Saving Money by Routing Buses Efficiently

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Understanding Routing Efficiency and Effectiveness

"Efficiency is getting the job done ***right"***

Or

Efficiency is doing the most with the fewest resources

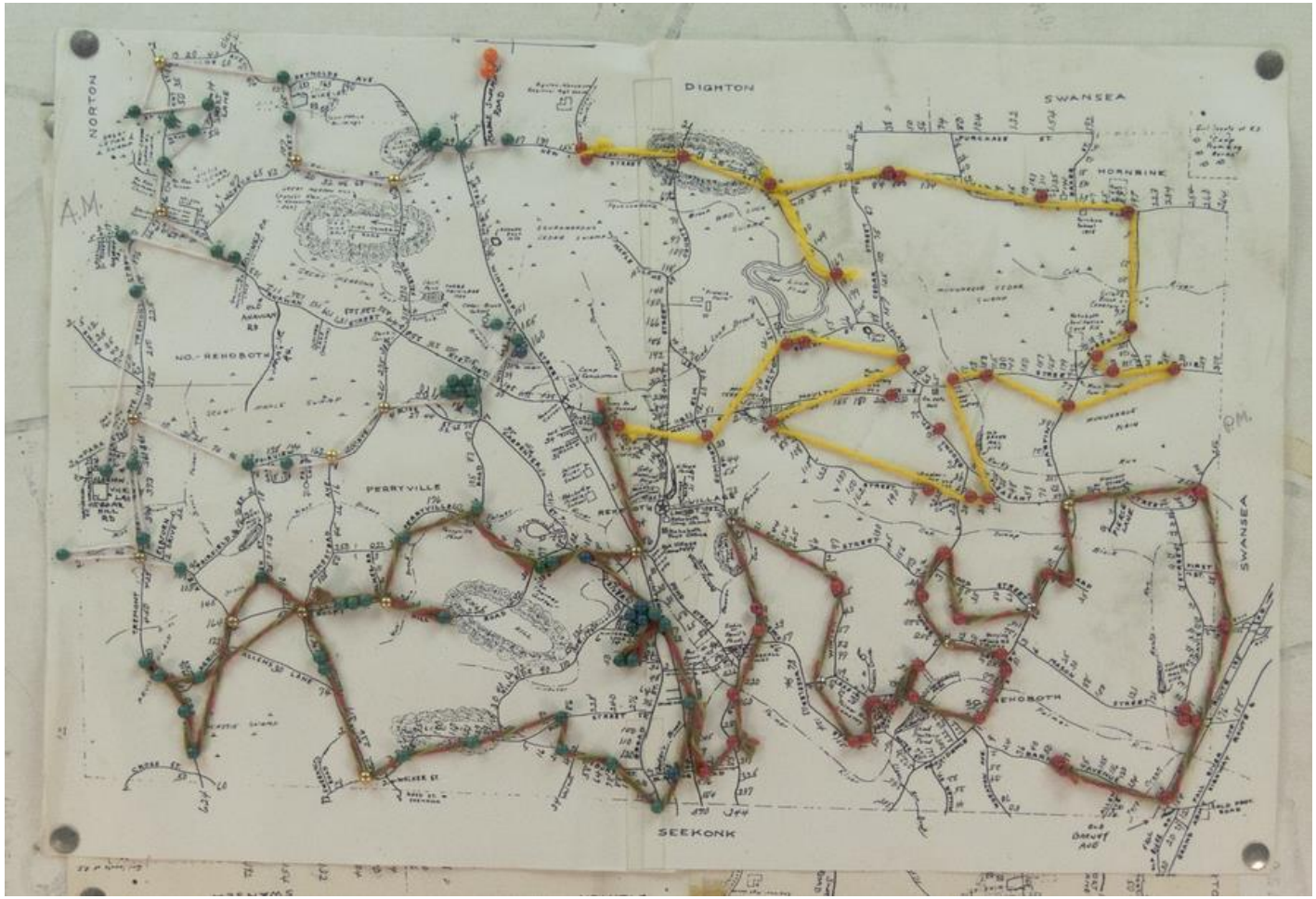
"Effectiveness is getting the ***right job done"***

Or

Effectiveness is providing services that meet or exceed an expected level

Are you Efficient or Effective?

- Hopefully, you are both!



Factors - driver issues

Drivers


I had a really bad day. First, my ex got run over by a bus. Then I got fired from my job as a bus driver.
Bummer.
ecards

Parents

From: [redacted]@ridesta.com>
Sent: Monday, August 18, 2014 7:36 AM
To: [redacted]
Subject: RE: HEY

Well can I have a favor and have a stop at [redacted] for my son and the neighbors girls? This would be my neighbors home. I live at 6.

From: [redacted]
Sent: Friday, August 15, 2014 9:22 AM
To: [redacted]
Subject: HEY

PUT AN ELEM STOP AT 7 REV PARKER.....YES I OWE HIM A FAVOR

[redacted]

Power of Parents

- School located in NC in a largely rural area
- One way in, one way out of the school
- 700 students attend
  - 7 buses transport 382 students
  - Assume the 318 students are car riders

- Huge traffic jam created by parents dropping students off on their way to work
- NC DOT came up with a solution – watch this video

Unionville
Elementary School
Tom Boyd Rd
Unionville Rd
Zack Rd
Google

Take a Look

- Are policies/procedures in place NOW
  - Number of students transported per bus?
  - Average ride time for students
    - The national average is 36 minutes for regular students; 38 minutes for special needs students.
    - In North Carolina the average ride time is 24 minutes; special needs students are in this same category and not broken out

Routing Assessment

- What policies/procedures are NOW in place that ***<u>aren't</u>*** giving efficient, safe routes
  - School Administrators
  - Bell times
  - Route Overlap
  - Eligibility requirements - transporting students not eligible for transportation
  - GPS – planned vs actual
  - Special Programs – choice schools, special needs
  - PARENTS dictating to you
  - Stop Location

What is an efficient Bus Route?

- Things to consider
  - Eligibility, who wants a ride
  - Bus route development
  - Bus stop criteria
  - Magnet or special needs runs
  - Student and Parent responsibilities
  - Bus Driver or Contractor concerns
  - Video, GPS, Stop Arm Cameras and review
  - Parent concerns
  - School administrators and school location: traffic patterns, loading/unloading safety
  - BELL TIMES

Figure It Out

- Student Data - how long students are on the bus?
- Bus parking overnight/mid-day
- Driver training
- Student Management

Numbers to Know

- Cost per student
- Cost per bus per day and per year
- Cost per trip
- Cost per mile
- Total seats/capacity available
- Buses needed per 100 riders
- Average ride times
- Trips Per Bus

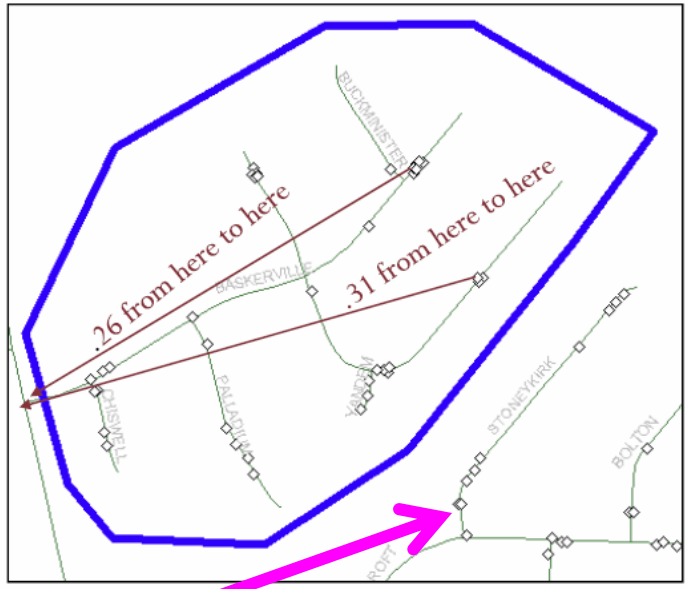
Best Practices

- Routing Software
- GPS Products
- Cameras
- Stop Locations

Examples!

- Do you know where your students are located and how many are in a neighborhood?
- Do you have measuring tools available (Google Earth, etc) to know how far they are from the main road?

- 62 Students
- Attend mostly two schools in the area



Legend = dots are students

Same Neighborhood – Google Earth

Google Earth

- Shows a right turn only out of community
- An available clubhouse on corner?
- Sidewalks show up
- BUT, it will not replace local knowledge!!

Show me How!

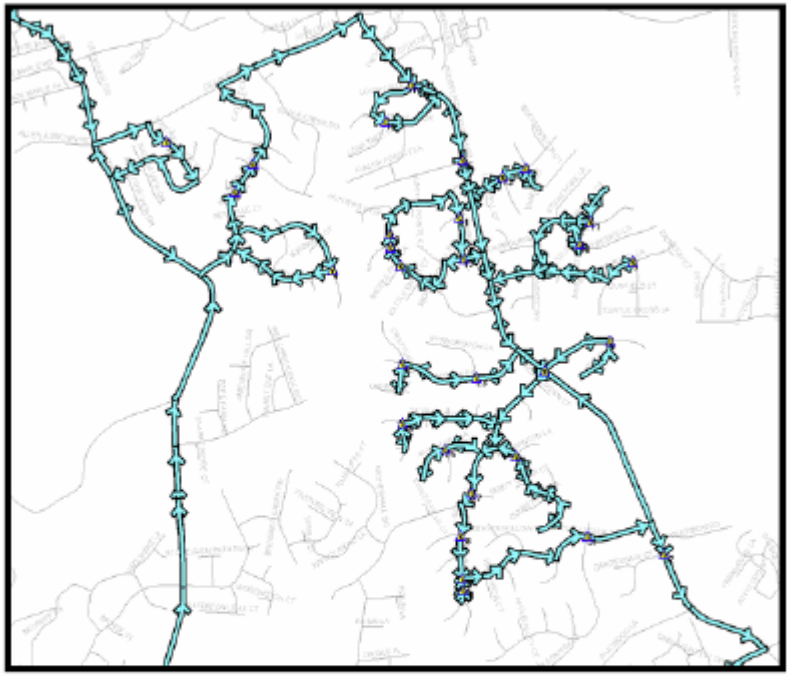
- Relocating stops to corners or to a common area in neighborhoods
- Ends the door-to-door pickups
- This will work in the more urban areas; not so much for rural areas – ***SAFETY*** of the students is the main consideration here!!!!

There's More …

- Instead of weaving in and out of neighborhoods, would your Board support streamlining stops creating more efficient bus routes?
- Knowing the cost per mile – in the following example it is $2.00 (driver pay, fuel, tires, etc included)
- Having the backing from Board, policy makers will help keep the stop locations from wandering back – especially if you associate a $$ figure!!!

Results?

Before



Cost: 31 miles 1-way

62 Miles per day

62 x $2.00 per mile = $124.00

$124.00 x 180 days of school

= $22,320.00 cost of running the bus

After

Cost: 18 miles one way

36 miles per day

36 x $2.00 = $72.00

$72.00 x 180 days of school

=$12,960.00 cost of running the bus

$9,360.00 savings making small changes

It can add up!!

Routing/Scheduling

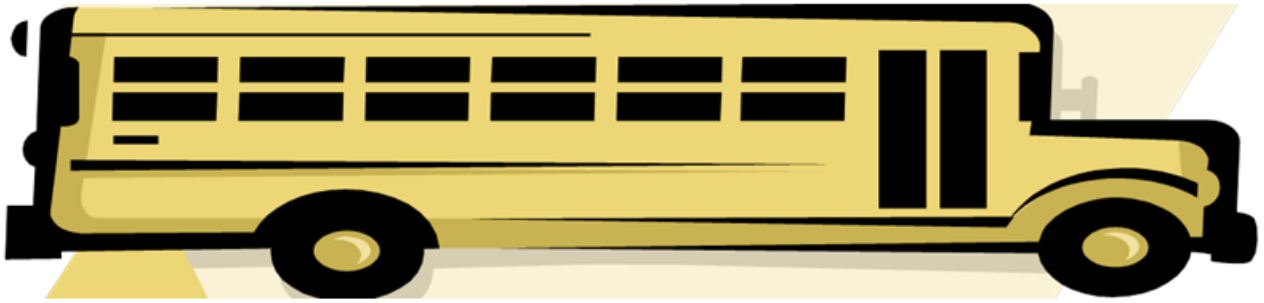
- High School
  - 8:00am
- Middle School
  - 8:00am
- Elementary School
  - 8:00am

* If all three schools start at the same time, then three buses are required to get the students to school.

Reusing buses by staggering bell times reduces the number of buses and costs.

Small Changes, BIG Savings

High School | Middle School | Elementary School



7:30 AM School Start | 8:15 AM School Start | 9:00 AM School Start

Offsetting bell times by 45 minutes under the same scenario reduces route fulfillment requirements from three buses to ONE bus.

Ditch School Bus Computer Routing, Study Says

January 04, 1986 | LEONARD BERNSTEIN | Times Staff Writer

The San Diego city schools' new $1.1-million computerized bus-routing system, which left thousands of children stranded waiting for buses in September, should be scrapped in favor of the traditional method of designing bus routes with pins and yarn on school district maps, a school system study recommends.

The report, which the Board of Education will consider Tuesday, suggests trying computerized routing again on a small-scale trial basis to determine if the system can handle the task of organizing bus routes for the 22,000 city school children transported each day.

"The evidence clearly indicates that the district neither achieved the desired and expected benefits nor improved the quality of service and, in fact, experienced a deterioration of service," the report said. The computerized system was designed by

In interviews and in the report, the five-person study team bluntly states that the downfall of the two-year effort to computerize the bus-routing system was a combination of a "blind faith in technology," turf wars between administrators, poor leadership and a lack of communication. Since last fall's problems, the district has returned to designing bus routes using maps and time schedules.

"There was an assumption that the technology could do what we wanted it to do, and we didn't test it before we got into it," said Ruben Carriedo, director of planning for the school system and chairman of the study team.

The report attributes blame for the snafu to everyone from Supt. Thomas W. Payzant to the administrators attempting to implement the system. But Payzant said, "Ultimately, I have to accept responsibility because the buck stops with the person at the top. I don't think there's any one individual on the staff who was responsible."

Payzant said the study team's analysis will not be used to discipline anyone. He said that he intends to gather school administrators' responses to the report before recommending whether the computerized routing system should be tried again next year.

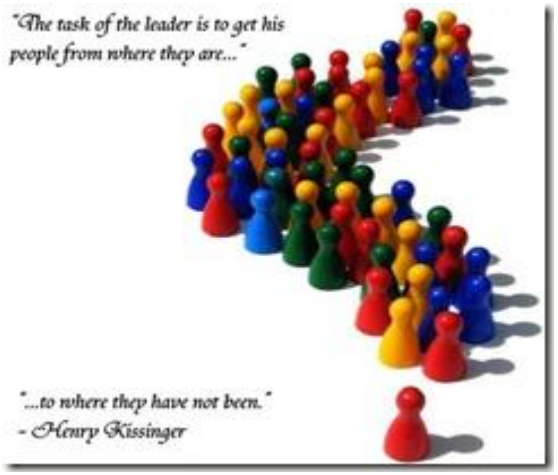
The report criticizes Payzant for failing to address concerns brought to him by his top administrators, possibly because project leader Virginia Barnes was issuing positive reports on her group's progress or because he was committed to making the system work. Barnes refused to comment on the report.

While software problems and the tremendous complexity of the system were the true problems, "the conclusion I drew, in retrospect, was probably the wrong one . . . that what I needed to do was to push people to work a little harder and get their act together," Payzant said.

The study also notes that:

Obstacles & Pitfalls

- Blind faith in technology
- Lack of communication
- Poor leadership
- Turf wars between administration
- No plan for implementing changes
- Inadequate training



This too, shall pass…

- Change – who likes it?
- Tight Budgets
- Backing from Board/Administrative staff
- TEST, TEST, TEST the changes before the “Roll Out”

Questions?


SLOW
SCHOOL
ZONE