



Efficient Bus Routing

CHALLENGES

- ▶ Increased & decreased ridership
 - ▶ Areas of growth
 - ▶ Seasonal
 - ▶ Sports
 - ▶ After school programs
 - ▶ Half day kindergarten
- ▶ Bus capacity
- ▶ Serve multiple schools
- ▶ Bell times
- ▶ Rural vs urban



Bus Capacity Utilization

- ▶ Federal regulations do not specify the number of students that can sit on a school bus seat. The school bus manufacturers determine the maximum seating capacity of a school bus. Generally, they fit three smaller elementary or two high school age students into a typical 39 inch school bus seat.
- ▶ School buses transport passengers in a wide range of sizes (height and weight), therefore it is not possible to define the absolute capacity of a school bus.

Special Needs Bus Capacity



Use the capacity listed divided by the original number of seats and adjust design capacity for the loss of each seat that is removed.

Add four back for each wheelchair position created.

Staggered Bell Times

- ▶ Where appropriate, each bus ideally would serve an elementary school, a middle school and a high school (three-tier staggered bell time).
- ▶ Rural and rural medium school districts have little capability to implement staggered bell times.

Routing Efficiency Development

- ▶ Computer routing software is available from many suppliers.
- ▶ Whether routing is done manually or by computer software, the basic information required is the same.
- ▶ Develop an auditing system that compares the routing software route or driver's route sheets to what is actually being driven.

Using GPS in Bus Routing



Optimizes routes for time and distance.



Observes where buses are traveling, where drivers are stopping.



Insures route compliance.



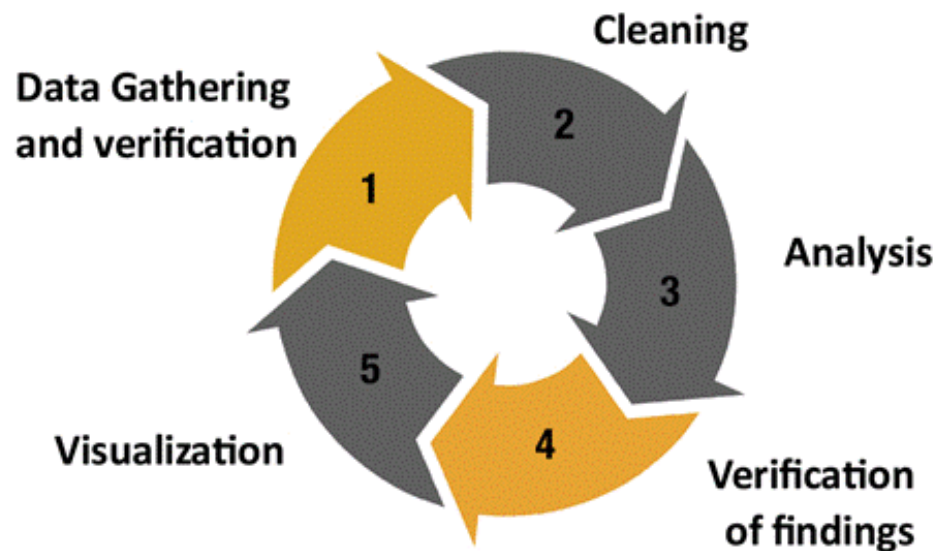
Tracks miles and minutes for state reporting.

Driver Audits

- ▶ Verifying routes for accurate miles and minutes compared to what the drivers are doing can be accomplished in one of three ways:

- ▶ Using GPS.
- ▶ Following drivers.
- ▶ Riding with drivers.

Phases of an investigation with data



Managing Maintenance & Operational Costs

- ▶ Well trained and certified bus technicians.
- ▶ Well trained and certified bus drivers.
- ▶ Alternative fuels
- ▶ Efficient sourcing of fuel
- ▶ Cameras
- ▶ Idle reduction
 - ▶ Utah law requires training of all school bus drivers in idle reduction
 - ▶ Diesel fired heaters
 - ▶ Heater pump systems