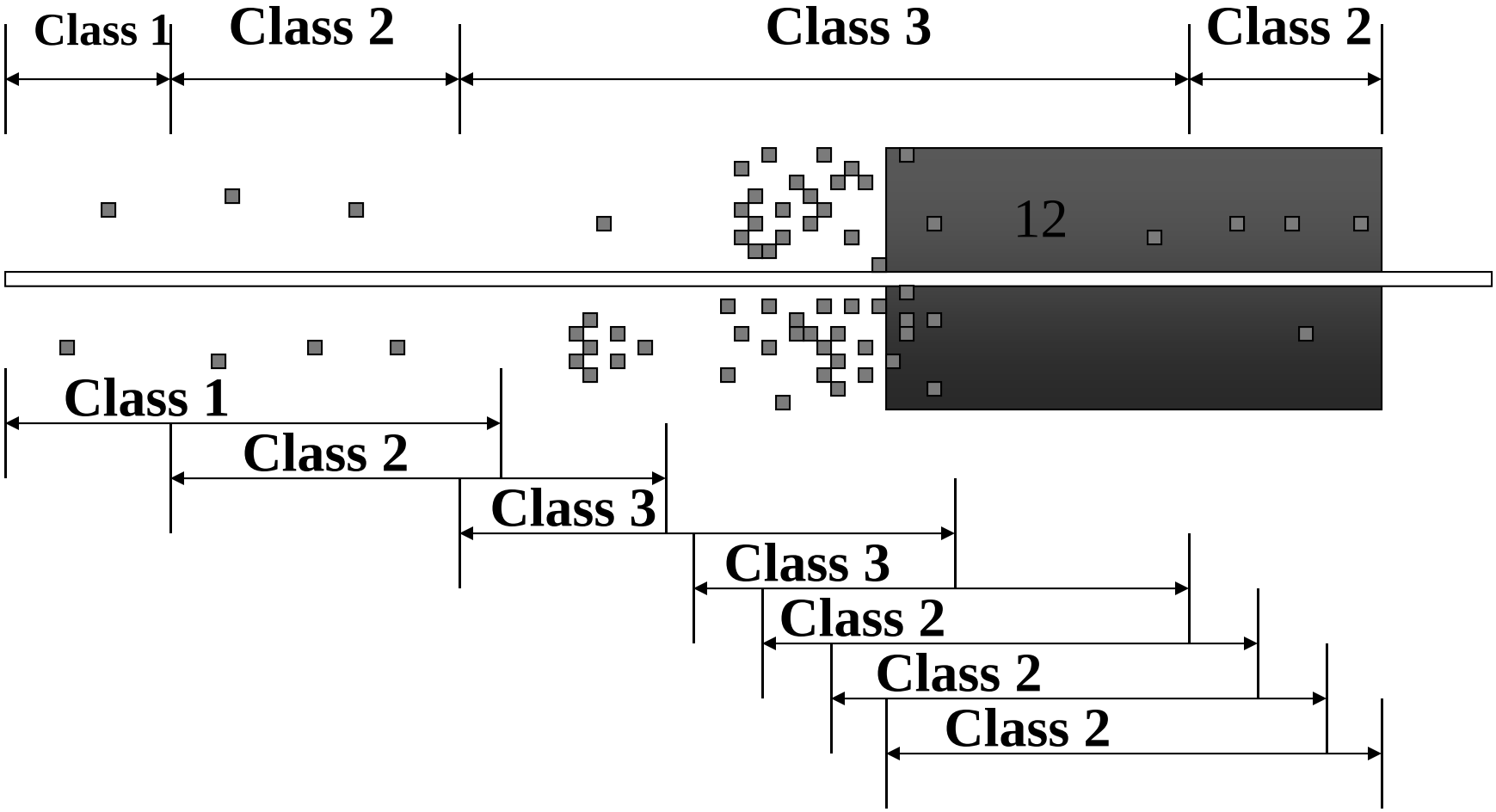

ViaData

# *Continuous Sliding Mile*



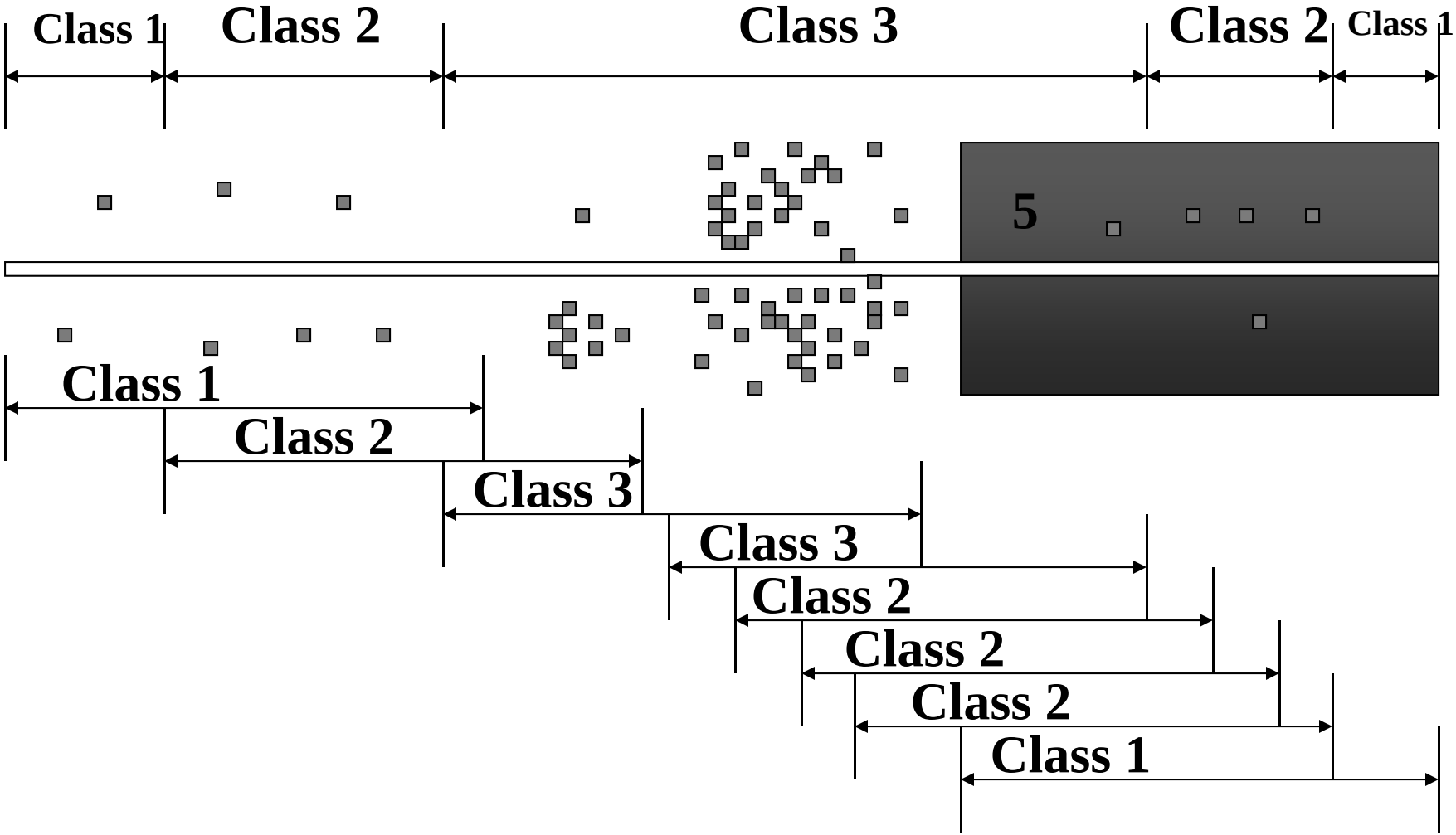

ViaData

# ***Continuous Sliding Mile***



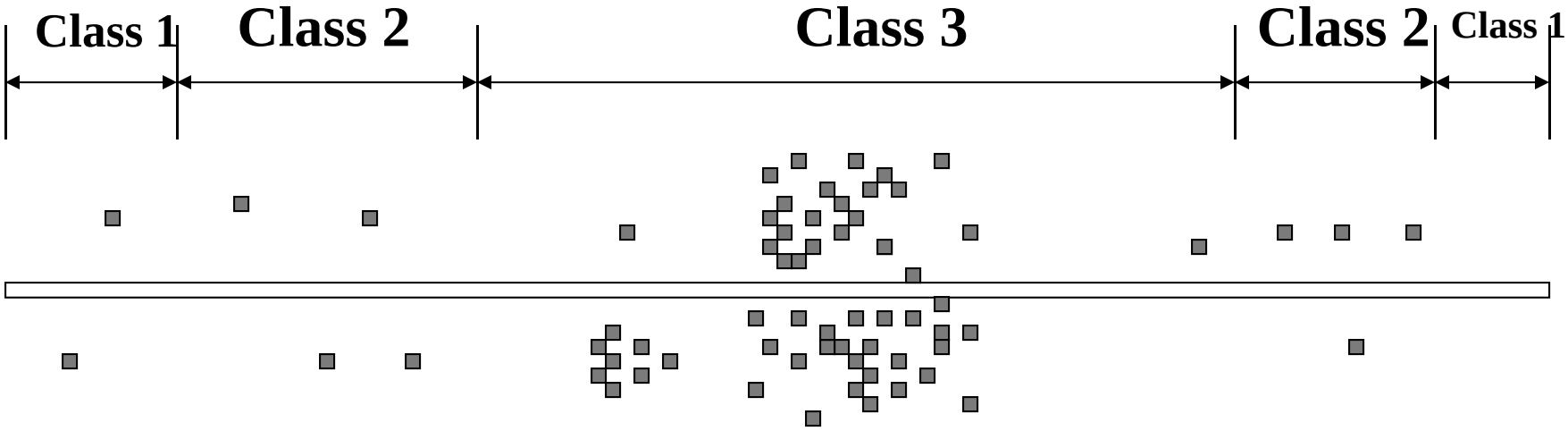

ViaData

# *Continuous Sliding Mile*




ViaData

# *Continuous Sliding Mile - the right way to do class location*





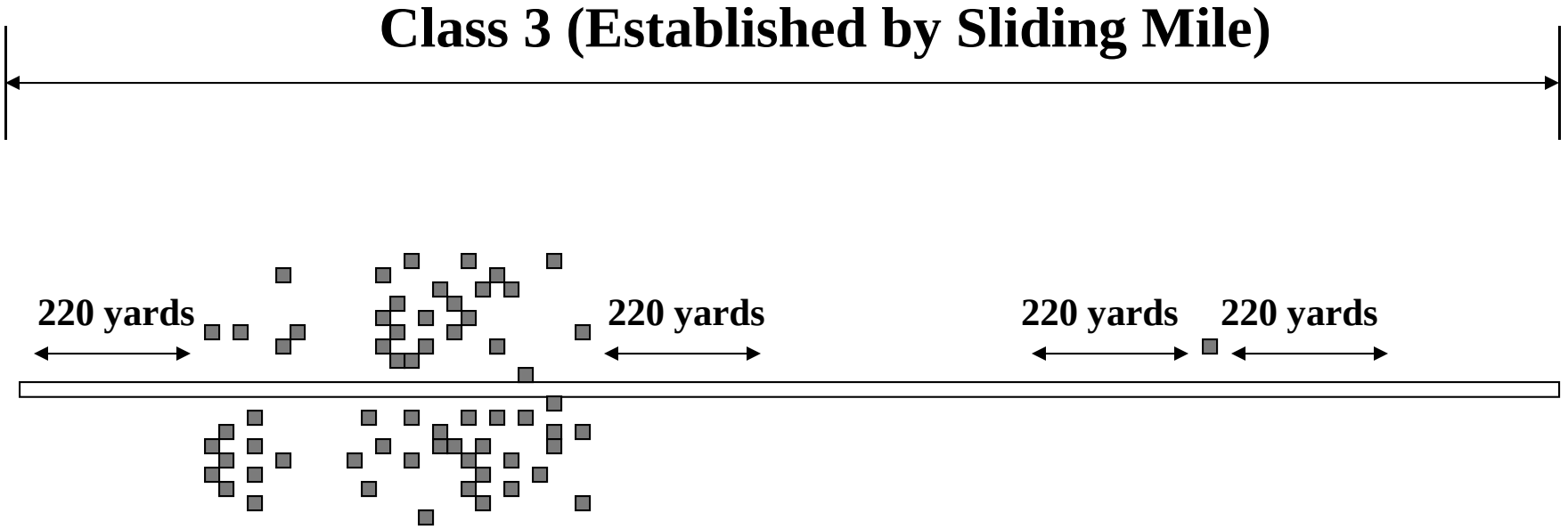
**End to End Mile – the *Wrong Way* to do class location**

ViaData

# Adjustment of Class Location Length: Clustering

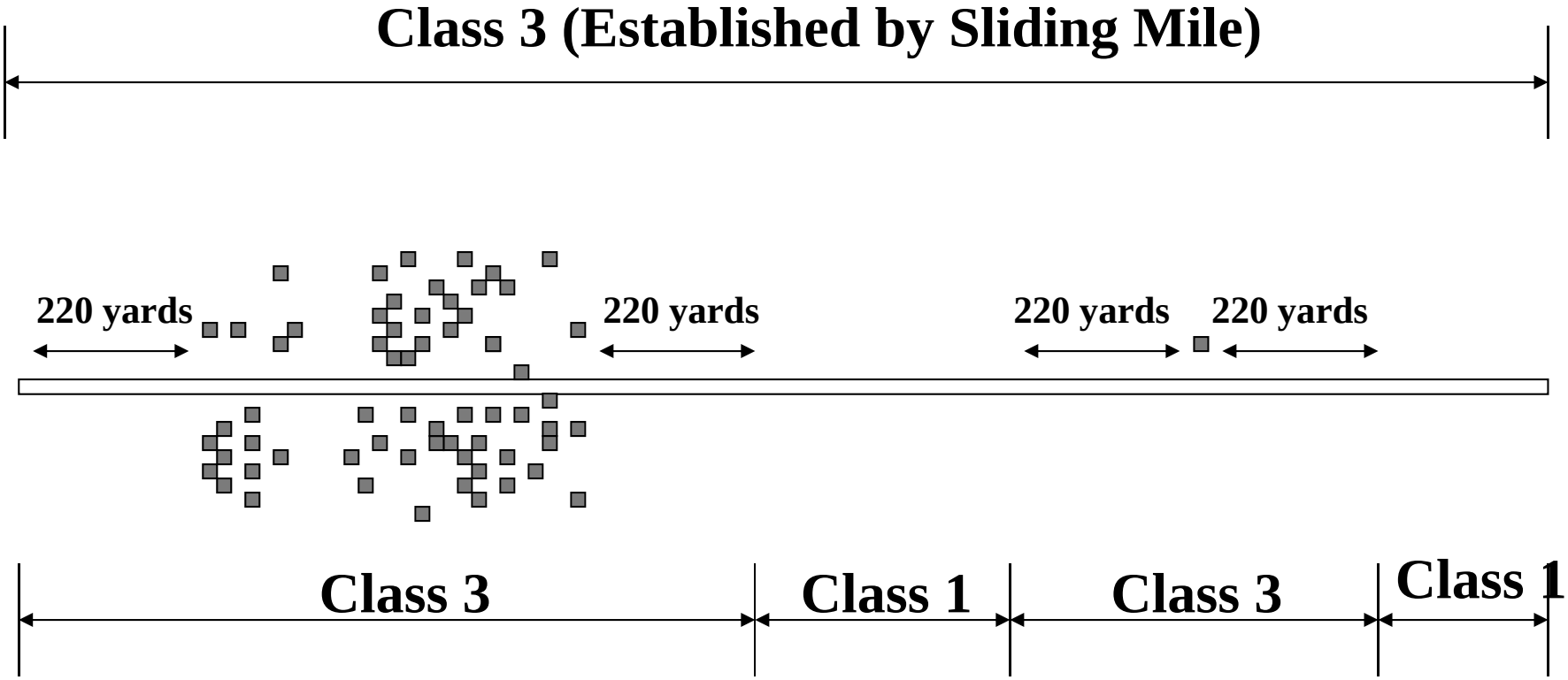
- The length of Class locations 2, 3, and 4 may be adjusted as follows:
  1) A Class 4 location ends 220 yards from the nearest building with four or more stories above ground.
  2) When a cluster of buildings intended for human occupancy requires a Class 2 or 3 location, the class location ends 220 yards from the nearest building in the cluster.

# *Clustering*



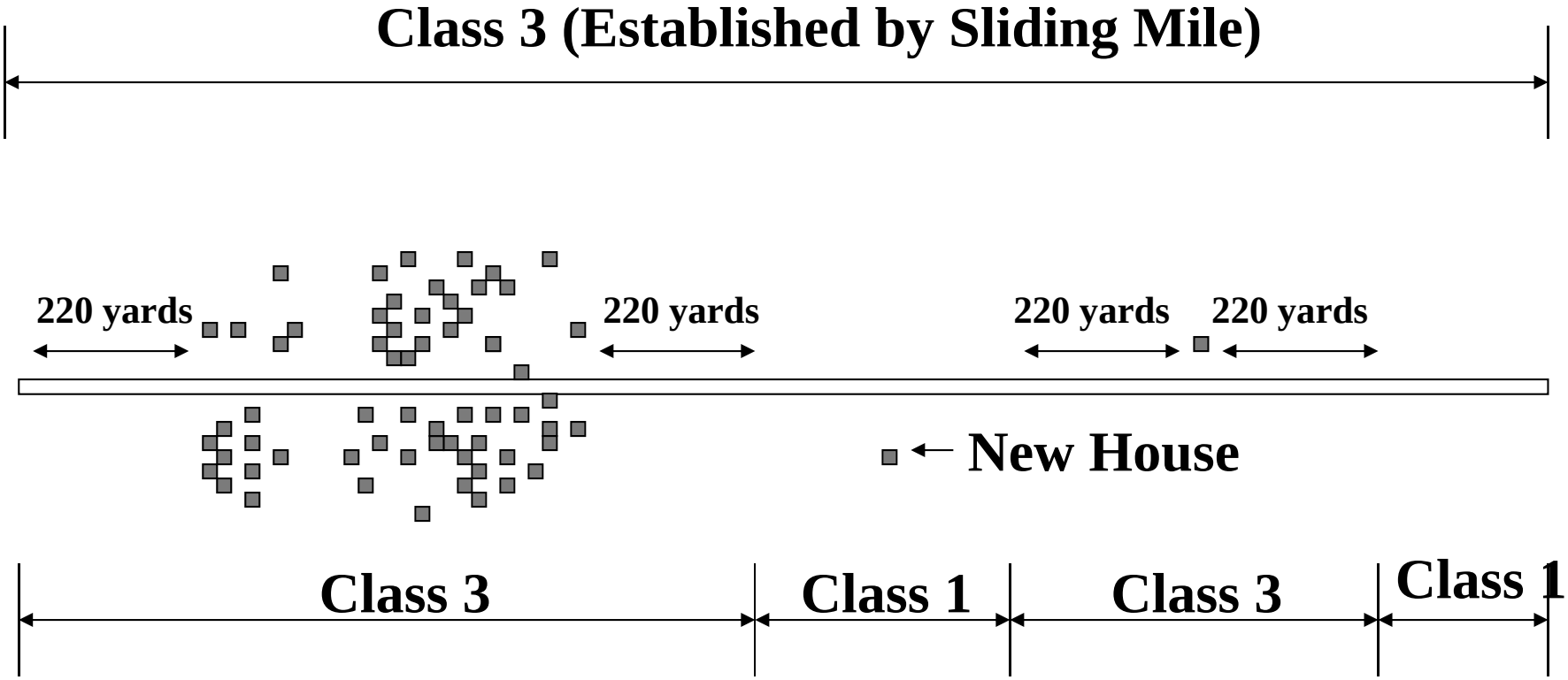

ViaData

# *Clustering*



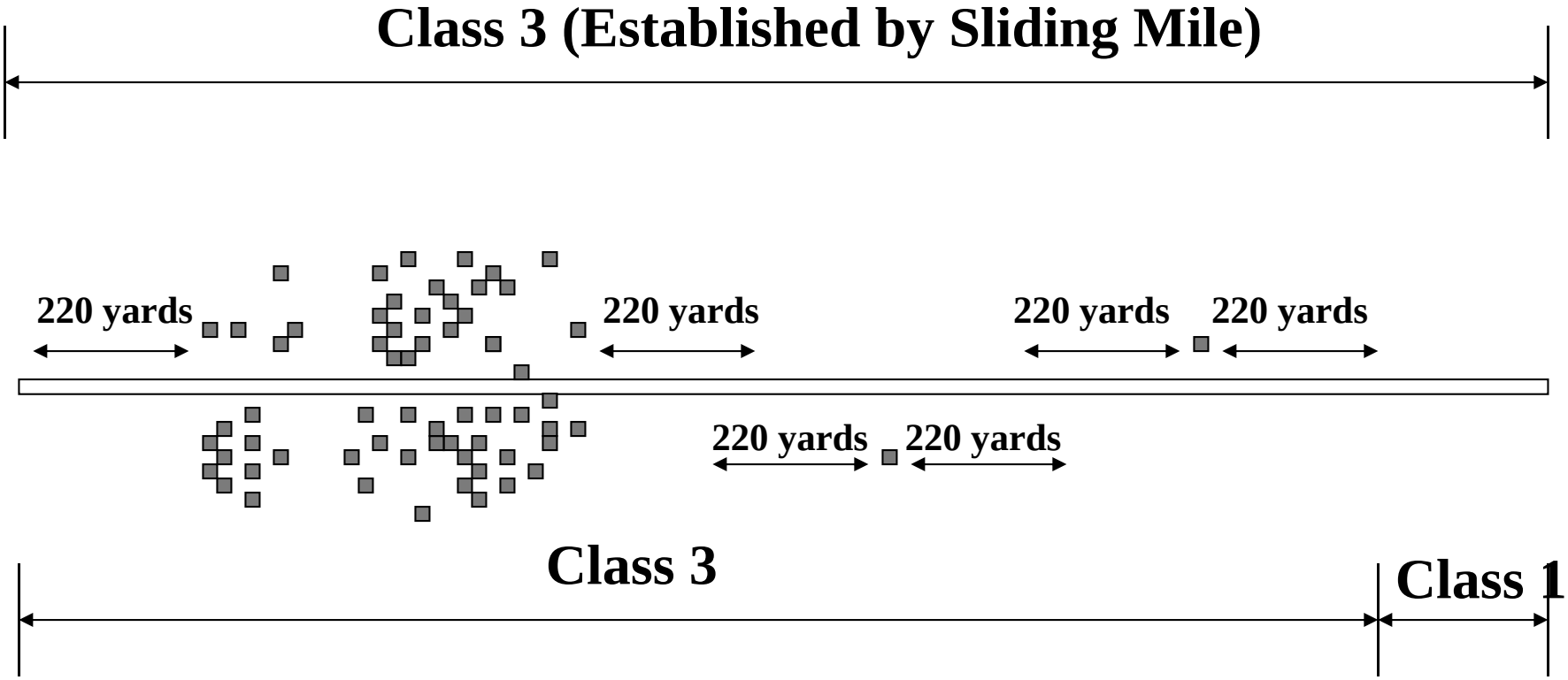

ViaData

# *Clustering*



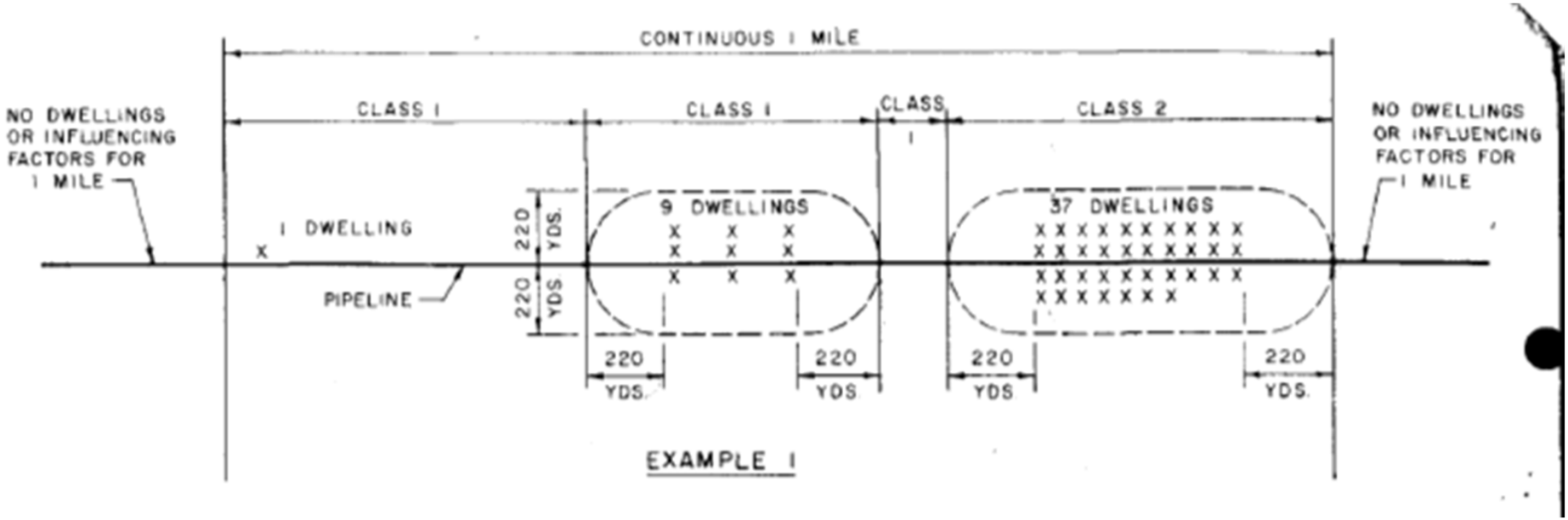

ViaData

# *Clustering*

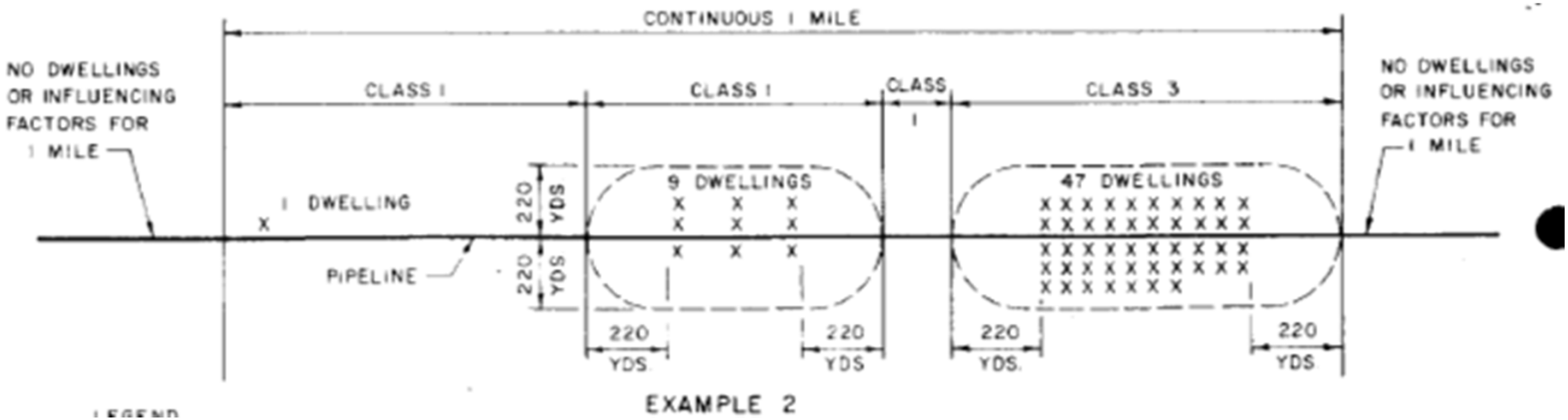



ViaData

# Clustering


CONTINUOUS 1 MILE
CLASS 1
CLASS 1
CLASS 1
CLASS 2
NO DWELLINGS OR INFLUENCING FACTORS FOR 1 MILE
NO DWELLINGS OR INFLUENCING FACTORS FOR 1 MILE
1 DWELLING
PIPELINE
220 YDS.
220 YDS.
9 DWELLINGS
37 DWELLINGS
220 YDS.
220 YDS.
220 YDS.
220 YDS.
EXAMPLE 1

# Clustering


CONTINUOUS 1 MILE
NO DWELLINGS OR INFLUENCING FACTORS FOR 1 MILE
CLASS 1
CLASS 1
CLASS 1
CLASS 3
NO DWELLINGS OR INFLUENCING FACTORS FOR 1 MILE
1 DWELLING
220 YDS
220 YDS
9 DWELLINGS
47 DWELLINGS
PIPELINE
220 YDS
220 YDS
220 YDS
220 YDS
EXAMPLE 2

# Clustering

- Your application of paragraph (f) of §192.5, to restrict the boundaries of Class 2 and Class 3 locations created by a cluster of buildings in otherwise Class 1 situations such as you portray in your drawing is not correct. Because the two clusters portrayed are within a continuous 1-mile length of pipeline, they affect one another and in the example you give would cause the class location to be Class 3 to a point of 220 yards beyond the extremities of the two "combined" clusters.

ViaData

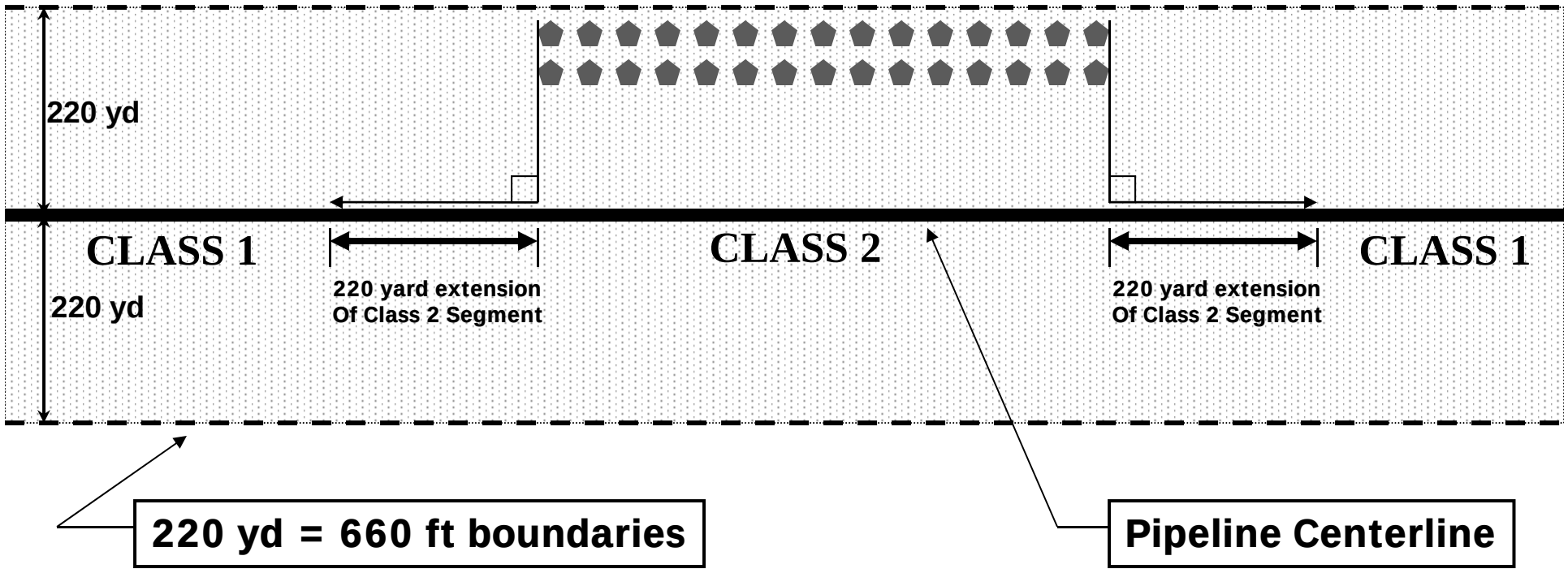
# Boundary Adjustment of Class Locations

- Two Methods
  - "perpendicular/parallel method"
  - "arc method”

# Arc Method for Adjustment of Class Location

- Interpretations in 192.5 #17 & #18 – December 1996
- Consequently, we ……find both the "arc method" and the "perpendicular/parallel method" to be acceptable for determining the 220 yard boundary for the cluster of buildings in § 192.5(f)

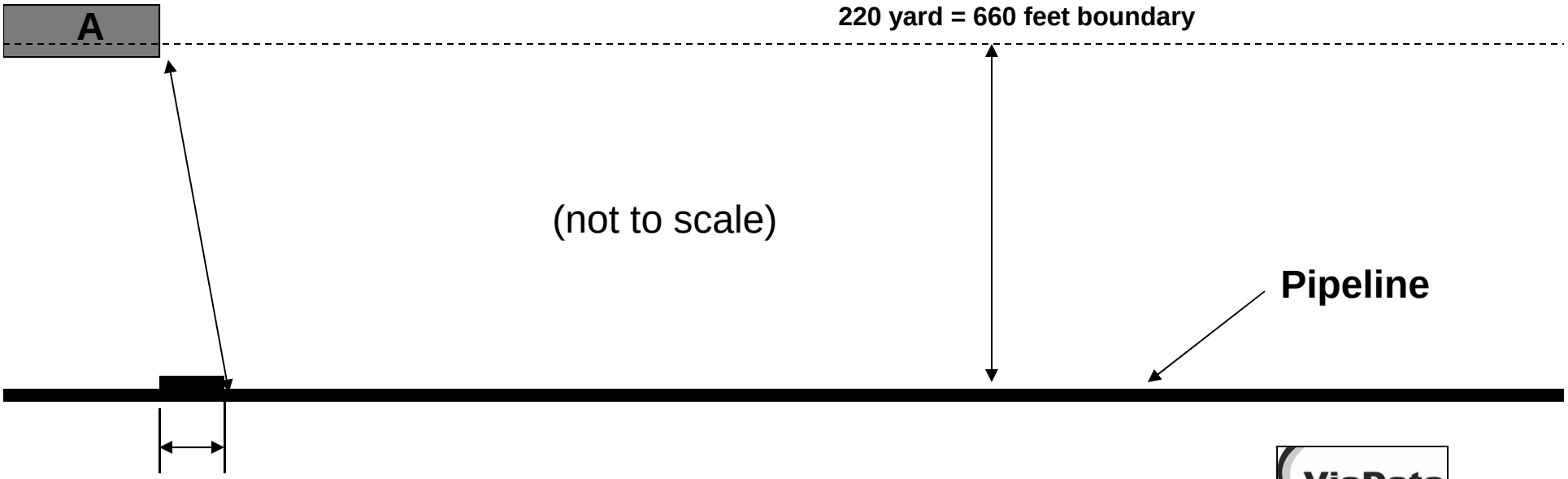
# Adjustment of Class Locations (192.5) with the Perpendicular / Parallel Method




(not to scale)

# Example of Arc Method Application

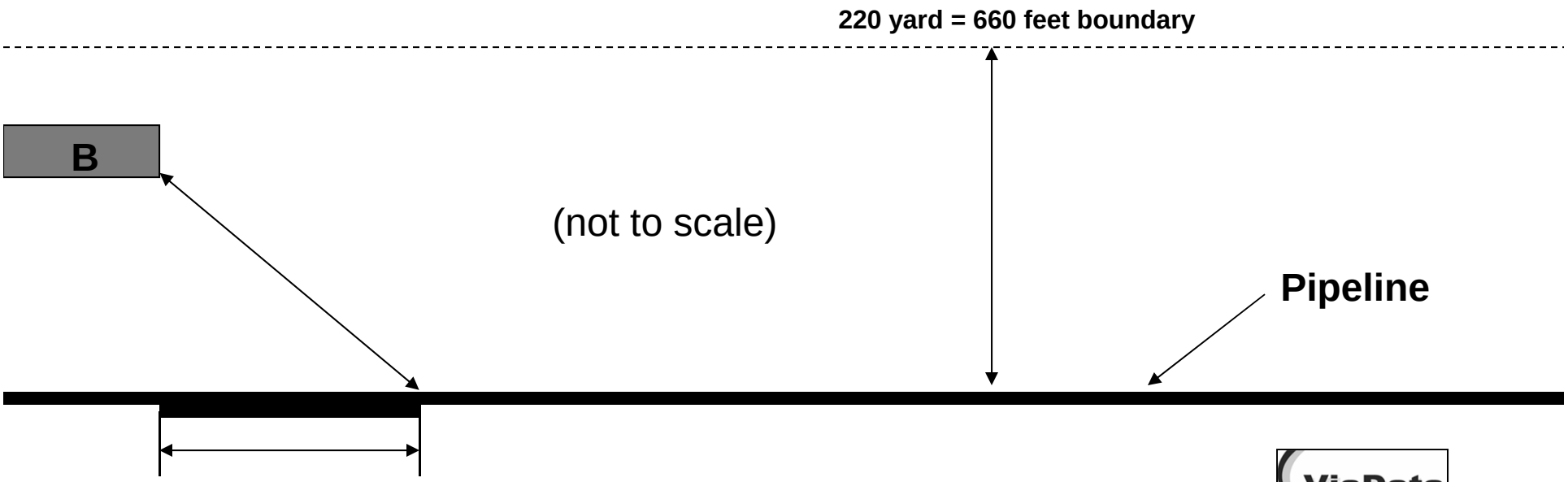
**Dwelling "A" is end of Class 3 Area Yellow Line represents length of class extension - <u>much less</u> than Perpendicular-Parallel Method**




ViaData

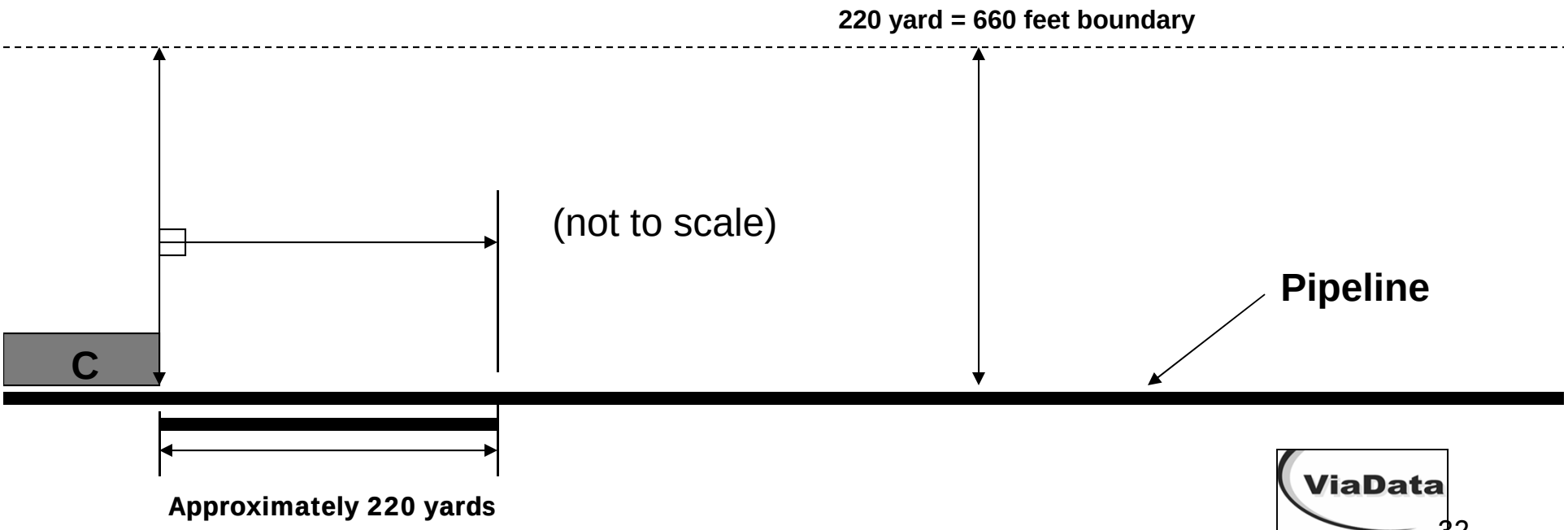
# Example of Arc Method Application

**Dwelling "B" is end of Class 3 Area - Blue Line represents length of class extension - less than Perpendicular-Parallel Method**



# Example of Arc Method Application

**Dwelling "C" is end of Class 3 Area - Red Line represents length of class extension as the dwelling or building approaches the center line of the pipeline. The result from the Arc Method approaches the same value as the Perpendicular-Parallel Method**



# Example of Arc Method Application

**Case 1: Dwelling “C” is end of Class 3 Area ( A & B are not present):**

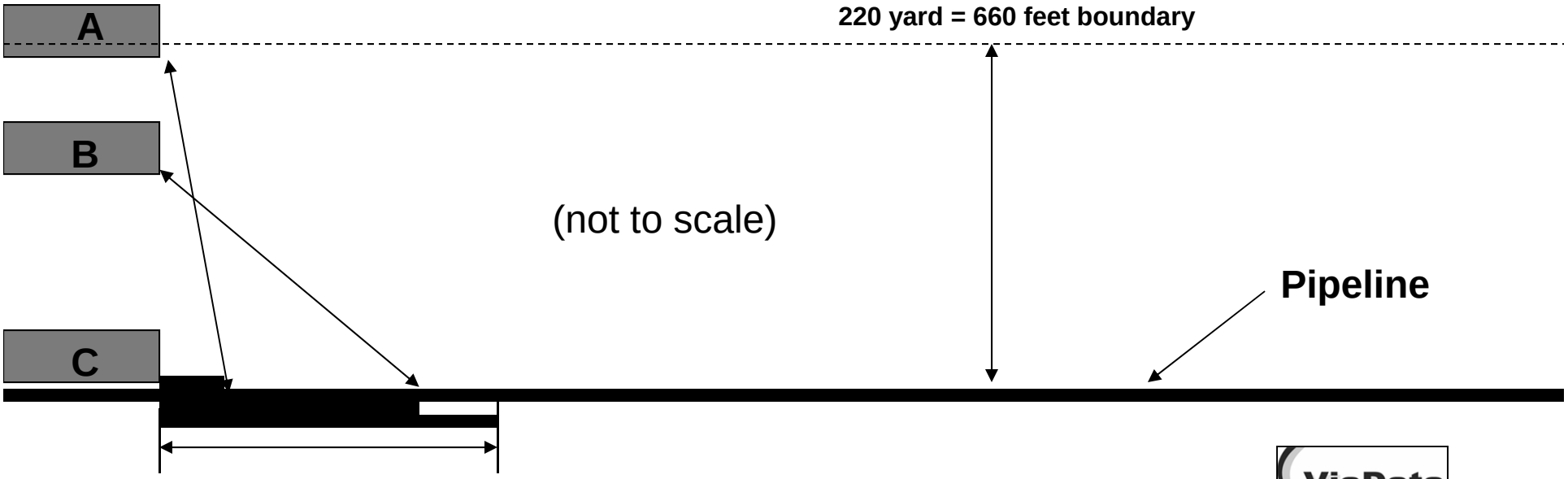
**Red Line represents length of class extension**

**Case 2: Dwelling “B” is end of Class 3 Area ( A & C are not present):**

**Blue Line represents length of class extension**

**Case 3: Dwelling “A” is end of Class 3 Area ( B & C are not present):**

**Yellow Line represents length of class extension**




ViaData

# Arc Method versus Perpendicular/Parallel Method Difference in Class Extension

| Distance from Pipeline (ft) | Length of Extension (ft) Arc Method | | Perp./Parallel Method | Difference (ft) |
|---|---|---|---|---|
| 0 | 660 | | 660 | 0 |
| 50 | 658 | | 660 | 2 |
| 100 | 652 | | 660 | 8 |
| 150 | 643 | | 660 | 17 |
| 200 | 629 | | 660 | 31 |
| 250 | 611 | | 660 | 49 |
| 300 | 588 | | 660 | 72 |
| 330 | 572 | | 660 | 88 |
| 350 | 560 | | 660 | 100 |
| 400 | 525 | | 660 | 135 |
| 450 | 483 | | 660 | 177 |
| 500 | 431 | | 660 | 229 |
| 550 | 365 | | 660 | 295 |
| 600 | 275 | | 660 | 385 |
| 650 | 114 | | 660 | 546 |
| 655 | 81 | | 660 | 579 |
| 657 | 63 | | 660 | 597 |
| 659 | 36 | | 660 | 624 |

# Impacts of Increasing to Higher Class Locations

- Frequency
  - Leak Surveys
  - Transmission Line Patrolling
- Depth of Cover Requirements
- Design Factor

| Design Factor | 0.72 | 0.60 | 0.50 | 0.40 |
|---|---|---|---|---|
| Class Location | 1 | 2 | 3 | 4 |

ViaData

# Class Location Implication on Calculated Wall Thickness (one example)

| P | D | E | T | F | S | t (in.) |
|---|---|---|---|---|---|---|
| 1440 | 30 | 1.0 | 1.0 | 0.72 | 65,000 | 0.462 |
| 1440 | 30 | 1.0 | 1.0 | 0.60 | 65,000 | 0.554 |
| 1440 | 30 | 1.0 | 1.0 | 0.50 | 65,000 | 0.665 |
| 1440 | 30 | 1.0 | 1.0 | 0.40 | 65,000 | 0.831 |

**Design Pressure = 1440 psig, Yield Strength = 65,000 psig, Diameter = 30 in., E = 1.0, T = 1.0**

ViaData

# Key Interpretations

## Answers to Operator Questions

ViaData

# Areas within 100 yards

- April 6, 2007
- *"For those areas within 100 yards of the pipeline, is the intent of 192.5(b)(3)(ii) to include, as Class 3 locations, building(s) such as a convenience store, i.e. Circle K, 7-11, etc., and video poker truck stops where persons may frequent on a daily basis?"*
- Yes, the intent of § 192.5(b)(3)(ii) is to include convenience stores, video poker truck stops and similar buildings in Class 3 locations where these facilities lie within 100 yards of the pipeline.

ViaData

# 20 Persons

- *"What is the interpretation under 192.5(b)(3)(ii) as to the 20 persons, such as all 20 present at one time or cumulative throughout the day?"*
- Under § 192.5(b)(3)(ii), the 20 or more persons must all be present at the same time. However, this does not require the continuous presence of 20 or more people. For example, the minimum requirement is met if 20 people are present at a convenience store at any one time during the day.

ViaData

# Four or more stories

- *"What is the definition and intent under 192.5(b)(4), where it addresses 'buildings with four or more stories above ground are prevalent'? If you have 10 buildings along a pipeline, a downtown area for example, and 5 or less of the buildings are four or more stories, would this be defined as prevalent and constitute being a Class 4 location?"*
- In the example you use, ten buildings in a downtown area with five or more buildings four stories or more would meet the definition of prevalent (i.e., prevailing).

ViaData

# Parking garages

- *“Are parking garages, open or closed, considered to be buildings intended to be utilized for determination of class location under 192.(b)(3)(ii) and 192.5(b)(4)?”*
- Though we do not define "buildings" in 49 CFR Part 192, we believe open or closed parking garages are buildings for class location determinations using any commonly accepted definition of buildings.

ViaData

# MAOP review

- *"In addition, 49 CFR 192.619(a)(3) allows an operator to establish an MAOP based upon the 5-year window for older systems prior to July 1, 1970. Once that has been established and documented and a class location study is performed resulting in a class location change from what it was on July 1, 1970, does the operator have to incorporate a class location factor for revision of the MAOP established by the 5-year window? Our contention is that the operator does not."*

ViaData

# MAOP review

- If a class location study identifies a pipeline segment with a hoop stress corresponding to an established MAOP that is not commensurate with the present class location, the operator must confirm or revise the MAOP of the pipeline segment using one of the three methods in § 192.611(a). Operators must use all the applicable class location factors wherever called for in each of these methods.

ViaData

# Arc method

- We have looked into your statement on the extent of use of the "arc method" and found that it has been used for many years by a large number of interstate operators. Consequently, we have reconsidered our interpretation in my letter of January 30, 1995, and find both the "arc method" and the "perpendicular/parallel method" to be acceptable for determining the 220 yard boundary for the cluster of buildings in § 192.5(f).
- 12/16/1996

ViaData

# Trail systems

- *Your question concerned allowing a trail system on a natural gas pipeline right-of-way.*
- Although a trail system bears some resemblance to a "small, well-defined outside area that is occupied by 20 or more people," it differs in a number of significant aspects. In particular, it appears that a trail used by hikers, bicycles, horses, cross country skiers, etc., would not be occupied by 20 or more people in a small and well-defined area at the same time. Furthermore, such a trail system would not be basically similar to a playground, recreation area, outdoor theater, or other place of public assembly. Therefore, the trail system would not require a change in class location.
- 9/27/1996

# Outdoor areas

- …three segments of gas pipelines in Rowan County, Kentucky that pass within 100 yards of an Outdoor Field Study Area used by the Rowan County School System. You asked if these pipeline segments are in a Class 3 location as defined by 49 CFR 192.5(d)(2).
- …it appears that the Outdoor Field Study Area is not occupied at least 5 days a week for any period of the year. Therefore, the pipeline segments are not in a Class 3 location under §192.5(d)(2).
- 6/3/1991

ViaData

# Motels

- … has a transmission line near a Holiday Inn was discussed with Furrow. The motel is not within 100 yards of the motel, but it may be within 220 yards.
- The question is: *Should the motel rooms be counted as dwellings units, similar to apartments, or as a single building?*

ViaData

# Motels

- In Furrow's opinion (emphasis) there is probably a distinction between a dwelling unit, which serves as a more permanent place of residence, and a motel room, which is generally occupied for a short term. He does not feel that the motel room would be classified as a dwelling unit for the purposes of the regulations.
- A motel alone would have to be within 100 yards of a pipeline and meet the occupancy requirements of 192.5(d)(2) to establish a class 3 location.
- NOTE: THIS IS AN OPINION, NOT AN INTERPRETATION. IT COULD BE REVERSED.
- 7/6/1989

# Clustering

- Your application of paragraph (f) of §192.5, to restrict the boundaries of Class 2 and Class 3 locations created by a cluster of buildings in otherwise Class 1 situations such as you portray in your drawing is not correct. Because the two clusters portrayed are within a continuous 1-mile length of pipeline, they affect one another and in the example you give would cause the class location to be Class 3 to a point of 220 yards beyond the extremities of the two "combined" clusters.
- 7/30/1982

ViaData

# Prevalent, four or more stories

- Having a single four or more story building within 220 yards of a gas pipeline does not require upgrading to Class 4 requirements because paragraph (e) states in part: "where buildings with four or more stories above ground are prevalent." The use of "prevalent" indicates that they are common or that there are more than one such building in the area. Therefore, a single four or more story building would not cause an area to be designated a Class 4 location.
- 7/30/1982

ViaData

# Building

- Subparagraph (f)(1) uses "building" in the singular because it is referring to the nearest building in group or cluster to which the boundary adjustment of 220 yards applies in relation to other dwelling units.
- 7/30/1982

# Review period

- By the plain meaning of this rule, an operator has 18 months from the time a change in class location occurs to complete the confirmation or revision. As you have indicated by alternative (1) above, a change in class location occurs when a structure is completed which results in a new class location. Consequently, the 18-month period begins upon completion of a structure which results in a new class location.
- 5/12/1978
- Changed to 24 months.

ViaData

# Human occupancy

- Intended for "human occupancy" is interpreted to mean that the building concerned is used for a purpose involving the presence of humans.
- 7/5/1977

ViaData

# Short term occupancy

- *…whether a pipeline within 100 yards of a fairgrounds which is occupied by more than 20 persons a day for only a 6-day period annually would be in a Class 3 location under §192.5(d)(2).*
- *…tractor-pull area which is occupied by more than 20 persons a day for only a 3-day period annually*
- *…122 feet of a church which is occupied on Sundays and Tuesdays by less than 20 persons each day but has a daily attendance of more than 20 persons during an annual one week revival would be in a Class 3 location.*

ViaData

# Short term occupancy

- …outside areas which are covered by the definition, i.e., playground, recreation area, outdoor theater, indicate that the definition is intended to apply to places where 20 or more persons assemble more frequently than one week annually.
- Therefore, usage of the fairgrounds, tractor-pull area, or church in the way you have described would not cause a pipeline within 100 yards thereof to be in a Class 3 location under §192.5(d)(2)
- 9/14/1976

ViaData

# Plant, industrial facilities

- OPSO analysis of your plant diagram and corresponding description of facilities indicates that all of your eight buildings or units are intended for human occupancy. The Administration Building and the Parking Lot lie within 100 yards of the pipeline and have a normal human occupancy of more than 20 persons. Therefore, this area appears to be in at least a Class 3 location (refer to Section 192.5(d)(2)).
- 4/21/1976

# Advisory Bulletin. ADB-02-02

- Annual Report for Gas Transmission and Gathering Systems now includes a section to report miles of pipe by class location
- Form PHMSA F 7100.2-1 (12/05)

ViaData