

Town of Greenwich

# First Selectman's Pedestrian Safety Advisory Committee

Public Outreach – Sidewalk Planning  
Workshops

November 13<sup>th</sup> & 18<sup>th</sup> 2008



# Introduction: Who We Are



- First Selectman's Pedestrian Safety Advisory Committee Members:
  - *Kip Burgweger, Committee Chairman*
  - *Amy Siebert: Commissioner, DPW*
  - *David Thompson: Chief Engineer, DPW*
  - *Kevin Conroy: Fuss and O'Neill*

# Introduction: What we are doing



- First Selectman's Pedestrian Safety Advisory Committee
  - *Review the goals and evaluation criteria of the 2006 Inventory of Pedestrian Safety Needs, based on input provided through public participation to give direction to the Town's sidewalk initiatives*
- Public Input
  - *Seek public opinion on:*
    - *Desired scope of the Town's sidewalk network*
    - *Criteria to evaluate the need for new sidewalks*
- **Our overall goals? To establish:**
  - ***What makes a sidewalk necessary to our Town?***
  - ***A fair basis for a long term, need based, Town-wide Sidewalk Master Plan***

# Why are we here tonight?



- Tonight is first of two public workshops...
  - *Sidewalk Need Questionnaire*
    - *Priority Evaluation Criteria Discussion*
    - *Design/Mitigation Issues*
  - *Public comment on Priority Criteria and Process*

# Introduction: What's Next



- **Activities Schedule**
  - *Several Committee Working Meetings*
  - *October 2, 2008 Introductory Public Meeting*
  - *Ongoing Committee Working Meetings*
  - *November 13 and 18, 2008 Sidewalk Criteria Public Meetings*
  - *Develop Draft Sidewalk Master Plan*
  - *Sidewalk Master Plan Public Meeting*
- *Information will continue to be posted on the Town's website*

# Sidewalk Needs Questionnaire






- Please take out your questionnaire and a pen
- Also available on the DPW website
  - *Can be returned by mail, fax, email, or in person to the DPW office in Town Hall*
  - *We will collect forms at the end of the tonight's workshop*
- Questionnaires are due back to DPW by Jan. 5, 2009
- Let's get started
  - *Name, address, and nearest elementary school*

# New Sidewalks?



Possible approaches for retrofitting streets with new sidewalks:

- Don't build anymore, anywhere 
- A sidewalk on every street 
- Somewhere in between 

# Planning Approach



## How Projects are Selected (3 Types):

- Need Based Project
  - *Addresses a predetermined deficiency or goal*
- Project of Opportunity
  - *Leverages activities outside the adopted program to expand/enhance the sidewalk network or progress need based projects stalled for reasons of cost, design/construction issues, or schedule*
- Project of Local Interest (Petition)
  - *Enjoys significant public support*
  - *Addresses local concerns that do not meet the criteria of a Need Based Project.*

# Overlapping Priorities Method



- Used to identify need based projects
- Most locations will experience conditions that are undesirable to some degree
- Select those conditions of highest concern
- Needs are determined from those locations where the priority conditions overlap
- For example: A need for a sidewalk exists when the location in question is:
  - *Near (specific pedestrian generating land uses) and;*
  - *In an area of high (volume, speed, density, accident history) and;*
  - *On a street of certain (width, classification, characteristics)*

# Overlapping Priorities Method



- Possible Evaluation Criteria
  - *Proximity to Pedestrian Generators*
  - *Zoning Density*
  - *Roadway (Functional) Classification*
  - *24 hour Traffic Volume (ADT)*
  - *Peak Hour Traffic Volume*
  - *Vehicle Speed*
  - *Roadway Width*
  - *Other (Misc.)*

# Question 1: Pedestrian Generators



- Why include this as a priority condition?
  - *High pedestrian activity near these land uses*
  - *Targets likely pedestrian areas*
- Why not?
  - *Excludes certain areas depending on land uses considered*
  - *May leave large gaps in the network*

# Question 1: Pedestrian Generators

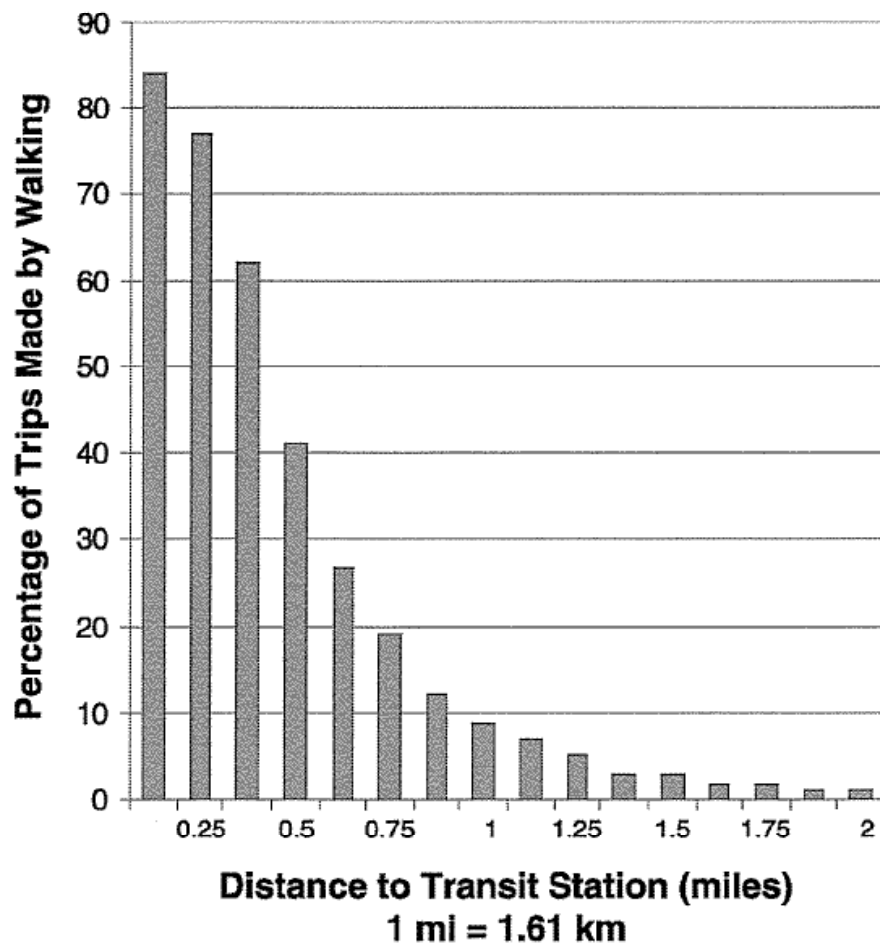


- Typical Pedestrian Generators
  - *Schools*
  - *Train Stations or other Transit Stops*
  - *Bus Stops*
  - *Commercial Zones*
  - *Village Centers*
  - *Hospitals*
  - *Elderly Housing*
  - *Community Centers*
  - *Libraries*
  - *Parks*
  - *Other Public Spaces*

# Transit Pedestrian Zone



The Relationship Between Distance to Transit Facility and Pedestrian Mode Choice



Source: Federal Transit Administration, Transit Cooperative Research Program, Transit and Urban Form, TCRP Report 16, 1996. Chart adapted from Figure 19.

## Distance is Key

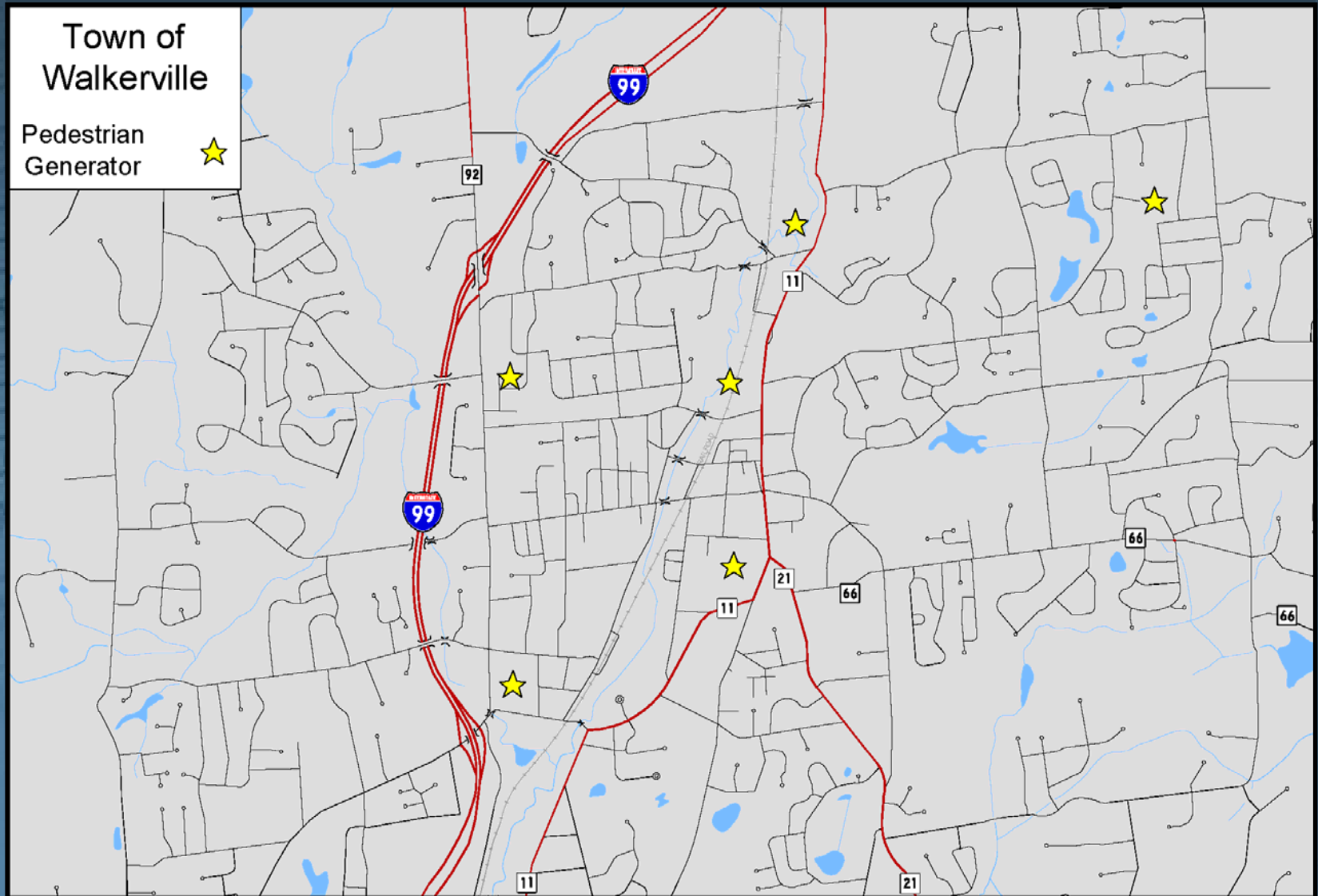
- 75% of all trips less than 1/4 mile by walking.
- 65% of all trips less than 1/2 mile by walking.
- 50% of all trips less than 2/3 mile by walking.

# Walkerville

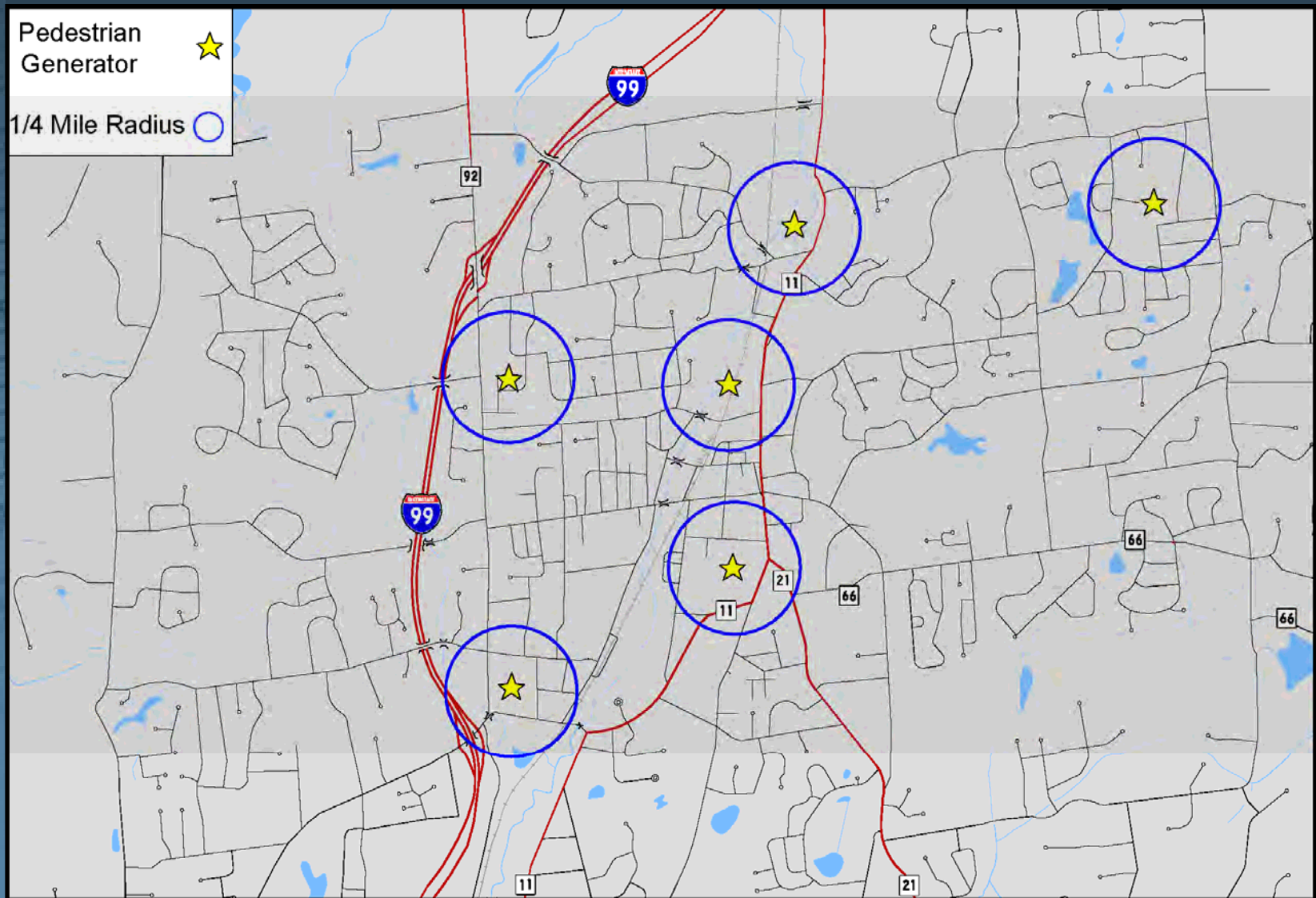


- To help visualize the effects of certain conditions we've created the fictional town of "Walkerville" to test different scenarios in a simplified environment
- Walkerville is approximately 18 sq. mi. in a suburban setting consisting of a central commercial district surrounded by residential development of varying densities
- Walkerville has an interstate highway and a rail line passing through it
- Walkerville currently has no sidewalks

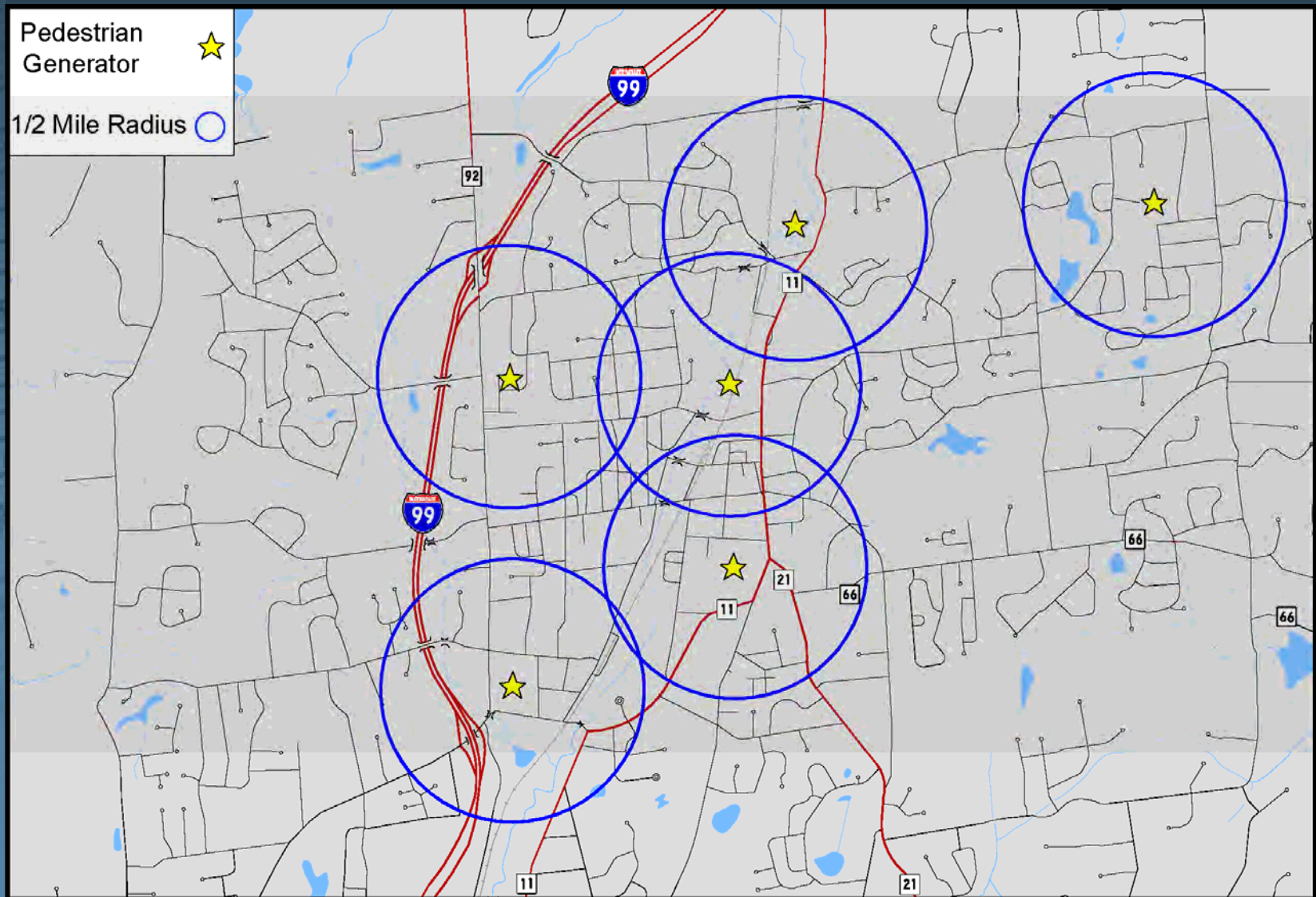
# Walkerville



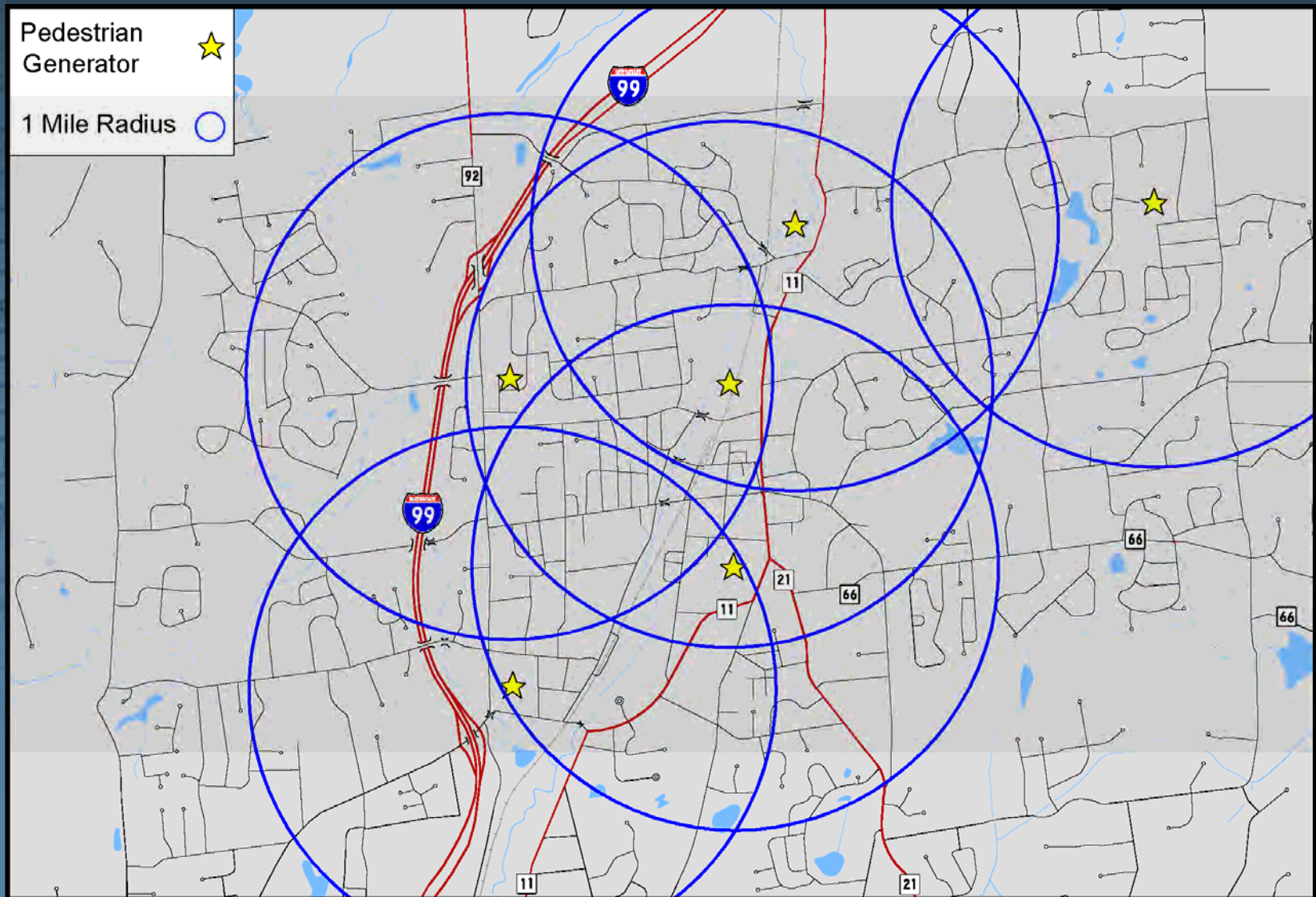
# Question 1: Pedestrian Generators



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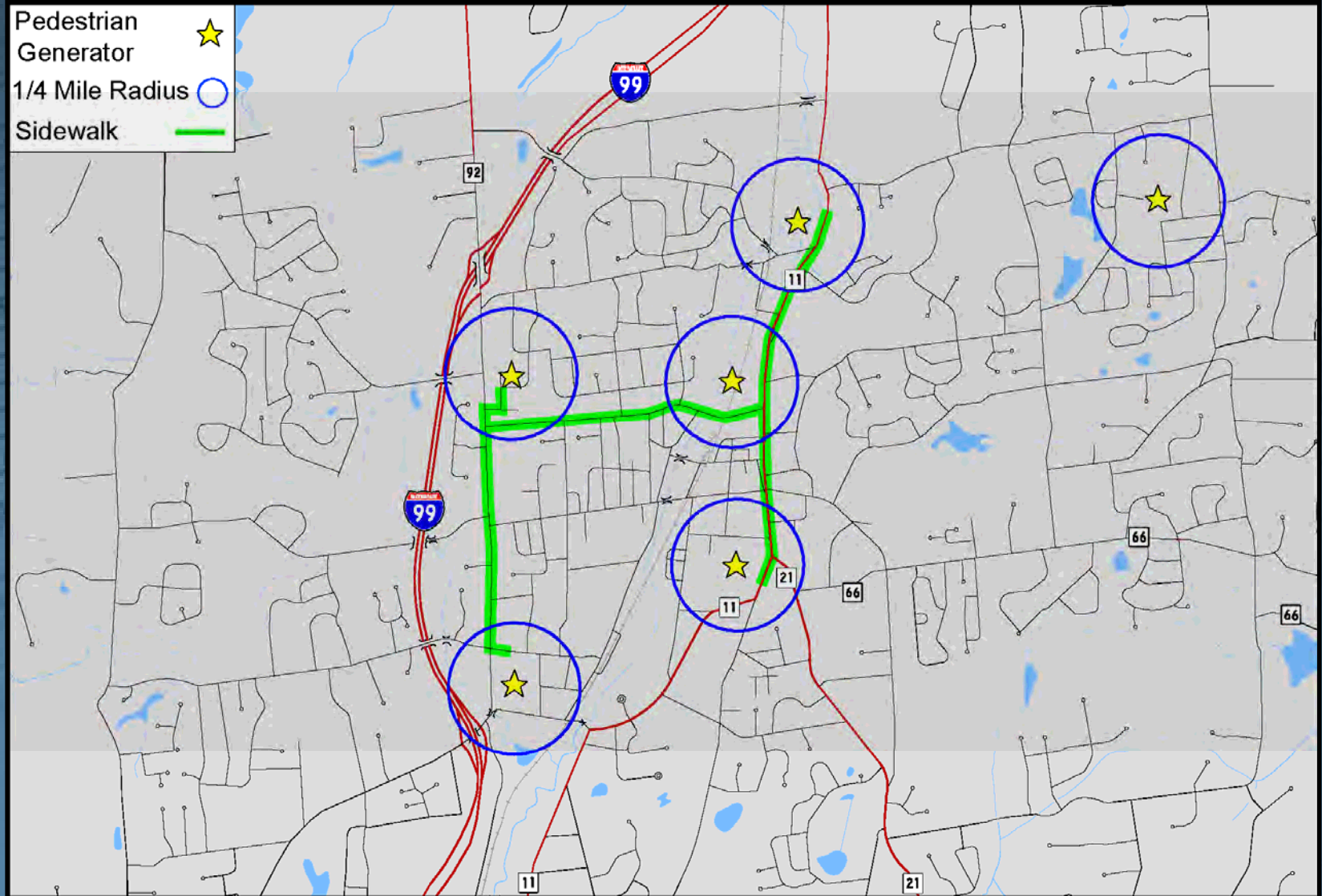
- Question 1: Which land uses should be considered as pedestrian generators for the purposes of sidewalk planning?
  - *More use types = a larger sidewalk network*
- How large of a radius should be used to determine the area of likely pedestrian activity?
  - *Larger distance = a larger sidewalk network*

## Question 2: Pedestrian Generators



- Why include this as a priority condition?
  - *Serves longer pedestrian trips*
  - *Connects compatible land uses*
  - *Can be used to connect smaller individual networks*
  - *Promotes a unified pedestrian network*
- Why not?
  - *Requires large demand for the combined pairs of land uses*
  - *Provides A -> B connections only*

# Question 2: Pedestrian Generators



## Question 2: Pedestrian Generators



- Question 2: How close together should pedestrian generators be to consider connecting them with a sidewalk?
  - *How far are you willing to regularly walk between destinations?*
    - *1/2 mile*
    - *3/4 mile*
    - *1 mile*
    - *1 1/2 mile*
    - *2+ mile*

## Question 3: Roadway Classification



- a.k.a. Functional Classification
- The process by which streets and highways are grouped into classes, or systems, according to the character of traffic service that they are intended to provide.
- There are four functional classifications: expressway, arterial, collector, and local.
- All streets are grouped into one of these classes, depending on the character of the traffic (i.e., local or long distance) and the degree of land access that they allow.

# Question 3: Roadway Classification

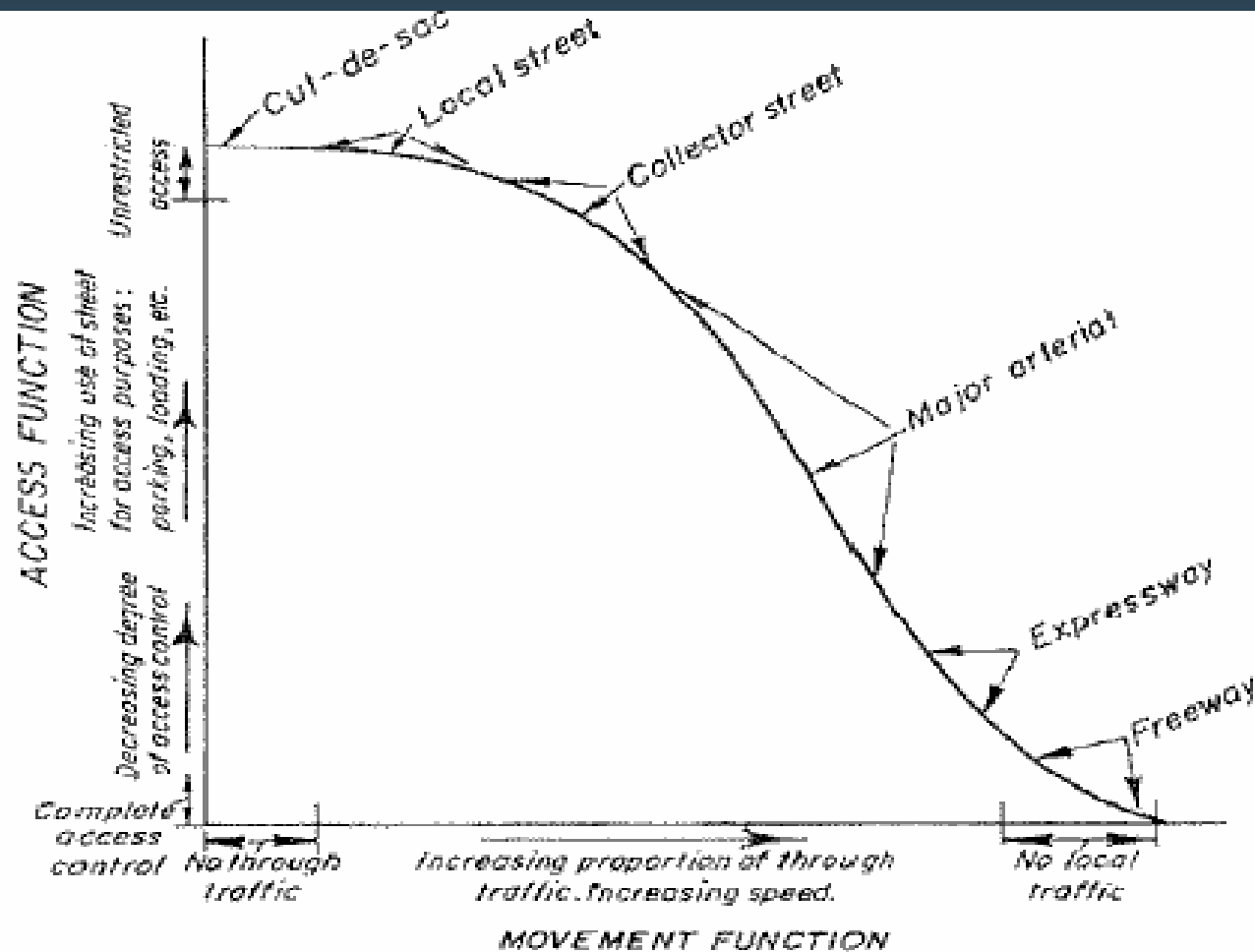
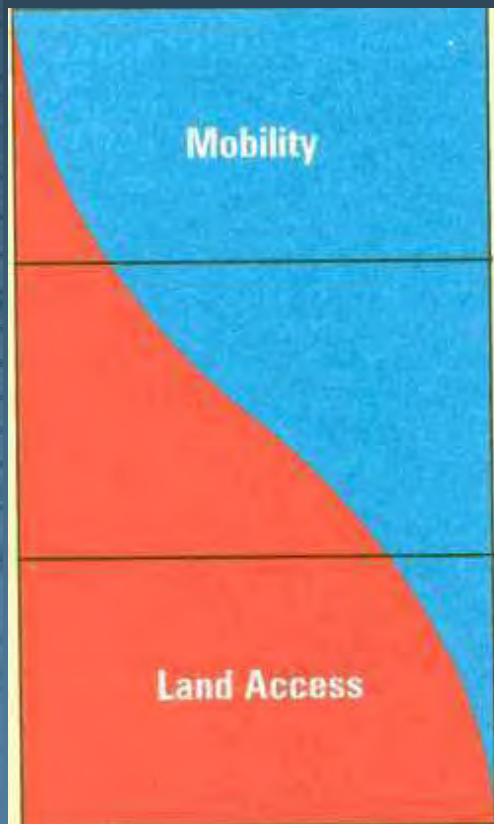


FIGURE 1 Schematic relationship between access and movement function of streets. [Source: *Fundamentals of Traffic Engineering*, 15th ed. ]

# Question 3: Roadway Classification



- Expressways
  - *highest degree of mobility*
  - *limited Access*
- Arterials
  - *higher mobility*
  - *low degree of access*
- Collectors
  - *balance between mobility and access*
- Locals
  - *lower mobility*
  - *highest degree of access*

## Question 3: Roadway Classification



- Why include this as a priority condition?
  - *Approximates speed and volume conditions without extensive data collection efforts*
  - *Higher order streets generally have more pedestrian uses*
  - *Higher order streets have a greater need to separate pedestrians from motor vehicles*
  - *Provides a basic sidewalk network*
- Why not?
  - *Most streets are classified as local*
  - *Does not take into account actual conditions*

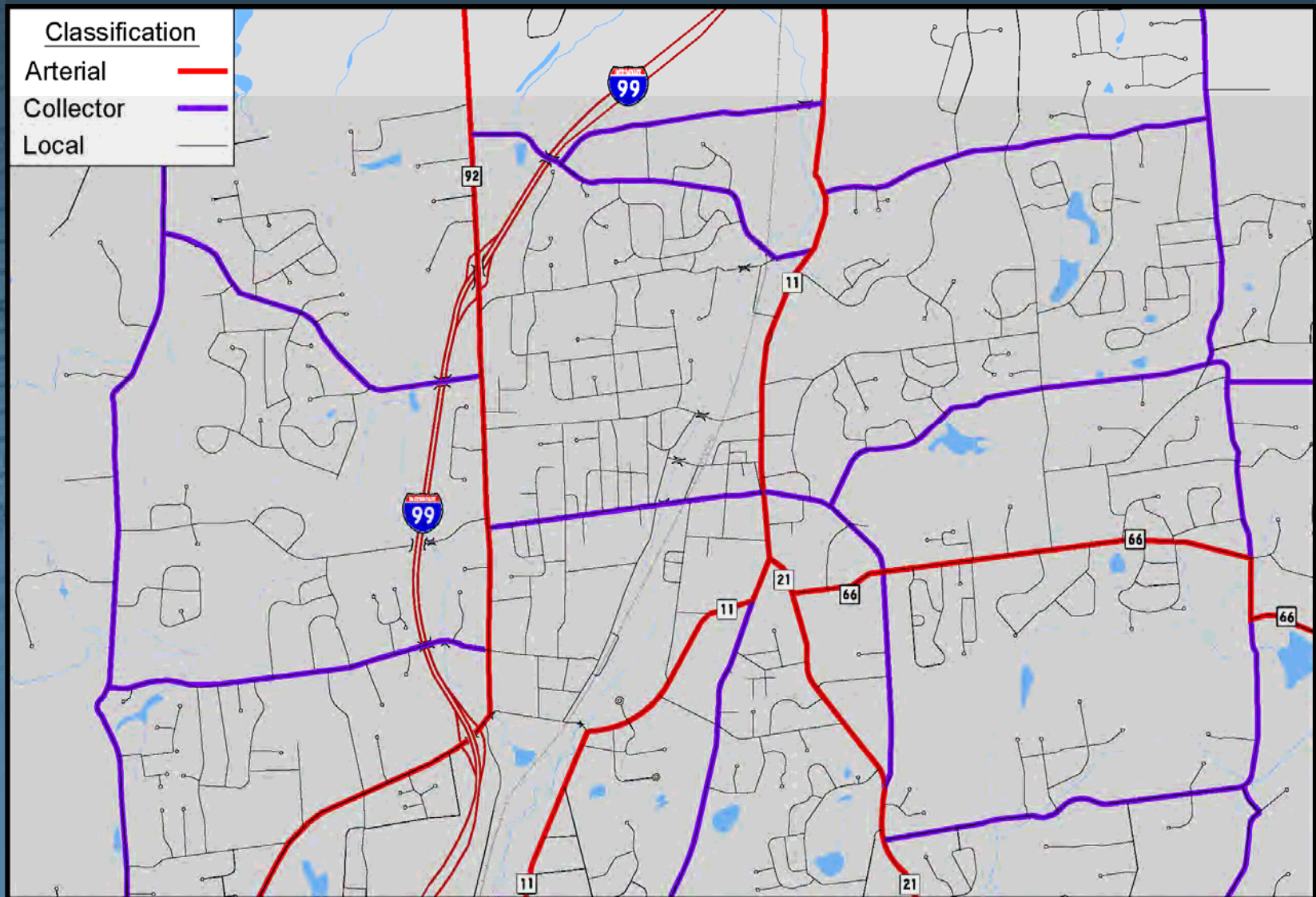
# Functional Classification



Functional System	% of Total Mileage	% of Total Travel
• Expressway	• 1.4	• 29.0
• Arterial	• 9.5	• 42.7
• Collector	• 20.5	• 15.2
• Local	• 68.6	• 13.1
• Total	• 100	• 100

Source: AASHTO Green Book

# Question 3: Roadway Classification



## Question 3: Roadway Classification



- Question 3: Which types for roadways should be considered for the purposes of sidewalk planning?
  - *Arterials Only (smallest network)*
  - *Include Collectors (includes most major streets)*
  - *Include Locals (largest possible network, all streets)*
  - *Consider any street that is not a cul-de-sac*

## Question 4: Zoning Density



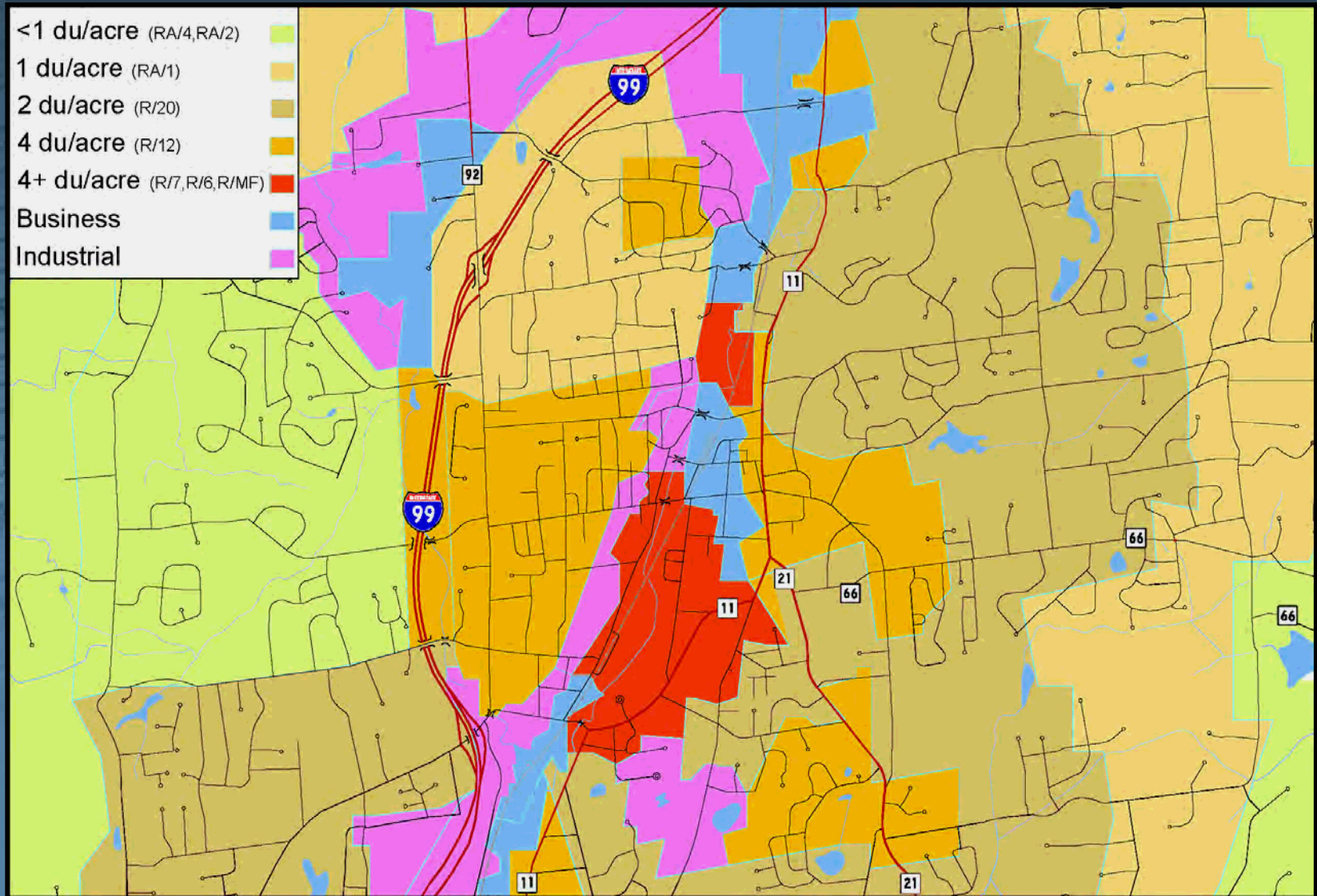
- Why include this as a priority condition?
  - *Higher population densities generate more pedestrian traffic*
  - *Filters out less populated areas that may have undesirable traffic conditions, but less of a pedestrian demand*
- Why not?
  - *Can exclude concentrated pedestrian traffic in outlying areas*
  - *Provides few alternatives to car-based travel in larger zones*

## Question 4: Zoning Density



- Measured in the number of residential dwelling units per acre (i.e. 2 du/ac = ½ acre single family lots)
- Commercial Zones – Greenwich Zoning Regs. Require sidewalks on both sides of the street in commercial zones
- Residential Zones
  - *RA-4, RA-2*
  - *RA-1, R-20*
  - *R-12, R-7, R-6, R-MF*
- Discussion often centers on whether to include R-20 (1/2 acre) and RA-1 (1 acre) zones

# Question 4: Zoning Density

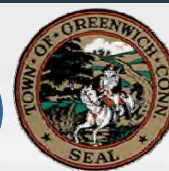


# Question 4: Zoning Density



- Question 4: What is the largest residential zone that should be considered for sidewalk planning purposes
  - *RA-4 (include all residential zones)*
  - *RA-2*
  - *RA-1*
  - *R-20*
  - *R-12*
  - *R-7, R-6, R-MF (include only those zones with >4 dwelling units per acre)*

## Question 5: Traffic Volume (Vehicular)



- Why include this as a priority condition?
  - *Key element when predicting accidents*
  - *High volume streets without sidewalks discourage pedestrian use*
  - *Higher volume = Fewer gaps for crossing*
- Why not?
  - *Volume data not readily available for all streets*
  - *Can be estimated using functional classification*
  - *Annual growth may continually add streets to the plan*

## Question 5: Traffic Volume (Vehicular)



- Two ways to measure traffic volume
- Average Daily Traffic (ADT)
  - *24 hour volume representing a typical day*
  - *Used for general roadway planning exercises*
  - *Assumes typical hourly distribution pattern*
    - *Noticeable volume peaks during AM and PM rush hour*
    - *Fairly consistent the rest of the day*
    - *Less activity during overnight period*
- Peak Hour Volume (PHV)
  - *Represents maximum activity during a typical day*
  - *Makes no representation for other time periods which may be typical or abnormally low.*

# Question 5: Traffic Volume (Vehicular)



- **Examples**

- *Arterials*

- *US Route 1 (Riverside)*    *21,000 ADT*            *1,698 PHV*
    - *North St.*                    *14,600 ADT*            *1,457 PHV*
    - *Sound Beach Ave.*        *10,000 ADT*            *899 PHV*

- *Collectors*

- *Tomac Ave.*                    *4,400 ADT*            *493 PHV*
    - *Patterson Ave.*                *5,500 ADT*            *607 PHV*

- *Locals*

- *Lenox Drive*                    *530 ADT*                *52 PHV*
    - *Park Ave. (Central)*        *1,900 ADT*            *230 PHV*

## Question 5: Traffic Volume (Vehicular)



- **Examples**

- *Concentrated volume during peak hour*

- *Henry Street*                      *1,200 ADT*                      *242 PHV*

- *Nearly 40% of traffic is during the AM and PM peak hours due to the proximity of Western Middle School and Hamilton Avenue School*

- *Maher Avenue*                      *1,100 ADT*                      *166 PHV*

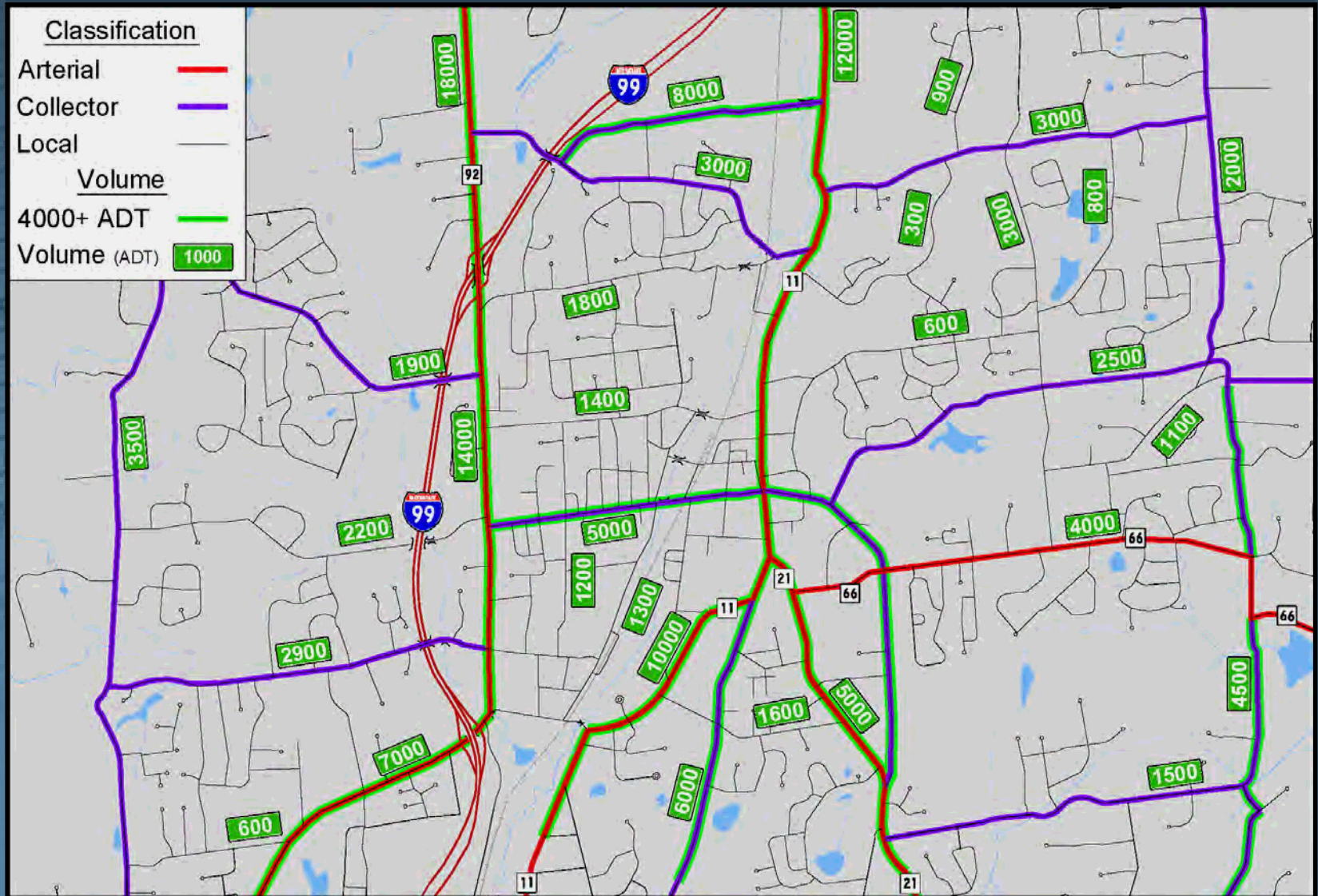
- *Nearly 30% of traffic is during the AM and PM peak hours due to the proximity of Brunswick School.*

## Question 5: Traffic Volume (Vehicular)

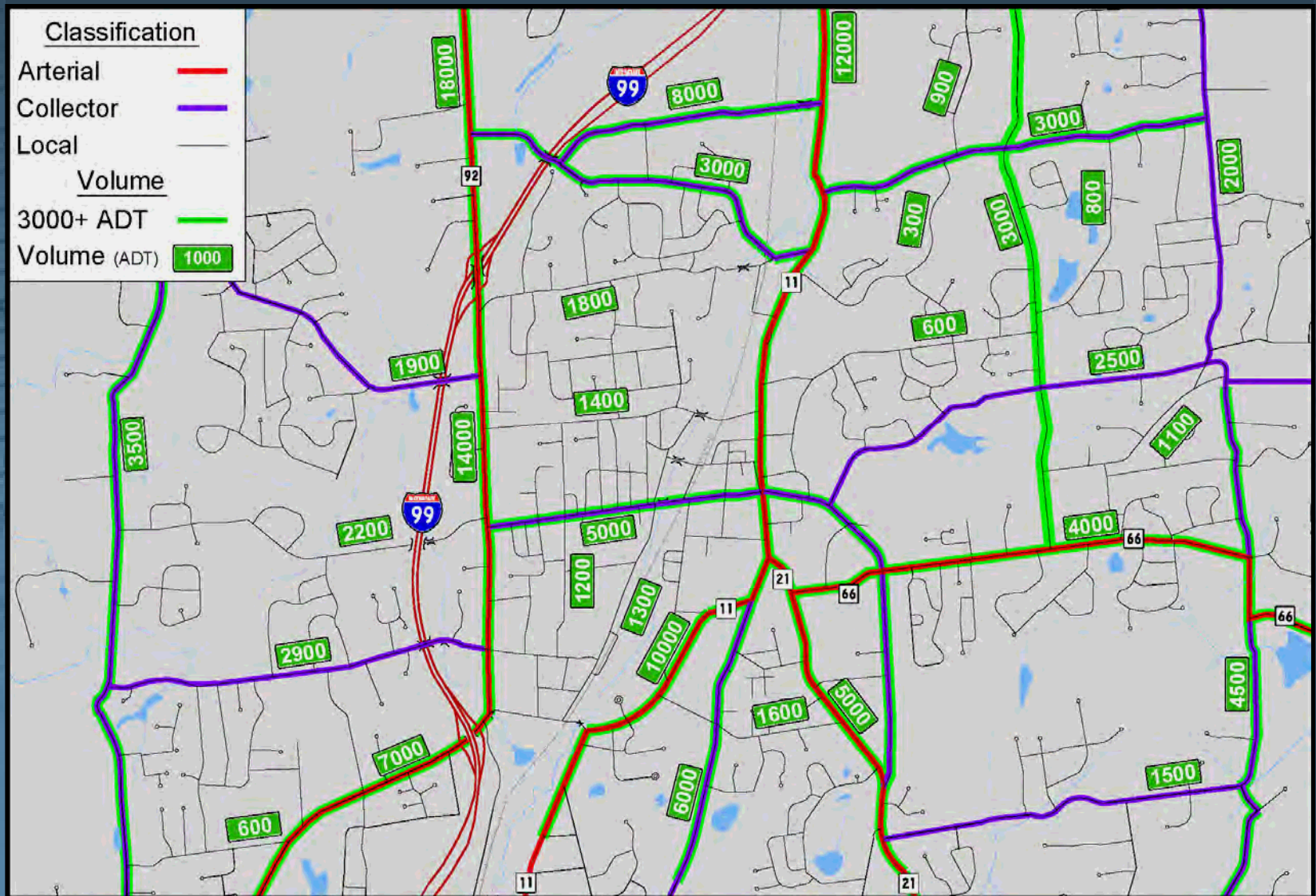


- How busy is a “busy” street?
- Helpful to think in terms of time
  - *How often do cars pass by on a busy street?*
    - *Every 5 seconds?*
    - *Every 10 seconds?*
    - *Once a minute?*
    - *Twice a minute?*
- If pedestrian walking speed is 3 ft/s than it takes 10 seconds to cross a 30 foot road.

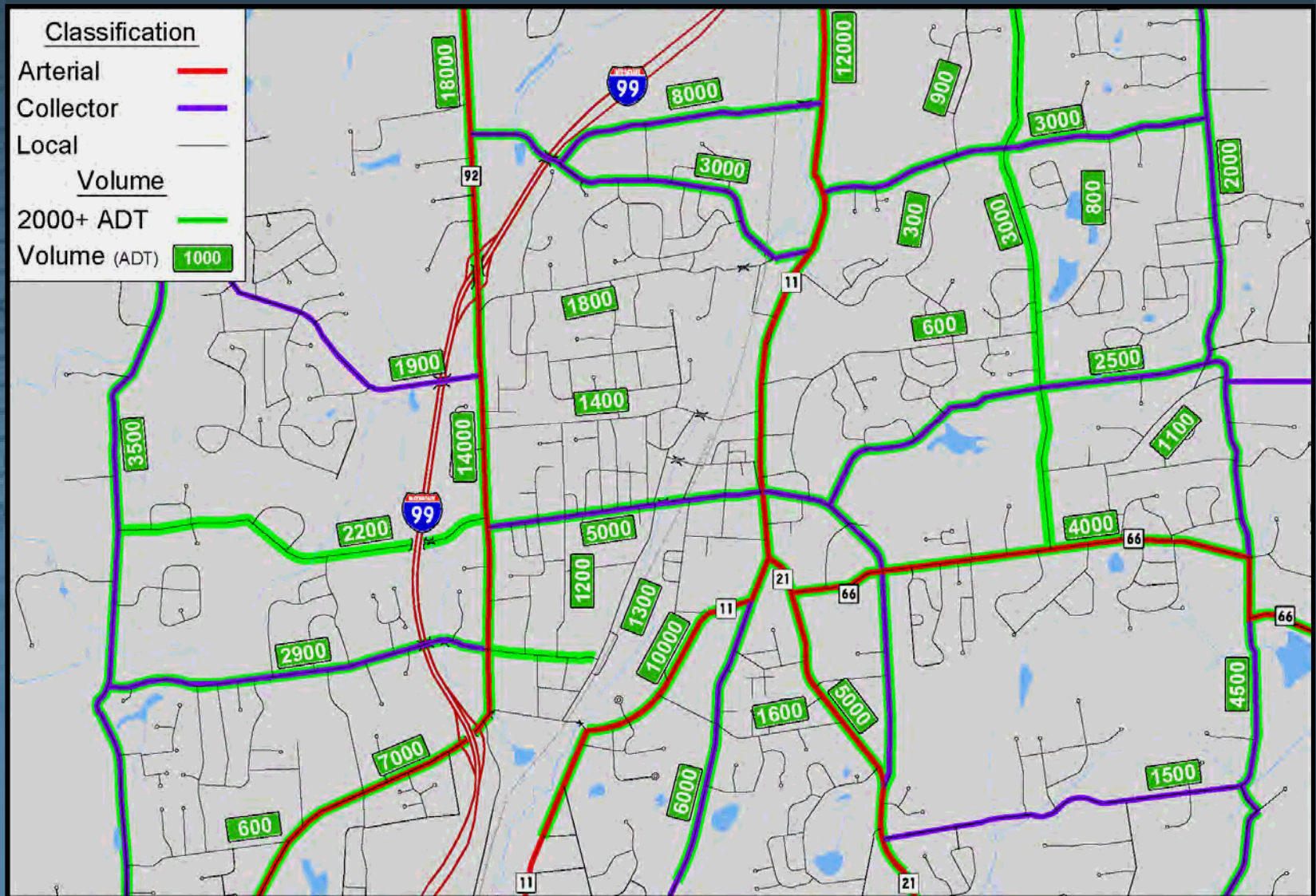
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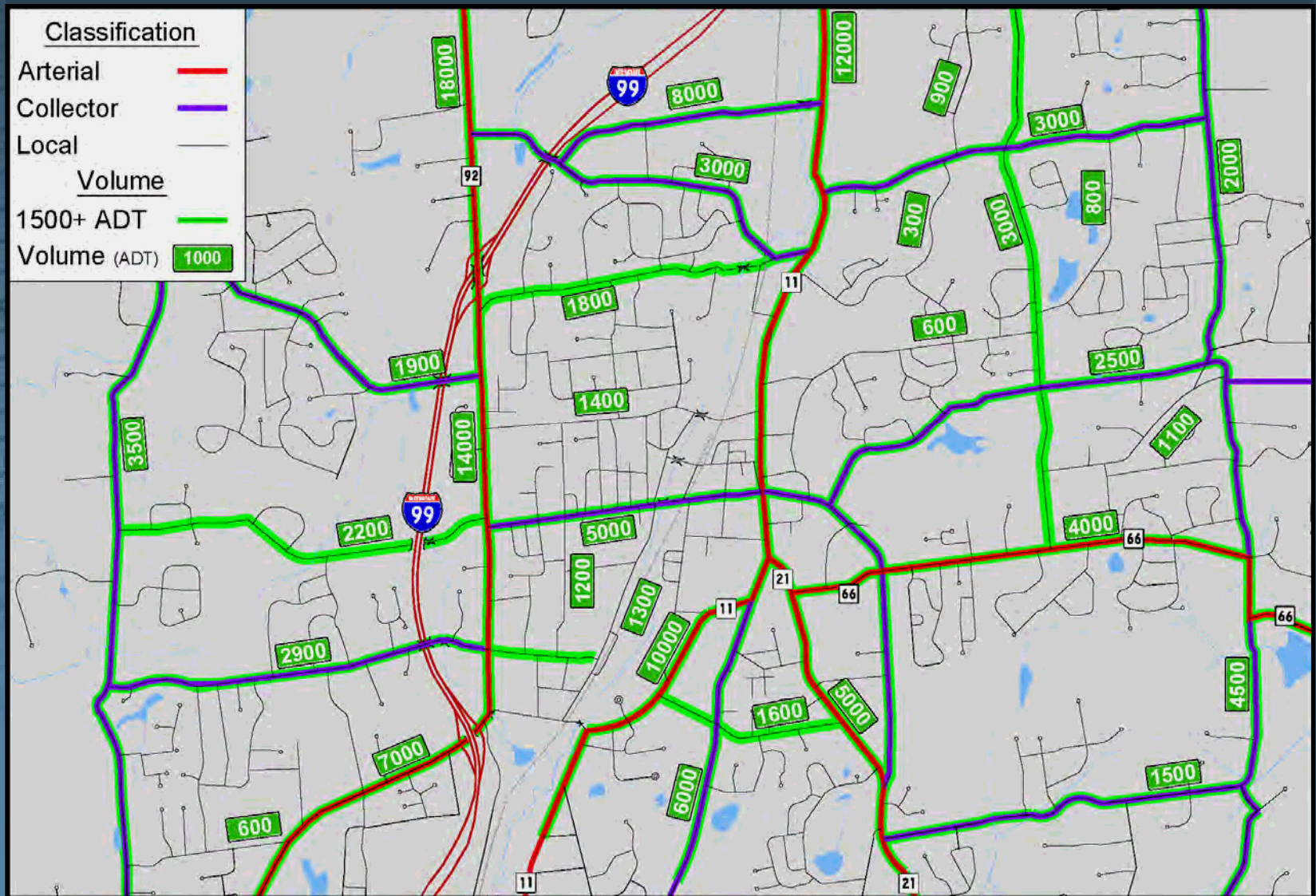
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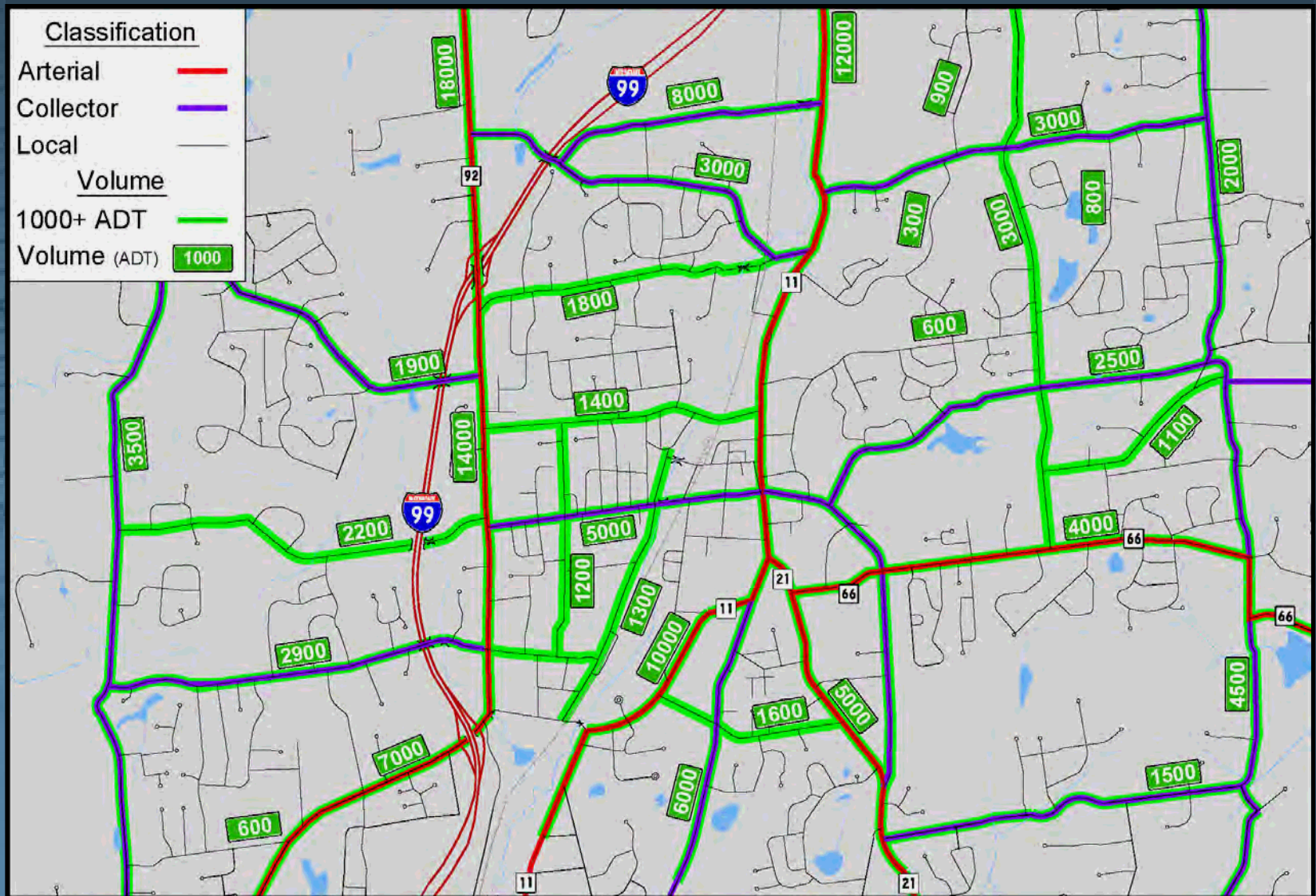
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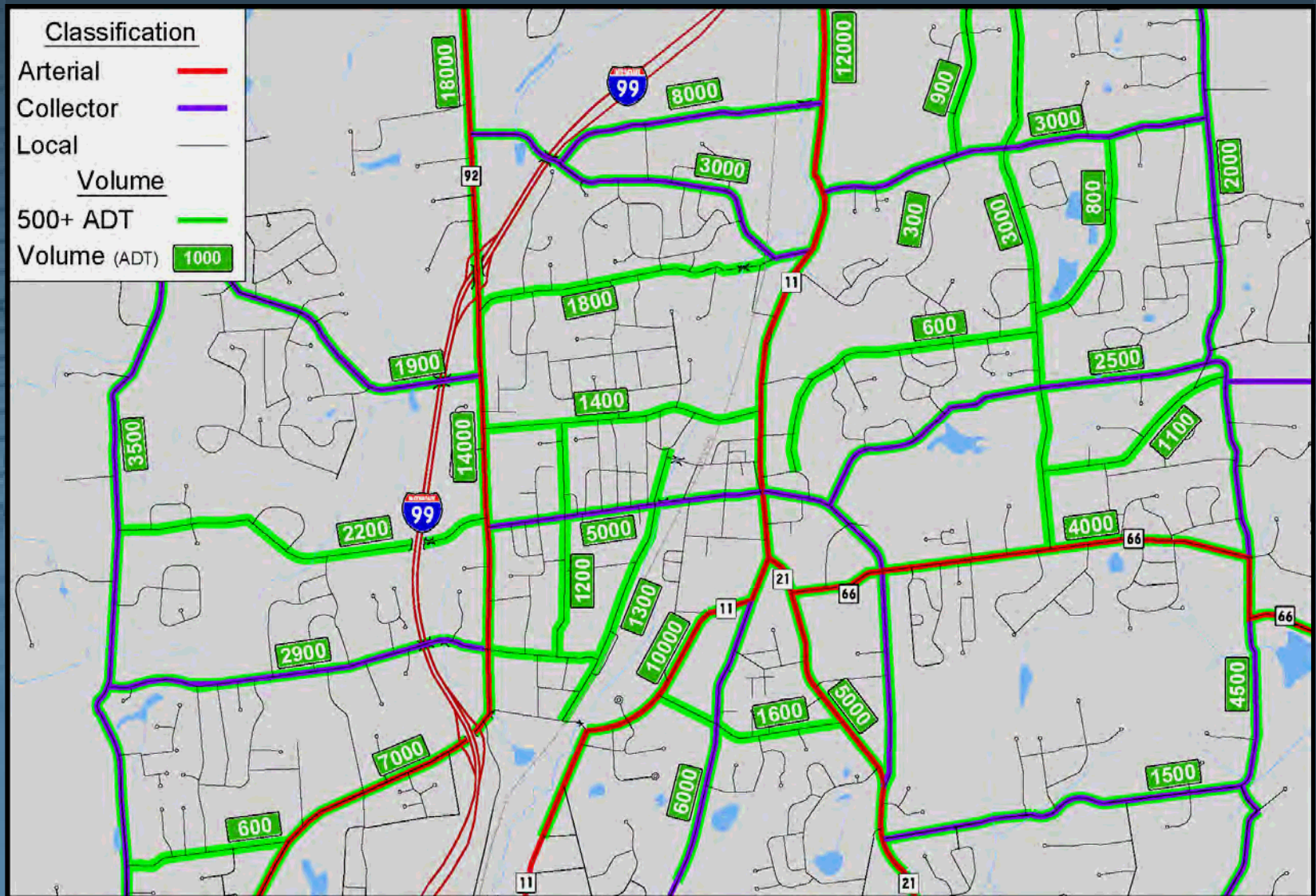
# Question 5: Traffic Volume (Vehicular)



# Question 5: Traffic Volume (Vehicular)



# Question 5: Traffic Volume (Vehicular)



## Question 5: Traffic Volume (Vehicular)



- Question 5: What level of traffic volume should require a sidewalk?
  - *How busy is "busy"*
  - *Does it matter if traffic is only heavy for a short period of time?*
  - *Should we only consider areas of consistently higher traffic?*

## Question 6: Traffic Speed (Vehicular)



- Why include this as a priority condition?
  - *Higher speeds require longer sight distances and greater separation from traffic to encourage pedestrian activity*
  - *Higher speeds require larger gaps in traffic for crossing*
- Why not?
  - *Speed data not readily available for all streets*
  - *Can be accounted for by using functional classification*
  - *Small speed deviation between streets of the same class*
  - *Traffic volume, lane width, and roadway curvature are better accident predictors than speed*

$$E = (365 \times ADT / 1000000) \times \exp(\beta_{st} - 0.04 \times ADT / 1000 + Ln f + Hazf + 0.12 \times HC + 0.05 \times VG)$$

## Question 6: Traffic Speed (Vehicular)



- The 85th percentile is:
  - *the speed at which 85% of the observed vehicles are traveling at or below.*
  - *based on the assumption that 85% of the drivers are traveling at a speed they perceive to be safe (Homburger et al. 1996)*
  - *Often used to set the posted speed limit (by engineers)*

Speed (mph)	Frequency of Vehicles	Cumulative Frequency	Cumulative Percent	Speed Percentile
21.4	3	3	3%	
22.2	2	5	5%	
23	1	6	6%	
24	7	13	13%	
25	8	21	21%	
26.1	9	30	30%	
27.2	11	41	41%	
28.9	13	54	54%	50th
30	9	63	63%	
31.5	10	73	73%	
33.3	10	83	83%	85th
35.2	9	92	92%	
37.5	6	98	98%	
40	1	99	99%	
42.8	1	100	100%	

## Question 6: Traffic Speed (Vehicular)



- Understanding the 5 mph rule of thumb:
  - *Sometimes used to determine whether the 85th percentile of speed is too high compared to the posted speed limit.*
    - *If the 85th percentile of speed is within 5 mph of the posted speed limit, then speeding not considered a significant issue.*
      - *Application varies by agency, some use a 10 mph rule*
      - *Other agencies use absolute speed as a benchmark (usually 35 mph)*
  - *Roadways are typically designed for 5 mph above the posted speed or measured 85<sup>th</sup> percentile speed*

## Question 6: Traffic Speed (Vehicular)



- Question 6: At what speed do passing vehicles make it undesirable to walk without a sidewalk?
  - *<25 mph (I don't consider it safe to walk on any street without a sidewalk)*
  - *25 mph (Speed limit on most residential streets)*
  - *30 mph (85<sup>th</sup>% speed on most residential streets +/- 2 mph)*
  - *35 mph (Widely considered to be excessive in 25 mph zone)*
  - *>35 mph (I generally feel safe walking on most streets)*

## Question 6: Traffic Speed (Vehicular)



- Question 6: What about your feelings in relation to the speed limit? Do you feel safe walking in the road...?
  - *<5 mph over (not safe on any street without a sidewalk)*
  - *5 mph over (not safe if speed is more than a few mph over the limit)*
  - *6-10 mph over (not safe if speeding is above 5 mph rule)*
  - *10-15 mph over (not safe if speeding is severe)*
  - *15+ mph over (safe walking on most streets)*

# Question 7: Roadway Width



- Why include this as a priority condition?
  - *The public right-of-way is for all users and should accommodate more than just cars*
  - *Adequate separation from vehicles is needed to encourage walking*
  - *On narrow roadways, even low traffic speeds and volume can be intimidating*
- Why not?
  - *There are many, many, narrow roadways in Town*
  - *Widths can vary greatly along a single roadway*
  - *Data not readily available*

# Question 7: Roadway Width



- Shy Distance
  - *Space left between vehicles or pedestrians as they pass each other. The amount of shy distance required for safety tends to increase with speed*
  - *The desired shy distance for a pedestrian is 2 feet (min.)*
- Minimum accessible width
  - *3 feet per ADA guidelines*
- Vehicle lane width
  - *12 feet is desired, 10 feet is practical minimum*

# Question 7: Roadway Width



- Adding up
  - $(2 + 3 + 12) \times 2 = 34$  feet or  $(2 + 3 + 10) = 30$  feet
  - *Pedestrians are generally not comfortable walking in the shoulder at less than these distances*
  - *Discomfort increases with speed and volume*
- Town of Greenwich Roadway Design Manual
  - *Minimum roadway width of 26 feet for new construction*
  - *Not many existing streets meet these guidelines*
- ConnDOT Highway Design Manual
  - *Recommends widths of 24-30 feet for similar roadways*
  - *The minimum width for bicycle lanes is 5 feet in each direction for a minimum width of 30 feet.*

# Question 7: Roadway Width



- Question 7: How wide should the road be for you to feel safe walking without a sidewalk?
  - <24 feet (*I can get by just about anywhere*)
  - 24 feet (*share the road and cars will go around*)
  - 26 feet (*I need at least 2 feet of space*)
  - 28 feet (*I need a defined shoulder or at least 4 feet of space*)
  - 30+ feet (*I need a full shoulder unless there is a sidewalk*)

## Question 8: Other Criteria



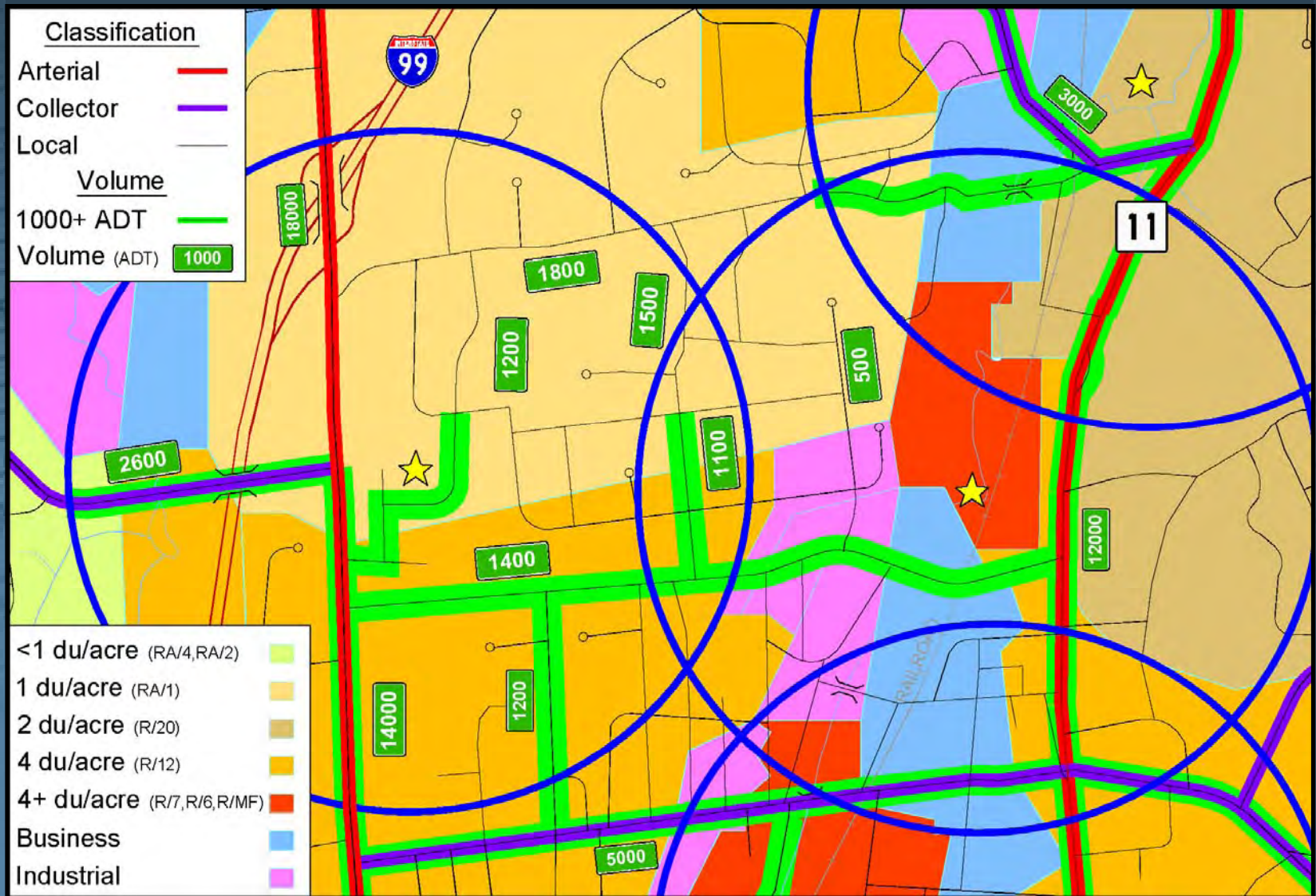
- Miscellaneous conditions that discourage walking
- Can be safety related or simply make walking unappealing
  - *Narrow bridges*
  - *Steep grades*
  - *Major street crossings*
  - *Lighting*
  - *Roadway Curvature*
- Accidents and gaps in the network continuity are automatic considerations and will be addressed by the Committee and DPW

## Question 9: Identify Priorities



- You are now a novice traffic engineer, Congrats.
- Use your new knowledge to assist the Committee in determining which conditions indicate the need for a sidewalk
- The Committee will select a number of criteria to create the draft master plan.
- By overlapping a number of criteria, the Committee will identify the areas with a demonstrated need for sidewalks

# Question 9: Identify Priorities



## Question 9: Identify Priorities



- You have a total of 10 points to distribute as you see fit on the different criteria. You may place all 10 on a single factor or spread them around
- The resulting master plan is a long term planning tool and does not necessarily mean a sidewalk project is imminent in a particular area
- Funding priority and resolution of design issues will greatly affect the timing of projects
- Projects with irresolvable design issues may be delayed indefinitely

# Question 10: Design Issues



- Planning is important, but many times physical restrictions dictate whether a project is ultimately built
- Question 10: Please offer your opinion on how the Town should proceed if confronted with the stated conditions.
  - *Many sidewalks may require easements from private landowners. Should the Town factor this into prioritizing projects for construction?*
  - *Removal of large trees or impacts to sensitive areas may be unavoidable. Should the Town factor this into prioritizing projects for construction?*
  - *Other impediments may be very costly to address. Should the Town factor this into prioritizing projects for construction?*

# Thanks for your participation!!



- Please return your questionnaires by January 5, 2009
  - *By placing them in the boxes located at the exit*
  - *To the Department of Public Works*
    - *by Mail, Fax, or in person at Town Hall*
    - *by Email through the DPW sidewalks website*
- Please return the pens for use at the next meeting

Town of Greenwich

# First Selectman's Pedestrian Safety Advisory Committee

Public Outreach – Sidewalk Planning  
Workshops

November 13<sup>th</sup> & 18<sup>th</sup> 2008

