Providing Coordinated Transit Services by Using a Transit-Functional Classification

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This paper describes a planning concept used in providing coordinated bus and rail service to a suburban county of the Washington, D.C., metropolitan area. This concept, which is that of a functional classification of transit services, is analogous to that long in use for highways. Four transit service classes are defined: transitway, regional, collector, and community. Like the highway classification, the transit classification has universal applicability to all metropolitan areas, although it is more easily illustrated in large areas. The transit-functional classification concept, used by Montgomery County, Maryland, as a network planning tool, was found to be particularly useful in planning a comprehensive restructuring of county bus services that provide coordinated services to the first part of Washington's Metrorail system extending into the suburbs. The county planning department has also used the transit-functional classification concept as a policy-planning tool in carrying out a fiscal impact analysis for a growth policy study and in transit financial planning and intergovernmental responsibilities for transit operations.

Over the years many authors have expressed their views on categorizing the numerous transit submodes in operation or on some planner's drawing board. It seems as though each planner or transit operator had developed a personal working definition to group and distinguish forms of transit service.

This paper first considers various classifications of transit and generalized concepts of functional classification. It then gives a specific conceptual definition of a functional classification of transit services. We felt that use of this transit-functional classification can bring the attention of transportation planners and political decision makers into focus so they can better address ways to improve transit services.

To illustrate the utility of the transit-functional classification, the paper describes how it has been used by transportation planners and decision makers in Montgomery County, Maryland, a rapidly urbanizing suburban county of the Washington, D.C., metropolitan area. One application was as a network-planning tool used to restructure bus services to the first of seven suburban segments of Washington's Metrorail system. A second application was as a policy-planning tool used as a component of a fiscal impact analysis of future growth. The paper also shows the utility of the transit-functional classification in addressing other policy-planning issues.

CONCEPT OF FUNCTIONAL CLASSIFICATION

To understand the concept of a functional classification for transit, we shall first examine it in relation to its traditional use in highway and regional systems planning. The generalized concept for both major urban transportation modes is then presented. The reason for using such a classification is that it provides a powerful transportation planning tool applicable to activities such as transit financial planning and policy matters and to assisting decision makers in determining which level of government should be responsible for implementing particular transit services.

Highway-Functional Classification

As discussed in many transportation engineering and planning texts, highway systems have long been classified according to their administrative, planning, and design purposes (1-3). While the terminology has varied from report to report and study to study, urban roadway classifications generally contain four components: expressways, arterials, collectors, and local roads.

Different criteria have also been used to classify different types of roads. As shown in the table below, the two main criteria in general use are (a) the degree to which the roadway serves through movements exclusively and (b) the degree to which it provides access to land abutting the roadway.

Highway-Functional Classification	Classification Factors	
	Through Movement	Land Access
Expressway	High	-
Arterial	↓	Low
Collector	Low	↑
Local street	-	High

Additional criteria such as typical trip length, spacing between similarly classed roadways, land-use areas linked by the different types of roadways, and traffic volumes on the roadways have also been used.

Such highway-functional classification schemes have been of value to transportation planners for many reasons. For instance, it has often been observed that, while those facilities primarily serving travel—the expressways—may only represent 5 or 10 percent of the roadway kilometers in a particular urban area, they may carry 40 to 50 percent of the vehicles.

These classifications have been used as a rationale by transportation officials and policymakers for planning urban transportation investment as well as setting specific priorities for funding, operation, and maintenance.

There is also a general correspondence between the classes of roadways and the level of government responsible for the construction and operation of them. Thus, by using the concept of highway-functional classification, transportation planners have been better able to bridge the gap between planning and implementation by the various levels of government. In addition, other planners have relied on such a classification to facilitate their work. For instance, many land-use plans and zoning ordinances use such classifications to help designate those areas that should have a particular type or intensity of land use.

Classification of Transit Modes

Many authors have classified different types of transit primarily according to the subtransit mode. For example, the Lea Transit Compendium (4) has identified six general transit classes as follows: (a) moving way,

Table 1. Vuchic's classification of transit modes.

Right-of-Way Category	Technology: Rail Guided	Rubber-Tire Guided and Other Modes	Highway
Fully controlled	Regional, rapid transit, light rail	Rapid transit, monorail, people movers, personal rapid transit	Bus on busway only
Partially controlled	Light rail	Dual-mode systems	Bus partially on busway
Surface street	Streetcar	Trolley bus	Surface bus

(b) light guideway, (c) personal rapid, (d) light rail, (e) heavy rail, and (f) roadway systems.

In their recent study, Public Transportation and Land Use Policy, Pushkarev and Zupan (5) define eight modes of public transportation. They indicate that "the different modes of public transportation are distinguished most visibly by the hardware they use, but more importantly by the type of service they provide and by the manner in which they operate." The eight modes they examine are taxicab, dial-a-bus, local bus, express bus, light rail, light guideway transit, standard rapid transit, and commuter rail.

Classifications such as these seem to have a common trend, which, as previously pointed out by Vuchic (6), appears to be to categorize a particular transit mode according to its type of technology. To address the question of transit mode classification, Vuchic has suggested a method based on the three characteristics as shown in Table 1: right-of-way, technology, and type of operation.

In retrospect, this research has basically adopted the right-of-way and type-of-operation dimensions and redefined their underlying characteristics. It should be pointed out that many of these classifications recognize that each transit mode has a range of suitability when it is functioning as the line-haul portion in a given demand context.

In their report on Bus Use of Highways, Levinson, Adams, and Hoey (7) not only speak of various transit modes as local bus, express bus, and rail rapid transit, but also give a bus-priority topology based on the criteria of corridor intensity and central business district (CBD) intensity. Perloff and Connell (8) speak of primary and subsidiary elements of transportation systems. The primary elements of the transportation system exist to provide transregional access and indicate that connecting various areas of the metropolitan region is the main rationale for the system. Associated with this primary system is auxiliary or secondary service that may provide back-up or feeder service to the primary routes. On the other hand, they define a subsidiary system as one whose "operations [are] limited to a particular group or location, or both, and therefore, its focus is not on generalized access but on penetrating to personal service demand levels."

Ward and Paulhus (9) identify four types of metropolitan travel according to the relative intensity of each end of the trip, i.e., whether they are in low- or high-density areas. They indicate "that total urban systems should be made up of multiple elements operating cooperatively, each tailored to the characteristics of a neighborhood or area it serves." They further indicate that "regional transit systems will consist of 1) a regional express bus or rail guideway network fed by 2) a public collection/distribution system, 3) high density circulation service provided where appropriate, with 4) accommodation to the usually dominant mode, auto."

One common thread through these last three classification schemes seems to be greater emphasis on the type of service provided to the transit user as well as on the type of area being served.

Generalized Concept of Functional Classification

It is proposed here that there is a generalized concept of functional classification that is applicable to both major transportation modes, highways and transit. From an urban planning perspective, the two key classification factors that functionally distinguish between components of transportation systems are the degree to which the transportation serves person movement and the degree to which the transportation serves land access.

In the first, we are primarily concerned with the degree to which the facility is serving regional, longer-distance travel generally in terms of line-haul capacity. In the second, we are concerned with the degree of access, because for some facilities people cannot reach their destinations off the transportation right-of-way unless they first get off at a transfer facility. As shown in the table below, this results in a classification for transit analogous to the one used for highways.

Transportation Mode		Classification Factors	
Highway	Transit	Through Movement	Land Access
Expressway	Transitway	High	-
Arterial	Regional	↓	Low
Collector	Collector	Low	↑
Local street	Community	-	High

This generalized concept could also be extended to bikeway and pedestrian systems, but we leave that task to other researchers.

Description of the Classes of Transit Service

In most large metropolitan areas, four distinct classes of transit service can be found. We define them as transitway, regional, collector, and community-class transit services. These classes are categorized according to their principal functions of serving people movement and land access.

Transitway Service

Transitway service, which is analogous to expressway-class roadways, primarily serves the through movement of people within an urban area and has access points limited to transit stations and terminals. It only serves people movement and does not provide direct access to land. Transitway service generally has exclusive or grade-separated right-of-way, although it is sometimes shared with other vehicles, such as commuter rail and freight trains that use the same track or a busway available to carpools.

Several transit technology modes fall within this service class, including commuter or regional rail, rapid or heavy rail transit, light rail transit in an exclusive or protected right-of-way, automated guideway transit, busway transit, and even waterborne transit operations.

Regional Transit Service

Regional transit service is analogous to arterial-class roadways. It primarily serves generally continuous movement throughout the urban area and secondarily provides direct access to activities on the land but has

no separate stations or terminals.

This class of service is most generally characterized by standard-size or high-capacity buses that travel on major arterial highways and follow a traditionally radially oriented route structure. While such service is usually characterized as having frequent stops, this class also includes express transit service, which is analogous to access-controlled arterial roadways. This service class also includes the transit technology mode of the traditional trolley or streetcar service.

Collector Transit Service

Collector service is analogous to collector-class roadways. It primarily serves access to activities on the land but also allows for through movement that frequently involves a transfer to complete the journey. Such services have traditionally been characterized as branch service off of main transit routes or crosstown services. Its main purpose has been to penetrate residential neighborhoods to bring transit service within walking distance of a greater number of potential patrons and to connect major activity centers in nonradial patterns.

Community Transit Service

Community service is analogous to local-street-class roadways. It primarily serves client-group or geographic subportions of a region, generally on a town, ward, or neighborhood scale. It provides a very high level of access to them but generally does not enable any through movement to other portions of the region without first transferring to one or more other class of transit service.

Such a transit service is generally characterized by the use of small buses or vans that operate either on a fixed route or on a demand-responsive basis.

Distinguishing Among Transit Service Classes

It may not always be a simple task to clearly identify a particular transit service as falling into one class or another. Even among highway and transportation planners preparing or updating a highway-functional classification for a particular urban area there is often disagreement about which class is most appropriate for a particular roadway. Likewise, we have found that, in attempting to define and apply such a transit functional classification, disagreement is bound to arise over which class best fits a particular transit service.

It is hoped that the conceptual definition given above and modified by experience over the coming years will enable many transportation planners to develop their own working operational definitions to supplement these conceptual ones. However, the reader should be cautioned against making simple generalizations, such as relating technology to class; e.g., all services operated by small buses are not community services.

USING THE TRANSIT-FUNCTIONAL CLASSIFICATION TO PROVIDE COORDINATED TRANSIT SERVICES

Most metropolitan areas have multiple operators of public transit service—from conventional fixed-route to fixed-schedule operation to paratransit of various kinds. It is emphasized that what distinguishes these services from one another is a functional classification, not ownership, technology, or size of vehicle. Whenever there are different types of services offered, it has rarely been a conscious choice based on a hierarchy of service. Rather, it has simply been that an area has decided that one or all kinds of service will not meet the needs of the people.

Coordinated Services in Toronto

A prime example of a conscious application of such a concept has been the coordination of bus and rail services in Toronto, where the Toronto Transportation Commission (TTC) has established a policy that buses and streetcars will feed into the subway. There has also been a determination not to provide regional-class service that duplicates the transitway service. Although it is possible to travel along the Yonge Street corridor by bus, parallel bus routes are structured and operated to act as either collectors to the rail or as community service.

Similar policy has also been applied to coordinate classes of service at terminal stations in Toronto. For example, at the Finch station on the Yonge Street route, located in the borough of North York, there are two major bus terminals: one for collector services operated by TTC itself and the other for regional bus routes operated by Grey Coach, GO Transit buses, and community services of various municipalities north of metropolitan Toronto.

The subway is clearly acting as transitway service for that portion of the metropolitan area. Grey Coach and GO Transit buses act as regional service because they serve communities far beyond what would be the normal service area of an on-line station. The municipal operations, while they may operate on some of the same access roads as the other two, are considered community-class services because their primary purpose is to provide penetration into nearby communities above and beyond the levels of the collector service that is provided in accordance with the regional standards of TTC or GO Transit.

Montgomery County, Maryland: A Case Study

We want to now focus on how this concept has been applied in Montgomery County, Maryland, a major suburban jurisdiction northwest of the District of Columbia. There, the extension of the Metrorail system into the county has been generally viewed as an opportunity to reduce public dependency on the automobile for trips to major regional activity centers.

Before Metrorail opened, the county decided to experiment with providing community-oriented services by using small buses. The first service on fixed routes was started in April 1975 in the most densely populated part of the county, Silver Spring. This area was also selected because it was scheduled to be the first area in the county to receive Metrorail service.

The object of this modest experiment was to evaluate public response to a low-fare (25 cents) operation that provided a high level of transit penetration into the neighborhoods and connected the major suburban commercial office area of Silver Spring. Public response was excellent; ridership grew to nearly 4000 weekday users. As an indicator that it was truly functioning as a community-class service, it had relatively high midday use, and work trips only accounted for about 40 percent of the ridership.

In the summer of 1975, staff of the planning department prepared a detailed projection of future transit operating costs as a component of a fiscal analysis for county growth policy studies. The concept of a functional classification of transit services was developed

at that time to address planning issues of

1. Expected mode of access to the rail system,
2. Providing transit access to the employment and retail centers in the county, and
3. Appropriate level of government to provide these projected transit services.

Part of that effort was the development of a sketch network showing the extent and integration of the various classes of service once the basic transitway service began to operate in two of the major radial corridors in the county. Metrorail has not been viewed as replacing all radially oriented, regional service in the county. This is because there are a number of major activity centers either not located along the rail system or located so that circumferential bus access is more direct than radial rail service. In addition, regional access must be maintained for trips beyond the rail or in important corridors where rail does not operate. In each of these examples, ridership projections showed considerable demand for line-haul transit service. Hence, a regional bus network complementary to Metrorail transitway service was designed for the county.

The street system of the county is not based on a grid pattern; there are relatively few through streets between neighborhoods, and streets within neighborhoods have numerous cul-de-sacs. Further, the county's experiments with community bus service are showing that the best way to serve these neighborhoods is by small buses that make several short trips on appropriate collector and local streets. There are many medium- and high-density neighborhoods clustered in the vicinity of the rail lines that need such service.

For this community-class operation, it is expected that the vehicles would not be making line-haul trips. Rather, they would augment the collector routes that will be traveling along these arterials and would feed either the regional bus or rail systems.

When these two complementary bus networks were completed, it became obvious that there was need for a third set of routes that had different service characteristics. First, service needed to be provided between activity centers within the county, including major concentrations of high-density housing. A second need was to provide transit to activity centers on roads that parallel the rail system but not closely enough for rail users to walk to rail stations. A third need, to provide service to activity centers between the two rail lines, was important because the two rail lines generally parallel each other in the county.

No clear-cut division of function, regional movement, or local access seemed paramount; rather, a blend of functions seemed necessary.

While the third network shared attributes with both of the other bus networks, it was clearly distinct from them. Its major role seemed to be that of collecting passengers, and, for purposes of identification, it was called the collector network.

Detailed transit network planning for the bus-rail coordination was begun in the summer of 1976 by using this transit-functional classification as an organizing concept. The county department of transportation, the operators of the ride-on minibus system, began their efforts later that fall and were joined only a few months after that by Metrorail. It became evident that all three agencies could readily agree on what the regional service and the community service should be but could not concur on the collector service.

The county council made a policy choice to use the county-operated services for all of the collector-class service in the vicinity of the Metrorail station. The council adopted the other elements for funding when the Glenmont Line to an interim terminal was opened at Silver Spring in February 1978.

It is also of interest to give some more details regarding the planning of coordinated bus and rail services for rail operations to Silver Spring. Certain basic principles were emphasized at the beginning of the process by the planning staff.

1. The identified functional classification of transit would provide the basic format for structuring the bus-rail coordination.
2. For economic reasons, there would be a 100 percent turnback of bus routes oriented toward the Washington central business district at the Silver Spring Metrorail station.
3. Ridership along the major corridor (Georgia Avenue) was sufficiently heavy in the north beyond Silver Spring to establish express-bus operations as a regional-class service.
4. Existing park-and-ride facilities would be retained.
5. Some of the savings accrued by not needing to operate the buses all the way into downtown Washington would be retained for extending existing Metrobus routes, creating new routes, and decreasing headways for re-regional- and collector-bus-class services.
6. Because of the incremental growth of the bus system over the years, there was no meaningful pattern of bus route names and numbers, and consequently there was the opportunity to establish more efficient and effective branching from the passengers' perspective; in addition, service improvements were combined with an almost complete route renaming and renumbering.
7. Lightly used Metrobus operations that had been functioning as collectors or branches of regional service generally terminating at the Silver Spring bus terminal would be discontinued.
8. There would be an accompanying major increase in ride-on operations that would provide greatly expanded community-class service to a larger area and also some collector service within the immediate service area of the Silver Spring Metrorail station.
9. All these changes were to occur on one date, two weeks after the opening of the Metrorail station. This was done with the realization that there would be a large amount of confusion, since people would not only be facing new bus service, but also encountering the rail operation, perhaps for the first time. It was believed that, once what was expected to be a short period of confusion was resolved, it would be easier for the transit-operating agencies to communicate travel options to patrons. This proved to be the case.

USING THE TRANSIT-FUNCTIONAL CLASSIFICATION FOR POLICY PLANNING

In addition to assisting in network planning for bus-rail coordination, the transit-functional classification concept is also useful as a policy-planning tool. Its utility in two policy-planning areas—transit financial planning and intergovernmental responsibilities for transit operations—is discussed below. There are other policy-planning applications that could be considered.

Transit Financial Planning

A major policy consideration facing all levels of government is one of how to fund transit service. It is proposed that the concept of a transit-functional classification be used in establishing fare policies for setting different

operating ratios for different classes of transit service. Transitway and regional-class transit services, especially for work-trip purposes, have definite value to each individual transit user. Consequently, there should be a user charge. However, those classes of service also definitely possess a component of public or social good that justifies public financing. It is our opinion that, for these classes of transit service, the user benefits are greater than the social benefits. Therefore, the operating ratio (the percentage of the transit costs paid by the user) for those service classes should be on the order of two-thirds to three-quarters of the cost of providing the service.

Generally, transitway and regional-class operations tend to be more productive in terms of riders per dollar. For any given fare structure it can be expected that this greater productivity could allow a lower level of subsidy compared to other classes of service. At the same time, the user is likely to perceive a higher value from transitway and regional-class services. For example, it is generally known that users of higher-quality express service will pay a premium fare for those services, a fare they would be unwilling to pay for conventional, multistop regional bus service.

At the other end of the spectrum of the transit-functional classification, community-class services, there is a much greater benefit to society in providing an enhanced mobility or fine-grained accessibility throughout the area served. However, there is still always some value to the users of the service. Consequently, there appears to be sufficient justification for this class of service having a policy operating ratio more on the order of one-fourth to one-third.

Collector-class transit services have a dual and roughly equal function of providing for movement throughout the region and serving activity on the land. The value to the user is not as great as that of regional class service in that there are frequently inconveniences to them such as transfers and circuitous routing. Consequently, it is recommended that this class of service should have a policy operating ratio of about one-half.

Such a policy-planning perspective has been used by the Montgomery County planning board in carrying out fiscal impact analyses of future county growth. Although there is not yet a complete or reliable system of cost and revenue analyses of routes, the different components of the transit system are apparently following this policy. For example, the ride-on services had an operating ratio of 27 percent in fiscal 1977/78, while the collector and regional bus services had a combined ratio of approximately 55 percent for the region.

Intergovernmental Issue: "Balkanization" of Transit?

For a long time there has been federal funding of highways based on perceived national priority as well as on a functional classification. Similarly, state highway departments generally also take financial responsibility for higher-class roadways and leave local governments the responsibility of providing more local access to streets within their boundaries. These differing needs have fostered a multitude of highway and road departments, each funded to meet the needs of its constituency.

It is suggested that there is a similar situation in urban public transportation, particularly in the larger urban areas. Establishing uniform standards of service for all components of a multijurisdictional metropolitan area is generally very difficult. The usual stereotype is that the suburban jurisdictions demand high-quality service oriented toward commuter operations but put little emphasis on midday or night service. The central core city is usually interested in frequent service at all times because of greater perceived social, environmental, or community benefit.

Beyond this stereotype, however, there are segments of the community that are perceived to have greater public transportation needs than other segments. The regional transit operator, for a number of reasons, is either unable or unwilling to provide these supplementary services. There is also the question of the ability of a regional operator to respond to highly localized needs. There must be consideration of the costs of providing the service in light of federally imposed standards: wage rates, labor protection clause, delays and perceived difficulties in receiving federal funding, handicapped mobility requirements, affirmative-action reporting requirements, etc. There is also the growing tendency to believe that bigger is not necessarily better, that the concentration of all public transit services into one huge operation may not, in fact, be more economical, that the economies of scale for the administrative functions are less than the major increase in cost of management overhead, decreased personal responsibility for quality operation in the lower management and operating ranks, and the decreased responsiveness to segments of a community.

Numerous experiments in this nation have been done to provide transit service in a community by sources other than the regional transit operation. One of the better known is the Knoxville brokerage-concept demonstration. In connection with that program, it has been pointed out that a significant proportion of high-occupancy vehicles are not owned by the Knoxville transit operator. In another example, numerous transit operators serve northern New Jersey communities by providing a connection to Manhattan at the Port Authority bus terminals. Reference is again made to the Toronto situation, where there are a number of transit operators feeding into the Finch station, or into various GO Train service along the lakeshore route.

One conclusion is that multiple ownership of transit operations per se in an area does not necessarily produce adverse conditions for the public.

However, we want to emphasize that "balkanization" does occur where multiple owners do not cooperate to produce the most cost-efficient or cost-effective operation. Looking again at the northern New Jersey example, the problem is not the multitude of bus operators, who provide the regional- or collector-class service, and the various operators of transitway-class services of the commuter and urban rail systems. A similar situation exists in the San Francisco Bay Area, where there would appear to be a need for improved coordination between the operators of regional-class bus services and the transitway class service of the rapid transit system.

Balkanization can even occur in the same ownership, as illustrated by the inability of the Washington Metro to completely integrate bus operations with the rail service in the northeast portion of the District of Columbia. Another example is New York State's Metropolitan Transportation Authority's problems of integrating the operations in Nassau County (which they own) with the Long Island Railroad (which they also own).

The difference between these various situations is that these latter cases of balkanization are examples of multiple operators, in the same corridor, of the same class of service. The former cases of coordinated services illustrate multiple classes of service that are operating to complement each other, regardless of the number of operators. The important conclusion for planning is that the classes of service have been coordinated within those communities. That is the key: coordination between classes of service. It allows each

class to do the job that it does the best and then to interface with each other to provide better transit service to the users and to the communities.

CONCLUSION

This paper has described a concept: a transportation planning tool of a functional classification of transit services. The concept has been applied and worked in a complex real-world test of providing coordinated transit services. It has worked because it makes technical, economic, and political sense. It has enabled implementation of a well-integrated transit system not only from the perspective of the operators but also from that of governmental officials, the general public, and, probably most importantly, the users.

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Institutional and Political Considerations of BART and Bus Coordination in the San Francisco Bay Area

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The experience of the San Francisco Bay Area with discussions and negotiations regarding coordinating bus and Bay Area Rapid Transit (BART) should be of interest to other metropolitan areas currently operating or constructing new rapid transit systems. While the technical aspects of implementing such service, for example, mutual fare-collection systems and realignments of routes and schedules, tend to be the more frequent subject of discussion among transportation professionals, the subtler political and institutional aspects of consideration negotiations can be the deciding factors leading to implementation or, conversely, to the continuation of duplicated transit service and inadequate feeder-bus service to rail transit stations. The service-coordination issue, then, calls for politically acceptable and institutionally feasible responses as well as technical studies. The Metropolitan Transportation Commission, a regional transportation planning agency for the San Francisco Bay Area, armed with the authority to allocate local and federal discretionary transportation funds, has established a framework that acknowledges the political and institutional constraints to BART-bus coordination and facilitates negotiations among the transit operators. While a resolution to the service-coordination issue is still off in the future, the Bay Area experience thus far has implications for other regions faced with similar transit problems.

In view of the continuing need for efficient public transit service in metropolitan areas that have both bus and some form of rail mode and the current construction of rapid rail systems, the issue of Bay Area Rapid Transit (BART) and bus coordination in the San Francisco Bay Area is a timely subject for discussion. While the technical aspects of implementing such coordinated service are more frequently discussed by transportation professionals, the subtler political and institutional aspects of interoperator service-coordination agreements are often overlooked. In actuality, to play down the politics of interoperator cooperation may often result in nonnegotiable positions among the individual rail and bus agencies and, ultimately, in the continuation of duplicated transit service and inadequate feeder-bus service to rail transit stations.

This paper will emphasize the process of service-coordination planning among the BART district, San Francisco Municipal Railway (Muni), and the Alameda-Contra Costa County Transit district (AC), and later the Metropolitan Transportation Commission, since the early stages of BART development. Specific recommendations for the more technical aspects of coordination will not be discussed as much as the political and institutional context in which interoperator negotiations took place.

The object of this paper is to point out the political and institutional aspects of coordination negotiations, not to make recommendations for either the Bay Area or other regions faced with the same bus-rail coordination issues.