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SECTION 7 – BICYCLE & PEDESTRIAN FACILITY STANDARDS

7.1 INTRODUCTION

The purpose of this Section is to outline the design and construction requirements for bicycle and pedestrian improvements in the City of Independence. The City regards facilities for bicyclists and pedestrians as important parts of the overall transportation system and not just recreational facilities and shall continue to improve and expand pedestrian and bicycle facilities, with a focus on improved connectivity between major activity centers while minimizing conflicts with other modes of transportation.

Bicycle and pedestrian facilities are addressed in the City of Independence Transportation System Plan (TSP) and the Parks System Master Plan (PSMP).

7.1.1 Bicycle and Pedestrian Facility System

To encourage bicycling and walking in the City, it is critical to provide safe and convenient systems that connect residential, commercial, and industrial destinations. Therefore, collector and arterial street design shall include bicycle facilities on or near the streets. Sidewalks shall be provided on (preferred) or near all streets. The multi-use path system shall be expanded to provide off-street pathways and trails for convenience, safety, and recreation.

7.1.2 Playground Facilities

Playground facilities shall be designed in conformance to the Consumer Product Safety Commission Handbook for Public Playground Safety, or latest edition.

7.2 DESIGN OF BICYCLE AND PEDESTRIAN FACILITIES

7.2.1 General Design, Location, and Easement Requirements

A. Design: The design of all bicycle and pedestrian facilities within the City of Independence shall be in conformance with applicable AASHTO, ODOT, and ADA requirements and standards, as provided in the AASHTO publication, “Guide for the Development of Bicycle Facilities,” the ODOT publication, “Oregon Bicycle and Pedestrian Plan,” and ADA Standards for Accessible Design, latest editions. For areas not fully addressed in the ADA Standards, the ADA Accessibility Guidelines (ADAAG), or Proposed Right of Way Accessibility Guidelines (PROWAG), designs modifications will be approved as determined by the Public Works Department authorized representative. Any deviation from the AASHTO, ODOT, ADA, or City standards shall require written approval from the Public Works Department authorized representative.

B. Location: Bicycle and pedestrian facilities shall be installed on the basis of the City of Independence's PSMP. In case of conflict, however, the PSMP takes precedence in matters dealing with off-street facilities.

C. Right-of-Way and Easements
   1. All public-owned bicycle facilities shall be constructed within a public right-of-way or easement. When a bicycle facility must be constructed outside the public right-of-way, an appropriate easement shall be granted to the City for construction and maintenance of the facility; the location and width of the easement shall be approved by the Public Works Department authorized representative. A temporary construction easement may also be required.
   2. All new development or redevelopment within the City shall provide an easement to access adjacent streets, neighborhoods, and properties, especially schools, retail, and

commercial areas. The intent of the easements is to reduce the length of travel to desired destinations from residential areas, thereby promoting bicycle/pedestrian travel.

7.2.2 On-Street Design Standards

A. Design Standards: On-street standards for different situations are described below. It is recommended that bicycle lanes be the preferred facility design on state highways, arterials, and collectors unless the posted speed limit is 30 MPH or less. Other facility designs should be used only if the bicycle lane cannot be constructed to the standard because of physical constraints. The alternative standards are listed in order of preference.
   1. Bicycle Lane
      a) Bicycle lanes shall always be one-way facilities and carry bicycle traffic in the same direction as adjacent motor vehicle traffic.
      b) The design shall include 10-foot minimum travel lanes for motor vehicles with 5-foot paved shoulders, or 5-foot paved lanes where on-street parking is allowed that are striped, marked, and signed as bicycle lanes.
      c) There shall be a minimum clear riding zone of 3.5 feet if there is a longitudinal joint between asphalt pavement and concrete gutter. Additional widths are recommended where substantial truck traffic is present, on grades, or where motor vehicle speeds exceed 35 miles per hour.
      d) This shall be the basic standard applied to bicycle lanes on all arterial and collector streets owned and operated by the city. Bicycles lanes on county and state owned and operated roadways shall meet the standards of that jurisdiction.
   2. Shoulder Bikeway: This design includes a 10-foot minimum travel lane for motor vehicles with 5-foot paved shoulders that are striped but not marked as a bicycle lane. This should only be used in rural situations when it is determined by the Public Works Department authorized representative that a marked bicycle lane is inappropriate.
   3. Shared Roadway: This design features minimum 12-foot travel lane widths for both motor vehicles and bicycles. This standard should be applied to all arterial and collector streets only when sufficient pavement width is not available for a separate bicycle lane and posted speed limits do not exceed 30 MPH. On arterial and collector streets, bicycle route signage is required to alert motorists to the potential presence of bicyclists.

B. Drainage Grates
   1. Drainage grate inlets and utility covers are potential problems for bicyclists. When a new roadway is designed, all such grates and covers shall be kept out of bicyclists' expected path.
   2. On new construction, curb inlets shall be used wherever possible to completely eliminate the exposure of bicyclists to grate inlets.
   3. Grates and utility covers shall be adjusted flush with the surface, including after a roadway is resurfaced.
   4. Grates shall be identified with a pavement marking, as indicated by the MUTCD, Part 9, or latest edition. Drainage grate inlets shall be bicycle-safe (as required by ORS 810.150) and hydraulically efficient.

C. Railroad Crossings
   1. Railroad-highway/multi-use path grade crossings should meet at right angles. The greater the approach angle deviates from 90^{o}, the greater the potential for a bicyclist's wheel to be trapped in the railroad flange-way.
   2. Where the crossing angle is less than 45^{o}, consideration shall be given to widening the outside lane, shoulder, or bicycle lane to allow bicyclists adequate room to cross the tracks close to a 90^{o} angle.

3. In the case of multi-use path crossings, centerline stripes shall be provided to encourage a right-angle approach. Where these options are not possible, commercially available compressible flange-way fillers shall be installed.
4. The roadway approach shall be at the same elevation as the rails.
5. Warning signs and pavement markings shall be installed in accordance with the MUTCD, Part 9.

7.2.3 Off-Street Design Standards

A. Bicycle and Pedestrian (Multi-use) Path: Multi-use paths are facilities on exclusive rights-of-way or easements. These facilities are physically separated from the roadway and are designed to exclude motor vehicle traffic, except at crossings. Separation shall be obtained by a barrier or by a minimum of 5 feet of open space. It is the City's policy not to illuminate multi-use paths.
   1. Width of Multi-use Paths: Paths shall have a minimum width of 10 feet for two-way multi-use traffic and 12 feet where high multi-use traffic is expected. In addition, a minimum 2-foot clear distance on both sides of the path is required, although a 3-foot side clear distance is preferred. The maximum gradient for side clear areas shall be 6H:1V.
   2. Overhead Vertical Clearance: Overhead vertical clearance shall be a minimum of 8 feet. However, vertical clearance shall be a minimum of 10 feet where vehicular traffic is expected and in under-crossings or tunnels.
   3. Horizontal Curves and Sight Distance:
      a) Multi-use path horizontal curves shall have a minimum 35-foot centerline curve radius.
      b) Corner sight distance shall be a minimum of 25 feet.
      c) When substandard radius curves must be used on multi-use paths because of right-of-way, topographical, or other considerations, standard curve warning signs and supplemental pavement markings shall be installed in accordance with the MUTCD, Part 9. The negative effects of substandard curves can be partially offset by widening the pavement through the curve and removing objects that impair sight distance.
   4. Drainage: The minimum pavement cross slope shall be 2%. Curves shall be banked with the low side on the inside of the curve. Paths constructed along hillsides shall have an interceptor ditch of suitable dimension on the uphill side.
   5. Super-elevation Rate: For most multi-use path applications, the super-elevation rate (i.e., a raised elevation of one side of the path) will vary from a minimum of 2% (the minimum necessary to encourage adequate drainage) to a maximum of 5% percent (beyond which maneuvering difficulties by slow bicyclists and adult tricyclists might be expected). The minimum super-elevation rate of 2% will be adequate for most conditions and will simplify construction.
   6. Grade:
      a) Grades on multi-use paths shall be kept to a minimum, especially long inclines, and are recommended to be no greater than 5%.
      b) Where terrain dictates, grades over 5% and less than 500 feet in length are acceptable only when consideration has been given to sight distance and stopping distances. In areas of generally steep terrain, it may be desirable to meander path alignments to attain reasonable grades for steep slope ascent.
      c) In no case shall a "down-hill" approach grade of the intersection of a multi-use path to a sidewalk or street exceed 5% for the last 50 feet unless provisions have been made to provide satisfactory sight vision between the two intersecting facilities.

d) Grade changes on pathways shall provide for a minimum pedal clearance of 6 inches. If use by pedestrians is expected, ADA requirements must be met.

7. Structures:
   a) Multi-use paths constructed along hillsides or next to drainage ditches steeper than 3H:1V shall be protected with an approved handrail system in conformance with these standards.
   b) Bridges designed exclusively for bicycle and pedestrian traffic shall be designed for pedestrian live loadings. Bridge width shall be the total of the path width plus the side clear distances. Bridge decks shall be designed with bicycle safe expansion joints. Decking boards shall be placed transverse to the direction of normal bike travel and shall be coated with a nonskid surfacing material approved by the City's Public Works Department.
   c) Where gravel driveways cross the path, a 5-foot paved apron shall be provided to minimize the transfer of gravel to the pathway.
8. Pavement Design:
   a) Subgrades shall be sterilized with a suitable non-environmentally hazardous herbicide that is approved by the City of Independence Public Works Department to prevent subsequent intrusion of hardy weeds, vines, or other plant material into or upheaving through path surfaces.
   b) Additional asphalt, base rock, and subgrade reinforcement shall be provided in path sections projected to bear heavy maintenance vehicle traffic. No less than one additional inch of asphalt shall be provided in these areas.
   c) The wearing surface of AC pavement shall conform to ODOT SSC Section 00745, "Hot Mixed Asphalt Concrete" for Level 1 HMAC. Pavement design shall be a minimum of 3 inches of AC pavement over a 4-inch thick base consisting of ¾"–0" crushed aggregate backfill, meeting requirements of Chapter 2 Subsection "Granular Fill." Base rock shall be compacted to 95% of the maximum dry density as determined by AASHTO T-180. Base rock shall be placed over a firm subgrade stripped as per Chapter 2 Subsection "Clearing and Grubbing."
   d) PCC pavement shall be an acceptable path surface alternative. The surface shall be broom finished and crack-control joints shall be saw-cut, not troweled. Minimum design thickness shall be 4 inches of PCC over a 2-inch base consisting of ¾"–0" crushed aggregate backfill, meeting requirements of Chapter 2 Subsection "Granular Fill." Base rock shall be compacted to 95% of the maximum dry density as determined by AASHTO T-180. Base rock shall be placed over a firm subgrade stripped as per Chapter 2 Subsection "Clearing and Grubbing."
   e) Location of expansion and contraction joints in PCC multi-use paths shall be approved by the Public Works Department authorized representative. All expansion joints, paving joints, driveway intersections, and railroad crossings shall be designed to maintain a smooth riding surface.
   f) Pathways in close proximity to trees shall be protected from root intrusion as per "Root Barriers" Chapter 2 Subsection "Curb and Grading Outside of Street."
9. Public Easements and Rights-of-Way: The City, through the development application process, may require the granting of a public easement for multi-use paths. Where it is deemed to be in the best interests of the City, a dedication of right-of-way may be required in lieu of an easement. Bike path easements and rights-of-way shall be no less than 15 feet wide, or wider as determined by the City in accordance with the following:
   a) Where terrain dictates cut or fill sections to meet path design requirements, additional width shall be required only to the extent necessary for sides lopes

B. Recreational Trail: This is an ADA accessible surface with a usable width of 4 to 6 feet conforming to the ADA Standards for Accessible Design requirements. It is the City's policy not to illuminate recreational trails.
C. Landscaping:
    1. Landscaping shall be provided along multi-use paths and recreational trails. Selection of trees, shrubs, and ground cover should include low-maintenance varieties that are drought tolerant and require little pruning. Shrubs should be low growing (under 3 feet at mature height). Location and placement of plant materials should not result in growth over or onto the path surface.
    2. All proposed plant materials shall be approved by the City of Independence. All landscaping, signs, and other potential obstructions shall be set back a minimum of 1 foot from the edge of the pathway surface. No exposed rock shall be permitted within 2 feet of the pathway surface. All exposed earth within 2 feet of the pathway surface shall be planted with grass, sod, or covered with 2" of bark dust.
    3. A number of important design considerations should be reviewed when selecting materials and planning planting schemes. Trees are of primary concern regarding location and variety. Specifically, placement and selection of trees should evaluate the following:
        a) Tree rooting characteristics - to avoid potential path surface upheaval.
        b) Tree size - trees shall be of satisfactory caliper to permit a minimum vertical clearance of 8 feet to the lowest branch. The clearance shall be a minimum of 10 feet where vehicular traffic is expected.
        c) Tree placement - to avoid creating hiding areas and future site distance issues.
D. Root Control: Pathways shall be protected from root intrusion as per "Root Barriers" in Chapter 2 Subsection "Curb and Grading Outside of Street."

7.2.4 Sidewalks

A. The location, design, and construction of sidewalks shall be in conformance with Chapter 2 Subsection "Sidewalks."
B. Special Design Standards: The physical environment shall be enhanced to encourage bicycling and walking by following these standards:
    1. Minimum sidewalk width shall be in conformance with Chapter 2 Subsection "Sidewalks."
    2. Issues should be addressed to encourage walking by providing a more pleasant environment. Urban design features to provide pedestrian amenities such as street trees, furniture, kiosks, trash receptacles, directional signage, and bicycle amenities such as bike racks, shall be provided when required by the City.
    3. Pedestrian facilities shall be consistent with the ADA Standards for Accessible Design.

7.2.5 Signing and Marking

A. All pathways and bicycle route shall be clearly identified and posted with signs are a common method for identifying bicycle routes. Signing and marking of bikeways are important in providing safety to users and shall be in conformance with the MUTCD, Part 9.
B. On multi-use paths, adequate signing and marking shall be used to alert users to potential hazards and to convey regulatory messages to bicyclists, pedestrians, and motorists at highway intersections. In addition, guide signs, such as to dictate directions, destinations, distances, route numbers, and names of crossing streets, shall be used in the same manner as they are used on highways.
C. On multi-use path areas where limited sight vision or curves exist, or where heavy volumes of bicycles or nighttime riding is expected, a 4-inch wide yellow centerline stripe shall be

used. Four-inch wide white edge lines (or fog lines) shall be used where nighttime bicycle traffic is expected. Skid-resistant pavement marking materials shall be used over materials that become slippery when wet.

7.3 TRAFFIC CONTROL

A. At intersections where bicycle traffic exists or is anticipated, bicycles shall be considered in the timing of the traffic signal cycle, as well as the traffic detection device.
B. To check the clearance interval, a bicyclist's speed of 10 miles per hour and a perception/reaction/braking time of 2.5 seconds shall be used. Detectors for traffic-actuated signals shall be sensitive to bicycles and shall be located in the bicyclist's expected path, including left-turn lanes. Where programmed visibility signal heads are used, they shall be checked to ensure that they are visible to bicyclists who are properly positioned on the road.
C. The MUTCD, Part 9, and the Oregon Supplement shall be consulted for guidance on signs and pavement markings. Where bicyclists are expected to use different patterns than motorists, direction signing shall be used to advise bicyclists of this special routing. At intersections, bicyclists proceeding straight through and motorist turning right must cross paths. It is recommended to use striping and signing configurations that encourage these crossings in advance of the intersection, in a merging fashion.

7.4 SUPPORT FACILITIES

In addition to improving public facilities and routes to connect destinations, the City requires basic design considerations for bicyclists and pedestrians when they arrive at their destination. City requirements for the following support facilities can be found in the PSMP and City zoning code:

A. On-site Bicycle and Pedestrian Circulation for all New Developments.
B. Bicycle and Pedestrian Paths.
C. Bicycle Parking Requirements.
D. Bicycle Lockers or Other Secure Parking Facilities
E. Locational Standards for Bicycle Parking.