

Compromise: A Necessary Element of Sacramento's LRT "Starter Line"

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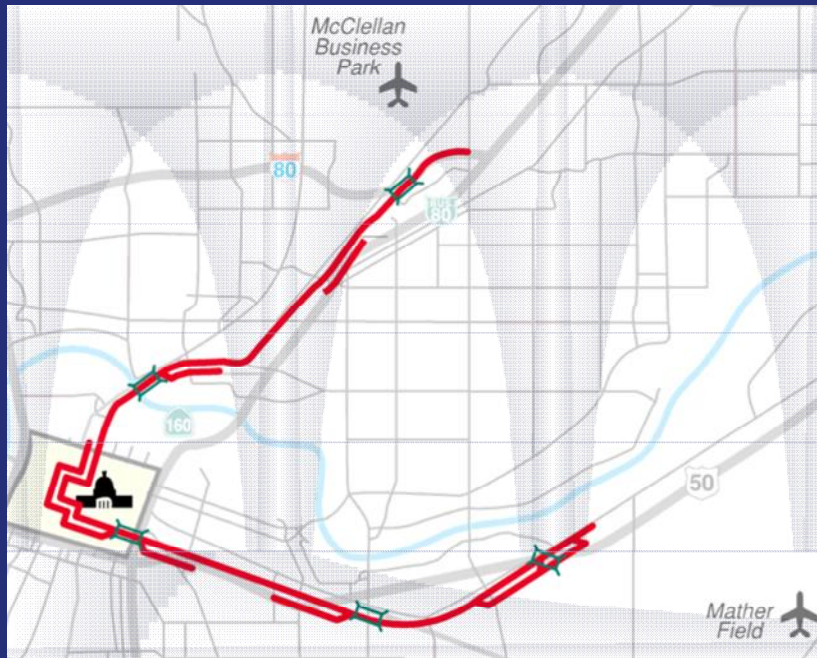


Key Presentation Take Aways

- Don't let the perfect get in the way of the good
- Seize opportunities when they arise
- Design for future upgrades, extensions
- Compromise judiciously when necessary

In Sacramento, no compromise \equiv no project

Starter Line: 1987



- **System: 18.3 miles**
- **61% single track**
- **27 stations & 8 Park- n-ride lots**
- **26 vehicles**
- **Maintenance Facility**
- **Cost: \$174.5 million (\$9.5 million/mile)**
- **Ridership: 6,000/day**



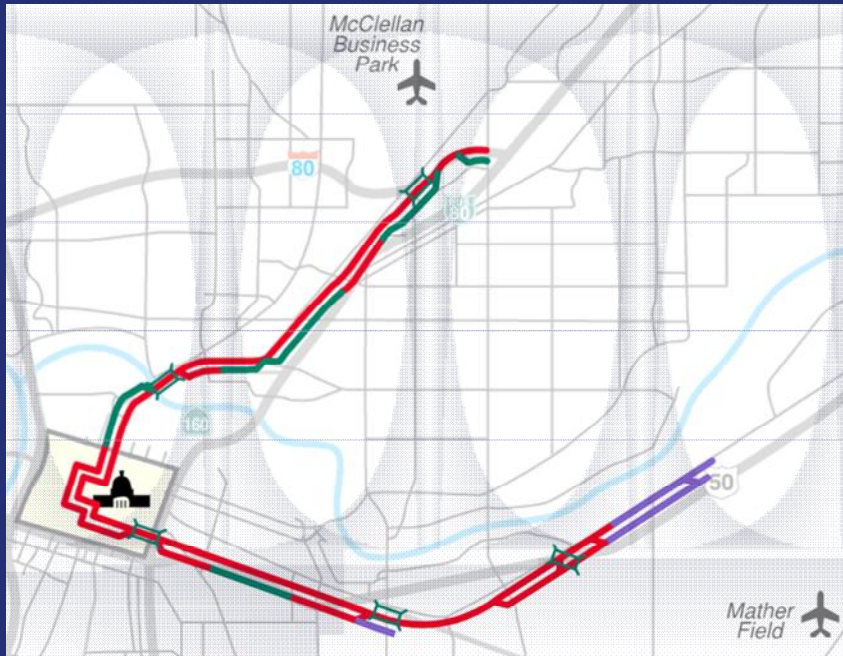
First 10 Years: Building Service Reliability



- 5 Double-track projects
- System: 18.3 miles
- 31% single track
- 2 stations & 1 PNR lot (system 29/9)
- 10 new vehicles (fleet 36)
- Cost: \$16.9 million
- Ridership: 27,000/day



First Extension (Mather Field): 1998



- 2.1 mile Extension and 1.2 miles double-track (system 20.4 miles)
- 22% single track
- 1 station & 1 PNR lot (system 30/10)
- No additional vehicles (fleet 36)
- Cost: \$33.1 million (\$14.4 million/mile)
- Ridership: 29,000/day

LTK South Sacramento Corridor: 2003



- **6.3 miles (system 26.7 miles)**
- **17% Single track**
- **7 stations & 3 PNR lots (system 37/13)**
- **24 vehicles (fleet 60)**
- **Cost: \$222 million (\$35.2 million/mile)**
- **Ridership: 37,000/day**

Sunrise Extension: 2004



- **2.7 mile extension & 2.6 mile double-track (system 29.4 miles)**
- **8% single track**
- **3 Stations & 1 PNR lot (system 40/14)**
- **16 vehicles (fleet 76)**
- **Cost: \$98 million (\$19.5 million/mile)**
- **Ridership: 47,000/day**



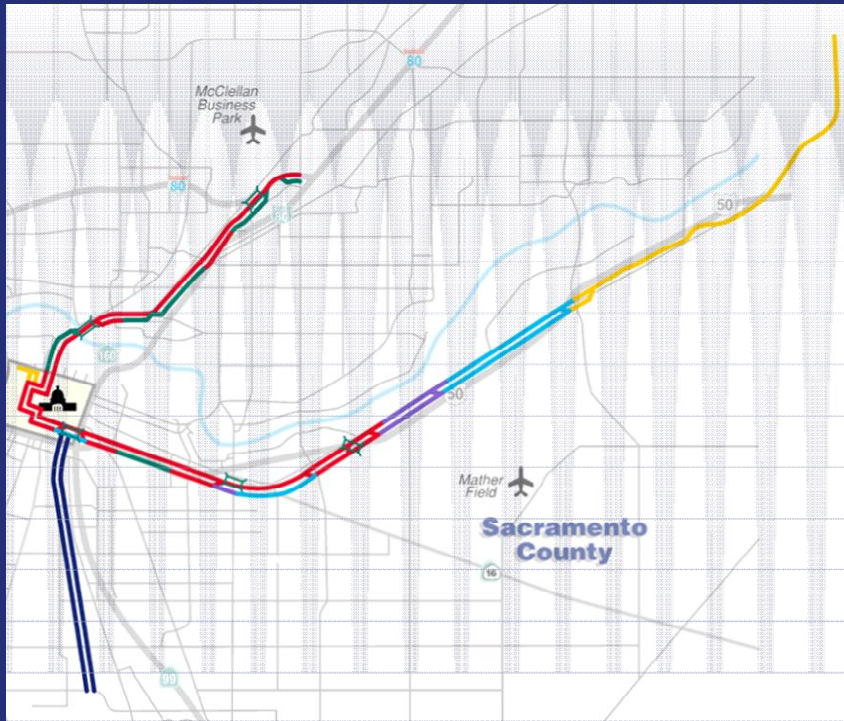
Folsom Extension: 2005



- **7.3 mile extension (system 36.7)**
- **20% single track**
- **4 stations & 4 PNR lots (system 44/18)**
- **No additional vehicles (fleet 76)**
- **Cost: \$123 million (\$19.5 million/mile)**
- **Ridership: 58,000/day**



Amtrak Extension: 2006



- 0.7 miles (system 37.4)
- 21% single track
- 3 stations (system 47/18)
- No new vehicles (fleet 76)
- Cost: \$40 million (\$19.5 million/mile)
- Ridership: 59,000/day



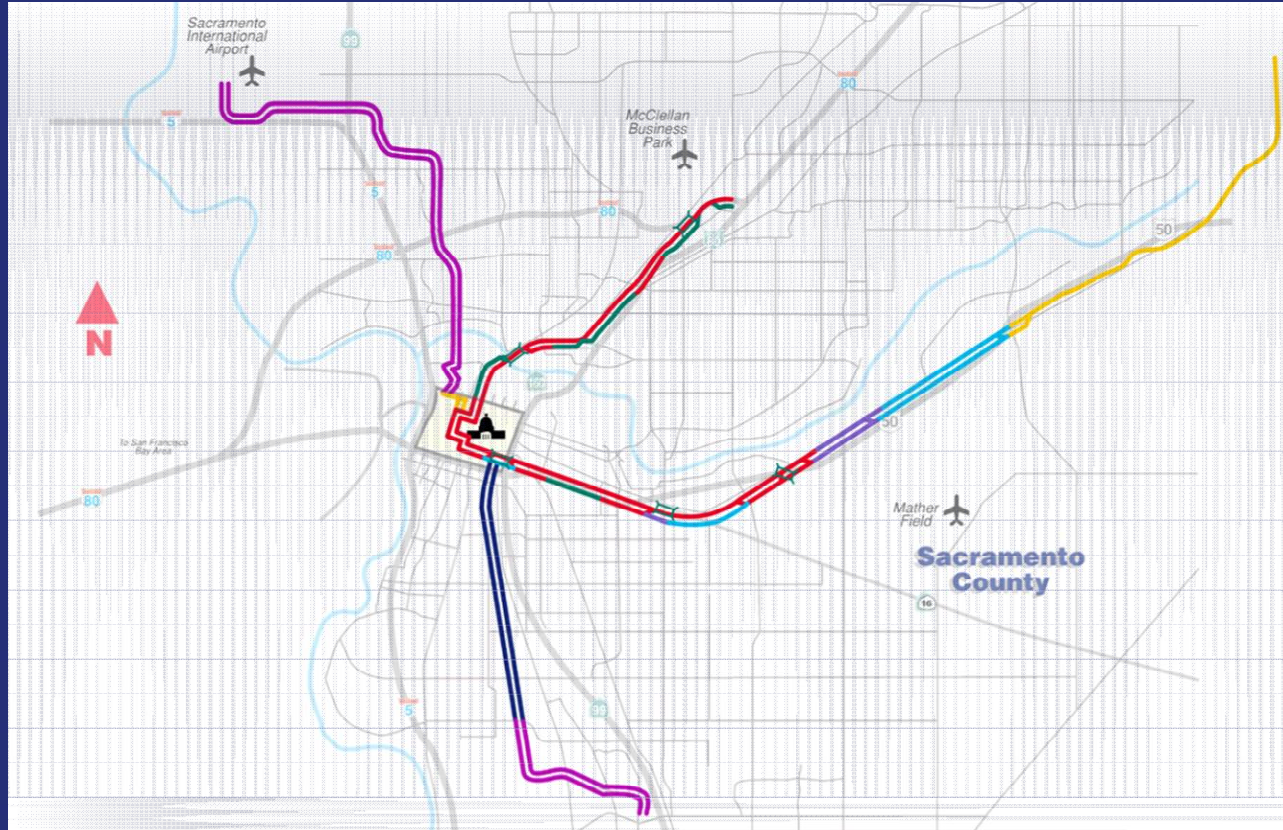
Green Line to the River District 2012



- 1.1 miles of new construction from H Street to Richards Boulevard
- New stations at 8th and H, and 7th and Richards
- Station names: 8th & H/County Center and 7th & Richards/Township 9
- 2.2-mile route from 7th & Richards to 13th Street Station



Planned Extensions



LTK Sacramento's LRT Investments

ITEM	STARTER	BUILD-OUT	EXTENSIONS	SOUTH	AMTRAK / RIVER	TOTAL
Line Miles	18.3	--	12.1	10.6	1.8	42.8
LRVs	26	10	16	24	21	97
Initial \$Mil	\$175	\$31	\$254	\$492	\$84	\$1,036
Avg \$Mil/Mile	\$9.6	\$1.7	\$21.0	\$46.4	\$46.7	\$24.2



Sacramento's Challenges

- Growing population
- Increasing congestion
- Opposition to more freeways
- Limited transit funding
- Thinly-served all-bus regional network



Sacramento's Opportunities

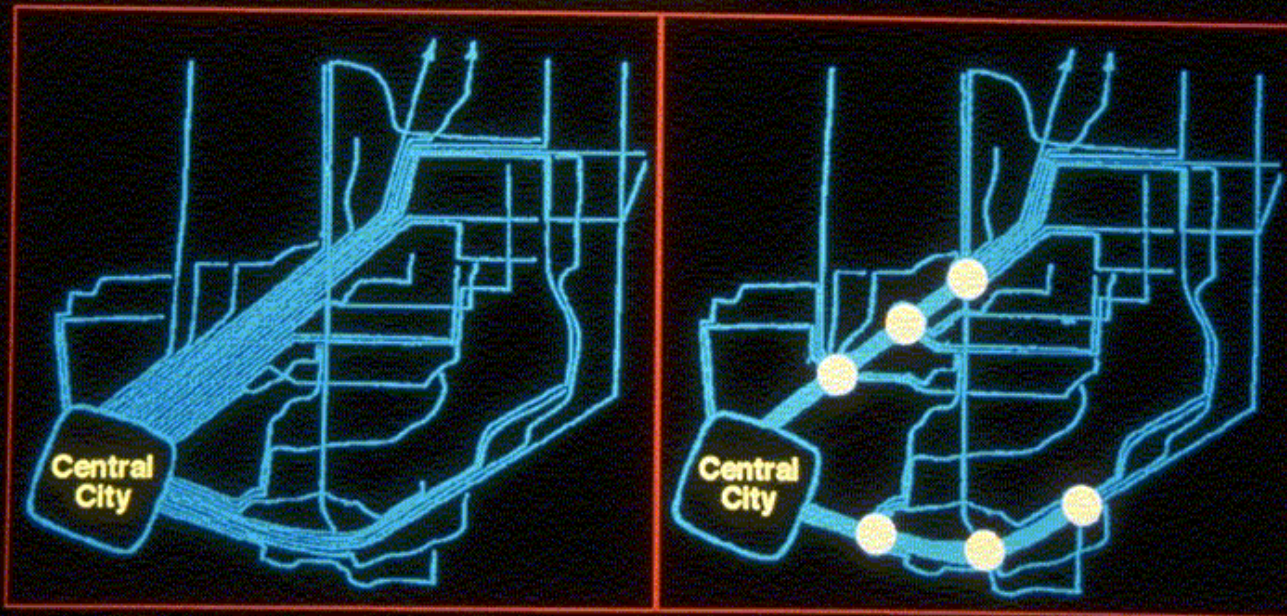
- Interstate Transfer entitlement
 - Time-limited “window of opportunity”
- Supportive state administration
- Pro-transit officials: city, county, RT
- Dedicated & vocal advocates
 - All supported building LRT



System Development Concept

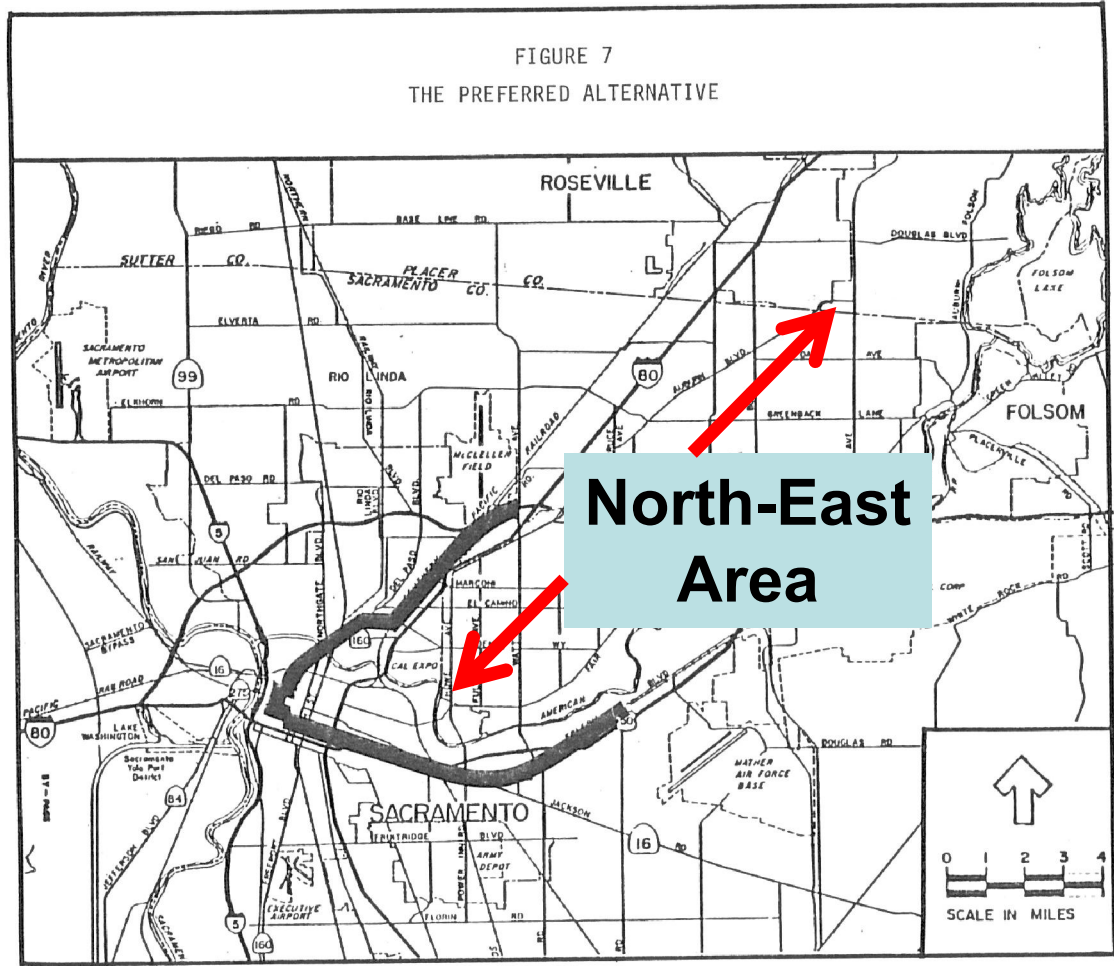
- Create “transit center” based system
- Construct LRT in primary corridors
- Redeploy buses to feed LRT trunks
- Build & operate economically
- Design for future build-out & expansion

Bus/ LRT Service Concept
Shows Northeast and East bus services before and after introduction of LRT in Sacramento.



White Circles = Transit Centers

- Long enough to be regionally significant
 - Not just a downtown circulator
- Serve greater North-East area
 - 2/3 of regional population
- Limit investment to “available” funds
 - Interstate Transfer
 - Minimal state/local matching



Key Design Principles

- Use available rights-of-way
- Limit investment to “starter line” facilities
- Employ proven, off-the-shelf equipment
- Build for efficient, no frills operation
 - System design derived from operating plan

Key Design Principle: **Build for Efficient, No Frills Operation**

- 15-minute LRT headways
 - Mesh w/buses on 15 or 30 minute headways
 - Enable 60% single track LRT line
 - Remove 60 peak hour buses downtown
- 4-car peak period trains
 - Match LRT capacity to forecast demand
- Large Park-Ride Lots
 - Compensate for limited bus/walk access

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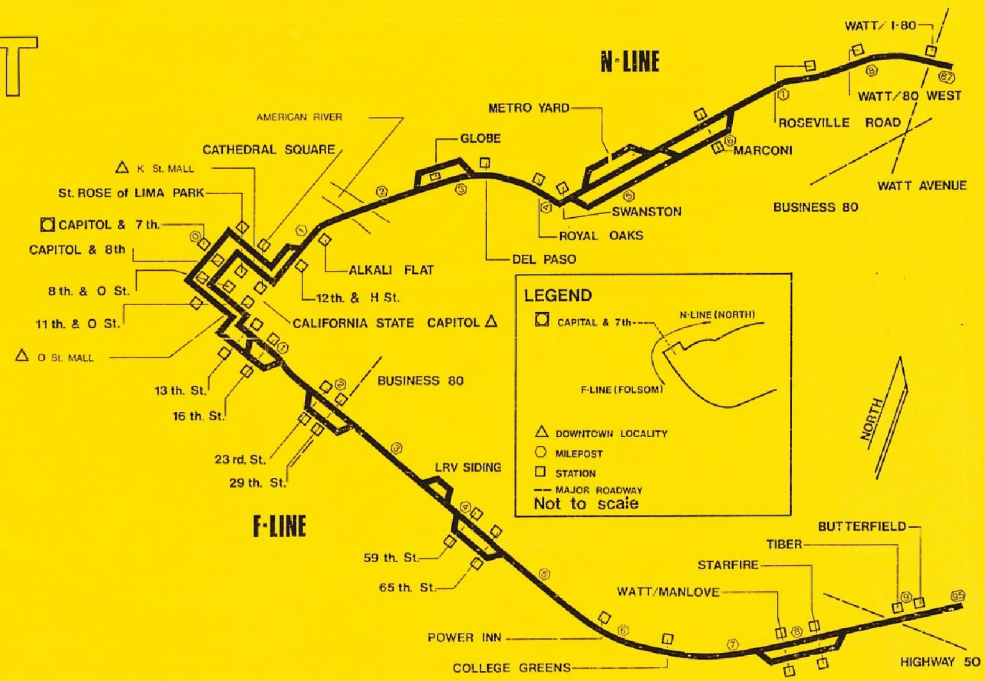
Intent: Coordinated Transit



Key Design Principle: Use Available Rights-of-Way

- 47% - Former freight RR branches
- 25% - Excess freeway lands
- 2% - Other private rights-of-way
- 12% - Reserved street lanes
- 4% - Pedestrian malls (K & O Streets)
- 10% - Shared street lanes

REGIONAL TRANSIT



TRACK CHART

SHEET 1 of 23
Revised: 7-14-87

Key Design Principle: **Limit Investment to Starter Line**

- Design for full double track, but build 60% single track
- Size substations for 4-car trains
- Design signals for 15-minute headways
- Run line-of-sight with traffic light priority in lower speed 2-track territory ≤ 35 mph
- Minimal shop/yard w/land to expand

Key Design Principle: **Employ Proven, Off-the-Shelf Equipment**

- LRVs used by others – Siemens U2A
- Conventional track materials, methods
- Conventional power, signals, commo



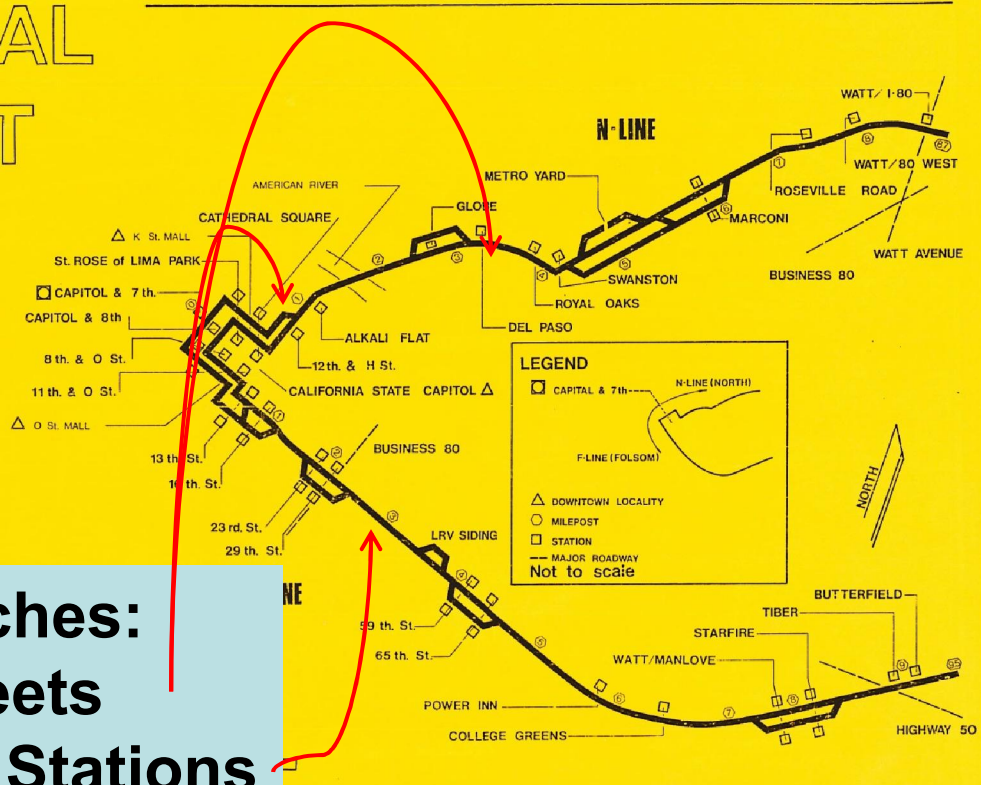
Was It Perfect? No, But It Was Good!

- The LRT line worked as planned
 - Realistic operating plan, timetable
- We blew the capital budget by 34%
 - Only LRVs & bridges were below estimates
- Ridership built slowly at first
 - Until bus/LRT connections implemented
- RT needed 10 more LRVs immediately
 - 4 cars on all 8 peak service trains

Did It Work? Yes

Forgiving TT Able to Accommodate

REGIONAL TRANSIT



Minor Glitches:

- Tight Meets
- Missing Stations



Was It Worth the Effort? Yes!

- Transit riding has grown:
 - LRT/wkdy: 20,500 (1990), 28,000 (2000)
 - System/year: 14 mil to 28 mil (1987-2000)
- LRT + bus connections work
- Money Was Found to Build Out & Extend
 - 18.3-mile Starter Now Mostly Double Track
 - 42.8 miles Expanded LRT as of 2015



RT's Growing LRT System

42 Miles Now – 53 Miles Future

- \$175 Million starter line
 - \$9.6 million per mile
 - Demonstrated desirability of rail
- Kept transit relevant & useful to more people in metro area
- Created momentum to fund & build more
 - Successful local referenda

- No compromise \equiv no project, but...
- No project = continuation of weak transit
- Seized opportunity = better service, sooner
- Building Starter Line:
 - Increased transit efficiency & riding
 - Generated consensus to fund build-out & extend system (7 projects to date)

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In Sacramento, LRT Made Transit Better

Thank You



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