



Park and Ride Options for Tompkins County

White Paper

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ABSTRACT

The purposes of this paper is to present the concept of Park and Ride (P&R) as a transportation system component and how it could be applied in Tompkins County. The paper describes P&R advantages and disadvantages mostly based on the experience of other urban areas as described in a variety of professional and academic reports. The author presents his own ideas and opinions of how P&R strategies could be adapted for use in Tompkins County. This is intended to serve as a starting point for discussion on the implementation of a P&R program in Tompkins County. It is expected that additional study will be needed on the subject.

PART I – P&R GENERAL INFORMATION

I.A. Introduction

The main purpose of implementing a P&R system is to provide common locations for individuals to transfer from a low to a high occupancy travel mode. Depending on its location, particularly its proximity to residential areas, P&R facilities may serve users of a variety of modes - automobiles, bicycles and pedestrian - as they transfer to transit and/or carpools. Park and ride can be best made to work, as part of a comprehensive approach to managing transportation. Park and ride must be coordinated with transit to minimize trip times, minimize boarding times, minimize fares and maximize frequency of service. P&R seeks to attract motorists from private automobiles therefore it must provide a level of convenience combined with costs that make it preferable to driving into the congested urban area. In general, a traveler will transfer between modes if it is the only way to complete the journey and/or the net benefits (comfort, time, costs) are greater.

For purposes of this discussion the target congested area or urban area will refer to downtown City of Ithaca and the Cornell University area. These are the principal employment center in Tompkins County and the destination of many commuters who would be the most likely users of a P&R system.

I.B. P&R Intent

P&R programs seek to achieve the following:

1. Provide an alternative to car use through public transport. To reduce the amount of car use within a congested area by providing for an alternative means of accessing a bus stop. P&R facilities can be used by long distance commuters or by those within walking or bicycling distance.
2. To intensify vehicle occupancy in the congested urban area. This would allow a greater number of person trips to access the urban area without increasing the number of vehicle movements while using the existing road space. P&R facilities should result in a reduction in the flow of vehicles 'downstream' of the park and ride site.

3. A more economically efficient provision of parking capacity. Use of P&R allow the increase in the provision of total effective parking for the target congested area without using scarce, valuable, city center land. To transfer parking capacity from the central area to the periphery makes center city land available for other purposes. The provision of parking capacity at the edge of the city can result in having more central land available for other more efficient or higher value purposes.

4. To improve journey quality for the motorist. P&R can save motorists and their vehicles the stresses of congestion, and/or locating a parking space in an urban area that may be unfamiliar. P&R should be designed to lower the perceived generalized cost of traveling into the target-congested area (i.e. downtown Ithaca and Cornell University) so as to attract more trips to the city. This may be achieved by reducing either: the actual or perceived relative money costs for park and ride compared with one or more of the alternatives, or the perceived effort costs relative to the other modes available to the individual traveler. In other words, use of P&R must be designed to be cheaper and/or more convenient than the alternative of driving the car into the congested urban area.

5. Contribute to environmental objectives. P&R should help reduce vehicular emissions by allowing either an overall reduction of traffic levels in the central area or a restructuring of traffic flows away from the center. The target area in general can be expected to benefit from reduced noise and vibration damage. Quality of life should be improved in terms of greater freedom of movement and reduced visual intrusion by traffic.

I.C. P&R Facility Types

P&R facilities are categorized by location, level of transit service provided and exclusive nature of the operation. In general P&R facilities are described as being in the following locations –

- Remote – located far from major activity centers. Focus on suburban or satellite communities. These locations seek to capture trips closer to the residence.
- Local – located at the end or along a major transit route. May have lower level of transit service – served by existing routes, no special dedicated service. Best describes the existing rural P&R in Tompkins County.
- Peripheral – located at the edge of a central business district (CBD) or major activity area and function to expand the amount of available parking by intercepting automobiles before they enter congested areas. Most of trip is done by automobile, the last segment by transit. Shuttle or express service and regular routes may be used in combination with reduced fare or free-fare zone.

Nature of operation – two types:

- Exclusive – planned, designed, constructed and operated specifically to serve as P&R facilities. Require significant capital costs and development time. This type of facility is more common in larger urban areas used in combination with express bus service, rail and/or HOV lanes.
- Shared-use – P&R facility serves multiple uses - parking for retail, church, schools, etc. Common in smaller urban areas without the large demand that would make exclusive lots infeasible.
 - Advantages: short implementation time, low capital and maintenance costs. Provide the opportunity to test the demand for service without incurring major investment. Retail, professional and other services are available to users.

- Disadvantages: possible space and design limitations. Expansion limitations. Parking space conflicts between P&R and other joint users. Formal agreements are needed.

I.D. Success Factors for P&R Facilities

Each metro area has its own geographic, demographic, employment and transportation system factors and components that make it unique. As these are the factors that affect the potential for success of P&R facilities, it follows that each metro area will have to design a unique P&R system to meet its needs. Nevertheless, a survey of the literature points to a number of factors that are found consistently in various P&R programs. Some of these are listed below.

Characteristics of Successful P&R Lots;

- High level of transit service – express buses/shuttles – 15 min. headways (time between buses) or less
- Location within close proximity of main roadway links – highways, arterials
- Access to HOV or priority lanes for buses (currently not available in Tompkins County)
- Express transit service during the peak hours
- Visible from adjacent arterials – to facilitate marketing the site and patron safety
- Parking costs at the destination(s) served by the lot are substantially higher than the cost of the P&R and bus fare
- Improve convenience or provide cost savings to users
- Supported by a strong promotional campaign

Other considerations:

- Opportunities for joint uses – i.e. retail, services such as dry cleaning, groceries, day care, etc.
- Visibility from adjacent business or neighboring properties as a component of security
- Passenger facilities – shelter, waiting area, telephone, traveler information, bicycle racks, etc.
- Attractiveness of the facility – landscaping, design, art
- Potential for expansion to meet future demand
- Compatibility with surrounding land uses
- Regulatory or environmental constraints
- Ease of vehicular access to the facility
- Ease of non-motorized access – bicycle and pedestrian links
- Location of site relative to congested area being served.
- Community impacts – i.e. impacts on neighboring land uses particularly residential

I.E. Location of Facilities

A review of the literature shows that there are some common site selection factors for P&R facilities. Again convenience, service and cost are key components to a site selection decision. The common site selection factors are listed below.

Site selection factors:

- Availability of land for acquisition and/or use.
- Opportunity for shared-use with existing land uses.
- Joint development opportunities (This refers to opportunities to build a P&R facility at the same time as the land is developed for another private or public use).

- Spacing – facility’s role in providing system-wide coverage for the target area. Do not build more facilities than are needed.
- Site accessibility from adjacent roadways – for personal and transit vehicles. Direct access from main thoroughfares is preferred.
- Locate site along major commute corridors.
- Location relative to congestion – location of site ‘upstream/downstream’ from congested areas.
- Non-motorized access – direct access to pedestrian and bicycle links is preferred.
- Site visibility to/from the road and to/from neighboring land uses.
- Size of available land – for current demand and for future expansion.
- Transit service – existing service, potential for new service and service enhancements.
- Development costs – purchase or lease price, grading, leveling, environmental factors, construction of supporting elements (shelters, sidewalks, etc.).
- Proximity to amenities – retail, professional services, food stores, dry cleaners, day care, etc.
- Land Use Compatibility – compatibility with surrounding land uses based in existing development, zoning, future plans for area.
- Security concerns – personal security and safety factors related to the site.
- Potential design constraints – topography, site dimensions, other constraints.
- Environmental considerations – noise sensitivity, hazardous waste issues, riparian issues, Title VI and environmental justice.
- Jurisdictional Support.
- Community Issues – level of community concerns/acceptance of proposed site.

I.F. Design

As much as any other aspect of P&R development the design of facilities will be site specific. However, once again there are certain components that should be considered when designing any P&R facility. These are listed below.

Design Components:

- Transit vehicles ingress and egress needs
- Transit passenger shelters
- Access points from the road
- Need for traffic signals or other traffic control devices
- Internal circulation
- Pedestrian facilities – walkways/sidewalks, furnishings (benches, etc.)
- Bicycle facilities – bike lockers
- Drop off points – kiss-and-ride
- Amenities – telephones, trash receptacles, newspaper and other vending machines, transit information
- Landscaping and other beautification – make P&R attractive
- Lighting for safety and security
- Security issues – lights, gates, fencing, cameras and surveillance equipment
- Signs – on site and off site directional
- Environmental considerations – runoff management, noise, visual impacts
- ADA compatibility

I.G. Operational Issues

Once built there are a variety of operational and maintenance issues to consider with P&R facilities. These will vary from facility to facility depending on their ownership, who are involved parties and other particulars of the site. Some of these potential issues are listed below.

- Marketing of facility – funding, lead agency
- Liability – who is responsible
- Lease agreements
- Parking fee structure – design, review and update
- Transit level of service – design, monitor and update
- Use of P&R facilities for carpools – generally accepted except in at-capacity lots.
- Maintenance – inspection, repairs, mowing & landscape, snow removal, security/gates, lighting
- Safety and Security issues: on-site enforcement, periodic patrols, automated monitoring, coordination with shared uses

I.H. Pros and Cons of P&R

By encouraging shifts to transit and ridesharing, Park & Ride facilities reduce urban highway traffic congestion and worksite parking demand. These benefits can be significant since Park & Ride tends to be most effective where traffic congestion and parking problems are worst. However, automobile Park & Ride only provides modest reductions in total road traffic, pollution, energy use and consumer costs, since a local automobile trip is still made.

Benefits of P&R:

- Cost savings to users – this depends on the fare strategy used and how it relates to the parking costs within the target urban area. Lower cost structures will result in a greater number of P&R users.
- Travel time savings – this depends on the level of congestion and ease of finding parking in the urban area and the frequency of transit service for P&R users.
- Reduces peak period traffic by increasing vehicle occupancy rates.
- Shifts automobile travel to alternative modes – transit and ridesharing.
- Lower demand for parking areas in CBD.
- Reduced energy consumption and automobile based emissions in hot spot areas.
- Enhanced mobility – P&R provide additional transportation options.
- Parking for special events - once established, P&R facilities can also be used to shuttle the public to special events in the downtown and Cornell (i.e. Ithaca Festival, Apple Harvest Festival, Cornell Graduation, etc.)
- Improved efficiency of the transit system. P&R bus services tend to be relatively efficient to operate. Motorist pay, through his or her investment in their own private vehicle, for the part of the journey which the public transit operator would find expensive to provide, leaving transit to operate high-volume limited-stop service from a very concentrated point of demand, the P&R lot. The result is a high rideship rate per unit distance.

Negatives of P&R:

- In some circumstances, P&R facilities may be one factor that facilitates urban sprawl by reducing the cost and inconvenience of long distance commutes.
- Just adding additional parking at the P&R location, without coordinating with parking strategies in the target urban area, is like adding additional capacity to roadways, which may lead to induced traffic. Alternatively, if parking continues to be cheap and convenient in the target area the P&R lot could remain unused.

- Providing high level of transit service for P&R facilities may lead current transit users to drive to the P&R facility to take advantage of the enhanced service. This may lead to additional vehicular trips and a reduction of ridership for existing transit routes.

In Europe some park and ride programs have resulted in reduced transit ridership. This is because instead of riding transit from remote locations to the urban centers people are opting to drive to the P&R and ride a bus for the remaining part of the trip – arguably the most congested. The danger in this trend is that it detracts from existing transit ridership. A solution proposed in the literature is to ensure that regular transit serves the P&R facilities.

Additional analysis is needed to determine the potential impact of a P&R program on rural transit routes in Tompkins County. Given the high rate of automobile use for commuting from outside the target urban area (Downtown Ithaca/Cornell) it is quite possible that any losses in ridership due to P&Rs as described in the previous paragraph would be more than made up by the P&R capture of vehicular commuters and transferring them to transit.

PART II - P&R IN TOMPKINS COUNTY

II.A. Introduction

The target urban area in Tompkins County, composed of adjacent activity nodes in the City of Ithaca Downtown and Cornell University, is strategically situated in the center of the county. The target area holds, by far, the largest concentration of employment in Tompkins County. The historical radial pattern of streets remains intact and continues to function as the primary commuting routes. Census data shows that Tompkins County is a net importer of labor, much of it heading for the target area. The target area also attracts a substantial number of commuters from throughout Tompkins County. The Census also indicates that approximately 51% of employees within the working area use a mode of transportation to work other than 'driving alone'. Within the City of Ithaca walk-to-work trips account for 41% of work based trips.

II.B. Participating Agencies

Cornell University and the *City of Ithaca* - Together, the City and the University hold the greatest employment concentrations and manage the largest parking facilities. With careful implementation, the P&R program could result in a reduction in the demand for parking in the target area, with some of the demand being accommodated in the P&R lots. Cornell and the City of Ithaca also play a role as partners in TCAT

TCAT - as the principal transit service provider will be critical in selecting the location and design of P&R facilities. In addition, TCAT will play a principal role in designing the service and fee structure for any new facilities.

ITCTC - provides access to federal funding and serves as a technical resource for transportation planning efforts.

Tompkins County – may provide planning assistance. Tompkins County would also need to support the P&R program as a TCAT partner.

Local Municipalities – the local municipalities corresponding to the proposed P&R facilities will need to be involved to support the program through policy, land use regulations, etc.

II.C. Existing Facilities

Currently there are a series of ten small park-and-ride facilities in communities around the county (see attached map at the end of the document). These facilities are located in Trumansburg, Town of Enfield, Newfield, Danby, Brooktondale, Village of Dryden, Village of Freeville, Village of Groton and two facilities in the Town of Lansing. Most of these serve 5 to 10 cars and connect to regular bus service.

Any P&R plan should include the existing rural facilities in its analysis and recommendations. These can serve to compliment and enhance potential P&R facilities located closer to the urban area. In addition, some of these facilities will continue to provide important service to outlying communities that will not be adequately addressed by facilities peripheral to the urban area.

II.D. Discussion on Potential Facilities

The focus of this White Paper analysis is on the provision of P&R facilities peripheral to the target urban area. As described above, peripheral facilities are located at the edge of the target area and function to reduce congestion by intercepting automobiles before they enter congested areas. Under this structure most of the commute trips are done by automobile with the last segment transferring to transit. Shuttle or express service and regular routes may be used in combination with reduced fare or free-fare incentives. This strategy, depending on its location and level of use may need to be coordinated with parking provision in the target area since it serves to expand the amount of available parking. In all cases, having less parking or higher cost parking in the target area is critical to creating the economic incentive that will lead motorist to use P&R. Otherwise, if parking is available and the cost is the same, commuters will opt for the convenience of driving to their final destination.

Preferred P&R corridors should serve high volumes of commuter traffic and have access to existing transit service. Using traffic count data and results from the Ithaca-Tompkins County Transportation Council travel demand model, a series of road corridors were identified as the primary P&R candidate commuting routes to the Ithaca urban area. These corridors are listed below followed by a brief description of each.

- SR-13/366 Overlap
- Elmira Road, SR-13 to the south of the city
- Trumansburg Road – SR-96
- Slaterville Road - SR-79
- North Triphammer Rd. – Pyramid Mall
- Eastshore Drive – SR-34
- Danby Road – SR-96B

SR-13/SR-366 Overlap

The SR-13/366 overlap highway section combines much of the commuter traffic from Cortland County, and the eastern and northeastern parts of Tompkins County. At the western end of the overlap SR-366 leads directly to Cornell University and neighboring destinations. Traffic on this route crosses the hamlet of Varna resulting in a significant impact to the quality of life in that community. West of the overlap SR-13 goes on to serve the Airport area, N. Triphammer Road and Downtown Ithaca. A P&R facility along the overlap section has the potential to capture a substantial amount of the traffic heading to Cornell University. Establishing this facility will need close coordination between TCAT and Cornell to develop incentives that encourage use of the P&R option.

Elmira Road - SR-13

SR-13 carries much of the traffic approaching the City of Ithaca from the south and southwest. In commuters from Tioga County, Elmira and other parts of Chemung County use this route. SR-34/96 joins SR-13 near the Town of Ithaca/Town of Newfield border. Land uses along the Elmira Road corridor within the City of Ithaca includes significant existing car oriented development and a substantial amount of new development is currently underway. The limited number of alternative routes makes Elmira Road particularly susceptible to congestion as its adjoining lands get developed. Establishing a P&R facility close to the City line, marked by the Gateway Bridge, will provide an option for commuters that would result in reductions in the number of vehicles approaching the downtown area. Many commercial developments in this area have large parking lots that could be developed as shared use P&R. The Home Depot and Buttermilk Falls Plaza are particularly attractive candidate locations because they are served by traffic signals and are located at the southern extreme of Elmira Road within the City, allowing the benefit of the P&R facility to include the whole corridor under consideration.

Trumansburg Road – SR-96

The ITCTC travel demand model shows the Trumansburg Road link from Cayuga Medical Center south to the City of Ithaca as having one of the highest volume to capacity ratios in the county. This corridor has no practical alternative route, which forces all vehicular traffic to concentrate on one roadway. The model also shows the hospital as a major origin/destination and the Village of Trumansburg as a significant residential concentration for many employees in the target urban area. Transit serving the Trumansburg to Ithaca/Cornell link is well established and popular. The hospital area at one time served as an informal P&R, illustrating the demand for this type of service. The Museum of the Earth and the hospital offer the best opportunities for shared use P&R facility development. The main advantage of the hospital location is that there is a traffic signal on that access road. However, the parking lot of the museum is closer to the road and has more P&R capacity than the hospital. An existing walkway connecting the museum and the hospital may facilitate designing a system that allows parking at the museum and bus boarding at the hospital.

Slaterville Road - SR-79

Pine Tree Road provides an important southern access to the Cornell University campus feeding from Slaterville Road. Pine Tree Road crosses a residential area that suffers considerably from high traffic volume. The NESTS Transit Planning Project (NTPP) includes some limited analysis of a potential P&R facility on the Bethel Grove Church Parking Lot. The study recommends express service from this P&R location to Cornell and to downtown Ithaca. This location is well situated to capture traffic before it reaches Pine Tree Road. With dedicated transit and coordination with Cornell University it offers an interesting option for P&R service.

North Triphammer Rd. – Pyramid Mall

The Pyramid Mall location was identified in the NTPP study as a potential transit hub. Currently, the mall serves as an important transit stop serving up to six different transit routes. The NTPP final report includes a substantial amount of information on the potential for that site including cost estimates, route analysis, etc. that will not be repeated in this paper. This facility could be a capture point for commuters approaching from the east on SR-13, and from the northern locations in the Town and Village of Lansing. With appropriate planning it could also attract bicycle and pedestrian users from nearby residential areas in the Village of Lansing.

Eastshore Drive – SR-34

Eastshore Drive parallels Triphammer Road as it approaches the target urban area. It is not recommended that P&R facility be considered along this corridor because it's residential nature, it has

limited transit service and its proximity to the proposed P&R facility at Pyramid Mall. Commuters along this route would be encouraged to use the Pyramid Mall P&R.

Danby Rd. – SR-96B

Danby Rd. is an important commuter corridor from the south of the City of Ithaca. This route serves Ithaca College and creates the possibility of increased participation by the College. The parking lot of the Axiohm Plant is a potential site for a P&R. Unfortunately, there are no joint uses associated with this location.

II.E. Fees

P&R fees may include parking fees and/or transit fees. In both cases fees can help generate needed revenue, but they can also discourage use, adding another out of pocket cost to users and additional inconvenience. The vast majority of both shared use and exclusive P&R facilities do not charge a fee for parking. Fees are charged only in P&R lots associated with rail in large metropolitan areas where parking is at a premium. In Ithaca, with its relative abundance of parking and short travel distances, P&R programs will probably need to be structured with free parking. Reduced rate transit for P&R users should also be considered. Fee structures will need to be coordinated with Cornell and the City of Ithaca who are the principal providers of parking in the target area.

II.F. Incentives

There are a series of incentives that could be offered to commuters in order to facilitate the switch to P&R. As discussed above transit and parking fees are a principal component of the decision to use P&R. Providing favorable rates to participants is a powerful incentive.

There are certain commuter choice tax incentives that may be applied with P&R. Commuter Choice refers to changes in the Internal Revenue Code 26 USC 132(f) which permits an employer to offer a tax-free benefit to employees who commute to work by methods other than driving alone. Use of park and ride lots and associated transit costs are eligible for commuter choice tax incentives.

Employer based financial contributions to TCAT or as a direct benefit to the employee would work to make P&R more attractive for the commuter. Any employer-based contribution should be coordinated with the commuter choice tax incentive to maximize the benefits to all participants.

A program to ensure a ride back to the P&R lot in case of emergencies will make it possible for some commuter to consider a P&R option. There are a number of strategies that can be used to provide this service and to manage it so it does not get abused. The emergency ride back may be handled by local taxi service or a designated shuttle service. Additional research will be needed to determine the best strategy to use in the Ithaca area based on participating agencies and the location of P&R facilities.



TOMPKINS COUNTY INTERMODAL FACILITIES

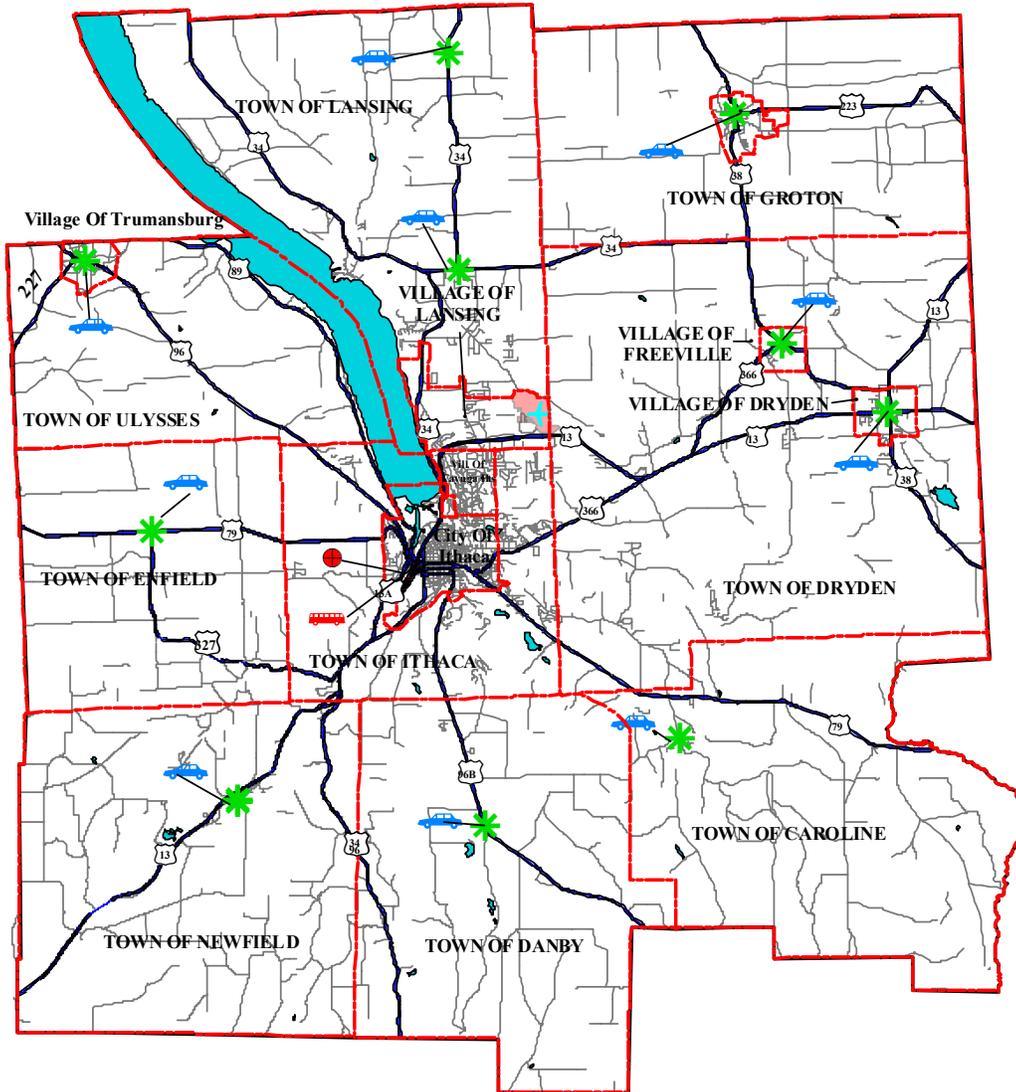


Fig. 10

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|------------------|-----------------------|-------------|----------------------|------------------------|
| Park and Ride | Intermodal Bus Stops | Rail Yard | Municipal Boundaries | N
February 12, 2004 |
| Airport | Intercity Bus Station | State Roads | MPO Boundary | |
| Airport Boundary | Other Roads | | | |

SOURCES:

- Bixby B., (ed.) (1986) Integration in Transport – The Role of Park and Ride. Oxford Polytechnic Department of Town Planning.
Bloomington, Indiana. Park and Ride Survey Final Report. February 2004
- Fisher, Jim. Mount Desert Island Park And Ride Study. Hancock County Planning Commission. Ellsworth, Maine. Revised: June 26, 2001. (<http://www.hcpcme.org/transportation/parkandride.doc>).
- Maricopa Association of Governments. MAG Park-and-Ride Study. January 2001.
- Katherine F. Turnbull, Ph.D. (1995). Effective Use of Park-and-Ride Facilities, National Cooperative Highway Research Program, Synthesis of Highway Practice 214. Washington Academy Press, Washington, DC.
- Palmer, Ian. Beel, Andrew. North West Regional Assembly. Regional Park and Ride Study - Final Report. August 26, 2003. (http://rpg.nwra.gov.uk/uploads/rpg_docs/631070585603.doc).
- Dr Graham P Parkhurst. Does Bus-Based Park and Ride Assist the Integration of Local Transport? *Parking News*, April 1999. (<http://www.cts.ucl.ac.uk/tsu/tpab9903.htm>).
- Dr Graham P Parkhurst. The Economic and Environmental Roles of Park and Ride, Paper presented to the 6th PTRC Annual Conference on Park and Ride, Confederation of Passenger Transport, London, June 1998. (<http://www.cts.ucl.ac.uk/tsu/papers/gp1.htm>).
- Pearmain D., Jones M. (1985) Transport Interchanges – Theory and Practice Summary Report. Oxford: Oxford Polytechnic Department of Town Planning.
- Virginia Department of Transportation. Northern Virginia Park & Ride Lot Feasibility Study. April 2003.
- Wambalaba, Francis; Goodwill, Julie. (2004) Evaluation of Shared Use Park and Ride Impact on Properties. National Center for Transit Research, CUTR.

Selected P&R Related Internet Links

- The UK offers many examples of excellent park and ride programs. The links below offer on-line information for specific park-and-ride facilities and systems nationwide –
<http://www.parkandride.net/>
<http://www.oxfordbus.co.uk/ParkRide.html>.
- Bloomington, Indiana. Park and Ride Survey Final Report --- February 2004 -
<http://bloomington.in.gov/egov/docs/1077289588779.htm>
- The Parking Connection –
<http://www.fta.dot.gov/library/policy/cc/fab.htm>
- Financial Mechanisms: Commuter Choice Tax Incentives -
http://www.commuterchoice.com/index.php?page=employers&sub=employers_supporting
- Victoria Transport Policy Institute – TDM Encyclopedia – Park & Ride Convenient Parking for Transit Users -
<http://www.vtpi.org/tdm/tdm27.htm>