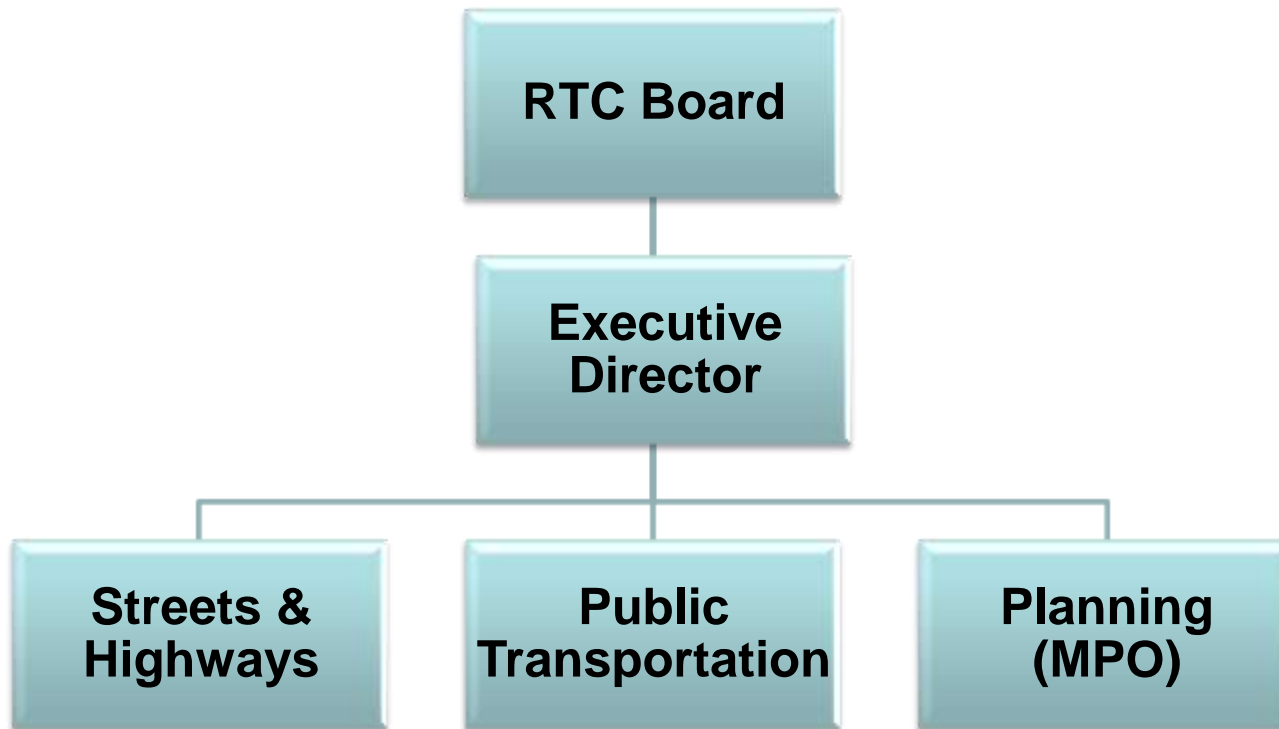




Green Transit Centers

By: Chris M. Tschirhart, MBA, PE
For: Nevada Transportation Conference
April 8, 2009

RTC of Washoe County: What We Do



Public Transportation - Programs

RIDE (fixed route intra-city bus service)

SIERRA SPIRIT (downtown Reno circulator)

INTERCITY (commuter express service to Carson City)

ACCESS (paratransit service)

TART (Tahoe Area Regional Transit)



RTC 4TH STREET STATION

200 E 4th Street, Reno (next to Natl. Bowling Stadium)
Begin construction in April 2009, Open in summer 2010



4TH STREET STATION

**PARSONS
BRINCKERHOFF**



RTC CENTENNIAL PLAZA

1421 Victorian Ave, Sparks (Victorian Square area)
Opened in October 2008



RTC CENTENNIAL PLAZA
Sparks, Nevada

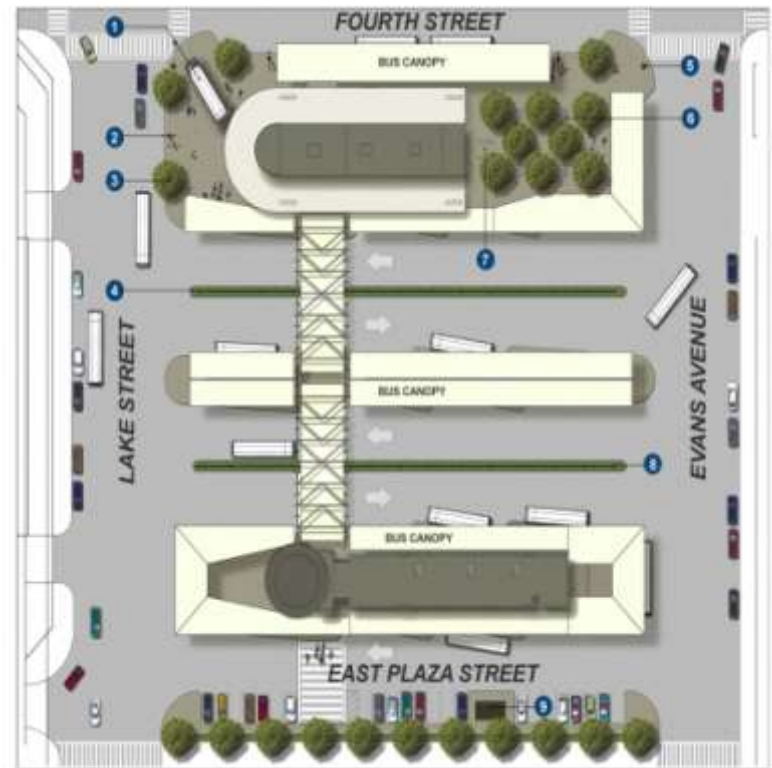
RTC CENTENNIAL PLAZA (Sparks)

- 15 bus bays (with canopies)
- 13,000 sf transit building
- Passenger amenities
- Park-like setting
- Public art
 - 40' tall Cowcatcher sculpture (by Donald Lipski)
 - large mural (by Loren Jahn)
- Space for transit-serving retail
- **Green** building



RTC 4TH STREET STATION (Reno)

- 25 bus bays (with canopies)
- Three transit islands
- 14,900 sf of transit buildings
- Passenger amenities
- Quality landscaping
- Public art
- Space for transit-serving retail
- **Green** building



Green Buildings

- **US Green Building Council (USGBC) LEED program**
- **LEED – Leadership in Energy and Environmental Design**
- **Six Categories**
 - **Sustainable Sites**
 - **Water Efficiency**
 - **Energy & Atmosphere**
 - **Materials & Resources**
 - **Indoor Environmental Quality**
 - **Innovation & Design**

Environmental & Financial Benefits

- **Lower operating costs** and increased asset value
- **Reduce waste** sent to landfills
- **Conserve energy and water**
- **Healthier and safer for occupants**
- **Reduce harmful greenhouse gas emissions**
- **Qualify for tax rebates, zoning allowances and other incentives in hundreds of cities**
- **Demonstrate an owner's commitment to environmental stewardship and social responsibility**

Source: USGBC website



- **Point system based on credits**
- **LEED for new construction: NC v2.1 & NC v2.2**
- **LEED Rating Levels (69 total possible credits)**
 - **Certified: 26 – 32 credits**
 - **Silver: 33 – 38 credits**
 - **Gold: 39 – 51 credits**
 - **Platinum: 52 – 69 credits**
- **RTC transit centers**



2.5. Green Building Council

Sustainable Sites

- **Redeveloped existing urban site**
 - Enhance community connectivity
 - Proximity to hotel & gaming, restaurants, retail centers & community services
 - Contributing to the progressive & vibrant streetscape of downtown Sparks
- **Erosion & sedimentation control (prerequisite)**



SS: Alternative Transportation

- **Three Credits:**
 - **Public Transportation Access**
 - **Bicycle Storage & Changing Rooms**
 - **Parking Capacity**
- **Reduces reliance on automobile use & promotes alternative transportation (bicycling & walking)**
- **On-site employee parking limited to the minimum number of parking spaces required by City of Sparks**
- **All RTC RIDE buses have bike racks**
- **Bicycle racks/lockers & employee changing facilities**



SS: Stormwater Management

- **Two credits:**
 - Rate or Quantity
 - Treatment
- **Capture all roof and surface storm waters & divert into an oil/grease/debris separator, then into an on-site infiltration system**
- **Benefits: Increases on-site water infiltration, reduces pollution from storm water runoff, & helps eliminate contaminants from entering the storm water system**

On-site infiltration system



SS: Reduce Heat Islands – Roof & Non-Roof

- **The color of the paving and roofing materials was selected to reduce heat islands (thermal gradient differences between developed and undeveloped areas), which helps minimize impact on microclimate and human surroundings**



Water Efficiency

- **Three Credits:**
 - **Efficient Landscaping (reduce by 50%)**
 - **Water Use Reduction (reduce by 30%)**
- **Select native plants to reduce need for irrigation**
- **Drip systems use less water; no grass turf**
- **Highly efficient toilet fixtures (including waterless urinals) & automatic controls on lavatories**
 - **Plus foaming soap dispensers & electric hand dryers (no paper)**

Examples of native plants with drip irrigation



Hardscape (no turf) & landscaping outside



artificial trees inside

Water Efficiency – inside building

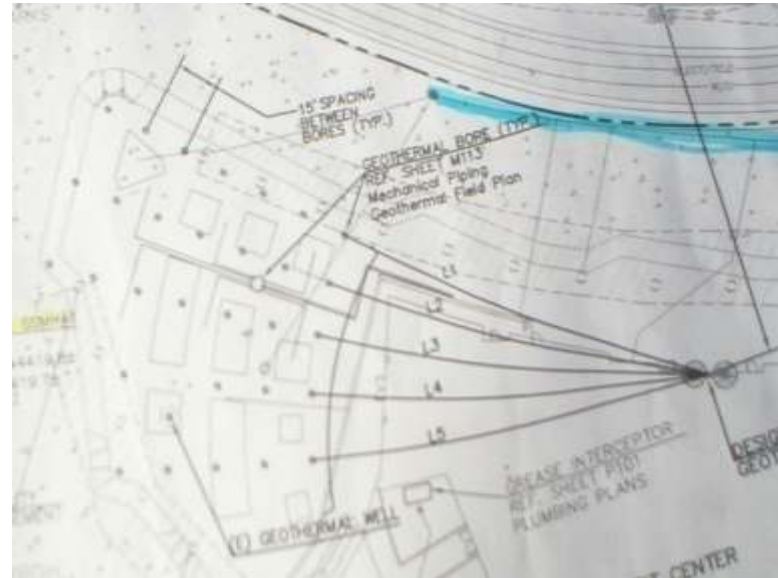
- Automatic controls on lavatories
- Foaming soap dispensers
- Electric hand dryers
 - Added benefit of reducing O&M costs
- Waterless urinals
 - Required variance from Sparks building official
 - Building codes evolve slowly
- Considered but rejected:
 - Composting toilets
 - Use of reclaimed water



Energy and Atmosphere

- **Three prerequisites**
 - fundamental commissioning (processes to optimize efficiency and functionality of HVAC systems)
 - minimum energy performance
 - CFC reduction in HVAC&R equipment
- **Six Credits**
 - optimize energy performance
 - additional commissioning
 - ozone depletion
- **Ground source heat pump system**
 - uses the ground's natural heat sink
 - no harmful ozone depleting CFC refrigerants

Ground source heat pump (well field)



Materials & Resources

- **Prerequisite – storage & collection of recyclables**
 - RTC set up a recycling station at the facility for the collection & storage of paper, glass, plastics, & metals
- **Four Credits**
 - Construction waste management (more than 75%)
 - Recycled content (more than 10% of building materials)
 - Local/Regional Materials
 - Certified Wood



MR: Construction Waste Management

- **More than 75% of construction waste was sent to recycling plants & diverted from disposal in landfill**
- **Examples**
 - **Crush & reuse concrete onsite**
 - **Grind & reuse asphalt onsite**
 - **Recycling of construction waste**
 - **Chipping trees onsite & sending to power plant for fuel**

Dumpsters to sort construction waste



Crushing Hardscape



Mulching trees for fuel



Efforts to “save” the trees
were not successful 😞





Grind & reuse asphalt onsite



MR: Recycled Content

- **More than 10% of building materials (steel frame, concrete foundations and slabs, carpet, ceiling tile, etc.) have recycled content**
- **Use of recycled materials reduces waste to landfills & reduces the impacts associated with extraction and processing of these raw materials**



MR: Local/Regional Materials

- To help reduce the cost associated with transporting building materials & to support local industry, at least 10% of the building materials (brick, cabinets, etc.) were manufactured within 500 miles of Sparks
- Examples: cement, paving stones, bricks



MR: Certified Wood

- To promote the use of managed forests for harvesting wood products, at least 50% of the wood products were produced from manufacturers certified in accordance with the Forest Stewardship Council's Principals and Criteria for wood building components
- Examples
 - Lumber
 - Doors
 - Cabinets



Indoor Environmental Quality

- **Two prerequisites**
 - Minimum IAQ Performance
 - Environmental Tobacco (ETS) Control
- **Eight Credits**
 - Carbon dioxide (CO₂) monitoring
 - Construction IAQ Management Plan
 - Low-Emitting Materials
 - Indoor Chemical & Pollutant Source Control
 - Thermal Comfort
 - Comply with ASHRAE 55-1992
 - Permanent Monitoring System

EQ: Environmental Tobacco (ETS) Control



EQ: Construction IAQ Management Plan



Example: cover vents to keep dust & debris out of HVAC system during construction

EQ: Daylight & Views

Two more credits

- **Daylight 75% of Spaces**
- **Views for 90% of Spaces**



Customers & employees like:

- **natural light**
- **view of buses**

Innovation & Design Process

- Three Credits
 - **Green** Housekeeping Program
 - Educational Community Outreach Program
 - LEED video available at:
 - Website: rtcwashoe.com
 - public viewing on monitor at transit center
 - LEED brochure
 - Tours & community presentations
 - LEED Accredited Professional



Challenges (or LEED for Roadways)

- How make street and highway projects **Green**?
- Design
 - Mindset (e.g. design features, specifications)
 - Heat island effect? **Green** asphalt?
- Construction
 - Stormwater management
 - Construction waste management
 - Recycled content
 - Local/Regional Materials
- Maintenance
 - Deicing, sweeping, water quality of runoff

Public Art (by Donald Lipski)

40' tall Cowcatcher sculpture



Artwork cutouts in beams



Public Art (by Loren Jahn)



Mural (north wall of I-80)

